AGENDA

Rogers City Council

May 27, 2025 - 7:00 PM

Work Session at 6:00 p.m.

1. CALL TO ORDER AND PLEDGE OF ALLEGIANCE

2. OPEN FORUM

Individuals may address the Council about any item not contained on the regular agenda. A maximum of 10 minutes is allocated for the Forum. If the full 10 minutes are not needed for the Forum, the Mayor will continue with the agenda. If additional time is needed for the Forum, the Council will continue the Forum following Other Business on the agenda. The Council will take no official action on items discussed at the Forum, with the exception of referral to staff of Commission for future report.

3. PRESENTATIONS

3.1 Recognize Former Plymouth Police Chief and Public Safety Director Mike Goldstein

- Approval of Resolution 2025-32MG; Recognizing Former Plymouth Police Chief and Public Safety Director Mike Goldstein

3.2 Presentation and Discussion with County Commissioner Kevin Anderson

4. APPROVE AGENDA

Council members may add items to the agenda for discussion purposes or staff direction only. The Council will not normally take official action on items added to the agenda.

5. CONSENT AGENDA

These items are considered to be routine and will be enacted by one motion. There will be no separate discussion of these items unless a Councilmember so requests, in which event the item will be removed from the Consent Agenda and placed elsewhere on the agenda.

5.1 Approval of the May 13, 2025 City Council Meeting Minutes

5.2 Approval of Bills and Claims

5.3 Approval of Application for Gambling Exempt Permit for Rogers Royals Tip Off Club to Conduct Bingo and a Raffle on November 8, 2025 at R Social on Main,

Located at 12901 Main Street, Rogers

5.4 Approval of Newsletter Publishing Contract for Rogers Senior Center

5.5 Approval of Resolution 2025-39 Approving the Northdale Addition Final Plat (Northdale Blvd Light Industrial Development) and Authorization to Execute a Development Agreement.

5.6 Approve Items related to Northview Preserve Final Plat:

- Approve Resolution 2025-41, Approval of Final Plat for Northview Preserve.
- Authorize Execution of Subdivision Agreement and Stormwater Maintenance Agreements related to Northview Preserve.

5.7 Approve Change Order No. 1, South Community Park Buildings, City Project No. 2104

5.8 Approve Change Orders No. 5 (Labor), 6 (Materials), 7 (Labor) and 8 (Materials), Indoor Turf Facility, City Project No. 2201

5.9 Approve Purchase of Tennant Floor Scrubber for Public Works Maintenance Facility

5.10 Approve an Easement Encroachment Agreement for 22238 138th Ave N

5.11 Approve Professional Services Agreement with Leo A Daly for City Hall/Police Department Architecture and Engineering, City Project No. 2202

5.12 Approval of Special Event Permit Application Agreement with Rogers Lions Club for Rockin' Rogers Days

6. PUBLIC HEARINGS

6.1 Public Hearing and Consideration of Resolution 2025-40 Authorizing the Assignment and Amendments to the MyPlas MIF Grant and Loan Agreements with GDB Circular, Inc.

7. GENERAL BUSINESS

7.1 Approve the Hire of Jesse (Jess) Hertwig as a Paid-on-Call Firefighter

7.2 Consider Applications by Rachel Development for Preliminary Plat and Planned Unit Development for Cowley Lake Preserve (169-lot Subdivision).

- Consider Ordinance 2025-03, Rezoning to PUD
- Consider Resolution 2025-32, Authorizing Summary Publication of

Ordinance
- Consider Resolution 2025-30, Approval of Preliminary Plat and Master Development Plan for Cowley Lake Preserve

8. OTHER BUSINESS

9. CORRESPONDENCE AND REPORTS

10. ADJOURN

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 3.1

Subject: Recognize Former Plymouth Police Chief and Public Safety Director Mike Goldstein

- Approval of Resolution 2025-32MG; Recognizing Former Plymouth Police Chief and Public Safety Director Mike Goldstein

Prepared By: Dan Wills, Chief of Police

Recommended Council Action

Motion to Approve Resolution 2025-32MG Recognizing former Plymouth Police Chief and Public Safety Director Mike Goldstein

Overview / Background / Analysis

Plymouth Public Safety Director/Police Chief Mike Goldstein retired in late January 2021, after a landmark career in Plymouth that has spanned more than three decades. Chief Goldstein passed away unexpectedly on May 20, 2025, due to a medical incident he suffered while traveling with his wife and friends.

Chief Goldstein's list of accomplishments includes developing inroads with schools, faith communities, community organizations and residents of all backgrounds. His areas of focus also included an elevated approach to officer hiring, wellness and training. He has bolstered the City of Plymouth's and the region's ability to prepare and respond to critical incidents, and encouraged other city departments to become learned in emergency management and organized exercises in order to be prepared to handle large-scale disasters.

Raised in Plymouth, Chief Goldstein devoted his entire professional life to the City of Plymouth until his retirement. In 1984, as a senior at Armstrong High School, he joined Plymouth's first class of Police Explorers. From there, Goldstein went on to be a part of the first group of Plymouth Police Reserves, volunteering with the department while studying criminal justice and public administration at the University of St. Thomas.

In 1990, he was hired as a full-time sworn Officer with the Plymouth Police Department wearing badge number 32. He was promoted to Sergeant in 1994, Lieutenant in 2001, Captain in 2003, Police Chief in 2004 and was named the city's Public Safety Director in 2015, when the Police and Fire departments joined under one umbrella. Throughout his career, Chief Goldstein acted as a mentor to countless young officers in the Plymouth Police Department as well as other departments in the region, including Rogers Police Chief Dan Wills.

After retirement, Chief Goldstein continued his involvement in law enforcement as the Director of Security for Pohlad Companies, working alongside former Rogers Police Chief Jeff Beahen. With his focus on officer health and well-being, in 2017, Chief Goldstein co-founded Provicta, whose mission is to provide a community of support for the physical and mental well-being of first responders through innovative wellness and technology solutions to optimize performance, build

resiliency to stress and improve long-term health outcomes.

Chief Wills will offer additional personal remembrances of Chief Goldstein at the City Council meeting.

Staff Recommendation
Motion to Approve Resolution 2025-32MG Recognizing former Plymouth Police Chief and Public Safety Director Mike Goldstein

Financial Impact: **Source Fund**:

Budgeted? N/A

Supporting Documentation
A. Resolution 2025-32MG

RESOLUTION NO. 2025-32MG

A RESOLUTION RECOGNIZING FORMER PLYMOUTH POLICE CHIEF AND PUBLIC SAFETY DIRECTOR MIKE GOLDSTEIN

WHEREAS, Chief Goldstein devoted his entire professional career with the Plymouth Police Department, first as an Explorer while in high school, then as a volunteer Reserve while pursuing his college degree in criminal justice and public administration; and

WHEREAS, in 1990 Chief Goldstein was hired as a full-time sworn Officer with the Plymouth Police Department wearing badge number 32; and

WHEREAS, Chief Goldstein rose through the ranks of the Plymouth Police Department first as Lieutenant, Captain and eventually Police Chief in 2004; and

WHEREAS, Chief Goldstein's endless list of accomplishments includes developing inroads with schools, faith communities, community organizations and residents of all backgrounds; and

WHEREAS, Chief Goldstein focused on an elevated approach to officer hiring, wellness and training.

WHEREAS, Chief Goldstein bolstered the City of Plymouth's and the region's ability to prepare and respond to critical incidents, and encouraged other departments to become learned in emergency management in order to handle large-scale disasters; and

WHEREAS, Chief Goldstein retired from the Plymouth Police Department in January, 2021, but continued to actively support the physical and mental well-being of first responders through innovative wellness and technology solutions to optimize performance, build resiliency to stress and improve long-term health outcomes; and

WHEREAS, Chief Goldstein passed away unexpectedly on May 20, 2025; and

WHEREAS, the City of Rogers recognizes Chief Goldstein's countless accomplishments, dedication to law enforcement and officer health and well-being and promotion of emergency preparedness.

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Rogers, Minnesota, that Plymouth Police Chief Mike Goldstein is hereby recognized in memoriam and the City Clerk is directed to forward this resolution to the family of Chief Goldstein.

Moved by Councilmember , seconded by Councilmember

The following voted in favor of said resolution:

The following voted against the same:

The following abstained:

Whereupon said resolution was declared duly passed and adopted, and was signed by the Mayor, and attested by the Clerk dated this 27th day of May, 2025.

_____
Mayor

ATTEST:

_____
City Clerk

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 3.2

Subject: Presentation and Discussion with County Commissioner Kevin Anderson
Prepared By:

Recommended Council Action

Overview / Background / Analysis

Staff Recommendation

Financial Impact: **Source Fund**:

Budgeted?

Supporting Documentation
None

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.1

Subject: Approval of the May 13, 2025 City Council Meeting Minutes
Prepared By: Stacie Brown, City Clerk

Recommended Council Action
Motion to approve the May 13, 2025 City Council meeting minutes.

Overview / Background / Analysis

Staff Recommendation
Motion to approve the May 13, 2025 City Council meeting minutes.

Financial Impact: **Source Fund**:

Budgeted? N/A

Supporting Documentation
A. 05132025min

1. CALL TO ORDER AND PLEDGE OF ALLEGIANCE

The regular meeting of the City Council of the City of Rogers was called to order by Mayor Klick on Tuesday, May 13, 2025, at 7:00 PM at Rogers Community Center, 21201 Memorial Drive, Rogers, MN, 55374 and online in the Zoom application.

Council present: Shannon Klick, Mark Eiden, Amy Enga, Kevin Jullie
Council excused: Joel Brockman

Staff present: Steve Stahmer, Administrator; Bridget Bruska, Finance Director; Patrick Farrens, Fire Chief; Doran Cote, Public Works Director/City Engineer; Brett Angell, Community Development Director; Alec Henderson, City Planner; Bob Vose, City Attorney; and Stacie Brown, City Clerk

2. OPEN FORUM

Natalie Nylin - 11960 Sahara Circle: Came forward to request Council consideration for allowing backyard chickens within the City of Rogers, regardless of lot size. Miss Nylin stated that she lives south of Territorial Road and recently raised 10 baby chicks in her basement until they were 10 weeks old. Because chickens are not allowed on their property, she had to re- home her chickens at her brother's house in Savage, where they are allowed to have chickens and goats on any size neighborhood lot. Miss Nylin shared a list of other cities in the Metro area where chickens are allowed, as well as the related benefits. She stated that her chickens would be kept on their lawn, and they would ask permission from neighbors. Miss Nylin asked the Council to consider changing the zoning rules to allow all Rogers residents to have backyard chickens.

Council thanked her for her input, and Mayor Klick explained that this topic is on a long list of items to be considered by the Council however, it's not the top item at this time.

3. PRESENTATIONS

None.

4. APPROVE AGENDA

Councilor Eiden moved, Councilor Enga seconded a motion approving the agenda as submitted. Motion carried 4-0.

5. CONSENT AGENDA

5.1 Approval of the April 22, 2025 Work Session Minutes and the April 22, 2025 City Council Meeting Minutes

5.2 Approval of Bills and Claims

5.3 Approval of a Special Event Permit Application and Request to Waive Fees from the Rogers Lions Club for Oktoberfest; September 6, 2025 at the 21st Century Bank Event Center, 12716 Main Street

5.4 Approval of a Temporary On-Sale Liquor License for the Rogers Lions Club for Oktoberfest; September 6, 2025 at the 21st Century Bank Event Center, 12716 Main Street

5.5 Scheduling a City Council Workshop for Tuesday, May 27, 2025 at 6:00 p.m.

5.6 Approve Job Descriptions and Posting Building Inspector Positions

5.7 Approval of a Consent to the Amended and Restated Easement Agreement for 21400 John Milless Drive (former Muni)

5.8 Approval of Resolution 2025-35 Approving the Participation of the Hennepin County Housing and Redevelopment Authority in an Affordable Housing Project (Duffy Main Street Senior)

5.9 Approval of an Easement Encroachment Agreement and Trail Easement with T5 Rogers, LLC for the Property at 13510 Rogers Drive

5.10 Approval of the Selection of Kutak Rock as the City's Bond and Economic Development Legal Counsel

5.11 Approve the Extended North Memorial Ambulance Lease of Rogers Fire Station 1 Space

5.12 Approve Quote to Paint Rogers Fire Station 1 Apparatus Bay and Other Areas

5.13 Approval of Playground Purchase for Territorial Park

5.14 Approve and Authorize Execution of a Grade Crossing Construction and Agreement for Fletcher Bypass, City Project No. 1409, Between BNSF Railway Company and City of Rogers

5.15 Approval for Fiber Expansion to South Community Park

5.16 Authorize Purchase of Replacement Compressor Controller from Gartner Refrigeration

5.17 Approval of Resolution 2025-38; Accepting Donation to the City from the Rogers Fire Auxiliary

Councilor Jullie requested to pull items 5.5 and 5.14 for separate discussion. Councilor Enga requested to pull item 5.17 for separate discussion.

Councilor Eiden moved, Councilor Jullie seconded a motion approving the Consent Agenda as amended. Motion carried 4-0.

Item 5.5: Councilor Jullie inquired about the subject of the requested workshop. Administrator Stahmer stated that it would be to discuss a Request for Proposals for a Civic Campus.

Councilor Jullie moved, Councilor Eiden seconded a motion to approve Item 5.5; scheduling a City Council workshop for Tuesday, May 27, 2025 at 6:00 p.m. Motion carried 4-0.

Item 5.14: Councilor Jullie asked for an update regarding an agreement being reached with BNSF Railway Company, with condemnation having been previously authorized on March 25th, 2025 to allow the project to move forward. Public Works Director/City Engineer Cote shared that an acceptable form of the agreement was received the following day, allowing the City to construct and maintain the crossing. As part of this agreement, the City would need to pay for some future maintenance as well. All costs are reflected in the agreement, allowing perpetual use of a crossing. Jullie asked if this was anticipated in the project budget, and Cote stated that the one unexpected cost was for future maintenance, which is now included in the agreement. Jullie asked if the old crossing is covered in this agreement, and Cote referenced a draft Ordinance included as an attachment, which proposes to close the crossing at Fletcher Lane. This is not required; however, it's included in consideration of vacating the crossing. Jullie asked if the project schedule will move forward sooner than anticipated, and Cote referenced a draft schedule which has been provided with a best-case scenario for a late-August bid award. Eiden inquired about the maintenance item costs, and Cote recommended paying up front due to the value of the dollar today being higher today than in the future. Jullie asked if it's unusual to pay for future maintenance, and Cote replied that it is something new under BNSF crossing agreements.

Councilor Jullie moved, Councilor Enga seconded a motion to approve Item 5.14; approving and authorizing execution of a Grade Crossing Construction and Maintenance Agreement for Fletcher Bypass, City Project No. 1409, between BNSF Railway Company and the City of Rogers. Motion carried 4-0.

Item 5.17: Councilor Enga acknowledged the Rogers Fire Auxiliary for their donation to the City, and Council expressed appreciation.

Councilor Enga moved, Mayor Klick seconded a motion to approve Item 5.17;

approving Resolution 2025-38; Accepting a Donation to the City from the Rogers Fire Auxiliary. Motion carried 4-0.

6. PUBLIC HEARINGS

None.

7. GENERAL BUSINESS

7.1 Consideration of the Main Street Center 2nd Addition Preliminary and Final Plat by Duffy Development

Community Development Director Angell presented the proposed Preliminary and Final Plat for the Main Street Center 2nd Addition, corresponding to the Duffy Main Street Development. He reviewed details of the property and the site plan which was previously approved, noting that nothing on the development itself is changing as a result of this plat request. Approval is contingent upon closing of the property, so the plat would not be recorded in advance of the closing. A Public Hearing was held for this request at the May Planning Commission meeting. Two individuals came forward to speak; one newer property owner expressing concerns about traffic in the Main Street corridor, and the owner of W&W properties, who spoke in favor of the request. Angell stated that planned improvements for that district were shared at the meeting. The developer is present this evening to respond to any questions.

Councilor Jullie asked to confirm this is consistent with what has been discussed with the developer, and nothing is different. Angell stated this is consistent with everything discussed with the developer over the last year and a half. Some changes are related to the financing structure with Minnesota Housing, however still consistent with the plan itself.

Councilor Eiden moved, Councilor Jullie seconded a motion approving Resolution 2025-34, subject to the conditions as listed in the Resolution. Motion carried 4-0.

7.2 Consider Items Related to Wood Lane Villas (Benzinger Properties, Inc.) 17-Lot Residential Subdivision

City Planner Henderson presented details of the proposed Wood Lane Villas subdivision, including the site location at 23415 Wood Lane, existing conditions, land use and zoning. This property is surrounded by the Skye Meadows development, and the Preliminary Plat incorporates approximately 5 acres into a residential development of 17 lots. The existing stub streets and utilities from Skye Meadows would be used. A Planned Unit Development (PUD) is requested, with minimum lot widths of 65 feet, lot sizes of sub-10,000 square feet, and 7.5-foot side setbacks. Henderson explained that this is a very clear site with no wetlands. Dedicated right-of-way and roadway improvements along Wood Lane are proposed (reconstructing from gravel). Most lots are sub-10,000 square feet, due to where the right-of-way dead-ended in the Skye Meadows development.

Henderson reviewed the purpose and standards for Planned Unit Developments. The requested minimum lot size is 7,800 square feet and interior side setbacks of 7.5 feet, with standard R2 zoning for the other setbacks. In the public interest, the request would provide a logical extension of utilities and streets, increased housing variety, and a cohesive architectural design with high-quality materials. This connects to Comprehensive Plan goals with housing diversity, sustainable growth, and extending transportation/sidewalk connectivity. Henderson shared renderings of the villa home products and a ghost plat from the Skye Meadows development for adjacent areas, with a very similar lot layout (orientation and lot count) as proposed. Henderson noted that Planned Unit Developments are high city-discretion items.

A Public Hearing was held at the May Planning Commission meeting. Several individuals came forward to express concerns about the amount of development in the area and traffic on Wood Lane; however, they seemed to understand that development happens. A concern was raised regarding screening, which the Planning Commission wanted to be addressed in the Resolution; a screening fence is recommended along the keyboard lots to the west. Separate from the plat, the Commission also wanted an evaluation for additional landscaping within the City-owned outlot to the west (to improve screening). Henderson stated that the applicant's Engineer is present to address any questions.

Councilor Eiden inquired about the purpose of a narrow outlot. Public Works Director/City Engineer Cote stated it was formerly Cartway, back in the Hassan Township days. With landlocked parcels to the south, it was vacated and remained as part of the outlot with Skye Meadows. Eiden asked why it wouldn't be incorporated, with concerns over the depth of the lots to the west. Henderson stated the additional 33 feet would not be enough to bring them to 10,000. There is a lift station at the end of the cul-de-sac to the south, and it may provide flexibility for redevelopment to the west. It was just space that wasn't incorporated into the Skye Meadows development. Eiden asked how far Wood Lane would be paved, and Henderson replied that it would be paved the width of the plat boundary. Cote confirmed that Wood Lane would continue to be gravel to the west.

Councilor Enga stated that during the Planning Commission meeting, residents owning 5-acre lots mentioned that people wander across their properties as if it were parkland, which is part of why screening is wanted. Eiden acknowledged that, despite reservations, he understands the challenges of this location and how it makes sense to finish it. However, he does not want round three of this, inquiring about the remaining ghost plat areas. Henderson replied that nothing is planned across the street; there is additional land which may allow flexibility for larger lots. Due to the stub streets, there are restrictions which make it difficult to shift. Henderson stated that ghost plats are strictly a conceptual exercise.

The Council discussed the prospects of adjusting the lot sizes, with the desire to

avoid smaller setbacks and smaller lots, as well as the Planning Commission recommendation for additional screening. Henderson confirmed that the screening under condition number nine in the Resolution would be the responsibility of the developer. Any screening done separately on the City-owned outlot would be the City's responsibility. Eiden asked if the outlot was to be mowed, and Cote stated that the intention at this time was to leave it, as it has been for the last five years. Enga shared that comments were made at the Planning Commission meeting regarding the look of the outlot. Cote explained that the property in question which is being developed was previously owned by a landscaper, who opted to maintain the outlot on his own.

Enga inquired if the grade of the new houses sits higher than the properties to the west. Dave Nash, the Engineer representing Benzinger Homes on this project came forward. He confirmed that in that corner, there is a 3-foot retaining wall proposed where the grade drops into the outlot area. However, if there is a benefit for the City and the developer to do additional grading in the outlot to make it work better, they are happy to do so. Right now, it's not their intention to do so, because it's not their land.

Mayor Klick expressed that though this makes sense for this scenario, it is not in line with the will of the Council. This is a rural area, and not desirable for this type of development, as residents continue to express a dislike for it. City Administrator Stahmer explained that Planning staff do make developers aware of the Council's concerns over Planned Unit Developments; however, they still have the right to apply, especially in this type of scenario. Council reviewed condition number nine again, and Henderson noted the condition could be further defined, including fence size and materials.

Councilor Eiden moved, Councilor Jullie seconded a motion approving Ordinance No. 2025-05; Rezoning Property from R2 to PUD for the Wood Lane Villas Development. Motion carried 4-0.

Councilor Enga moved, Councilor Jullie seconded a motion approving Resolution 2025- 36; Authorizing Summary Publication of Ordinance 2025-05. Motion carried 4-0.

Councilor Eiden moved, Councilor Enga seconded a motion approving Resolution 2025-37; Granting Approval of the Preliminary Plat and Master Development Plan for the Wood Lane Villas Subdivision. Motion carried 4-0.

7.3 Approval of Ordinance No. 2025-04, An Ordinance Mandating the Hauling of Source Separated Organics

City Administrator Stahmer recapped the background regarding Hennepin County Ordinance 13, mandating the hauling of source-separated organics recycling:

The Hennepin County Board of Commissioners previously adopted County Ordinance 13, which requires all cities in the County to ensure that curbside organics recycling is made available to all residential properties in each municipality (cities under 10,000 population can comply via drop-off sites). Like all other cities, Rogers must comply with this Ordinance, or Hennepin County will implement a program and charge the City directly, to be paid by utility/recycling customers, likely at a significantly higher cost to residents. Rogers is now the final City that had a population of over 10,000 residents at the time of Ordinance adoption, which has not yet complied with Ordinance 13.

Billing by garbage haulers for those organics services is complicated by the fact that the State Statute essentially requires each hauler to charge the same monthly rate to all of their company's customers within a given city, whether a specific customer actually uses the organics service or not. So, a customer who chooses not to request an organics recycling cart and does not use the service must, under State law, be charged the same monthly rate as a customer who does request a cart and actively recycles organics. These are State and County requirements, not those of the City.

The City of Rogers has worked diligently to seek various forms of relief related to this Ordinance from the County Board, by way of requesting the ability to implement centralized drop-off locations, which are an allowed alternative for cities under 10,000 population. If allowed, this would have been a significantly cheaper alternative for residents while complying with the Ordinance/Statute, as compared with curbside service. Ultimately, the City was informed that the County cannot provide such relief/amendment due to its required Minnesota Pollution Control Agency (MPCA) solid waste plan, and the City must therefore comply with curbside service provision as soon as possible. When this issue began to be discussed, the City considered two broad alternatives to complying with the County Ordinance:

- Licensing all residential garbage haulers and requiring that they offer curbside organics recycling to their customers in Rogers.
- Organizing collection through a single hauler in the same manner that single-sort recycling is done today, with the City needing to be in the middle of the billing process.

A third option would have been to allow the County to take over organics licensing, as stated in Ordinance 13, whereby the County asserts their right to charge the City back for that service program. In researching and reviewing potential options and contracts, City Attorney Vose provided the opinion that the City should not be required to either license or organize collection under the County Ordinance, largely given that the City is not currently licensing haulers as the licensing authority per County Ordinance/State Statute.

Pursuant to discussions between Attorney Vose and the Attorney for the County, a new option arose, which would allow the City to comply with Ordinance 13 by

adopting a simple City Ordinance that requires all garbage/refuse haulers operating in the City of Rogers to offer organics collection, and to comply with County and State reporting and billing requirements. That Ordinance is provided in this evening's meeting packet for Council to review.

Stahmer reiterated that the City Council and staff realize and understand that many residents who choose not to use their organics recycling service but are nevertheless charged the monthly fee, will find these requirements unfair. However, this issue is not within the control of the City of Rogers, and compliance is not optional. The Council's goal has been to comply with the minimum requirements in the least onerous and invasive way possible.

Councilor Eiden asked where funds are going; if haulers are charging all residents and only a small percentage are using the service. Stahmer replied that this does appear to be a windfall at this time for haulers, particularly in areas where there are low participation rates. Eiden noted that residents may feel compelled to compare prices. Councilor Enga asked fees could increase if participation rates increase. Stahmer replied that he can't say for sure, but most contracts are written in tiers.

Councilor Jullie expressed that the City should have a clear message (in simple terms) to residents about where this mandate is coming from, and how much the City has done to advocate for residents on this issue. Stahmer stated the topic will be covered in upcoming newsletters. Jullie proposed that it would be good to have this on the website. Jullie asked if organics are being picked up on the same day as garbage, and Public Works Director/City Engineer Cote replied that Republic Services stated that the pickups would occur on the same day (not with the same truck). However, it's at the hauler's discretion.

Councilor Enga moved, Councilor Jullie seconded a motion approving Ordinance 2025-04. Motion carried 4-0.

8. OTHER BUSINESS

None.

9. CORRESPONDENCE AND REPORTS

None.

10. ADJOURN

Mayor Klick adjourned the meeting at 8:06 p.m.

Respectfully Submitted,

Stacie Brown
City Clerk

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.2

Subject: Approval of Bills and Claims
Prepared By:

Recommended Council Action
Motion to approve bills and claims as presented.

Overview / Background / Analysis
According to the City's purchasing policy, all purchases made by City staff must be reviewed and approved by the City Council during each Council meeting via the consent agenda.

The accounts payable registers detailing the payments issued by the City since the cutoff date of the last Council meeting are attached to this item.

Staff Recommendation
Motion to approve bills and claims as presented.

Financial Impact: N/A **Source Fund**: N/A

Budgeted? N/A

Supporting Documentation
A. AP Cover Sheet
B. 05-09-2025 Checks #95164-95204 & ACH Payments
C. 05-09-2025 Checks #95205-95227 - UB Overpayments
D. 05-14-2025 Checks #95228-95266 & ACH Payments

CITY OF ROGERS
05.27.2025 CITY COUNCIL MEETING
OPERATING ACCOUNTS - ADDITIONAL CLAIMS PAID/TO BE PAID

City Payroll Checks, Taxes & Misc Fees Paid		
5/15/2025	ADP Child Support/Garnishment	124.62
5/15/2025	ADP Direct Deposits	248,408.26
5/9/2025	ADP Fees	759.90
5/9/2025	ADP Fees	1,080.00
5/9/2025	ADP Fees	1,754.24
5/9/2025	ADP Fees	811.81
5/15/2025	ADP Payroll Taxes	96,508.92
5/19/2025	Humana (Employee Paid Supplemental Plan)	458.88
5/8/2025	Health Equity FSA/DCAP	600.00
5/20/2025	ICMA Deferred Compensation	2,778.83
5/9/2025	Optum Health Plan Fund	3,300.00
5/14/2025	Optum Health Plan Fund	1,650.00
5/16/2025	Optum Health Plan Fund	6,234.20
5/19/2025	PERA	73,084.71
5/19/2025	State of MN HCSP	3,720.11
5/19/2025	State of MN - Deferred Comp	12,325.00
	Payroll & Misc Fee Expenditures	453,599.48
City Checks & ACH Paid		
05.09.2025	City Checks & ACH Paid (95164-95204)	249,870.26
05.09.2025	City Checks UB Overpayments (95205-95227)	2,833.67
05.14.2025	City Checks & ACH Paid (95228-95266)	591,583.47
	City Check & ACH Expenditures	844,287.40
City Misc ACH/Wires Paid		
5/16/2025	Civic Pay ACH Fees Utility Billing	41.17
5/12/2025	Wells Fargo Client Analysis Fees	2,219.84
5/12/2025	Pitney Bowes Postage - Auto Replenish	1,000.00
5/15/2025	MNDOR - City Sales Tax	3,586.00
5/19/2025	MNDOR - Water Sales Tax	3,197.00
	City ACH/Wire Expenditures	10,044.01
	City Total To Be Approved	**1,307,930.89**
Liquor Misc ACH/Wires Paid		
5/12/2025	MNDOR - Liquor Sales Tax	57,048.00
	Liquor ACH/Wire Expenditures	57,048.00
	Liquor Total to Be Approved	**57,048.00**

Accounts Payable

Computer Check Proof List by Vendor

User: mrathlisberger@rogersmn.gov
Printed: 05/08/2025 - 1:10PM
Batch: 00002.05.2025

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: acrst	Across the Street Productions			Check Sequence: 1	ACH Enabled: False
27763	Blue Card-Palmer	385.00	05/09/2025	207-420-2210-44360-0000	
	Check Total:	385.00			
Vendor: actin	Active911 Inc			Check Sequence: 2	ACH Enabled: False
622418	Active 911 Subscription Renewal	441.00	05/09/2025	100-420-2100-44330-0000	
	Check Total:	441.00			
Vendor: almed	Allied Medical Training			Check Sequence: 3	ACH Enabled: False
4024	EMT Certification-Grandlund	715.50	05/09/2025	100-420-2210-44360-0000	
	Check Total:	715.50			
Vendor: aspmi	Aspen Mills			Check Sequence: 4	ACH Enabled: False
352384	Uniform Shirts - SW Gardas	57.83	05/09/2025	100-420-2100-42180-0000	
352752	Uniform Shirts - SW Gardas	93.63	05/09/2025	100-420-2100-42180-0000	
353026	Apparel-Folkstad & Blake	145.93	05/09/2025	100-420-2210-42180-0000	
	Check Total:	297.39			
Vendor: belco	Bellboy Corporation			Check Sequence: 5	ACH Enabled: True
020752860	THC	413.50	05/09/2025	609-497-9760-42535-0000	
	Check Total:	413.50			
Vendor: Wirbe	BreakThru Beverage Minnesota Wine & Sprirts			Check Sequence: 6	ACH Enabled: True
121120280	Liquor	10,555.49	05/09/2025	609-497-9760-42510-0000	
121120281	Liquor	56.89	05/09/2025	609-497-9760-42510-0000	
121120281	Mix	67.40	05/09/2025	609-497-9760-42540-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
121120282	Wine	647.61	05/09/2025	609-497-9760-42530-0000	
413471771	Liquor Credit	-15.24	05/09/2025	609-497-9760-42510-0000	
	Check Total:	11,312.15			
Vendor: terpo	Brookfield Renewable			Check Sequence: 7	ACH Enabled: True
200100249649	RAC Solar April 2025	286.21	05/09/2025	205-450-5205-43810-0000	
	Check Total:	286.21			
Vendor: cabcl	Cable Cloud			Check Sequence: 8	ACH Enabled: True
CC26600	City Hall Cubicle Project 2nd Expansion - Cablı	468.50	05/09/2025	400-000-0000-10100-0000	
CC26600	City Hall Cubicle Project 2nd Expansion - Cablı	-468.50	05/09/2025	400-000-0000-10100-4012	
CC26600	City Hall Cubicle Project 2nd Expansion - Cablı	468.50	05/09/2025	400-410-1940-45700-0000	
	Check Total:	468.50			
Vendor: capbe	Capitol Beverage			Check Sequence: 9	ACH Enabled: True
30260036	Beer Credit	-19.60	05/09/2025	609-497-9760-42520-0000	
3116531	Beer Credit	-63.60	05/09/2025	609-497-9760-42520-0000	
3125493	Beer Credit	-549.10	05/09/2025	609-497-9760-42520-0000	
3125496	THC	1,032.00	05/09/2025	609-497-9760-42535-0000	
3125496	Beer	9,458.10	05/09/2025	609-497-9760-42520-0000	
3125496	Wine	411.00	05/09/2025	609-497-9760-42530-0000	
3128849	Beer	4,489.50	05/09/2025	609-497-9760-42520-0000	
	Check Total:	14,758.30			
Vendor: carcl	Carson, Clelland & Schreder			Check Sequence: 10	ACH Enabled: True
7580	April Attorney Fees	8,930.00	05/09/2025	100-420-2100-43040-0000	
	Check Total:	8,930.00			
Vendor: cdwgo	CDW Government			Check Sequence: 11	ACH Enabled: True
AD8R63G	6904544 OTTERBOX CHARGING PAD F/MA	25.61	05/09/2025	100-430-3000-42000-0000	
	Check Total:	25.61			
Vendor: cemag	Cemstone Aggregates			Check Sequence: 12	ACH Enabled: False
7716432	FS 1 Floor Covering Reno Prep-Concrete	836.50	05/09/2025	449-420-2210-45200-2505	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
7719238	FS 1 Floor Covering Reno Prep-Concrete	812.50	05/09/2025	449-420-2210-45200-2505	
	Check Total:	1,649.00			
Vendor: cenen	CenterPoint Energy Resources Corp.			Check Sequence: 13	ACH Enabled: False
13775555-9	Gas - SCP April	26.01	05/09/2025	100-450-5200-43830-0000	
	Check Total:	26.01			
Vendor: cenen	CenterPoint Energy Resources Corp.			Check Sequence: 14	ACH Enabled: False
5542017-8	Gas - Sr. Center April	23.91	05/09/2025	100-450-5186-43830-0000	
	Check Total:	23.91			
Vendor: cenen	CenterPoint Energy Resources Corp.			Check Sequence: 15	ACH Enabled: False
13775557-5	Gas - SCP Warming House April	150.90	05/09/2025	100-450-5200-43830-0000	
	Check Total:	150.90			
Vendor: cenen	CenterPoint Energy Resources Corp.			Check Sequence: 16	ACH Enabled: False
5490566-6	Gas - CH April	266.49	05/09/2025	100-410-1940-43830-0000	
5490566-6	Gas - PW April	621.78	05/09/2025	100-430-3000-43830-0000	
	Check Total:	888.27			
Vendor: cenen	CenterPoint Energy Resources Corp.			Check Sequence: 17	ACH Enabled: False
11177201-8	Gas - Event Center April	498.61	05/09/2025	100-410-1941-43830-0000	
	Check Total:	498.61			
Vendor: cenen	CenterPoint Energy Resources Corp.			Check Sequence: 18	ACH Enabled: False
11626254-4	Gas - Splash Pad April	98.71	05/09/2025	100-450-5200-43830-0000	
	Check Total:	98.71			
Vendor: cenen	CenterPoint Energy Resources Corp.			Check Sequence: 19	ACH Enabled: False
6403368750-6	Gas - 21701 Industrial Blvd. April	26.01	05/09/2025	100-410-1940-43830-0000	
	Check Total:	26.01			
Vendor: embpw	Century Link			Check Sequence: 20	ACH Enabled: False
313942943	RWAS Phone April & May	363.10	05/09/2025	609-497-9760-43210-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	363.10			
Vendor: berbe	Chas. A. Bernick, Inc.			Check Sequence: 21	ACH Enabled: False
10348201	THC	919.00	05/09/2025	609-497-9760-42535-0000	
10348202	NA	230.90	05/09/2025	609-497-9760-42540-0000	
10348202	Beer	1,078.15	05/09/2025	609-497-9760-42520-0000	
	Check Total:	2,228.05			
Vendor: cinco	Cintas Corporation			Check Sequence: 22	ACH Enabled: True
4228270549	RWAS Mats & Towels 4/23/25	260.71	05/09/2025	609-497-9760-43100-0000	
4229006365	Uniform - WTR 4/30/25	6.17	05/09/2025	601-494-9440-42180-0000	
4229006365	Mats & Towels 4/30/25	22.00	05/09/2025	100-430-3000-44060-0000	
4229006365	Uniform - PW 4/30/25	25.33	05/09/2025	100-430-3000-42180-0000	
4229006365	Uniform - Janitorial 4/30/25	2.24	05/09/2025	100-410-1940-44060-0000	
4229006365	Uniform - PK 4/30/25	16.96	05/09/2025	100-450-5200-42180-0000	
4229006365	Uniform - SWR 4/30/25	6.16	05/09/2025	602-495-9490-42180-0000	
4229006365	Uniform - Gen'l. Gov't. Bldgs. 4/30/25	2.95	05/09/2025	100-410-1940-42180-0000	
4229011668	PD Floor Mats 04/30/25	72.16	05/09/2025	100-420-2100-44060-0000	
	Check Total:	414.68			
Vendor: citda	City of Dayton			Check Sequence: 23	ACH Enabled: False
2025	Advanced Auto Extrication Course X6	2,100.00	05/09/2025	100-420-2210-44360-0000	
	Check Total:	2,100.00			
Vendor: mnpip	Core & Main LP			Check Sequence: 24	ACH Enabled: False
W900149	4 Goldline Internal CPLG For Fox Creek West	9.16	05/09/2025	404-000-0000-10100-0000	
W900149	4 Goldline SW Snap End Cap For Fox Creek We	-9.16	05/09/2025	404-000-0000-10100-4016	
W900149	4 Goldline Hwy Perf 250' SGL Wall 4 Fox Creek	-275.00	05/09/2025	404-000-0000-10100-4016	
W900149	4 Goldline SW Snap End Cap For Fox Creek We	9.16	05/09/2025	404-000-0000-10100-0000	
W900149	4 Goldline SW Snap End Cap For Fox Creek We	9.16	05/09/2025	404-450-5200-45300-2503	
W900149	4 Goldline Internal CPLG For Fox Creek West	9.16	05/09/2025	404-450-5200-45300-2503	
W900149	4 Goldline Hwy Perf 250' SGL Wall 4 Fox Creek	275.00	05/09/2025	404-000-0000-10100-0000	
W900149	4 Goldline Internal CPLG For Fox Creek West	-9.16	05/09/2025	404-000-0000-10100-4016	
W900149	4 Goldline Hwy Perf 250' SGL Wall 4 Fox Creek	275.00	05/09/2025	404-450-5200-45300-2503	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
W900331	61WTWB67K528 K528 BREAKABLE KIT FL	517.32	05/09/2025	601-494-9440-42104-0000	
	Check Total:	810.64			
Vendor: dahdi	Dahlheimer Distributing Co.			Check Sequence: 25	ACH Enabled: True
2410585	Beer Credit	-67.20	05/09/2025	609-497-9760-42520-0000	
2432632	Beer Credit	-52.20	05/09/2025	609-497-9760-42520-0000	
2444171	Beer Credit	-719.20	05/09/2025	609-497-9760-42520-0000	
2452355	Beer	2,915.97	05/09/2025	609-497-9760-42520-0000	
2452355	Soft Drink	170.00	05/09/2025	609-497-9760-42540-0000	
2452923	THC	802.00	05/09/2025	609-497-9760-42535-0000	
2452924	NA	241.20	05/09/2025	609-497-9760-42540-0000	
2454983	Beer	11,279.35	05/09/2025	609-497-9760-42520-0000	
2454984	THC	171.00	05/09/2025	609-497-9760-42535-0000	
2454985	Beer	49.20	05/09/2025	609-497-9760-42520-0000	
2455297	Beer Credit	-352.20	05/09/2025	609-497-9760-42520-0000	
2458451	NA	56.60	05/09/2025	609-497-9760-42540-0000	
2458452	THC	610.00	05/09/2025	609-497-9760-42535-0000	
2458453	Beer	4,296.65	05/09/2025	609-497-9760-42520-0000	
	Check Total:	19,401.17			
Vendor: cldis	Dick Family Inc.			Check Sequence: 26	ACH Enabled: True
2089532	Beer	579.00	05/09/2025	609-497-9760-42520-0000	
2089532	THC	296.00	05/09/2025	609-497-9760-42535-0000	
2093160	THC	210.50	05/09/2025	609-497-9760-42535-0000	
2093160	Beer	471.60	05/09/2025	609-497-9760-42520-0000	
	Check Total:	1,557.10			
Vendor: dmxmu	DMX Music - Minneapolis			Check Sequence: 27	ACH Enabled: False
58859458	RWAS Music May	53.45	05/09/2025	609-497-9760-43100-0000	
	Check Total:	53.45			
Vendor: facmo	Elliot Auto Supply Co, Inc.			Check Sequence: 28	ACH Enabled: False
128-216020	#35-023 WIX WP10129 Cabin Air Panel	8.79	05/09/2025	602-495-9490-42103-0000	
128-216020	#35-023 WIX WP10129 Cabin Air Panel	8.79	05/09/2025	601-494-9440-42103-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	17.58			
Vendor: feren	Ferguson Enterprises #1657			Check Sequence: 29	ACH Enabled: False
1572513	Rental: Pipe Crimper For Plumbing Work	50.00	05/09/2025	205-450-5205-44100-0000	
1574308	Parts To Redo Plumbing At The RAC	181.46	05/09/2025	205-450-5205-42102-0000	
1575303	Parts To Redo Plumbing At The RAC	195.02	05/09/2025	205-450-5205-42102-0000	
CM183392	RETURN: IF 1 PXP SR 90 ELL 01:1440931	-10.57	05/09/2025	205-450-5205-42102-0000	
CM183392	RETURN: LF 1 PXPXP TEE 01:1440931	-16.05	05/09/2025	205-450-5205-42102-0000	
CM183392	RETURN: LF 1X1 ORS PXF ADPT 011575303	-14.10	05/09/2025	205-450-5205-42102-0000	
	Check Total:	385.76			
Vendor: finwa	Finken Water Centers			Check Sequence: 30	ACH Enabled: True
1485910	Hassan Hall Water Softener May	18.00	05/09/2025	100-410-1940-42100-0000	
	Check Total:	18.00			
Vendor: marso	Marc Frederickson			Check Sequence: 31	ACH Enabled: False
1945	RAC Solar Salt (50 Bags)	397.50	05/09/2025	205-450-5205-43820-0000	
	Check Total:	397.50			
Vendor: gense	General Security Serv. Corp.			Check Sequence: 32	ACH Enabled: True
50041531	FS2-Fire Alarm & Monitoring 5/1/25-7/31/25	179.85	05/09/2025	100-420-2210-43100-0000	
50041531	CR-Fire Test 5/1/25-7/31/25	25.20	05/09/2025	100-410-1940-43100-0000	
50041531	CH-Elevator Monitoring 5/1/25-7/31/25	30.00	05/09/2025	100-410-1940-43100-0000	
50041531	EC-Fire Alarm & Monitoring 5/1/25-7/31/25	74.85	05/09/2025	100-410-1941-43100-0000	
50041531	SPAD-Inspection Fire Alarm & Mon. 5/1/25-7/3	254.85	05/09/2025	100-450-5200-43100-0000	
50041531	CH-Fire Test & Alarm Sys. Mon.5/1/25-7/31/25	27.86	05/09/2025	100-410-1940-43100-0000	
50041531	RAC-Fire Test Fire Alarm & Mon. 5/1/25-7/31/2	92.85	05/09/2025	205-450-5205-43100-0000	
50041531	FS1-Fire Test 5/1/25-7/31/25	19.80	05/09/2025	100-420-2210-43100-0000	
50041531	PW-Fire Test & Alarm Sys. Mon. 5/1/25-7/31/25	64.99	05/09/2025	100-430-3000-43100-0000	
	Check Total:	770.25			
Vendor: mires	Global Reserve			Check Sequence: 33	ACH Enabled: True
ORD-16355	THC	380.80	05/09/2025	609-497-9760-42535-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	380.80			
Vendor: hassa	Hassan Sand & Gravel, Inc.			Check Sequence: 34	ACH Enabled: True
185399	Buckshot/Pea Rock For Fox Creek West	-1,028.86	05/09/2025	404-000-0000-10100-4016	
185399	Buckshot/Pea Rock For Fox Creek West	1,028.86	05/09/2025	404-450-5200-45300-2503	
185399	Buckshot/Pea Rock For Fox Creek West	1,028.86	05/09/2025	404-000-0000-10100-0000	
185462	Buckshot/Pea Rock For Fox Creek West	-517.91	05/09/2025	404-000-0000-10100-4016	
185462	Buckshot/Pea Rock For Fox Creek West	517.91	05/09/2025	404-000-0000-10100-0000	
185462	Buckshot/Pea Rock For Fox Creek West	517.91	05/09/2025	404-450-5200-45300-2503	
	Check Total:	1,546.77			
Vendor: inbre	Insight Brewing			Check Sequence: 35	ACH Enabled: False
23445	THC	915.00	05/09/2025	609-497-9760-42535-0000	
	Check Total:	915.00			
Vendor: frobu	iSport Networks LLC			Check Sequence: 36	ACH Enabled: False
RAC250501	RAC Expansion Naming Rights Consult Phase II	2,000.00	05/09/2025	410-450-5200-43100-0000	
	Check Total:	2,000.00			
Vendor: johbr	Johnson Brothers Liquor Co.			Check Sequence: 37	ACH Enabled: False
2773497	Liquor	557.50	05/09/2025	609-497-9760-42510-0000	
2773498	Wine	90.63	05/09/2025	609-497-9760-42530-0000	
2773536	Liquor	2,345.40	05/09/2025	609-497-9760-42510-0000	
2773537	Wine	1,868.77	05/09/2025	609-497-9760-42530-0000	
2773539	Liquor	2,465.75	05/09/2025	609-497-9760-42510-0000	
2776424	Liquor	139.27	05/09/2025	609-497-9760-42510-0000	
2776554	Liquor	531.35	05/09/2025	609-497-9760-42510-0000	
2776555	Wine	157.77	05/09/2025	609-497-9760-42530-0000	
2778574	Liquor	1.75	05/09/2025	609-497-9760-42510-0000	
2778575	Wine	269.25	05/09/2025	609-497-9760-42530-0000	
2778614	Liquor	4,505.76	05/09/2025	609-497-9760-42510-0000	
2778615	Wine	1,466.34	05/09/2025	609-497-9760-42530-0000	
2778616	Liquor	3,885.50	05/09/2025	609-497-9760-42510-0000	
3761903	Beer	110.80	05/09/2025	609-497-9760-42520-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
3761904	THC	167.10	05/09/2025	609-497-9760-42535-0000	
3763548	Beer	60.00	05/09/2025	609-497-9760-42520-0000	
3763549	THC	58.95	05/09/2025	609-497-9760-42535-0000	
6964401	Wine	158.20	05/09/2025	609-497-9760-42530-0000	
6964439	Liquor	1,111.22	05/09/2025	609-497-9760-42510-0000	
6964440	Wine	2,585.50	05/09/2025	609-497-9760-42530-0000	
6964441	Mix	53.90	05/09/2025	609-497-9760-42540-0000	
6968379	Liquor	1,959.53	05/09/2025	609-497-9760-42510-0000	
6968380	Wine	2,326.71	05/09/2025	609-497-9760-42530-0000	
6968381	Mix	218.40	05/09/2025	609-497-9760-42540-0000	
7516329	Wine	490.50	05/09/2025	609-497-9760-42530-0000	
7517278	Wine	0.88	05/09/2025	609-497-9760-42530-0000	
7517282	Wine	839.38	05/09/2025	609-497-9760-42530-0000	
	Check Total:	28,426.11			
Vendor: k&seng	K&S Engraving LLC			Check Sequence: 38	ACH Enabled: True
13891	Par Tags SCBA Tags & Wall Tags	59.00	05/09/2025	100-420-2210-42100-0000	
	Check Total:	59.00			
Vendor: shagr	Kelbro Company			Check Sequence: 39	ACH Enabled: False
122-00068	Ice	164.24	05/09/2025	609-497-9760-42570-0000	
471718	Ice	49.90	05/09/2025	609-497-9760-42570-0000	
81-00008	Ice	233.41	05/09/2025	609-497-9760-42570-0000	
	Check Total:	447.55			
Vendor: btac	Melanie Koenen			Check Sequence: 40	ACH Enabled: True
1039	Wellness Session #6	130.00	05/09/2025	100-420-2100-43140-0000	
	Check Total:	130.00			
Vendor: lels	Law Enforcement Labor Services, Inc.			Check Sequence: 41	ACH Enabled: True
May 2025	May 2025 Union Dues	292.00	05/09/2025	100-000-0000-21709-0000	
May 2025	May 2025 Union Dues	1,168.00	05/09/2025	100-000-0000-21709-0000	
	Check Total:	1,460.00			

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: lawpr	Lawson Products			Check Sequence: 42	ACH Enabled: False
9312444925	50370 #14X1 Hex Wash Hd Self-Drill Screws	30.04	05/09/2025	100-430-3120-42260-0000	
9312444926	97691 Thin Nose Grease Couple	25.18	05/09/2025	100-430-3000-42100-0000	
9312448845	Various Washers Screws Lug Nuts & Etc.	463.59	05/09/2025	100-430-3000-42100-0000	
9312448846	1148492 1/4-20 316 SS Nylon Insert Locknuts	33.10	05/09/2025	100-430-3000-42100-0000	
9312448846	81874 1/4 316 Stainless Steel Flat Washer	23.10	05/09/2025	100-430-3000-42100-0000	
	Check Total:	575.01			
Vendor: lucli	Luce Line Brewing			Check Sequence: 43	ACH Enabled: False
E-3768	THC	402.00	05/09/2025	609-497-9760-42535-0000	
E-3793	Beer	310.00	05/09/2025	609-497-9760-42520-0000	
	Check Total:	712.00			
Vendor: marco	Marco Inc			Check Sequence: 44	ACH Enabled: True
553422544	Copier / Printer Contract May	194.13	05/09/2025	609-497-9760-44120-0000	
553422544	Copier / Printer Contract May	802.65	05/09/2025	100-410-1325-44120-0000	
553422544	Copier / Printer Contract May	244.80	05/09/2025	205-450-5205-44120-0000	
553422544	Copier / Printer Contract May	266.29	05/09/2025	100-410-1520-44120-0000	
553422544	Copier / Printer Contract May	140.29	05/09/2025	602-495-9490-44120-0000	
553422544	Copier / Printer Contract May	2,126.43	05/09/2025	100-430-3000-44120-0000	
553422544	Copier / Printer Contract May	1,996.41	05/09/2025	100-420-2100-44120-0000	
553422544	Copier / Printer Contract May	140.29	05/09/2025	601-494-9440-44120-0000	
553422544	Copier / Printer Contract May	367.20	05/09/2025	100-450-5120-44120-0000	
553422544	Copier / Printer Contract May	2,032.86	05/09/2025	100-420-2210-44120-0000	
553422544	Copier / Printer Contract May	140.29	05/09/2025	603-496-9495-44120-0000	
553422544	Copier / Printer Contract May	96.40	05/09/2025	100-450-5186-44120-0000	
	Check Total:	8,548.04			
Vendor: cleri	McDonald Distributing Company			Check Sequence: 45	ACH Enabled: True
803096	Beer	41.00	05/09/2025	609-497-9760-42520-0000	
803096	THC	720.00	05/09/2025	609-497-9760-42535-0000	
	Check Total:	761.00			
Vendor: menar	Menards, Inc.			Check Sequence: 46	ACH Enabled: True

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
46920	RUBBER WALL BASE 4X1/8X4	11.00	05/09/2025	100-410-1940-42102-0000	
46920	TEC WALL BASE ADHESIVE	4.97	05/09/2025	100-410-1940-42102-0000	
46920	COVE BASE ADH SPREADER	2.96	05/09/2025	100-410-1940-42102-0000	
47331	COMP SPRING 3/4 X 10 1/2	5.79	05/09/2025	100-430-3120-42103-0000	
47331	COMP SPRING 5/8 X 10-1/2	5.29	05/09/2025	100-430-3120-42103-0000	
47649	ZEP 3201 HD SPRAY BOTTLE	6.50	05/09/2025	100-410-1940-42102-0000	
47649	100CT 4MIL NITRILE GLOVES	13.42	05/09/2025	100-410-1940-42102-0000	
47649	GLASS LINT - FREE CLOTH 6P	5.59	05/09/2025	100-410-1940-42102-0000	
47649	FEBREZE PLUG REFILL 2PK	11.86	05/09/2025	100-420-2210-42102-0000	
47649	FEBREZE PLUG REFILL 2PK	15.08	05/09/2025	100-410-1940-42102-0000	
47649	GLASS LINT - FREE CLOTH 6P	4.40	05/09/2025	100-420-2210-42102-0000	
47649	ZEP 3201 HD SPRAY BOTTLE	5.11	05/09/2025	100-420-2210-42102-0000	
47649	100CT 4MIL NITRILE GLOVES	10.55	05/09/2025	100-420-2210-42102-0000	
	Check Total:	102.52			
Vendor: metcou	Metropolitan Council Environmental Services			Check Sequence: 47	ACH Enabled: True
0001187318	June 2025 METC Services	113,442.32	05/09/2025	602-495-9490-43115-0000	
	Check Total:	113,442.32			
Vendor: midla	Midwest Landscapes			Check Sequence: 48	ACH Enabled: True
10085	Colorado Zafiro Spruce #3	89.47	05/09/2025	100-450-5200-43180-0000	
10085	Cupressina Spruce 5'	303.56	05/09/2025	100-450-5200-43180-0000	
	Check Total:	393.03			
Vendor: milch	Miller Chevrolet			Check Sequence: 49	ACH Enabled: False
188185	#35-017 23404450 Receptacle	65.24	05/09/2025	100-450-5200-42103-0000	
	Check Total:	65.24			
Vendor: mindehe	Minn. Dept. of Health			Check Sequence: 50	ACH Enabled: False
Operator Exam	J. Abrahamson Class C Operator Exam Fee	32.00	05/09/2025	601-494-9440-44380-0000	
	Check Total:	32.00			
Vendor: schso	MN Equipment Inc.			Check Sequence: 51	ACH Enabled: True
P44824	TCU23048 Shield	215.72	05/09/2025	100-450-5200-42103-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
P44826	#15-019 R269302 Knob	15.75	05/09/2025	100-450-5200-42103-0000	
	Check Total:	231.47			
Vendor: norto	Northern Tool & Equipment			Check Sequence: 52	ACH Enabled: True
1e7f13de	97557 26RS 62 Chain Loop	28.99	05/09/2025	100-450-5200-42105-0000	
1e7f13de	6042471 Compact 2-Tool Combo Kit	249.00	05/09/2025	100-450-5200-42105-0000	
	Check Total:	277.99			
Vendor: nbh	Nothing But Hemp LLC			Check Sequence: 53	ACH Enabled: True
3448	THC	1,278.00	05/09/2025	609-497-9760-42535-0000	
	Check Total:	1,278.00			
Vendor: raima	Railroad Management Co III, LLC			Check Sequence: 54	ACH Enabled: False
524538	10 Inch Water Pipeline Crossing License Fees	417.05	05/09/2025	601-494-9440-44380-0000	
	Check Total:	417.05			
Vendor: rogtr	Rogers True Value Hardware Inc			Check Sequence: 55	ACH Enabled: False
29465	3004826 Wall Plate 1G Duplex SS	13.16	05/09/2025	100-410-1940-42102-0000	
	Check Total:	13.16			
Vendor: rpmgr	RPM Graphics Incorporated			Check Sequence: 56	ACH Enabled: False
29754	Temporary Signage	297.00	05/09/2025	404-450-5200-42100-0000	
	Check Total:	297.00			
Vendor: souwi	Southern Glazers Wine & Spirits of Minnesota			Check Sequence: 57	ACH Enabled: False
2615475	Liquor	1.28	05/09/2025	609-497-9760-42510-0000	
2615476	Liquor	2,922.92	05/09/2025	609-497-9760-42510-0000	
2615478	Wine	1,372.26	05/09/2025	609-497-9760-42530-0000	
	Check Total:	4,296.46			
Vendor: sprso	Springbrook Holding Co LLC			Check Sequence: 58	ACH Enabled: False
INV-020565	CivicPay Transaction Fee - April 2025	1,053.80	05/09/2025	601-494-9440-44300-0000	
INV-020565	CivicPay Transaction Fee - April 2025	311.35	05/09/2025	603-496-9495-44300-0000	
INV-020565	CivicPay Transaction Fee - April 2025	119.75	05/09/2025	100-430-3245-44300-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
INV-020565	CivicPay Transaction Fee - April 2025	910.10	05/09/2025	602-495-9490-44300-0000	
	Check Total:	2,395.00			
Vendor: state	Starnet Technologies			Check Sequence: 59	ACH Enabled: False
028827	Annual NCC Monitoring @ Rogers High School	240.00	05/09/2025	602-495-9490-43100-0000	
	Check Total:	240.00			
Vendor: strei	Streicher's Inc.			Check Sequence: 60	ACH Enabled: False
I1754045	Uniforms - Vest - Officer Herold	1,548.90	05/09/2025	100-420-2100-42180-0000	
I1759236	Uniform - Vest - Carrier - Herold	338.97	05/09/2025	100-420-2100-42180-0000	
	Check Total:	1,887.87			
Vendor: sunbel	Sunbelt Rentals			Check Sequence: 61	ACH Enabled: False
167634138-0001	FS 1 Floor Covering Reno Prep-Rental: Diamon	112.03	05/09/2025	449-420-2210-45200-2505	
167634138-0001	FS 1 Floor Covering Reno Prep-Rental: Floor Sa	368.39	05/09/2025	449-420-2210-45200-2505	
	Check Total:	480.42			
Vendor: accbe	TASC			Check Sequence: 62	ACH Enabled: False
IN3439988	Administration Fee Active Continuant Fee April	5.15	05/09/2025	100-410-1325-44300-0000	
	Check Total:	5.15			
Vendor: tshwill	The Sherwin Williams Co			Check Sequence: 63	ACH Enabled: True
4396-0	GALLON B20W2951 PM200 HP 0 EG EW FOI	118.30	05/09/2025	100-410-1940-42102-0000	
	Check Total:	118.30			
Vendor: twicis	Twin City Seed Co			Check Sequence: 64	ACH Enabled: False
201016	Factor T Staples	780.00	05/09/2025	603-496-9495-44055-0000	
	Check Total:	780.00			
Vendor: vinin	Vinocopia Inc			Check Sequence: 65	ACH Enabled: True
0371484-IN	Wine	1,261.00	05/09/2025	609-497-9760-42530-0000	
0371484-IN	Mix	24.00	05/09/2025	609-497-9760-42540-0000	
0371484-IN	Liquor	234.25	05/09/2025	609-497-9760-42510-0000	
0371897-IN	Liquor	302.50	05/09/2025	609-497-9760-42510-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	1,821.75			
Vendor: grain	W.W. Grainger, Inc.			Check Sequence: 66	ACH Enabled: True
9492987335	33W499 Metal Dome Valve Cap PK100	19.11	05/09/2025	100-430-3000-42100-0000	
	Check Total:	19.11			
Vendor: xcele	Xcel Energy			Check Sequence: 67	ACH Enabled: False
51-6488908-5	Lift Stations March	1,923.72	05/09/2025	602-495-9490-43810-0000	
	Check Total:	1,923.72			
Vendor: xcele	Xcel Energy			Check Sequence: 68	ACH Enabled: False
51-6488911-0	Traffic Signal - S. Ramp Hwy 101 & 94 April	12.65	05/09/2025	100-430-3120-43170-0000	
	Check Total:	12.65			
Vendor: xcele	Xcel Energy			Check Sequence: 69	ACH Enabled: False
51-6488910-9	Police Dept. - 21860 Industrial Blvd March	1,711.81	05/09/2025	100-420-2100-43810-0000	
51-6489910-9	City Hall-22350 S. Diamond Lk. Rd. March	513.25	05/09/2025	100-410-1940-43810-0000	
51-6489910-9	Public Works-22350 S. Diamond Lk. Rd. March	1,197.61	05/09/2025	100-430-3000-43810-0000	
	Check Total:	3,422.67			
Vendor: ziein	Ziegler, Inc.			Check Sequence: 70	ACH Enabled: True
IN001897542	#15-017 1721055 Bushings	44.24	05/09/2025	100-430-3120-42103-0000	
	Check Total:	44.24			
	Total for Check Run:	249,870.26			
	Total of Number of Checks:	70			

Accounts Payable

Computer Check Proof List by Vendor

User: mrathlisberger@rogersmn.gov
Printed: 05/08/2025 - 2:24PM
Batch: 00003.05.2025



Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: UB*00460	Jeffrey Benzinger			Check Sequence: 1	ACH Enabled: False
	Refund Check 006689-000, 12675 Island View (	68.00	05/09/2025	601-000-0000-20200-0000	
	Check Total:	68.00			
Vendor: UB*00455	Lisa Bonden			Check Sequence: 2	ACH Enabled: False
	Refund Check 007878-000, 21740 Linden Way	54.66	05/09/2025	601-000-0000-20200-0000	
	Check Total:	54.66			
Vendor: UB*00458	Amy Ebert			Check Sequence: 3	ACH Enabled: False
	Refund Check 003131-000, 12632 Adeline Way	89.25	05/09/2025	601-000-0000-20200-0000	
	Check Total:	89.25			
Vendor: UB*00466	Julie Guyott			Check Sequence: 4	ACH Enabled: False
	Refund Check 010938-000, 24569 Superior Dr	57.25	05/09/2025	601-000-0000-20200-0000	
	Check Total:	57.25			
Vendor: UB*00452	Christopher Knopik			Check Sequence: 5	ACH Enabled: False
	Refund Check 007173-000, 12754 Adeline Way	30.75	05/09/2025	601-000-0000-20200-0000	
	Check Total:	30.75			
Vendor: UB*00456	Linda Larson			Check Sequence: 6	ACH Enabled: False
	Refund Check 010905-000, 20585 Twilight Tr	12.06	05/09/2025	601-000-0000-20200-0000	
	Check Total:	12.06			
Vendor: UB*00453	Lennar Family of Builders			Check Sequence: 7	ACH Enabled: False
	Refund Check 012539-000, 23275 Amber Dr	91.64	05/09/2025	601-000-0000-20200-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	91.64			
Vendor: UB*00457	Lennar Family of Builders			Check Sequence: 8	ACH Enabled: False
	Refund Check 012546-000, 23445 1/2 124th	1,015.91	05/09/2025	601-000-0000-20200-0000	
	Check Total:	1,015.91			
Vendor: UB*00465	Craig Linsday			Check Sequence: 9	ACH Enabled: False
	Refund Check 011938-000, 22975 Wood Ln	64.18	05/09/2025	601-000-0000-20200-0000	
	Check Total:	64.18			
Vendor: UB*00461	Suzanne Maki			Check Sequence: 10	ACH Enabled: False
	Refund Check 004885-000, 12665 Elm Pkwy	74.29	05/09/2025	601-000-0000-20200-0000	
	Check Total:	74.29			
Vendor: UB*00459	Vicky Peterson			Check Sequence: 11	ACH Enabled: False
	Refund Check 008427-000, 12532 Marion Ct	40.26	05/09/2025	601-000-0000-20200-0000	
	Check Total:	40.26			
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 12	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	40.57	05/09/2025	601-000-0000-20200-0000	
	Check Total:	40.57			
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 13	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	132.71	05/09/2025	602-000-0000-20200-0000	
	Check Total:	132.71			
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 14	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	79.97	05/09/2025	601-000-0000-20200-0000	
	Check Total:	79.97			
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 15	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	4.83	05/09/2025	601-000-0000-20200-0000	
	Check Total:	4.83			

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 16	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	25.00	05/09/2025	603-000-0000-20200-0000	
	Check Total:	25.00			
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 17	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	29.83	05/09/2025	100-000-0000-20200-0000	
	Check Total:	29.83			
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 18	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	53.10	05/09/2025	602-000-0000-20200-0000	
	Check Total:	53.10			
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 19	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	11.34	05/09/2025	603-000-0000-20200-0000	
	Check Total:	11.34			
Vendor: UB*00463	Pulte Homes of MN			Check Sequence: 20	ACH Enabled: False
	Refund Check 013396-000, 12825 Farnham Ln	17.40	05/09/2025	601-000-0000-20200-0000	
	Check Total:	17.40			
Vendor: UB*00464	Jesse Rossow			Check Sequence: 21	ACH Enabled: False
	Refund Check 007598-000, 21083 Goldenrod L	44.88	05/09/2025	601-000-0000-20200-0000	
	Check Total:	44.88			
Vendor: UB*00454	Touch 'Em All Car Wash			Check Sequence: 22	ACH Enabled: False
	Refund Check 004205-000, 21675 137th Ave N	630.42	05/09/2025	601-000-0000-20200-0000	
	Check Total:	630.42			
Vendor: UB*00462	Deanna Wesley			Check Sequence: 23	ACH Enabled: False
	Refund Check 011082-000, 13666 Twilight Tr	165.37	05/09/2025	601-000-0000-20200-0000	
	Check Total:	165.37			

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Total for Check Run:	2,833.67			
	Total of Number of Checks:	23			

Accounts Payable

Computer Check Proof List by Vendor

User: mrathlisberger@rogersmn.gov
Printed: 05/14/2025 - 8:31AM
Batch: 00004.05.2025

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: adain	Adam's Pest Control Inc			Check Sequence: 1	ACH Enabled: True
4079344	Commercial Pest Control April	103.88	05/14/2025	100-410-1941-43100-0000	
	Check Total:	103.88			
Vendor: AFLAC	AFLAC			Check Sequence: 2	ACH Enabled: False
030431	EE Paid Insurance Premiums May 2025	970.14	05/14/2025	100-000-0000-21751-0000	
	Check Total:	970.14			
Vendor: ancom	Ancom Communications Inc			Check Sequence: 3	ACH Enabled: True
127757	Gamma Sign-St 2	187.50	05/14/2025	449-420-2210-45200-2209	
	Check Total:	187.50			
Vendor: aswss	Louise Marie Anderson			Check Sequence: 4	ACH Enabled: True
April 2025	SW Supervisory Services - April	150.00	05/14/2025	100-420-2100-43100-0000	
	Check Total:	150.00			
Vendor: andenmn	Anderson Engineering of Minnesota, LLC			Check Sequence: 5	ACH Enabled: False
24353	Work On Rogers Territorial Park April	6,250.00	05/14/2025	404-450-5200-43030-2207	
	Check Total:	6,250.00			
Vendor: belco	Bellboy Corporation			Check Sequence: 6	ACH Enabled: True
0207669600	THC	1,061.50	05/14/2025	609-497-9760-42535-0000	
	Check Total:	1,061.50			
Vendor: Wirbe	BreakThru Beverage Minnesota Wine & Sprirts			Check Sequence: 7	ACH Enabled: True
121234895	Mix	180.85	05/14/2025	609-497-9760-42540-0000	
121234896	Liquor	686.24	05/14/2025	609-497-9760-42510-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
121234897	Wine	218.90	05/14/2025	609-497-9760-42530-0000	
121343769	Mix	29.80	05/14/2025	609-497-9760-42540-0000	
121343770	Liquor	3,301.53	05/14/2025	609-497-9760-42510-0000	
	Check Total:	4,417.32			
Vendor: canri	Cannon River Winery			Check Sequence: 8	ACH Enabled: False
18063	Wine	180.00	05/14/2025	609-497-9760-42530-0000	
	Check Total:	180.00			
Vendor: capbe	Capitol Beverage			Check Sequence: 9	ACH Enabled: True
2466848	Beer Credit	-26.50	05/14/2025	609-497-9760-42520-0000	
3131914	Wine	411.00	05/14/2025	609-497-9760-42530-0000	
3131914	Liquor	1,461.25	05/14/2025	609-497-9760-42510-0000	
3131914	THC	200.00	05/14/2025	609-497-9760-42535-0000	
3131914	Beer	6,947.70	05/14/2025	609-497-9760-42520-0000	
	Check Total:	8,993.45			
Vendor: miste	Car Wash Partners Inc			Check Sequence: 10	ACH Enabled: True
232820	PD Car Washes - April	248.00	05/14/2025	100-420-2100-44040-0000	
	Check Total:	248.00			
Vendor: cdwgo	CDW Government			Check Sequence: 11	ACH Enabled: True
AD87C7M	Network Equipment For Rogers Field House	9,788.20	05/14/2025	410-450-5200-45200-2201	
AD9KE5U	Network Equipment For Rogers Field House	734.39	05/14/2025	410-450-5200-45200-2201	
AD9KT9M	Computer Headset - P. Moen	151.19	05/14/2025	100-430-3000-42010-0000	
AD9M62B	OTTERBOX CASE DEFENDER IPHONE 15/1	53.19	05/14/2025	100-410-1940-42100-0000	
	Check Total:	10,726.97			
Vendor: berbe	Chas. A. Bernick, Inc.			Check Sequence: 12	ACH Enabled: False
10351398	THC	72.00	05/14/2025	609-497-9760-42535-0000	
10351399	Beer	2,318.20	05/14/2025	609-497-9760-42520-0000	
	Check Total:	2,390.20			
Vendor: cinco	Cintas Corporation			Check Sequence: 13	ACH Enabled: True

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
4229725621	Mats & Towels 5/7/25	67.34	05/14/2025	100-430-3000-44060-0000	
4229725621	Uniform - PK 5/7/25	18.38	05/14/2025	100-450-5200-42180-0000	
4229725621	Uniform - Janitorial 5/7/25	2.24	05/14/2025	100-410-1940-44060-0000	
4229725621	Uniform - Gen'l. Gov't. Bldgs.5/7/25	2.95	05/14/2025	100-410-1940-42180-0000	
4229725621	Uniform - PW 5/7/25	25.52	05/14/2025	100-430-3000-42180-0000	
4229725621	Uniform - WTR 5/7/25	6.26	05/14/2025	601-494-9440-42180-0000	
4229725621	Uniform - SWR 5/7/25	6.26	05/14/2025	602-495-9490-42180-0000	
4229731195	CR Floor Mats 5/7/25	8.86	05/14/2025	100-410-1940-44060-0000	
	Check Total:	137.81			
Vendor: citro	City of Rogers			Check Sequence: 14	ACH Enabled: False
003412-000	RWAS Water April	57.80	05/14/2025	609-497-9760-43820-0000	
004728-000	Water Service-12909 Main St April	48.91	05/14/2025	100-410-1940-43820-0000	
004729-000	Sr. Center Utilities - April 2025	27.71	05/14/2025	100-450-5186-43820-0000	
004730-000	Sewer/Water-FD April '25	11.09	05/14/2025	100-420-2210-43820-0000	
004730-000	Sewer/Water-CR April '25	99.82	05/14/2025	100-410-1940-43820-0000	
004732-000	Utility Service-PW April	234.57	05/14/2025	100-430-3000-43820-0000	
004732-000	Utility Service-CH April	100.54	05/14/2025	100-410-1940-43820-0000	
004734-000	NCP Utilities - April 2025	17.11	05/14/2025	100-450-5200-43820-0000	
004736-000	RAC Utility Service - April 2025	908.31	05/14/2025	205-450-5205-43820-0000	
007397-000	PD Sewer/Water - April	31.11	05/14/2025	100-420-2100-43820-0000	
008783-000	Utility Service-NCP Pk. Bldg April	15.70	05/14/2025	100-450-5200-43820-0000	
010149-000	Event Center Utilities - April 2025	96.51	05/14/2025	100-410-1941-43820-0000	
011577-000	Utility Service-Splash Pad April	48.41	05/14/2025	100-450-5200-43820-0000	
012576-000	21701 Industrial Blvd. - Boyer Bldg. April	120.41	05/14/2025	100-410-1940-43820-0000	
	Check Total:	1,818.00			
Vendor: comca	Comcast Cable Communications Inc.			Check Sequence: 15	ACH Enabled: False
8772 10 560 000	8772 10 560 0008870 FD April '25	2.27	05/14/2025	100-420-2210-43210-0000	
	Check Total:	2.27			
Vendor: mnpip	Core & Main LP			Check Sequence: 16	ACH Enabled: False
W926269	IPERL 1 3TS 1000G SM 4WHL I4S3GLXX	345.16	05/14/2025	601-494-9440-42150-0000	
W936184	Freight	39.20	05/14/2025	601-494-9440-42150-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
W936184	740N4 1 C -STYLE INSETTER 1X1 DPXDP L/	1,080.00	05/14/2025	601-494-9440-42150-0000	
W936184	740-454 1 SOLDER SWIVEL NL NO LEAD 51	96.00	05/14/2025	601-494-9440-42150-0000	
W936184	740-4M4 1 MIP SWIVEL NO LEAD 5149-245	96.00	05/14/2025	601-494-9440-42150-0000	
W936184	IPERL 1 3TS 1000G SM 4WHL I483GLXX	1,891.86	05/14/2025	601-494-9440-42150-0000	
W941540	48 GOLDFLO WTIB SOLID 20' AASHTO DU/	2,127.40	05/14/2025	603-496-9495-44055-0000	
	Check Total:	5,675.62			
Vendor: dahdi	Dahlheimer Distributing Co.			Check Sequence: 17	ACH Enabled: True
2460918	Beer	162.50	05/14/2025	609-497-9760-42520-0000	
2461088	THC	1,347.00	05/14/2025	609-497-9760-42535-0000	
2461089	Beer	13,688.28	05/14/2025	609-497-9760-42520-0000	
2461594	Beer	306.00	05/14/2025	609-497-9760-42520-0000	
2464400	THC	201.00	05/14/2025	609-497-9760-42535-0000	
2464401	NA	298.80	05/14/2025	609-497-9760-42540-0000	
2464402	Beer	715.45	05/14/2025	609-497-9760-42520-0000	
2466849	THC	480.00	05/14/2025	609-497-9760-42535-0000	
2466850	Beer	4,967.70	05/14/2025	609-497-9760-42520-0000	
976-00174	Beer Credit	-60.00	05/14/2025	609-497-9760-42520-0000	
	Check Total:	22,106.73			
Vendor: cldis	Dick Family Inc.			Check Sequence: 18	ACH Enabled: True
2096916	THC	630.00	05/14/2025	609-497-9760-42535-0000	
2096916	Beer	101.75	05/14/2025	609-497-9760-42520-0000	
	Check Total:	731.75			
Vendor: ecmpu	ECM Publishers, Inc.			Check Sequence: 19	ACH Enabled: True
1046971	Public Notice - Ordinance 2025-02	168.00	05/14/2025	100-410-1325-43520-0000	
1046972	Public Notice - Ordinance 2025-04	80.00	05/14/2025	100-410-1325-43520-0000	
	Check Total:	248.00			
Vendor: facmo	Elliot Auto Supply Co, Inc.			Check Sequence: 20	ACH Enabled: False
1-10717216	WIX WP10019 Cabin Air Filter	31.72	05/14/2025	100-420-2100-42103-0000	
1-10718167	WIX 24211 Cabin Air Panel	14.08	05/14/2025	100-420-2100-42103-0000	
128-216105	SPL 700526WR 26 Splash Weather Repel	34.90	05/14/2025	100-420-2100-42103-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
128-216105	SPL 700521WR 21 Splash Weather Repel	31.70	05/14/2025	100-420-2100-42103-0000	
128-216137	DEL 8-01816 HYBRID WIPER BL (SLP-1)	26.20	05/14/2025	100-420-2100-42103-0000	
128-216137	DEL 8-02416 HYBRID WIPER BL (SLP-1)	26.20	05/14/2025	100-420-2100-42103-0000	
128-216169	RETURNDEL 8-01816 19388167 HYBRID WII	-13.10	05/14/2025	100-420-2100-42103-0000	
128-216466	4) FVP CCSOST-11 CARB CLEANER 50 State	16.24	05/14/2025	100-430-3000-42100-0000	
128-216466	12)FVP NCBC-15 N/C BRAKE CLEAN 15 OZ	46.44	05/14/2025	100-430-3000-42100-0000	
128-216496	DEL 24226707 24226707 Automatic Trans #35-(	15.21	05/14/2025	602-495-9490-42103-0000	
128-216496	DEL 24226707 24226707 Automatic Trans #35-(	15.22	05/14/2025	601-494-9440-42103-0000	
128-Z17810	Core Credit - Golf Cart	-48.00	05/14/2025	100-430-3000-42103-0000	
128-Z17810	Core Credit	-27.00	05/14/2025	100-430-3000-42103-0000	
128-Z17810	Core Credit - Golf Cart	-48.00	05/14/2025	205-450-5205-42103-0000	
6-1696036	DEL 8-91816 19388167 HYBRID WIPER BL (S	13.10	05/14/2025	100-420-2100-42103-0000	
	Check Total:	134.91			
Vendor: esker	Esker Inc			Check Sequence: 21	ACH Enabled: True
460303807	Esker - April 2025	721.32	05/14/2025	100-410-1520-43190-0000	
	Check Total:	721.32			
Vendor: gopst	Gopher State One-Call Inc			Check Sequence: 22	ACH Enabled: True
5040722	Locates April 2025	290.25	05/14/2025	601-494-9440-43150-0000	
5040722	Locates April 2025	94.50	05/14/2025	603-496-9495-43150-0000	
5040722	Locates April 2025	290.25	05/14/2025	602-495-9490-43150-0000	
	Check Total:	675.00			
Vendor: grabe	Grape Beginnings, Inc.			Check Sequence: 23	ACH Enabled: False
MN00165632	Wine	530.00	05/14/2025	609-497-9760-42530-0000	
	Check Total:	530.00			
Vendor: hassa	Hassan Sand & Gravel, Inc.			Check Sequence: 24	ACH Enabled: True
185820	Stormwater Repair On David Koch & Wilfred La	888.75	05/14/2025	603-496-9495-44055-0000	
	Check Total:	888.75			
Vendor: heapar	Health Partners			Check Sequence: 25	ACH Enabled: False
616867895613	May ER Paid Health Insurance	196.50	05/14/2025	609-497-9780-41310-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
616867895613	May ER Paid Health Insurance	6,047.42	05/14/2025	602-495-9490-41310-0000	
616867895613	May ER Paid Health Insurance	2,179.70	05/14/2025	205-450-5205-41310-0000	
616867895613	May ER Paid Health Insurance	4,097.60	05/14/2025	100-420-2210-41310-0000	
616867895613	May ER Paid Health Insurance	1,237.22	05/14/2025	100-410-1940-41310-0000	
616867895613	May ER Paid Health Insurance	5,711.96	05/14/2025	609-497-9760-41310-0000	
616867895613	May ER Paid Health Insurance	36,208.33	05/14/2025	100-420-2100-41310-0000	
616867895613	May EE Paid Health Insurance	16,046.09	05/14/2025	100-000-0000-21706-0000	
616867895613	May ER Paid Health Insurance	231.49	05/14/2025	100-430-3245-41310-0000	
616867895613	May ER Paid Health Insurance	3,882.75	05/14/2025	100-410-1910-41310-0000	
616867895613	May ER Paid Health Insurance	3,259.75	05/14/2025	100-410-1950-41310-0000	
616867895613	May ER Paid Health Insurance	491.25	05/14/2025	100-450-5186-41310-0000	
616867895613	May ER Paid Health Insurance	6,440.41	05/14/2025	601-494-9440-41310-0000	
616867895613	May ER Paid Health Insurance	491.25	05/14/2025	203-465-6500-41310-0000	
616867895613	May ER Paid Health Insurance	1,754.41	05/14/2025	100-430-3000-41310-0000	
616867895613	May ER Paid Health Insurance	1,213.69	05/14/2025	100-410-1330-41310-0000	
616867895613	May ER Paid Health Insurance	1,869.51	05/14/2025	603-496-9495-41310-0000	
616867895613	May ER Paid Health Insurance	491.25	05/14/2025	100-410-1941-41310-0000	
616867895613	May ER Paid Health Insurance	7,464.83	05/14/2025	100-450-5200-41310-0000	
616867895613	May ER Paid Health Insurance	5,194.70	05/14/2025	100-430-3120-41310-0000	
616867895613	May ER Paid Health Insurance	2,017.00	05/14/2025	100-420-2400-41310-0000	
616867895613	May ER Paid Health Insurance	196.50	05/14/2025	100-420-2500-41310-0000	
616867895613	May ER Paid Health Insurance	6,436.29	05/14/2025	100-410-1325-41310-0000	
616867895613	May ER Paid Health Insurance	1,502.05	05/14/2025	100-450-5120-41310-0000	
616867895613	May ER Paid Health Insurance	4,262.05	05/14/2025	100-410-1520-41310-0000	
	Check Total:	118,924.00			
Vendor: hencosh	Hennepin County Accounts Receivable			Check Sequence: 26	ACH Enabled: False
1000245846	Radio Fleet Fee April	582.60	05/14/2025	100-430-3000-43250-0000	
1000245850	Radio Fleet Fee - April	5,001.71	05/14/2025	100-420-2100-44120-0000	
	Check Total:	5,584.31			
Vendor: htgar	Hickey Thorstenson Grover LTD			Check Sequence: 27	ACH Enabled: True
23576	RAC Expansion Engineering Services Thru 4/30	63,480.25	05/14/2025	411-450-5205-43030-2406	
23576	Reimbursables - RAC Expansion Engineering Se	459.82	05/14/2025	411-450-5205-43030-2406	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	63,940.07			
Vendor: hohen	Hohensteins Inc			Check Sequence: 28	ACH Enabled: False
817257	Beer	432.00	05/14/2025	609-497-9760-42520-0000	
817257	Mix	63.75	05/14/2025	609-497-9760-42540-0000	
	Check Total:	495.75			
Vendor: infos	InfoSend			Check Sequence: 29	ACH Enabled: False
286138	Infosend Printing Fees April 2025	437.66	05/14/2025	603-496-9495-43500-0000	
286138	Infosend Printing Fees April 2025	1,481.32	05/14/2025	601-494-9440-43500-0000	
286138	Infosend Printing Fees April 2025	168.33	05/14/2025	100-430-3245-43500-0000	
286138	Infosend Printing Fees April 2025	1,279.32	05/14/2025	602-495-9490-43500-0000	
	Check Total:	3,366.63			
Vendor: innof	Innovative Office Solutions LLC			Check Sequence: 30	ACH Enabled: True
IN4831945	Trash Can Liners	109.08	05/14/2025	100-410-1940-42100-0000	
IN4833091	Trash Can Liners	181.00	05/14/2025	100-420-2100-42100-0000	
	Check Total:	290.08			
Vendor: johbr	Johnson Brothers Liquor Co.			Check Sequence: 31	ACH Enabled: False
2773538	NA	38.75	05/14/2025	609-497-9760-42540-0000	
2781963	Liquor	60.10	05/14/2025	609-497-9760-42510-0000	
2781964	Liquor	718.79	05/14/2025	609-497-9760-42510-0000	
2781965	Wine	785.01	05/14/2025	609-497-9760-42530-0000	
2783665	Liquor	702.85	05/14/2025	609-497-9760-42510-0000	
2783666	Wine	614.39	05/14/2025	609-497-9760-42530-0000	
2783708	Liquor	5,803.88	05/14/2025	609-497-9760-42510-0000	
2783709	Wine	788.01	05/14/2025	609-497-9760-42530-0000	
2783710	Mix	119.31	05/14/2025	609-497-9760-42540-0000	
2783711	THC	411.12	05/14/2025	609-497-9760-42535-0000	
2783712	Liquor	2,715.79	05/14/2025	609-497-9760-42510-0000	
6972371	Liquor	3.54	05/14/2025	609-497-9760-42510-0000	
6972372	Wine	3,261.22	05/14/2025	609-497-9760-42530-0000	
6972416	Liquor	648.00	05/14/2025	609-497-9760-42510-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
6972417	Wine	2,557.22	05/14/2025	609-497-9760-42530-0000	
6972418	NA	73.77	05/14/2025	609-497-9760-42540-0000	
	Check Total:	19,301.75			
Vendor: shagr	Kelbro Company			Check Sequence: 32	ACH Enabled: False
122-00174	Ice	482.24	05/14/2025	609-497-9760-42570-0000	
	Check Total:	482.24			
Vendor: konin	KONE Inc			Check Sequence: 33	ACH Enabled: False
871670740	Elevator Maintenance May	181.08	05/14/2025	100-410-1940-44010-0000	
871670740	Elevator Maintenance May	181.08	05/14/2025	205-450-5205-44010-0000	
	Check Total:	362.16			
Vendor: kueco	KUE Contractors Inc			Check Sequence: 34	ACH Enabled: False
Pay App #18	Rogers Fire Station 2 Pay App #18	3,356.92	05/14/2025	449-420-2210-45200-2209	
	Check Total:	3,356.92			
Vendor: lanli	Language Line Services			Check Sequence: 35	ACH Enabled: False
11603155	April Interpreter Services	104.52	05/14/2025	100-420-2100-43100-0000	
	Check Total:	104.52			
Vendor: laneq	Lano Equipment, Inc.			Check Sequence: 36	ACH Enabled: False
03-1150658	2025 Rahn Groomer SN: 16536	3,830.00	05/14/2025	100-450-5200-45800-0000	
	Check Total:	3,830.00			
Vendor: lawpr	Lawson Products			Check Sequence: 37	ACH Enabled: False
9312456190	1568887 114" X314 NYLON FLATWASHER	24.91	05/14/2025	100-430-3120-42260-0000	
	Check Total:	24.91			
Vendor: lyn&mc	Lynde & McLeod, Inc			Check Sequence: 38	ACH Enabled: False
OFF-YW-10567	Black Dirt For Stormwater Repairs	150.00	05/14/2025	603-496-9495-44055-0000	
OFF-YW-10574	Black Dirt For Stormwater Repairs	150.00	05/14/2025	603-496-9495-44055-0000	
Y-10017	Credit For Wrong Price Charged	-100.00	05/14/2025	603-496-9495-44055-0000	
Y-10023	Yard Waste Activity For April	1,846.56	05/14/2025	100-450-5200-43180-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	2,046.56			
Vendor: maceq	MacQueen Equipment, Inc.			Check Sequence: 39	ACH Enabled: True
P48203	Calibration Gas	609.61	05/14/2025	100-420-2210-44040-0000	
P48204	4XR Gas Monitor-Mini Pumper	1,091.89	05/14/2025	400-420-2210-45500-0000	
	Check Total:	1,701.50			
Vendor: madga	Madden Galanter Hansen LLP			Check Sequence: 40	ACH Enabled: True
4/30/2025	Labor Relations Services April 2025	67.50	05/14/2025	100-410-1325-43040-0000	
	Check Total:	67.50			
Vendor: marri	Marie Ridgeway LICSW, LLC			Check Sequence: 41	ACH Enabled: True
3202	April Wellness Check-Ins & Therapy Session	730.00	05/14/2025	100-420-2100-43140-0000	
	Check Total:	730.00			
Vendor: mattri	Matheson Tri-Gas Inc			Check Sequence: 42	ACH Enabled: False
0031388229	Monthly Medical Oxygen - April	214.01	05/14/2025	100-420-2100-42170-0000	
	Check Total:	214.01			
Vendor: cleri	McDonald Distributing Company			Check Sequence: 43	ACH Enabled: True
804248	Liquor	110.00	05/14/2025	609-497-9760-42510-0000	
804248	THC	820.00	05/14/2025	609-497-9760-42535-0000	
	Check Total:	930.00			
Vendor: menar	Menards, Inc.			Check Sequence: 44	ACH Enabled: True
47643	FS 1 Floor Covering Reno Prep-Pool Trowel 14	26.39	05/14/2025	449-420-2210-45200-2505	
47643	FS 1 Floor Covering Reno Prep-5/8" X 20' Reba	112.00	05/14/2025	449-420-2210-45200-2505	
48273	1G STEEL BLANK PLATES	3.98	05/14/2025	100-410-1940-42102-0000	
48273	1G STEEL BLANK PLATES	3.98	05/14/2025	100-420-2210-42102-0000	
48319	4" Internal Snap Coupler-Fox Creek West	-13.56	05/14/2025	404-000-0000-10100-4016	
48319	4"x100' Corr Tubing Perf-Fox Creek West	-119.98	05/14/2025	404-000-0000-10100-4016	
48319	4"x3" Reducing Coupler-Fox Creek West	8.38	05/14/2025	404-450-5200-45300-2503	
48319	4"x3" Reducing Coupler-Fox Creek West	8.38	05/14/2025	404-000-0000-10100-0000	
48319	4"x3" Reducing Coupler-Fox Creek West	-8.38	05/14/2025	404-000-0000-10100-4016	

Invoice No		Description	Amount	Pmt Date	Acct Number	Reference
48319		4" Internal Snap Coupler-Fox Creek West	13.56	05/14/2025	404-000-0000-10100-0000	
48319		4" Internal Snap Coupler-Fox Creek West	13.56	05/14/2025	404-450-5200-45300-2503	
48319		50:1 Fuel Premix 110 Oz	39.30	05/14/2025	100-450-5200-42120-0000	
48319		Ortho GC YLVK Wand 1 Gal.	69.94	05/14/2025	100-450-5200-43180-0000	
48319		4"x100' Corr Tubing Perf-Fox Creek West	119.98	05/14/2025	404-450-5200-45300-2503	
48319		4"x100' Corr Tubing Perf-Fox Creek West	119.98	05/14/2025	404-000-0000-10100-0000	
48374		GREAT STUFF SMRT DISP P&S	155.76	05/14/2025	603-496-9495-44055-0000	
48374		TOOLBOX WHITE RAGS 200CT	9.88	05/14/2025	100-450-5200-42100-0000	
48374		ORTHO WC RTU 1.33GAL WAND	37.94	05/14/2025	100-450-5200-43180-0000	
		Check Total:	601.09			
Vendor:	metwe	Metro West Inspection Services			Check Sequence: 45	ACH Enabled: True
4535		April 2025 Building Inspections	48,099.57	05/14/2025	100-420-2400-43110-0000	
		Check Total:	48,099.57			
Vendor:	metcou	Metropolitan Council Environmental Services			Check Sequence: 46	ACH Enabled: True
April 2025		SAC Report 4/2025	93,485.70	05/14/2025	408-430-3330-43851-0000	
		Check Total:	93,485.70			
Vendor:	midamg	Mid America Goods LLC			Check Sequence: 47	ACH Enabled: False
5006		THC	289.99	05/14/2025	609-497-9760-42535-0000	
		Check Total:	289.99			
Vendor:	milch	Miller Chevrolet			Check Sequence: 48	ACH Enabled: False
188117		84347490 Mirror #6892	343.64	05/14/2025	100-420-2100-42103-0000	
188117		22976569 Housing #6892	56.41	05/14/2025	100-420-2100-42103-0000	
CM188117		RETURNED: 22976569 HOUSING #6892	-56.41	05/14/2025	100-420-2100-42103-0000	
		Check Total:	343.64			
Vendor:	mnccc1	Minnesota Counseling & Couples			Check Sequence: 49	ACH Enabled: True
477004		Wellness Session #5	250.00	05/14/2025	100-420-2100-43140-0000	
		Check Total:	250.00			
Vendor:	schso	MN Equipment Inc.			Check Sequence: 50	ACH Enabled: True

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
P45756	131-4547-03 BLADE 22	23.09	05/14/2025	100-450-5200-42103-0000	
	Check Total:	23.09			
Vendor: monse	Monticello Senior Center			Check Sequence: 51	ACH Enabled: False
5/5/2025	5/5/25 Treasure Island Casino Transportation	475.00	05/14/2025	100-450-5186-44326-0000	
	Check Total:	475.00			
Vendor: napa	NAPA Auto Parts			Check Sequence: 52	ACH Enabled: False
388384	#35-039 XP5363 Iridium Spark Plug	44.94	05/14/2025	100-420-2400-42103-0000	
389055	Valve Cap	0.44	05/14/2025	100-430-3000-42103-0000	
389055	Tool	3.52	05/14/2025	100-430-3000-42105-0000	
389153	SUPER DUTY GREASE COU	13.98	05/14/2025	100-430-3000-42120-0000	
389350	RETURN: 400264 ENGINE OIL FILTER	-26.14	05/14/2025	100-450-5200-42103-0000	
389350	RETURN: 9276 AIR FILTER	-31.80	05/14/2025	100-450-5200-42103-0000	
389350	RETURN: 500854 AIR FILTER	-14.60	05/14/2025	100-450-5200-42103-0000	
389350	RETURN: 400013 OIL FILTER	-17.23	05/14/2025	100-450-5200-42103-0000	
389569	CABIN AIR FILTER	12.83	05/14/2025	100-420-2100-42103-0000	
389958	1372 ENGINE OIL FILTER #35-028	2.49	05/14/2025	601-494-9440-42103-0000	
389958	1372 ENGINE OIL FILTER #35-028	2.48	05/14/2025	602-495-9490-42103-0000	
389964	2362 AIR FILTER	4.13	05/14/2025	601-494-9440-42103-0000	
389964	1516 ENGINE OIL FILTER	2.48	05/14/2025	602-495-9490-42103-0000	
389964	1516 ENGINE OIL FILTER	2.49	05/14/2025	601-494-9440-42103-0000	
389964	2362 AIR FILTER	4.13	05/14/2025	602-495-9490-42103-0000	
390190	Bulk Trailer Wire	132.00	05/14/2025	100-430-3000-42103-0000	
	Check Total:	136.14			
Vendor: forhi	Northwoods Ford			Check Sequence: 53	ACH Enabled: False
DEAL# 21000460	2025 Super Duty F-350 SN: 1FDRF3HN6SED1(	27,351.00	05/14/2025	602-495-9490-45500-0000	
DEAL# 21000460	2025 Super Duty F-350 SN: 1FDRF3HN6SED1(	27,351.00	05/14/2025	601-494-9440-45500-0000	
	Check Total:	54,702.00			
Vendor: nbh	Nothing But Hemp LLC			Check Sequence: 54	ACH Enabled: True
3537	THC	360.00	05/14/2025	609-497-9760-42535-0000	
3538	THC	756.00	05/14/2025	609-497-9760-42535-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	1,116.00			
Vendor: pauso	Paustis & Sons			Check Sequence: 55	ACH Enabled: True
264568	Wine	1,068.67	05/14/2025	609-497-9760-42530-0000	
	Check Total:	1,068.67			
Vendor: pomti	Pomp's Tire Service Inc.			Check Sequence: 56	ACH Enabled: True
150190502	Repair Loader Tire #20-001	568.90	05/14/2025	100-430-3000-44040-0000	
150190866	New Loader Tires W/Labor #20-001	8,653.47	05/14/2025	100-430-3000-44040-0000	
150190874	New Grader Tires W/ Labor #20-003	4,796.25	05/14/2025	100-430-3000-44040-0000	
	Check Total:	14,018.62			
Vendor: porpi	Portolite Pitching Mounds LLC			Check Sequence: 57	ACH Enabled: False
12765	Pitching Mounds South Community Park	11,016.20	05/14/2025	410-450-5200-45200-2104	
	Check Total:	11,016.20			
Vendor: poyan	Andrea Poythress			Check Sequence: 58	ACH Enabled: True
5/5/2025	Mileage Claim - 5/5/25 A. Poythress	37.10	05/14/2025	100-410-1520-44360-0000	
	Check Total:	37.10			
Vendor: prelo	Premier Locating Inc			Check Sequence: 59	ACH Enabled: False
43046	Locates	451.50	05/14/2025	601-494-9440-43150-0000	
43046	Locates	147.00	05/14/2025	603-496-9495-43150-0000	
43046	Locates	451.50	05/14/2025	602-495-9490-43150-0000	
	Check Total:	1,050.00			
Vendor: repse	Republic Services #899			Check Sequence: 60	ACH Enabled: False
0899-004734505	Refuse-FD Mar '25-St 1	28.46	05/14/2025	100-420-2210-43840-0000	
0899-004734505	Refuse-CR Mar '25-St 1	256.11	05/14/2025	100-410-1940-43840-0000	
0899-004734505	Refuse-FD Mar '25-St 2	147.89	05/14/2025	100-420-2210-43840-0000	
0899-004734576	Overage - 3/18/2025	32.80	05/14/2025	205-450-5205-43840-0000	
0899-004734576	Trash/Recycling - April 2025	262.53	05/14/2025	205-450-5205-43840-0000	
0899-004734949	Event Center Garbage March	471.07	05/14/2025	100-410-1941-43840-0000	
0899-004746684	Curbside Recycling - April 2025	25,536.91	05/14/2025	100-430-3245-43100-0000	

Invoice No		Description	Amount	Pmt Date	Acct Number	Reference
0899-004750276		Hassan Town Hall -Waste Svc - Apr	108.14	05/14/2025	100-410-1940-43840-0000	
0899-004750300		Refuse St 1 CR-April '25	255.27	05/14/2025	100-410-1940-43840-0000	
0899-004750300		Refuse-St 1 FD-April '25	28.36	05/14/2025	100-420-2210-43840-0000	
0899-004750300		Refuse St 2-April '25	147.37	05/14/2025	100-420-2210-43840-0000	
0899-004750343		CH-Garbage April	92.42	05/14/2025	100-410-1940-43840-0000	
0899-004750343		PW-Garbage April	215.62	05/14/2025	100-430-3000-43840-0000	
0899-004750372		RAC Garbage Pickup May 2025	231.15	05/14/2025	205-450-5205-43840-0000	
0899-004750491		PD Garbage Services - May	233.97	05/14/2025	100-420-2100-43840-0000	
0899-004750750		Evt Ctr Garbage Pickup Apr 2025	469.47	05/14/2025	100-410-1941-43840-0000	
		Check Total:	28,517.54			
Vendor:	tragr	RFS Enterprises Inc			Check Sequence: 61	ACH Enabled: True
304483		Vehicle Maintenance - 6814	307.69	05/14/2025	100-420-2100-44040-0000	
		Check Total:	307.69			
Vendor:	rogtr	Rogers True Value Hardware Inc			Check Sequence: 62	ACH Enabled: False
29472		Tube Vinyl	1.19	05/14/2025	205-450-5205-42103-0000	
29499		Power Dry & Vinegar-Windows	33.48	05/14/2025	100-420-2210-44010-0000	
29499		Paint-Frames	6.99	05/14/2025	100-420-2210-42100-0000	
29501		Misc Hardware	6.00	05/14/2025	100-430-3000-42100-0000	
29517		Nipples Couplings Connectors & Valve -Lion's P	63.44	05/14/2025	100-450-5200-42104-0000	
		Check Total:	111.10			
Vendor:	tcpro	Sabot Promotional LLC			Check Sequence: 63	ACH Enabled: True
68400		Business Cards For P. Moen	71.50	05/14/2025	100-430-3000-42000-0000	
		Check Total:	71.50			
Vendor:	schst	Stacy A. Scharber			Check Sequence: 64	ACH Enabled: True
Scharber		Mileage Reimbursement	65.80	05/14/2025	100-410-1325-44360-0000	
Scharber		Bill Counter Reimbursement	50.00	05/14/2025	100-410-1520-42000-0000	
		Check Total:	115.80			
Vendor:	scrin	SCR Inc St Cloud			Check Sequence: 65	ACH Enabled: False
AW20815		Ice Plant Controller CPU Testing	624.00	05/14/2025	205-450-5205-44040-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
AW20816	Refrigeration Repair & Maint. 9/26/24 & 2/13/25	1,789.88	05/14/2025	205-450-5205-44040-0000	
	Check Total:	2,413.88			
Vendor: signar	SignArt Co Inc			Check Sequence: 66	ACH Enabled: False
3337	Station 1-Signage	11,058.08	05/14/2025	403-420-2210-45200-0000	
	Check Total:	11,058.08			
Vendor: simpli	Simplifile LC			Check Sequence: 67	ACH Enabled: False
930985318444SFL	Recording Fees 4/25/25	138.75	05/14/2025	100-410-1910-43520-0000	
	Check Total:	138.75			
Vendor: souwi	Southern Glazers Wine & Spirits of Minnesota			Check Sequence: 68	ACH Enabled: False
2615477	NA	28.28	05/14/2025	609-497-9760-42540-0000	
2618322	Liquor	9,739.35	05/14/2025	609-497-9760-42510-0000	
2618323	Wine	1,052.68	05/14/2025	609-497-9760-42530-0000	
2621179	Liquor	7.68	05/14/2025	609-497-9760-42510-0000	
2621180	Liquor	4,759.60	05/14/2025	609-497-9760-42510-0000	
2621181	Wine	779.20	05/14/2025	609-497-9760-42530-0000	
	Check Total:	16,366.79			
Vendor: strei	Streicher's Inc.			Check Sequence: 69	ACH Enabled: False
I1757479	Uniforms - Beck	1,104.84	05/14/2025	100-420-2100-42180-0000	
I1757480	Uniforms - Beck	416.94	05/14/2025	100-420-2100-42180-0000	
I1760335	Uniforms - Vest - Zachman	1,887.87	05/14/2025	100-420-2100-42180-0000	
	Check Total:	3,409.65			
Vendor: urbgr	Urban Growler Brewing Company, LLC			Check Sequence: 70	ACH Enabled: False
E-39654	Beer	321.50	05/14/2025	609-497-9760-42520-0000	
E-39654	THC	630.00	05/14/2025	609-497-9760-42535-0000	
	Check Total:	951.50			
Vendor: vescu	Vescio's Customizing & Restor			Check Sequence: 71	ACH Enabled: True
10145	6814 - Squad Repairs	1,691.97	05/14/2025	100-420-2100-44040-0000	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	1,691.97			
Vendor: vanas	VIA Actuarial Solutions			Check Sequence: 72	ACH Enabled: False
RGF-2025-04	FYE2024/25 GASB 67/68 Actuarial Report	2,200.00	05/14/2025	403-420-2210-43140-0000	
	Check Total:	2,200.00			
Vendor: grain	W.W. Grainger, Inc.			Check Sequence: 73	ACH Enabled: True
9495358401	Trash Bags Paper Towels Gloves	456.03	05/14/2025	100-410-1940-42100-0000	
9495761000	Toilet Paper	110.66	05/14/2025	100-410-1940-42100-0000	
	Check Total:	566.69			
Vendor: watco	Watson Company			Check Sequence: 74	ACH Enabled: True
149285	RAC Concessions	327.72	05/14/2025	205-450-5205-42550-0000	
149287	NCP Concessions	1,164.67	05/14/2025	100-450-5120-42550-0000	
	Check Total:	1,492.39			
Vendor: thore	West Publishing Corporation			Check Sequence: 75	ACH Enabled: False
851892708	April Online Investigation Services	355.30	05/14/2025	100-420-2100-43100-0000	
	Check Total:	355.30			
	Total for Check Run:	591,583.47			
	Total of Number of Checks:	75			

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.3

Subject: Approval of Application for Gambling Exempt Permit for Rogers Royals Tip Off Club to Conduct Bingo and a Raffle on November 8, 2025 at R Social on Main, Located at 12901 Main Street, Rogers

Prepared By: Stacie Brown, City Clerk

Recommended Council Action

Motion to approve a gambling permit application for Rogers Royals Tip Off Club to conduct bingo and a raffle on November 8, 2025 at R Social on Main, located at 12901 Main Street, Rogers

Overview / Background / Analysis

Rogers Tip Off Club has submitted an application for a gambling permit to conduct bingo and a raffle on November 8, 2025 at R Social, located at 12901 Main Street, Rogers.

Staff Recommendation

Motion to approve a gambling permit application for Rogers Royals Tip Off Club to conduct bingo and a raffle on November 8, 2025 at R Social on Main, located at 12901 Main Street, Rogers

Financial Impact: **Source Fund**:

Budgeted? N/A

Supporting Documentation

None

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.4

Subject: Approval of Newsletter Publishing Contract for Rogers Senior Center
Prepared By: Mike Bauer, Parks & Recreation Director

Recommended Council Action

Overview / Background / Analysis
The Rogers Seniors Newsletter was initiated in 2008 by a dedicated volunteer group to serve the informational and social needs of our community's senior population. In 2012, with the hiring of the City's first part-time Senior Program Coordinator, the City of Rogers formally took over content creation for the newsletter while continuing to collaborate with the Rogers-Hassan Senior Friendship Group and ISD 728 Community Education.

Since then, newsletter content has been shared among the Recreation and Facilities Coordinator (Seniors), volunteers, and ISD 728. ISD 728 has managed the layout and printing of approximately 400 copies monthly, which volunteers then fold and stuff into envelopes for mailing. Community Education has invoiced the City annually for associated paper and postage, averaging about two thousand two hundred dollars a year.

While the newsletter has been a valued communication tool, its layout has remained unchanged and does not align with the City of Rogers' current branding standards. In reviewing options for modernization, staff researched newsletter solutions used by nearby senior centers and identified Liturgical Publications Inc. (LPI) as a strong fit.

Summary of the Proposed Contract with Liturgical Publications Inc. (LPI)

LPI will publish 12 monthly issues of a 16-page (8.5" x 11") newsletter, each containing:

- 13.5 pages of custom content
- 2.5 pages of advertising
- Professional layout, collation, stapling, and mailing services
- 600 printed copies per issue

250 copies will be quarter-folded and tabbed for mailing, and the remaining copies will be delivered flat to the Senior Center.

Costs and Revenue:

LPI will cover the publishing and distribution costs in exchange for advertising rights.

The City of Rogers will pay, based on 250 mailed newsletters, $2,402.40 to fold,tab, and mail out the newsletters.

Value-Added Services Include:

Unlimited access to LPI's WeCreate content and artwork platform

Online archive of the last 12 issues hosted on MyCommunityOnline.com

Digital content submission platform

Optional royalty payments if advertising revenue exceeds thresholds, the City will receive 20% of annual advertising revenue exceeding $8,500, with the threshold increasing 4% annually

Term:

5-year initial contract starting October 1, 2025

Option for renewal unless canceled in writing at least 180 days before expiration

Benefits to the City and Senior Community:

- A modernized newsletter consistent with current City branding
- Continuity and professional design, reducing staff workload
- Increased potential for community engagement and information access
- Possible revenue stream from advertising
- Maintains a collaborative spirit with the Rogers-Hassan Senior Friendship Group and ISD 728

Staff Recommendation

Financial Impact: **Source Fund**:

Budgeted? Yes

Supporting Documentation

A. Senior Newsletter Contract 2025 LPI

SERVICE AGREEMENT

This Agreement is made this 20 day of March, 2025 by and between Liturgical Publications Inc (Provider) and Rogers Senior Center, Rogers, MN (Customer). The parties agree that the Customer will use Provider's services as defined in section II below and shall provide content on a timely basis. In consideration for Provider providing a complete and continuous service, the Customer agrees to distribute the service to its members and hereby assigns to Provider, all its rights to any advertising revenue from the service. Every attempt will be made to deliver the services in a timely manner, however, the customer acknowledges that the Provider cannot be held responsible for delivery exceptions due to weather emergencies, strikes, natural disasters, or acts of God.

I. TERM: This agreement shall commence immediately and shall continue in effect for 5 consecutive Service Years (each service year consisting of 12 services), with the first initial service year to begin on the 01 day of October, 2025. The term of this Agreement shall include the initial Service Year(s) and any subsequent renewal(s) (collectively the "Agreement Term").

II. SERVICES: Provider shall provide to Customer all benefits outlined in the Agreement, provided 25 spaces of advertising sponsorship is maintained at all times during the term of this Agreement; otherwise, Provider reserves the right to use alternate printing procedures or production methods; modify certain terms and conditions, or terminate this Agreement.
Absent the existence of factors beyond the control of either party (including without limitation due to acts of God, natural disasters, war or the failure of Internet service providers, other vendors, or shipping carriers and without such party's fault or negligence), Provider shall deliver the service to Customer within 7 business days. services received after 2pm CST may take an additional business day.

A. Provider shall provide the following service(s)/services:

- 12 issues of a(n) 16 page (8.5x11) Newsletter consisting of 13.5 page(s) of content and 2.5 pages of sponsorship (3 pages of advertising: 1/2 page ads at the bottom of pages: 2,3,6, 11, 12, 14), collate and staple. 250 sent to Eagle Printing: Quarter Fold & Tabbed, the rest sent flat to Senior Center. Qty. 250 Quarter Fold $54.00 Tabbing $24.00 Mailing $122.20 Quantity published will be 600 copies per publication. Newsletter will consist of the following:Cover Sheet: Digital 11x17 4/4.Sheet 2: Digital 11x17 4/4.Sheet 3: Digital 11x17 4/4.Sheet 4: Digital 11x17 4/4.

B. Royalties:

- For the duration of this agreement Provider will pay the Customer a profit sharing royalty in an amount equal to 20% of paid advertising revenue in excess of $8,500 per service year. The amount of $8,500 will increase by 4% each subsequent service year.

III. VALUE ADDED SERVICES: Provide at no additional cost.

A. Customer will have unlimited access to Provider's web-based service for content submission processes

B. Unlimited access to WeCreate*, a Content and artwork resource to help produce vibrant communications (a $499/yr. value) – our source for content and artwork to help you produce a better service.

C. Provider reserves the right to reproduce, publish, and/or distribute materials designed by Provider and distributed to Customer for the purpose of marketing and promotion.

D. MyCommunityOnline (https://mycommunityonline.com) - Your publication's presence on the Internet that includes the last twelve issues of your publication online. Customer agrees to install the MyCommunityOnline Widget on their website. Customer agrees to submit to Provider a digital distribution list of deliverable email addresses.

IV. AGREEMENT: The contents of this document, including attached exhibits and/or subsequent renewal Agreements, extensions, or revisions constitutes the entire Agreement regarding the subject matter contained herein between Provider and the Customer. The parties understand and agree to be bound by its terms and conditions. This Agreement shall bind the parties, their successors and assigns. This Agreement is not intended to supersede or modify other agreements.
Customer agrees to provide Provider a copy of their vendor list for purposes of distribution of content and solicitation of advertising for the service. Provider agrees to maintain confidentiality of these lists and only use them for contracted services between Provider and the Customer and shall treat all such information under Provider's data privacy statement found at 4lpi.com/privacy-policy. Customer also agrees to make available a telephone, Internet connection (if available), and workspace for the Provider's representative during scheduled

sponsorship campaign(s). The Customer further agrees to insert a timely pre-sell message into their Services as defined in Paragraph II.

V. RENEWAL: Provider and Customer agree that at any date prior to the expiration of this Agreement, this Agreement may be renewed or revised on terms then mutually agreeable to both parties. If the Customer has not signed a new Agreement with Provider or notified Provider in writing of its decision to non-renew service at least 180 days prior to the expiration of the Agreement Term, the parties agree to then renew this Agreement for such a period and under such terms as are identical to those contained in this Agreement.

VI. ParishesOnline.com, WeCreate, WeConnect and other brand items are brand identities and/or trademarks of the Provider. Provider reserves the right to upgrade, modify, suspend, or replace with like quality any aforementioned brand identity products during the Term of this Agreement.

Prior to replacing the service provided by the Provider, the Customer agrees to give the Provider the opportunity to match or exceed any other Provider's offer before entering into an agreement with them.

Rogers Senior Center
City of Rogers
22350 South Diamond Lake Road
Rogers, MN 55374
7634280939

Liturgical Publications Inc
2875 South James Drive
New Berlin, WI 53151
(217) 473-9688

By:_____ DATE:_____ ← SIGN HERE _____

Ms. Shannon Klick

Teresa Perkins 154
Communication Consultant

Service Agreement Addendum

Customer Satisfaction Guarantee

Provider expects to perform according to the terms of the Service Agreement to the Customer's satisfaction. If Customer is unsatisfied with Provider's performance or that of any Assignee under the terms of this Agreement for any reason, we simply ask you to notify us in writing and give us 90 days to resolve the situation and perform to Customer's satisfaction. The following form is provided for that purpose:

_____

_____

_____

_____

_____

_____

_____ _____

Customer Name Customer Signature

If after 90 days Provider fails to resolve the situation to Customer's satisfaction, Provider grants to the Customer the right to terminate this contact at their discretion and determine the termination date. As of the termination date Provider and Customer will mutually release each other of any and all obligations under the agreement and Provider will refund to the advertisers any prepaid advertising revenue it has collected.

BY: _____

Teresa Perkins

Communication Consultant

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.5

Subject: Approval of Resolution 2025-39 Approving the Northdale Addition Final Plat (Northdale Blvd Light Industrial Development) and Authorization to Execute a Development Agreement.

Prepared By: Brett Angell, Community Development Director

Recommended Council Action

Motion to approve Resolution 2025-39 approving the Northdale Addition Final Plat and authorization to enter into a Development Agreement, subject to the terms and conditions as listed in the resolution.

Overview / Background / Analysis

CP West, LLC ("Developer") has submitted an application for final plat approval related to a light industrial development along Northdale Blvd. On January 14th, 2025, the City Council approved Resolutions 2024-123 and 2024-124, granting preliminary plat, site plan, and conditional use permit approval for the three-building light industrial development. The proposed final plat is consistent with the preliminary plat review and conditions the council reviewed. Prior to the preliminary plat and site plan review, the City Council also reviewed this item in the concept stage, as well as approved the findings of an environmental assessment worksheet (EAW).

Subject Property

The subject property is currently a 45.53-acre parcel on the north end of Northdale Blvd. Adjacent to the property is Highway 101 to the east, the Crow River to the north, single-family residential to the west, and light industrial to the south. The property is zoned and guided as RC-Regional Employment Center. The proposed development of the property is consistent with the zoning and guidance.

Final Plat

The submitted final plat, named Northdale Addition, proposes to subdivide the property into two lots and one outlot. Lot 1 is a total of 13.8 acres in size and would be developed into a 208,000-square-foot building. Lot 2 is a total of 18.32 acres in size and would be developed into a 234,000-square-foot building. Outlot A is a total of 13.26 acres in size and would be a future development property for a 115,000-square-foot building in the future. Outlot A will have to be platted into a lot prior to its development in the future. The proposed final plat is consistent with the preliminary plat and meets all code requirements for lot size and dimensions.

Development Details

The approved site plan includes three buildings totaling approximately 557,000 square

feet. Buildings A and B are at the south end of the property and face outward, so the rear of the buildings face internal to the site. Building C to the north will be developed in the future. The property has one main access point at the south end of Northdale Blvd. Internally, private drive aisles connect all the properties. A separate emergency vehicle-only access is provided in-between buildings B and C. A majority of the proposed trees for the development would be planted on the west side of the property to provide as much of a visual buffer from the adjacent residential areas as possible.

At the time of site plan approval (Resolution 2024-123), additional conditions of approval were listed related to a requirement that building signage lighting is restricted on non-daytime hours and to explore options to reduce any impact of lighting. Following the site plan approval, the developer, city staff, and the lighting engineer discussed options for the lighting on the west side. The adjustments to the lighting plan included reduced light pole heights, reduced height of the wall-mounted lights on the building, shields to the pole-mounted lights to reduce visibility of the light pack, and box structures to the wall-mounted lights to reduce visibility of the light packs.

Overall, the proposed development plans are consistent with the site plan approval in 2024 and incorporate the conditions and comments from staff into the final design. From a timing perspective, building permit applications have been submitted. Staff anticipate construction to begin on Buildings A and B in summer 2025.

Development Agreement
A draft version of the development agreement is included with this item. The proposed development agreement encompasses Lots 1 and 2. The future development of Outlot A shall require a separate development agreement at the time that building moves forward.

Staff Recommendation
Staff recommends approval of Resolution 2025-39, approving the Northdale Addition Final Plat, subject to the terms and conditions as listed in the resolution. Additionally, staff recommends the council authorize the execution of a Development Agreement for the Northdale Addition development.

Financial Impact: Not applicable. **Source Fund**: Not applicable.

Budgeted? N/A

Supporting Documentation
A. Resolution No. 2025-39 Northdale Blvd Final Plat
B. Northdale Addition Draft Development Agreement
C. Location Map
D. Final Plat
E. Northdale Addition Civil Plans
F. Photometric Plan

G. Building 1 Architectural Renderings
H. Building 2 Architectural Renderings

RESOLUTION NO. 2025 - 39

A RESOLUTION GRANTING APPROVAL OF THE NORTHDALE ADDITION FINAL PLAT AND AUTHORIZATION TO ENTER INTO A DEVELOPMENT AGREEMENT

WHEREAS, CP West, LLC ("Applicant") has submitted a Final Plat application to the City of Rogers ("City") requesting approval of the Northdale Addition final plat ("Plat") for the parcel at with the PID 11-120-23-21-0002 and legally described on Exhibit A (the "Subject Property/Property"); and,

WHEREAS, the Plat subdivides the existing 45.53-acre parcel into two (2) lots and one (1) outlot as depicted in Exhibit B; and,

WHEREAS, the Developer intends to construct two (2) light industrial buildings of 234,000 square feet and 209,000 square feet on Lot 1 and Lot 2 of the Subject Property following this Plat. The Developer intends to develop the outlot in the future following platting of the property in the future, which will be subject to additional city approval.; and

WHEREAS, on January 14, 2024, the City Council approved Resolution 2024-123 approving the Preliminary Plat and Site Plan for the development on the subject property; and,

WHEREAS, the Subject Property contains approximately 45.53 acres is zoned as RC – Regional Employment Center and is guided at Regional Mixed-Use; and

WHEREAS, the Plat and development plans are consistent with 2040 Comprehensive Plan and current zoning regulations for the City; and

WHEREAS, the Plat satisfies RC zoning standards, and is consistent with the Preliminary Plat for the Northdale Addition development as approved by the City Council on January 14, 2024, per Resolution 2024-123.

NOW THEREFORE, BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF ROGERS, MINNESOTA, that the Final Plat for Northdale Addition is hereby approved as proposed by the developer, subject to the following conditions:

1. The Final Plat shall not be released for recording until the Developer's Agreement is executed by both parties and all fees, escrows, financial security obligations due with the Development are received by the City.
2. Recording of the Final Plat must occur within 30-days of its release by the City to Developer with the land records office of Hennepin County.
3. The Final Plat shall incorporate any comments from the City Attorney review of the Plat and provided plat opinion.
4. A building permit shall not be issued until recording of the Final Plat and Developer's Agreement.

BE IT FURTHER RESOLVED, the City of Rogers and CP West, LLC shall execute a Developer's Agreement for the Development, identifying the terms and conditions of the development and fees, escrows, and financial security obligations of the Developer, including

payment of any assessments levied against the Subject Property. The Agreement shall be filed with Hennepin County for recording.

Moved by Councilmember , seconded by Councilmember

The following voted in favor of said resolution:

The following voted against the same:

The following abstained:

Whereupon said resolution was declared duly passed and adopted, and was signed by the Mayor, and attested by the Clerk dated this 27th day of May, 2025.

_____
Shannon Klick, Mayor

ATTEST:

_____
Stacie Brown, City Clerk

EXHIBIT A

LEGAL DESCRIPTION

Existing Legal Description

That part of the Southeast Quarter of the Southwest Quarter of Section 2, Township 120, Range 23, lying South of the Crow River.

Also

That part of the East Half of the Northwest Quarter of Section 11, Township 120, Range 23 lying North of the South 1458.75 feet and West of the westerly right-of-way of State Highway No. 101. Excepting therefrom that part of Tracts A and B described below:

Tract A:
That part of the Southeast Quarter of the Southwest Quarter of Section 2, Township 120 North, Range 23 West, Hennepin County, Minnesota, lying south of the Crow River and westerly of the westerly right of way line of Trunk Highway No. 101 as now located and established;

Tract B:
That part of the Northeast Quarter of the Northwest Quarter of Section 11, Township 120 North, Range 23 West, Hennepin County, Minnesota, lying north of the south 1458.75 feet of the East Half of the Northwest Quarter of said Section 11, and west of the westerly right of way line of Trunk Highway No. 101 as now located and established; which lies westerly of the westerly boundary of Minnesota Department of Transportation Right of Way Plat No. 27-61 as the same is on file and of record in the office of the County Recorder in and for said County and easterly of Line 1 described below:

Line 1:
Commencing at the intersection of the south line of said Section 2 with the westerly boundary of said Plat No. 27-61; thence southerly on an assumed azimuth of 180 degrees 02 minutes 32 seconds along said westerly plat boundary for 382.00 feet to the point of beginning of Line 1 to be described; thence on an azimuth of 356 degrees 56 minutes 21 seconds for 831.22 feet; thence on an azimuth of 270 degrees 02 minutes 33 seconds for 50.00 feet; thence on an azimuth of 00 degrees 02 minutes 33 seconds for 367.02 feet, more or less, to the shore line of the Crow River and there terminating.

Proposed Legal Description

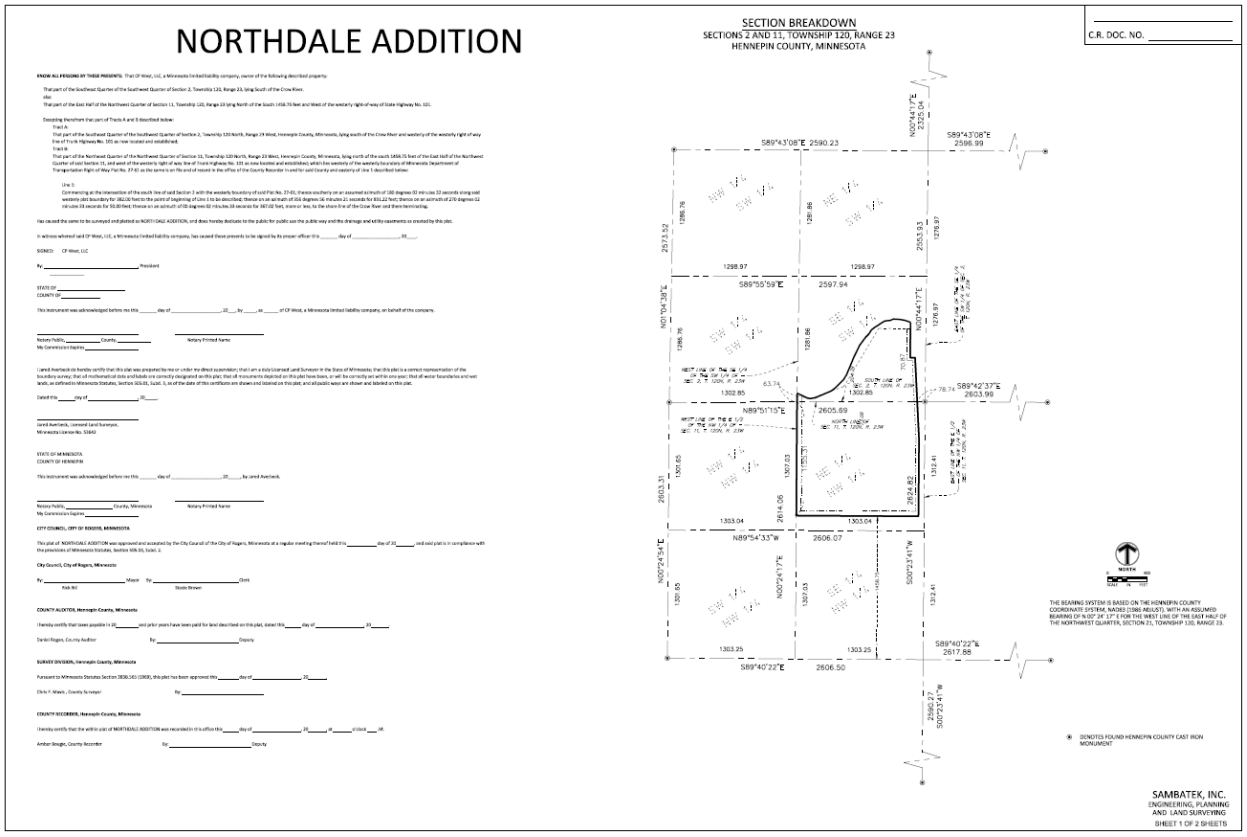
Lot 1 - 2, Block 1, Northdale Addition, Hennepin County, Minnesota

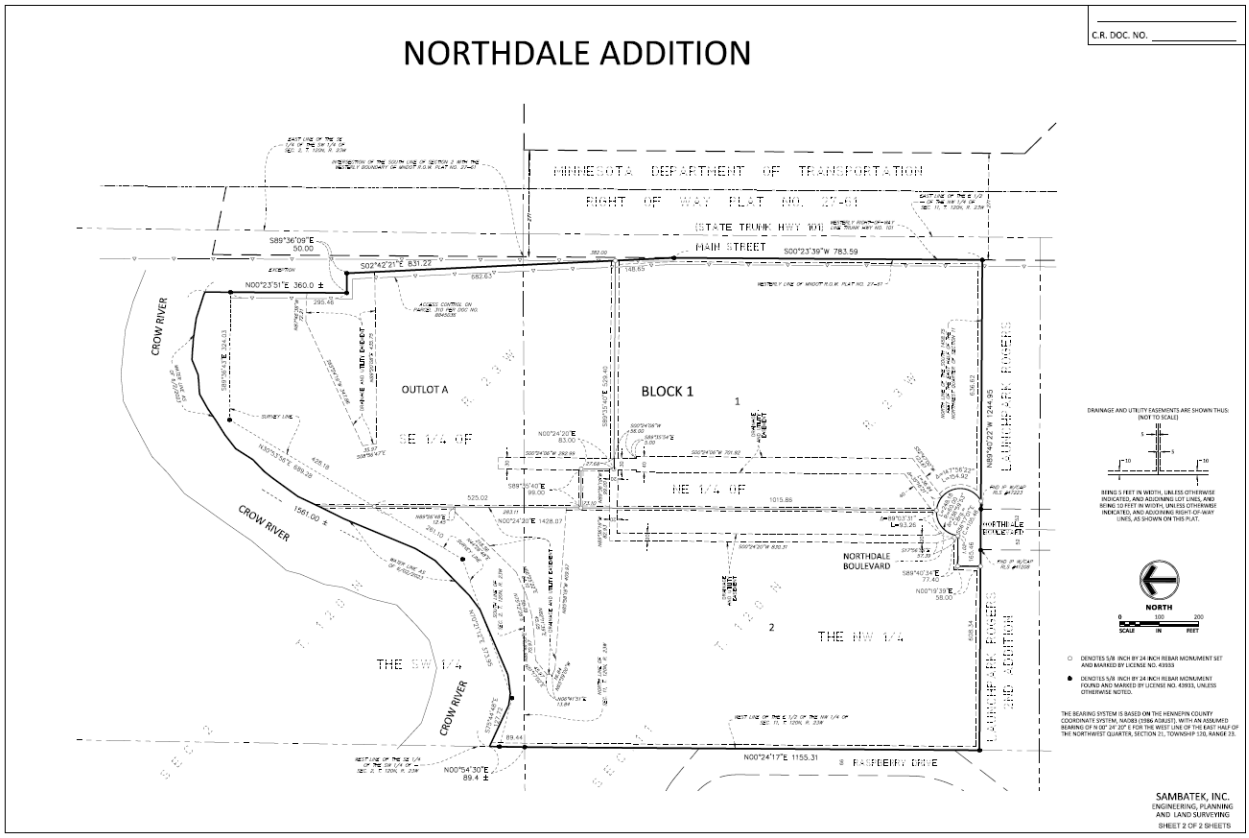
AND

OUTLOT A, Northdale Addition, Hennepin County, Minnesota

EXHIBIT B

FINAL PLAT





[Torrens Cert#]
[Abstract Cert#]

DEVELOPMENT AGREEMENT

NORTHDALE ADDITION

THIS DEVELOPER'S AGREEMENT ("Agreement") is made this May 27th, 2025 by and between the City of Rogers, a municipal corporation under the laws of Minnesota ("City"), located at 22350 Diamond Lake Road, Rogers, Minnesota 55374, and *CP West, LLC,* a Minnesota limited liability company, located at *5402 Parkdale Dr, STE 105, St. Louis, Park, MN 55416*("Developer").

RECITALS

A. The purpose of this Agreement is to set forth the general rights, obligations and duties of the City and the Developer with respect to the development in the City of an industrial development, commonly known as "*Northdale Addition*", comprised of three industrial buildings totaling approximately 557,000 square feet in combines size on three lots.

B. This Development Agreement applies to Phase 1 of Northdale Addition ("Development") which consists of approximately 45.38 acres described as Lots 1 & 2 and Outlot A of Northdale Addition, according to the recorded plat thereof ("Subject Property") and legally described as attached in Exhibit A.

C. Development of the Subject Property consists of two (2) buildings for a total of 442,000 square feet, as more specifically set forth in Exhibit D. The Final Plat also includes one (1) outlot.

D. Pursuant to an approved Preliminary Plat for development of Northdale Addition by Resolution No. 2024-123, adopted by the City Council January 14, 2025 and Final Plat for Northdale Addition by Resolution No. 2025-39 on May 27, 2025 (collectively, the "City Approvals"). The terms and conditions of the City Approvals incorporated into this Subdivision

Agreement by reference. Development of the Property shall be in conformance with City Code, City Approvals, and this Subdivision Agreement.

F. The City and the Developer now desire to enter into this Agreement setting forth certain requirements and obligations relating to the development of the Subject Property, including but not limited to the execution and recording of certain instruments. This Agreement replaces and supersedes any previous oral agreements, understandings, or previous negotiations between the parties in relation to the Subject Property.

G. The City requires that the Developer perform work and install certain on and off-site improvements within the Subject Property, which work and improvements typically consist of the grading and erosion control, public utilities (sewer, water and storm sewer), streets, private utilities (gas, electric, and communications), sidewalks and trails, street signs and traffic control signs, lighting, boulevard landscaping, drainage swales, street cleaning, front yard trees, and wetland buffers, which improvements to the Subject Property shall be referred to herein as the "Improvements."

AGREEMENT

In consideration of each party's promise as set forth in this Agreement, it is mutually agreed as follows:

ARTICLE ONE
CONSTRUCTION OF IMPROVEMENTS; EASEMENTS & RIGHTS OF ENTRY

1.01. Developer Responsible. The Developer has submitted its plans and specifications for the Development to the City for the City's review and approval. Developer agrees to construct and pay for the Improvements required for development of the Subject Property, as described in plans and specifications approved by of the City Engineer or designee ("Approved Plans"). For the purpose of this Agreement, the Approved Plans shall include the Grading, Erosion Control, Storm Water/SWPPP and Street and Utility Plan Sets dated March 28, 2025 with a final revision date of May 27, 2025, and approved by the City Engineer on *XXX* as more specifically set forth in Exhibit C. The Improvements shall be constructed in accordance with City specifications and the Approved Plans. Prior to beginning construction, the Developer or the Developer's engineer shall submit a copy of the Approved Plans to the Public Works Director and shall schedule a preconstruction meeting with all concerned parties, including City staff and engineers to review the program for construction work. All labor and work will be in strict conformance with the Approved Plans. Any deviation from the Approved Plans must be preapproved in writing by the Public Works Director, which shall not be unreasonably withheld. Developer shall pay for Improvements which costs are estimated and listed in the attached Exhibit B.

1.02. Staking, Surveying and Inspections. Developer must provide all required staking and surveying for the Improvements in order to ensure that the completed Improvements conform to the Approved Plans. The Developer will provide for construction inspection and material testing for the Improvements. The Developer shall instruct its engineer to provide full-time field inspection personnel in order for the Developer's engineer to be able to certify that the construction work meets

the approved City standards as a condition of City acceptance. In addition, the City may, at the City's discretion and at the Developer's expense, have one or more City inspectors and a soil engineer inspect the work on a full or part-time basis. The designated City inspectors must be notified and present to witness all utility tests. This includes watermain (hydrostatic testing, conductivity testing, disinfection testing), sanitary sewer (trace wire, leakage testing, deflection testing), and any other utility testing as deemed necessary by the City Engineer. The Developer, its contractors and subcontractors, shall follow all instructions received from the City's inspectors. The Developer and/or the Developer's engineer shall provide for on-site project management. The Developer's engineer is responsible for design changes and contract administration between the Developer and the Developer's contractor. The Developer or his or her engineer shall schedule a pre-construction meeting at a mutually agreeable time at City Hall with all parties concerned, including the City staff, to review the program for the construction work.

All labor and work shall be done and performed in the best and most workmanlike manner and in strict conformance with the approved plans and specifications. The Developer agrees to furnish to the City a list of contractors being considered for retention by the Developer for the performance of the work required by the contract. The Developer shall not do any work or furnish any materials not covered by the plans and specifications and special conditions of this contract, for which reimbursement is expected from the City, unless such work is first approved in writing by the City Engineer or designee. Costs incurred by the City for the additional inspection activities will be recovered through the Escrow described in Article Two and shall be calculated at 3% of the estimated cost of proposed public improvements, as shown in the attached Exhibit B.

1.03. Unsatisfactory Labor or Material. The Public Works Director shall not reject as defective and/or unsuitable any material or labor delivered consistent with the Approved Plans. In the event that the Public Works Director reasonably rejects as defective or unsuitable material, then such material must be removed and replaced with approved material at the sole cost and expense of the Developer. In the event the Public Works Director reasonably rejects as defective or unsuitable any material supplied by the Developer, then the labor must be completed again to the specifications and approval of the Public Works Director at the sole cost and expense of the Developer.

1.04. Records. Upon request by the Public Works Director, Developer will provide requested copies of bids, change orders, suppliers, subcontractors, or related matters, relating to the Improvements.

1.05. Final Inspection/Acceptance. Upon completion of the Improvements and any work required following inspection(s) by the Public Works Director, the Public Works Director and the Developer's contractor and/or engineer will promptly make a final inspection of the Improvements to determine that the Improvements were installed pursuant to the Approved Plans. Before final payment is made to the contractor by the Developer, the Public Works Director shall be satisfied that all work is satisfactorily completed in accordance with the Approved Plans, and the Developer's engineer shall submit a written statement attesting to the same. Final approval and acceptance of the Development and Improvements shall be in writing from the City to Developer ("Final Approval"), and shall include acceptance of any Improvements which are to be transferred to the City.

1.06. As-built Plans. Upon completion of the Improvements, the Developer shall provide the City with: (i) a full set of as-built plans in a digital PDF and AutoCAD.DWG format, and (ii) an as-built

survey in a AutoCAD.DWG format for City records in accordance with the City's most recent Engineering Guidelines. Utility profiles are not required to be included in the as-built plans.

1.07. Maintenance Bond. The Developer and/or its contractor shall be required to furnish the City a two (2) year maintenance bond guaranteeing the Improvements that are transferred to the City. The maintenance bond shall be provided to the City upon final inspection and acceptance of said Improvements.

1.08 Landscaping Bond. The Developer shall be required to furnish the City a two (2) year warranty bond or letter of credit guaranteeing the landscaping work in the amount of the landscaping improvement associated with this phase of the development. The landscaping bond shall be provided to the City and commence upon final inspection and acceptance of said landscaping improvements.

1.09. Maintenance of Public Property. Developer agrees to assume full financial responsibility for any damage which may occur to public property with the development of Subject Property, including, but not limited to, streets, street sub-base, base, bituminous surface, curb, utility system including, but not limited to water main, sanitary sewer or storm sewer when said damage occurs as a result of the activity which takes place during the development of the Subject Property by the Developer, its contractors or subcontractors or assigns. The Developer further agrees to pay all costs required to repair the streets or utility systems, or both, damaged or cluttered with debris when occurring as a direct or indirect result of the construction that takes place by said Developer, its contractors or subcontractors or assigns during the course of the Development. In the event the Developer fails to maintain or repair the damaged public property within a reasonable period after receipt of written notice of the nature of the default or damage, but not to exceed 14 days, the City may undertake making or causing it to be repaired or maintained. The City may draw down on the escrow, Letter of Credit or any other cash deposits made by Developer to pay such costs, if Developer fails to complete the repairs.

1.10. Maintenance of Improvements. Developer shall be responsible for all maintenance, upkeep and repair (including, but not limited to snow plowing, mowing, weed control, and grading) of the Improvements until issuance of the Final Approval. Developer shall remain responsible for all maintenance and upkeep of Improvements that are not transferred to the City. Developer hereby agrees to indemnify and hold the City harmless from any and all claims for damages of any nature whatsoever arising out of Developer's acts or omissions in performing the obligations imposed upon Developer by this paragraph.

1.11. Easement to the Developer. The City, at no charge to Developer, grants to the Developer a Temporary Construction Easement ("Easement") over, under and across the rights-of-way dedicated to the public in the Northdale Addition Final Plat for purpose of construction of the Improvements. The Easement will commence with the filing of this Agreement with Hennepin County, and shall terminate upon the acceptance City's issuance of the Final Approval.

1.12. Easement to the City. The Developer grants to the City, its agents, representatives, employees, officers, and contractors, a right of entry to access all areas of the Subject Property to perform any and all work and inspections necessary or deemed appropriate by the City or to take any corrective

actions deemed necessary by the City in conjunction with this Agreement. The right of entry conveyed by the Developer to the City shall continue until the City's issuance of the Final Approval. The City will provide the Developer with reasonable notice prior to exercising its rights hereunder, except in the case of an emergency.

ARTICLE TWO
DEVELOPMENT STANDARDS & REQUIREMENTS

2.01. Development Standards. The Approved Plans reflect the City Approvals of the Development. Development standards, including, but not limited to, setbacks and lot dimensions to which the Developer and/or assigned must satisfy are according to the Regional Employment Center (RC) Zoning District. The Developer and/or assigned may build no more or less than the number or amount of commercial/industrial space as shown on the Approved Plans.

2.02. Architectural Guidelines. Architectural guidelines and renderings are attached as Exhibit D and shall be verified upon issuance of building permits.

2.03. Development Signage. The Developer shall submit detailed sign plans to City staff for all signage proposed for the Development, including the development entrance monument signs prior to making application for a building permit.

ARTICLE THREE
FINANCIAL GUARANTY & REQUIRED PAYMENTS

3.01. Development Costs. All fees and costs as further set out in Exhibit B must be paid in full to the City prior to the delivery of the Final Plat to Developer for recording.

3.02. Financial Guaranty, Improvements. Prior to commencement of construction of the Improvements, the Developer will furnish the City an irrevocable Letter of Credit or cash escrow deposit in the same amount equal to 125 percent of non-public Improvements and 150 percent of the Improvements to be dedicated to the City (collectively referred hereafter as "Security"), approved by the City Attorney, in the amount as set forth in Exhibit B. If by Letter of Credit, the Security must contain a provision that prohibits the issuer or surety from terminating the Security without first giving 45 days' written notice to the City of the proposed termination or expiration of the Security. In the event, the Security provided by developer does not conform with the requirements of Section 3.02, then the Developer, following notice from the City, shall provide a substitute Security. Failure of the Developer to post a substitute Security within five (5) business days after notice by the City shall constitute a default that shall be grounds for drawing on the Security. The City Administrator may grant a reduction in the Security upon written request by the Developer based upon the value of the completed work at the time of the requested reduction. The Security may not be reduced to less than 10 percent of the original amount until all work required of the Developer by this Agreement has been completed and accepted by the City. The Security shall be released upon the City's issuance of the Final Approval. Upon failure of the Developer to complete the Improvements in accordance with this Agreement or otherwise perform under this Agreement, the City may declare the Developer to be in default and the amount of the Security shall be paid over to the City. From the proceeds of the Security, the City shall be reimbursed for any attorneys' fees, engineering fees or other technical or

professional assistance, including the work of the City staff and employees, and the remainder thereof shall be used by the City to complete the Improvements. The Developer shall be liable to the City to the extent that the Security is inadequate to reimburse the City its costs and pay for the completion of the work. The Security provided by Developer in the form of a Letter of Credit shall comply with the City's Letter of Credit policy which Developer hereby acknowledges receipt of a copy thereof.

	Reduction	Release*
Site grading and erosion control	50-percent after rough grading and soil stabilization, 90-percent after testing, inspection, acceptance and approval of submitted as-builts	Project completion and removal of erosion control
Watermain improvements	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	After testing, inspection, acceptance and approval of submitted as-builts
Sanitary sewer improvements	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	After testing, inspection, acceptance and approval of submitted as-builts
Stormwater management facilities	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	After functionality is observed by city staff and approval of submitted as-builts
Street improvements	75-percent after first lift installed and all curbing installed and backfilled	After acceptance
Parking lot improvements	75-percent after first lift installed and all curbing installed and backfilled	Project completion
Sidewalk/trail improvements	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	After acceptance
Wetland and buffer restoration	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	Restoration complete
Wetland monitoring	$1/5^{th}$ at submittal of each annual report	After 5 years of annual reports
Landscaping and tree mitigation	20-percent after full installation	After one full growing season following installation

3.03. Escrow. The Developer shall submit an Escrow Receipt Form and escrow for the Development as required by Exhibit B ("Escrow"). This Escrow is to be used by the City staff to charge costs of services or materials in connection activities required under this Agreement as set

forth on the attached Exhibit B. If, at any time prior to completion of the development contract administration process, the balance in the Escrow is depleted to less than 10 percent of the originally required Escrow amount, the Developer shall deposit additional funds in the cash escrow account as determined by the City. Developer shall pay additional escrow as reasonably determined by the City within 10 days of written demand. Failure to make payment of the additional escrow amount will permit the City to supplement those amounts from the Security pursuant to Section 4.02 or to issue the Developer a stop work order. A new Escrow Receipt Form must be completed when replenishing the escrow and to ensure that contact information on the new Escrow Receipt Form is the same as the original escrow form. The City shall return the unused escrow balance to the Developer no sooner than six (6) months after the acceptance of the Improvements by the City at the contact information provided on the Escrow Receipt Form(s).

ARTICLE FOUR
OTHER REQUIREMENTS

4.01. Indemnification. Notwithstanding anything to the contrary in this Agreement, the City, its officials, agents and employees shall not be personally liable or responsible in any manner to the Developer, the Developer's contractor or subcontractor, material suppliers, laborers or to any other person or persons and Developer shall hold the City, its officials, agents and employees harmless from any claim, demand, damages, actions or causes of action of any kind or character, including the costs, disbursements, and expenses of defending the same, which costs may include but are not limited to, attorneys' fees, consulting engineering services, and other technical or professional assistance arising from or related to this Agreement, Developer's performance or non-performance under this Agreement, or the completion of or failure to complete the work required by this Agreement. The Developer further agrees that it will indemnify, defend, and hold harmless the City and its governing body members, officers, and employees, from any claims or actions arising out of the presence, if any, of hazardous wastes or pollutants on the Subject Property, except to the extent caused by the acts or omissions of the City. Nothing in this section will be construed to limit or affect any limitations on liability of the City under State or federal law, including without limitation Minnesota Statutes Sections 466.04 and 604.02.

4.02. Insurance. The Developer must keep the insurance in force at all times that construction on the Development is in progress. The insurance must name the City as an additional insured. The Developer shall furnish proof of insurance acceptable to the City, covering any public liability or property damage by reason of the operation of the Developer's equipment, laborers, and hazard caused by the Improvements, and include at least the following:

a. Comprehensive general liability insurance (including operations, contingent liability, operations of subcontractors, competed operations and contractual liability insurance) together with an Owner's Contractor's Policy with limits against bodily injury, including death, and property damage (to include, but not be limited to damages caused by erosion or flooding) which may arise out of Developer's work or the work of any of its subcontractors. The exclusion for underground collapse shall be removed.

b. Limits for bodily injury or death shall not be less than $500,000.00 for one person and $1,500,000.00 for each occurrence; limits for property damage shall not be less than $2,000,000.00 for each occurrence.

c. Worker's compensation insurance, with statutory coverage, if applicable.

d. Developer shall file a Certificate of Insurance with the City Clerk prior to commencing site grading. Developer shall be responsible for insuring that the Certificate bear the following wording.

"Should any of the above policies be canceled or terminated before the expiration date thereof, the issuing company shall give thirty (30) days written notice of cancellation or termination to the Certificate Holder."

4.03. Private Easements. Developer shall provide to the City evidence of all executed private easements between the Developer and adjacent property owner(s). Private easements shall be recorded with Hennepin County; a copy of said recording shall be provided to the City with a copy of the private easement.

4.04. Building Permits and Occupancy. Building permits shall only be issued upon execution of this Agreement by the City and Developer and all amounts due and securities required under this Agreement are paid to the City, the Final Plat is recorded and a receipt of said recording is provided to the City, and the streets (including curb and gutter installation) needed for access to lots where permits are requested are paved with the base course of bituminous, and the sewer and water service utilities are tested and approved by the City Engineer or designee. Prior to recording of the Final Plat, permits for grading and erosion control may be issued in conjunction with an approved grading permit and payment of the required Security and Escrow by Developer to the City as identified in Exhibit B. No occupancy of any newly constructed building in said Final Plat shall occur until the base course of bituminous is in place and a certificate of occupancy has been issued by the City Building Official. The Developer shall use the model home only for real estate sales purposes and no other purposes.

4.05. Underground Utilities. The Developer shall contact the electric, telephone, gas and cable companies that are authorized to provide service to the Subject Property for the purpose of ascertaining whether any of those utility providers intend to install underground lines within the Development. The placement of private underground utilities shall be designed and constructed according to City standards and specifications, and coordinated with the placement of public underground utilities. Underground utility plans shall be reviewed and approved by the Public Works Director. Any costs associated with the installation of underground utilities required by the utility companies shall be solely borne by the Developer. The Developer agrees to comply with applicable requirements of franchise ordinances in effect in the City, copies of which are available from the City Clerk.

4.06. Street Cleaning. Developer shall contract with a street cleaning firm to provide street cleaning services within and immediately adjacent to the Property. A copy of said contract shall be submitted to and approved by City prior to the issuance of a grading permit. This contract shall name City as an authorized agent to order street cleaning services as City deems necessary. The cost of the street

cleaning under the contract shall be paid for by Developer. During development of the Property, the Developer shall clean dirt and debris from streets adjoining or within its development on a weekly basis that has resulted from construction work by the Developer, its contractors, subcontractors, agents or assigns. The City will inspect the Subject Property not less than on a weekly basis to determine whether it is necessary to take additional measures to clean dirt and debris from the streets. After 24 hours' telephone notice to the Developer's owner's representative, the City may complete or contract to complete the clean-up at the Developer's expense. The City may draw down on the Escrow or Security to pay such costs.

4.07. Construction Hours; Noise; Dust. Developer will comply with all requirements of the City pertaining to the hours and days during which construction activities may take place. Unless otherwise approved in writing by the City Administrator, construction hours shall be 7:00 a.m. to 7:00 p.m. Monday through Friday and 9:00 a.m. to 5:00 p.m. on Saturday, and upon request, due to construction delays out of the Developer's control, extended Saturday hours and Sunday hours established by the City Administrator. The Developer shall not be permitted to work on construction of the Improvements on holidays, except in the case of emergencies. The Developer shall provide dust control to the satisfaction of the City Engineer. Developer shall be responsible for coordinating special work hours with the City Engineer and City Inspectors.

4.09. Lighting. The Developer shall be financially responsible for the cost of street lighting (Lighting Plan) for the Development. The Lighting Plan shall be designed and constructed according to City standards and specifications. The Developer shall submit a final Lighting Plan for review and approval to the Public Works Director prior to commencing construction.

4.10. Erosion Control. Developer shall be responsible for compliance with an approved erosion control plan. The Developer will be given a telephone notice when an unsatisfactory condition exists that is determined to be a Developer's responsibility. Work to correct said unsatisfactory condition shall commence within 72 hours from the time of the telephone notice to Developer's owner's representative. If work is not commenced within 72 hours of said telephone notice, City will proceed to do the required work at the expense of the Developer. If it is determined that the unsatisfactory condition could result in degradation of downstream water quality, Developer shall, upon telephone notice, immediately proceed to correct said unsatisfactory condition. If Developer does not, within the stated time period, respond to said unsatisfactory condition, City has the right to enter upon the Subject Property and correct said condition. City shall be entitled to reimbursement and may draw on the Escrow or Security to cover its costs and expenses including, but not limited to legal, fiscal and engineering related to correction of the condition. City may draw on Developer's financial escrow and Security.

4.11. Other Approvals. In addition to the City Approvals, other governmental agencies have reviewed and approved components of the Plans, if required. It is the responsibility of the Developer to ensure that all permits from appropriate governmental agencies are received prior to beginning construction of any Improvements.

4.12. Final Plat. The Developer shall record the Final Plat for Northdale Addition in the land records office for Hennepin County, Minnesota within 30 days of its release by the City to the Developer. Developer shall provide a copy of said recording to the City.

4.13. Additional Work or Materials. All Improvements the Developer is required to complete pursuant to this Agreement shall be designed and constructed according to City standards and specifications and completed at no expense to the City, including, without limitation, any reimbursement by the City for work paid for by the Developer. The Developer agrees that it will make no claim for compensation for work or materials so done or furnished.

4.14. Miscellaneous Obligations. Developer shall comply with the terms and conditions set forth in this Agreement and following ordinances and resolutions pertaining to the Development: *list items/resolutions.*

4.15 Special Provisions. The following special provisions shall apply to all developments:

A. The Developer or businesses must obtain a sign permit from the City's Building Official prior to installation of any monument or wall mounted signs.

B. The Developer shall supply a complete set of the approved construction plans in an AutoCAD.DWG electronic file format before the preconstruction conference.

C. The Developer shall include the "City of Rogers Standard Details and Specifications" (all applicable sections) in the contract documents of their improvement project.

D. Additional Special Provisions:
   a. Obtain all required Hennepin County and MnDOT right-of-way construction permits.
   b. Obtain all Elm Creek Watershed Commission approval.
   c. Obtain MDH, MPCA & MCES permits.

ARTICLE FIVE
DEFAULT AND REMEDIES

5.01. Default by Developer. In the event of default by the Developer as to any of the work to be completed by the Developer, its successors or assigns, the City may, at its option perform the work and the Developer shall promptly reimburse the City for any expense incurred by the City, provided the Developer is first given notice of the work in default, not less than 72 hours in advance and does not, within that 72-hour period, diligently proceed to remedy such default. In the event of such unremedied default, the City may immediately bring legal action against the Developer and/or draw upon the Security sums that exceed the costs or damage to the City, the City will return such excess amounts. In addition to its other remedies provided herein, the City may levy the cost in whole or in part as a special assessment against the Subject Property. Developer waives its rights to notice of hearing and hearing on such assessments and its right to appeal such assessments pursuant to Minnesota Statutes §429.081.

5.02. Complete Improvements-Right of Entry. In addition to the City's other remedies under this Agreement, if the Developer's breach involves failure to complete the Improvements, the City is hereby authorized, at its option, following 30 days written notice to Developer, to enter on to all portions of the Subject Property it deems necessary to complete the installation of any or all of the Improvements to which the default relates.

5.03. Denial of Permits. Breach of any term of this Agreement by the Developer or failure to comply with City ordinances shall be grounds for denial of building or occupancy permits for buildings within the Final Plat until such breach is corrected by the Developer.

5.04. Rights Cumulative. No remedy conferred in this Agreement is intended to be exclusive and each shall be cumulative and shall be in addition to every other remedy. The election of any one or more remedies shall not constitute a waiver of any other remedy.

5.05. Attorney Fees. The Developer will pay the City's costs and expenses, including attorneys' fees, in the event a suit or action is brought to enforce the terms of this Agreement or in the event an action is brought upon a bond or letter of credit furnished by the Developer as provided herein.

ARTICLE SIX
MISCELLANEOUS PROVISIONS

6.01. Amendment. Any amendment to this Agreement must be in writing and signed by both parties.

6.02. Assignment. The Developer may not transfer or assign any of its obligations under this Agreement without the prior written consent of the City, which shall not be unreasonably withheld.

6.03. Agreement to Run with Land. The Developer agrees to record this Agreement among the land records of Hennepin County, Minnesota contemporaneously with recording the Final Plat of Northdale Addition and corresponding Final Plat Resolution No. 2025-39. The provisions of this Agreement shall run with the land and be binding upon the Developer and its successors in interest. Notwithstanding the foregoing, no conveyance of the Subject Property or any part thereof shall relieve the Developer of its personal liability for full performance of this Agreement unless the City expressly so releases the Developer in writing.

6.04. Release. Upon completion of Improvements, the City's issuance of the Final Approval, and satisfaction of all of the Developer's obligations under this Agreement, which shall be evidenced by the expiration of the maintenance bond required by Section 1.07 of this Agreement, the City agrees to execute Certificate of Completion or other recordable instrument releasing the Subject Property from the terms of this Agreement.

6.05. Severability. The provisions of this Agreement are severable, and in the event that any provision of this Agreement is found invalid, the remaining provisions shall remain in full force and effect.

6.06. Notices. All notices, certificates or other communications required to be given to City or Developer hereunder shall be deemed given i) on the same day of personally delivered, ii) one (1) day after being deposited with a nationally recognized overnight air courier, or iii) two (2) business days

after mailing by certified or registered mail, return receipt requested, with postage fully pre-paid and addressed as follows:

CITY:
City of Rogers
22350 South Diamond Lake Road
Rogers, MN 55374
Telephone: (763) 428-2253
Attn: Steve Stahmer, City Administrator

DEVELOPER:
CP West, LLC
5402 Parkdale Dr, STE 105
St. Louis Park, MN 55416
Telephone: (XXX) XXX-XXXX
Attn: Thomas Noble, Principal

The City and Developer, by notice given hereunder, may designate different addresses to which subsequent notice, certificate or other communications should be sent.

6.07. No Third-Party Beneficiary. This Agreement and any financial guarantees required pursuant to its terms are not intended for the benefit of any third party.

6.08. Consent. The Developer represents and warrants that there are no other persons or entities with interests in the Property, except the interest of a mortgagee, if required. The consent of such mortgagee is attached hereto as Exhibit E.

6.09. Applicable Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Minnesota. The Developer agrees to comply with all laws, ordinances, and regulations of Minnesota and the City that are applicable to the Subject Property.

6.10. Counterparts. This Agreement may be executed simultaneously in any number of counterparts, each of which shall be an original and shall constitute one and the same Agreement.

6.11. Non-waiver. Each right, power or remedy conferred upon the City or the Developer by this Agreement is cumulative and in addition to every other right, power or remedy, express or implied, now or hereafter arising, or available to the City or the Developer at law or in equity, or under any other agreement. Each and every right, power and remedy set forth in this Agreement or otherwise so existing may be exercised from time to time as often and in such order as may be deemed expedient by the City or the Developer and shall not be a waiver of the right to exercise at any time thereafter any other right, power or remedy. If either party waives in writing any default or nonperformance by the other party, such waiver shall be deemed to apply only to such event and shall not waive any other prior or subsequent default.

6.12 Supersedes and Replaces. The parties understand and agreed that this Agreement supersedes and replaces all oral agreements, previous development agreements, and negotiations between the parties in relation thereto.

[This page was intentionally left blank.]

IN WITNESS OF THE ABOVE, the duly authorized representatives of the parties have caused this Agreement to be executed in duplicate on the date and year written above.

CP WEST, LLC

_____

Thomas Noble

Its Principal

STATE OF MINNESOTA)
) ss.
COUNTY OF)

The foregoing instrument was acknowledged before me this _____ day of _____ 2025, Thomas Noble, Principal, of *CP West, LLC*, a Minnesota limited liability company, on behalf of the corporation.

_____
Notary Public

CITY OF ROGERS

_____
Shannon Klick
Its Mayor

_____
Stacie Brown
Its City Clerk

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

The foregoing instrument was acknowledged before me this 27th day of May, 2025 by Shannon Klick and by Stacie Brown, the Mayor and City Clerk, respectively, of the City of Rogers, a Minnesota municipal corporation, on behalf of the corporation.

_____
Notary Public

THIS INSTRUMENT WAS DRAFTED BY:
City of Rogers
22350 South Diamond Lake Road
Rogers MN 55374
(763) 428-2253

EXHIBIT A

NORTHDALE ADDITION
LEGAL DESCRIPTION OF THE PROPERTY

NORTHDALE ADDITION, Hennepin County, Minnesota, according to the recorded plat thereof

EXHIBIT B

NORTHDALE ADDITION
FEES, IMPROVEMENT COSTS & FINANCIAL SECURITIES

[Insert final Exhibit B Table]

2024 EXHIBIT B

[NAME]

DEVELOPMENT INFORMATION	
Acres	40.00
Units	100.00
Lots	100.00

SECTION 1: PLATTING FEES OWED (CREDITS)	COST	PER ACRE/UNIT/LOT	AMOUNT DUE	NOTES
Water Trunk	3,000.00	Per Acre	120,000.00	
Sanitary Sewer Trunk	2,550.00	Per Acre	102,000.00	
Storm Sewer Trunk	2,350.00	Per Acre	94,000.00	
Park Dedication	6,000.00	Per Unit	600,000.00	
Subdivision GIS Data Entry Fee	50.00	Per Acre	2,000.00	
Lot Origination Fee	350.00	Per Lot	35,000.00	
Subtotal Platting Fees			**953,000.00**	
[List Credits, if Applicable]			-	
Total Platting Fees			**953,000.00**	

SECTION 2: ADMINISTRATIVE AND DEVELOPMENT RELATED COSTS	AMOUNT DUE	NOTES
Administrative	**3,000.00**	3% of Constr-public improvements
[List Development Agreement Specific Items, if Applicable]	-	
Subtotal Administrative and Development Related Costs	**3,000.00**	
[List Credits, if Applicable]	-	
Total Administrative and Development Related Costs	**3,000.00**	

SECTION 3: IMPROVEMENT COSTS	LETTER OF CREDIT	ESCROW	NOTES
Engineering - Onsite Field Observation		3,000.00	City Engineer - Contract
Utilities - Onsite Field Inspection		-	City Utilities
Engineering - Plan Review		-	City Engineer - Contract
Engineering - Watershed Permit Fee		-	City Engineer - Contract
Environmental		-	Wetland Engineer - Contract
Legal		-	City Attorney - Contract
Planning		-	City Planner
Finance		-	City Not Financing
Site Cleanup Escrow		-	
Non-Public Improvements			
Landscaping			
Construction - WCA/Mitigation	-		
Construction - Site (Grading)	-		
Construction - Storm Ponding	-		
Public Improvements Dedicated to the City			
Construction - Road Improvements	100,000.00		
Construction - Utility Improvements (Storm Sewer)	-		
Construction - Utility Improvements (Watermain)	-		
Construction - Utility Improvements (Sanitary Sewer)	-		
Subtotal Improvement Costs	**100,000.00**	**3,000.00**	
[List Credits, if Applicable]	-	-	
Total Improvement Costs	**100,000.00**	**3,000.00**	

SECTION 4: LOC / ESCROW / FEES REQUIRED	LETTER OF CREDIT	ESCROW	NOTES
Escrow			
Section 1: Platting Fees		953,000.00	
Section 2: Administrative Fees		3,000.00	
Section 2: Development Related Costs		-	110 % of Development Related Items
Section 3: Cash Escrow		3,300.00	110% of Cash Escrow Subtotal
Security			
Section 3: Letter of Credit	150,000.00		125% Non Public Improvements / 150% Improvements Dedicated to City
Total Letter of Credit and Cash Required	**150,000.00**	**959,300.00**	

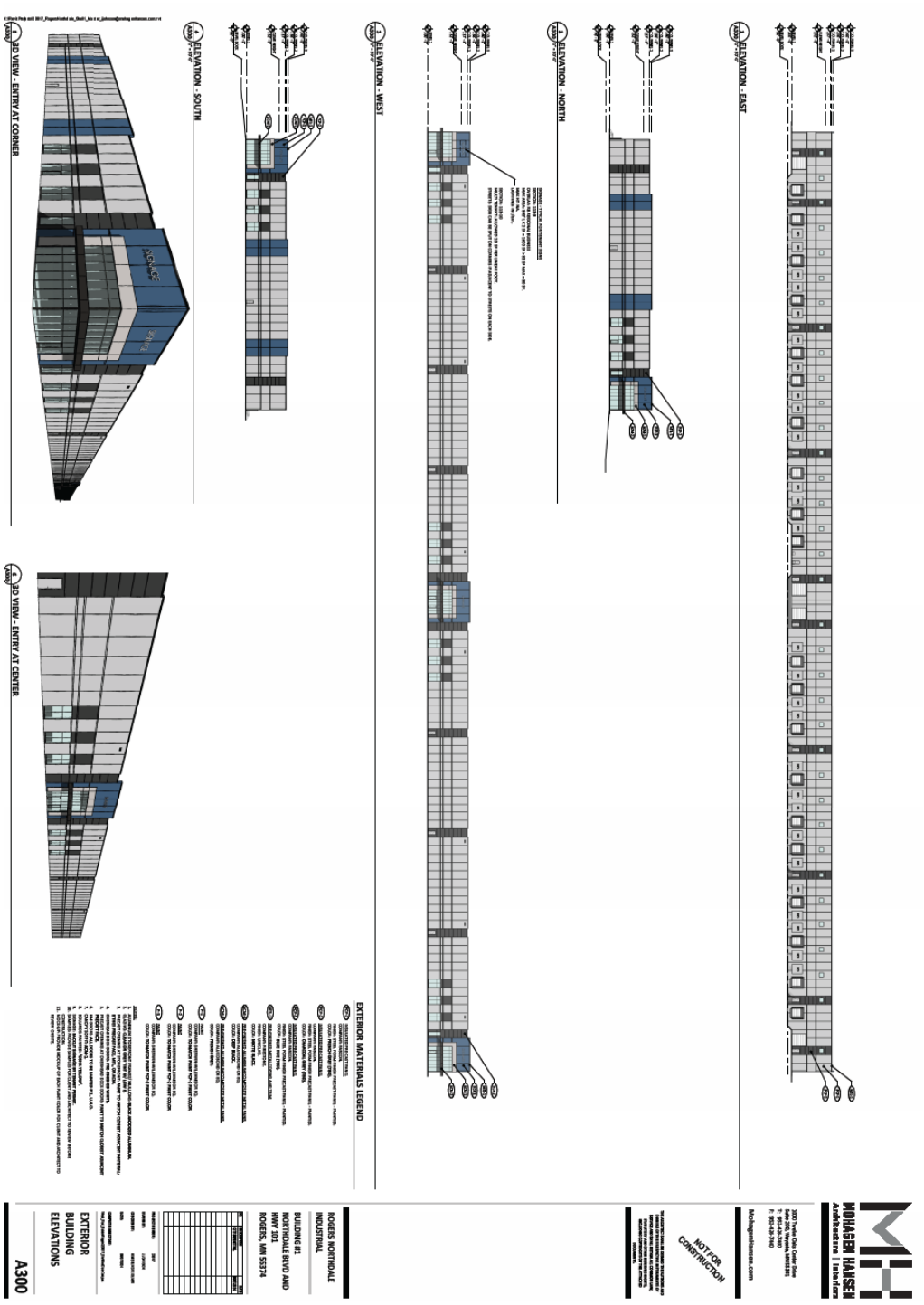
EXHIBIT C

NORTHDALE ADDITION
APPROVED PLANS

TO BE INSERTED

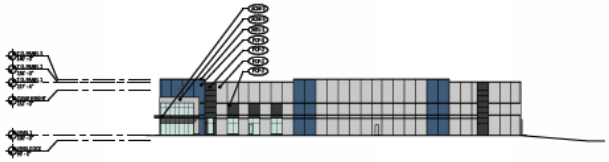
EXHIBIT D

NORTHDALE ADDITION
ARCHITECTURAL RENDERINGS

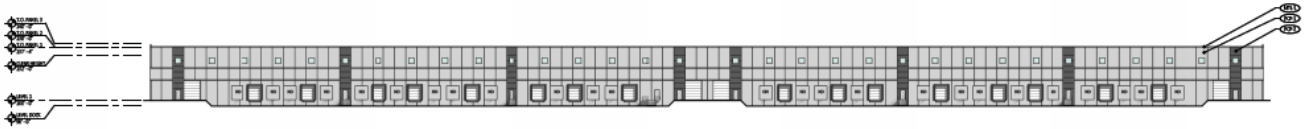




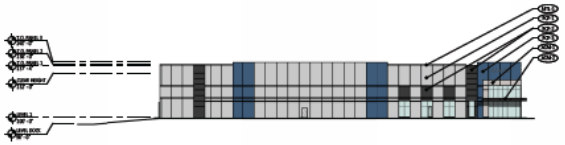
3 A300 ELEVATION - EAST
1" = 30'-0"



3 A300 ELEVATION - NORTH
1" = 30'-0"



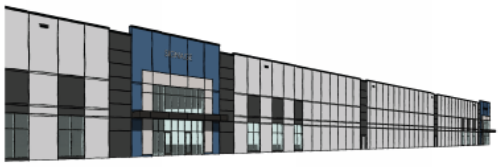
3 A300 ELEVATION - WEST
1" = 30'-0"



4 A300 ELEVATION - SOUTH
1" = 30'-0"



5 A300 3D VIEW - ENTRY AT CORNER



6 A300 3D VIEW - ENTRY AT CENTER

EXTERIOR MATERIALS LEGEND

MCP-1 INSULATED PRE-CAST PANEL
COMPANY: NARCON.
FINISH: STEEL FOAM FINISH PRECAST PANEL - PAINTED.
COLOR: FRENCH GRAY (7005).

MCP-2 INSULATED PRE-CAST PANEL
COMPANY: NARCON.
FINISH: STEEL FOAM FINISH PRECAST PANEL - PAINTED.
COLOR: CHARCOAL GREY (7067).

MCP-3 INSULATED PRE-CAST PANEL
COMPANY: NARCON.
FINISH: STEEL FOAM FINISH PRECAST PANEL - PAINTED.
COLOR: RUSH RED (7063).

MTL-1 PRE-FINISHED METAL COPING AND TRIM
COMPANY: FIRESTONE.
FINISH: UNICLAD.
COLOR: MATTE BLACK.

ACM-1 PRE-FINISHED ALUMINUM COMPOSITE METAL PANEL
COMPANY: ALUCOBOND OR EQ.
COLOR: DEEP BLACK.

ACM-2 PRE-FINISHED ALUMINUM COMPOSITE METAL PANEL
COMPANY: ALUCOBOND OR EQ.
COLOR: FRENCH GRAY.

P-1 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: TO MATCH PAINT PCP-1 PAINT COLOR.

P-2 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: TO MATCH PAINT PCP-2 PAINT COLOR.

P-3 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: TO MATCH PAINT PCP-3 PAINT COLOR.

NOTES:
1. ALUMINUM STOREFRONT FRAMES/ MULLIONS: BLACK ANODIZED ALUMINUM.
2. GLAZING: CLEAR OR GREY TINT W/ LOW E.
3. PRECAST OPENING AT STOREFRONT: PAINT TO MATCH CLOSEST ADJACENT MATERIAL/ EITHER PRECAST FACE, MTL, OR ACM.
4. OVERHEAD DOOR DOORS: PRE-FINISHED WHITE.
5. PRECAST OPENING AT OVERHEAD DOOR DOORS: PAINT TO MATCH CLOSEST ADJACENT PRECAST FACE.
6. PM DOORS: ALL DOORS TO BE PAINTED P-1, U.N.O.
7. CANOPY SOFFIT: ACM-2.
8. BOLLARDS: PAINTED "OSHA YELLOW".
9. SIGNAGE: BACKLIT SIGNAGE BY TENANT PERMIT.
10. SHAPES: PROVIDE SHAPES FOR CLIENT AND ARCHITECT TO REVIEW BEFORE CONSTRUCTION.
11. MCG-1/P: PROVIDE MOCK-UP OF EACH PAINT COLOR FOR CLIENT AND ARCHITECT TO REVIEW ONSITE.

MOHAGEN HANSEN
Architecture | Interiors

3000 Twelve Oaks Center Drive
Suite 200, Wayzata, MN 55391
T: 952-426-7600
F: 952-426-7640

MohagenHansen.com

NOT FOR CONSTRUCTION

THIS ARCHITECT SHALL BE DEEMED THE AUTHOR AND OWNER OF THESE RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS OF THE ATTACHED DOCUMENTS.

ROGERS NORTHDALE INDUSTRIAL

BUILDING #2
NORTHDALE BLVD AND HWY 101
ROGERS, MN 55374

NO.	DESCRIPTION	DATE
	CITY SUBMITTAL	09/27/24

EXTERIOR BUILDING ELEVATIONS

A300

EXHIBIT E

NORTHDALE ADDITION
CONSENT

_____ ("Bank") holds a mortgage encumbering the Property.

The Property is subject to the foregoing Developer's Agreement and, accordingly, Bank hereby consents to the Developer's Agreement; provided, that in doing so, Bank shall not be liable to the City or any other person for the performance or non-performance of the Agreement by the Developer; provided further, that in the event that Bank acquires fee title to the Property by foreclosure or sale in lieu of foreclosure, Bank shall not be required to perform any of the obligations required of the Developer in said Agreement during the Bank's term of ownership so long as Bank is actively marketing the Property for sale and maintaining the Property in compliance with applicable ordinances.

_____

Dated:_____, 20__

By: _____

Its: _____

ACKNOWLEDGEMENT FOR BANK

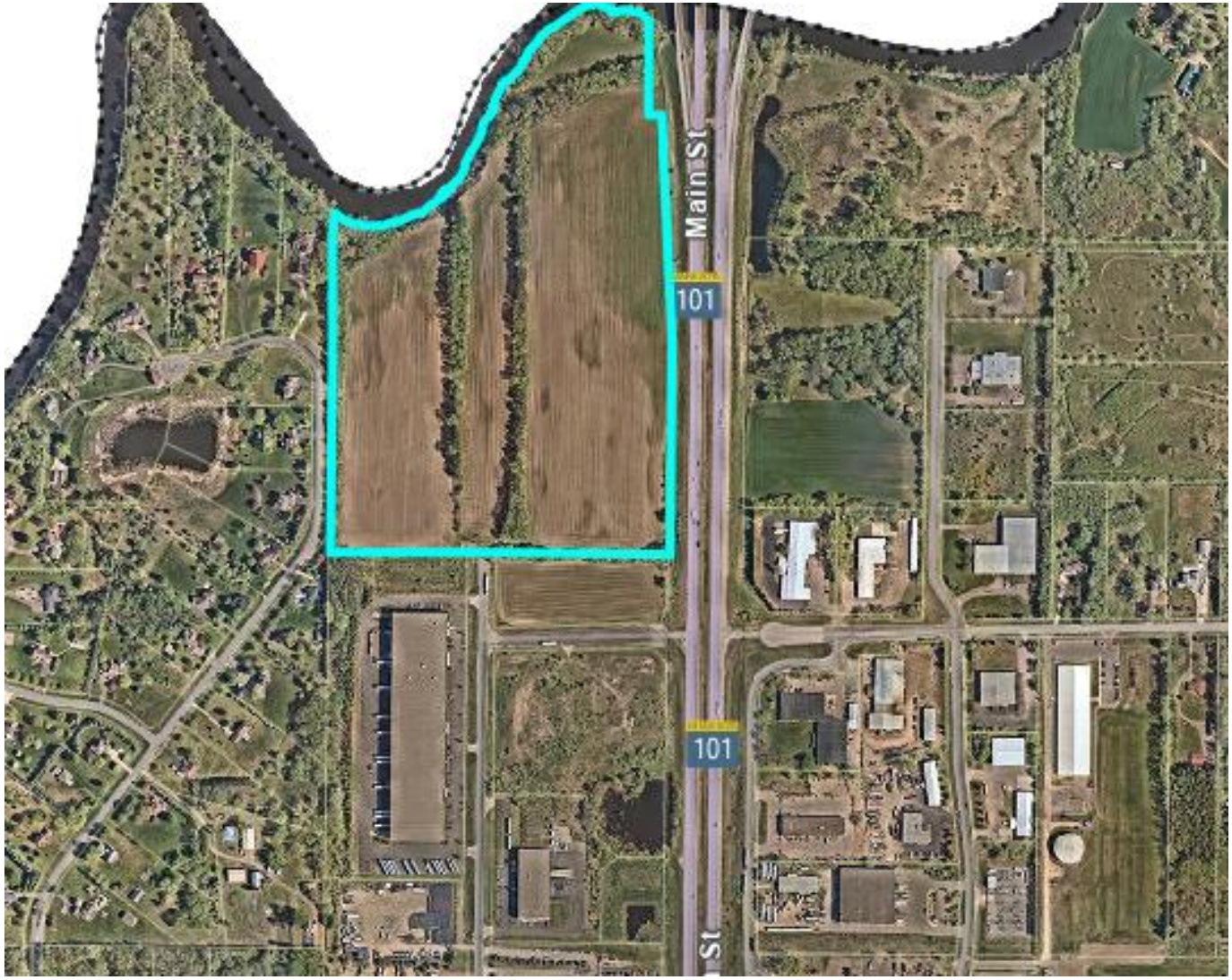
STATE OF MINNESOTA)
)ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 2024, by _____, the _____ of _____, a _____ under the laws of _____, on behalf of the _____.

_____
Notary Public

[Developer to provide the required consents]

LOCATION MAP



NORTHDALE ADDITION

KNOW ALL PERSONS BY THESE PRESENTS: That CP West, LLC, a Minnesota limited liability company, owner of the following described property:

That part of the Southeast Quarter of the Southwest Quarter of Section 2, Township 120, Range 23, lying South of the Crow River.
also
That part of the East Half of the Northwest Quarter of Section 11, Township 120, Range 23 lying North of the South 1458.75 feet and West of the westerly right-of-way of State Highway No. 101.

Excepting therefrom that part of Tracts A and B described below:
Tract A:
That part of the Southeast Quarter of the Southwest Quarter of Section 2, Township 120 North, Range 23 West, Hennepin County, Minnesota, lying south of the Crow River and westerly of the westerly right of way line of Trunk Highway No. 101 as now located and established;
Tract B:
That part of the Northeast Quarter of the Northwest Quarter of Section 11, Township 120 North, Range 23 West, Hennepin County, Minnesota, lying north of the south 1458.75 feet of the East Half of the Northwest Quarter of said Section 11, and west of the westerly right of way line of Trunk Highway No. 101 as now located and established; which lies westerly of the westerly boundary of Minnesota Department of Transportation Right of Way Plat No. 27-61 as the same is on file and of record in the office of the County Recorder in and for said County and easterly of Line 1 described below:

Line 1:
Commencing at the intersection of the south line of said Section 2 with the westerly boundary of said Plat No. 27-61; thence southerly on an assumed azimuth of 180 degrees 02 minutes 32 seconds along said westerly plat boundary for 382.00 feet to the point of beginning of Line 1 to be described; thence on an azimuth of 356 degrees 56 minutes 21 seconds for 831.22 feet; thence on an azimuth of 270 degrees 02 minutes 33 seconds for 50.00 feet; thence on an azimuth of 00 degrees 02 minutes 33 seconds for 367.02 feet, more or less, to the shore line of the Crow River and there terminating.

Has caused the same to be surveyed and platted as NORTHDALE ADDITION, and does hereby dedicate to the public for public use the public way and the drainage and utility easements as created by this plat.

In witness whereof said CP West, LLC, a Minnesota limited liability company, has caused these presents to be signed by its proper officer this _____ day of _____, 20____.

SIGNED: CP West, LLC

By: _____, President

STATE OF _____
COUNTY OF _____

This instrument was acknowledged before me this _____ day of _____, 20___, by _____, as _____ of CP West, a Minnesota limited liability company, on behalf of the company.

_____ _____
Notary Public, _____ County, _____ Notary Printed Name
My Commission Expires _____

I Jared Averbeck do hereby certify that this plat was prepared by me or under my direct supervision; that I am a duly Licensed Land Surveyor in the State of Minnesota; that this plat is a correct representation of the boundary survey; that all mathematical data and labels are correctly designated on this plat; that all monuments depicted on this plat have been, or will be correctly set within one year; that all water boundaries and wet lands, as defined in Minnesota Statutes, Section 505.01, Subd. 3, as of the date of this certificate are shown and labeled on this plat; and all public ways are shown and labeled on this plat.

Dated this _____day of _____, 20____.

_____
Jared Averbeck, Licensed Land Surveyor,
Minnesota License No. 53642

STATE OF MINNESOTA
COUNTY OF HENNEPIN

This instrument was acknowledged before me this _____ day of _____, 20____, by Jared Averbeck.

_____ _____
Notary Public, _____ County, Minnesota Notary Printed Name
My Commission Expires _____

CITY COUNCIL, CITY OF ROGERS, MINNESOTA

This plat of NORTHDALE ADDITION was approved and accepted by the City Council of the City of Rogers, Minnesota at a regular meeting thereof held this _____ day of 20_____, and said plat is in compliance with the provisions of Minnesota Statutes, Section 505.03, Subd. 2.

City Council, City of Rogers, Minnesota

By: _____ Mayor By: _____ Clerk
Rick Ihli Stacie Brown

COUNTY AUDITOR, Hennepin County, Minnesota

I hereby certify that taxes payable in 20_____ and prior years have been paid for land described on this plat, dated this _____ day of _____, 20_____.

Daniel Rogan, County Auditor By: _____ Deputy

SURVEY DIVISION, Hennepin County, Minnesota

Pursuant to Minnesota Statutes Section 383B.565 (1969), this plat has been approved this _____ day of _____, 20_____.

Chris F. Mavis , County Surveyor By: _____

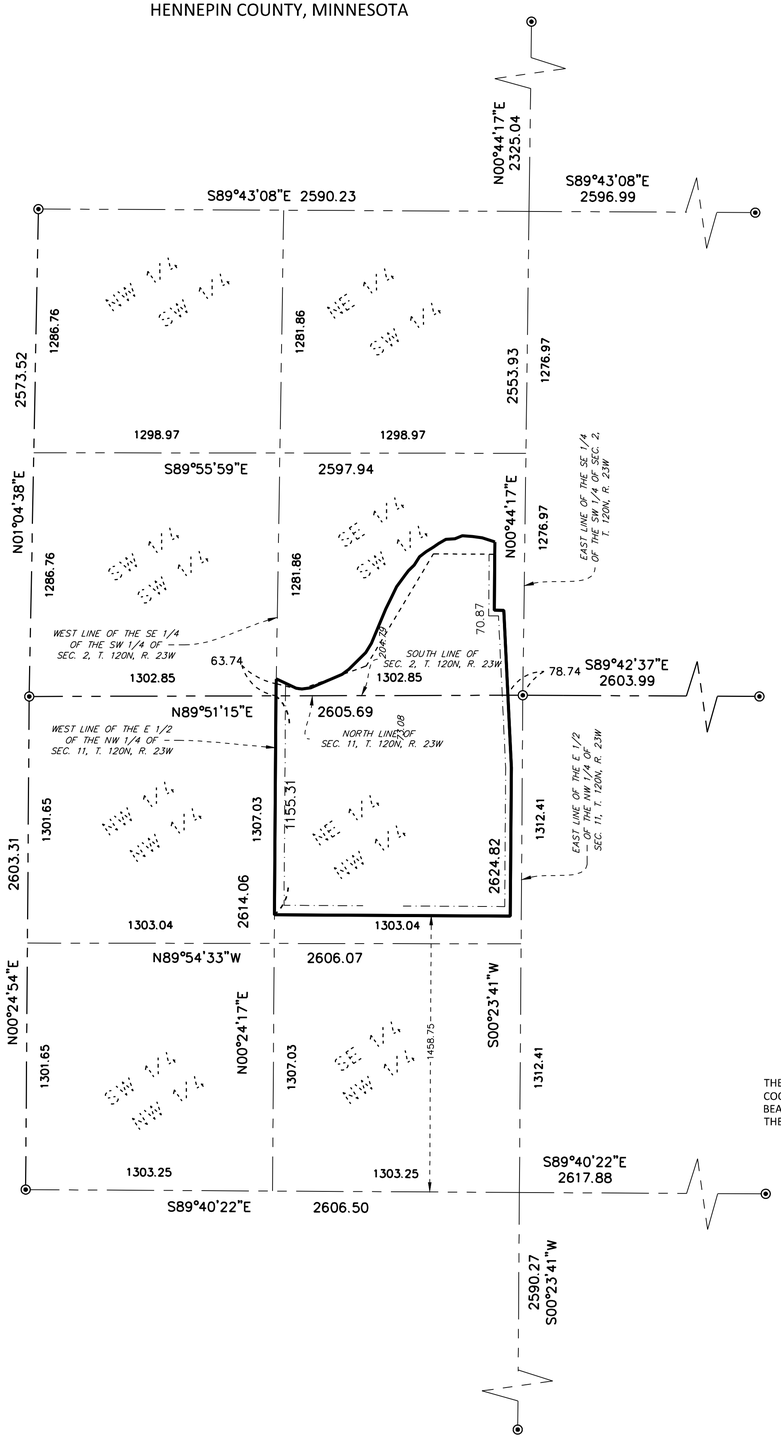
COUNTY RECORDER, Hennepin County, Minnesota

I hereby certify that the within plat of NORTHDALE ADDITION was recorded in this office this _____ day of _____, 20_____, at _____ o'clock ___ .M.

Amber Bougie, County Recorder By: _____ Deputy

SECTION BREAKDOWN
SECTIONS 2 AND 11, TOWNSHIP 120, RANGE 23
HENNEPIN COUNTY, MINNESOTA

C.R. DOC. NO. _____



NORTH
0 400
SCALE IN FEET

THE BEARING SYSTEM IS BASED ON THE HENNEPIN COUNTY COORDINATE SYSTEM, NAD83 (1986 ADJUST). WITH AN ASSUMED BEARING OF N 00° 24' 17" E FOR THE WEST LINE OF THE EAST HALF OF THE NORTHWEST QUARTER, SECTION 21, TOWNSHIP 120, RANGE 23.

⊙ DENOTES FOUND HENNEPIN COUNTY CAST IRON MONUMENT

SAMBATEK, INC.
ENGINEERING, PLANNING
AND LAND SURVEYING
SHEET 1 OF 2 SHEETS

NORTHDALE ADDITION

C.R. DOC. NO. _____

MINNESOTA DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY PLAT NO. 27-61

EAST LINE OF THE SE 1/4 OF THE SW 1/4 OF SEC. 2, T. 120N, R. 23W

INTERSECTION OF THE SOUTH LINE OF SECTION 2 WITH THE WESTERLY BOUNDARY OF MNDOT R.O.W. PLAT NO. 27-61

EAST LINE OF THE E 1/2 OF THE NW 1/4 OF SEC. 11, T. 120N, R. 23W

271

(STATE TRUNK HWY 101)

WESTERLY RIGHT-OF-WAY LINE TRUNK HWY NO. 101

MAIN STREET

S89°36'09"E 50.00

EXCEPTION

S02°42'21"E 831.22

682.63

382.00

148.65

S00°23'39"W 783.59

WESTERLY LINE OF MNDOT R.O.W. PLAT NO. 27-61

N00°23'51"E 360.0 ±

295.46

ACCESS CONTROL ON PARCEL 310 PER DOC NO. 8845036

CROW RIVER

N87°46'39"W 72.21

DRAINAGE AND UTILITY EASEMENT

N89°20'08"E 435.75

S65°29'19"W 347.86

35.97

S08°56'47"E

WATER LINE AS OF 6/12/2023

S89°36'43"E 324.03

SURVEY LINE

N30°53'56"E 689.28

428.18

OUTLOT A

BLOCK 1

1

S89°35'40"E 529.40

N00°24'20"E 83.00

S00°24'06"W 56.00

S89°35'54"E 5.00

DRAINAGE AND UTILITY EASEMENT

S00°24'06"W 292.99

S00°24'06"W 701.92

27.68

30

40

20

S89°35'40"E 99.00

N89°36'19"W 99.00

NE 1/4 OF

SE 1/4 OF

S52°47'00"W 12.81

Δ=147°56'22" L=154.92

Δ=35°16'21" L=56.94

525.02

1015.86

283.11

N00°24'20"E 1428.07

N89°26'48"E 12.45

261.10

218.56

N44°28'48"E

SURVEY LINE

WATER LINE AS OF 6/02/2023

CROW RIVER

1561.00 ±

N89°36'19"W 82.93

N85°58'19"W 408.97

S00°24'20"W 830.31

Δ=89°03'31" L=93.26

S17°56'56"E 57.39

NORTHDALE BOULEVARD

S89°40'34"E 77.40

N00°19'39"E 58.00

FND IP W/CAP RLS #47223

FND IP W/CAP RLS #41208

N89°40'22"W 1244.95

636.62

608.34

165.46

52

52

NORTH LINE OF THE SOUTH 1458.75 FEET OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 11

LAURINDA PARK ROGERS 2ND ADDITION

SOUTH LINE OF SEC. 2, T. 120N, R. 23W

N69°22'10"E 42.10

N71°26'49"E 3.96

N69°22'10"E 20.00

N21°37'10"E 42.10

DRAINAGE AND UTILITY EASEMENT

16.84

N65°39'00"W

N06°41'51"E 13.84

NORTH LINE OF SEC. 11, T. 120N, R. 23W

2

THE SW 1/4

THE NW 1/4

N70°21'12"E 373.95

S75°44'48"E 127.72

89.44

WEST LINE OF THE SE 1/4 OF THE SW 1/4 OF SEC. 2, T. 120N, R. 23W

N00°54'30"E 89.4 ±

WEST LINE OF THE E 1/2 OF THE NW 1/4 OF SEC. 11, T. 120N, R. 23W

N00°24'17"E 1155.31

66 RASPBERRY DRIVE

DRAINAGE AND UTILITY EASEMENTS ARE SHOWN THUS: (NOT TO SCALE)

5 5 10 10

BEING 5 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, AND ADJOINING LOT LINES, AND BEING 10 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, AND ADJOINING RIGHT-OF-WAY LINES, AS SHOWN ON THIS PLAT.

NORTH

0 100 200
SCALE IN FEET

○ DENOTES 5/8 INCH BY 24 INCH REBAR MONUMENT SET AND MARKED BY LICENSE NO. 43933

● DENOTES 5/8 INCH BY 24 INCH REBAR MONUMENT FOUND AND MARKED BY LICENSE NO. 43933, UNLESS OTHERWISE NOTED.

THE BEARING SYSTEM IS BASED ON THE HENNEPIN COUNTY COORDINATE SYSTEM, NAD83 (1986 ADJUST). WITH AN ASSUMED BEARING OF N 00° 24' 20" E FOR THE WEST LINE OF THE EAST HALF OF THE NORTHWEST QUARTER, SECTION 21, TOWNSHIP 120, RANGE 23.

SAMBATEK, INC.
ENGINEERING, PLANNING AND LAND SURVEYING

SHEET 2 OF 2 SHEETS

CONSULTANT CONTACT LIST:

DEVELOPER/OWNER
CP WEST LLC
5402 PARKDALE DRIVE, SUITE 105
ST. LOUIS PARK, MN 55416
TEL: 952-224-2500
EMAIL: TNOBLE@WESTREINC.COM
CONTACT: THOMAS NOBLE

CIVIL ENGINEER
SAMBATEK
12800 WHITEWATER DRIVE, SUITE 300
MINNETONKA, MN 55343
TEL: 763-476-6010
EMAIL: JBAILEY@SAMBATEK.COM
CONTACT: JOSEPH BAILEY

ARCHITECT
MOHAGEN HANSEN
1000 TWELVE OAKS CENTER DRIVE, SUITE 200
WAYZATA, MN 55391
TEL: 952-426-7413
EMAIL: SOLIVER@MOHAGENHANSEN.COM
CONTACT: STEVE OLIVER

SURVEYOR
SAMBATEK
12800 WHITEWATER DRIVE, SUITE 300
MINNETONKA, MN 55343
TEL: 763-476-6010
EMAIL: JAVERBECK@SAMBATEK.COM
CONTACT: JARED AVERBECK

GEOTECHNICAL
BRAUN INTERTEC
1826 BUERKLE ROAD
ST. PAUL, MN 55110
TEL: 651-487-7006
EMAIL: JKURPIUS@BRAUNINTERTEC.COM
CONTACT: JOEL KURPIUS

LANDSCAPE ARCHITECT
SAMBATEK
12800 WHITEWATER DRIVE, SUITE 300
MINNETONKA, MN 55343
TEL: 763-476-6010
EMAIL: JWORKMAN@SAMBATEK.COM
CONTACT: JOHN WORKMAN

Permit Plans
for
Northdale Boulevard Industrial
Rogers, Minnesota

Presented by:
CP West, LLC

BENCHMARKS

1. THE VERTICAL DATUM IS BASED ON NAVD88.

BENCHMARK #1
SANITARY MH LID — ELEV.=890.43
SOUTH SIDE OF SITE

BENCHMARK #2
1/2" CAPPED IRON PIPE — ELEV.=892.05
WEST SIDE OF SITE

SHEET INDEX

SHEET	DESCRIPTION	REVISION
C1.01	TITLE SHEET	
C2.01	EXISTING CONDITIONS	
C2.02	DEMOLITION PLAN	
C2.03	DEMOLITION PLAN (ENLARGED)	
C3.01	SITE PLAN	
C3.02	VEHICLE MANEUVERING PLAN	
C4.01	GRADING PLAN (OVERALL)	
C4.02	GRADING PLAN (NORTH)	
C4.03	GRADING PLAN (SOUTH)	
C4.04	GRADING PLAN INSETS	
C4.05	GRADING PLAN NOTES	
C5.01	PHASE ONE EROSION CONTROL PLAN	
C5.02	PHASE TWO EROSION CONTROL PLAN	
C5.03	EROSION CONTROL NOTES	
C5.04	EROSION CONTROL DETAILS	
C5.05	SWPPP	
C5.06	SWPPP	
C6.01	UTILITY PLAN (OVERALL)	
C6.02	UTILITY PLAN (NORTH)	
C6.03	UTILITY PLAN (SOUTH)	
C6.04	PUBLIC WATERMAIN	
C6.05	PUBLIC WATERMAIN	
C6.06	PUBLIC SANITARY SEWER	
C6.07	NORTHDALE BLVD. EXISTING UTILITIES	
C6.08	NORTHDALE BLVD. EXISTING UTILITIES (ENLARGED)	
C6.09	LIFT STATION	
C6.10	LIFT STATION	
C6.11	LIFT STATION TOP SLAB DETAILS	
C7.01	STORM SEWER PLAN (NORTH)	
C7.02	STORM SEWER PLAN (SOUTH)	
C8.01	NORTHDALE BLVD	
C9.01	DETAILS	
C9.02	DETAILS	
C9.03	DETAILS	
C9.04	DETAILS	
C9.05	DETAILS	
C9.06	DETAILS	
C9.07	DETAILS	
L0.01	TREE PRESERVATION PLAN	
L0.02	TREE INVENTORY 1	
L0.03	TREE INVENTORY 2	
L0.04	TREE INVENTORY 3	
L0.05	TREE INVENTORY 4	
L1.01	LANDSCAPE PLAN	
L1.02	LANDSCAPE NOTES & DETAILS	



VICINITY MAP
NO SCALE

GOVERNING SPECIFICATIONS

CITY OF ROGERS SPECIFICATIONS (2023)
CITY ENGINEER'S ASSOCIATION OF MINNESOTA STANDARD SPECIFICATIONS (2018)
MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION (2020 EDITION)
MN PLUMBING CODE (2020)

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY
Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

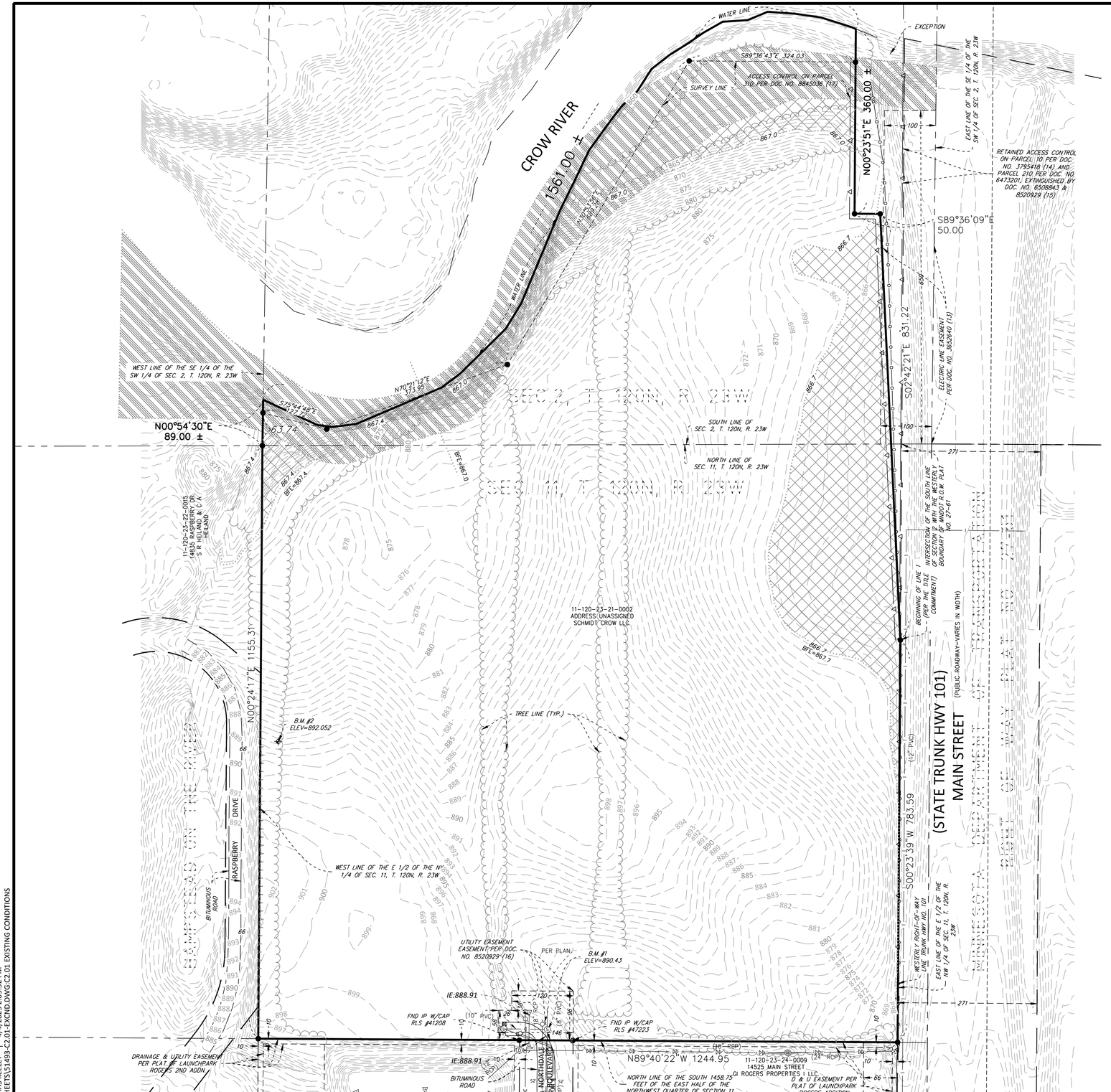
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

TITLE SHEET

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C1.01
01 OF 45
REV.

24:15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:12 PM
J:\PROJECTS\51493\CAD\SHEETS\51493 C1.01-TITLE.DWG C1.01 TITLE SHEET



LEGEND

- FEMA FLOOD ZONE LINE
- EASEMENT LINE
- SETBACK LINE
- TIE LINE
- RESTRICTED ACCESS
- FOUND MONUMENT MARKED 43933 (UNLESS OTHERWISE NOTED)
- UTILITY POLE
- BOUNDARY LINE
- RIGHT-OF-WAY LINE
- SECTION LINE
- QUARTER SECTION LINE
- SIXTEENTH SECTION LINE
- UNDERLYING / ADJACENT LOT
- 866.5 CONTOUR
- FEMA REGULATORY FLOODWAY
- FEMA ZONE AE
- WATERMAIN
- SANITARY SEWER
- STORM SEWER
- FLARED END SECTION
- OVERHEAD WIRE
- CHAIN LINK FENCE

DESCRIPTION

Parcel 1:
That part of the Southeast Quarter of the Southwest Quarter of Section 2, Township 120, Range 23, lying South of the Crow River.

also

That part of the East Half of the Northwest Quarter of Section 11, Township 120, Range 23 lying North of the South 1458.75 feet and West of the westerly right-of-way of State Highway No. 101.

Excepting therefrom that part of Tracts A and B described below:

Tract A:
That part of the Southeast Quarter of the Southwest Quarter of Section 2, Township 120 North, Range 23 West, Hennepin County, Minnesota, lying south of the Crow River and westerly of the westerly right of way line of Trunk Highway No. 101 as now located and established;

Tract B:
That part of the Northeast Quarter of the Northwest Quarter of Section 11, Township 120 North, Range 23 West, Hennepin County, Minnesota, lying north of the south 1458.75 feet of the East Half of the Northwest Quarter of said Section 11, and west of the westerly right of way line of Trunk Highway No. 101 as now located and established;

which lies westerly of the westerly boundary of Minnesota Department of Transportation Right of Way Plat No. 27-61 as the same is on file and of record in the office of the County Recorder in and for said County and easterly of Line 1 described below:

Line 1:
Commencing at the intersection of the south line of said Section 2 with the westerly boundary of said Plat No. 27-61; thence southerly on an assumed azimuth of 180 degrees 02 minutes 32 seconds along said westerly plat boundary for 382.00 feet to the point of beginning of Line 1 to be described; thence on an azimuth of 356 degrees 56 minutes 21 seconds for 831.22 feet; thence on an azimuth of 270 degrees 02 minutes 33 seconds for 50.00 feet; thence on an azimuth of 00 degrees 02 minutes 33 seconds for 367.02 feet, more or less, to the shore line of the Crow River and there terminating.

(All Abstract Property)

PROPERTY SUMMARY

1. SUBJECT PROPERTY DOES NOT HAVE AN ASSIGNED ADDRESS , THE PROPERTY IDENTIFICATION NUMBER IS 10-120-23-21-0002.
2. THE GROSS AREA OF THE SUBJECT PROPERTY IS 45.37 ACRES OR 1,976,751 SQUARE FEET. THE AREA IS MEASURED TO WATER EDGE AS LOCATED ON 6/2/2023.
3. THE SUBJECT PROPERTY IS ZONED RC- REGIONAL EMPLOYMENT CENTER, PER CITY OF ROGERS ZONING MAP DATED JUNE 23, 2020.

BENCHMARKS

1. THE VERTICAL DATUM IS BASED ON NAVD88.

BENCHMARK #1
SANITARY MH LID ELEV.=890.43
SOUTH SIDE OF SITE

BENCHMARK #2
1/2" CAPPED IRON PIPE ELEV.=892.05
WEST SIDE OF SITE

SURVEY NOTES

1. THE BEARING SYSTEM IS BASED ON THE HENNEPIN COUNTY COORDINATE SYSTEM, NAD83 (1986 ADJUST). WITH AN ASSUMED BEARING OF N 00° 24' 17" E FOR THE WEST LINE OF THE EAST HALF OF THE NORTHWEST QUARTER, SECTION 21, TOWNSHIP 120, RANGE 23.
2. FIELD WORK WAS COMPLETED ON 06/02/2023.
3. EVIDENCE OF UNDERGROUND UTILITIES EXISTING ON OR SERVING THE SURVEYED PROPERTY IS SHOWN PER THE FOLLOWING:
   A GOPHER STATE ONE CALL (GSOC) REQUEST WAS PLACED ON 5/15/2023 AND ASSIGNED GSOC TICKET NOS. 231355012 AND 231355238.

   UTILITY INFORMATION SHOWN HEREON IS A COMPILATION OF PROVIDED MAP INFORMATION AND THOSE VISIBLE UTILITIES AND MARKED UTILITIES WHICH WERE LOCATED DURING THE SURVEY FIELD WORK. UTILITY SUPPLIERS OFTEN DO NOT RESPOND TO LOCATE REQUESTS IN THE FIELD BUT MAY PROVIDE MAPS, PLANS, AND DRAWINGS IN LIEU OF PHYSICAL LOCATION. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN HEREON ARE IN THE EXACT LOCATION AS INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE AVAILABLE INFORMATION. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. PURSUANT TO MS 216.D CONTACT GOPHER STATE ONE CALL AT (651-454-0002) PRIOR TO ANY EXCAVATION.

NORTH
0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, survey, or report was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota.

Print Name: MARK R. SALO

Date 03/28/2025 License # 43933

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY EJH
DESIGNED BY
CHECKED BY JJA
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

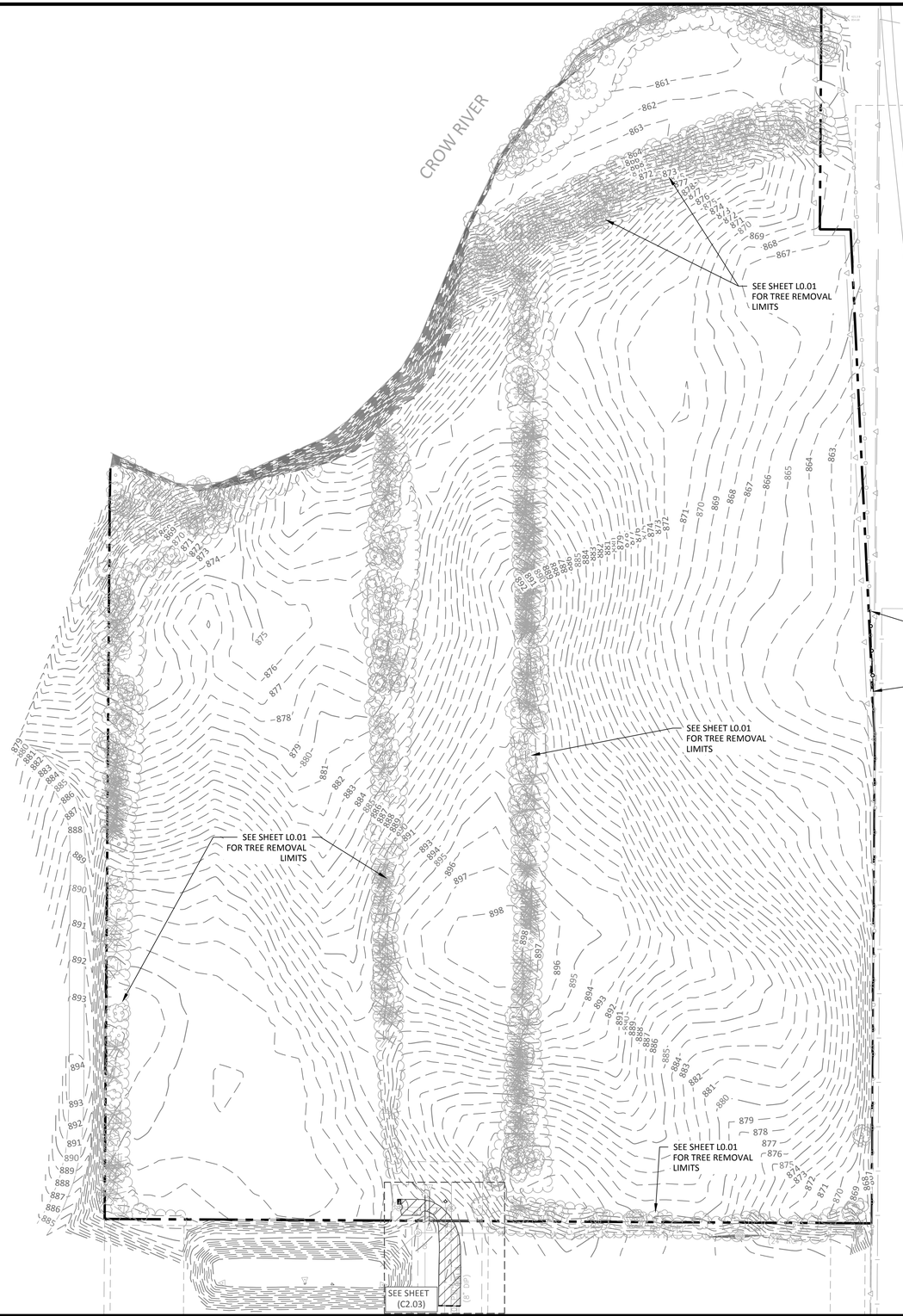
EXISTING CONDITIONS

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET C2.01
02 OF 45
REV.

24:15 (UMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:32 PM
J:\PROJECTS\51493\CAD\SHEETS\51493 C2.01-EXCND.DWG C2.01 EXISTING CONDITIONS

© 2021 Sambatek



DEMOLITION NOTES

1. DEMOLITION NOTES ARE NOT COMPREHENSIVE. CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION TO OBTAIN A CLEAR UNDERSTANDING OF THE INTENDED SCOPE OF WORK.
2. THE DESIGN SHOWN IS BASED ON ENGINEER'S UNDERSTANDING OF EXISTING CONDITIONS. THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE BASED UPON ALTA AND TOPOGRAPHIC MAPPING PREPARED BY SAMBATEK, 06/05/2023. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS WITHOUT EXCEPTION, CONTRACTOR SHALL HAVE MADE, AT OWN EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.
3. THE CONTRACTOR IS RESPONSIBLE FOR DEMOLITION, REMOVAL, AND DISPOSING IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES AND IN ACCORDANCE WITH APPLICABLE CODES, OF ALL STRUCTURES, PADS, WALLS, FLUMES, FOUNDATIONS, PARKING, DRIVES, DRAINAGE STRUCTURES, UTILITIES, ETC., SUCH THAT THE IMPROVEMENTS SHOWN ON THE PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE GEOTECHNICAL REPORT AND/OR GEOTECHNICAL ENGINEER.
4. CLEARING AND GRUBBING: CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING THE DEBRIS IN A LAWFUL MANNER. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL.
5. CONTRACTOR IS RESPONSIBLE FOR THE DISCONNECTION OF UTILITY SERVICES TO EXISTING BUILDINGS PRIOR TO DEMOLITION OF THE BUILDINGS.
6. CONTRACTOR IS SPECIFICALLY CAUTIONED THAT LOCATIONS OF EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM INFORMATION AVAILABLE. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE UTILITY MAPPING ACCURACY. PRIOR TO START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES 48 HOURS PRIOR TO ANY EXCAVATION FOR ON-SITE LOCATIONS OF EXISTING UTILITIES. THE LOCATIONS OF UTILITIES SHALL BE OBTAINED BY THE CONTRACTOR BY CALLING MINNESOTA GOPHER STATE ONE CALL AT 800-252-1166 OR 651-454-0002.
7. THE MAPPING LOCATION OF ALL EXISTING SEWERS, PIPING, AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AS THE EXACT LOCATION, OR AS THE ONLY OBSTACLES THAT MAY OCCUR ON THE SITE. VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PROCEEDING WITH WORK. UTILITIES DETERMINED TO BE ABANDONED SHALL BE REMOVED IF UNDER THE BUILDING INCLUDING 10' BEYOND FOUNDATIONS.
8. **CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO REMOVAL AND/OR RELOCATION OF UTILITIES. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANIES' FORCES AND ANY FEES WHICH ARE TO BE PAID TO UTILITY COMPANIES FOR SERVICES. CONTRACTOR IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.**
9. **ELECTRICAL, TELEPHONE, CABLE, WATER, FIBER OPTIC CABLE AND/OR GAS LINES NEEDING TO BE REMOVED OR RELOCATED SHALL BE COORDINATED WITH THE AFFECTED UTILITY COMPANY. ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY IS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. CONTRACTOR SHALL PAY CLOSE ATTENTION TO EXISTING UTILITIES WITHIN THE ROAD RIGHT OF WAY DURING CONSTRUCTION.**
10. CONTRACTOR MUST PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, BARRICADES, ENCLOSURES, ETC., TO THE BEST PRACTICES.
11. CONTINUOUS ACCESS SHALL BE MAINTAINED FOR THE SURROUNDING PROPERTIES AT ALL TIMES DURING DEMOLITION OF THE EXISTING FACILITIES.
12. PRIOR TO DEMOLITION OCCURRING, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED AND APPROVED BY THE LOCAL AUTHORITY.
13. CONTRACTOR SHALL LIMIT SAW-CUT & PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR.
14. CONTRACTOR TO PROTECT EXISTING FEATURES WHICH ARE TO REMAIN. DAMAGE TO ANY EXISTING CONDITIONS TO REMAIN WILL BE REPLACED AT CONTRACTOR'S EXPENSE.
15. ABANDON OR REMOVE ALL SANITARY, WATER AND STORM SERVICES PER CITY STANDARDS. COORDINATE ALL WORK WITH CITY. ALL STREET RESTORATION SHALL BE COMPLETED IN COMPLIANCE WITH LOCAL STANDARDS.
16. CONTRACTOR SHALL PREPARE AND SUBMIT TO THE GOVERNING AUTHORITY A TRAFFIC AND/OR PEDESTRIAN TRAFFIC PLAN PER CITY/COUNTY/STATE STANDARDS TO BE APPROVED BY THE LOCAL GOVERNING AUTHORITY.

LEGEND

- GAS METER
- HYDRANT
- LIGHT
- STORM SEWER
- DRAINTILE
- WATERMAIN
- FORCEMAIN (SAN.)
- SANITARY SEWER
- OVERHEAD WIRE
- TELEPHONE PEDESTAL
- UNDERGROUND CABLE TV
- ELECTRIC TRANSFORMER
- GAS METER
- WIRE FENCE
- IRON FENCE
- WOOD FENCE
- CHAIN LINK FENCE
- BLOCK RETAINING WALL
- SPRINKLER HEAD
- SPRINKLER VALVE
- GUIDE RAIL
- HANDRAIL
- TREE LINE
- TREES / SHRUBS
- CONCRETE
- BOLLARD
- SIGN
- CONCRETE CURB
- BUILDING LINE
- REMOVE UTILITY LINE
- REMOVE CONCRETE CURB
- SAW CUT LINE
- REMOVE BITUMINOUS PAVEMENT
- REMOVE CONCRETE PAVEMENT
- REMOVE GRAVEL DRIVE
- REMOVE LANDSCAPING
- REMOVE BUILDING
- REMOVE TREE
- REMOVE EXISTING STRUCTURE
- REMOVE LIGHT
- REMOVE CHAIN LINK FENCE

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NORTH

0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

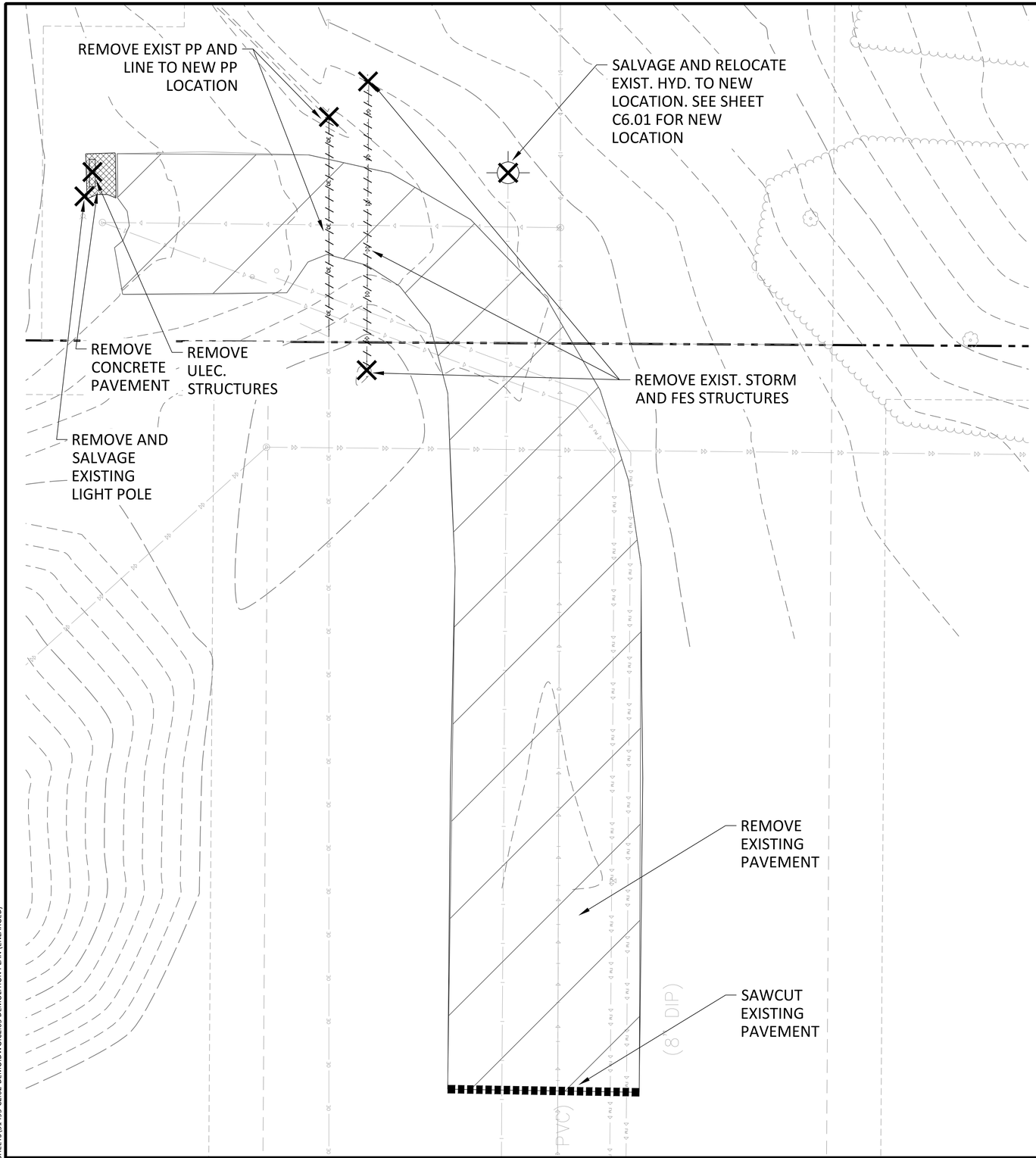
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

DEMOLITION PLAN

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET C2.02
03 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:17 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C2.02-DEMO.DWG C2.02 DEMOLITION PLAN



DEMOLITION NOTES

1. DEMOLITION NOTES ARE NOT COMPREHENSIVE. CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION TO OBTAIN A CLEAR UNDERSTANDING OF THE INTENDED SCOPE OF WORK.
2. THE DESIGN SHOWN IS BASED ON ENGINEER'S UNDERSTANDING OF EXISTING CONDITIONS. THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE BASED UPON ALTA AND TOPOGRAPHIC MAPPING PREPARED BY SAMBATEK, 06/05/2023. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS WITHOUT EXCEPTION, CONTRACTOR SHALL HAVE MADE, AT OWN EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.
3. THE CONTRACTOR IS RESPONSIBLE FOR DEMOLITION, REMOVAL, AND DISPOSING IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES AND IN ACCORDANCE WITH APPLICABLE CODES, OF ALL STRUCTURES, PADS, WALLS, FLUMES, FOUNDATIONS, PARKING, DRIVES, DRAINAGE STRUCTURES, UTILITIES, ETC., SUCH THAT THE IMPROVEMENTS SHOWN ON THE PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE GEOTECHNICAL REPORT AND/OR GEOTECHNICAL ENGINEER.
4. CLEARING AND GRUBBING: CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING THE DEBRIS IN A LAWFUL MANNER. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL.
5. CONTRACTOR IS RESPONSIBLE FOR THE DISCONNECTION OF UTILITY SERVICES TO EXISTING BUILDINGS PRIOR TO DEMOLITION OF THE BUILDINGS.
6. CONTRACTOR IS SPECIFICALLY CAUTIONED THAT LOCATIONS OF EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM INFORMATION AVAILABLE. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE UTILITY MAPPING ACCURACY. PRIOR TO START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES 48 HOURS PRIOR TO ANY EXCAVATION FOR ON-SITE LOCATIONS OF EXISTING UTILITIES. THE LOCATIONS OF UTILITIES SHALL BE OBTAINED BY THE CONTRACTOR BY CALLING MINNESOTA GOPHER STATE ONE CALL AT 800-252-1166 OR 651-454-0002.
7. THE MAPPING LOCATION OF ALL EXISTING SEWERS, PIPING, AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AS THE EXACT LOCATION, OR AS THE ONLY OBSTACLES THAT MAY OCCUR ON THE SITE. VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PROCEEDING WITH WORK. UTILITIES DETERMINED TO BE ABANDONED SHALL BE REMOVED IF UNDER THE BUILDING INCLUDING 10' BEYOND FOUNDATIONS.
8. **CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO REMOVAL AND/OR RELOCATION OF UTILITIES. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANIES' FORCES AND ANY FEES WHICH ARE TO BE PAID TO UTILITY COMPANIES FOR SERVICES. CONTRACTOR IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.**
9. **ELECTRICAL, TELEPHONE, CABLE, WATER, FIBER OPTIC CABLE AND/OR GAS LINES NEEDING TO BE REMOVED OR RELOCATED SHALL BE COORDINATED WITH THE AFFECTED UTILITY COMPANY. ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY IS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. CONTRACTOR SHALL PAY CLOSE ATTENTION TO EXISTING UTILITIES WITHIN THE ROAD RIGHT OF WAY DURING CONSTRUCTION.**
10. CONTRACTOR MUST PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, BARRICADES, ENCLOSURES, ETC., TO THE BEST PRACTICES.
11. CONTINUOUS ACCESS SHALL BE MAINTAINED FOR THE SURROUNDING PROPERTIES AT ALL TIMES DURING DEMOLITION OF THE EXISTING FACILITIES.
12. PRIOR TO DEMOLITION OCCURRING, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED AND APPROVED BY THE LOCAL AUTHORITY.
13. CONTRACTOR SHALL LIMIT SAW-CUT & PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR.
14. CONTRACTOR TO PROTECT EXISTING FEATURES WHICH ARE TO REMAIN. DAMAGE TO ANY EXISTING CONDITIONS TO REMAIN WILL BE REPLACED AT CONTRACTOR'S EXPENSE.
15. ABANDON OR REMOVE ALL SANITARY, WATER AND STORM SERVICES PER CITY STANDARDS. COORDINATE ALL WORK WITH CITY. ALL STREET RESTORATION SHALL BE COMPLETED IN COMPLIANCE WITH LOCAL STANDARDS.
16. CONTRACTOR SHALL PREPARE AND SUBMIT TO THE GOVERNING AUTHORITY A TRAFFIC AND/OR PEDESTRIAN TRAFFIC PLAN PER CITY/COUNTY/STATE STANDARDS TO BE APPROVED BY THE LOCAL GOVERNING AUTHORITY.

LEGEND

- GAS METER
- HYDRANT
- LIGHT
- STORM SEWER
- DRAINTILE
- WATERMAIN
- FORCEMAIN (SAN.)
- SANITARY SEWER
- OVERHEAD WIRE
- TELEPHONE PEDESTAL
- UNDERGROUND CABLE TV
- ELECTRIC TRANSFORMER
- GAS METER
- WIRE FENCE
- IRON FENCE
- WOOD FENCE
- CHAIN LINK FENCE
- BLOCK RETAINING WALL
- SPRINKLER HEAD
- SPRINKLER VALVE
- GUIDE RAIL
- HANDRAIL
- TREE LINE
- TREES / SHRUBS
- CONCRETE
- BOLLARD
- SIGN
- CONCRETE CURB
- BUILDING LINE
- REMOVE UTILITY LINE
- REMOVE CONCRETE CURB
- SAW CUT LINE
- REMOVE BITUMINOUS PAVEMENT
- REMOVE CONCRETE PAVEMENT
- REMOVE GRAVEL DRIVE
- REMOVE LANDSCAPING
- REMOVE BUILDING
- REMOVE TREE
- REMOVE EXISTING STRUCTURE
- REMOVE LIGHT
- REMOVE CHAIN LINK FENCE

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NORTH

0 10 20
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

DEMOLITION PLAN (ENLARGED)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

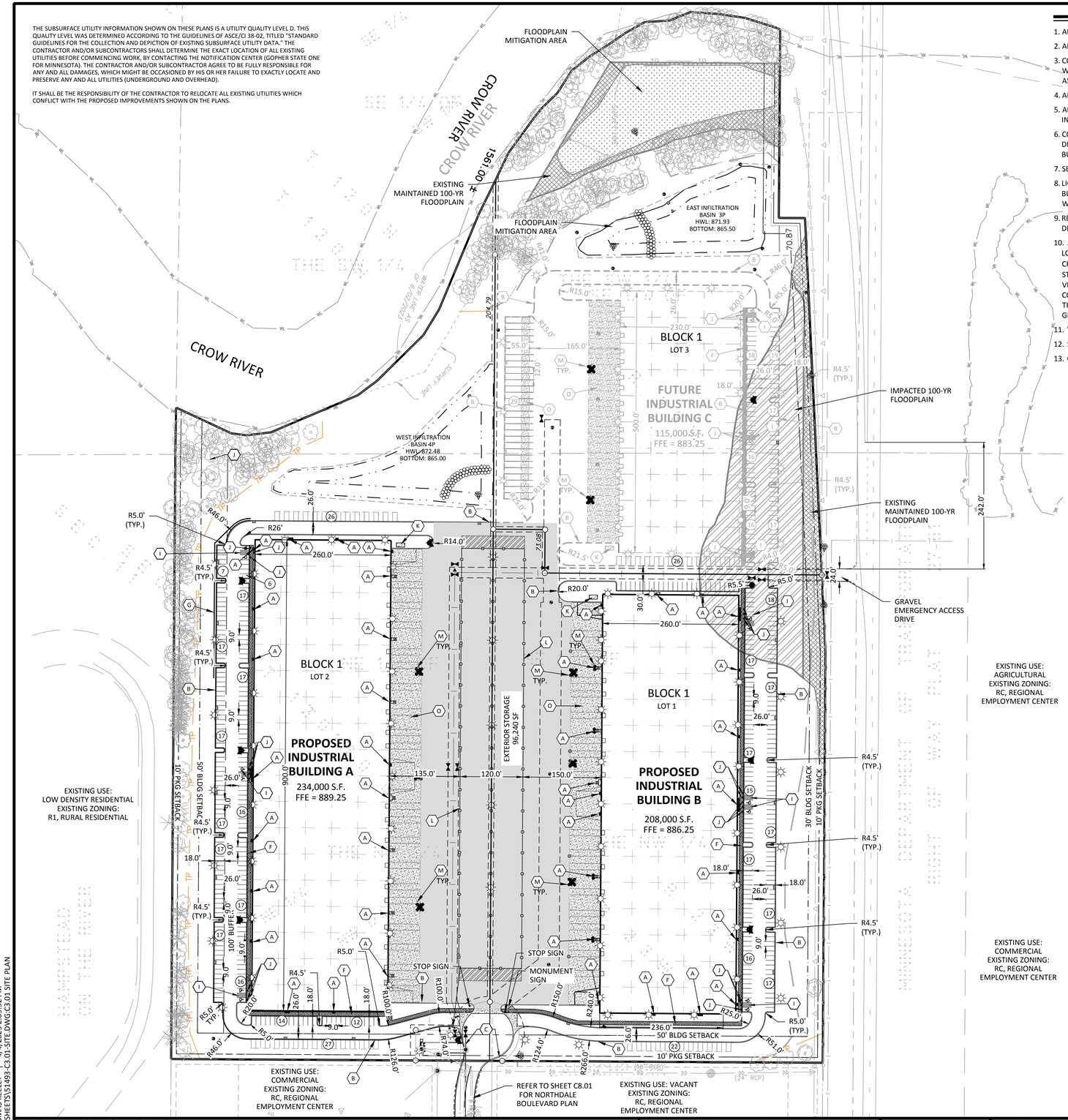
SHEET
C2.03
04 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:17 PM
L:\PROJECTS\51493\CAD\SHEETS\51493 C2.02 DEMO.DWG C2.03 DEMOLITION PLAN (ENLARGED)

© 2021 Sambatek

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



DEVELOPMENT NOTES

1. ALL DIMENSIONS ARE ROUNDED TO THE NEAREST TENTH FOOT.
2. ALL DIMENSIONS SHOWN ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL REVIEW PAVEMENT GRADIENT AND CONSTRUCT "GUTTER OUT" WHERE WATER DRAINS AWAY FROM CURB. ALL OTHER AREAS SHALL BE CONSTRUCTED AS "GUTTER IN" CURB. COORDINATE WITH GRADING CONTRACTOR.
4. ALL AREAS ARE ROUNDED TO THE NEAREST SQUARE FOOT.
5. ALL PARKING STALLS TO BE 9' IN WIDTH AND 18' IN LENGTH UNLESS OTHERWISE INDICATED.
6. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF EXIT PORCHES, RAMPS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
7. SEE ARCHITECTURAL PLANS FOR MONUMENT SIGN DETAILS.
8. LIGHT STANDARD LOCATIONS ARE FOR REFERENCE ONLY, SITE LIGHTING PLAN IS DESIGN BUILD BY CONTRACTOR. CONTRACTOR SHALL CONFIRM LIGHT STANDARD LOCATION WITH LIGHTING VENDOR.
9. REFER TO FINAL PLAT FOR LOT BOUNDARIES, LOT NUMBERS, LOT AREAS, AND LOT DIMENSIONS.
10. ALL GRADIENT ON SIDEWALKS ALONG THE ADA ROUTE SHALL HAVE A MAXIMUM LONGITUDINAL SLOPE OF 5% (1:20), EXCEPT AT CURB RAMPS (1:12), AND A MAXIMUM CROSS SLOPE OF 2.00% (1:50). MAXIMUM SLOPE IN ANY DIRECTION ON AN ADA PARKING STALL OR ACCESS AISLE SHALL BE IN 2.00% (1:50). CONTRACTOR SHALL REVIEW AND VERIFY THE GRADIENT IN THE FIELD ALONG THE ADA ROUTES PRIOR TO PLACING CONCRETE OR BITUMINOUS. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF THERE IS A DISCREPANCY BETWEEN THE GRADIENT IN THE FIELD VERSUS THE DESIGN GRADIENT. COORDINATE ALL WORK WITH PAVING CONTRACTOR.
11. "NO PARKING" SIGNS SHALL BE PLACED ALONG ALL DRIVEWAYS AS REQUIRED BY CITY.
12. STREET NAMES ARE SUBJECT TO APPROVAL BY THE CITY.
13. CONTRACTOR SHALL PROVIDE RECORD PLANS AS REQUIRED BY PERMITTING AGENCIES.

FLOODPLAIN MITIGATION

EXISTING FLOODPLAIN VOLUME = 18,541 CUBIC YARDS
PROPOSED FLOODPLAIN VOLUME = 18,908 CUBIC YARDS

LEGEND

PROPOSED	EXISTING	
		BOUNDARY LINE
		CONCRETE CURB
		EASEMENT LINE
		BUILDING LINE
		RETAINING WALL
	WL	WETLAND
		TREE LINE
		SAW CUT LINE
		SIGN
		BOLLARD
##		PARKING STALL COUNT
1		KEY NOTE
		LIGHT POLE (BY OTHERS)

- STANDARD DUTY ASPHALT PAVING
- HEAVY DUTY ASPHALT PAVING
- CONCRETE PAVING
- CONCRETE SIDEWALK
- PAVEMENT BY OTHERS (SEE ARCHITECTURAL PLANS)
- 100 YEAR FLOOD PLAIN
- IMPACTED 100 YEAR FLOOD PLAIN
- MITIGATED FLOOD PLAIN

DEVELOPMENT SUMMARY

AREA		
LOT 1, BLOCK 1	601,116.47 SF	13.80 AC
LOT 2, BLOCK 1	797,999.62 SF	18.32 AC
LOT 3, BLOCK 1	577,635.53 SF	13.26 AC
NET SITE AREA	1,976,751.62 SF	45.38 AC

PERVIOUS/IMPERVIOUS	
LOT 1, BLOCK 1	
IMPERVIOUS/BUILDING	(79.1%) 479,293.56 SF
PERVIOUS	(20.9%) 125,823 SF
LOT 2, BLOCK 1	
IMPERVIOUS/BUILDING	(64.4%) 513,928.62 SF
PERVIOUS	(35.6%) 284,071 SF
LOT 3, BLOCK 1	
IMPERVIOUS/BUILDING	(46.5%) 268,574.53 SF
PERVIOUS	(53.5%) 309,061 SF
GROSS TOTAL (MAX 75%)	
IMPERVIOUS/BUILDING	(63.4%) 1,254,082.62 SF
PERVIOUS	(36.6%) 722,669 SF

BUILDING SETBACKS	
CORRIDOR	30 FT
RESIDENTIAL ADJACENT	50 FT
PARKING SETBACKS	10 FT

ZONING	
EXISTING ZONING	RC-REGIONAL EMPLOYMENT CENTER
PROPOSED ZONING	RC-REGIONAL EMPLOYMENT CENTER

PARKING RATIOS
INDUSTRIAL PARKING: 1 PER 2000 SF
OFFICE: 1 PER 200 SF
85/15 FOR EACH BUILDING

PARKING SUMMARY	BUILDING AREA	REQUIRED	PROVIDED	PROOF	TOTAL
BUILDING A	234,000 SF	276 STALLS	207 STALLS	53 STALLS	260 STALLS
BUILDING B	208,000 SF	244 STALLS	168 STALLS	22 STALLS	190 STALLS
BUILDING C	115,000 SF	135 STALLS	103 STALLS	26 STALLS	129 STALLS
TRAILER PROVIDED			29 STALLS		
BUILDING A (ADA PROVIDED)			6 STALLS		
BUILDING B (ADA PROVIDED)			7 STALLS		
BUILDING C (ADA PROVIDED)			6 STALLS		
TOTAL			19 STALLS		

KEY NOTES

A. BUILDING, STOOPS, STAIRS (SEE ARCHITECTURAL PLANS)
B. B-612 CONCRETE CURB AND GUTTER (SEE SHEET C9.04, DETAIL 02)
C. B-618 CONCRETE CURB AND GUTTER (SEE SHEET C9.04, DETAIL 02)
D. CONCRETE APRON (SEE SHEET C9.04, DETAIL CON-12)
E. FLAT CURB SECTION TYPE 1 (SEE SHEET C9.03, DETAIL 09)
F. 7' CONCRETE SIDEWALK (SEE SHEET C9.03, DETAIL 07)
G. RETAINING WALL (SEE SHEET C9.04, DETAIL 01)
H. ADA ACCESS LOCATION (SEE SHEETS C9.06 & C9.07, MNDOT DETAILS)
I. ACCESSIBLE STALL STRIPING (SEE SHEET C9.03, DETAIL 05)
J. ACCESSIBLE PARKING SIGN (SEE SHEET C9.03, DETAIL 04)
K. TRANSFORMER (SEE ARCHITECTURAL PLANS)
L. CHAIN LINK FENCE (SEE SHEET L1.02, DETAIL 06)
M. CONCRETE BOLLARDS (SEE SHEET C9.03, DETAIL 06)
O. CONCRETE TRUCK DOCK
P. TIP OUT CURB (SEE SHEET C9.04, DETAIL 02)

NORTH
0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY
Date 03/28/2025 License # 58645

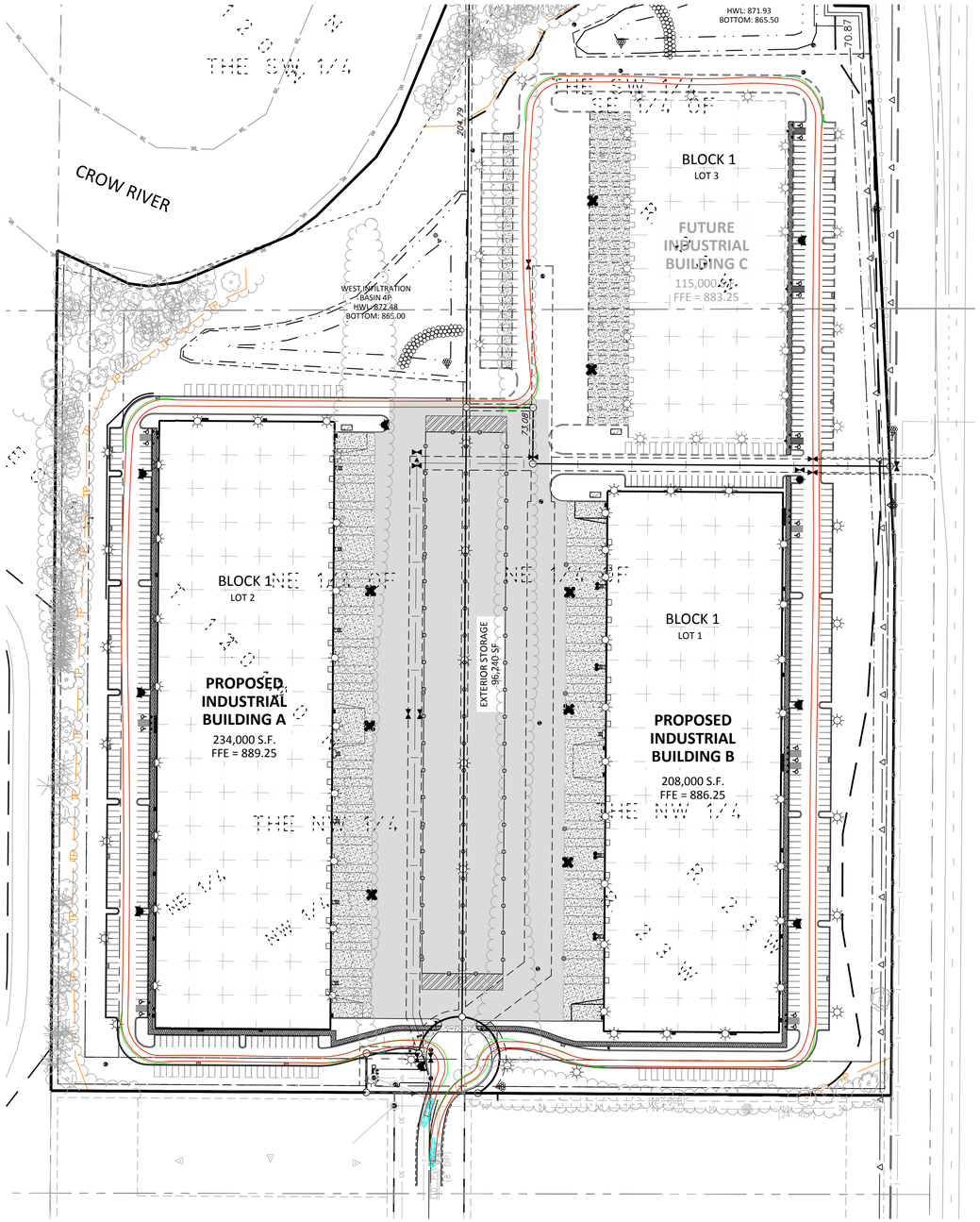
PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

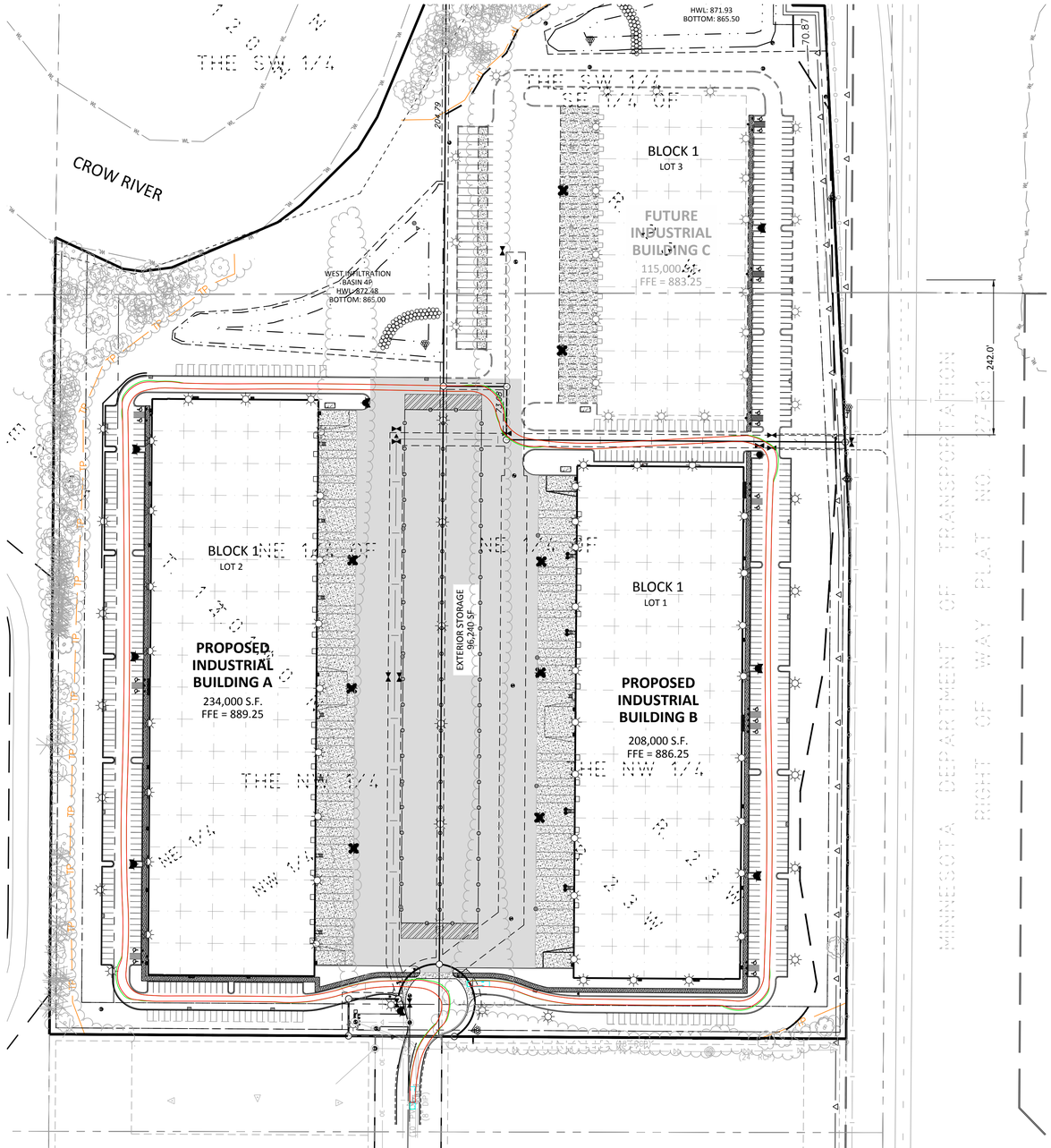
SITE PLAN
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C3.01
05 OF 45
REV.

24.1S (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:52 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C3.01-SITE.DWG\C3.01 SITE PLAN



FIRE TRUCK MANEUVERING SCHEMATIC



GARBAGE TRUCK MANEUVERING SCHEMATIC

NORTH

0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

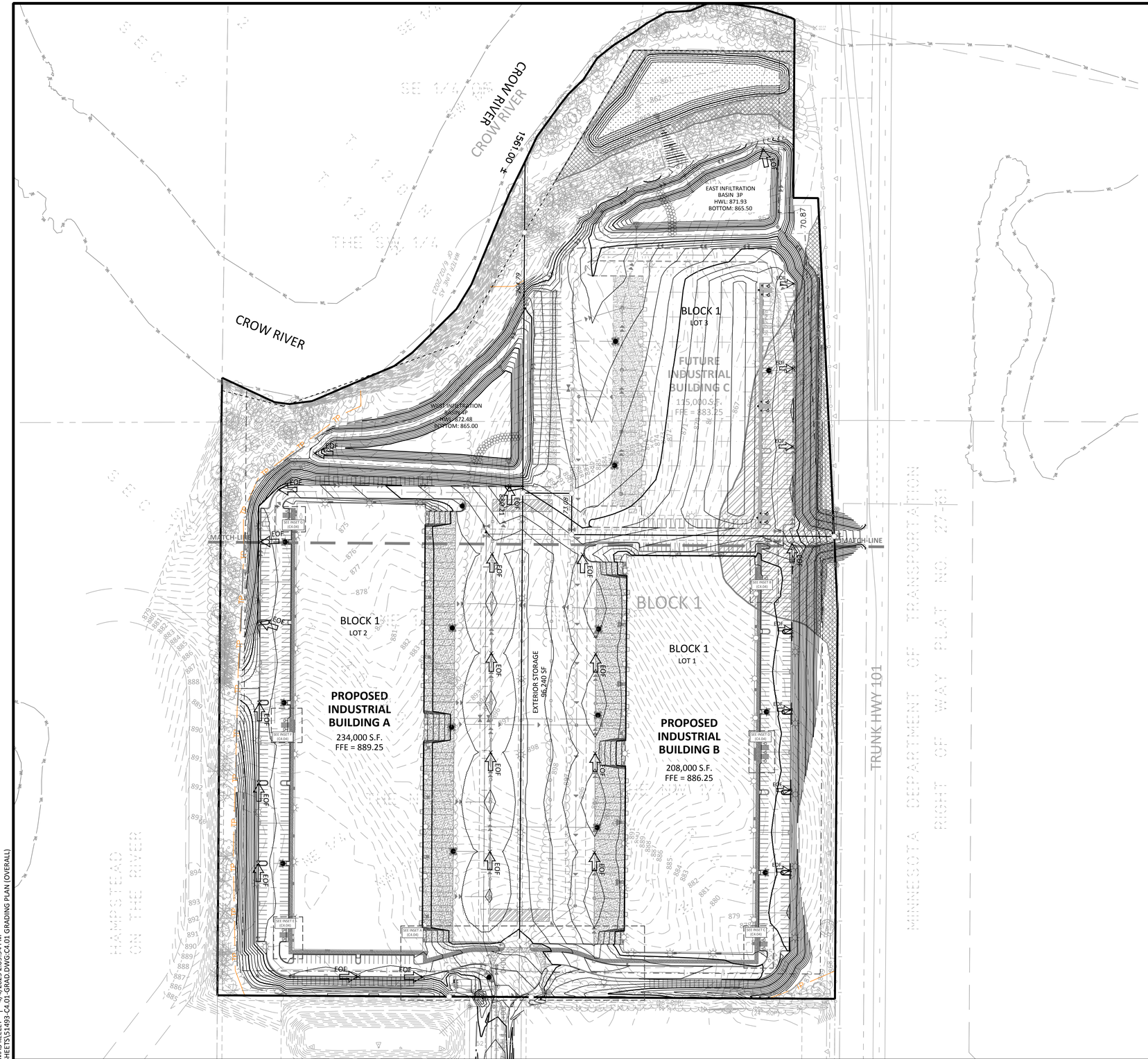
VEHICLE MANEUVERING PLAN

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C3.02
06 OF 45
REV.

© 2021 Sambatek

24:15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:52 PM
J:\PROJECTS\51493\CAD\SHEETS\51493 C3.01-SITE.DWG C3.02 VEHICLE MANEUVERING PLAN



LEGEND

PROPOSED	EXISTING	
		BOUNDARY LINE
		CONCRETE CURB
		STORM SEWER
		DRAINTILE
		BUILDING LINE
		RETAINING WALL
902	902	CONTOUR
	WL	WETLAND
		TREE LINE
902.50	902.50	SPOT ELEVATIONS
		RIPRAP
EOF 902.50		OVERFLOW ELEV.
	ST # 999.9	SOIL BORING
TP		TREE PROTECTION FENCE

- CONCRETE PAVING
- CONCRETE SIDEWALK
- PAVEMENT BY OTHERS (SEE ARCHITECTURAL PLANS)
- 100 YEAR FLOOD PLAIN
- IMPACTED 100 YEAR FLOOD PLAIN
- MITIGATED FLOOD PLAIN

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NORTH

0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

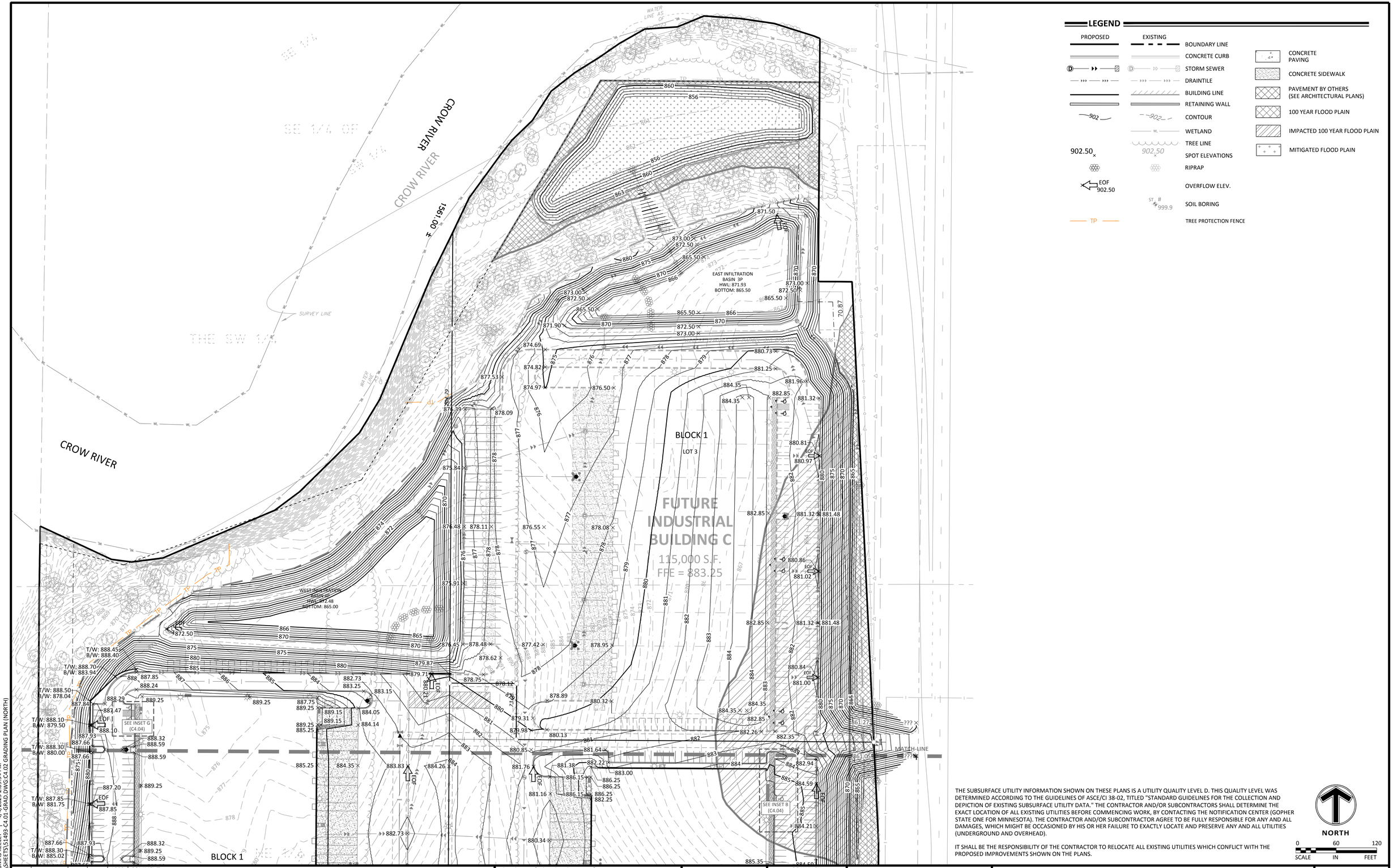
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

GRADING PLAN (OVERALL)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C4.01
07 OF 45
REV.

24-15 (LMS TECH) | THOMAS.KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C4.01-GRAD.DWG\C4.01 GRADING PLAN (OVERALL)



THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

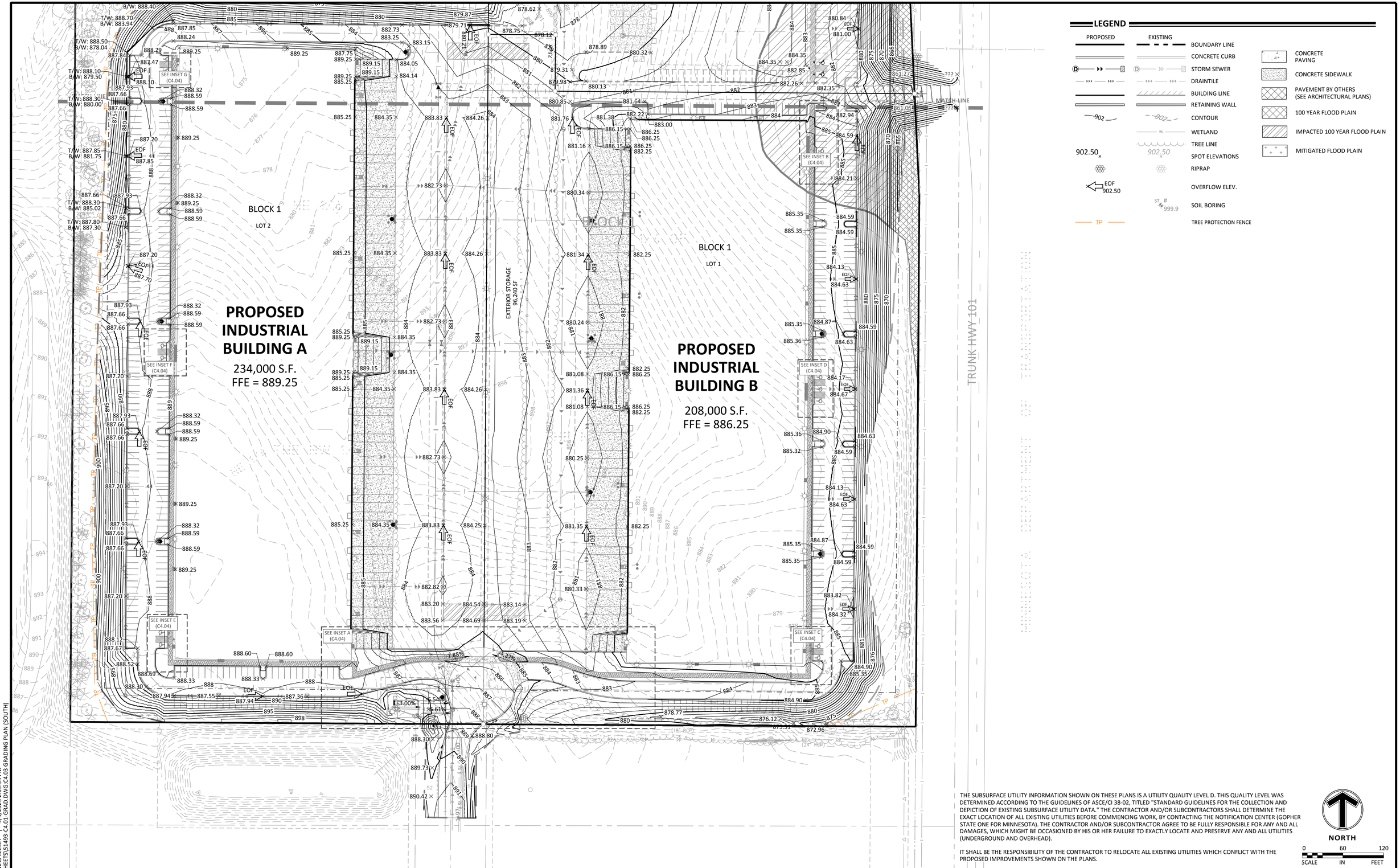
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

GRADING PLAN (NORTH)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C4.02
08 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CAD\SHEETS\51493 C4.01 GRAD.DWG C4.02 GRADING PLAN (NORTH)



THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NORTH

0 60 120
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

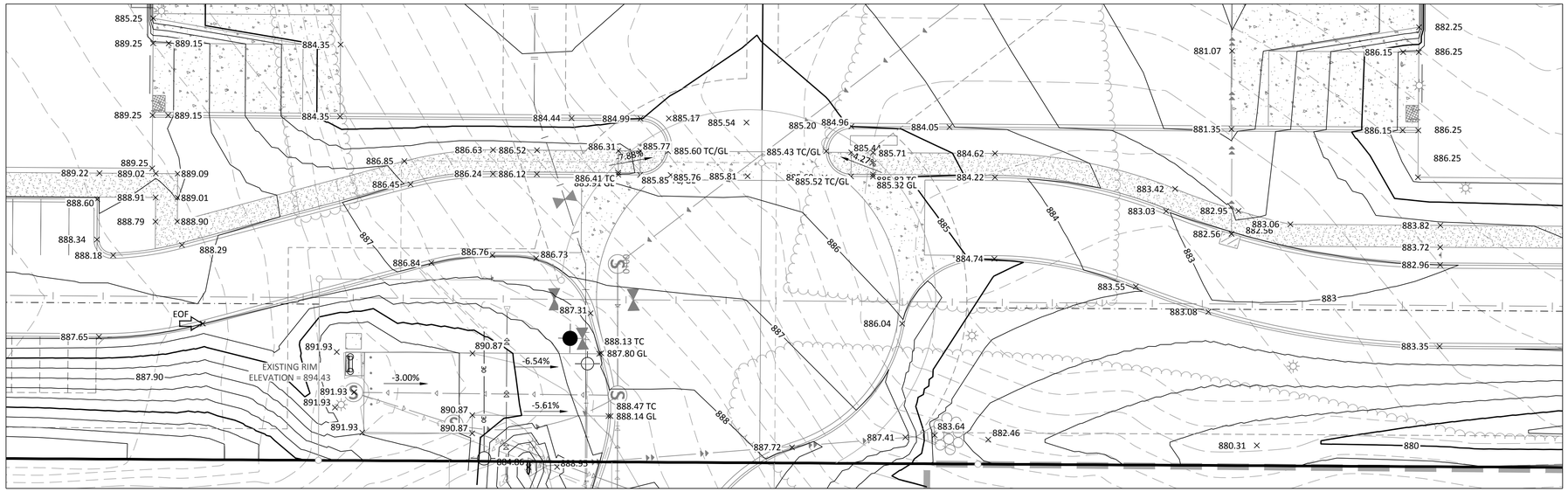
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

GRADING PLAN (SOUTH)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C4.03
09 OF 45
REV.

24.1S (LMS TECH) | THOMAS.KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C4.01-GRAD.DWG|C4.03 GRADING PLAN (SOUTH)

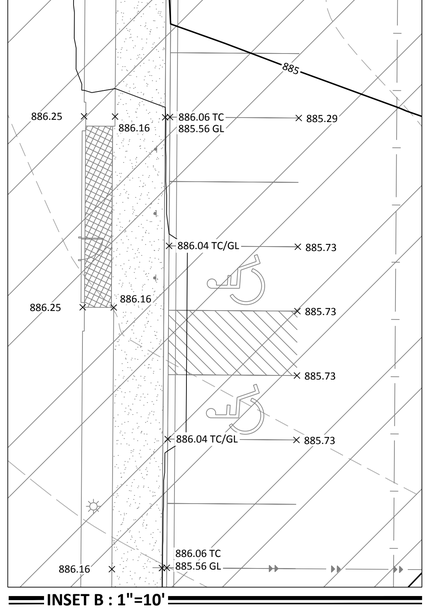


LEGEND

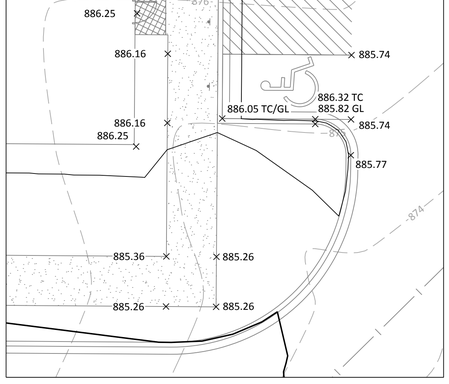
PROPOSED	EXISTING	
	BOUNDARY LINE	
	CONCRETE CURB	
D	STORM SEWER	
	DRAINTILE	
	BUILDING LINE	
	RETAINING WALL	
902	CONTOUR	
	WETLAND	
	TREE LINE	
902.50	SPOT ELEVATIONS	
	RIPRAP	
EOF 902.50	OVERFLOW ELEV.	
	SOIL BORING	
TP	TREE PROTECTION FENCE	

- CONCRETE PAVING
- CONCRETE SIDEWALK
- PAVEMENT BY OTHERS (SEE ARCHITECTURAL PLANS)
- 100 YEAR FLOOD PLAIN
- IMPACTED 100 YEAR FLOOD PLAIN
- MITIGATED FLOOD PLAIN

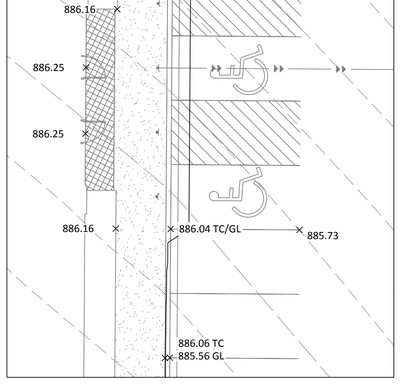
INSET A : 1"=20'



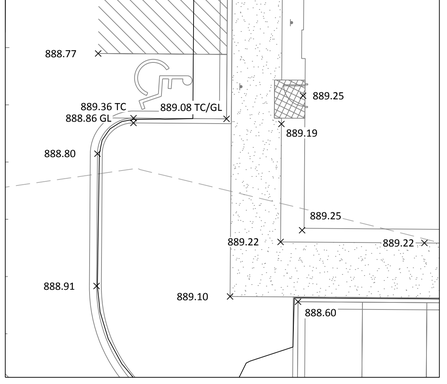
INSET B : 1"=10'



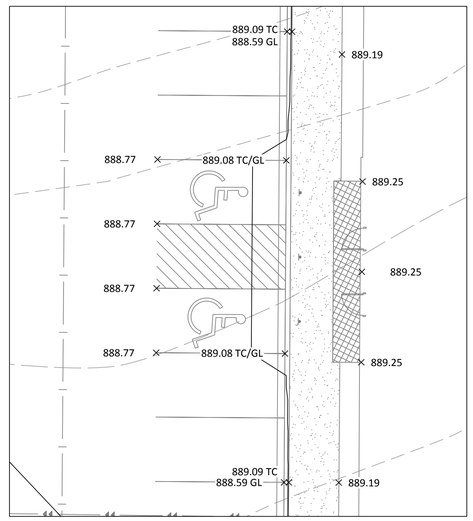
INSET C : 1"=10'



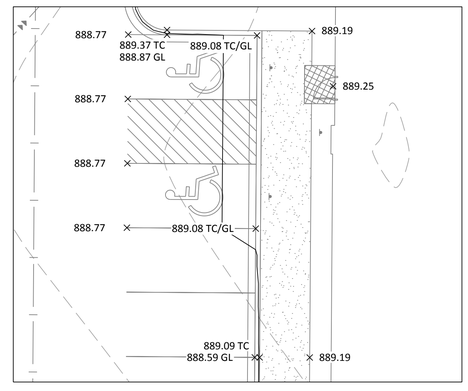
INSET D : 1"=10'



INSET E : 1"=10'



INSET F : 1"=10'



INSET G : 1"=10'

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

GRADING PLAN INSETS

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C4.04
10 OF 45
REV.

24:15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C4.01-GRAD.DWG C4.04 GRADING PLAN INSETS

GRADING NOTES

1. PROPOSED CONTOURS ARE TO FINISHED SURFACE ELEVATION. SPOT ELEVATIONS ALONG PROPOSED CURB DENOTE GUTTER GRADE.
2. CONTRACTOR SHALL REVIEW PAVEMENT GRADIENT AND CONSTRUCT "GUTTER OUT" WHERE WATER DRAINS AWAY FROM CURB. ALL OTHER AREAS SHALL BE CONSTRUCTED AS "GUTTER IN" CURB.
3. ALL GRADIENT ON SIDEWALKS ALONG THE ADA ROUTE SHALL HAVE A MAXIMUM LONGITUDINAL SLOPE OF 5% (1:20), EXCEPT AT CURB RAMPS (1:12), AND A MAXIMUM CROSS SLOPE OF 2.00% (1:50). MAXIMUM SLOPE IN ANY DIRECTION ON AN ADA PARKING STALL OR ACCESS AISLE SHALL BE IN 2.00% (1:50). CONTRACTOR SHALL REVIEW AND VERIFY THE GRADIENT IN THE FIELD ALONG THE ADA ROUTES PRIOR TO PLACING CONCRETE OR BITUMINOUS. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF THERE IS A DISCREPANCY BETWEEN THE GRADIENT IN THE FIELD VERSUS THE DESIGN GRADIENT. COORDINATE ALL WORK WITH PAVING CONTRACTOR.
4. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
5. SAFETY NOTICE TO CONTRACTORS: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE DUTY OF THE ENGINEER OR THE DEVELOPER TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE.
6. CONTRACTOR SHALL COMPLETE THE SITE GRADING CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER'S SOILS ENGINEER. ALL SOIL TESTING SHALL BE COMPLETED BY THE OWNER'S SOILS ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED SOIL TESTS AND INSPECTIONS WITH THE SOILS ENGINEER.

   A GEOTECHNICAL ENGINEERING SOILS REPORT HAS BEEN COMPLETED BY:

   COMPANY: BRAUN INTERTEC

   ADDRESS: 1826 BUERKLE ROAD, ST. PAUL, MN 55110

PHONE: 651-487-3245

DATE: JANUARY 17, 2025

   CONTRACTOR SHALL OBTAIN A COPY OF THE SOILS REPORT.

7. CONTRACTOR SHALL COMPLETE DEWATERING AS REQUIRED TO COMPLETE THE SITE GRADING CONSTRUCTION.
8. PRIOR TO PLACEMENT OF THE AGGREGATE BASE, A TEST ROLL SHALL BE PERFORMED ON THE STREET AND PARKING AREA SUBGRADE. CONTRACTOR SHALL PROVIDE A LOADED TANDEM AXLE TRUCK WITH A GROSS WEIGHT OF 25 TONS. THE TEST ROLLING SHALL BE AT THE DIRECTION OF THE SOILS ENGINEER AND SHALL BE COMPLETED IN AREAS AS DIRECTED BY THE SOILS ENGINEER. CORRECTION OF THE SUBGRADE SOILS SHALL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SOILS ENGINEER.
9. REPLACE ALL SUBGRADE SOIL DISTURBED DURING THE CONSTRUCTION THAT HAVE BECOME UNSUITABLE AND WILL NOT PASS A TEST ROLL. REMOVE UNSUITABLE SOIL FROM THE SITE AND IMPORT SUITABLE SOIL AT NO ADDITIONAL COST TO THE OWNER.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING VEHICULAR AND PEDESTRIAN TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING SIGNS, DIRECTIONAL SIGNS, FLAGMEN AND LIGHTS TO CONTROL THE MOVEMENT OF TRAFFIC WHERE NECESSARY. TRAFFIC CONTROL DEVICES SHALL CONFORM TO APPROPRIATE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARDS.
11. EXISTING TREES AND OTHER NATURAL VEGETATION WITHIN THE PROJECT AND/OR ADJACENT TO THE PROJECT ARE OF PRIME CONCERN TO THE CONTRACTOR'S OPERATIONS AND SHALL BE A RESTRICTED AREA. CONTRACTOR SHALL PROTECT TREES TO REMAIN AT ALL TIMES. EQUIPMENT SHALL NOT NEEDLESSLY BE OPERATED UNDER NEARBY TREES AND EXTREME CAUTION SHALL BE EXERCISED WHEN WORKING ADJACENT TO TREES. SHOULD ANY PORTION OF THE TREE BRANCHES REQUIRE REMOVAL TO PERMIT OPERATION OF THE CONTRACTOR'S EQUIPMENT, CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL TREE TRIMMING SERVICE TO TRIM THE TREES PRIOR TO THE BEGINNING OF OPERATION. SHOULD CONTRACTOR'S OPERATIONS RESULT IN THE BREAKING OF ANY LIMBS, THE BROKEN LIMBS SHOULD BE REMOVED IMMEDIATELY AND CUTS SHALL BE PROPERLY PROTECTED TO MINIMIZE ANY LASTING DAMAGE TO THE TREE. NO TREES SHALL BE REMOVED WITHOUT AUTHORIZATION BY THE ENGINEER. COSTS FOR TRIMMING SERVICES SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONSTRUCTION AND NO SPECIAL PAYMENT WILL BE MADE.
    a. RESTRICTED AREAS SHALL INCLUDE ALL DESIGNATED TREED AREAS OUTSIDE OF THE DESIGNATED CONSTRUCTION ZONE. ALL VEGETATION WITHIN THE RESTRICTED AREAS SHALL REMAIN.
    b. CONTRACTOR SHALL RESTRICT ALL GRADING AND CONSTRUCTION ACTIVITIES TO AREAS DESIGNATED ON THE PLANS. ACTIVITIES WITHIN THE CONSTRUCTION MAY BE RESTRICTED TO A NARROWER WIDTH IN THE FIELD TO SAVE ADDITIONAL TREES AS DIRECTED BY THE OWNER.
    c. ACTIVITIES PROHIBITED OUTSIDE OF THE CONSTRUCTION BOUNDARIES WOULD INCLUDE, BUT NOT BE LIMITED TO: SOIL AND OTHER MATERIAL STOCKPILING, EQUIPMENT OR MACHINERY STORAGE, DRIVING OF ANY VEHICLE, LEAKAGE OR SPILLAGE OF ANY "WASHOUT" OR OTHER TOXIC MATERIAL. THE COLLECTION OF OTHER DEBRIS AND SOIL STOCKPILING WILL BE IN AN AREA DETERMINED ON-SITE BY THE ENGINEER.
    d. ALL RESTRICTED AREAS SHALL BE FENCED OFF WITH BRIGHT ORANGE POLYETHYLENE SAFETY NETTING AND STEEL STAKES AS SHOWN ON THE TREE PROTECTION DETAIL. AT NO TIME SHALL THIS FENCING BE REMOVED OR ACTIVITY OF ANY KIND TAKE PLACE WITHIN IT. FINAL PLACEMENT OF ALL PROTECTIVE FENCING SHALL BE COMPLETE BEFORE ANY WORK COMMENCES ON-SITE.
    e. BEFORE COMMENCING WITH ANY EXCAVATION CONTRACTOR SHALL COMPLETE ALL PREPARATORY WORK REGARDING TREE REMOVAL, ROOT PRUNING, TREE PRUNING AND STUMP REMOVAL TO THE SATISFACTION OF THE OWNER.
    f. PREPARATORY WORK SHALL INCLUDE THE FOLLOWING AND SHALL BE COMPLETED UNDER THE DIRECT SUPERVISION OF THE OWNER'S REPRESENTATIVE:
    i. TREE REMOVAL: CONTRACTOR SHALL FELL THE TREES. AT NO TIME SHALL TREES BE BULLDOZED OUT, BUT SHALL BE CUT DOWN AND STUMPS REMOVED SEPARATELY. PRIOR TO THE FELLING OF ALL TREES, PROPER REMOVAL OF A PORTION OR ALL OF THE CANOPY SHALL BE COMPLETED SO THAT TREES IN THE RESTRICTED AREAS SHALL NOT BE INJURED IN THE PROCESS.
    ii. ROOT PRUNING: BEFORE ANY STUMPS ARE TO BE REMOVED, ALL ROOTS SHALL BE SEVERED FROM ROOTS IN THE RESTRICTED AREAS BY SAW CUTTING WITH A VERMEER DESIGNED FOR ROOT PRUNING, BY HAND, OR WITH A CHAINSAW. TREE ROOTS PROJECTING INTO THE CONSTRUCTION ZONE SHALL BE EXPOSED PRIOR TO ROOT PRUNING WITH SMALL MACHINERY, I.E..., BOBCAT.
    iii. STUMP REMOVAL: AT SUCH TIME THAT ROOTS HAVE BEEN PROPERLY SEVERED, STUMPS MAY BE REMOVED. WHERE REMOVAL OF CERTAIN STUMPS COULD CAUSE DAMAGE TO EXISTING PROTECTED TREES, TREE STUMPS SHALL BE GROUND OUT. ALL STUMP REMOVAL SHALL BE UNDER THE DIRECT SUPERVISION OF THE OWNER'S REPRESENTATIVE.
    iv. TREE PRUNING: PROPER PRUNING OF TREES IN THE RESTRICTED ZONE SHALL BE DIRECTED BY AND SUPERVISION AT ALL TIMES BY THE OWNER'S REPRESENTATIVE.
    g. AN OWNER'S REPRESENTATIVE WILL BE AVAILABLE AT ALL TIMES DURING THE PREPARATORY AND CONSTRUCTION PERIOD.
    h. MULCH RATHER THAN SEED OR SOD WILL BE USED AT THE BASE OF QUALITY TREES TO A PERIMETER DETERMINED BY THE OWNER'S REPRESENTATIVE. AREAS TO BE SEEDED FOR EROSION CONTROL PURPOSES WITHIN THE CONSTRUCTION ZONE ARE TO BE DETERMINED BY THE OWNER'S REPRESENTATIVE. NATURAL GROUND COVER WILL BE MAINTAINED WHEREVER POSSIBLE.
    i. THE USE OF RETAINING WALLS NEAR TREES, IN ADDITION TO THOSE REQUIRED ON THE PLANS SHALL BE DETERMINED IN THE FIELD, BASED ON TREE LOCATIONS AND TOPOGRAPHY.
12. EXCAVATE TOPSOIL FROM AREAS TO BE FURTHER EXCAVATED OR REGRADED AND STOCKPILE IN AREAS DESIGNATED ON THE SITE. CONTRACTOR SHALL SALVAGE ENOUGH TOPSOIL FOR RESPREADING ON THE SITE AS SPECIFIED. EXCESS TOPSOIL SHALL BE PLACED IN EMBANKMENT AREAS, OUTSIDE OF BUILDING PADS, ROADWAYS AND PARKING AREAS. CONTRACTOR SHALL SUBCUT CUT AREAS, WHERE TURF IS TO BE ESTABLISHED, TO THE DEPTH SPECIFIED IN THE LANDSCAPING PLANS. RESPREAD TOPSOIL IN AREAS WHERE TURF IS TO BE ESTABLISHED PER LANDSCAPING PLANS.
13. TRENCH BORROW CONSTRUCTION: IF ALLOWED BY THE OWNER, CONTRACTOR SHALL COMPLETE "TRENCH BORROW" EXCAVATION IN AREAS DIRECTED BY THE ENGINEER IN ORDER TO OBTAIN STRUCTURAL MATERIAL. TREES SHALL NOT BE REMOVED OR DAMAGED AS A RESULT OF THE EXCAVATION, UNLESS APPROVED BY THE ENGINEER. THE EXCAVATION SHALL COMMENCE A MINIMUM OF 10 FEET FROM THE LIMIT OF THE BUILDING PAD. THE EXCAVATION FROM THIS LIMIT SHALL EXTEND AT A MINIMUM SLOPE OF 1 FOOT HORIZONTAL TO 1 FOOT VERTICAL (1:1) DOWNWARD AND OUTWARD FROM THE FINISHED SURFACE GRADE ELEVATION. THE TRENCH BORROW EXCAVATION SHALL BE BACKFILLED TO THE PROPOSED FINISHED GRADE ELEVATION, AND SHALL BE COMPACTED IN ACCORDANCE WITH REQUIREMENTS OF THE QUALITY COMPACTION METHOD AS OUTLINED IN MN/DOT SPECIFICATION 2105.3F2. SNOW FENCE SHALL BE FURNISHED AND PLACED ALONG THE PERIMETER OF THE TRENCH BORROW AREA WHERE THE SLOPES EXCEED 2 FOOT HORIZONTAL TO 1 FOOT VERTICAL (2:1).
14. FINISHED GRADING SHALL BE COMPLETED, CONTRACTOR SHALL UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING, INCLUDING ADJACENT TRANSITION AREAS. PROVIDE A SMOOTH FINISHED SURFACE WITHIN SPECIFIED TOLERANCES, WITH UNIFORM LEVELS OR SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE SHOWN, OR BETWEEN SUCH POINTS AND EXISTING GRADES. AREAS THAT HAVE BEEN FINISHED GRADED SHALL BE PROTECTED FROM SUBSEQUENT CONSTRUCTION OPERATIONS, TRAFFIC AND EROSION. REPAIR ALL AREAS THAT HAVE BECOME RUTTED, ERODED OR HAS SETTLED BELOW THE CORRECT GRADE. ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO EQUAL OR BETTER THAN ORIGINAL CONDITION OR TO THE REQUIREMENTS OF THE NEW WORK.
15. TOLERANCES
    a. THE COMMERCIAL BUILDING SUBGRADE FINISHED SURFACE ELEVATION SHALL NOT VARY BY MORE THAN 0.10 FOOT ABOVE, OR 0.10 FOOT BELOW, THE PRESCRIBED ELEVATION AT ANY POINT WHERE MEASUREMENT IS MADE.
    b. THE STREET OR PARKING AREA SUBGRADE FINISHED SURFACE ELEVATION SHALL NOT VARY BY MORE THAN 0.05 FOOT ABOVE, OR 0.10 FOOT BELOW, THE PRESCRIBED ELEVATION OF ANY POINT WHERE MEASUREMENT IS MADE.
    c. AREAS WHICH ARE TO RECEIVE TOPSOIL SHALL BE GRADED TO WITHIN 0.10OOT ABOVE OR BELOW THE REQUIRED ELEVATION, UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
    d. TOPSOIL SHALL BE GRADED TO PLUS OR MINUS 1/2 INCH OF THE SPECIFIED THICKNESS.
16. AFTER THE SITE GRADING IS COMPLETED, IF EXCESS OR SHORTAGE OF SOIL MATERIAL EXISTS, CONTRACTOR SHALL TRANSPORT ALL EXCESS SOIL MATERIAL OFF THE SITE TO AN AREA SELECTED BY THE CONTRACTOR, OR IMPORT SUITABLE MATERIAL TO THE SITE.
17. CONTRACTOR SHALL DETERMINE THE LOCATION OF ANY HAUL ROADS THAT MAY BE REQUIRED TO COMPLETE THE SITE GRADING CONSTRUCTION AND SHALL INDICATE HAUL ROADS ON EROSION AND SEDIMENT CONTROL "SITE MAP". CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE GOVERNING AUTHORITY OF EACH ROADWAY. CONTRACTOR SHALL POST WHATEVER SECURITY AND COMPLY WITH ALL CONDITIONS WHICH ARE REQUIRED BY EACH GOVERNING AUTHORITY OF EACH ROADWAY.
18. FILL PLACED WITHIN THE BUILDING PAD AREAS SHALL BE IN CONFORMANCE WITH HUD/FHA PROCEDURES AND DATA SHEET 79G.
19. RETAINING WALL(S) SHALL BE CONSTRUCTED OF MODULAR BLOCK MATERIAL. CONTRACTOR SHALL SUBMIT TO THE ENGINEER AND LOCAL AUTHORITY CERTIFIED ENGINEERING DRAWINGS, DESIGN CALCULATIONS AND SOIL BORINGS. THE CERTIFIED ENGINEER FOR THE RETAINING WALL(S) SHALL PROVIDE CONSTRUCTION OBSERVATIONS OF THE RETAINING WALL IMPROVEMENT, AND A LETTER CERTIFYING THE INSTALLATION OF THE WALL(S) WAS CONSTRUCTED IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS.
20. CONTRACTOR SHALL PROVIDE RECORD PLANS AS REQUIRED BY PERMITTING AGENCIES.
21. NEW ADA RAMPS MUST BE COMPLIANT WITH THE LATEST ADA STANDARDS, INSPECTED FOR COMPLIANCE BY THE CONTRACTOR AND A MNDOT ADA WORKSHEET FOR EACH RAMP PROVIDED TO THE CITY OF ROGERS.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

GRADING PLAN NOTES

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C4.05
11 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C4.01-GRAD.DWG|C4.05 GRADING PLAN NOTES



LEGEND

PROPOSED	EXISTING	
		CONCRETE CURB
D	D	STORM SEWER
		DRAINTILE
902	902	CONTOUR
		RIPRAP
EOF 902.5		OVERFLOW ELEV.
		BIO-ROLL
SF		SILT FENCE
SD		SILT DIKE
		LIMITS OF DISTURBANCE
ST # 999.9		SOIL BORING
		DIRECTION OF OVERLAND FLOW
		TEMPORARY DIVERSION DITCH
		CHECK DAM
		LIMITS OF DRAINAGE SUB-BASIN
IP#		INLET PROTECTION DEVICE
		TEMPORARY STONE CONSTRUCTION ENTRANCE
SB		TEMPORARY SEDIMENT BASIN
TSM		TEMPORARY STABILIZATION MEASURES (SEED, MULCH, MATS OR BLANKETS AS OUTLINED IN THE SWPP)
TS		TEMPORARY STORAGE AND PARKING AREA

EROSION CONTROL MATERIALS QUANTITIES

ITEM	UNIT	QUANTITY
SILT FENCE	LINEAR FEET	4,228
CONSTRUCTION ENTRANCE	UNIT	1

* REFER TO SHEET C5.03 & C5.04 FOR GENERAL NOTES, MAINTENANCE NOTES, LOCATION MAPS, AND STANDARD DETAILS

NOTE TO CONTRACTOR

THE EROSION CONTROL PLAN SHEETS ALONG WITH THE REST OF THE SWPPP MUST BE KEPT ONSITE UNTIL THE NOTICE OF TERMINATION IS FILED WITH THE MPCA, THE CONTRACTOR MUST UPDATE THE SWPPP, INCLUDING THE EROSION CONTROL PLAN SHEETS AS NECESSARY TO INCLUDE ADDITIONAL REQUIREMENTS, SUCH AS ADDITIONAL OR MODIFIED BMPS DESIGNED TO CORRECT PROBLEMS IDENTIFIED. AFTER FILING THE NOTICE OF TERMINATION, THE SWPPP, INCLUDING THE EROSION CONTROL PLAN SHEETS, AND ALL REVISIONS TO IT MUST BE SUBMITTED TO THE OWNER, TO BE KEPT ON FILE IN ACCORDANCE WITH THE RECORD RETENTION REQUIREMENTS DESCRIBED IN THE SWPPP NARRATIVE.

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NORTH

0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

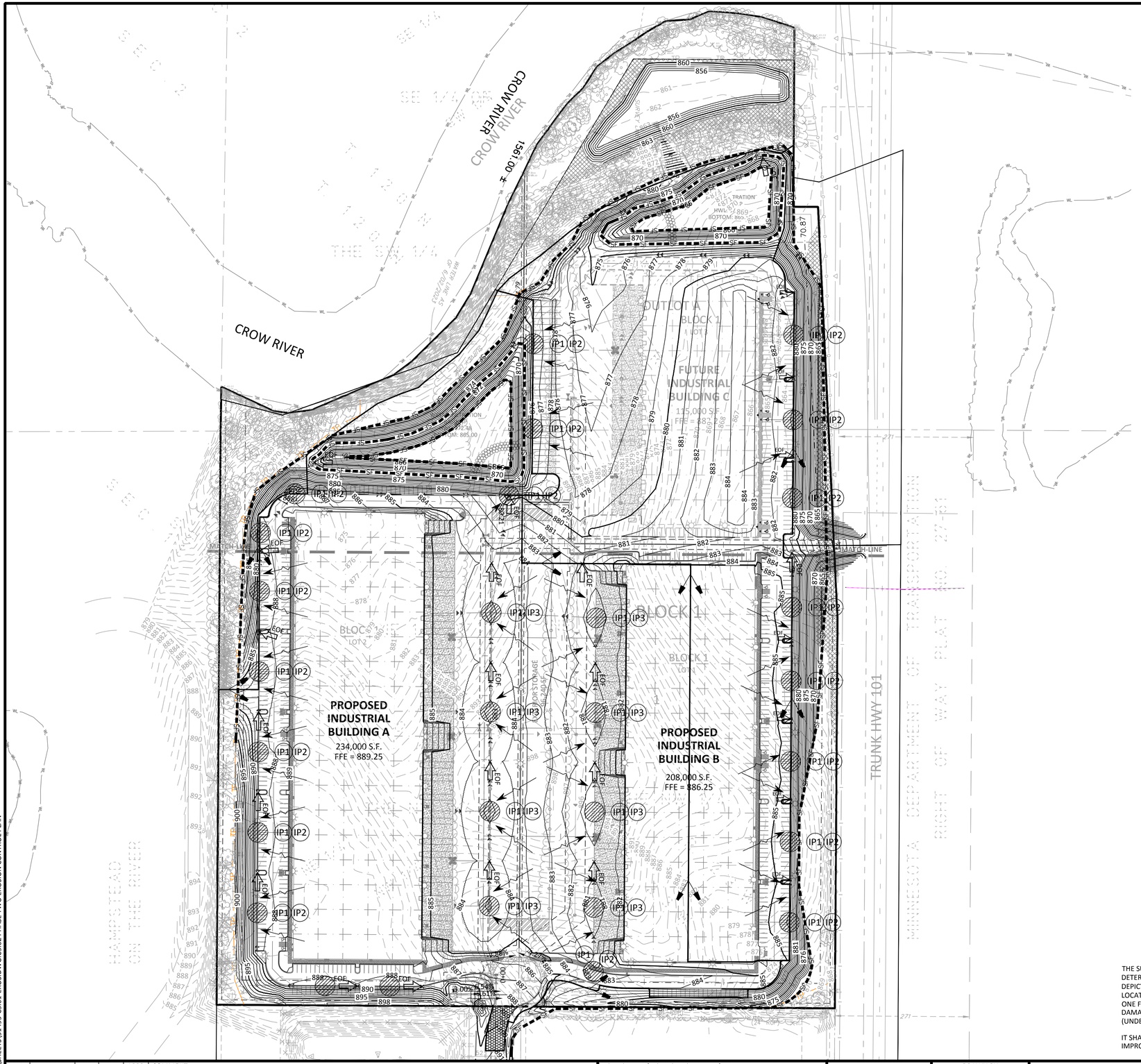
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

PHASE ONE EROSION CONTROL PLAN

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C5.01
12 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:53 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C5.01-EROS.SWPPP-C5.01 PHASE ONE EROSION CONTROL PLAN



LEGEND

PROPOSED	EXISTING	
		CONCRETE CURB
D	D	STORM SEWER
		DRAINTILE
902	902	CONTOUR
		RIPRAP
EOF 902.5		OVERFLOW ELEV.
		BIO-ROLL
SF		SILT FENCE
SD		SILT DIKE
		LIMITS OF DISTURBANCE
ST # 999.9		SOIL BORING
		DIRECTION OF OVERLAND FLOW
		TEMPORARY DIVERSION DITCH
		CHECK DAM
		LIMITS OF DRAINAGE SUB-BASIN
IP#		INLET PROTECTION DEVICE
		TEMPORARY STONE CONSTRUCTION ENTRANCE
SB		TEMPORARY SEDIMENT BASIN
TSM		TEMPORARY STABILIZATION MEASURES (SEED, MULCH, MATS OR BLANKETS AS OUTLINED IN THE SWPP)
TS		TEMPORARY STORAGE AND PARKING AREA

EROSION CONTROL MATERIALS QUANTITIES

ITEM	UNIT	QUANTITY
SILT FENCE	LINEAR FEET	7,987
CONSTRUCTION ENTRANCE	UNIT	1
INLET PROTECTION DEVICE (IP-1)	UNIT	27
INLET PROTECTION DEVICE (IP-2)	UNIT	19
INLET PROTECTION DEVICE (IP-3)	UNIT	8

* REFER TO SHEET C5.03 & C5.04 FOR GENERAL NOTES, MAINTENANCE NOTES, LOCATION MAPS, AND STANDARD DETAILS

NOTE TO CONTRACTOR

THE EROSION CONTROL PLAN SHEETS ALONG WITH THE REST OF THE SWPPP MUST BE KEPT ONSITE UNTIL THE NOTICE OF TERMINATION IS FILED WITH THE MPCA. THE CONTRACTOR MUST UPDATE THE SWPPP, INCLUDING THE EROSION CONTROL PLAN SHEETS AS NECESSARY TO INCLUDE ADDITIONAL REQUIREMENTS, SUCH AS ADDITIONAL OR MODIFIED BMPS DESIGNED TO CORRECT PROBLEMS IDENTIFIED. AFTER FILING THE NOTICE OF TERMINATION, THE SWPPP, INCLUDING THE EROSION CONTROL PLAN SHEETS, AND ALL REVISIONS TO IT MUST BE SUBMITTED TO THE OWNER, TO BE KEPT ON FILE IN ACCORDANCE WITH THE RECORD RETENTION REQUIREMENTS DESCRIBED IN THE SWPPP NARRATIVE.

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NORTH

0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

PHASE TWO EROSION CONTROL PLAN

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C5.02
13 OF 45
REV.

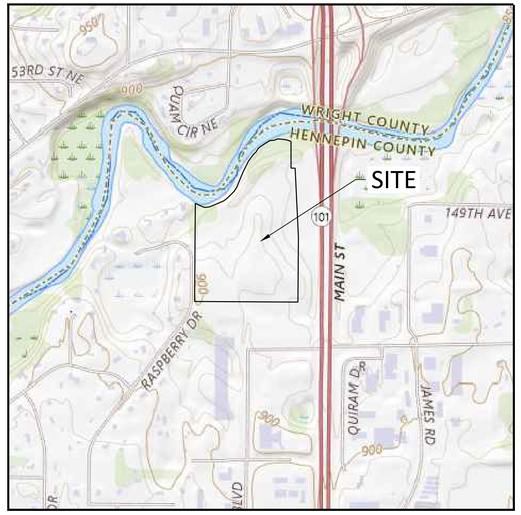
24.15 | LMS TECH | THOMAS KEELEY | 4/4/2025 2:09:53 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C5.01-EROS.DWG C5.02 PHASE TWO EROSION CONTROL PLAN

EROSION & SEDIMENTATION CONTROL NOTES & DETAILS / "SITE MAP"



SITE LOCATION MAP

NOT TO SCALE



USGS MAP

NOT TO SCALE

SEQUENCE OF CONSTRUCTION

PHASE I:

1. INSTALL STABILIZED CONSTRUCTION ENTRANCES.
2. PREPARE TEMPORARY PARKING AND STORAGE AREA.
3. CONSTRUCT THE SILT FENCES ON THE SITE.
4. INSTALL INLET PROTECTION DEVICES ON EXISTING STORM STRUCTURES, AS SHOWN ON THE PLAN.
5. CONSTRUCT THE SEDIMENTATION AND SEDIMENT TRAP BASINS, AS REQUIRED.
6. HALT ALL ACTIVITIES AND CONTACT THE CIVIL ENGINEERING CONSULTANT TO PERFORM INSPECTION OF BMPs. GENERAL CONTRACTOR SHALL SCHEDULE AND CONDUCT STORM WATER PRE-CONSTRUCTION MEETING WITH ENGINEER AND ALL GROUND DISTURBING CONTRACTORS BEFORE PROCEEDING WITH CONSTRUCTION.
7. CLEAR AND GRUB THE SITE.
8. BEGIN GRADING THE SITE.
9. START CONSTRUCTION OF BUILDING PAD AND STRUCTURES.

PHASE II:

1. TEMPORARY SEED DENUDED AREAS.
2. INSTALL UTILITIES, UNDERDRAINS, STORM SEWERS, CURBS AND GUTTERS.
3. INSTALL RIP RAP AROUND OUTLET STRUCTURES.
4. INSTALL INLET PROTECTION AROUND ALL STORM SEWER STRUCTURES.
5. PREPARE SITE FOR PAVING.
6. PAVE SITE.
7. INSTALL INLET PROTECTION DEVICES.
8. COMPLETE GRADING AND INSTALL PERMANENT SEEDING AND PLANTING.
9. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES (ONLY IF SITE IS STABILIZED), IF REQUIRED BY THE CONTRACT.

GENERAL EROSION NOTES

1. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME. WHERE A CONFLICT EXISTS BETWEEN LOCAL JURISDICTIONAL STANDARD SPECIFICATIONS AND SAMBATEK STANDARD SPECIFICATIONS, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IS COMPRISED OF THIS DRAWING (EROSION & SEDIMENTATION CONTROL PLAN-ESC PLAN), THE STANDARD DETAILS, THE PLAN NARRATIVE, AND ITS APPENDICES, PLUS THE PERMIT AND ALL SUBSEQUENT REPORTS AND RELATED DOCUMENTS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETING & SUBMITTING THE APPLICATION FOR THE MPCA GENERAL STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH STORM WATER POLLUTION PREVENTION SHALL OBTAIN A COPY OF THE SWPPP AND THE STATE OF MINNESOTA NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT (NPDES PERMIT, ISSUED AUGUST 1, 2023) AND BECOME FAMILIAR WITH THE CONTENTS. THE SWPPP AND ALL OTHER RELATED DOCUMENTS MUST BE KEPT AT THE SITE DURING CONSTRUCTION.
4. CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES (BMP'S) AS REQUIRED BY THE SWPPP & PERMITS. CONTRACTOR SHALL OVERSEE THE INSPECTION & MAINTENANCE OF THE BMP'S AND EROSION PREVENTION FROM BEGINNING OF CONSTRUCTION AND UNTIL CONSTRUCTION IS COMPLETED, IS APPROVED BY ALL AUTHORITIES, AND THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA BY EITHER THE OWNER OR OPERATOR AS APPROVED ON PERMIT. ADDITIONAL BMP'S SHALL BE IMPLEMENTED AS DICTATED BY CONDITIONS AT NO ADDITIONAL COST TO OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.
5. CONTRACTOR SHALL COMPLY WITH TRAINING REQUIREMENTS IN PART 21.1-21.3 OF THE GENERAL PERMIT.
6. BMP'S AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE. CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY PERMITTING AGENCY OR OWNER.
7. ESC PLAN MUST CLEARLY DELINEATE ALL STATE WATERS. PERMITS FOR ANY CONSTRUCTION ACTIVITY IMPACTING STATE WATERS OR REGULATED WETLANDS MUST BE MAINTAINED ON SITE AT ALL TIMES.
8. CONTRACTOR SHALL MINIMIZE CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THE ESC PLANS SHALL BE CLEARLY DELINEATED (E.G. WITH FLAGS, STAKES, SIGNS, SILT FENCE, ETC.) ON THE DEVELOPMENT SITE BEFORE WORK BEGINS. GROUND DISTURBING ACTIVITIES MUST NOT OCCUR OUTSIDE THE LIMITS OF DISTURBANCE.
9. GENERAL CONTRACTOR SHALL DENOTE ON PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
10. ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) MUST BE LIMITED TO A DEFINED AREA OF THE SITE AND SHALL BE CONTAINED AND PROPERLY TREATED OR DISPOSED. NO ENGINE DEGREASING IS ALLOWED ON SITE.
11. ALL LIQUID AND SOLID WASTES GENERATED BY CONCRETE WASHOUT OPERATIONS MUST BE CONTAINED IN A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER. A COMPACTED CLAY LINER IS NOT ACCEPTABLE. THE LIQUID AND SOLID WASTES MUST NOT CONTACT THE GROUND, AND THERE MUST NOT BE RUNOFF FROM THE CONCRETE WASHOUT OPERATIONS OR AREAS. LIQUID AND SOLID WASTES MUST BE DISPOSED OF PROPERLY AND IN COMPLIANCE WITH MPCA REGULATIONS. A SIGN MUST BE INSTALLED ADJACENT TO EACH WASHOUT FACILITY TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE PROPER FACILITIES. SELF-CONTAINED CONCRETE WASHOUTS ON CONCRETE DELIVERY TRUCKS ARE ALLOWED.
12. SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
13. DUST ON THE SITE SHALL BE CONTROLLED. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
14. SOLID WASTE: COLLECTED SEDIMENT, ASPHALT & CONCRETE MILLINGS, FLOATING DEBRIS, PAPER, PLASTIC, FABRIC, CONSTRUCTION & DEMOLITION DEBRIS & OTHER WASTES MUST BE DISPOSED OF PROPERLY & MUST COMPLY WITH MPCA DISPOSAL REQUIREMENTS.
15. HAZARDOUS MATERIALS: OIL, GASOLINE, PAINT & ANY HAZARDOUS SUBSTANCES MUST BE PROPERLY STORED, INCLUDING SECONDARY CONTAINMENT, TO PREVENT SPILLS, LEAKS OR OTHER DISCHARGE. RESTRICTED ACCESS TO STORAGE AREAS MUST BE PROVIDED TO PREVENT VANDALISM. STORAGE & DISPOSAL OF HAZARDOUS WASTE MUST BE IN COMPLIANCE WITH MPCA REGULATIONS.
16. ALL STORM WATER POLLUTION PREVENTION MEASURES PRESENTED ON THIS PLAN, AND IN THE SWPPP, SHALL BE INITIATED AS SOON AS PRACTICABLE AND PRIOR TO SOIL DISTURBING ACTIVITIES UPSLOPE.
17. DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS STOPPED SHALL BE TEMPORARILY SEEDED, WITHIN 14 DAYS OF INACTIVITY. SEEDING SHALL BE IN ACCORDANCE WITH MN/DOT SEED MIXTURE NUMBER 21-111 OR 21-112 DEPENDING ON THE SEASON OF PLANTING (SEE MN/DOT SPECIFICATION SECTION 2575.3) SEEDING METHOD AND APPLICATION RATE SHALL CONFORM TO MN/DOT SPECIFICATION SECTION 2575.3. TEMPORARY MULCH SHALL BE APPLIED IN ACCORDANCE WITH MN/DOT SPECIFICATION SECTION 2575.3F1 AND 2575.3G. ALTERNATIVELY, HYDRAULIC SOIL STABILIZER IN ACCORDANCE WITH MN/DOT SPECIFICATION SECTION 2575.3H MAY BE USED IN PLACE OF TEMPORARY MULCH.
18. DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY STOPPED SHALL BE PERMANENTLY STABILIZED. THESE AREAS SHALL BE STABILIZED IN ACCORDANCE WITH THE TIME TABLE DESCRIBED ABOVE. REFER TO THE GRADING PLAN AND/OR LANDSCAPE PLAN FOR VEGETATIVE COVER.
19. CONTRACTORS OR SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING SEDIMENT FROM CONVEYANCES & FROM TEMPORARY SEDIMENTATION BASINS THAT ARE TO BE USED AS PERMANENT WATER QUALITY MANAGEMENT BASINS. SEDIMENT MUST BE STABILIZED TO PREVENT IT FROM BEING WASHED BACK INTO THE BASIN, CONVEYANCES, OR DRAINAGEWAYS DISCHARGING OFF-SITE OR TO SURFACE WATERS. THE CLEANOUT OF PERMANENT BASINS MUST BE SUFFICIENT TO RETURN THE BASIN TO DESIGN CAPACITY.
20. ON-SITE & OFF-SITE SOIL STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION THROUGH IMPLEMENTATION OF BMP'S. STOCKPILE AND BORROW AREA LOCATIONS SHALL BE NOTED ON THE SITE MAP AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS.
21. TEMPORARY SOIL STOCKPILES MUST HAVE SILT FENCE OR OTHER EFFECTIVE SEDIMENT CONTROLS & CANNOT BE PLACED IN SURFACE WATERS, INCLUDING STORMWATER CONVEYANCES SUCH AS CURB & GUTTER SYSTEMS OR CONDUITS & DITCHES.
22. SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION.
23. DUE TO THE GRADE CHANGES DURING THE DEVELOPMENT OF THE PROJECT, CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION CONTROL MEASURES (SILT FENCES, CHECK DAMS, INLET PROTECTION DEVICES, ETC.) TO PREVENT EROSION.
24. ALL CONSTRUCTION SHALL BE STABILIZED AT THE END OF EACH WORKING DAY, THIS INCLUDES BACKFILLING OF TRENCHES FOR UTILITY CONSTRUCTION AND PLACEMENT OF GRAVEL OR BITUMINOUS PAVING FOR ROAD CONSTRUCTION.

MAINTENANCE NOTES

ALL MEASURES STATED ON THIS EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLAN SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. THE DESIGNATED CONTACT PERSON NOTED ON THIS PLAN MUST ROUTINELY INSPECT THE CONSTRUCTION ON SITE ONCE EVERY SEVEN DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CLEANED AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:

1. ALL SILT FENCES MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WHEN THEY BECOME NONFUNCTIONAL OR THE SEDIMENT REACHES 1/2 OF THE HEIGHT OF THE FENCE. THESE REPAIRS MUST BE MADE WITHIN 24 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.
2. TEMPORARY AND PERMANENT SEDIMENTATION BASINS MUST BE DRAINED AND THE SEDIMENT REMOVED WHEN THE DEPTH OF SEDIMENT COLLECTED IN THE BASIN REACHES 1/2 THE STORAGE VOLUME. DRAINAGE AND REMOVAL MUST BE COMPLETED WITHIN 72 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS (SEE PART 10.1-10.5 OF THE GENERAL PERMIT).
3. SURFACE WATERS, INCLUDING DRAINAGE DITCHES AND CONVEYANCE SYSTEMS, MUST BE INSPECTED FOR EVIDENCE OF SEDIMENT BEING DEPOSITED BY EROSION. CONTRACTOR MUST REMOVE ALL DELTAS AND SEDIMENT DEPOSITED IN SURFACE WATERS, INCLUDING DRAINAGE WAYS, CATCH BASINS, AND OTHER DRAINAGE SYSTEMS, AND RESTABILIZE THE AREAS WHERE SEDIMENT REMOVAL RESULTS IN EXPOSED SOIL. THE REMOVAL AND STABILIZATION MUST TAKE PLACE WITHIN SEVEN (7) DAYS OF DISCOVERY UNLESS PRECLUDED BY LEGAL, REGULATORY, OR PHYSICAL ACCESS CONSTRAINTS. CONTRACTOR SHALL USE ALL REASONABLE EFFORTS TO OBTAIN ACCESS. IF PRECLUDED, REMOVAL AND STABILIZATION MUST TAKE PLACE WITHIN SEVEN (7) CALENDAR DAYS OF OBTAINING ACCESS. CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL LOCAL, REGIONAL, STATE AND FEDERAL AUTHORITIES AND RECEIVING ANY APPLICABLE PERMITS, PRIOR TO CONDUCTING ANY WORK.
4. CONSTRUCTION SITE VEHICLE EXIT LOCATIONS MUST BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING ONTO PAVED SURFACES. TRACKED SEDIMENT MUST BE REMOVED FROM ALL OFF-SITE PAVED SURFACES, WITHIN 24 HOURS OF DISCOVERY, OR IF APPLICABLE, WITHIN A SHORTER TIME TO COMPLY WITH PART 9.11-9.12 OF THE GENERAL PERMIT.
5. CONTRACTOR IS RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF TEMPORARY AND PERMANENT WATER QUALITY MANAGEMENT BMPS, AS WELL AS ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS, FOR THE DURATION OF THE CONSTRUCTION WORK AT THE SITE. THE PERMITTEE(S) ARE RESPONSIBLE UNTIL ANOTHER PERMITTEE HAS ASSUMED CONTROL (ACCORDING TO PART 3.1 TO 3.8 OF THE MPCA GENERAL PERMIT) OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED OR THE SITE HAS UNDERGONE FINAL STABILIZATION, AND A (N.O.T.) HAS BEEN SUBMITTED TO THE MPCA.
6. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED IN A MANNER AND AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS (E.G., FUGITIVE SEDIMENT IN STREETS COULD BE WASHED INTO STORM SEWERS BY THE NEXT RAIN AND/OR POSE A SAFETY HAZARD TO USERS OF PUBLIC STREETS).
7. ALL INFILTRATION AREAS MUST BE INSPECTED TO ENSURE THAT NO SEDIMENT FROM ONGOING CONSTRUCTION ACTIVITIES IS REACHING THE INFILTRATION AREA AND THESE AREAS ARE PROTECTED FROM COMPACTION DUE TO CONSTRUCTION EQUIPMENT DRIVING ACROSS THE INFILTRATION AREA.

DEVELOPER/OWNER:
CP WEST LLC
5402 PARKDALE DRIVE, SUITE 105
ST. LOUIS PARK, MN 55416
952-224-2500

SITE OPERATOR / GENERAL CONTRACTOR
" TO BE DETERMINED"

SUPERINTENDENT:
" TO BE DETERMINED"

AREA SUMMARY IN ACRES

PAVEMENT AREA	16.21 AC±
BUILDING AREA	12.78 AC±
SEEDED AREA	9.78 AC±
TOTAL DISTURBED	39.19 AC±
PRE - CONSTRUCTION IMPERVIOUS	0.08 AC±
POST - CONSTRUCTION IMPERVIOUS	29.00 AC±

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

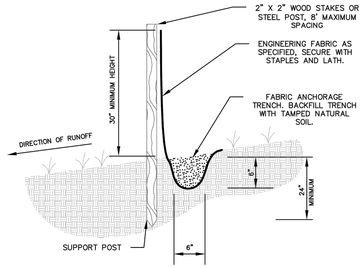
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

EROSION CONTROL NOTES

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

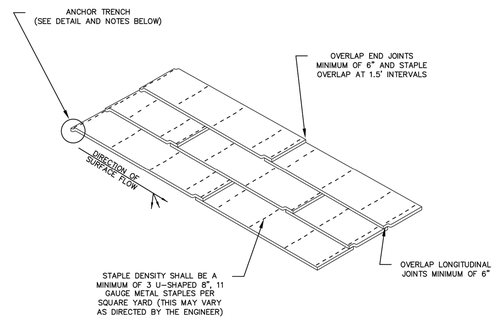
SHEET
C5.03
14 OF 45
REV.

24-15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:53 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C5.01-EROS.SWG.C5.03 EROSION CONTROL NOTES

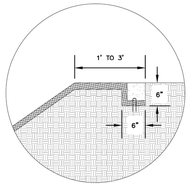


DOUBLE SILT FENCE TO BE REQUIRED NEAR WETLANDS

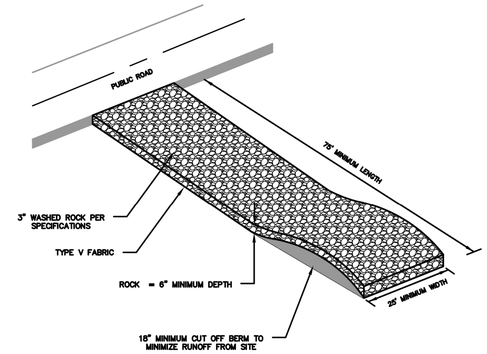
CITY OF ROGERS | STANDARD SILT FENCE | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–1



ANCHOR TRENCH
1. DIG 6" X 6" TRENCH
2. LAY BLANKET IN TRENCH
3. STAPLE AT 1.5' INTERVALS
4. BACKFILL WITH NATURAL SOIL AND COMPACT
5. BLANKET LENGTH SHALL NOT EXCEED 100' WITHOUT AN ANCHOR TRENCH



CITY OF ROGERS | EROSION CONTROL BLANKET INSTALLATION | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–5



NOTE:
TYPE V FILTER FABRIC SHALL BE PLACED UNDER ROCK TO STOP MUD MIGRATION THROUGH MATERIAL.

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OF FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.

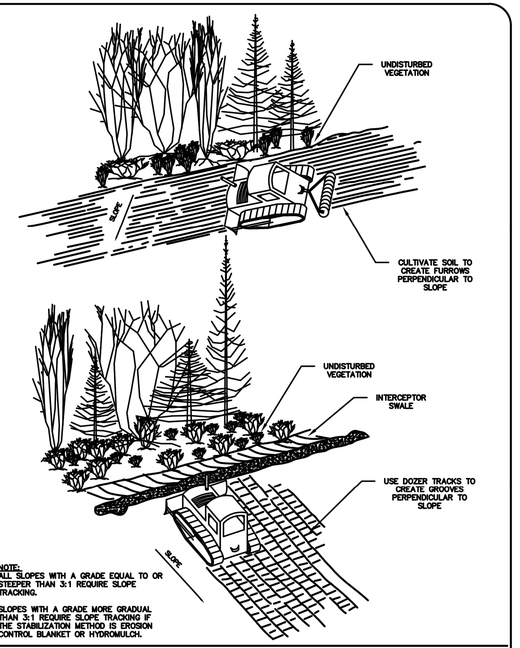
WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.

WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM

IN AREAS WITH CONCRETE WALK THERE SHALL BE 6" OF SAND PLACED OVERTOP THE SIDEWALK PRIOR TO PLACEMENT OF THE 3" WASHED ROCK.

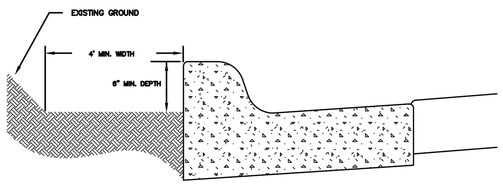
CITY OF ROGERS | CONSTRUCTION ROCK ENTRANCE | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–10



NOTE:
ALL SLOPES WITH A GRADE EQUAL TO OR STEEPER THAN 3:1 REQUIRE SLOPE TRACKING.

SLOPES WITH A GRADE MORE GRADUAL THAN 3:1 REQUIRE SLOPE TRACKING IF THE STABILIZATION METHOD IS EROSION CONTROL BLANKET OR HYDROMULCH.

CITY OF ROGERS | SLOPE TRACKING | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–12

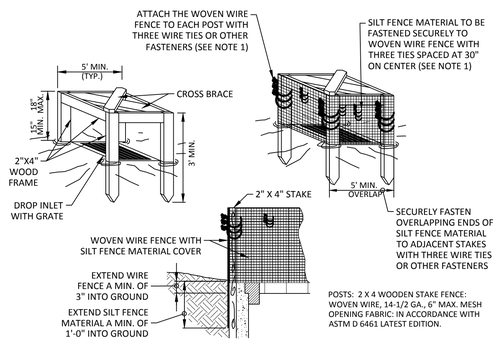


NOTES:

BOULEVARD CUTTING IS REQUIRED ON ALL CONSTRUCTION JOBS IN THE CITY OF ROGERS WHERE THE CONTRACTOR WILL BE DISTURBING THE EXISTING TERRAIN AND MORE THEN 3 DAYS UNTIL FINAL STABILIZATION.

CONTRACTOR IS RESPONSIBLE FOR CLEANING OUT ANY SEDIMENT FROM THE BOULEVARD CUT AREA. THIS MAY RESULT IN MULTIPLE CLEANOUTS AS DIRECTED BY THE ENGINEER.

CITY OF ROGERS | BOULEVARD CUT | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–14

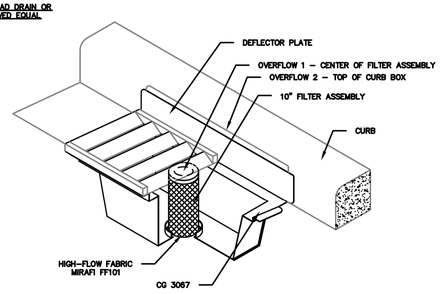


POSTS: 2 X 4 WOODEN STAKE FENCE: WOVEN WIRE, 14-1/2 GA., 6" MAX. MESH OPENING FABRIC: IN ACCORDANCE WITH ASTM D 6461 LATEST EDITION.

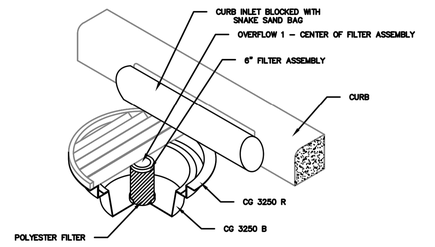
1. ATTACH THE WOVEN WIRE FENCE TO EACH POST AND THE GEOTEXTILE TO THE WOVEN WIRE FENCE (SPACED EVERY 30") WITH THREE WIRE TIES OR OTHER FASTENERS, ALL SPACED WITHIN THE TOP 8" OF THE FABRIC. ATTACH EACH TIE DIAGONALLY 45 DEGREES THROUGH THE FABRIC, WITH EACH PUNCTURE AT LEAST 1" VERTICALLY APART.
2. WHEN TWO SECTIONS OF SILT FENCE MATERIAL ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED ACROSS TWO POSTS.
3. MAINTENANCE SHALL BE PERFORMED AS NOTED IN THE SWPPP. DEPTH OF ACCUMULATED SEDIMENTS MAY NOT EXCEED ONE-HALF THE HEIGHT OF THE FABRIC. MAINTENANCE CLEANOUT MUST BE CONDUCTED REGULARLY TO PREVENT ACCUMULATED SEDIMENTS FROM REACHING ONE-HALF THE HEIGHT OF THE SILT FENCE MATERIAL ABOVE GRADE.
4. ALL SILT FENCE INLETS SHALL INCLUDE WIRE SUPPORT.

IP1 SILT FENCE INLET PROTECTION — N.T.S.

WIMCO ROAD DRAIN OR APPROVED EQUAL

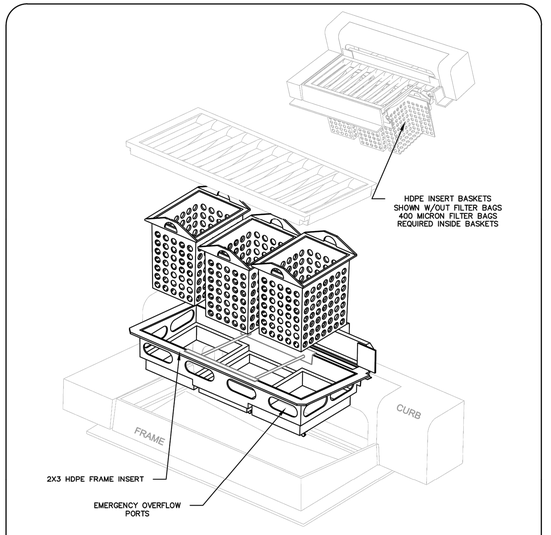


WIMCO ROAD DRAIN OR APPROVED EQUAL



CITY OF ROGERS | CURB INLET PROTECTION | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–15

IP2 CURB DRAIN INLET PROTECTION — N.T.S.



MANUFACTURED BY ROYAL ENVIRONMENTAL SYSTEMS

CITY OF ROGERS | INFRASAFE – 2'X3' DEBRIS COLLECTION DEVICE | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–17

IP3 INLET PROTECTION FILTER — N.T.S.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024	DRAWN BY TPK
DESIGN REVIEW 11/14/2024	DESIGNED BY JDB
PERMIT SUBMITTAL 03/28/2025	CHECKED BY JDB
CONSTRUCTION DOCUMENTS	PROJECT NO. 51493

Sambatek www.sambatek.com
Engineering | Surveying | Planning | Environmental

EROSION CONTROL DETAILS

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET C5.04
15 OF 45
REV.

24 IS LMS TECH1 | THOMAS.KEELEY | 4/4/2025 2:09:53 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C5.01-EROS.DWG C5.04 EROSION CONTROL DETAILS

SECTION 1: SITE EVALUATION, ASSESSMENT, AND PLANNING

1.1 PROJECT/SITE INFORMATION

NORTHDALE BOULEVARD INDUSTRIAL
HWY 101 & 147TH AVE NORTH
CITY: ROGERS
STATE: MN
ZIP CODE:55374
COUNTY: HENNEPIN

THE PROPOSED NORTHDALE INDUSTRIAL PROJECT IS LOCATED ON AN APPROXIMATELY 43.8-AC SITE LOCATED AT THE NORTHWEST CORNER OF THE INTERSECTION BETWEEN 147TH AVE NORTH AND HIGHWAY 101 IN ROGERS, MN. THE PROJECT LOCATION IS BOUNDED ON THE NORTH PROPERTY LINE BY THE CROW RIVER AND ON THE EAST BY HIGHWAY 101. THE PROJECT INCLUDES CONSTRUCTION OF THREE INDUSTRIAL BUILDINGS ALONG WITH ASSOCIATED UTILITY IMPROVEMENTS, LANDSCAPING, AND HARDSCAPING.

NPDES PERMIT NUMBER: _____

1.2 CONTACT INFORMATION/RESPONSIBLE PARTIES

COMPANY/ORGANIZATION NAME: CP WEST LLC
CONTACT NAME: THOMAS NOBLE
ADDRESS: 5402 PARKDALE DRIVE, SUITE 105
CITY, STATE, ZIP CODE: ST.LOUIS PARK MN 55416
TELEPHONE NUMBER: 952-224-2500
FAX/EMAIL:TNOBLE@WESTREINC.COM

GENERAL CONTRACTOR (TO BE COMPLETED BY GENERAL CONTRACTOR):
COMPANY/ORGANIZATION NAME:
CONTACT NAME:
ADDRESS:
CITY, STATE, ZIP CODE:
TELEPHONE NUMBER:
FAX/EMAIL:
INSERT AREA OF CONTROL (IF MORE THAN ONE OPERATOR AT SITE):

THE GENERAL CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE MINNESOTA GENERAL PERMIT AUTHORIZATION TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM/STATE DISPOSAL SYSTEM PERMIT PROGRAM (GENERAL PERMIT). THE GENERAL CONTRACTOR MUST COMPLY WITH ANY LOCAL GOVERNING AGENCY (LGU) HAVING JURISDICTION CONCERNING EROSION AND SEDIMENT CONTROL. THE GENERAL CONTRACTOR SHALL BE REQUIRED TO BE A CO-APPLICANT WITH THE OWNER. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE EROSION AND SEDIMENT CONTROL DEVICES.

THE "APPLICATION FOR GENERAL STORM-WATER PERMIT FOR CONSTRUCTION ACTIVITY (MN R100001)" SHALL BE COMPLETED BY THE GENERAL CONTRACTOR AND SUBMITTED ONLINE, ALONG WITH THE REQUIRED APPLICATION FEE, THROUGH THE MPCA'S WEBSITE.

UNLESS NOTIFIED BY THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA) TO THE CONTRARY, APPLICANTS WHO SUBMIT A COMPLETE APPLICATION FORM IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL PERMIT ARE AUTHORIZED TO DISCHARGE STORM WATER FROM THE CONSTRUCTION SITE UNDER THE TERMS AND CONDITIONS OF THIS PERMIT SEVEN (7) CALENDAR DAYS THE ONLINE APPLICATION PROCESS IS COMPLETE(HTTPS://NETWEB.PCA.STATE.MN.US/PRIVATE/).

(NOTE: ALL PROJECTS UNDER 50 ACRES MUST SUBMIT THE PERMIT APPLICATION USING THE ONLINE PROCESS. MAILED APPLICATIONS ARE ONLY ACCEPTED FOR PROJECTS THAT DISTURB 50 OR MORE ACRES, AND HAVE A DISCHARGE POINT WITHIN 1 MILE OF A PROTECTED WATER.)

ADDITIONALLY, AUTHORIZATION WILL BE DELAYED UNDER THE FOLLOWING CIRCUMSTANCES:

- IF THE PROJECT DISTURBS 50 ACRES OR MORE AND HAS A DISCHARGE POINT WITHIN 1 MILE AND FLOWS TO AN IMPAIRED OR SPECIAL WATER WHOSE DISCHARGE MAY REACH AN IMPAIRED OR SPECIAL WATER LISTED IN SECTION 23 OF THE GENERAL PERMIT THE APPLICANT SHALL SUBMIT THE STORM WATER POLLUTION PREVENTION PLAN AND A COMPLETED APPLICATION AT LEAST 30 CALENDAR DAYS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES. UNLESS NOTIFIED BY THE MPCA TO THE CONTRARY, COVERAGE BECOMES EFFECTIVE 30 CALENDAR DAYS AFTER THE POSTMARKED DATE OF THE COMPLETED APPLICATION.
- IF THE PROJECT INCLUDES ALTERNATIVE METHODS THE APPLICATION AND TWO ALTERNATIVE TREATMENT PLANS MUST BE SUBMITTED A MINIMUM OF 90 DAY BEFORE CONSTRUCTION STARTS.

EROSION & SEDIMENT CONTROL SUBCONTRACTOR (RESPONSIBLE FOR IMPLEMENTING & UPDATING SWPPP - TO BE COMPLETED BY CONTRACTOR):
COMPANY/ORGANIZATION NAME:
CONTACT NAME:
ADDRESS:
CITY, STATE, ZIP CODE:
TELEPHONE NUMBER:
FAX/EMAIL:

EROSION & SEDIMENT CONTROL INSPECTOR (SEE PART 6.1 OF THIS SWPPP FOR MORE INFORMATION ON INSPECTION RESPONSIBILITIES- TO BE COMPLETED BY CONTRACTOR):
COMPANY/ORGANIZATION NAME:
CONTACT NAME:
ADDRESS:
CITY, STATE, ZIP CODE:
TELEPHONE NUMBER:
FAX/EMAIL:

GROUND DISTURBING SUBCONTRACTOR(S):
COMPANY/ORGANIZATION NAME:
CONTACT NAME:
ADDRESS:
CITY, STATE, ZIP CODE:
TELEPHONE NUMBER:
FAX/EMAIL:

THE GENERAL CONTRACTOR SHALL PROVIDE A CHAIN OF RESPONSIBILITY WITH ALL OPERATORS ON THE SITE TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE AND THE NOT SUBMITTED.

THIS SWPPP WAS PREPARED BY:
COMPANY/ORGANIZATION NAME: SAMBATEK
CONTACT NAME: ALESSANDRA STUTZ
ADDRESS: 12800 WHITEWATER DRUVE SUITE 300
CITY, STATE, ZIP CODE: MINNETONKA MN 55343
TELEPHONE NUMBER:763.520.8460
FAX/EMAIL: ASTUTZ@SAMBATEK.COM

SWPPP DESIGNER CERTIFICATION CARD:

1.3 NATURE OF CONSTRUCTION ACTIVITY

NATURE OF CONSTRUCTION:

THIS SWPPP HAS BEEN PREPARED FOR MAJOR ACTIVITIES ASSOCIATED WITH CONSTRUCTION OF THREE INDUSTRIAL BUILDINGS ALONG WITH ASSOCIATED UTILITY IMPROVEMENTS, LANDSCAPING, AND HARDSCAPING.

ANTICIPATED APPROXIMATE TIMELINES:

ESTIMATED PROJECT START DATE: XX/XX/XX
ESTIMATED PROJECT COMPLETION DATE: XX/XX/XX

1.4 SOILS, SLOPES, VEGETATION, AND CURRENT DRAINAGE PATTERNS

SOIL TYPE(S):

PRELIMINARY BORING LOGS WERE COMPLETED BY BRAUN INTERTEC ON JULY 12, 2024. THE BORING LOGS SHOW EXISTING SOIL ONSITE CONSISTS OF POORLY GRADED SAND AND SILTY SAND AT DEPTHS OF 2-21 FEET BELOW GROUND SURFACE. GROUNDWATER WAS DETECTED 19 FEET BELOW GROUND SURFACE. POORLY GRADED SAND IS CONSIDERED HYDROLOGIC SOIL GROUP (HSG) A AND IS SUITABLE FOR INFILTRATION AT A RATE OF 0.8 INCHES PER HOUR. SILTY SANDS ARE CONSIDERED HSG B AND ARE SUITABLE FOR INFILTRATION AT A RATE OF 0.45 INCHES PER HOUR.

SLOPES:

(DESCRIBE THE EXISTING TOPOGRAPHY ON THE SITE. DESCRIBE HOW THAT TOPOGRAPHY WILL BE IMPACTED BY GRADING ACTIVITIES)

DRAINAGE PATTERNS:

IN EXISTING CONDITIONS, SITE RUNOFF FLOWS EAST TO THE DITCH ALONG HIGHWAY 101 AND NORTH TO THE CROW RIVER. THE HIGHWAY 101 DITCH ULTIMATELY DOES ROUTE TO THE CROW RIVER.

IN PROPOSED CONDITIONS, RUNOFF FROM THE MAJORITY OF THE PROPOSED SITE AREA WILL ROUTE TO THE PROPOSED STORMWATER FACILITIES WHICH ULTIMATELY DISCHARGE NORTH TO THE CROW RIVER. THE PERVIOUS PERIMETER OF THE SITE DISCHARGES EAST TO THE EXISTING DITCH ALONG HIGHWAY 101. THE NORTHERN PORTION OF THE SITE DISCHARGES DIRECTLY NORTH TO THE CROW RIVER. AS IN EXISTING CONDITIONS, THE DITCH ALONG HIGHWAY 101 ULTIMATELY ROUTES TO THE CROW RIVER, MAKING THE CROW RIVER THE ULTIMATE DISCHARGE LOCATION

VEGETATION:

VEGETATION WITHIN THE LIMITS OF DISTURBANCE WILL REQUIRE CLEARING & GRUBBING DUE TO ALTERING GRADES. EXISTING TREES SHALL BE PROTECTED IN ACCORANCE WITH THE TREE PRESERVATION PLAN. THE SITE SHALL BE REVEGETATED IN ACCORDANCE WITH THE LANDSCAPING PLAN.

RAINFALL INFORMATION:

RAINFALL INFORMATION - THE AVERAGE TOTAL ANNUAL PRECIPITATION IS ABOUT 28.32 INCHES. OF THIS ABOUT 17.31 INCHES, OR 61 PERCENT, USUALLY FALLS IN MAY THROUGH SEPTEMBER. THE AVERAGE ANNUAL SNOWFALL IS 57.3 INCHES.

1.5 CONSTRUCTION SITE ESTIMATES

PROJECT AREA SUMMARY:

TOTAL PROJECT AREA: 43.8 ACRES
CONSTRUCTION SITE AREA TO BE DISTURBED: 39.2 ACRES

IMPERVIOUS AREAS:

IMPERVIOUS AREA BEFORE CONSTRUCTION (ACRES): 0.08
IMPERVIOUS AREA AFTER CONSTRUCTION (ACRES): 29.00

1.6 RECEIVING WATERS

CONSTRUCTION PHASE STORM WATER SYSTEM DESCRIPTION:

DURING CONSTRUCTION, EROSION AND SEDIMENT CONTROL DEVICES SUCH AS INLET PROTECTION AND SILT FENCE WILL WORK TO REDUCE SEDIMENT RUNOFF FROM LEAVING THE SITE AND THEREBY PROTECT RECIVEING WATERS.

DESCRIPTION OF RECEIVING WATERS:

THE PROJECT SITE IS WITHIN ONE AERIAL MILE OF ONE IMPAIRED STREAM AND ONE IMPAIRED LAKE. THE CROW RIVER IS LOCATED APPROXIMATELY 0.14 MILES FROM THE SITE AMD HAS AN EPA-APPROVED IMPAIRMENT FOR: BENTHIC MACROINVERTEBRATES BIOASSESSMENTS; FECAL COLIFORM; FISH BIOASSESSMENTS; MERCURY IN FISH TISSUE; NUTRIENTS; TURBIDITY. FOSTER LAKE IS LOCATED APPRXIMATELY 0.87 MILES FROM THE SITE AND HAS AN EPA-APPROVED IMPAIRMENT FOR: NUTRIENTS.

1.7 SITE FEATURES AND SENSITIVE AREAS TO BE PROTECTED

(DESCRIBE UNIQUE FEATURES THAT ARE TO BE PRESERVED AND THE MEASURES PROPOSED TO PROTECT THESE FEATURES)

1.8 POTENTIAL SOURCES OF POLLUTION

POTENTIAL SOURCES OF SEDIMENT AND OTHER POLLUTANTS TO STORMWATER RUNOFF:

CONSTRUCTION PHASE POLLUTANT SOURCES ANTICIPATED AT THE SITE ARE DISTURBED (BARE) SOIL, VEHICLE FUELS AND LUBRICANTS, CHEMICALS ASSOCIATED WITH BUILDING CONSTRUCTION, AND BUILDING MATERIALS. WITHOUT ADEQUATE CONTROL THERE IS THE POTENTIAL FOR EACH TYPE OF POLLUTANT TO BE TRANSPORTED BY STORM WATER.

1.9 ENDANGERED/THREATENED SPECIES

THERE ARE FOUR ENDANGERED AND THREATENED SPECIES KNOWN TO BE IN THE AREA. THE TRICOLORED BAT, THE WHOOPING CRANE, THE WESTERN REGAL FRITILARY, AND THE MONARCH BUTTERFLY. IT IS NOT ANTICIPATED THE CONSTRUCTION ACTIVITIES WILL DISRUPT HABITAT OF THESE ENDANGERED SPECIES, HOWEVER IF THESE ENDANGERED OR THREATENED SPECIES ARE OBSERVED WITHIN THE PROJECT LOCATION WHILE PROJECT ACTIVITIES ARE GOING ON, THE CONTRACTOR IS TO STOP WORK IMMEDIATELY AND ENGINEER OF RECORD IS TO BE NOTIFIED.

THE UNITED STATES FISH AND WILDLIFE SERVICE LISTS THE TRICOLORED BAT AS A PROPOSED ENDANGERED SPECIES. THE TRICOLORED BAT IS A SMALL INSECTIVOROUS BAT THAT IS DISTINGUISHED BY ITS UNIQUE TRICOLORED FUR AND OFTEN APPEARS YELLOWISH TO NEARLY ORANGE. DURING THE WINTER, TRICOLORED BATS ARE OFTEN FOUND IN CAVES AND ABANDONED MINES, ALTHOUGH IN THE SOUTHERN UNITED STATES, WHERE CAVES ARE SPARSE, TRICOLORED BATS ARE OFTEN FOUND ROOSTING IN ROAD-ASSOCIATED CULVERTS WHERE THEY EXHIBIT SHORTER TORPOR BOUTS AND FORAGE DURING WARM NIGHTS. DURING THE SPRING, SUMMER, AND FALL, TRICOLORED BATS ARE FOUND IN FORESTED HABITATS WHERE THEY ROOST IN TREES, PRIMARILY AMONG LEAVES OF LIVE OR RECENTLY DEAD DECIDUOUS HARDWOOD TREES, BUT MAY ALSO BE FOUND IN SPANISH MOSS, PINE TREES, AND OCCASIONALLY HUMAN STRUCTURES

TRICOLORED BAT IS GREATLY THREATENED BY WHITE-NOSE SYNDROME (WNS), WHICH HAS CAUSED A DECLINE IN BAT POPULATIONS BY UP TO 99 PERCENT. THIS FUNGAL DISEASE LOOKS LIKE A WHITE FUZZ ON THE BATS FACE. BATS WITH WNS MAY DO STRANGE THIGNS LIKE FLY OUTSIDE IN THE DAYTIME AND WINTER. IF A BAT WITH WNS IS ENCOUNTERED OR SUSPECTED, REPORT THE SIGHTING TO THE MINNESOTA DEPARTMENT OF NATURAL RESOURCES:

REPORT WEBSITE: HTTP://WWW.DNR.STATE.MN.US/REPORTBATS/INDEX.HTML
REPORT PHONE: 888-345-1730
REPORT EMAIL: MBS.REPORTS@STATE.MN.US

TO REPORT UNUSUAL BAT ACTIVITY OR GROUPS OF BATS IN MINNESOTA. THE DNR IS INTERESTED IN WINTER AND SUMMER ROOST SITES –AS WELL AS SICK OR DYING BATS.

THE UNITED STATES FISH AND WILDLIFE SERVIE LIST WHOOPING CRANE AS AN EXPERIMENTAL POPULATION. THE WHOOPING CRANE BREEDS, MIGRATES, WINTERS, AND FORAGES IN A VARIETY OF WETLAND AND OTHER HABITATS, INCLUDING COASTAL MARSHES AND ESTUARIES, INLAND MARSHES, LAKES, PONDS, WET MEADOWS AND RIVERS, AND AGRICULTURAL FIELDS. THERE IS ONE GROUP OF CRANES WHICH ARE KNOWN TO MIGRATE THROUGH MINNESOTA.

THE UNITED STATES FISH AND WILDLIFE SERVICE LISTS THE MONARCH BUTTERFLY AS AN AN ENDANGERED SPECIES CANDIDATE. MONARCH HABITAT REQUIRES MILKWEED AND FLOWERING PLANTS WHETHER IT'S A FIELD, ROADSIDE AREA, OPEN AREA, WET AREA OR URBAN GARDEN. ADULT MONARCHS FEED ON THE NECTAR OF MANY FLOWERS DURING BREEDING AND MIGRATION, BUT THEY CAN ONLY LAY EGGS ON MILKWEED PLANTS. FOR OVERWINTERING MONARCHS, HABITAT WITH A SPECIFIC MICROCLIMATE IS NEEDED FOR PROTECTION FROM THE ELEMENTS, AS WELL AS MODERATE TEMPERATURES TO AVOID FREEZING. THESE CONDITIONS VARY BETWEEN POPULATIONS. FOR THE EASTERN NORTH AMERICAN POPULATION, MOST MONARCHS OVERWINTER IN OYAMEL FIR TREE ROOSTS LOCATED IN MOUNTAINOUS REGIONS IN CENTRAL MEXICO AT AN ELEVATION OF 2,400 TO 3,600 METERS.

THE WESTERN REGAL FRITILLARY IS LISTED AS PROPOSED THREATENED BY USFWS. THE REGAL FRITILLARY IS A BRUSH-FOOTED BUTTERFLY WITH LARGE, ORANGE AND BLACK WINGS. HABITAT ALTERATION, INCLUDING LOSS OF SPECIFIC FOOD PLANTS AND PLACES TO LIVE/GROW DURING CRITICAL STAGES OF ITS LIFE CYCLE HAS, OVER THE PAST 30 YEARS, REDUCED THE SPECIES' RANGE AND ABUNDANCE. REGAL FRITILLARY BUTTERFLIES LIVE IN TALL-GRASS PRAIRIE AND OTHER OPEN AND SUNNY LOCATIONS SUCH AS DAMP MEADOWS, MARSHES, WET FIELDS, AND MOUNTAIN PASTURES. ADULTS ARE RARELY ENCOUNTERED AWAY FROM NATIVE PRAIRIES, AND THEY APPEAR TO HAVE A STRONG TENDENCY TO REMAIN WITHIN THE BOUNDARIES OF THESE HABITATS. A VIABLE (I.E., SELF-SUSTAINING) POPULATION NEEDS ABOUT 120 TO 240 ACRES.

1.10 HISTORIC PRESERVATION

THERE ARE NO KNOWN HISTORIC SITES ON THE CONSTRUCTION SITE. SHPO INVENTORY SHOWS TWO HISTORIC BRIDGE POINTS, BRIDGE 27020 AND BRIDGE 27019, ARE LOCATED NORTHEAST OF THE PROPOSED SITE, AND HISTORIC TRUNK HIGHWAY 101 IS LOCATED EAST OF THE SITE.

1.11 APPLICABLE FEDERAL, TRIBAL, STATE OR LOCAL PROGRAMS

LOCAL GOVERNING UNIT (LGU) REQUIREMENTS:

THE PROJECT IS LOCATED WITHIN THE ELM CREEK WATERSHED MANAGEMENT ORGANIZATION (ECWMO). STORMWATER MANAGEMENT HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE ECWMO, CITY OF ROGERS, AND MPCA THROUGH THE CONSTRUCTION OF SURFACE INFILTRATION BASINS AND DRY FOREBAYS. STORMWATER REQUIREMENTS FOR THE PROJECT INCLUDE:

- RATE CONTROL REQUIREMENT: RUNOFF RATES FOR THE PROPOSED ACTIVITY SHALL NOT EXCEED EXISTING RUNOFF RATES FOR THE 2, 10, AND 100-YEAR CRITICAL STORM EVENTS AND RAINFALL DISTRIBUTION FOR THE PROJECT LOCATION (ECWMO, CITY)
- VOLUME CONTROL REQUIREMENT: STORMWATER RUNOFF VOLUME MUST BE INFILTRATED/ABSTRACTED ONSITE IN THE AMOUNT EQUIVALENT TO 1.1 INCH OF RUNOFF FROM THE SUM OF NEW AND FULLY RECONSTRUCTED IMPERVIOUS SURFACES (ECWMO).
- WATER QUALITY REQUIREMENTS: THERE SHALL BE NO NET INCREASE IN TOTAL PHOSPHOROUS OR TOTAL SUSPENDED SOLIDS FROM PRE-DEVELOPMENT LAND COVER TO POST-DEVELOPMENT LAND COVER (ECWMO, CITY). FULL INFILTRATION OF 1.1 INCHES OF RUNOFF FROM ALL IMPERVIOUS SURFACES SATISFIES THE WATER QUALITY REQUIREMENT (ECWMO).

1.12 MITIGATION MEASURES FROM ENVIRONMENTAL REVIEWS/TMDLS/IMPAIRED WATERS

1.13 MAPS

EROSION AND SEDIMENT CONTROL PLANS:

(REVISE THE FOLLOWING AS NECESSARY)
THE FOLLOWING SITE DEVELOPMENT PLAN SHEETS ARE AN INTEGRAL PART OF THIS SWPPP:

C-5.01 - PHASE I EROSION AND SEDIMENTATION CONTROL PLAN/"SITE MAP"
C-5.02 - PHASE II EROSION AND SEDIMENTATION CONTROL PLAN/"SITE MAP"
C-5.04 - EROSION AND SEDIMENTATION CONTROL DETAILS
C-5.03 - EROSION AND SEDIMENTATION CONTROL NOTES/"SITE MAP"

SHOW THE FOLLOWING ON THE EROSION AND SEDIMENT CONTROL PLANS:

- ***EXISTING AND FINAL GRADES***
- ***DIVIDING LINES AND DIRECTION OF FLOW FOR ALL PRE AND POST-CONSTRUCTION STORM WATER RUNOFF DRAINAGE AREAS LOCATED WITHIN THE PROJECT LIMITS***
- ***IMPERVIOUS SURFACE AREAS (PRE- AND POST-CONSTRUCTION AREA TABULATIONS)***
- ***SOIL TYPES***
- ***DELINEATED WETLAND LOCATIONS WITHIN ONE MILE OF THE PROJECT BOUNDARIES, WHICH WILL RECEIVE STORM WATER RUNOFF FROM THE SITE, (IF NOT POSSIBLE TO SHOW ON THE PLAN SHEET, THEY MUST BE IDENTIFIED WITH AN ARROW INDICATING BOTH DIRECTION AND DISTANCE TO THE SURFACE WATER, OR ON A USGS 7.5 MINUTE QUADRANGLE MAP OR EQUIVALENT)***
- ***LOCATION AND TYPE OF ALL TEMPORARY AND PERMANENT EROSION PREVENTION AND SEDIMENT CONTROL MEASURES, INCLUDING METHODS FOR FINAL STABILIZATION***
- ***BOUNDARIES OF DISTURBED CONSTRUCTION AREAS***
- ***PHASING OF CONSTRUCTION IN ORDER TO MINIMIZE DURATION OF EXPOSED SOILS***
- ***STANDARD PLATES/SPECS FOR PROPOSED BMPS***
- ***SEDIMENT CONTROL PRACTICES FOR PROPOSED TEMPORARY OR PERMANENT DRAINAGE DITCHES WHERE APPROPRIATE***
- ***ESTIMATED PRELIMINARY QUANTITIES TABULATION FOR TEMPORARY BMPS***
- ***ANY AREAS THAT ARE ADJACENT TO AND DRAIN TO PUBLIC WATERS FOR WHICH THE DNR HAS PROMULGATED "WORK IN WATER RESTRICTIONS"***
- ***BUFFERS***
- ***STEEP SLOPES***
- ***MAINTENANCE PLANS FOR PERMANENT STORMWATER SYSTEMS***
- ***KARST AREAS***

SECTION 2: EROSION AND SEDIMENT CONTROL BMPS

EROSION CONTROL BMPS:

THE PURPOSE OF EROSION CONTROL IS TO PREVENT SOIL PARTICLES FROM BECOMING SUSPENDED IN WATER AND BEING TRANSPORTED TO EITHER DOWNSTREAM SURFACE WATERS OR DOWNSTREAM PROPERTIES.

APPROPRIATE CONSTRUCTION PHASING, VEGETATIVE BUFFER STRIPS, HORIZONTAL SLOPE GRADING, AND OTHER CONSTRUCTION PRACTICES THAT MINIMIZE EROSION MUST BE PLANNED FOR AND IMPLEMENTED.

IN THE NATURAL CONDITION, SOIL IS STABILIZED BY NATIVE VEGETATION. THE PRIMARY TECHNIQUE TO BE USED AT THIS PROJECT FOR FINAL STABILIZATION OF SITE SOIL WILL BE TO PROVIDE A PROTECTIVE COVER OF VEGETATION, PAVEMENT, OR BUILDING.

ALL EXPOSED AREAS MUST BE STABILIZED AS SOON AS POSSIBLE (BUT NO LATER THAN THE NEXT WORK DAY) TO LIMIT SOIL EROSION, BUT IN NO CASE LATER THAN 7 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. TEMPORARY SOIL STOCKPILES WITHOUT SIGNIFICANT SILT, CLAY OR ORGANIC COMPONENTS (E.G. CLEAN AGGREGATED STOCKPILES, DEMOLITION CONCRETE STOCKPILES, SAND STOCKPILES) AND THE CONSTRUCTED BASE COMPONENTS OF ROADS, PARKING LOTS AND SIMILAR SURFACES ARE EXEMPT FROM THIS REQUIREMENT, BUT MUST COMPLY WITH SECTION 2.7 OF THIS SWPPP (SECTION 8.4, 9.9, 9.10, AND 23.9 OF THE GENERAL PERMIT).

SEDIMENT CONTROL BMPS:

THE PURPOSE OF SEDIMENT CONTROL IS TO PREVENT SOIL PARTICLES THAT HAVE BEEN SUSPENDED IN WATER FROM ENTERING SURFACE WATERS, INCLUDING CURB AND GUTTER SYSTEMS AND STORM SEWER INLETS. SEDIMENT CONTROL BMPS HAVE BEEN DESIGNED AS PART OF THIS SWPPP.

IF THE DOWN GRADIENT TREATMENT SYSTEM IS OVERLOADED, THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING ADDITIONAL UP GRADIENT SEDIMENT CONTROL PRACTICES OR REDUNDANT BMPS TO ELIMINATE THE OVERLOADING AND MUST AMEND THE SWPPP TO IDENTIFY THE ADDITIONAL PRACTICES.

SEDIMENT CONTROL PRACTICES MUST ALWAYS BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS AND BE LOCATED UPGRADIENT OF ANY BUFFER ZONES. THE PERIMETER SEDIMENT CONTROL PRACTICES MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN. THESE PRACTICES MUST REMAIN IN PLACE UNTIL FINAL STABILIZATION IS ACHIEVED (SEE SECTION 8 OF THIS SWPPP).

THE TIMING OF THE INSTALLATION OF SEDIMENT CONTROL PRACTICES MAY BE ADJUSTED TO ACCOMMODATE SHORT-TERM ACTIVITIES SUCH AS CLEARING OR GRUBBING, OR PASSAGE OF VEHICLES. ANY SHORT TERM ACTIVITY MUST BE COMPLETED AS QUICKLY AS POSSIBLE AND THE SEDIMENT CONTROL PRACTICES MUST BE RE-INSTALLED IMMEDIATELY AFTER THE ACTIVITY IS COMPLETED. SEDIMENT CONTROL PRACTICES MUST BE INSTALLED BEFORE THE NEXT RAIN EVENT EVEN IF THE ACTIVITY IS NOT COMPLETE.

2.1 MINIMIZE DISTURBED AREA AND PROTECT NATURAL FEATURES AND SOIL

CONSTRUCTION SHALL BE PHASED IN ACCORDANCE WITH THE PHASING PLAN SHOWN ON SHEET C5.03.

PHASE I:

1. INSTALL STABILIZED CONSTRUCTION ENTRANCES.
2. PREPARE TEMPORARY PARKING AND STORAGE AREA.
3. CONSTRUCT THE SILT FENCES ON THE SITE.
4. INSTALL INLET PROTECTION DEVICES ON EXISTING STORM STRUCTURES, AS SHOWN ON THE PLAN.
5. CONSTRUCT THE SEDIMENTATION AND SEDIMENT TRAP BASINS, AS REQUIRED.
6. HALT ALL ACTIVITIES AND CONTACT THE CIVIL ENGINEERING CONSULTANT TO PERFORM INSPECTION OF BMPs. GENERAL CONTRACTOR SHALL SCHEDULE AND CONDUCT STORM WATER PRE-CONSTRUCTION MEETING WITH ENGINEER AND ALL GROUND DISTURBING CONTRACTORS BEFORE PROCEEDING WITH CONSTRUCTION.
7. CLEAR AND GRUB THE SITE.
8. BEGIN GRADING THE SITE.
9. START CONSTRUCTION OF BUILDING PAD AND STRUCTURES.

PHASE II:

1. TEMPORARY SEED DENUDED AREAS.
2. INSTALL UTILITIES, UNDERDRAINS, STORM SEWERS, CURBS AND GUTTERS.
3. INSTALL RIP RAP AROUND OUTLET STRUCTURES.
4. INSTALL INLET PROTECTION AROUND ALL STORM SEWER STRUCTURES.
5. PREPARE SITE FOR PAVING.
6. PAVE SITE.
7. INSTALL INLET PROTECTION DEVICES.
8. COMPLETE GRADING AND INSTALL PERMANENT SEEDING AND PLANTING.
9. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES (ONLY IF SITE IS STABILIZED), IF REQUIRED BY THE CONTRACT.

2.2 PRESERVE 50 FOOT NATURAL BUFFER

THE CONTRACTOR MUST PRESERVE A 50 FOOT NATURAL BUFFER (OR IF A BUFFER IS INFEASIBLE ON THE SITE PROVIDE REDUNDANT SEDIMENT CONTROLS) WHEN A SURFACE WATER IS LOCATED WITHIN 50 FEET OF THE PROJECTS EARTH DISTURBANCES AND STORMWATER FLOWS TO THE SURFACE WATER. THE CONTRACTOR IS NOT REQUIRED TO ENHANCE THE QUALITY OF THE VEGETATION THAT ALREADY EXISTS IN THE BUFFER OR PROVIDE VEGETATION IF NONE EXISTS.

2.3 CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT

MEASURES SHOULD BE TAKEN TO ENSURE THAT "CLEAN" RUNOFF FROM OFF SITE IS DIVERTED AROUND DISTURBED AREAS ON SITE. CARE SHOULD BE TAKEN THAT RE-ROUTING OFF SITE RUNOFF DOES NOT RESULT IN FLOODING OR OTHER ISSUES ON ADJACENT PROPERTIES.

BMP DESCRIPTION: TEMPORARY DIVERSION DITCH

INSTALLATION SCHEDULE: INSTALL TEMPORARY DIVERSION DITCHES AS SHOWN ON THE SWPPP PLAN SHEETS, AND AS NEEDED THROUGHOUT CONSTRUCTION, PRIOR TO UP GRADIENT GROUND DISTURBING ACTIVITIES

MAINTENANCE AND INSPECTION REQUIREMENTS: THE WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE OR FROM THE POINT OF DISCHARGE INTO ANY SURFACE WATER. THIS STABILIZATION MUST BE COMPLETED WITHIN 24 HOURS OF CONNECTING TO A SURFACE WATER. THE REMAINDER OF THE DITCH MUST BE STABILIZED WITHIN 7 DAYS OF CONNECTING TO A SURFACE WATER AND AFTER CONSTRUCTION HAS CEASED.

TEMPORARY OR PERMANENT DITCHES THAT ARE BEING USED AS A SEDIMENT CONTAINMENT SYSTEM DO NOT NEED TO BE STABILIZED, BUT MUST BE STABILIZED WITHIN 24 HOURS AFTER NO LONGER BEING USED AS A SEDIMENT CONTAINMENT SYSTEM.

DITCHES MUST BE INSPECTED EVERY 7 DAYS, AND WITHIN 24 HOURS AFTER A 0.5" 24-HOUR RAIN EVENT. ANY SEDIMENT DEPOSITED IN DIVERSION DITCHES MUST BE REMOVED AND ANY EXPOSED SOILS STABILIZED WITHIN 7 DAYS OF DISCOVERY UNLESS PRECLUDED BY LEGAL, REGULATORY, OR PHYSICAL ACCESS CONSTRAINTS. IF PRECLUDED, NOTE REASON FOR DELAY ON MAINTENANCE LOG.

RESPONSIBLE STAFF (CONTRACTOR TO COMPLETE):

2.4 STABILIZE SOILS

1. **TEMPORARY SEEDING** - DISTURBED AREAS THAT ARE NOT YET AT FINAL GRADE BUT THAT WILL NOT BE ACTIVELY WORKED FOR 7 DAYS OR MORE MUST BE TEMPORARILY STABILIZED. TEMPORARY STABILIZATION MUST BE INITIATED IMMEDIATELY WHERE WORK HAS TEMPORARILY CEASED AND MUST BE COMPLETED NO LATER THAN 7 CALENDAR DAYS AFTER WORK IN THAT PORTION OF THE SITE HAS TEMPORARILY CEASED. TEMPORARY SEEDING SHALL BE IN ACCORDANCE WITH MN/DOT SEED MIXTURE NUMBER 21-111 OR 21-112 DEPENDING ON THE SEASON OF PLANTING (SEE MN/DOT SPECIFICATION SECTION 2575.3) SEEDING METHOD AND APPLICATION RATE SHALL CONFORM TO MN/DOT SPECIFICATION SECTION 2575.3. TEMPORARY MULCH SHALL BE APPLIED IN ACCORDANCE WITH MN/DOT SPECIFICATION SECTION 2575.3C. ALTERNATIVELY, HYDRAULIC SOIL STABILIZER IN ACCORDANCE WITH MN/DOT SPECIFICATION SECTION 2575.3E MAY BE USED IN PLACE OF TEMPORARY MULCH.

PERMANENT STABILIZATION - ALL AREAS AT FINAL GRADE MUST BE STABILIZED WITHIN 7 DAYS AFTER COMPLETION OF THE MAJOR CONSTRUCTION ACTIVITY. PERMANENT STABILIZATION MUST BE INITIATED IMMEDIATELY WERE WORK HAS PERMANENTLY CEASED AND MUST BE COMPLETED NO LATER THAN 7 CALENDAR DAYS AFTER CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS PERMANENTLY CEASED. SEEDED AREAS SHALL BE PROTECTED WITH MULCH. PERMANENT MULCH SHALL CONFORM TO MN/DOT SPECIFICATION 3882, TYPE 3 AT 2 TONS/ACRE AND SHALL BE DISK ANCHORED. HYDRAULIC SOIL STABILIZER MAY BE USED IN PLACE OF MULCH IF APPROVED BY CIVIL ENGINEER. IF HYDRAULIC SOIL STABILIZER IS USED, IT SHALL BE MN/DOT TYPE 6.

2.5 PROTECT SLOPES

STEEP SLOPE AREAS - THE CONTRACTOR MUST MINIMIZE THE NEED FOR DISTURBANCE OF PORTIONS OF THE PROJECT THAT HAVE STEEP SLOPES (3:1 OR STEEPER). FOR THOSE SLOPED AREAS WHICH MUST BE DISTURBED, THE CONTRACTOR MUST USE TECHNIQUES SUCH AS PHASING AND STABILIZATION PRACTICES DESIGNED FOR STEEP SLOPES, SUCH AS DRAINING AND TERRACING. SLOPES STEEPER THAN 3:1 MUST BE PROTECTED BY EROSION CONTROL BLANKETS.

BMP DESCRIPTION: EROSION CONTROL BLANKET

INSTALLATION SCHEDULE: INSTALL EROSION CONTROL BLANKETS AS SHOWN ON THE SWPPP PLAN SHEETS, AND AS NEEDED THROUGHOUT CONSTRUCTION, WITHIN THE TIMEFRAME ALLOWED FOR STABILIZATION AFTER WORK H

2.10 CONTROL STORMWATER DISCHARGE POINTS

1. PIPE OR OTHER TEMPORARY OR PERMANENT OUTLETS MUST BE STABILIZED WITH TEMPORARY OR PERMANENT ENERGY DISSIPATION WITHIN 24 HOURS AFTER CONNECTION TO A SURFACE WATER.
2. STABILIZE THE NORMAL WETTED PERIMETER OF A DRAINAGE DITCH OR SWALE WITHIN 200 FEET OF THE PROPERTY EDGE WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER. THE REMAINDER OF THE DITCH MUST BE STABILIZED WITHIN 7 CALENDAR DAYS OF CONNECTION.

BMP DESCRIPTION: RIPRAP

INSTALLATION SCHEDULE: INSTALL RIPRAP AS SHOWN ON SWPPP PLANS AND/OR GRADING PLANS. INSTALLATION MUST BE COMPLETED WITHIN 24 HOURS OF CONNECTING TO A SURFACE WATER.

MAINTENANCE AND INSPECTION REQUIREMENTS: INSPECT OUTLETS EVERY 7 DAYS OR WITHIN 24 HOURS AFTER A 0.5" 24-HOUR RAIN EVENT. REPAIR, REPLACE OR SUPPLEMENT NON-FUNCTIONING RIPRAP ENERGY DISSIPATION WITHIN 3 DAYS OR BY THE NEXT RAIN EVENT, WHICHEVER COMES FIRST. ANY OFF SITE ACCUMULATION OF SEDIMENT MUST BE REMOVED IN MANNER AND AT A FREQUENCY TO MINIMIZE OFF-SITE IMPACTS.

RESPONSIBLE STAFF (CONTRACTOR TO COMPLETE):

2.11 CHEMICAL EROSION AND SEDIMENT CONTROL BMPS

POLYMERS, FLOCCULANTS, OR OTHER SEDIMENTATION TREATMENT CHEMICALS MUST BE APPLIED AFTER CONVENTIONAL EROSION AND SEDIMENT CONTROL DEVICES ARE UTILIZED. CHEMICALS MAY ONLY BE APPLIED WHERE TREATED STORMWATER IS DIRECTED TO A SEDIMENT CONTROL SYSTEM WHICH ALLOWS FOR FILTRATION OR SETTLEMENT OF THE FLOC PRIOR TO DISCHARGE. CONSIDERATION MUST BE GIVEN WHEN SELECTING CHEMICALS TO THE EXPECTED SOIL TYPES TO BE EXPOSED DURING CONSTRUCTION, AND TO THE EXPECTED TURBIDITY, PH AND FLOW RATE OF STORMWATER FLOWING INTO THE CHEMICAL TREATMENT SYSTEM OR AREA. IF CHEMICALS ARE PART OF THE EROSION CONTROL PLAN, THEY MUST BE USED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICES, AND WITH DOSING SPECIFICATION AND SEDIMENT REMOVAL DESIGN SPECIFICATIONS PROVIDED BY THE MANUFACTURER OR PROVIDER/SUPPLIER OF THE APPLICABLE CHEMICALS.

SECTION 3: DEWATERING & BASIN DRAINING

3.1 DEWATERING AND BASIN DRAINING

ALLOWABLE NON-STORMWATER DISCHARGES, AS DEFINED BY THE GENERAL PERMIT, ARE LIMITED TO DEWATERING AND BASIN DRAINING. DEWATERING OR BASIN DRAINING THAT MAY HAVE TURBID OR SEDIMENT LADEN DISCHARGE WATER MUST BE DISCHARGED TO A TEMPORARY OR PERMANENT SEDIMENTATION BASIN ON THE PROJECT SITE WHENEVER POSSIBLE. IF THE WATER CANNOT BE DISCHARGED TO A SEDIMENTATION BASIN PRIOR TO ENTERING THE SURFACE WATER, IT MUST BE TREATED WITH THE APPROPRIATE BMPS, SUCH THAT THE DISCHARGE DOES NOT ADVERSELY AFFECT THE RECEIVING WATER OR DOWNSTREAM LANDOWNERS. THE CONTRACTOR MUST ENSURE THAT DISCHARGE POINTS ARE ADEQUATELY PROTECTED FROM EROSION AND SCOUR. THE DISCHARGE MUST BE DISPERSED OVER NATURAL ROCK RIPRAP, SAND BAGS, PLASTIC SHEETING OR OTHER ACCEPTED ENERGY DISSIPATION MEASURES. ADEQUATE SEDIMENTATION CONTROL MEASURES ARE REQUIRED FOR DISCHARGE WATER THAT CONTAINS SUSPENDED SOLIDS. ALL WATER FROM DEWATERING OR BASIN DRAINING MUST BE DISCHARGED IN A MANNER THAT DOES NOT CAUSE NUISANCE CONDITIONS, EROSION IN RECEIVING CHANNELS OR ON DOWNSLOPE PROPERTIES, OR INUNDATION IN WETLANDS CAUSING SIGNIFICANT ADVERSE IMPACT TO THE WETLAND. IF THE CONTRACTOR ELECTS TO UTILIZE FILTERS WITH BACKWASH WATER, THE CONTRACTOR MUST HAUL THE BACKWASH WATER AWAY FOR DISPOSAL, RETURN THE BACKWATER TO THE BEGINNING OF THE TREATMENT PROCESS, OR INCORPORATE THE BACKWASH WATER INTO THE SITE IN A MANNER THAT DOES NOT CAUSE EROSION. THE CONTRACTOR MUST REPLACE AND CLEAN THE FILTER MEDIA USED IN DEWATERING DEVICES WHEN REQUIRED TO RETAIN ADEQUATE FUNCTION. CONTRACTOR SHALL OBTAIN A WATER USE (APPROPRIATION) PERMIT FROM THE MINNESOTA DNR FOR DEWATERING ACTIVITIES THAT WILL WITHDRAW MORE THAN 10,000 GALLONS OF WATER PER DAY OR 1 MILLION GALLONS PER YEAR.

SECTION 4: GOOD HOUSEKEEPING BMPS

4.1 MATERIAL HANDLING AND WASTE MANAGEMENT

1. **SOLID WASTE DISPOSAL** - NO SOLID MATERIALS, INCLUDING CONSTRUCTION AND DEMOLITION MATERIALS, COLLECTED SEDIMENT, ASPHALT AND CONCRETE MILLINGS, SHALL BE ALLOWED TO BE CARRIED FROM THE SITE WITH STORM WATER. ALL SOLID WASTE, INCLUDING DISPOSABLE MATERIALS INCIDENTAL TO THE MAJOR CONSTRUCTION ACTIVITIES, MUST BE COLLECTED AND PLACED IN CONTAINERS. THE CONTAINERS WILL BE EMPTIED PERIODICALLY BY A CONTRACT TRASH DISPOSAL SERVICE AND HAULED AWAY FROM THE SITE. DISPOSAL OF SOLID WASTES MUST COMPLY WITH MPCA REQUIREMENTS.
2. **GROUNDWATER PROTECTION** - SUBSTANCES THAT HAVE THE POTENTIAL FOR POLLUTING SURFACE AND/OR GROUNDWATER MUST BE CONTROLLED BY WHATEVER MEANS NECESSARY IN ORDER TO ENSURE THAT THEY DO NOT DISCHARGE FROM THE SITE. AS AN EXAMPLE, SPECIAL CARE MUST BE EXERCISED DURING EQUIPMENT FUELING AND SERVICING OPERATIONS. IF A SPILL OCCURS, IT MUST BE CONTAINED AND DISPOSED OF SO THAT IT WILL NOT FLOW FROM THE SITE OR ENTER GROUNDWATER, EVEN IF THIS REQUIRES REMOVAL, TREATMENT, AND DISPOSAL OF SOIL. IN THIS REGARD, POTENTIALLY POLLUTING SUBSTANCES SHOULD BE HANDLED IN A MANNER CONSISTENT WITH THE IMPACT THEY REPRESENT.
3. **SANITARY FACILITIES** - ALL PERSONNEL INVOLVED WITH CONSTRUCTION ACTIVITIES MUST COMPLY WITH STATE AND LOCAL SANITARY SEPTIC SYSTEM REGULATIONS. PORTABLE TOILETS MUST BE POSITIONED SO THAT THEY ARE SECURE AND WILL NOT BE TIPPED OR KNOCKED OVER. TEMPORARY SANITARY FACILITIES WILL BE PROVIDED AT THE SITE THROUGHOUT THE CONSTRUCTION PHASE WHERE REQUIRED BY STATE OR LOCAL REGULATIONS. THEY MUST BE UTILIZED BY ALL CONSTRUCTION PERSONNEL AND BE SERVICED BY A COMMERCIAL OPERATOR.

4.2 ESTABLISH PROPER STORAGE, HANDLING & DISPOSAL PRACTICES

HAZARDOUS MATERIALS & TOXIC WASTE (INCLUDING OIL, DIESEL FUEL, GASOLINE, HYDRAULIC FLUIDS, PAINT SOLVENTS, PETROLEUM-BASED PRODUCTS, WOOD PRESERVATIVES, ADDITIVES, CURING COMPOUNDS, AND ACIDS) MUST BE STORED IN WATERPROOF CONTAINERS WITH SECONDARY CONTAINMENT, AND THEIR LOCATION(S) MUST BE NOTED ON THE SWPPP MAP. EXCEPT DURING APPLICATION, THE CONTENTS MUST BE KEPT IN TRUCKS OR WITHIN STORAGE FACILITIES IN ACCORDANCE WITH SECTION 12.4 OF THE GENERAL PERMIT. STORAGE AND DISPOSAL OF HAZARDOUS WASTE MUST BE IN COMPLIANCE WITH MCPA REGULATIONS. RUNOFF CONTAINING SUCH MATERIAL MUST BE COLLECTED, REMOVED FROM THE SITE, TREATED, AND DISPOSED AT AN APPROVED SOLID WASTE OR CHEMICAL DISPOSAL FACILITY.

BUILDING PRODUCTS THAT HAVE THE POTENTIAL TO LEACH POLLUTANTS AND PESTICIDES, HERBICIDES, INSECTICIDES, FERTILIZERS, TREATMENT CHEMICALS AND LANDSCAPE MATERIALS MUST BE UNDER COVER BY PLASTIC SHEETING OR TEMPORARY ROOFS TO PREVENT DISCHARGE, OR PROTECTED BY SIMILAR EFFECTIVE MEANS TO PREVENT CONTACT WITH STORMWATER.

4.3 DESIGNATE WASHOUT AREAS

THE CONTRACTOR SHALL DESIGNATE AREAS FOR CONCRETE AND OTHER (STUCCO, PAINT, FOR RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS RELATED TO THE CONSTRUCTION ACTIVITY) WASHOUTS, AND NOTE THE LOCATIONS ON THE SITE MAP. ALL LIQUID AND SOLID WASTES GENERATED BY WASHOUT OPERATIONS MUST BE CONTAINED IN A LEAK PROOF CONTAINMENT FACILITY OR IMPERMEABLE LAYER. A COMPACTED CLAY LINER IS NOT AN ACCEPTABLE IMPERMEABLE LAYER. THE LIQUID AND SOLID WASTES MUST NOT CONTACT THE GROUND, AND THERE MUST NOT BE RUNOFF FROM THE WASHOUT OPERATIONS OR AREAS. LIQUID AND SOLID WASTE MUST BE DISPOSED OF PROPERLY AND IN COMPLIANCE WITH MPCA REGULATIONS. A SIGN MUST BE INSTALLED ADJACENT TO EACH WASHOUT FACILITY TO INFORM SITE WORKERS TO UTILIZE PROPER FACILITIES FOR DISPOSAL OF CONCRETE AND OTHER WASTES.

BMP DESCRIPTION: CONCRETE WASHOUT

INSTALLATION SCHEDULE: PRIOR TO CONCRETE WORK.

MAINTENANCE AND INSPECTION REQUIREMENTS: INSPECT CONCRETE WASHOUTS FOR EVIDENCE OF DISCHARGE EVERY 7 DAYS OR WITHIN 24 HOURS AFTER A 0.5" 24-HOUR RAIN EVENT. REPAIR, REPLACE OR SUPPLEMENT NON-FUNCTIONING CONCRETE WASHOUTS WITHIN 3 DAYS OR BY THE NEXT USE, WHICHEVER COMES FIRST.

RESPONSIBLE STAFF (CONTRACTOR TO COMPLETE):

4.4 ESTABLISH PROPER EQUIPMENT/VEHICLE FUELING AND MAINTENANCE PRACTICES

THE CONTRACTOR SHALL DESIGNATE AREAS FOR EQUIPMENT FUELING, CLEANING, MAINTENANCE AND REPAIR, AND NOTE THE LOCATION(S) ON THE SWPPP SITE MAPS. RUNOFF MUST BE CONTAINED WITHIN THE DESIGNATED AREAS (I.E. THROUGH USE OF A TEMPORARY BERM). THE AREAS MUST NOT BE LOCATED IN ANY SURFACE WATER. SPECIAL CARE MUST BE EXERCISED DURING EQUIPMENT FUELING AND SERVICING OPERATIONS. IF A SPILL OCCURS, IT MUST BE CONTAINED AND DISPOSED OF SO THAT IT WILL NOT FLOW FROM THE SITE OR ENTER GROUNDWATER, EVEN IF THIS REQUIRES REMOVAL, TREATMENT, AND DISPOSAL OF SOIL. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT ADEQUATE SUPPLIES ARE AVAILABLE AT ALL TIMES TO CLEAN UP DISCHARGED MATERIALS AND THAT AN APPROPRIATE DISPOSAL METHOD IS AVAILABLE FOR RECOVERED SPILLED MATERIALS. NO ENGINE DEGREASING IS ALLOWED ON SITE.

4.5 CONTROL EQUIPMENT/VEHICLE WASHING

THE CONTRACTOR SHALL DESIGNATE LOCATION(S) FOR VEHICLE WASHING, AND NOTE THE LOCATION(S) ON THE SWPPP SITE MAP. RUNOFF FROM THE WASHING AREA MUST BE CONTAINED IN A SEDIMENT BASIN OR OTHER SIMILARLY EFFECTIVE CONTROLS AND WASTE FROM THE WASHING ACTIVITY MUST BE PROPERLY DISPOSED OF. THE CONTRACTOR MUST PROPERLY USE AND STORE SOAPS, DETERGENTS AND SOLVENTS. ENGINE DEGREASING OF TRUCKS AND OTHER CONSTRUCTION VEHICLES IS ALSO PROHIBITED.

4.6 SPILL PREVENTION AND CONTROL PLAN

1. **ACCIDENTAL SPILL** - DISCHARGE OF OIL OR OTHER HAZARDOUS SUBSTANCES IS SUBJECT TO REPORTING AND CLEAN UP REQUIREMENTS. IN CASE OF AN ACCIDENTAL SPILL, THE MINNESOTA POLLUTION CONTROL AGENCY IS TO BE NOTIFIED AT THEIR **24-HOUR TELEPHONE NUMBER: 651-649-5451**. REFER TO SECTION 12 OF THE GENERAL PERMIT.
2. **GROUNDWATER PROTECTION** - SUBSTANCES THAT HAVE THE POTENTIAL FOR POLLUTING SURFACE AND/OR GROUNDWATER MUST BE CONTROLLED BY WHATEVER MEANS NECESSARY IN ORDER TO ENSURE THAT THEY DO NOT DISCHARGE FROM THE SITE. AS AN EXAMPLE, SPECIAL CARE MUST BE EXERCISED DURING EQUIPMENT FUELING AND SERVICING OPERATIONS. IF A SPILL OCCURS, IT MUST BE CONTAINED AND DISPOSED OF SO THAT IT WILL NOT FLOW FROM THE SITE OR ENTER GROUNDWATER, EVEN IF THIS REQUIRES REMOVAL, TREATMENT, AND DISPOSAL OF SOIL. IN THIS REGARD, POTENTIALLY POLLUTING SUBSTANCES SHOULD BE HANDLED IN A MANNER CONSISTENT WITH THE IMPACT THEY REPRESENT.

SECTION 5: POST-CONSTRUCTION BMPS

[DESCRIBE PERMANENT STORM WATER SYSTEM, AND INCLUDE REFERENCE TO DESIGN CALCULATIONS. REFER TO SECTION 15, 16, 17, 18, AND 19 OF THE GENERAL PERMIT, AS WELL AS LGU REQUIREMENTS. NOTE: THE 2018 GENERAL PERMIT REQUIRES INFILTRATION OF THE WATER QUALITY VOLUME (1" OVER THE NEW IMPERVIOUS)]

BMP DESCRIPTION: SUMP MANHOLE

INSTALLATION SCHEDULE: ALONG WITH STORM SEWER NETWORK

MAINTENANCE AND INSPECTION REQUIREMENTS: PRACTICE SHOULD BE INSPECTED (AND CLEANED OUT IF DEEMED NECESSARY) SEMI-ANNUALLY TO ENSURE THAT SEDIMENT IS NOT BEGINNING TO WASH OUT DURING STORM EVENTS. DEVICES SHOULD BE CLEANED OUT AT LEAST ONCE PER YEAR OR AS NEEDED.

RESPONSIBLE STAFF (CONTRACTOR TO COMPLETE):

BMP DESCRIPTION: INFILTRATION BASIN

INSTALLATION SCHEDULE: AFTER SITE IS STABILIZED

MAINTENANCE AND INSPECTION REQUIREMENTS: NO HEAVY EQUIPMENT TO BE PLACED IN THESE AREAS, MINIMIZING THE COMPACTION. PERIODIC CHECK OF FLOW CONDITIONS TO TRACK DRAWDOWN OF THE WATER IN THE BASIN.

THE DEVICE WILL BE INSPECTED AND CLEARED OF SEDIMENT BUILD UP TWICE PER YEAR AND AS NEEDED. PLANTED VEGETATION ALSO NEEDS TO BE INSPECTED PERIODICALLY AND REPLACED AS NECESSARY. INSPECTION WILL ALSO INCLUDE CHECKING FOR ANY PROBLEMATIC EROSION TAKING PLACE ON THE SLOPES OF THE BASIN. EROSION ISSUES WILL BE REPAIRED AS THEY ARE FOUND.

RESPONSIBLE STAFF (CONTRACTOR TO COMPLETE):

SECTION 6: INSPECTIONS

6.1 INSPECTIONS

1. **INSPECTION FREQUENCY AND RESPONSIBILITY**

[OPTION 1 - CONTRACTOR RESPONSIBLE FOR INSPECTIONS]

BETWEEN THE TIME THIS SWPPP IS IMPLEMENTED AND FINAL SITE STABILIZATION IS ACHIEVED AND THE NOTICE OF TERMINATION FILED WITH THE MPCA, ALL DISTURBED AREAS AND POLLUTANT CONTROLS MUST BE INSPECTED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS FOLLOWING A RAINFALL OF 0.5 INCHES OR GREATER. THE PURPOSE OF SITE INSPECTIONS IS TO ASSESS PERFORMANCE OF POLLUTANT CONTROLS. THE INSPECTIONS WILL BE CONDUCTED BY THE CONTRACTOR'S DESIGNATED REPRESENTATIVE. BASED ON THESE INSPECTIONS, THE CONTRACTOR WILL DECIDE WHETHER IT IS NECESSARY TO MODIFY THIS SWPPP, ADD OR RELOCATE STRUCTURAL BMPS, OR WHATEVER ELSE MAY BE NEEDED IN ORDER TO PREVENT POLLUTANTS FROM LEAVING THE SITE VIA STORM WATER RUNOFF. IF THE SWPPP REQUIRES MODIFICATION, THOSE CHANGES TO THE SWPPP MUST BE DOCUMENTED. THE CONTRACTOR HAS THE DUTY TO CAUSE POLLUTANT CONTROL MEASURES TO BE REPAIRED, MODIFIED, MAINTAINED, SUPPLEMENTED, OR WHATEVER ELSE IS NECESSARY IN ORDER TO ACHIEVE EFFECTIVE POLLUTANT CONTROL.

2. **INSPECTION PROCEDURES** - EXAMPLES OF PARTICULAR ITEMS TO EVALUATE DURING SITE INSPECTIONS ARE LISTED BELOW. THIS LIST IS NOT INTENDED TO BE COMPREHENSIVE. DURING EACH INSPECTION THE INSPECTOR MUST EVALUATE OVERALL POLLUTANT CONTROL SYSTEM PERFORMANCE AS WELL AS PARTICULAR DETAILS OF INDIVIDUAL SYSTEM COMPONENTS. ADDITIONAL FACTORS SHOULD BE CONSIDERED AS APPROPRIATE TO THE CIRCUMSTANCES.

A. PRE-INSPECTION PREPARATION:

1. INSPECTORS SHOULD BE FAMILIAR WITH THE SWPPP, INCLUDING THE EROSION AND SEDIMENT CONTROL PLANS, PAST INSPECTION REPORTS, AND MAINTENANCE LOGS.
2. PAY SPECIAL ATTENTION TO STORM WATER DISCHARGE TO SPECIAL/IMPAIRED WATERS AND WETLANDS; DISCHARGES TO SPECIAL/IMPAIRED WATERS AND WETLANDS HAVE ADDITIONAL REQUIREMENTS THAT ARE DESCRIBED IN SECTION 23 OF THE GENERAL PERMIT, AND ADDRESSED IN THIS SWPPP.

B. SITE ENTRY:

1. BEFORE ENTERING THE SITE, OBSERVE THE SURROUNDINGS AND VARIOUS STAGES OF CONSTRUCTION. NOTE AREAS FOR IN-DEPTH REVIEW AND ANY POTENTIAL ISSUES.
2. THIS IS A GOOD TIME TO VIEW CONSTRUCTION SITE VEHICLE TRACKING PAD LOCATIONS AND PERIMETER CONTROLS.

C. RECORDS REVIEW:

1. VERIFY THAT A COPY OF THE SWPPP AND APPLICATION FOR THE NPDES STORM WATER PERMIT, AND COPIES OF ALL CONSTRUCTION SITE INSPECTIONS ARE ON SITE.
2. VERIFY THAT THE TIMING FOR INSTALLATION OF ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS, AS WELL AS CONSTRUCTION PHASING, IS GENERALLY BEING FOLLOWED.
3. SWPPPS ARE INTENDED TO BE DYNAMIC DOCUMENTS, VERIFY THAT AMENDMENTS OR CHANGES TO THE SWPPP ARE BEING MADE WHEN:
   A. A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, WEATHER OR SEASONAL CONDITIONS HAVE A SIGNIFICANT EFFECT ON STORM WATER DISCHARGES
   B. INSPECTIONS INDICATE THE SWPPP IS NOT EFFECTIVE
   C. THE SWPPP IS NOT CONSISTENT WITH THE TERMS OF THE GENERAL PERMIT

D. SITE INSPECTION (NOTE TIMELINES FOR MAINTENANCE INCLUDED IN INSPECTION/MAINTENANCE REPORT)

1. INSPECT DISCHARGE POINTS DOWNSTREAM AND OFF-SITE AREAS FOR SIGNS OF IMPACT.
2. INSPECT PERIMETER CONTROLS:
   A. HAVE PERIMETER CONTROLS BEEN PROPERLY INSTALLED AND MAINTAINED?
   B. ARE VEHICLE TRACKING PADS FUNCTIONING PROPERLY? ARE ADDITIONAL ENTRANCES/EXITS BEING USED THAT ARE NOT STABILIZED?
   C. ALL STORM DRAINS MUST BE PROTECTED AND TEMPORARY STOCKPILES MUST HAVE SEDIMENT CONTROLS INSTALLED.
   D. ALL EXPOSED SOILS MUST HAVE TEMPORARY OR PERMANENT EROSION PROTECTION WITHIN 7 DAYS OF INACTIVITY.
3. COMPARE BMPS IN THE SWPPP WITH CONSTRUCTION SITE CONDITIONS: ARE REQUIRED BMPS IN PLACE; ARE ADDITIONAL BMPS NEEDED; ARE BMPS IN PLACE PROPERLY INSTALLED AND MAINTAINED?
4. INSPECT AREAS THAT HAVE BEEN DISTURBED AND ARE NOT CURRENTLY BEING WORKED. ANY UNSEEDED OR UNMULCHED BARE AREAS THAT HAVE BEEN IDLE FOR 7 DAYS SHOULD BE NOTED.
5. INSPECT AREAS WITH FINAL STABILIZATION. IN ORDER FOR FINAL STABILIZATION TO BE ACHIEVED, AREAS MUST HAVE A UNIFORM COVER WITH A DENSITY OF 70% OVER ENTIRE AREA. TEMPORARY BMPS SHOULD BE REMOVED AND AREAS DISTURBED BY REMOVAL SEEDED AS NECESSARY.

E. EXIT INTERVIEW:

1. DEBRIEF THE PERSON IN CHARGE. EXPLAIN THE IDENTIFIED DEFICIENCIES AND ANY AREAS OF CONCERN.

F. A COPY OF THE COMPLETED INSPECTION REPORT MUST BE KEPT WITH THE SWPPP ON SITE.

THE INSPECTION REPORT USED SHOULD INCLUDE, AT A MINIMUM, THE FOLLOWING:

- DATE & TIME OF INSPECTION
- NAME OF INSPECTOR(S)
- FINDINGS OF INSPECTIONS AND RECOMMENDATIONS FOR CORRECTIVE ACTIONS
- CORRECTIVE ACTIONS TAKEN, INCLUDING DATES, TIMES AND NAMES OF PARTY COMPLETING MAINTENANCE
- DATE & AMOUNT OF RAINFALL
- RECORD OF ALL POINTS OF DISCHARGE FROM THE PROPERTY AND DESCRIPTION OF DISCHARGE
- NOTE TO UPDATE THE SWPPP

6.2 DELEGATION OF AUTHORITY

DULY AUTHORIZED REPRESENTATIVE(S) OR POSITION(S):

COMPANY OR ORGANIZATION NAME:
NAME:
POSITION:
ADDRESS:
CITY, STATE, ZIP CODE:
TELEPHONE NUMBER:
FAX/EMAIL:

6.3 CORRECTIVE ACTION LOG

THE INSPECTION/MAINTENANCE FORM, AVAILABLE UPON REQUEST, INCORPORATES BOTH INSPECTION AND MAINTENANCE REPORTING INTO A SINGLE FORM. THIS FORM ALSO SPECIFIES THE TIME ALLOWED FOR CORRECTIONS TO BE PERFORMED. IF THE PARTY PERFORMING INSPECTIONS CHOOSES TO USE ANOTHER INSPECTION FORM, A SEPARATE CORRECTIVE ACTION LOG MUST BE PROVIDED.

SECTION 7: RECORD KEEPING AND TRAINING

7.1 RECORDKEEPING

RECORD RETENTION - THE OWNER MUST KEEP THE SWPPP INCLUDING ALL CHANGES MADE TO IT DURING CONSTRUCTION (SEE SECTION 7.2 OF THIS SWPPP), ALONG WITH THE FOLLOWING ADDITIONAL RECORDS ON FILE FOR THREE YEARS AFTER COMPLETION OF THE CONSTRUCTION PROJECT (FINAL STABILIZATION AND NOTICE OF TERMINATION):

1. ANY OTHER STORMWATER RELATED PERMITS REQUIRED FOR THE PROJECT
2. RECORDS OF ALL INSPECTIONS AND MAINTENANCE CONDUCTED DURING CONSTRUCTION
3. ALL PERMANENT OPERATION AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED, INCLUDING ALL RIGHT OF WAY, CONTRACTS, COVENANTS AND OTHER BINDING REQUIREMENTS REGARDING PERPETUAL MAINTENANCE
4. ALL REQUIRED CALCULATIONS FOR DESIGN OF THE TEMPORARY AND PERMANENT STORM WATER MANAGEMENT SYSTEMS

7.2 AMENDMENTS

THE CONTRACTOR SHALL KEEP A RECORD LOG OF ALL MODIFICATIONS TO THE SWPPP. AN EXAMPLE OF A SWPPP UPDATE LOG FORM CAN BE PROVIDED UPON REQUEST.

MODIFICATIONS TO THE SWPPP - THIS SWPPP INTENDS TO CONTROL WATER-BORNE AND LIQUID POLLUTANT DISCHARGES BY SOME COMBINATION OF INTERCEPTION, FILTRATION, AND CONTAINMENT. THE GENERAL CONTRACTOR AND SUBCONTRACTORS IMPLEMENTING THIS SWPPP MUST REMAIN ALERT TO THE NEED TO PERIODICALLY REFINE AND UPDATE THE SWPPP IN ORDER TO ACCOMPLISH THE INTENDED GOALS. THIS SWPPP MUST BE AMENDED AS NECESSARY DURING THE COURSE OF CONSTRUCTION IN ORDER TO KEEP IT CURRENT WITH THE POLLUTANT CONTROL MEASURES UTILIZED AT THE SITE. AMENDING THE SWPPP DOES NOT MEAN THAT IT HAS TO BE REPRINTED. IT IS ACCEPTABLE TO ADD ADDENDA, SKETCHES, NEW SECTIONS, AND/OR REVISED DRAWINGS. THIS SWPPP MUST BE UPDATED AS NECESSARY TO INCLUDE ADDITIONAL REQUIREMENTS, SUCH AS ADDITIONAL OR MODIFIED BMPS, DESIGNED TO CORRECT PROBLEMS IDENTIFIED OR ADDRESS SITUATIONS WHENEVER:

1. THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, WEATHER OR SEASONAL CONDITIONS THAT HAS A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR UNDERGROUND WATERS.
2. INSPECTIONS OR INVESTIGATIONS BY SITE OPERATORS, LOCAL, STATE OR FEDERAL OFFICIALS INDICATE THE SWPPP IS NOT EFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR UNDERGROUND WATERS OR THAT THE DISCHARGES ARE CAUSING WATER QUALITY STANDARD EXCEEDANCES.
3. THE SWPPP IS NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY, OR THE SWPPP IS NOT CONSISTENT WITH THE TERMS AND CONDITIONS OF THE GENERAL PERMIT.
4. THE MPCA HAS DETERMINED THAT THE PROJECT'S STORM WATER DISCHARGES MAY CAUSE OR CONTRIBUTE TO NON-ATTAINMENT OF ANY APPLICABLE WATER STANDARD, OR THAT THE SWPPP DOES NOT INCORPORATE REQUIREMENTS RELATED TO AN APPROVED TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION PLAN. IN THIS CASE, THE SWPPP MUST BE UPDATED OR A SUPPLEMENTAL BMP ACTION PLAN DEVELOPED TO ADDRESS THE IDENTIFIED CONCERNS.

7.3 TRAINING

THE PERMITTEE(S) MUST FULFILL TRAINING REQUIREMENTS AND INCLUDE RECORDS OF TRAINING IN THE SWPPP. REFRESHER TRAINING MUST BE ATTENDED EVERY THREE YEARS STARTING THREE YEARS, FROM THE ISSUANCE OF THE 2018 GENERAL PERMIT (ISSUED 8/1/18). INDIVIDUALS REQUIRED TO BE TRAINED INCLUDE:

1. INDIVIDUALS PREPARING THE SWPPP
2. INDIVIDUALS OVERSEEING IMPLEMENTATION OF, REVISING, AND AMENDING THE SWPPP AND INDIVIDUALS PERFORMING INSPECTIONS. ONE OF THESE INDIVIDUALS MUST BE AVAILABLE FOR AN ON SITE INSPECTION WITHIN 72 HOURS UPON REQUEST BY THE MPCA.
3. INDIVIDUALS PERFORMING OR SUPERVISING THE INSTALLATION, MAINTENANCE AND REPAIR OF BMPS. AT LEAST ONE INDIVIDUAL ON A PROJECT MUST BE TRAINED IN THESE JOB DUTIES.

THE CONTENT AND EXTENT OF TRAINING MUST BE COMMENSURATE WITH THE INDIVIDUAL'S JOB DUTIES AND RESPONSIBILITIES WITH REGARD TO ACTIVITIES COVERED UNDER THE GENERAL PERMIT. AT LEAST ONE INDIVIDUAL TRAINED IN THE JOB DUTIES LISTED ABOVE MUST BE PRESENT ON THE SITE OR AVAILABLE TO THE SITE IN 72 HOURS.

TRAINING DOCUMENTATION MUST INCLUDE:

1. NAMES OF PERSONNEL ASSOCIATED WITH THE PROJECT THAT ARE REQUIRED TO BE TRAINED
2. DATES OF TRAINING AND NAMES OF INSTRUCTOR AND ENTITY PROVIDING TRAINING
3. CONTENT OF TRAINING COURSE, INCLUDING NUMBER OF HOURS OF TRAINING
4. DOCUMENTATION MUST BE KEPT WITH THE SWPPP. TRAINING RECORD/CERTIFICATION TEMPLATE IS AVAILABLE UPON REQUEST.

INDIVIDUALS MUST BE TRAINED BY LOCAL, STATE, FEDERAL AGENCIES, PROFESSIONAL ORGANIZATIONS, OR OTHER ENTITIES WITH EXPERTISE IN EROSION PREVENTION, SEDIMENT CONTROL, OR PERMANENT STORMWATER MANAGEMENT SUCH AS THE UNIVERSITY OF MINNESOTA, MINNESOTA EROSION CONTROL ASSOCIATION, SOIL AND WATER CONSERVATION DISTRICTS, OR THE MPCA.

SECTION 8: FINAL STABILIZATION / PERMIT TERMINATION

FINAL STABILIZATION - TO ACHIEVE FINAL STABILIZATION OF THE SITE, THE CONTRACTOR WILL IMPLEMENT THE FOLLOWING MEASURES AFTER ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED.

1. ALL SOILS MUST BE STABILIZED BY A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70 PERCENT OVER THE ENTIRE PERVIOUS SURFACE AREA, OR BY OTHER EQUIVALENT MEANS NECESSARY TO PREVENT SOIL FAILURE UNDER EROSIVE CONDITIONS. REFER TO LANDSCAPING PLANS/SPECIFICATIONS FOR TYPE OF VEGETATIVE COVER.
2. THE PERMANENT STORMWATER MANAGEMENT SYSTEM IS CONSTRUCTED, MEETS ALL REQUIREMENTS IN SECTIONS 15, 16, 17, 18, AND 19 OF THE GENERAL PERMIT AND IS OPERATING AS DESIGNED. TEMPORARY OR PERMANENT SEDIMENTATION BASINS THAT ARE TO BE USED AS PERMANENT WATER QUALITY MANAGEMENT BASINS HAVE BEEN CLEAN OF ANY ACCUMULATED SEDIMENT. ALL SEDIMENT HAS BEEN REMOVED FROM CONVEYANCE SYSTEMS AND DITCHES ARE STABILIZED WITH PERMANENT COVER.
3. ALL TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL BMPS MUST BE REMOVED.
4. FOR CONSTRUCTION PROJECTS ON LAND USED FOR AGRICULTURAL PURPOSES FINAL STABILIZATION MAY BE ACCOMPLISHED BY RETURNING THE DISTURBED LAND TO ITS PRECONSTRUCTION AGRICULTURAL USE.
5. FOR RESIDENTIAL CONSTRUCTION ONLY, INDIVIDUAL LOTS ARE CONSIDERED FINALLY STABILIZED IF THE STRUCTURE(S) ARE FINISHED AND TEMPORARY EROSION PROTECTION AND DOWNGRADIENT PERIMETER CONTROL HAS BEEN COMPLETED AND THE RESIDENCE HAS BEEN SOLD TO THE HOMEOWNER. ADDITIONALLY, THE PERMITTEE HAS DISTRIBUTED THE MPCA'S "HOMEOWNER FACT SHEET" TO THE HOMEOWNER TO INFORM THE HOMEOWNER OF THE NEED FOR, AND BENEFITS OF, PERMANENT COVER.

PERMIT TERMINATION - TO ACHIEVE PERMIT TERMINATION FOR THE SITE, PERMITTEES MUST COMPLY WITH SECTIONS 4 & 13 OF THE GENERAL PERMIT.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

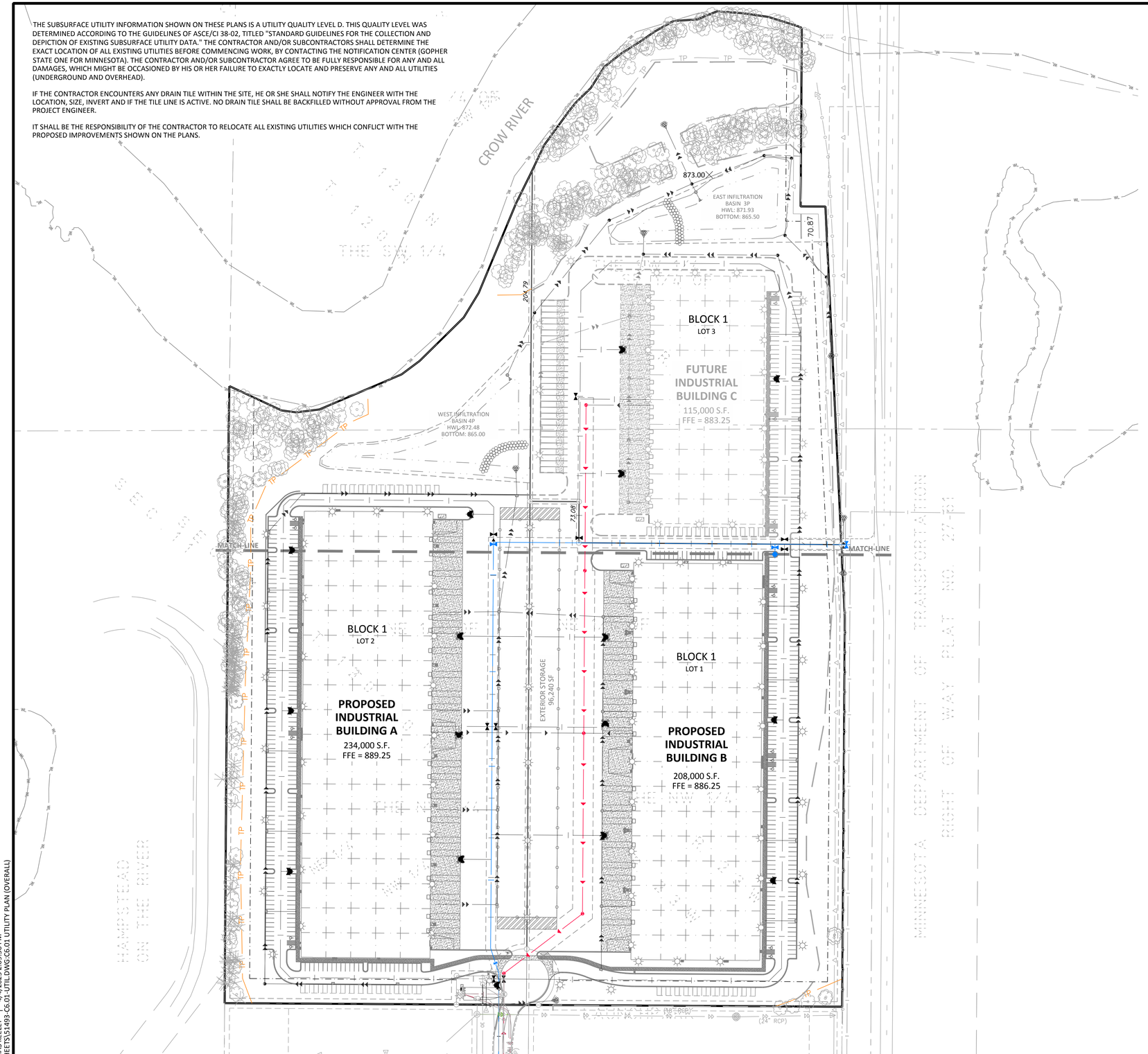
SWPPP

CP WEST, LLC
NORTHDALE

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



LEGEND

PROPOSED	EXISTING	
CO	CO	SANITARY SEWER
LS FM S	LS FM S	FORCEMAIN (SAN.)
D	D	STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE

CO — PUBLIC SANITARY SEWER

PUBLIC WATERMAIN

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

UTILITY CONSTRUCTION NOTES

1. THE UTILITY IMPROVEMENTS FOR THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "STANDARD UTILITIES SPECIFICATIONS" AS PUBLISHED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA (CEAM), EXCEPT AS MODIFIED HEREIN. CONTRACTOR SHALL OBTAIN A COPY OF THESE SPECIFICATIONS.
   a. ALL UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIRMENTS, INCLUDING BUT NOT LIMITED TO CITY, DEPARTMENT OF LABOR AND INDUSTRY AND MINNESOTA DEPARTMENT OF HEALTH REQUIREMENTS.
   b. CONTRACTOR SHALL NOT OPEN, TURN OFF, INTERFERE WITH, OR ATTACH ANY PIPE OR HOSE TO OR TAP WATERMAIN BELONGING TO THE CITY UNLESS DULY AUTHORIZED TO DO SO BY THE CITY. ANY ADVERSE CONSEQUENCES OF ANY SCHEDULED OR UNSCHEDULED DISRUPTIONS OF SERVICE TO THE PUBLIC ARE THE LIABILITY OF CONTRACTOR.
   c. A MINIMUM VERTICAL SEPARATION OF 18 INCHES, AND HORIZONTAL SEPARATION OF 10-FEET, BETWEEN OUTSIDE PIPE AND/OR STRUCTURE WALLS, IS REQUIRED AT ALL WATERMAIN AND SEWER MAIN (STORM AND SANITARY) CROSSINGS.
2. ALL MATERIALS SHALL BE AS SPECIFIED IN CEAM SPECIFICATIONS EXCEPT AS MODIFIED HEREIN.
   a. ALL MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE CITY.
   b. ALL SANITARY SEWER TO BE PVC SDR-35, UNLESS NOTED OTHERWISE.
   i. ALL SANITARY SEWER SERVICES TO BUILDING SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   ii. ALL SANITARY SEWER WITHIN 10 FEET OF, CROSSING ABOVE, OR WITHIN 12-INCHES BELOW, A POTABLE WATER LINE SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   c. ALL WATERMAIN TO BE PVC C-900, UNLESS NOTED OTHERWISE.
   i. ALL WATERMAIN TO HAVE 7.5-FEET OF COVER OVER TOP OF WATERMAIN.
   ii. PROVIDE THRUST BLOCKING AND MECHANICAL JOINT RESTRAINTS ON ALL WATERMAIN JOINTS PER CITY STANDARDS.
   iii. WHERE A SEWER LINE CROSSES A WATER SERVICE, THE WATER SERVICE SHALL NOT CONTAIN ANY JOINTS OR CONNECTIONS WITHIN 10 FEET OF THE CROSSING.
   d. ALL STORM SEWER PIPE TO BE SMOOTH INTERIOR DUAL WALL HDPE PIPE WITH WATERTIGHT GASKETS, UNLESS NOTED OTHERWISE.
   i. ALL STORM SEWER CROSSING ABOVE, OR WITHIN 12-INCHES BELOW, A POTABLE WATER LINE SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   ii. ALL STORM SEWER PIPE FOR ROOF DRAIN SERVICES TO THE BUILDING, OR WITHIN 10' OF A BUILDING, SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   e. RIP RAP SHALL BE Mn/DOT CLASS 3.
3. COORDINATE ALL BUILDING SERVICE CONNECTION LOCATIONS AND INVERT ELEVATIONS WITH MECHANICAL CONTRACTOR PRIOR TO CONSTRUCTION.
4. ALL BUILDING SERVICE CONNECTIONS (STORM, SANITARY, WATER) WITH FIVE FEET OR LESS COVER ARE TO BE INSULATED FROM BUILDING TO POINT WHERE 5-FEET OF COVER IS ACHIEVED.
5. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
6. SAFETY NOTICE TO CONTRACTORS: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE DUTY OF THE ENGINEER OR THE DEVELOPER TO CONDUCT CONSTRUCTION REVIEW OF CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE.
7. ALL AREAS OUTSIDE THE PROPERTY BOUNDARIES THAT ARE DISTURBED BY UTILITY CONSTRUCTION SHALL BE RESTORED IN KIND. SODDED AREAS SHALL BE RESTORED WITH 6 INCHES OF TOPSOIL PLACED BENEATH THE SOD.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING SIGNS, DIRECTIONAL SIGNS, FLAGMEN AND LIGHTS TO CONTROL THE MOVEMENT OF TRAFFIC WHERE NECESSARY. TRAFFIC CONTROL DEVICES SHALL CONFORM TO APPROPRIATE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARDS.
9. ALL SOILS TESTING SHALL BE COMPLETED BY AN INDEPENDENT SOILS ENGINEER. EXCAVATION FOR THE PURPOSE OF REMOVING UNSTABLE OR UNSUITABLE SOILS SHALL BE COMPLETED AS REQUIRED BY THE SOILS ENGINEER. THE UTILITY BACKFILL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE SOILS ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED SOILS TESTS AND SOIL INSPECTIONS WITH THE SOILS ENGINEER. A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY:COMPANY:
   ADDRESS:
   PHONE:
   DATED:
   CONTRACTOR SHALL OBTAIN A COPY OF THIS SOILS REPORT.
10. CONTRACTOR SHALL SUBMIT 2 COPIES OF SHOP DRAWINGS FOR MANHOLE AND CATCH BASIN STRUCTURES TO _____. CONTRACTOR SHALL ALLOW 5 WORKING DAYS FOR SHOP DRAWING REVIEW.
11. CONTRACTOR AND MATERIAL SUPPLIER SHALL DETERMINE THE MINIMUM DIAMETER REQUIRED FOR EACH STORM SEWER STRUCTURE.
12. THE UTILITY DESIGN DOES NOT INCLUDE WATERMAIN ELEVATIONS. THE CONTRACTOR SHALL INSTALL WATERMAIN AT DEPTHS REQUIRED BY APPLICABLE AGENCIES AND SHALL DETERMINE LOCATIONS OF CONFLICTS WITH OTHER UTILITIES AND INCLUDE THE REQUIRED EFFORTS TO AVOID CONFLICTS (BENDS, MATERIAL CHANGES, ETC.) IN THEIR BIDS.
13. CONTRACTOR SHALL PROVIDE RECORD PLANS AS REQUIRED BY PERMITTING AGENCIES.

NORTH

0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

UTILITY PLAN (OVERALL)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

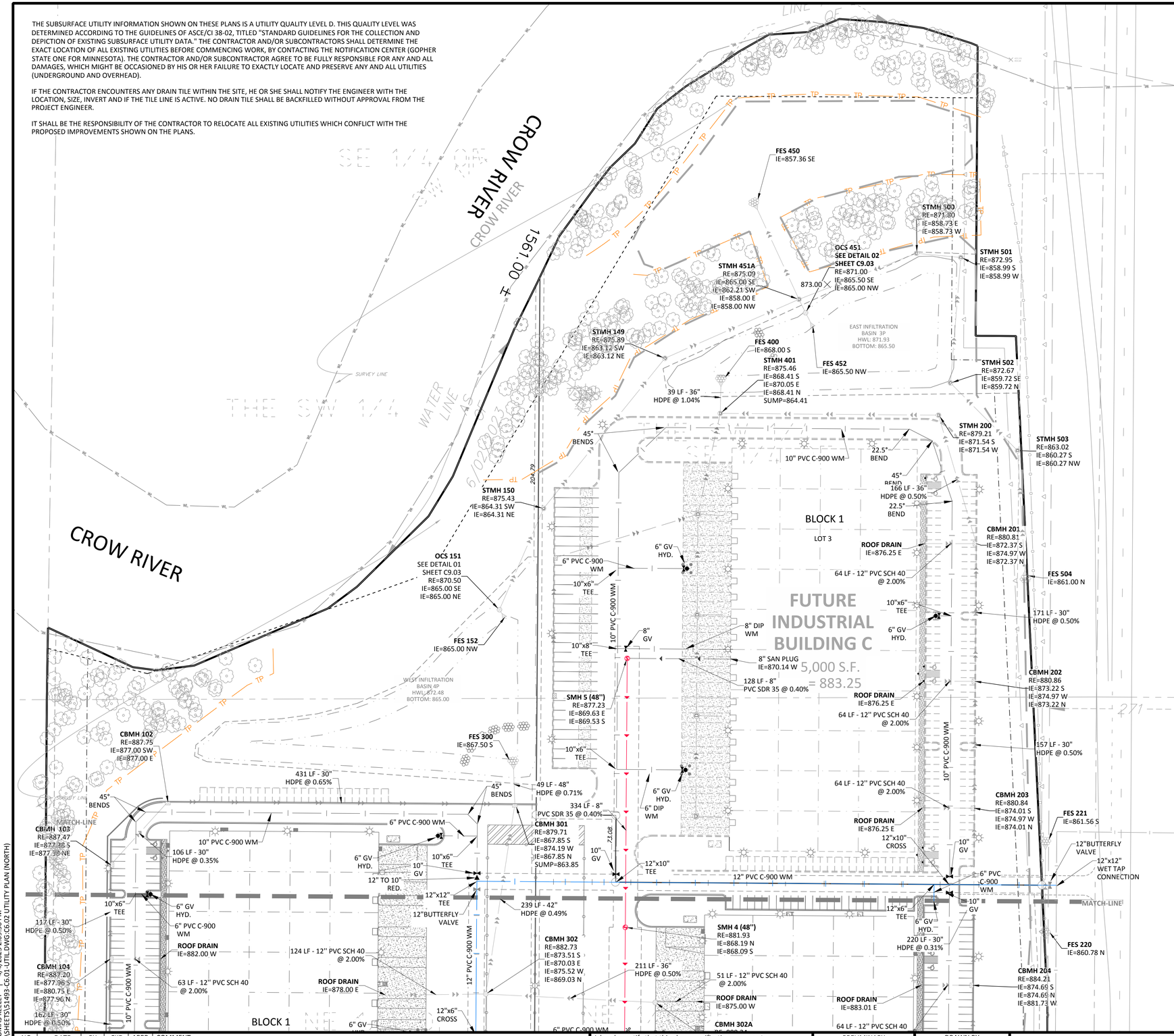
SHEET
C6.01
18 OF 45
REV.

24:15 (LMS TECH) | T:\PROJECTS\51493\CAD\SHEETS\51493_C6.01-UTILDWG.C6.01 UTILITY PLAN (OVERALL) | 4/4/2025 2:09:50 PM

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



LEGEND

PROPOSED	EXISTING	
		SANITARY SEWER
		FORCEMAIN (SAN.)
		STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE
		PUBLIC SANITARY SEWER
		PUBLIC WATERMAIN

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

UTILITY CONSTRUCTION NOTES

1. THE UTILITY IMPROVEMENTS FOR THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "STANDARD UTILITIES SPECIFICATIONS" AS PUBLISHED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA (CEAM), EXCEPT AS MODIFIED HEREIN. CONTRACTOR SHALL OBTAIN A COPY OF THESE SPECIFICATIONS.
   a. ALL UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIRMENTS, INCLUDING BUT NOT LIMITED TO CITY, DEPARTMENT OF LABOR AND INDUSTRY AND MINNESOTA DEPARTMENT OF HEALTH REQUIREMENTS.
   b. CONTRACTOR SHALL NOT OPEN, TURN OFF, INTERFERE WITH, OR ATTACH ANY PIPE OR HOSE TO OR TAP WATERMAIN BELONGING TO THE CITY UNLESS DULY AUTHORIZED TO DO SO BY THE CITY. ANY ADVERSE CONSEQUENCES OF ANY SCHEDULED OR UNSCHEDULED DISRUPTIONS OF SERVICE TO THE PUBLIC ARE THE LIABILITY OF CONTRACTOR.
   c. A MINIMUM VERTICAL SEPARATION OF 18 INCHES, AND HORIZONTAL SEPARATION OF 10-FEET, BETWEEN OUTSIDE PIPE AND/OR STRUCTURE WALLS, IS REQUIRED AT ALL WATERMAIN AND SEWER MAIN (STORM AND SANITARY) CROSSINGS.
2. ALL MATERIALS SHALL BE AS SPECIFIED IN CEAM SPECIFICATIONS EXCEPT AS MODIFIED HEREIN.
   a. ALL MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE CITY.
   b. ALL SANITARY SEWER TO BE PVC SDR-35, UNLESS NOTED OTHERWISE.
   i. ALL SANITARY SEWER SERVICES TO BUILDING SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   ii. ALL SANITARY SEWER WITHIN 10 FEET OF, CROSSING ABOVE, OR WITHIN 12-INCHES BELOW, A POTABLE WATER LINE SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   c. ALL WATERMAIN TO BE DUCTILE IRON - CLASS 52, or PVC C-900, UNLESS NOTED OTHERWISE.
   i. ALL WATERMAIN TO HAVE 7.5-FEET OF COVER OVER TOP OF WATERMAIN.
   ii. PROVIDE THRUST BLOCKING AND MECHANICAL JOINT RESTRAINTS ON ALL WATERMAIN JOINTS PER CITY STANDARDS.
   iii. WHERE A SEWER LINE CROSSES A WATER SERVICE, THE WATER SERVICE SHALL NOT CONTAIN ANY JOINTS OR CONNECTIONS WITHIN 10 FEET OF THE CROSSING.
   d. ALL STORM SEWER PIPE TO BE SMOOTH INTERIOR DUAL WALL HDPE PIPE WITH WATERTIGHT GASKETS, UNLESS NOTED OTHERWISE.
   i. ALL STORM SEWER CROSSING ABOVE, OR WITHIN 12-INCHES BELOW, A POTABLE WATER LINE SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   ii. ALL STORM SEWER PIPE FOR ROOF DRAIN SERVICES TO THE BUILDING, OR WITHIN 10' OF A BUILDING, SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   e. RIP RAP SHALL BE Mn/DOT CLASS 3.
3. COORDINATE ALL BUILDING SERVICE CONNECTION LOCATIONS AND INVERT ELEVATIONS WITH MECHANICAL CONTRACTOR PRIOR TO CONSTRUCTION.
4. ALL BUILDING SERVICE CONNECTIONS (STORM, SANITARY, WATER) WITH FIVE FEET OR LESS COVER ARE TO BE INSULATED FROM BUILDING TO POINT WHERE 5-FEET OF COVER IS ACHIEVED.
5. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
6. SAFETY NOTICE TO CONTRACTORS: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE DUTY OF THE ENGINEER OR THE DEVELOPER TO CONDUCT CONSTRUCTION REVIEW OF CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE.
7. ALL AREAS OUTSIDE THE PROPERTY BOUNDARIES THAT ARE DISTURBED BY UTILITY CONSTRUCTION SHALL BE RESTORED IN KIND. SODDED AREAS SHALL BE RESTORED WITH 6 INCHES OF TOPSOIL PLACED BENEATH THE SOD.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING SIGNS, DIRECTIONAL SIGNS, FLAGMEN AND LIGHTS TO CONTROL THE MOVEMENT OF TRAFFIC WHERE NECESSARY. TRAFFIC CONTROL DEVICES SHALL CONFORM TO APPROPRIATE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARDS.
9. ALL SOILS TESTING SHALL BE COMPLETED BY AN INDEPENDENT SOILS ENGINEER. EXCAVATION FOR THE PURPOSE OF REMOVING UNSTABLE OR UNSUITABLE SOILS SHALL BE COMPLETED AS REQUIRED BY THE SOILS ENGINEER. THE UTILITY BACKFILL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE SOILS ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED SOILS TESTS AND SOIL INSPECTIONS WITH THE SOILS ENGINEER. A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY:COMPANY:
   ADDRESS:
   PHONE:
   DATED:
   CONTRACTOR SHALL OBTAIN A COPY OF THIS SOILS REPORT.
10. CONTRACTOR SHALL SUBMIT 2 COPIES OF SHOP DRAWINGS FOR MANHOLE AND CATCH BASIN STRUCTURES TO _____. CONTRACTOR SHALL ALLOW 5 WORKING DAYS FOR SHOP DRAWING REVIEW.
11. CONTRACTOR AND MATERIAL SUPPLIER SHALL DETERMINE THE MINIMUM DIAMETER REQUIRED FOR EACH STORM SEWER STRUCTURE.
12. THE UTILITY DESIGN DOES NOT INCLUDE WATERMAIN ELEVATIONS. THE CONTRACTOR SHALL INSTALL WATERMAIN AT DEPTHS REQUIRED BY APPLICABLE AGENCIES AND SHALL DETERMINE LOCATIONS OF CONFLICTS WITH OTHER UTILITIES AND INCLUDE THE REQUIRED EFFORTS TO AVOID CONFLICTS (BENDS, MATERIAL CHANGES, ETC.) IN THEIR BIDS.
13. CONTRACTOR SHALL PROVIDE RECORD PLANS AS REQUIRED BY PERMITTING AGENCIES.

NORTH

0 60 120
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

UTILITY PLAN (NORTH)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

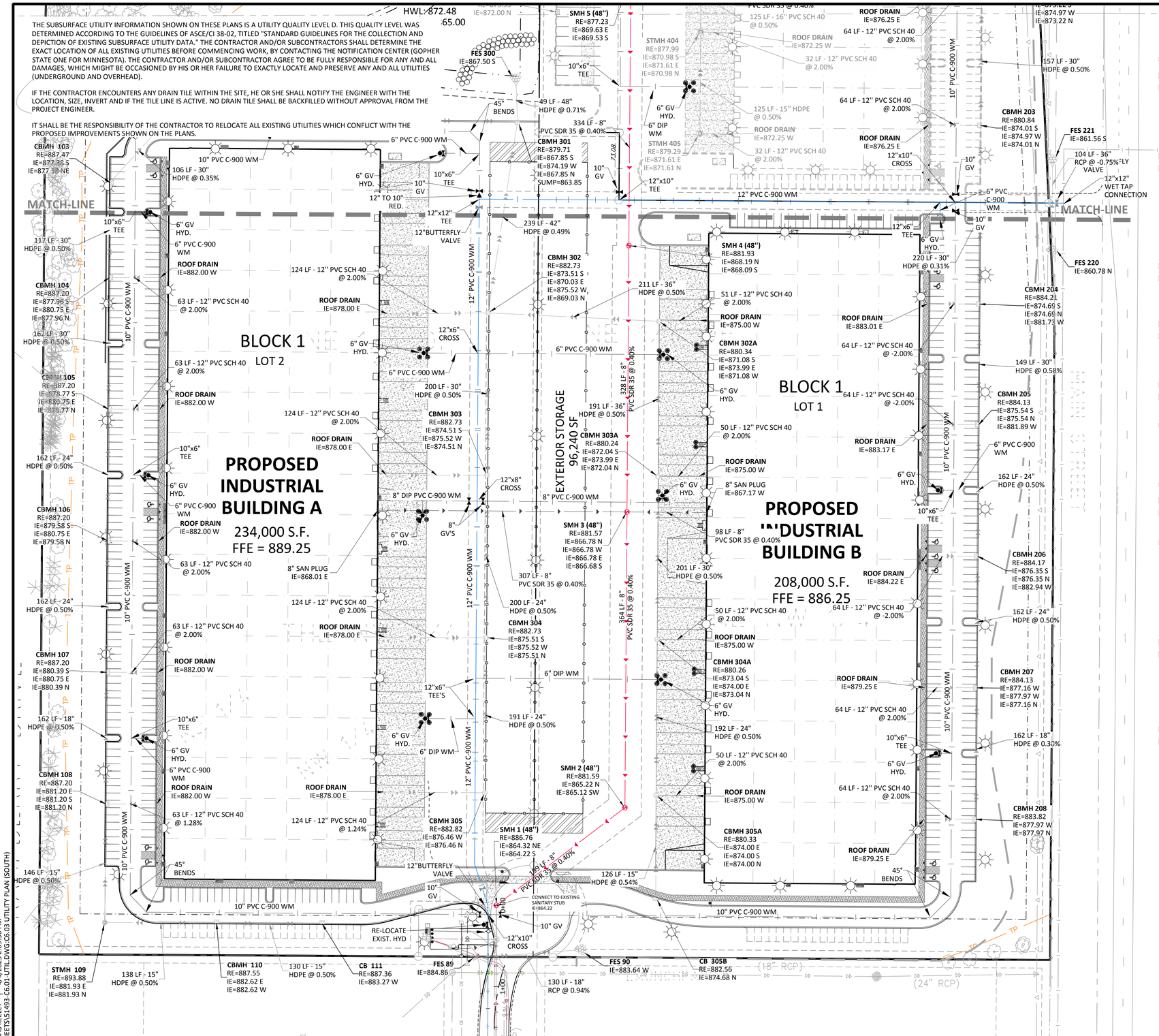
SHEET
C6.02
19 OF 45
REV.

24.15 (LMS TECH) | THOMAS.KEELEY | 4/4/2025 2:09:50 PM
L:\PROJECTS\51493\CAD\SHEETS\51493 C6.01 UTIL.DWG C6.02 UTILITY PLAN (NORTH)

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



LEGEND

PROPOSED	EXISTING	
		SANITARY SEWER
		FORCEMAIN (SAN.)
		STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE

PUBLIC SANITARY SEWER

PUBLIC WATERMAIN

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

UTILITY CONSTRUCTION NOTES

1. THE UTILITY IMPROVEMENTS FOR THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "STANDARD UTILITIES SPECIFICATIONS" AS PUBLISHED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA (CEAM), EXCEPT AS MODIFIED HEREIN. CONTRACTOR SHALL OBTAIN A COPY OF THESE SPECIFICATIONS.
   a. ALL UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIRMENTS, INCLUDING BUT NOT LIMITED TO CITY, DEPARTMENT OF LABOR AND INDUSTRY AND MINNESOTA DEPARTMENT OF HEALTH REQUIREMENTS.
   b. CONTRACTOR SHALL NOT OPEN, TURN OFF, INTERFERE WITH, OR ATTACH ANY PIPE OR HOSE TO OR TAP WATERMAIN BELONGING TO THE CITY UNLESS DULY AUTHORIZED TO DO SO BY THE CITY. ANY ADVERSE CONSEQUENCES OF ANY SCHEDULED OR UNSCHEDULED DISRUPTIONS OF SERVICE TO THE PUBLIC ARE THE LIABILITY OF CONTRACTOR.
   c. A MINIMUM VERTICAL SEPARATION OF 18 INCHES, AND HORIZONTAL SEPARATION OF 10-FEET, BETWEEN OUTSIDE PIPE AND/OR STRUCTURE WALLS, IS REQUIRED AT ALL WATERMAIN AND SEWER MAIN (STORM AND SANITARY) CROSSINGS.
2. ALL MATERIALS SHALL BE AS SPECIFIED IN CEAM SPECIFICATIONS EXCEPT AS MODIFIED HEREIN.
   a. ALL MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE CITY.
   b. ALL SANITARY SEWER TO BE PVC SDR-35, UNLESS NOTED OTHERWISE.
      i. ALL SANITARY SEWER SERVICES TO BUILDING SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
      ii. ALL SANITARY SEWER WITHIN 10 FEET OF, CROSSING ABOVE, OR WITHIN 12-INCHES BELOW, A POTABLE WATER LINE SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   c. ALL WATERMAIN TO BE DUCTILE IRON - CLASS 52, or PVC C-900, UNLESS NOTED OTHERWISE.
      i. ALL WATERMAIN TO HAVE 7.5-FEET OF COVER OVER TOP OF WATERMAIN.
      ii. PROVIDE THRUST BLOCKING AND MECHANICAL JOINT RESTRAINTS ON ALL WATERMAIN JOINTS PER CITY STANDARDS.
      iii. WHERE A SEWER LINE CROSSES A WATER SERVICE, THE WATER SERVICE SHALL NOT CONTAIN ANY JOINTS OR CONNECTIONS WITHIN 10 FEET OF THE CROSSING.
   d. ALL STORM SEWER PIPE TO BE SMOOTH INTERIOR DUAL WALL HDPE PIPE WITH WATERTIGHT GASKETS, UNLESS NOTED OTHERWISE.
      i. ALL STORM SEWER CROSSING ABOVE, OR WITHIN 12-INCHES BELOW, A POTABLE WATER LINE SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
      ii. ALL STORM SEWER PIPE FOR ROOF DRAIN SERVICES TO THE BUILDING, OR WITHIN 10' OF A BUILDING, SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   e. RIP RAP SHALL BE Mn/DOT CLASS 3.
3. COORDINATE ALL BUILDING SERVICE CONNECTION LOCATIONS AND INVERT ELEVATIONS WITH MECHANICAL CONTRACTOR PRIOR TO CONSTRUCTION.
4. ALL BUILDING SERVICE CONNECTIONS (STORM, SANITARY, WATER) WITH FIVE FEET OR LESS COVER ARE TO BE INSULATED FROM BUILDING TO POINT WHERE 5-FEET OF COVER IS ACHIEVED.
5. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
6. SAFETY NOTICE TO CONTRACTORS: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE DUTY OF THE ENGINEER OR THE DEVELOPER TO CONDUCT CONSTRUCTION REVIEW OF CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE.
7. ALL AREAS OUTSIDE THE PROPERTY BOUNDARIES THAT ARE DISTURBED BY UTILITY CONSTRUCTION SHALL BE RESTORED IN KIND. SODDED AREAS SHALL BE RESTORED WITH 6 INCHES OF TOPSOIL PLACED BENEATH THE SOD.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING SIGNS, DIRECTIONAL SIGNS, FLAGMEN AND LIGHTS TO CONTROL THE MOVEMENT OF TRAFFIC WHERE NECESSARY. TRAFFIC CONTROL DEVICES SHALL CONFORM TO APPROPRIATE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARDS.
9. ALL SOILS TESTING SHALL BE COMPLETED BY AN INDEPENDENT SOILS ENGINEER. EXCAVATION FOR THE PURPOSE OF REMOVING UNSTABLE OR UNSUITABLE SOILS SHALL BE COMPLETED AS REQUIRED BY THE SOILS ENGINEER. THE UTILITY BACKFILL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE SOILS ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED SOILS TESTS AND SOIL INSPECTIONS WITH THE SOILS ENGINEER. A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY:COMPANY:
   ADDRESS:
   PHONE:
   DATED:
   CONTRACTOR SHALL OBTAIN A COPY OF THIS SOILS REPORT.
10. CONTRACTOR SHALL SUBMIT 2 COPIES OF SHOP DRAWINGS FOR MANHOLE AND CATCH BASIN STRUCTURES TO _____. CONTRACTOR SHALL ALLOW 5 WORKING DAYS FOR SHOP DRAWING REVIEW.
11. CONTRACTOR AND MATERIAL SUPPLIER SHALL DETERMINE THE MINIMUM DIAMETER REQUIRED FOR EACH STORM SEWER STRUCTURE.
12. THE UTILITY DESIGN DOES NOT INCLUDE WATERMAIN ELEVATIONS. THE CONTRACTOR SHALL INSTALL WATERMAIN AT DEPTHS REQUIRED BY APPLICABLE AGENCIES AND SHALL DETERMINE LOCATIONS OF CONFLICTS WITH OTHER UTILITIES AND INCLUDE THE REQUIRED EFFORTS TO AVOID CONFLICTS (BENDS, MATERIAL CHANGES, ETC.) IN THEIR BIDS.
13. CONTRACTOR SHALL PROVIDE RECORD PLANS AS REQUIRED BY PERMITTING AGENCIES.

NORTH

SCALE 0 60 120 IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

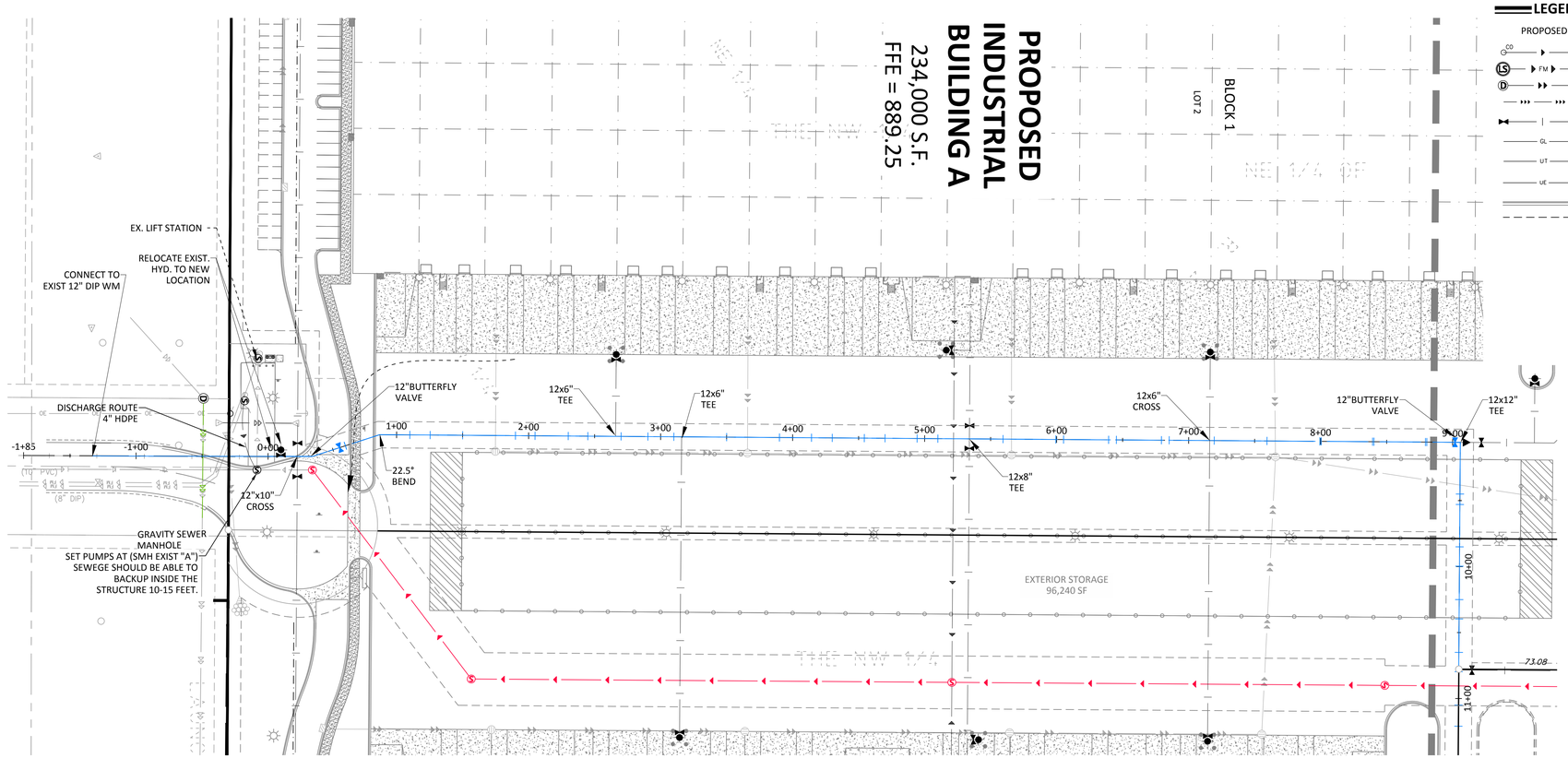
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

UTILITY PLAN (SOUTH)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET C6.03
20 OF 45
REV.

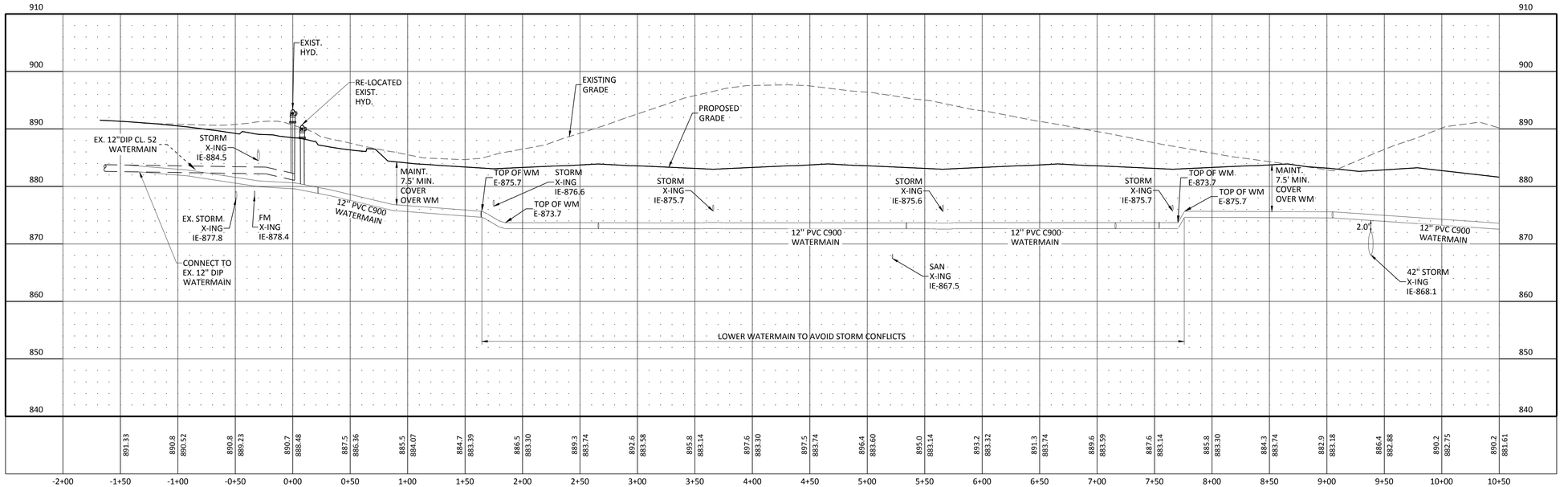
24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:50 PM
L:\PROJECTS\51493 CAD\SHEETS\51493-C6.01-UTIL.DWG C6.03 UTILITY PLAN (SOUTH)



LEGEND

PROPOSED	EXISTING	
		SANITARY SEWER
		FORCEMAIN (SAN.)
		STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE
		PUBLIC SANITARY SEWER
		PUBLIC WATERMAIN

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.



NORTH

0 50 100
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/05/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

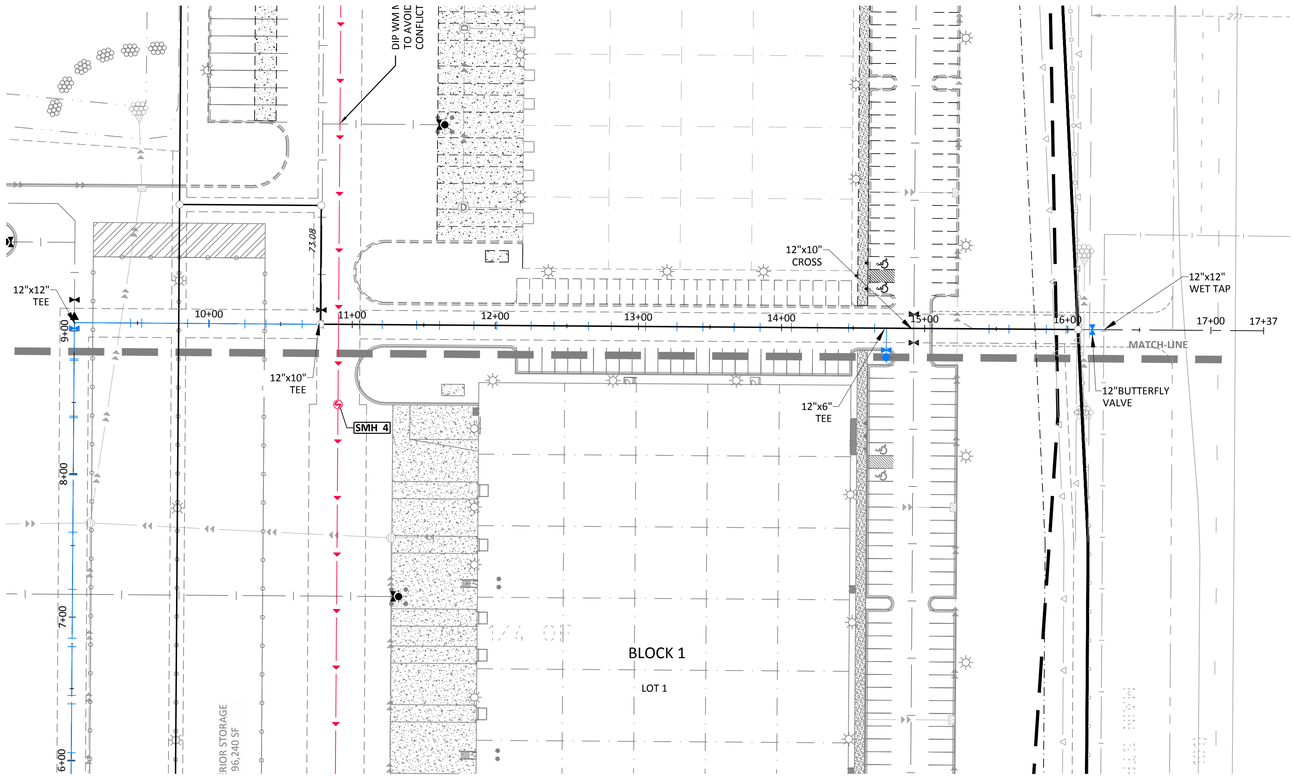
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

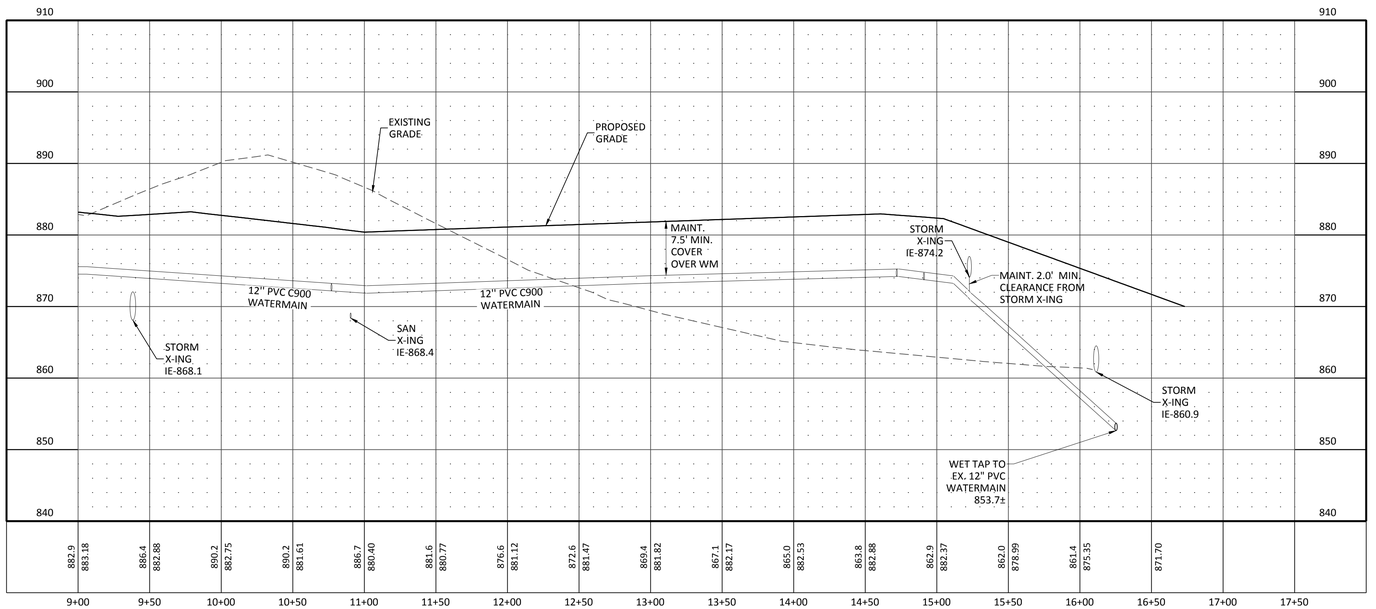
PUBLIC WATERMAIN

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C6.04
21 OF 45
REV. ##

24:15 (JMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:41 PM
L:\PROJECTS\51493\CADSHEETS\51493-C6.04-SAN-WATER PUBLIC PROFILES.DWG C6.04 PUBLIC WATERMAIN





LEGEND

PROPOSED	EXISTING	
		SANITARY SEWER
		FORCEMAIN (SAN.)
		STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE
		PUBLIC SANITARY SEWER
		PUBLIC WATERMAIN

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NORTH

0 50 100
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

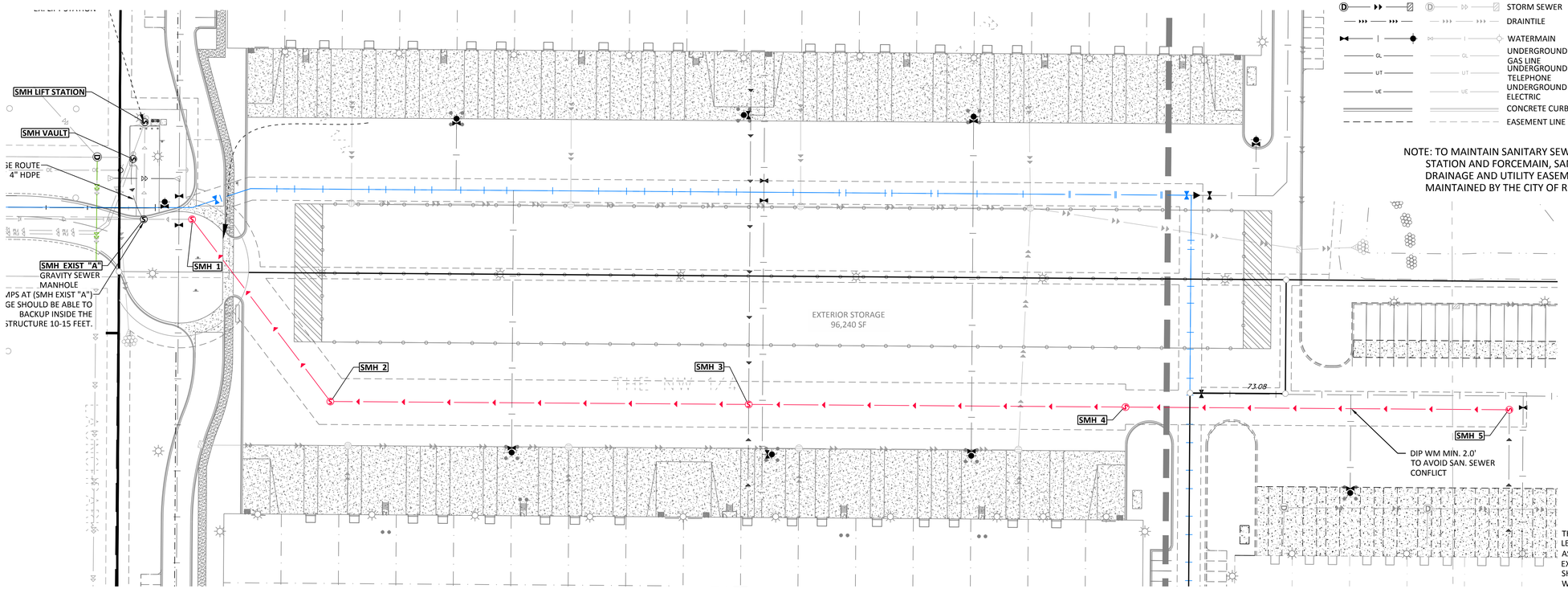
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

PUBLIC WATERMAIN

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C6.05
22 OF 45
REV. ##

24.15 (LMS TECH) | THOMAS.KEELEY | 4/4/2025 2:09:41 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C6.04-SAN-WATER PUBLIC PROFILES.DWG C6.05 PUBLIC WATERMAIN



LEGEND

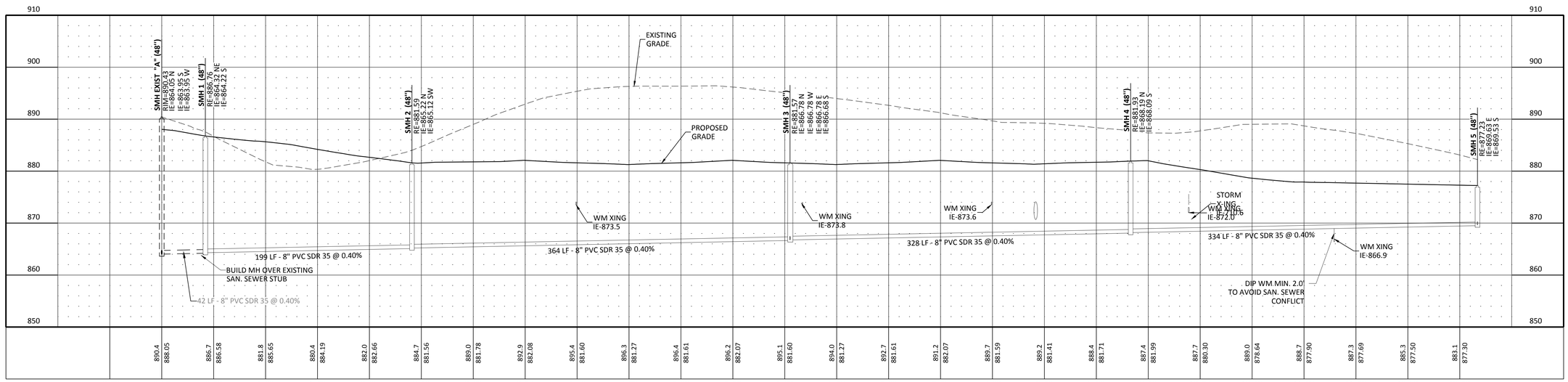
PROPOSED	EXISTING	
		SANITARY SEWER
		FORCEMAIN (SAN.)
		STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE
		PUBLIC SANITARY SEWER
		PUBLIC WATERMAIN

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



NORTH

0 50 100

SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

PUBLIC SANITARY SEWER

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C6.06
23 OF 45
REV. ##

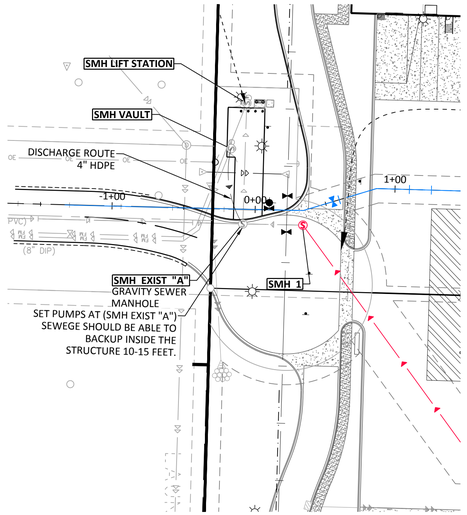
© 2021 Sambatek

24:15 (LMS TECH) | T:\PROJECTS\51493\CAD\SHEETS\51493-C6.04-SAN-WATER PUBLIC PROFILES.DWG,C6.06 PUBLIC SANITARY SEWER | THOMAS KEELEY | 4/4/2025 2:09:41 PM

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

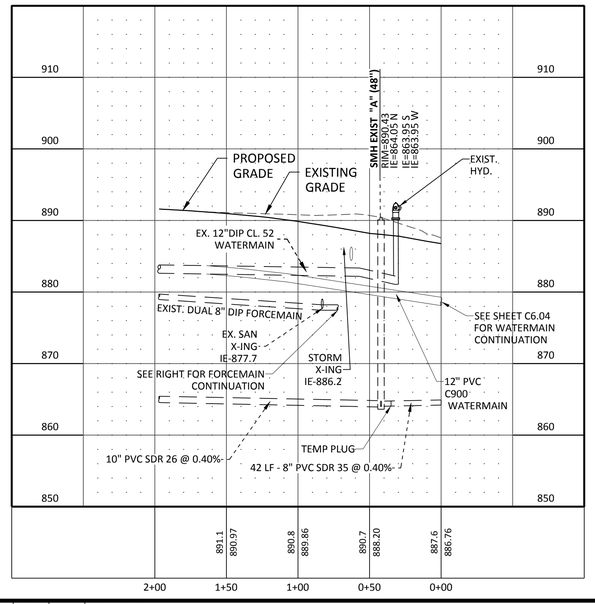
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



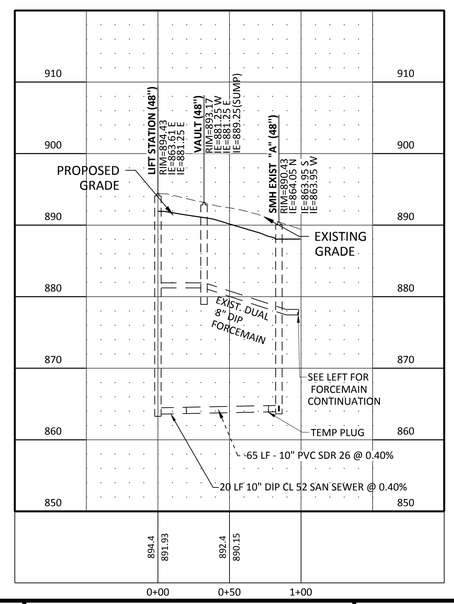
SMH EXIST "A" NOTES

1. TEMP PLUG THE EXISTING NORTH AND WEST INVERTS OF SMH EXIST "A".
2. PROVIDE TWO 150 GPM SUBMERSIBLE PUMPS WITH 5 HP MOTORS HOUSED IN SMH EXIST "A" TO PUMP SEWAGE TO VAULT MH 4" CONNECTION.
3. ROUTE 4" HDPE DISCHARGE PIPE BACK INTO EXISTING FORCEMAIN VIA TEMP FM CONNECTION (SEE DETAIL)

NORTHDALE BLVD.



EX. LIFT STATION - EX. SAN MH



LEGEND

PROPOSED	EXISTING	
		SANITARY SEWER
		FORCEMAIN (SAN.)
		STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE
		PUBLIC SANITARY SEWER
		PUBLIC WATERMAIN

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

UTILITY CONSTRUCTION NOTES

1. THE UTILITY IMPROVEMENTS FOR THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "STANDARD UTILITIES SPECIFICATIONS" AS PUBLISHED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA (CEAM), EXCEPT AS MODIFIED HEREIN. CONTRACTOR SHALL OBTAIN A COPY OF THESE SPECIFICATIONS.
   a. ALL UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIRMENTS, INCLUDING BUT NOT LIMITED TO CITY, DEPARTMENT OF LABOR AND INDUSTRY AND MINNESOTA DEPARTMENT OF HEALTH REQUIREMENTS.
   b. CONTRACTOR SHALL NOT OPEN, TURN OFF, INTERFERE WITH, OR ATTACH ANY PIPE OR HOSE TO OR TAP WATERMAIN BELONGING TO THE CITY UNLESS DULY AUTHORIZED TO DO SO BY THE CITY. ANY ADVERSE CONSEQUENCES OF ANY SCHEDULED OR UNSCHEDULED DISRUPTIONS OF SERVICE TO THE PUBLIC ARE THE LIABILITY OF CONTRACTOR.
   c. A MINIMUM VERTICAL SEPARATION OF 18 INCHES, AND HORIZONTAL SEPARATION OF 10-FEET, BETWEEN OUTSIDE PIPE AND/OR STRUCTURE WALLS, IS REQUIRED AT ALL WATERMAIN AND SEWER MAIN (STORM AND SANITARY) CROSSINGS.
2. ALL MATERIALS SHALL BE AS SPECIFIED IN CEAM SPECIFICATIONS EXCEPT AS MODIFIED HEREIN.
   a. ALL MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE CITY.
   b. ALL SANITARY SEWER TO BE PVC SDR-35, UNLESS NOTED OTHERWISE.
   i. ALL SANITARY SEWER SERVICES TO BUILDING SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   ii. ALL SANITARY SEWER WITHIN 10 FEET OF, CROSSING ABOVE, OR WITHIN 12-INCHES BELOW, A POTABLE WATER LINE SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   c. ALL WATERMAIN TO BE DUCTILE IRON - CLASS 52, or PVC C-900, UNLESS NOTED OTHERWISE.
   i. ALL WATERMAIN TO HAVE 7.5-FEET OF COVER OVER TOP OF WATERMAIN.
   ii. PROVIDE THRUST BLOCKING AND MECHANICAL JOINT RESTRAINTS ON ALL WATERMAIN JOINTS PER CITY STANDARDS.
   iii. WHERE A SEWER LINE CROSSES A WATER SERVICE, THE WATER SERVICE SHALL NOT CONTAIN ANY JOINTS OR CONNECTIONS WITHIN 10 FEET OF THE CROSSING.
   d. ALL STORM SEWER PIPE TO BE SMOOTH INTERIOR DUAL WALL HDPE PIPE WITH WATERTIGHT GASKETS, UNLESS NOTED OTHERWISE.
   i. ALL STORM SEWER CROSSING ABOVE, OR WITHIN 12-INCHES BELOW, A POTABLE WATER LINE SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   ii. ALL STORM SEWER PIPE FOR ROOF DRAIN SERVICES TO THE BUILDING, OR WITHIN 10' OF A BUILDING, SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR USE WITHIN A BUILDING (SEE TABLE 701.2 OF 2020 MN PLUMBING CODE).
   e. RIP RAP SHALL BE Mn/DOT CLASS 3.
3. COORDINATE ALL BUILDING SERVICE CONNECTION LOCATIONS AND INVERT ELEVATIONS WITH MECHANICAL CONTRACTOR PRIOR TO CONSTRUCTION.
4. ALL BUILDING SERVICE CONNECTIONS (STORM, SANITARY, WATER) WITH FIVE FEET OR LESS COVER ARE TO BE INSULATED FROM BUILDING TO POINT WHERE 5-FEET OF COVER IS ACHIEVED.
5. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
6. SAFETY NOTICE TO CONTRACTORS: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE DUTY OF THE ENGINEER OR THE DEVELOPER TO CONDUCT CONSTRUCTION REVIEW OF CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE.
7. ALL AREAS OUTSIDE THE PROPERTY BOUNDARIES THAT ARE DISTURBED BY UTILITY CONSTRUCTION SHALL BE RESTORED IN KIND. SODDED AREAS SHALL BE RESTORED WITH 6 INCHES OF TOPSOIL PLACED BENEATH THE SOD.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING SIGNS, DIRECTIONAL SIGNS, FLAGMEN AND LIGHTS TO CONTROL THE MOVEMENT OF TRAFFIC WHERE NECESSARY. TRAFFIC CONTROL DEVICES SHALL CONFORM TO APPROPRIATE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARDS.
9. ALL SOILS TESTING SHALL BE COMPLETED BY AN INDEPENDENT SOILS ENGINEER. EXCAVATION FOR THE PURPOSE OF REMOVING UNSTABLE OR UNSUITABLE SOILS SHALL BE COMPLETED AS REQUIRED BY THE SOILS ENGINEER. THE UTILITY BACKFILL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE SOILS ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED SOILS TESTS AND SOIL INSPECTIONS WITH THE SOILS ENGINEER. A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY:COMPANY:
   ADDRESS:
   PHONE:
   DATED:
   CONTRACTOR SHALL OBTAIN A COPY OF THIS SOILS REPORT.
10. CONTRACTOR SHALL SUBMIT 2 COPIES OF SHOP DRAWINGS FOR MANHOLE AND CATCH BASIN STRUCTURES TO _____. CONTRACTOR SHALL ALLOW 5 WORKING DAYS FOR SHOP DRAWING REVIEW.
11. CONTRACTOR AND MATERIAL SUPPLIER SHALL DETERMINE THE MINIMUM DIAMETER REQUIRED FOR EACH STORM SEWER STRUCTURE.
12. THE UTILITY DESIGN DOES NOT INCLUDE WATERMAIN ELEVATIONS. THE CONTRACTOR SHALL INSTALL WATERMAIN AT DEPTHS REQUIRED BY APPLICABLE AGENCIES AND SHALL DETERMINE LOCATIONS OF CONFLICTS WITH OTHER UTILITIES AND INCLUDE THE REQUIRED EFFORTS TO AVOID CONFLICTS (BENDS, MATERIAL CHANGES, ETC.) IN THEIR BIDS.
13. CONTRACTOR SHALL PROVIDE RECORD PLANS AS REQUIRED BY PERMITTING AGENCIES.

NORTH

0 50 100
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

NORTHDALE BLVD. EXISTING UTILITIES

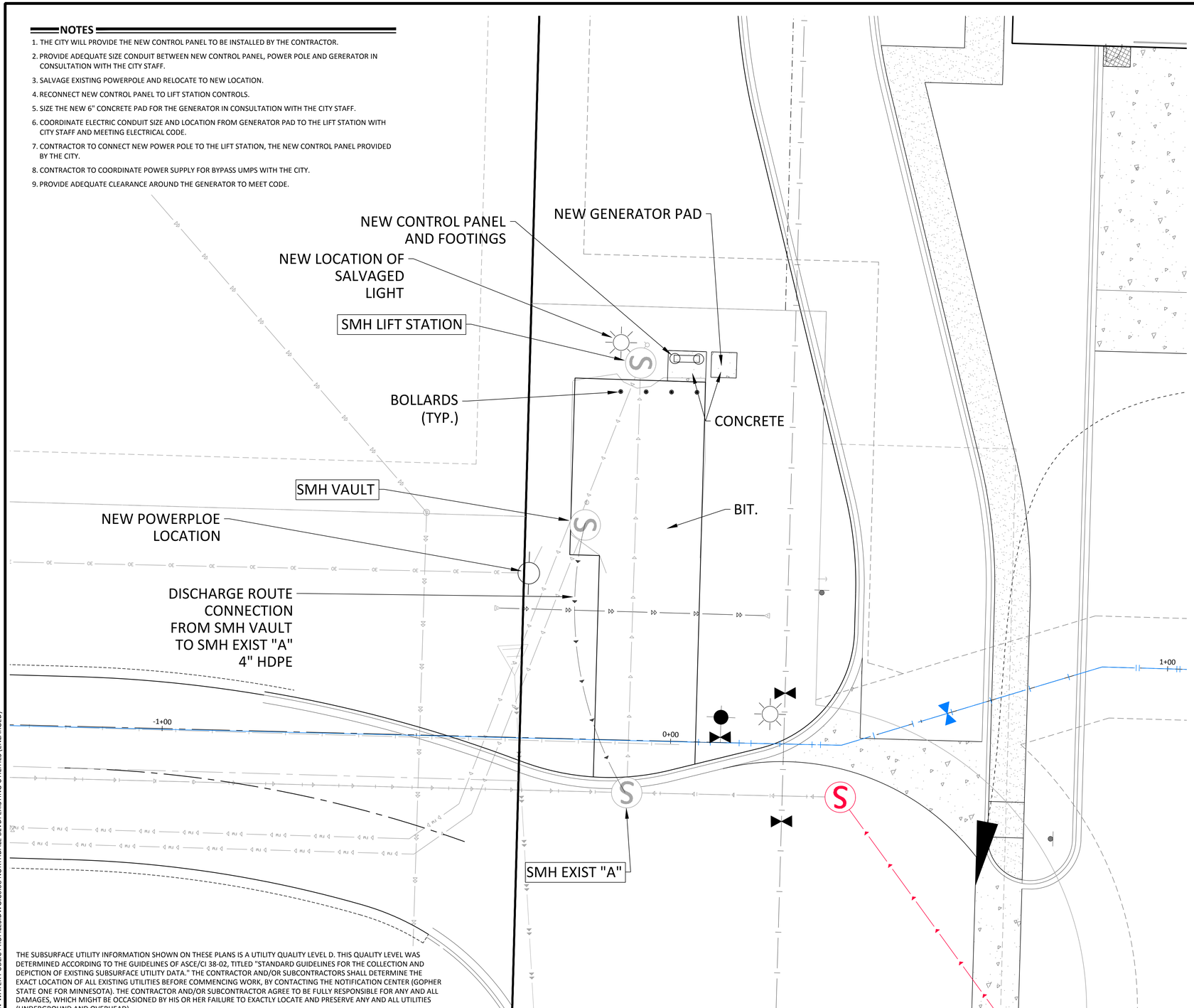
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C6.07
24 OF 45
REV. ##

24.1S (LWS TECH) | THOMAS KEELEY | 4/4/2025 2:09:41 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C6.04-SAN-WATER PUBLIC PROFILES.DWG;C6.07 NORTHDALE BLVD. EXISTING UTILITIES

NOTES

1. THE CITY WILL PROVIDE THE NEW CONTROL PANEL TO BE INSTALLED BY THE CONTRACTOR.
2. PROVIDE ADEQUATE SIZE CONDUIT BETWEEN NEW CONTROL PANEL, POWER POLE AND GERERATOR IN CONSULTATION WITH THE CITY STAFF.
3. SALVAGE EXISTING POWERPOLE AND RELOCATE TO NEW LOCATION.
4. RECONNECT NEW CONTROL PANEL TO LIFT STATION CONTROLS.
5. SIZE THE NEW 6" CONCRETE PAD FOR THE GENERATOR IN CONSULTATION WITH THE CITY STAFF.
6. COORDINATE ELECTRIC CONDUIT SIZE AND LOCATION FROM GENERATOR PAD TO THE LIFT STATION WITH CITY STAFF AND MEETING ELECTRICAL CODE.
7. CONTRACTOR TO CONNECT NEW POWER POLE TO THE LIFT STATION, THE NEW CONTROL PANEL PROVIDED BY THE CITY.
8. CONTRACTOR TO COORDINATE POWER SUPPLY FOR BYPASS UMPS WITH THE CITY.
9. PROVIDE ADEQUATE CLEARANCE AROUND THE GENERATOR TO MEET CODE.



THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

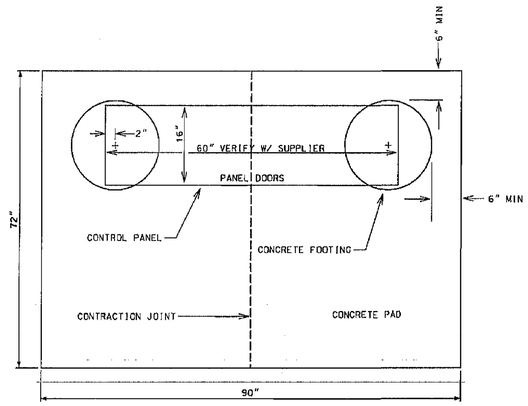
LEGEND

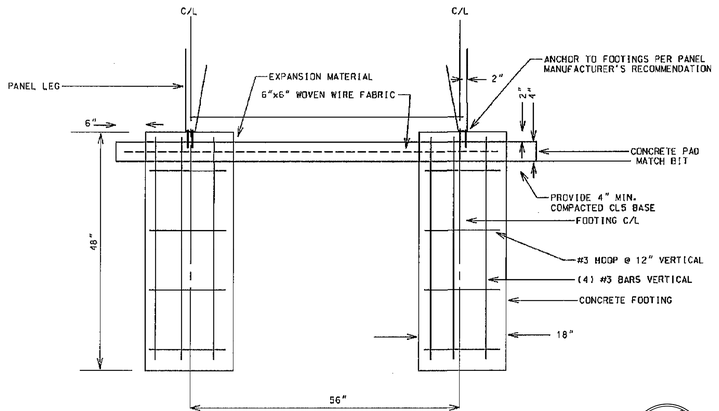
PROPOSED	EXISTING	
		SANITARY SEWER
		FORCEMAIN (SAN.)
		STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE
		PUBLIC SANITARY SEWER
		PUBLIC WATERMAIN
		STANDARD DUTY ASPHALT PAVING
		CONCRETE PAVING

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

SMH EXIST "A" NOTES

1. TEMP PLUG THE EXISTING NORTH AND WEST INVERTS OF SMH EXIST "A".
2. PROVIDE TWO 150 GPM SUBMERSIBLE PUMPS WITH 5 HP MOTORS HOUSED IN SMH EXIST "A" TO PUMP SEWAGE TO VAULT MH 4" CONNECTION.
3. ROUTE 4" HDPE DISCHARGE PIPE BACK INTO EXISTING FORCEMAIN VIA TEMP FM CONNECTION (SEE DETAIL)





PANEL FOOTING DETAIL
NTS

NORTH
0 10 20
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

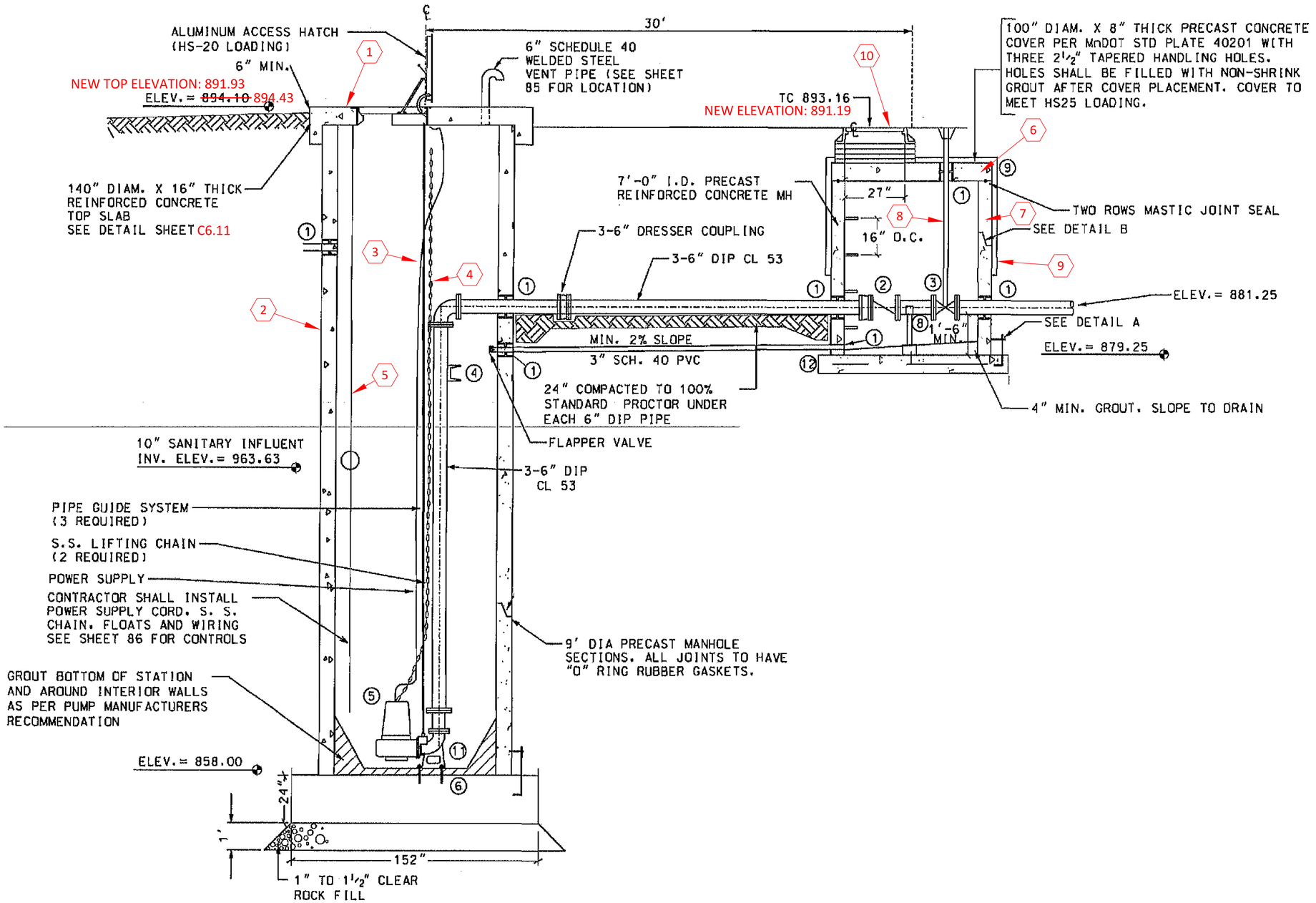
NORTHDALE BLVD. EXISTING UTILITIES (ENLARGED)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C6.08
25 OF 45
REV. ##

© 2021 Sambatek

24.15 (LMS TECH) | THOMAS.KEELEY | 4/4/2025 2:09:41 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C6.04-SMH WATER PUBLIC PROFILES.DWG



EXIST. SANITARY LIFT STATION

SCALE: NONE

KEY NOTES

1. REMOVE AND SALVAGE AND REINSTALL REINFORCED CONCRETE TOP SLAB.
2. REMOVE TOP 30" SECTION OF THE LIFT STATION.
3. CUT GUIDE RAILS TO MATCH THE LOWER ELEVATIONS OF THE LIFT STATION. REATTACH THE GUIDE RAILS TO THE TOP SLAB AS OF PRESENT.
4. REMOVE PART OF STAINLESS STEEL CHAIN TO MATCH SHALLOWER LIFT STATION DEPTH AND REATTACH CABLE OR CHAIN TO WET WELL STRUCTURE OR TO CABLE RACK MODIFICATIONS .
5. REMOVE PART OF POWER SUPPLY CABLE TO MATCH SHALLOWER LIFT STATION DEPTH.
6. REMOVE AND REINSTALL 8" THICK PRECAST COVER.
7. REMOVE SECTION OF 7'0" ID PRECAST REINFORCED CONCRETE MH AND ADJUSTMENT RING TO MATCH NEW ELEVATION.
8. CUT STATIONARY ROD TO MATCH NEW ELEVATIONS.
9. 2" POLYSTYRENE INSULATION ON TOP AND EXTENDING 4' DOWN FROM MH TOP
10. RE-USE NEENAH R-1785E CASTING.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

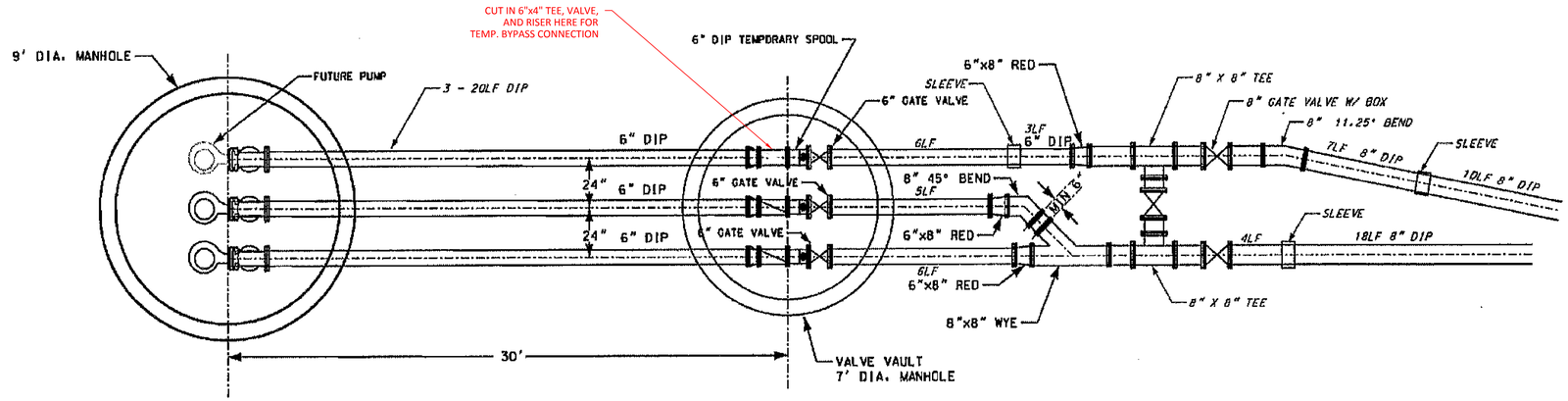
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

LIFT STATION

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C6.09
24 OF 45
REV. ##

24:15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:41 PM
J:\PROJECTS\51493\CAD\SHEETS\51493_C6.04-SAN-WATER-PUBLIC PROFILES.DWG C6.09 LIFT STATION

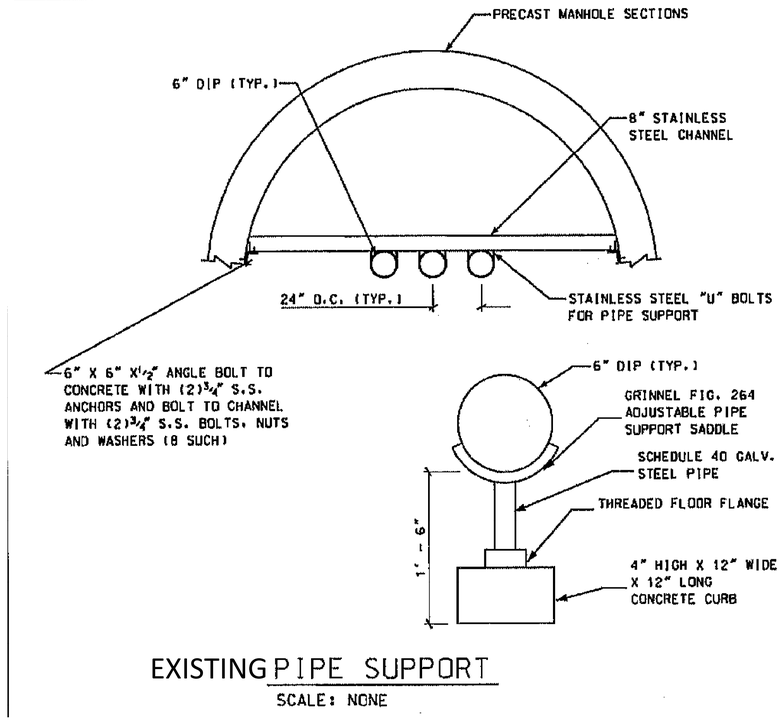


NOTE: ALL DISCHARGE DIP PIPE SHALL BE CLASS 53

BYPASS PLAN

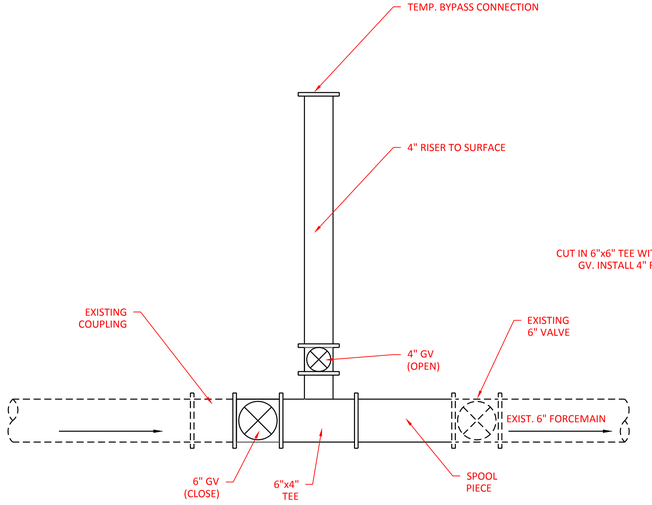
ALL PIPE JOINTS RESTRAINED - MEGALUG OR APPROVED EQUAL

EXISTING FOR REFERENCE



EXISTING PIPE SUPPORT

SCALE: NONE



BYPASS CONNECTION

NTS

PICTURE OF VALVE MH



NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

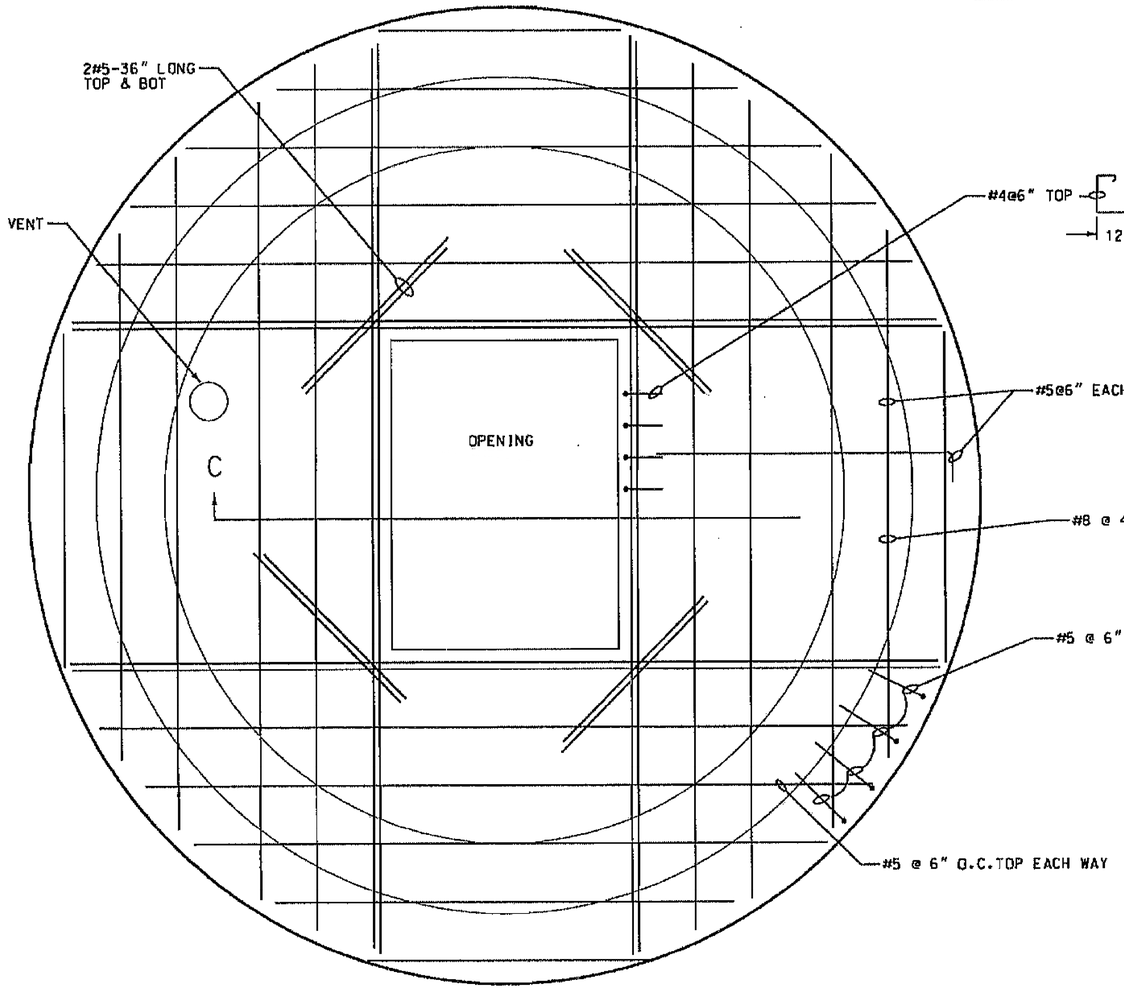
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

LIFT STATION

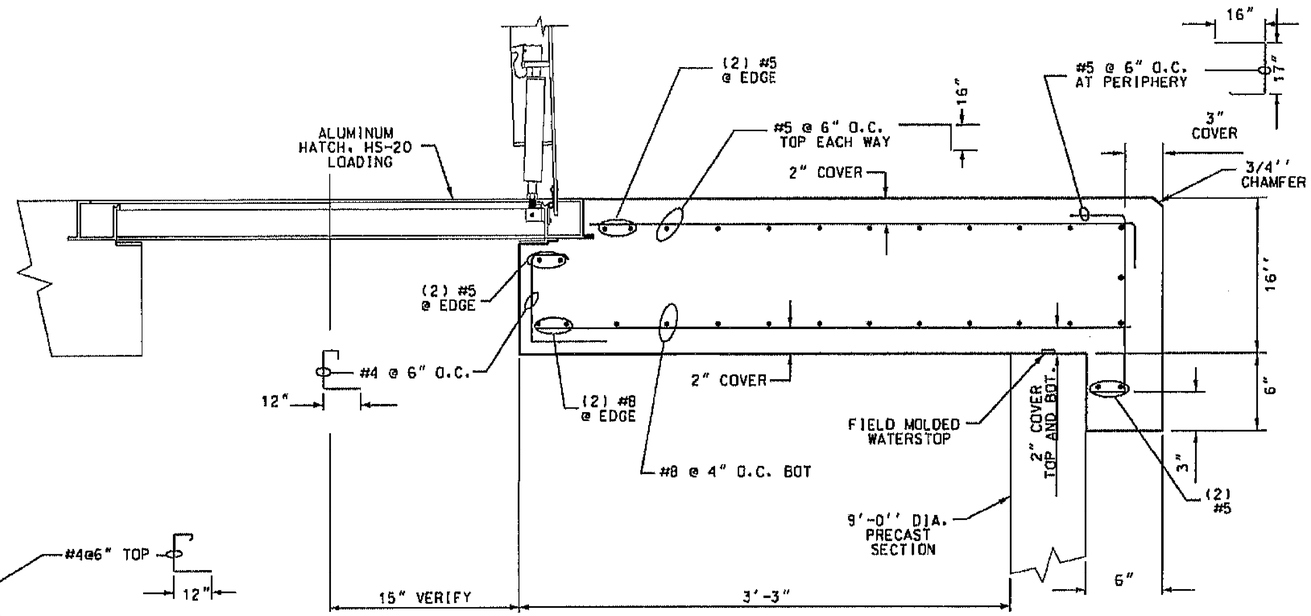
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C6.10
25 OF 45
REV. ##

24-15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:41 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C6.04-SAN-WATER PUBLIC PROFILES.DWG\C6.10 LIFT STATION



EXISTING
TOP SLAB
SCALE: 1½"=1'-0"



DETAIL C
NO SCALE

NOTES

1. THE APPROXIMATE WEIGHT OF THE TOP SLAB COVER IS 42 TONS.
2. REMOVE, SALVAGE, AND REINSTALL THE EXISTING TOP SLAB.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

LIFT STATION TOP SLAB DETAILS

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

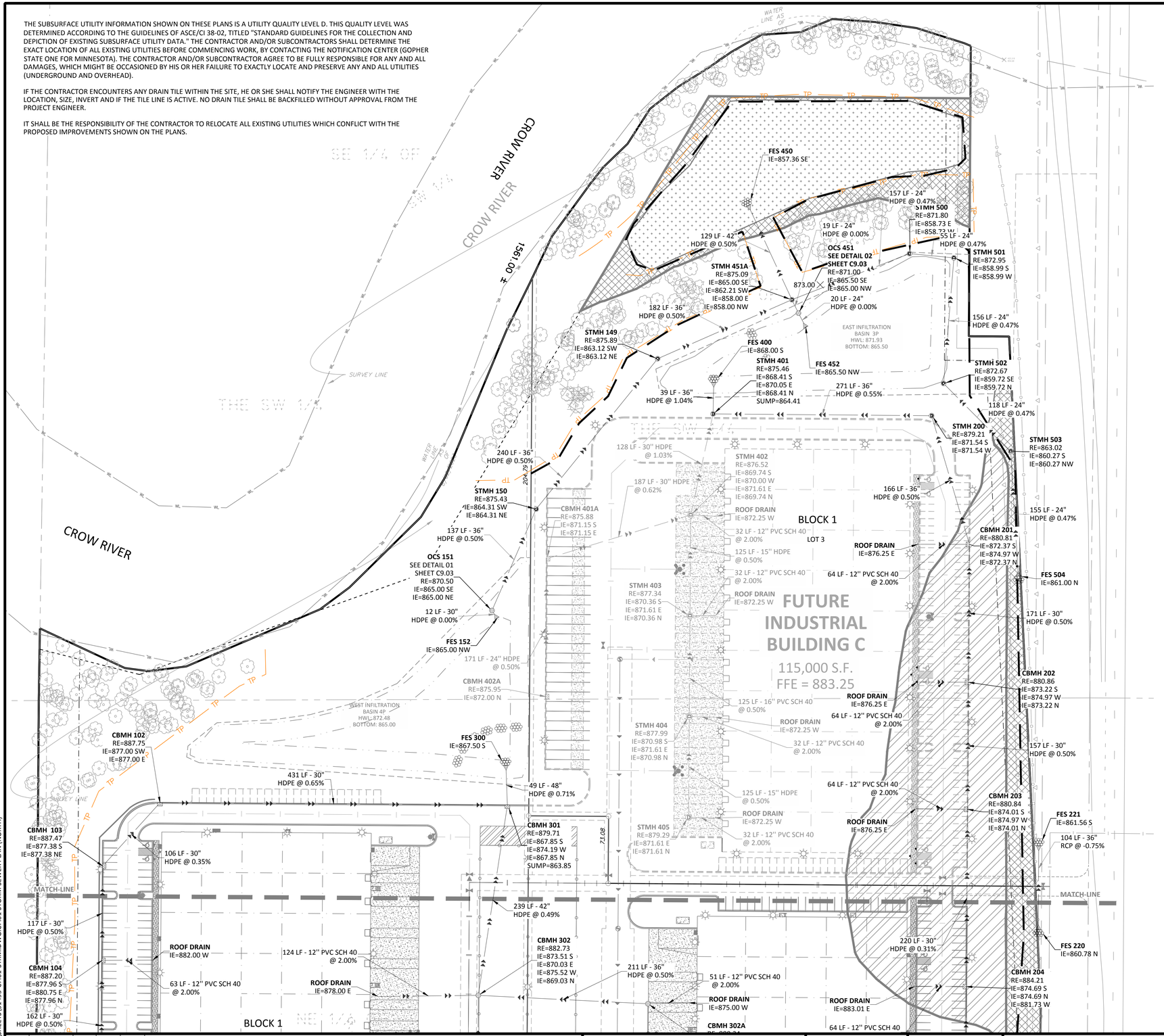
SHEET
C6.11
26 OF 45
REV. ##

24:15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:41 PM
J:\PROJECTS\51493\CAD\SHEETS\51493_C6.04-SAN-WATER PUBLIC PROFILES.DWG,C6.11 LIFT STATION TOP SLAB DETAILS

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



LEGEND

PROPOSED	EXISTING	
CO ▸ S	CO ▸ S	SANITARY SEWER
LS FM ▸ S	LS FM ▸ S	FORCEMAIN (SAN.)
D ▸▸	D ▸▸	STORM SEWER
▸▸▸	▸▸▸	DRAINTILE
⋈ | ●	⋈ | ◇	WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

UTILITY CONSTRUCTION NOTES

SEE SHEET C6.01, OVERALL UTILITY PLAN

STORM SEWER STRUCTURE SCHEDULE

NUMBER	TYPE	CASTING*
102	CATCH BASIN MANHOLE	R-3067-VB
103	CATCH BASIN MANHOLE	R-3067-VB
104	CATCH BASIN MANHOLE	R-3067-VB
105	CATCH BASIN MANHOLE	R-3067-VB
106	CATCH BASIN MANHOLE	R-3067-VB
107	CATCH BASIN MANHOLE	R-3067-VB
108	CATCH BASIN MANHOLE	R-3067-VB
109	STORM MANHOLE	R-1642
110	CATCH BASIN MANHOLE	R-3067-VB
111	CATCH BASIN	R-3067-VB
300	FLARED END SECTION	
301	CATCH BASIN MANHOLE	R-3067-VB
302	CATCH BASIN MANHOLE	R-2557
303	CATCH BASIN MANHOLE	R-2557
304	CATCH BASIN MANHOLE	R-2557
305	CATCH BASIN MANHOLE	R-2557
302A	CATCH BASIN MANHOLE	R-2557
303A	CATCH BASIN MANHOLE	R-2557
304A	CATCH BASIN MANHOLE	R-2557
305A	CATCH BASIN MANHOLE	R-2557
305B	CATCH BASIN MANHOLE	R-2557
200	STORM MANHOLE	R-1642
201	CATCH BASIN MANHOLE	R-3067-VB
202	CATCH BASIN MANHOLE	R-3067-VB
203	CATCH BASIN MANHOLE	R-3067-VB
204	CATCH BASIN MANHOLE	R-3067-VB
205	CATCH BASIN MANHOLE	R-3067-VB
206	CATCH BASIN MANHOLE	R-3067-VB
207	CATCH BASIN MANHOLE	R-3067-VB
208	CATCH BASIN MANHOLE	R-3067-VB
400	FLARED END SECTION	
401	STORM MANHOLE	R-1642
500	STORM MANHOLE	R-1642
501	STORM MANHOLE	R-1642
502	STORM MANHOLE	R-1642
503	STORM MANHOLE	R-1642
504	FLARED END SECTION	
149	STORM MANHOLE	R-1642
150	STORM MANHOLE	R-1642
151	OUTLET CONTROL STRUCTURE	GRATE
152	FLARED END SECTION	
450	FLARED END SECTION	
451A	STORM MANHOLE	R-1642
451	OUTLET CONTROL STRUCTURE	GRATE
221	FLARED END SECTION	
220	FLARED END SECTION	
89	FLARED END SECTION	
90	FLARED END SECTION	

*INDICATES NEENAH FOUNDRY CASTING NO., OR APPROVED EQUAL

NOTE: CONTRACTOR AND THEIR SUPPLIER SHALL DETERMINE THE MINIMUM DIAMETER REQUIRED FOR EACH STORM SEWER STRUCTURE.

NORTH

0 60 120

SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

STORM SEWER PLAN (NORTH)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

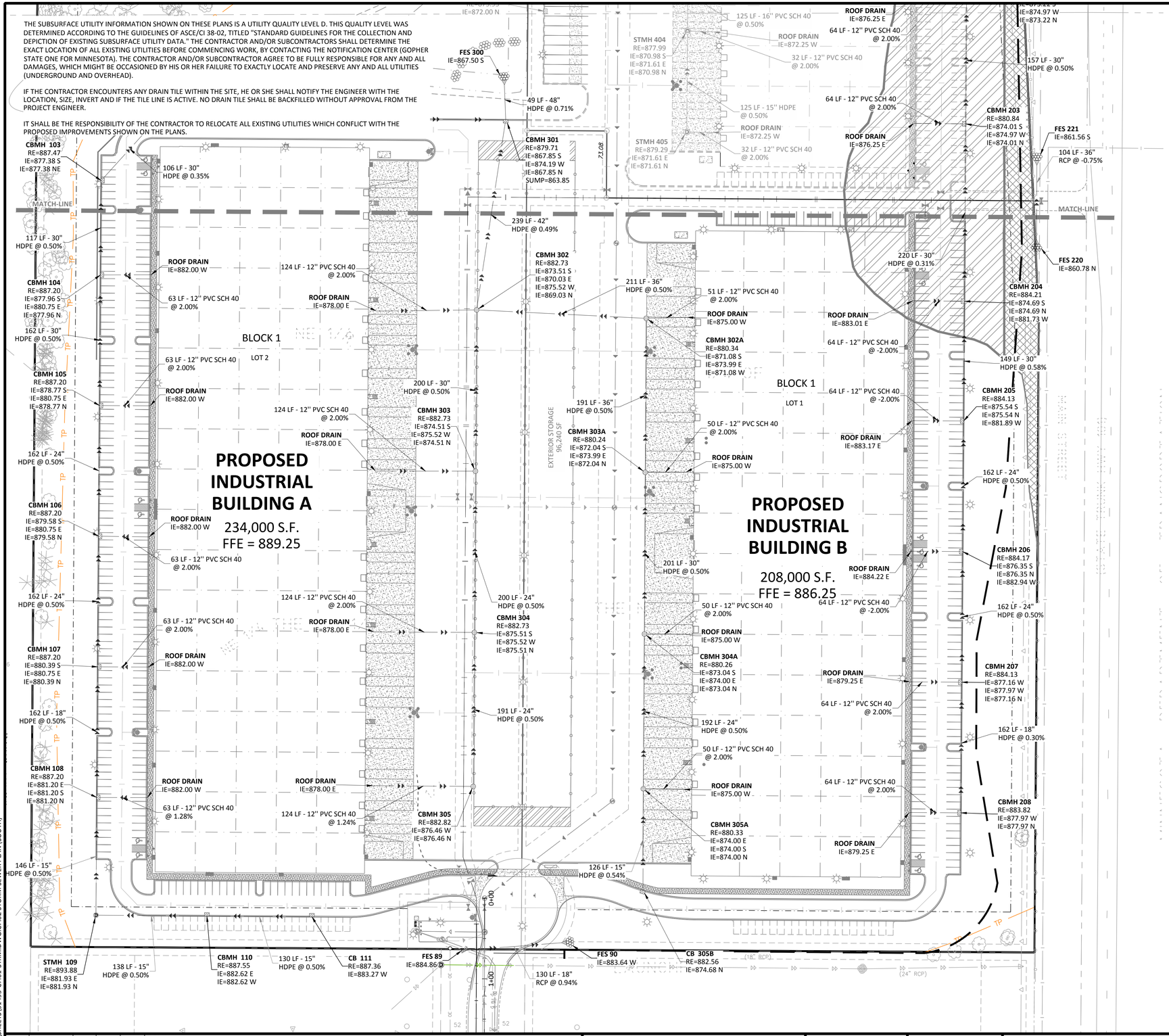
SHEET
C7.01
29 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:26 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C7.01STRMDWG C7.01 STORM SEWER PLAN (NORTH)

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IF THE CONTRACTOR ENCOUNTERS ANY DRAIN TILE WITHIN THE SITE, HE OR SHE SHALL NOTIFY THE ENGINEER WITH THE LOCATION, SIZE, INVERT AND IF THE TILE LINE IS ACTIVE. NO DRAIN TILE SHALL BE BACKFILLED WITHOUT APPROVAL FROM THE PROJECT ENGINEER.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



LEGEND

PROPOSED	EXISTING	
		SANITARY SEWER
		FORCEMAIN (SAN.)
		STORM SEWER
		DRAINTILE
		WATERMAIN
GL	GL	UNDERGROUND GAS LINE
UT	UT	UNDERGROUND TELEPHONE
UE	UE	UNDERGROUND ELECTRIC
		CONCRETE CURB
		EASEMENT LINE

NOTE: TO MAINTAIN SANITARY SEWER DEPTHS AND AVOID ADDITIONAL SANITARY LIFT STATION AND FORCEMAIN, SANITARY SEWER WILL NEED TO BE PLACED IN PUBLIC DRAINAGE AND UTILITY EASEMENT PER CITY STANDARDS; OWNED AND MAINTAINED BY THE CITY OF ROGERS.

UTILITY CONSTRUCTION NOTES

SEE SHEET C6.01, OVERALL UTILITY SHEET

MNDLI STORMWATER BMP ELEVATIONS

BMP	*MAXIMUM INLET ELEVATION	PROPOSED INLET ELEVATION
INFILTRATION BASIN 3P	868.00	868.00
INFILTRATION BASIN 4P	867.50	868.50
*MAXIMUM ALLOWABLE OUTLET ELEVATION BASED ON MPCA DESIGN CRITERIA		

NORTH

0 60 120
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY TPK
DESIGNED BY JDB
CHECKED BY JDB
PROJECT NO. 51493

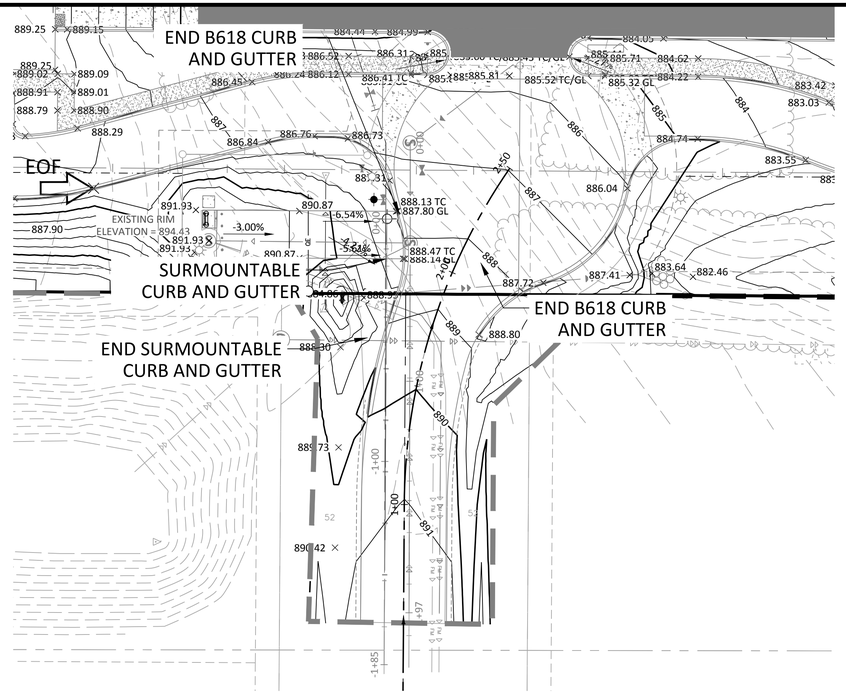
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

STORM SEWER PLAN (SOUTH)

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C7.02
30 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:26 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C7.01 STRM.DWG C7.02 STORM SEWER PLAN (SOUTH)



NORTHDALE BLVD - 1"=30'

LEGEND

PROPOSED	EXISTING	
		BOUNDARY LINE
		CONCRETE CURB
		STORM SEWER
		DRAINTILE
		BUILDING LINE
		RETAINING WALL
902	902	CONTOUR
	WL	WETLAND
		TREE LINE
902.50	902.50	SPOT ELEVATIONS
		RIPRAP
EOF 902.50		OVERFLOW ELEV.
	ST # 999.9	SOIL BORING

CONCRETE PAVING

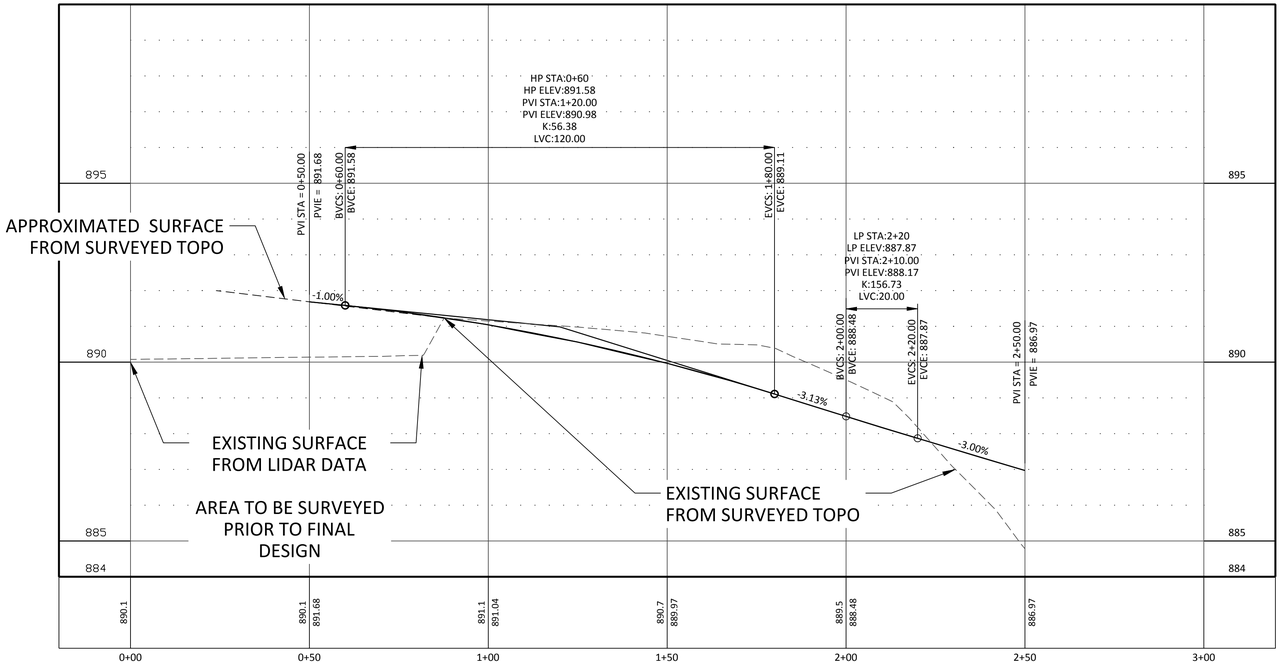
CONCRETE SIDEWALK

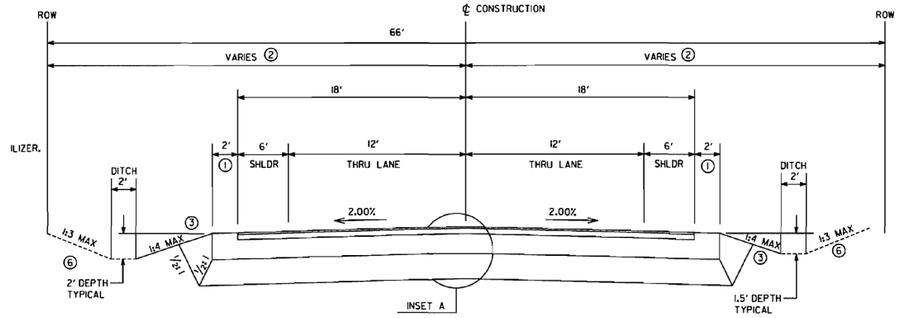
PAVEMENT BY OTHERS (SEE ARCHITECTURAL PLANS)

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

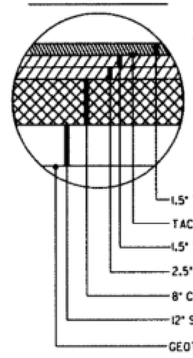
Northdale Blvd





TYPICAL SECTION
NORTHDALE BOULEVARD

INSET A



KEY NOTES

1. 12" CLASS 5 SHOULDER
2. SEE STREET PLANS FOR ACTUAL DIMENSIONS
3. MINIMUM 4" TOPSOIL, SEED, MULCH & FERTILIZER ON ALL DISTURBED AREAS UNLESS NOTED OTHERWISE.
4. 4" CONCRETE MEDIAN
5. SALVAGED AGGREGATE WILL BE USED IN LIEU OF CLASS V MODIFIED ON JAMES ROAD, 147TH AVENUE AND ALL DRIVEWAYS.
6. ALL DITCH BOTTOMS AND ALL SLOPES GREATER THAN 1:4 SHALL BE RESTORED USING MIN 6" TOPSOIL, SEED, WOOD FIBER BLANKET, AND FERTILIZER.

1.5" TYPE LV4 WEARING COURSE (LVWE45035B)
TACK COAT
1.5" TYPE LV3 NON WEARING COURSE (LVNW35035B)
2.5" TYPE LV3 NON WEARING COURSE (LVNW35035B)
8" CLASS V AGGREGATE BASE - MODIFIED ⑤
12" SELECT GRANULAR MATERIAL
GEOTEXTILE FABRIC TYPE V

NORTH
0 60 120
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

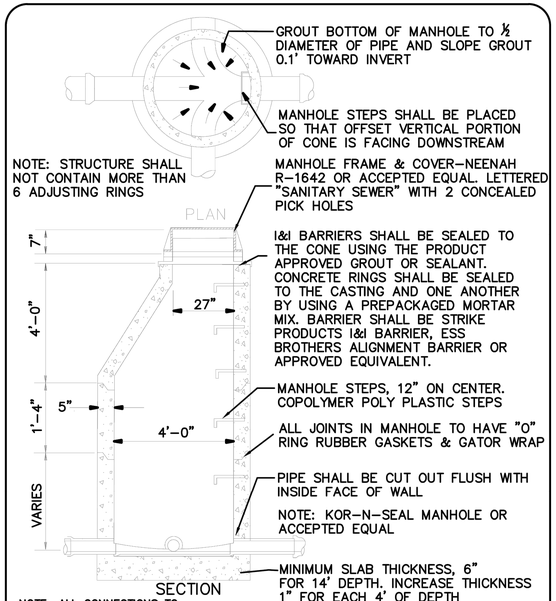
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

NORTHDALE BLVD

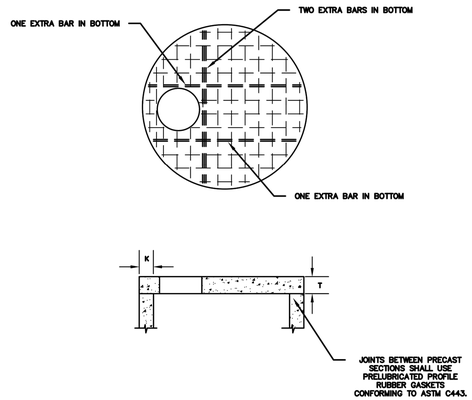
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C8.01
31 OF 45
REV.

24-15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:03 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C8.01 STRT.DWG C8.01 NORTHDALE BLVD



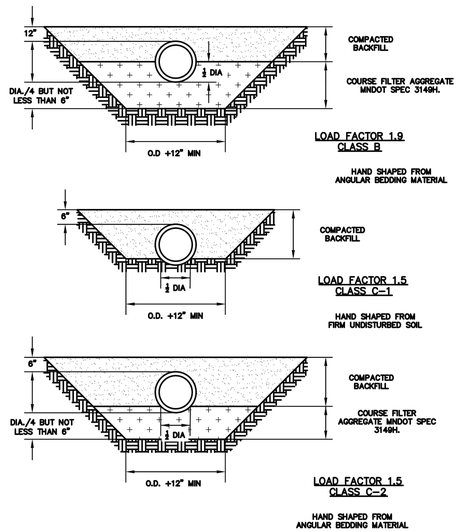
CITY OF ROGERS	STANDARD SANITARY MANHOLE	Standard Details	Date: SEPTEMBER, 2020	Revised:	SAN–4



COVER REQUIREMENTS				
COVER DIAMETER	T	K	BOTTOM BARS	TOP BARS
59"	6"	6"	NO. 5 – 6"	X
65"	6"	6"	NO. 5 – 6"	X
72"	6"	7"	NO. 5 – 4"	NO. 5 – 8"
78"	6"	7"	NO. 5 – 4"	NO. 5 – 8"
85"	6"	8"	NO. 5 – 4"	NO. 5 – 8"
93"	6"	8"	NO. 5 – 4"	NO. 5 – 4"
100"	6"	8"	NO. 5 – 4"	NO. 5 – 4"
106"	6"	8"	NO. 5 – 4"	NO. 5 – 4"
113"	6"	8"	NO. 5 – 4"	NO. 5 – 4"
119"	6"	8"	NO. 5 – 4"	NO. 5 – 4"

1" MINIMUM COVER ON REBAR

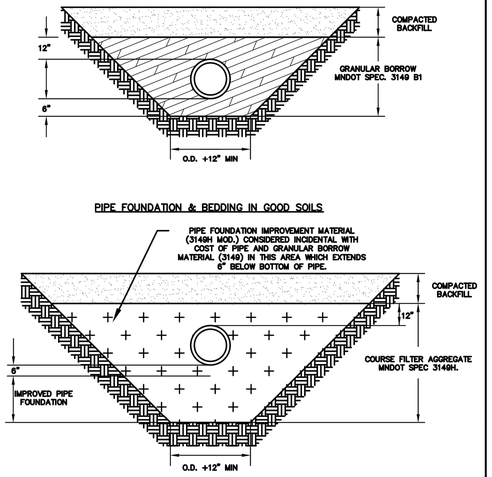
CITY OF ROGERS	MANHOLE TOP SLAB	Standard Details	Date: SEPTEMBER, 2020	Revised:	SAN–8



NOTES:

"DIA" DENOTES OUTSIDE DIAMETER OF PIPE

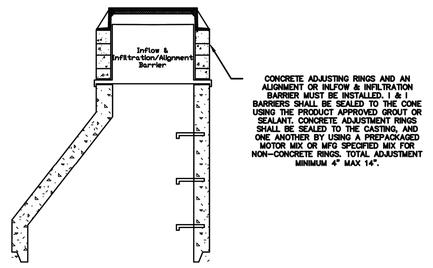
CITY OF ROGERS	PIPE BEDDING METHODS FOR RCP OR DIP	Standard Details	Date: SEPTEMBER, 2020	Revised:	SAN–11

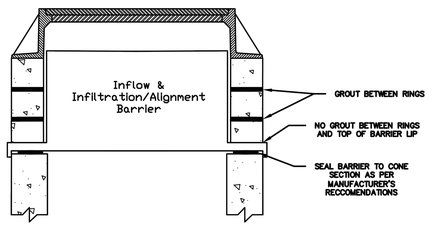


CITY OF ROGERS	PIPE BEDDING METHODS FOR PVC	Standard Details	Date: SEPTEMBER, 2020	Revised:	SAN–12

Notes

Barrier shall be Strike Products I&I Barrier, Ess Brothers Alignment Barrier or approved equivalent.





CITY OF ROGERS	PIPE TO NEW MANHOLE CONNECTION	Standard Details	Date: SEPTEMBER, 2020	Revised:	SAN–14

VALVE REQUIRED EVERY 600' ON LATERALS
VALVE REQUIRED EVERY 1000' ON TRUNKS
VALVE REQUIRED ON EVERY SERVICE

BITUMASTIC ANTI–CORROSIVE COATING REQUIRED ON ALL BARE METALS (AEROSOL SPRAY IS NOT ACCEPTABLE)

ALL MECHANICAL JOINT BOLTS SHALL BE COR–BLUE

7.5' MINIMUM COVER REQUIRED OVER TOP OF WATER MAIN

"MEGALUG" JOINT RESTRAINTS OR ACCEPTED EQUAL REQUIRED FROM VALVE TO TEE

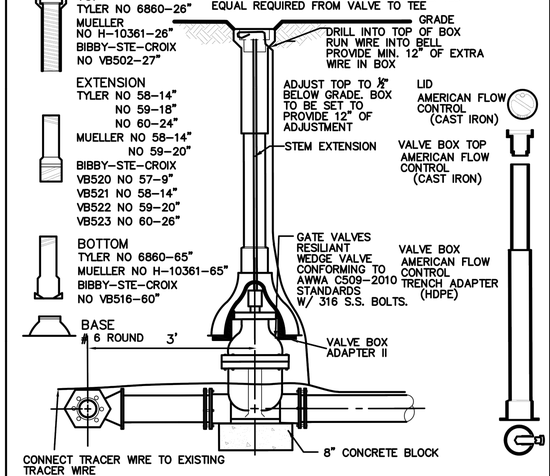
DROP LID
TYLER NO 6860
MUELLER NO H–10361
BIBBY–STE–CROIX NO B–5160

TOP
TYLER NO 6860–26"
MUELLER NO H–10361–26"
BIBBY–STE–CROIX NO VB502–27"

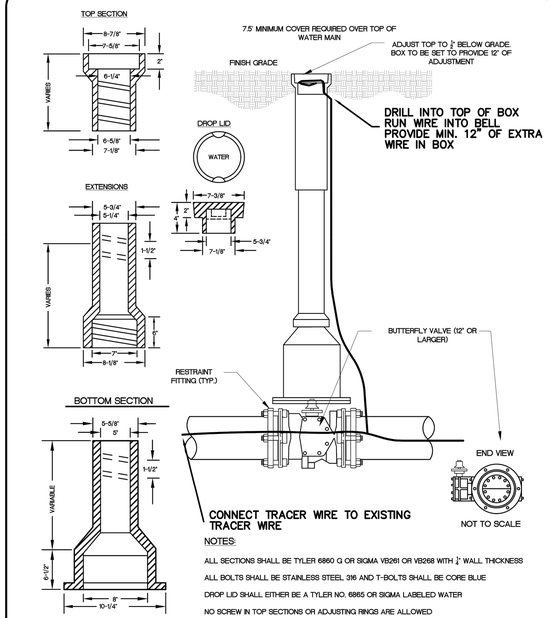
EXTENSION
TYLER NO 58–14"
NO 59–18"
NO 60–24"
MUELLER NO 58–14"
NO 59–20"
BIBBY–STE–CROIX
VB520 NO 57–9"
VB521 NO 58–14"
VB522 NO 59–20"
VB523 NO 60–26"

BOTTOM
TYLER NO 6860–65"
MUELLER NO H–10361–65"
BIBBY–STE–CROIX NO VB516–60"

BASE
6 ROUND 3'



CITY OF ROGERS	GATE VALVE AND BOX INSTALLATION	Standard Details	Date: SEPTEMBER, 2020	Revised:	WAT–01



NOTES:

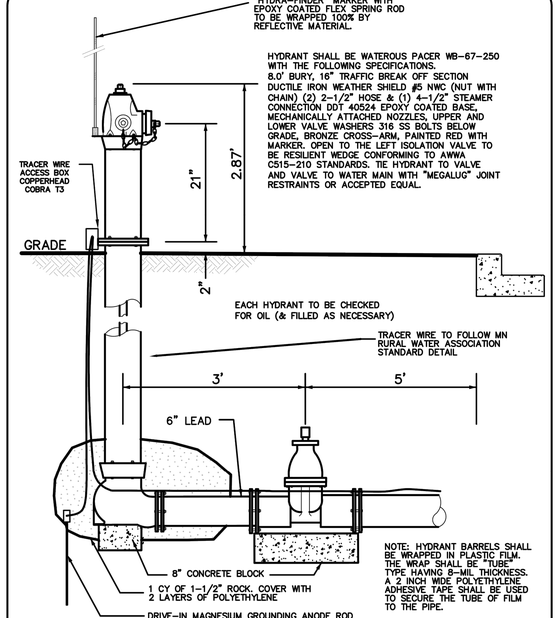
ALL SECTIONS SHALL BE TYLER 6860 Q OR SIGMA VB261 OR VB268 WITH ¼" WALL THICKNESS

ALL BOLTS SHALL BE STAINLESS STEEL 316 AND T–BOLTS SHALL BE CORE BLUE

DROP LID SHALL EITHER BE A TYLER NO. 6865 OR SIGMA LABELED WATER

NO SCREW IN TOP SECTIONS OR ADJUSTING RINGS ARE ALLOWED

CITY OF ROGERS	BUTTERFLY VALVE AND BOX INSTALLATION	Standard Details	Date: SEPTEMBER, 2020	Revised:	WAT–02



CITY OF ROGERS	GATE VALVE AND HYDRANT INSTALLATION	Standard Details	Date: SEPTEMBER, 2020	Revised:	WAT–03

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C9.01-DTLS.DWG C9.01 DETAILS

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

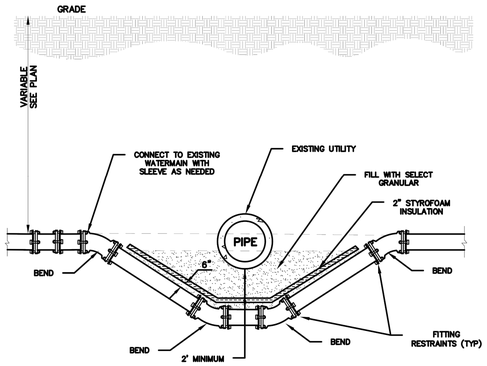
PRELIMINARY 08/07/2024	DRAWN BY TPK
DESIGN REVIEW 11/14/2024	DESIGNED BY JDB
PERMIT SUBMITTAL 03/28/2025	CHECKED BY JDB
CONSTRUCTION DOCUMENTS	PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

DETAILS

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C9.01
32 OF 45
REV.



NOTES:

PREFERRED METHOD OF OFFSET WATERMAIN IS OVER DEPTH EXCAVATION.

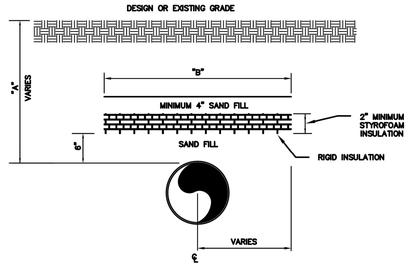
PLACE 6" COMPACTED SAND BELOW INSULATION

SEE STANDARD PLATE WAT-9 & WAT-10 TO DETERMINE THE REQUIRED RESTRAINT REQUIREMENTS ALL NUTS AND BOLTS TO BE 316 STAINLESS STEEL.

MAINTAIN A 2.0' MINIMUM CLEAR ZONE SEPARATION BETWEEN CONFLICTING UTILITIES

ON NEW WATERMAIN DIVE WATERMAIN UNDER CONFLICTING PIPE

CITY OF ROGERS	OFFSET WATERMAIN	Standard Details	Date: SEPTEMBER, 2020	Revised:	WAT-07



NOTES:

PIPE SHALL BE CENTERED UNDER INSULATION UNLESS OTHERWISE SPECIFIED

COVER OVER PIPE - "A"	WIDTH OF INSULATION BOARD - "B"
2'	12'
3'	10'
4'	8'
5'	6'
6'	4'

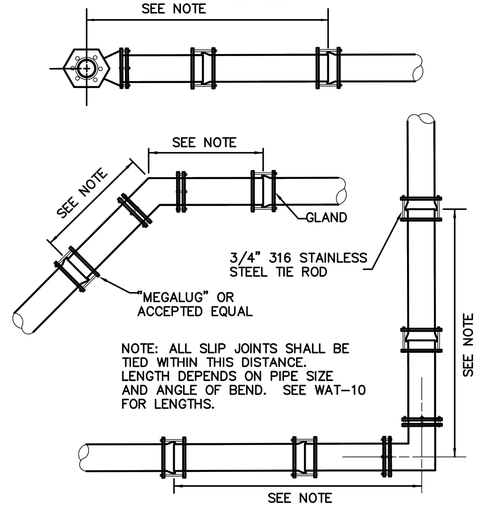
2" OF INSULATION = 2' OF COVER

CITY OF ROGERS	INSULATION DETAIL	Standard Details	Date: SEPTEMBER, 2020	Revised:	WAT-08

BITUMASTIC ANTI-CORROSIVE COATING REQUIRED ON ALL BARE METALS (AEROSOL SPRAY IS NOT ACCEPTABLE)

ALL GLANDS USED FOR JOINT RESTRAINT SHALL BE EPOXY COATED.

ALL MECHANICAL JOINT BOLTS SHALL BE COR BLUE.



CITY OF ROGERS	WATERMAIN TYING DETAIL	Standard Details	Date: SEPTEMBER, 2020	Revised:	WAT-09

TRACER WIRE

TRACER WIRE SHALL BE COPPERHEAD #12 AWG CCS COMPLYING WITH ASTM-D-1248, 30 VOLT RATING GREEN FOR SEWER SERVICES AND FORCEMAIN AND BLUE FOR WATER MAIN
- #1230HS HIGH STRENGTH FOR OPEN CUT
- #1245EHS EXTRA HIGH STRENGTH FOR HORIZONTAL DIRECTIONAL DRILLING AND JACK/BORING
- SPLICING 2 WIRES, DRYCONN KING 6 BLUE
- SPLICING 3 OR MORE, DRYCONN DIRECT BURY LUG YELLOW
- WIRE SPLICING WILL BE ALLOWED WHEN APPROVED ONLY

ALL NEW TRACER WIRE INSTALLATIONS SHALL BE LOCATED USING TYPICAL LOW FREQUENCY (512 HZ) LINE TRACING EQUIPMENT, WITNESSED BY THE CONTRACTOR, ENGINEER AND FACILITY OWNER AS APPLICABLE, PRIOR TO ACCEPTANCE OF OWNERSHIP.

POLYVINYL CHLORIDE PIPE (PVC) - C900

PVC WATER DISTRIBUTION PIPE AND JOINTS SHALL CONFORM TO:
AWWA C-900 (DR)
ASTM D3139

NOTE: TRACER WIRE ACCESSES SHALL NOT EXCEED 500-FT

DUCTILE IRON PIPE

DIP WATER DISTRIBUTION PIPE SHALL BE PRESSURE CLASS 350 AWWA C150/151.

PLASTIC FILM WRAP FOR DIP

WATER DISTRIBUTION PIPE, RISER PIPE, AND HYDRANT BARRELS SHALL BE WRAPPED IN PLASTIC FILM. THE WRAP SHALL BE "TUBE" TYPE HAVING 8-MIL THICKNESS. A 2 INCH WIDE POLYETHYLENE ADHESIVE TAPE SHALL BE USED TO SECURE THE TUBE OF FILM TO THE PIPE.

DUCTILE IRON FITTINGS

WATER MAIN FITTINGS SHALL CONFORM TO ANSI A21.53, A21.11 & A21.4. FITTINGS SHALL BE COATED WITH 6 - 8 MM MINIMUM THICKNESS FUSION BONDED EPOXY CONFORMING TO ANSI/AWWA C550 AND C116/A21.16.

THRUST RESTRAINT

ALL WATER MAIN, VALVES, SERVICES, FITTINGS, STUBS, EXTENSIONS, BLIND FLANGES, AND PLUGS USED FOR RETAINING WATER PRESSURE MUST BE TIED WITH "MEGALUG" JOINT RESTRAINTS OR ACCEPTED EQUAL. BASED UPON A 150 PSI TEST PRESSURE AND 7.5' COVER, THE FOLLOWING SHOWS THE MINIMUM LENGTH OF PIPE EACH WAY OF A FITTING TO BE RESTRAINED. JOINT RESTRAINTS TO BE EPOXY COATED AS REQUIRED ON WATER MAIN FITTINGS.

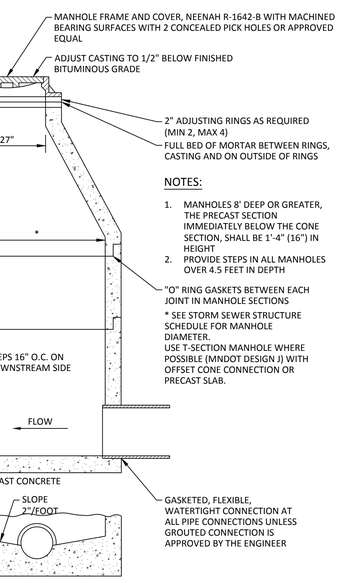
PIPE DIAMETER	DEAD END TEE BRANCH OR 90^BEND	45^BEND	22-1/2^BEND
4" (SERVICE)	22 LF	5 LF	2 LF
6"	23 LF	7 LF	3 LF
8"	30 LF	10 LF	5 LF
10"	39 LF	12 LF	5 LF
12"	50 LF	16 LF	5 LF

ALL TEES WITH A VALVE IMMEDIATELY AFTER A TEE BRANCH SHOULD BE TREATED AS A 90 DEGREE BEND.

WHERE RESTRAINED JOINTS ARE REQUIRED AND THE PIPE IS IN A CASING NEAR THE FITTING TO BE RESTRAINED, THE LENGTH OF PIPE IN THE CASING SHALL NOT BE INCLUDED IN THE LENGTH OF PIPE NECESSARY TO DEVELOP SUFFICIENT SOIL FRICTION TO OVERCOME THRUST.

ALL BARE METALS SHALL HAVE TWO COATS OF BITUMASTIC OR ACCEPTED EQUAL. (AEROSOL SPRAY IS NOT ACCEPTABLE) ALL MECHANICAL JOINT BOLTS SHALL BE COR-BLUE.
ALL JOINT TIE RODS AND NUTS SHALL BE 316 STAINLESS STEEL.

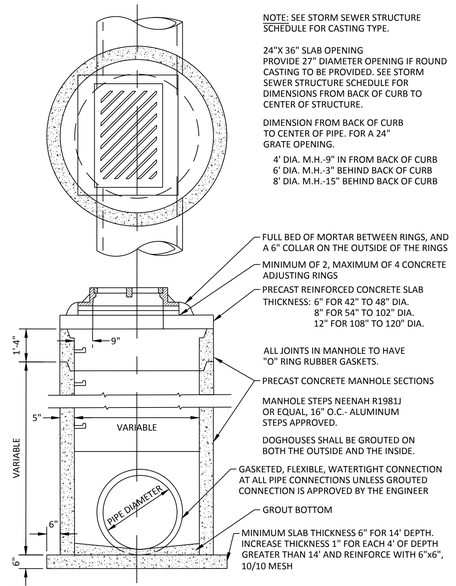
CITY OF ROGERS	WATER MAIN DETAILS AND TIE SCHEDULE TABLE	Standard Details	Date: SEPTEMBER, 2020	Revised:	WAT-10



NOTES:
1. MANHOLES 8' DEEP OR GREATER, THE PRECAST SECTION IMMEDIATELY BELOW THE CONE SECTION, SHALL BE 1'-4" (16") IN HEIGHT
2. PROVIDE STEPS IN ALL MANHOLES OVER 4.5 FEET IN DEPTH

* SEE STORM SEWER STRUCTURE SCHEDULE FOR MANHOLE DIAMETER.
USE T-SECTION MANHOLE WHERE POSSIBLE (MNDOT DESIGN J) WITH OFFSET CONE CONNECTION OR PRECAST SLAB.

01 STORM SEWER MANHOLE N.T.S.

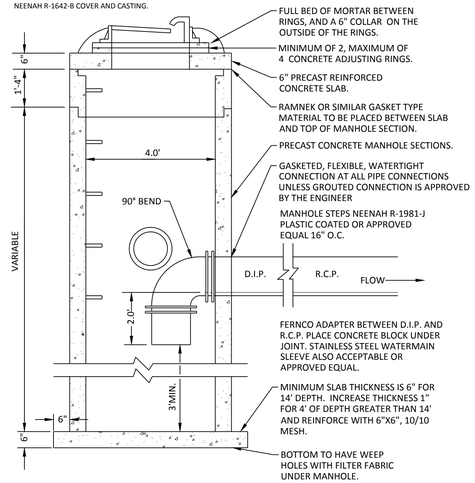


02 CATCH BASIN MANHOLE N.T.S.

NOTE:
OTHER ACCEPTABLE CATCH BASIN CASTINGS DEPENDING UPON THE CIRCUMSTANCES.

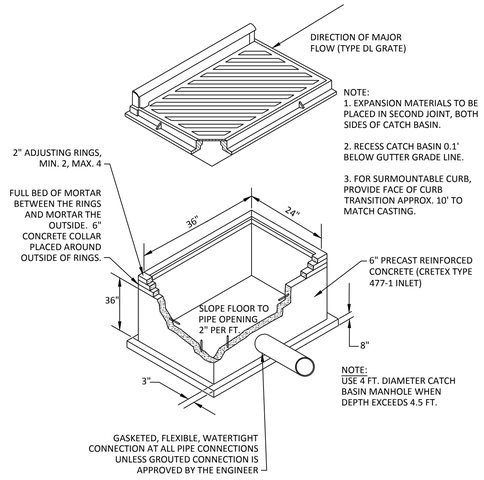
NEENAH R-2561-A BEEHIVE GRATE AND CASTING
NEENAH R-2573 CONCAVE GRATE AND CASTING
NEENAH R-2577 CONVEX GRATE AND CASTING

24"X36"SLAB OPENING FOR NEENAH R-3067 CASTING, FOR EQUAL, WITH D.L., D.R. OR VANE GRATE. 27" DIAMETER OPENING FOR NEENAH R-1642-B COVER AND CASTING.



03 CATCH BASIN MANHOLE WITH SUMP N.T.S.

CATCH BASIN CASTING ASSEMBLY
(SEE STORM SEWER SCHEDULE FOR CASTING TYPE)



05 24"x36" CATCH BASIN N.T.S.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

DETAILS

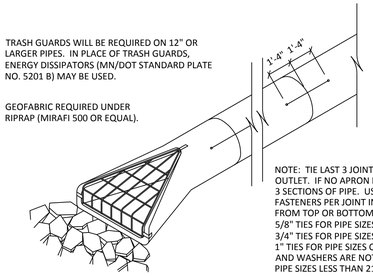
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C9.02
33 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C9.01-DTLS.DWG C9.02 DETAILS

TRASH GUARDS WILL BE REQUIRED ON 12" OR LARGER PIPES. IN PLACE OF TRASH GUARDS, ENERGY DISSIPATORS (MN/DOT STANDARD PLATE NO. 5201 B) MAY BE USED.

GEOFABRIC REQUIRED UNDER RIPRAP (MIRAFI 500 OR EQUAL).



NOTE: TIE LAST 3 JOINTS ON INLET AND OUTLET. IF NO APRON IS USED, TIE LAST 3 SECTIONS OF PIPE. USE 2 TIE BOLT FASTENERS PER JOINT INSTALLED AT 60" FROM TOP OR BOTTOM OF PIPE. USE 5/8" TIES FOR PIPE SIZES 12" TO 27". USE 3/4" TIES FOR PIPE SIZES 30" TO 66". USE 1" TIES FOR PIPE SIZES OVER 72". NUTS AND WASHERS ARE NOT REQUIRED ON PIPE SIZES LESS THAN 21".

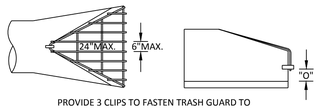
HAND-PLACED RIPRAP, 1 FOOT DEEP

SIZE OF PIPE	RIPRAP REQUIRED
54" & Over	20-24 CU. YD.
36" to 48"	10-13 CU. YD.
27" to 33"	6-8 CU. YD.
24" & Less	4-6 CU. YD.

NOTE: ONE CU. YD. IS APPROXIMATELY 1.4 TONS.

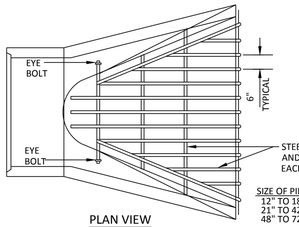
INDIVIDUAL STONES, EXCEPT THOSE USED FOR CHINKING, SHALL NOT WEIGHT LESS THAN 50 LBS. EACH.
PLACE RIPRAP AROUND SIDES AND OVER TOP OF FLARED END SECTIONS.

SIZE OF PIPE	BARS	BOLTS	"O"
12" TO 18"	¾"	⅝"	4"
21" TO 42"	1"	¾"	6"
48" TO 72"	1-¼"	1"	12"



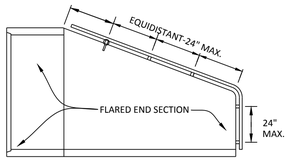
PROVIDE 3 CLIPS TO FASTEN TRASH GUARD TO F.E.S. HOT DIP GALVANIZE AFTER FABRICATION.

01 FLARED END SECTION
N.T.S.



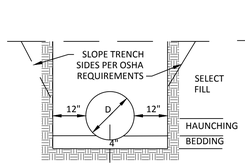
PLAN VIEW

SIZE OF PIPE	BARS	BOLTS	"O"
12" TO 18"	¾"	⅝"	4"
21" TO 42"	1"	¾"	6"
48" TO 72"	1-1/4"	1"	12"



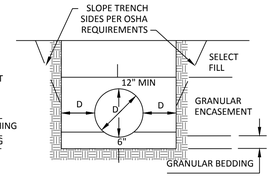
ELEVATION

02 TRASH GUARD
N.T.S.



REINFORCED CONCRETE PIPE OR DIP

1. BEDDING AND HAUNCHING MATERIAL SHALL BE ASTM D2321-CI.I, II, III, OR IV A SOILS, AND SHALL BE SHAPED TO THE BOTTOM OF THE PIPE. COMPACT BEDDING MATERIAL TO 95% STANDARD PROCTOR.
2. SELECT FILL SHALL BE SELECT MATERIAL FREE OF LARGE ROCKS (3"+) AND SHALL BE PLACED IN 8" MAX. LOOSE LIFTS AND COMPACTED TO 95% STANDARD PROCTOR.



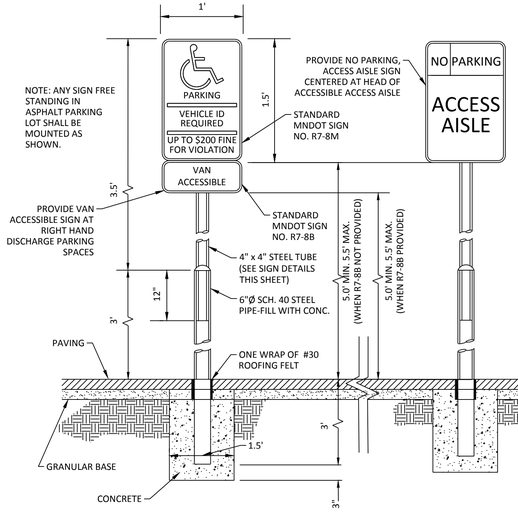
FLEXIBLE PIPE: INCLUDES CORRUGATEDMETAL PIPE

CORRUGATED POLYETHYLENE PIPE AND/OR POLYVINYL CHLORIDE PIPE

1. GRANULAR BEDDING AND ENCASEMENT MATERIAL SHALL BE CLASS I OR II (REF. ASTM D2321 OR MN/DOT 3149.2F) GRANULAR MATERIAL, AND SHALL BE COMPACTED TO 95% STANDARD PROCTOR.
2. SELECT FILL PLACEMENT AND COMPACTION. SAME AS FOR RCP.

NOTE: FOR HDPE INSTALLED BELOW EXISTING OR FUTURE GROUND WATER ELEVATIONS, PIPE BEDDING AND ENCASEMENT SHALL BE CLASS I, CRUSHED ROCK PER ASTM D2321.

03 TRENCH AND BEDDING DETAILS
N.T.S.



04 ACCESSIBLE PARKING SIGN
N.T.S.

VAN ACCESSIBLE/STD. ADA/STANDARD

90° PARKING

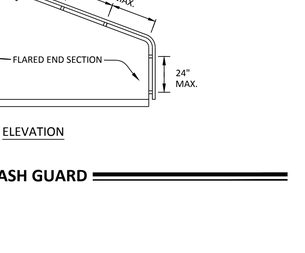
90° PARKING

SIGN TO BE ADDED TO "ACCESSIBLE PARKING SIGN" 1C/1D

"VAN - ACCCESSIBLE" SIGNAGE. INSTALL AT DESIGNATED VAN HANDICAP SPACES, SIGNAGE SHALL BE BLUE BACKGROUND WITH WHITE CHARACTERS, 3" HIGH, UPPER CASE HELVETICA.

LOCATE AT EDGE OF PARKING SPACE

08 ADA/STANDARD STRIPING
N.T.S.



ALL PIPES SHALL BE PAINTED TRAFFIC YELLOW

06 CONCRETE PIPE BOLLARD
N.T.S.

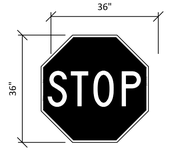
SECTION A-A

GENERAL NOTES FOR CONCRETE CONSTRUCTION:

1. THE CONCRETE SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF MN/DOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION".
2. SIDEWALK CONTROL JOINTS SHALL BE LOCATED AT 5 FEET ON CENTER. SIDEWALK EXPANSION JOINTS SHALL BE LOCATED AT A MAXIMUM OF 100 FEET ON CENTER, AND WHERE SIDEWALK ABUTS CURB, STRUCTURES, AND OTHER FIXED OBJECTS. SEAL ALL EXPANSION JOINTS. BROOM FINISH SHALL BE PERPENDICULAR TO THE LINE OF TRAFFIC.

*THE THICKNESS SHALL BE INCREASED TO A MINIMUM DEPTH OF ___ INCHES AT DRIVEWAY CROSSINGS.

07 CONCRETE SIDEWALK
N.T.S.

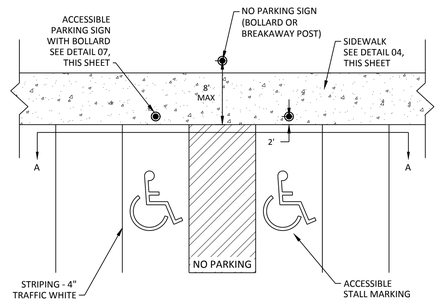


WHITE LEGEND RED BACKGROUND

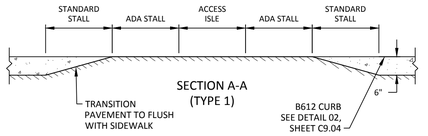
R1-1

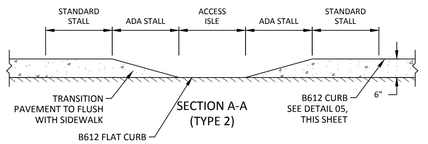
36" x 36" "STOP" SIGN
N.T.S.

08 STOP SIGN
N.T.S.



PLAN VIEW OF ADA PARKING





09 ADA PARKING
N.T.S.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

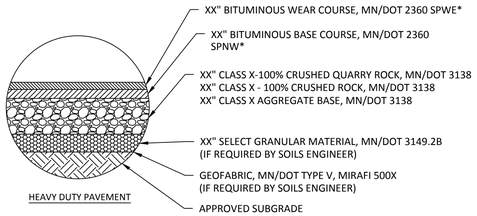
DETAILS

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C9.03
34 OF 45
REV.

24.15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
C:\PROJECTS\51493\CAD\SHEETS\51493 C9.01-DTLS.DWG C9.03 DETAILS

© 2021 Sambatek

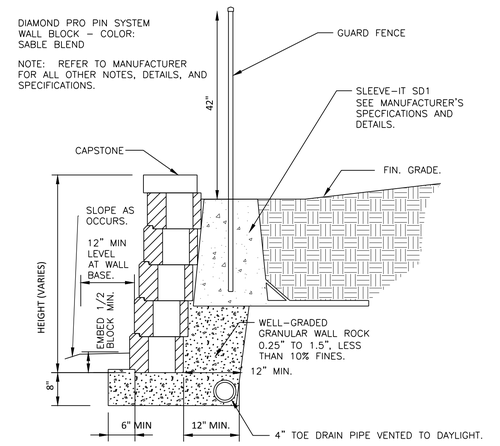


* REFER TO BITUMINOUS MIX DESIGN REQUIREMENT PROVIDED BY THE GEOTECHNICAL CONSULTANT

NOTES:

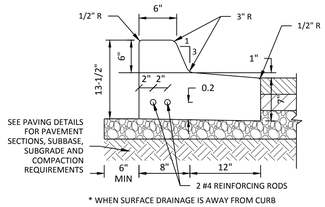
1. THE PAVEMENT SECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MNDOT "STANDARD SPECIFICATION FOR CONSTRUCTION", AND ALSO THE REQUIREMENTS OF THE OWNER'S GEOTECHNICAL CONSULTANT.
2. ALL THICKNESSES, AS SPECIFIED, ARE TO BE CONSIDERED MINIMUM DEPTHS, AFTER COMPACTION.
3. MN/DOT SPEC. 2357 BITUMINOUS TACK COAT SHALL BE PLACED BETWEEN SUCCESSIVE BITUMINOUS LIFTS AND AGAINST ABUTTING CONCRETE CURB EDGES.

01 PAVEMENT SECTIONS
N.T.S.



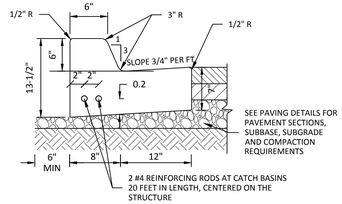
1 C9.04 DIAMOND PRO PIN SYSTEM
3/4" = 1'-0"

P-CO-NOR-01

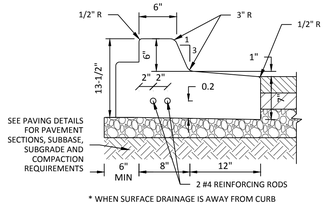


* WHEN SURFACE DRAINAGE IS AWAY FROM CURB

B612 CONCRETE CURB W/REVERSE GUTTER*



B612 CONCRETE CURB & GUTTER*



* WHEN SURFACE DRAINAGE IS AWAY FROM CURB

MODIFIED B612 CONCRETE CURB (ALONG SIDEWALK)*

02 B612 CONCRETE CURB & GUTTER
N.T.S.

NOTES:

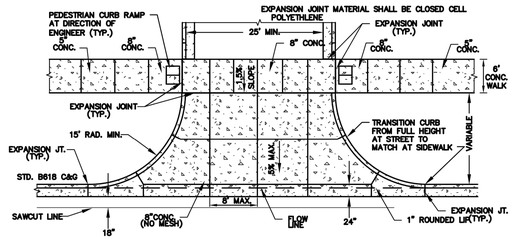
FORM CONTRACTION JOINT AS NEEDED TO PRODUCE APPROXIMATELY SQUARE PANELS (MAX. AREA OF 64 S.F.)

8" CLASS 5 BASE

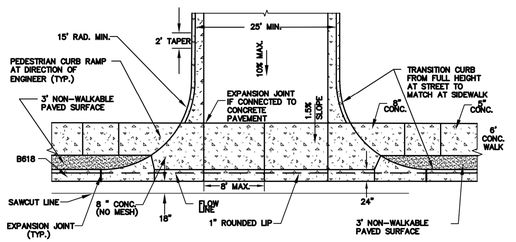
4" BIT PAVEMENT IN 2 – 2" LIFTS

EXPANSION JOINT MATERIAL SHALL BE CLOSED CELL POLYETHLENE

COMMERCIAL DRIVEWAY WITH BOULEVARD SIDEWALK



COMMERCIAL DRIVEWAY WITH SIDEWALK



CITY OF ROGERS

INDUSTRIAL / COMMERCIAL DRIVEWAY APRON

Standard Details

Date: SEPTEMBER, 2020

Revised: OCTOBER, 2022

CON–12

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

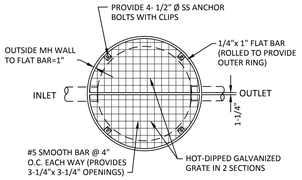
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

DETAILS

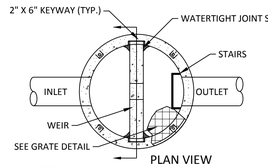
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C9.04
35 OF 45
REV.

24:15 (LMS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
J:\PROJECTS\51493\CAD\SHEETS\51493-C9.01-DTLS.DWG C9.04 DETAILS

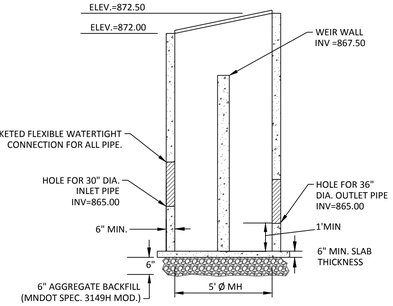


GRATE DETAIL



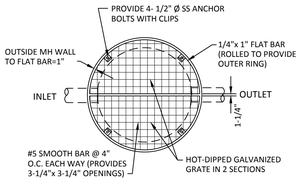
PLAN VIEW

NOTE:
WHEN WEIR WALL HEIGHT IS GREATER THAN 6' THE FOLLOWING SHALL BE REQUIRED:
1. STEPS
2. 6' Ø MH
3. 8" WEIR WALL W/ 8" KEYWAY

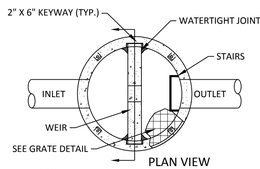


NOTE: ALL PVC FITTINGS WITHIN STRUCTURE SHALL BE AWWA C-900 OR C-907 (FITTINGS), SUITABLE FOR PRESSURE SERVICE WITH WATERTIGHT CONNECTIONS. NON PERFORATED PIPE SHALL BE INSULATED. DUCTILE IRON MAY BE SUBSTITUTED FOR PVC.

01 OCS 151 - BASIN OUTLET STRUCTURE WITH WEIR
N.T.S.

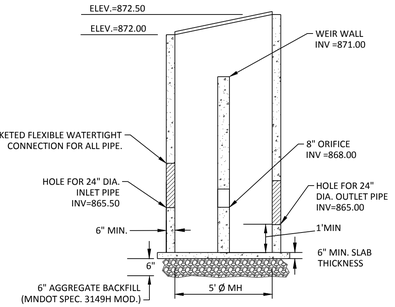


GRATE DETAIL



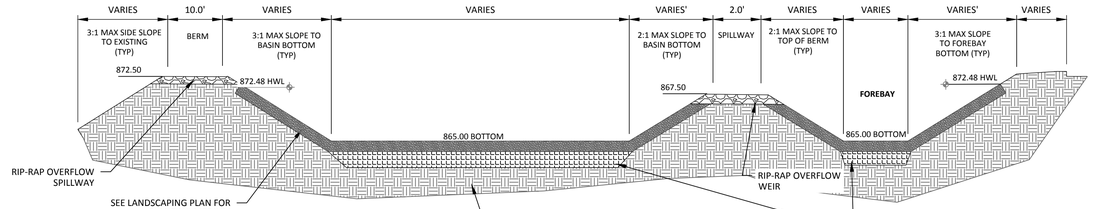
PLAN VIEW

NOTE:
WHEN WEIR WALL HEIGHT IS GREATER THAN 6' THE FOLLOWING SHALL BE REQUIRED:
1. STEPS
2. 6' Ø MH
3. 8" WEIR WALL W/ 8" KEYWAY



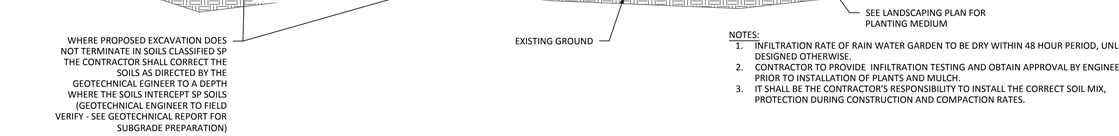
NOTE: ALL PVC FITTINGS WITHIN STRUCTURE SHALL BE AWWA C-900 OR C-907 (FITTINGS), SUITABLE FOR PRESSURE SERVICE WITH WATERTIGHT CONNECTIONS. NON PERFORATED PIPE SHALL BE INSULATED. DUCTILE IRON MAY BE SUBSTITUTED FOR PVC.

02 OCS 451 - BASIN OUTLET STRUCTURE WITH WEIR
N.T.S.



NOTES:
1. INFILTRATION RATE OF RAIN WATER GARDEN TO BE DRY WITHIN 48 HOUR PERIOD, UNLESS DESIGNED OTHERWISE.
2. CONTRACTOR TO PROVIDE INFILTRATION TESTING AND OBTAIN APPROVAL BY ENGINEER, PRIOR TO INSTALLATION OF PLANTS AND MULCH.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSTALL THE CORRECT SOIL MIX, PROTECTION DURING CONSTRUCTION AND COMPACTION RATES.

01 INFILTRATION POND 4P SECTION
NOT TO SCALE



NOTES:
1. INFILTRATION RATE OF RAIN WATER GARDEN TO BE DRY WITHIN 48 HOUR PERIOD, UNLESS DESIGNED OTHERWISE.
2. CONTRACTOR TO PROVIDE INFILTRATION TESTING AND OBTAIN APPROVAL BY ENGINEER, PRIOR TO INSTALLATION OF PLANTS AND MULCH.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSTALL THE CORRECT SOIL MIX, PROTECTION DURING CONSTRUCTION AND COMPACTION RATES.

01 INFILTRATION POND 3P SECTION
NOT TO SCALE

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

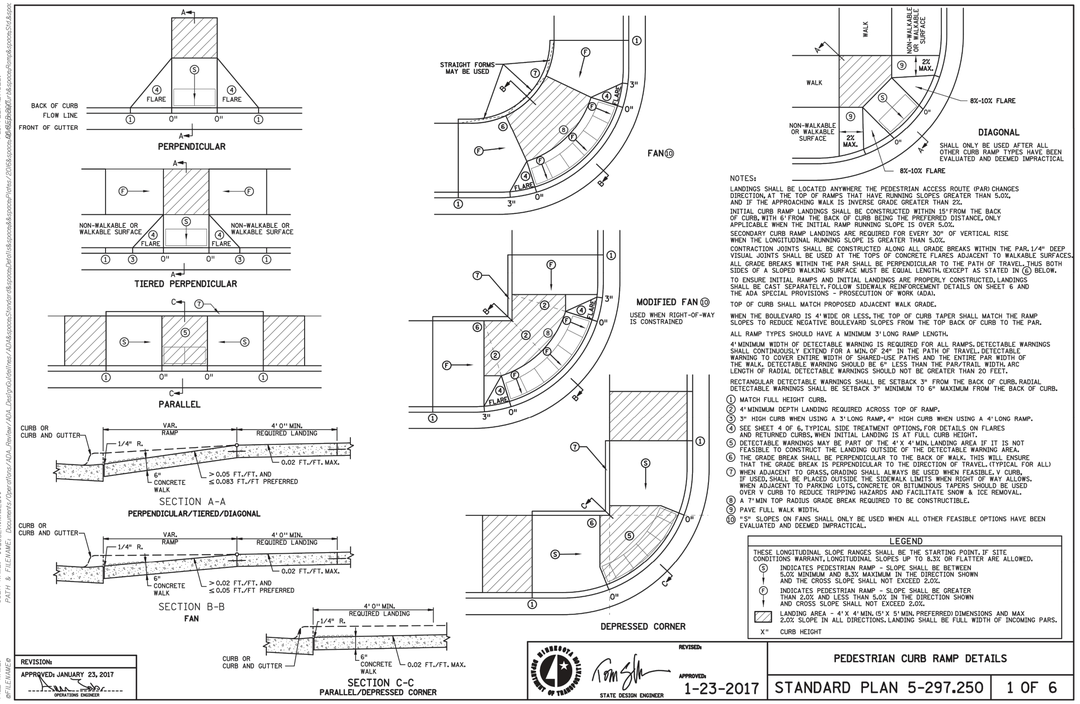
DETAILS

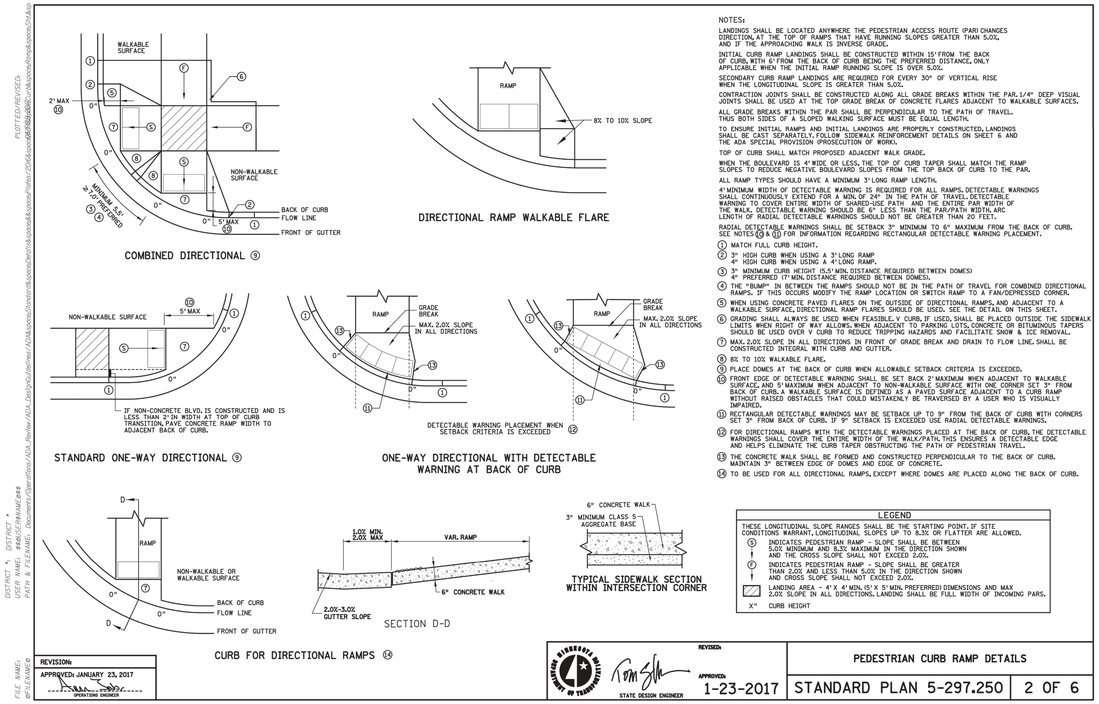
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

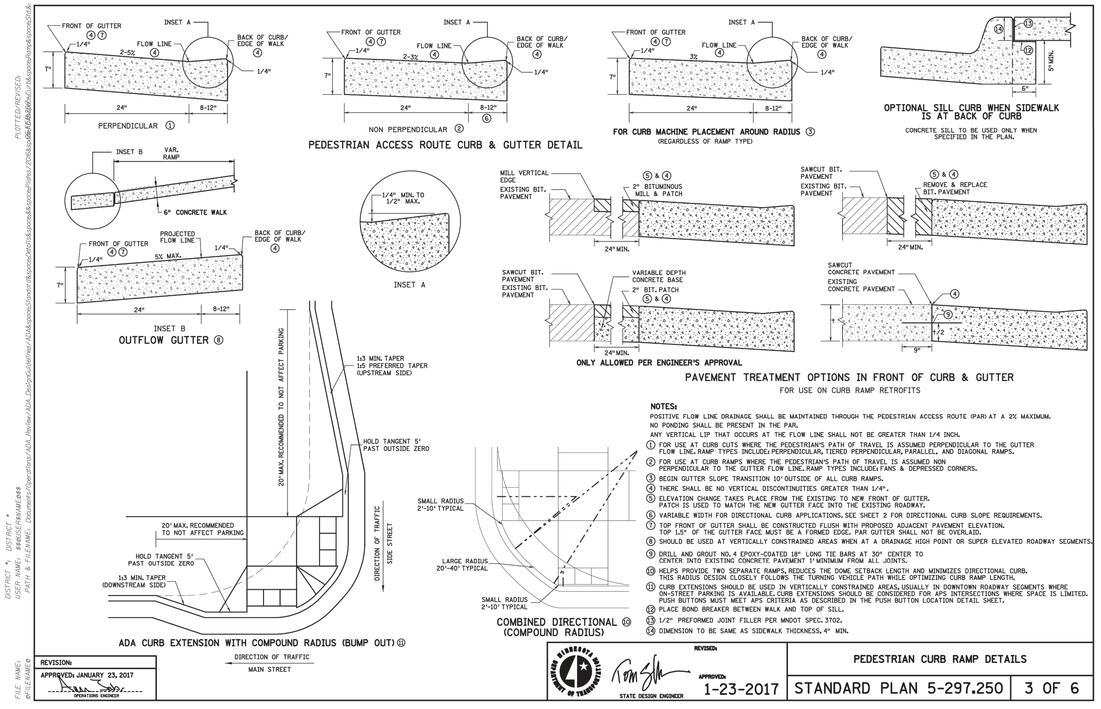
SHEET
C9.05
36 OF 45
REV.

© 2021 Sambatek

24.1S (LWS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CADSHEETS\51493-C9.01-DTLS.DWG(C9.05 DETAILS







NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

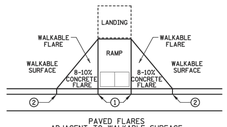
Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

DETAILS

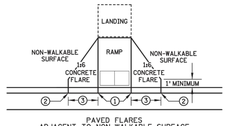
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C9.06
37 OF 45
REV.

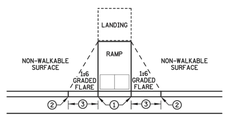
24.1S (LWS TECH) | THOMAS KEELEY | 4/4/2025 2:09:54 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-C9.01-DTLS.DWG C9.06 DETAILS



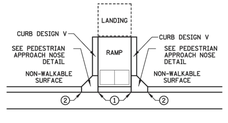
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

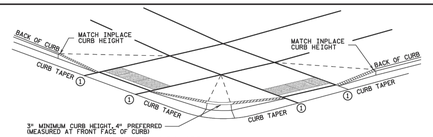


GRADED FLARES

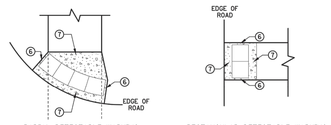


RETURNED CURB ⑤

TYPICAL SIDE TREATMENT OPTIONS ④ ⑪



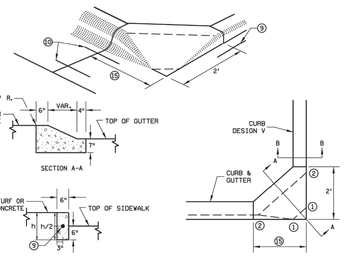
DETECTABLE EDGE WITH ⑥ CURB AND GUTTER



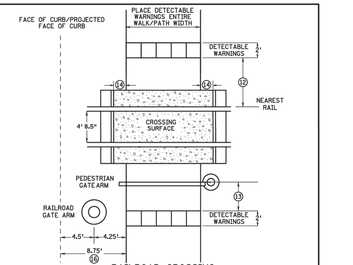
RADIAL DETECTABLE WARNING

RECTANGULAR DETECTABLE WARNING

DETECTABLE EDGE WITHOUT CURB AND GUTTER



PEDESTRIAN APPROACH NOSE DETAIL
(FOR RETURNED CURB SIDE TREATMENT)



RAILROAD CROSSING PLAN VIEW

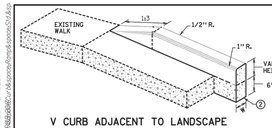
NOTES:
SEE STANDARD PLATE 7038 AND THIS SHEET FOR ADDITIONAL DETAILS ON DETECTABLE WARNING.
A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.
CONCRETE FLARE LENGTHS ADJACENT TO NON-WALKABLE SURFACES SHOULD BE LESS THAN 8'LONG MEASURED ALONG THE RAMPS FROM THE BACK OF CURB.

① 0" CURB HEIGHT.
② FULL CURB HEIGHT.
③ 2' FOR 4" HIGH CURB AND 3' FOR 6" HIGH CURB.
④ SIDE TREATMENTS ARE APPLICABLE TO ALL RAMP TYPES AND SHOULD BE IMPLEMENTED AS NEEDED AS FIELD CONDITIONS DICTATE. THE ENGINEER SHALL DETERMINE THE RAMP SIDE TREATMENTS BASED ON MAINTENANCE OF BOTH ROADWAY AND SIDEWALK, ADJACENT PROPERTY CONSIDERATIONS, AND MITIGATING CONSTRUCTION IMPACTS.
⑤ TYPICALLY USED FOR MEDIANS AND ISLANDS.
⑥ WHEN NO CONCRETE FLARES ARE PROPOSED, THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE EDGE OF ROADWAY, MAINTAIN 3" MAX. BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.
⑦ IF NO CURB AND GUTTER IS PLACED IN RURAL SECTIONS, DETECTABLE WARNINGS SHALL BE PLACED 1' FROM THE EDGE OF BITUMINOUS ROADWAY AND/OR BITUMINOUS SHARED-USE PATH TO PROVIDE VISUAL CONTRAST.
⑧ ALL CONSTRUCTED CURBS MUST HAVE A CONTINUOUS DETECTABLE EDGE FOR THE VISUALLY IMPAIRED. THIS DETECTABLE EDGE REQUIRES DETECTABLE WARNINGS WHEREVER THERE IS ZERO-INCH HIGH CURB. CURB TAPERS ARE CONSIDERED A DETECTABLE EDGE WHEN THE TAPER STARTS WITHIN 3" OF THE EDGE OF THE DETECTABLE WARNINGS AND UNIFORMLY RISES TO A 3-INCH MINIMUM CURB HEIGHT. ANY CURB NOT PART OF A CURB TAPER AND LESS THAN 3 INCHES IN HEIGHT IS NOT CONSIDERED A DETECTABLE EDGE AND THEREFORE IS NOT COMPLIANT WITH ACCESSIBILITY STANDARDS.
⑨ DRILL AND GROUT 1 - NO. 4 12" LONG REINFORCEMENT BAR (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE V CURB.
⑩ DRILL AND GROUT 2 - NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE CURB AND GUTTER.
⑪ SIDE TREATMENT EXAMPLES SHOWN ARE WHEN THE INITIAL LANDING IS APPROXIMATELY LEVEL WITH THE FULL HEIGHT CURB (I.E. 6"LONG RAMP FOR 6" HIGH CURB). WHEN THE INITIAL LANDING IS MORE THAN 1" BELOW FULL HEIGHT CURB REFER TO SHEETS 1 & 2 TO MODIFY THE CURB HEIGHT TAPERS AND MAINTAIN POSITIVE BOULEVARD DRAINAGE.
⑫ NEAREST EDGE OF DETECTABLE WARNING SURFACES SHALL BE PLACED 12"MINIMUM TO 15'MAXIMUM FROM THE NEAREST RAIL. FOR SKEWED RAILWAYS IN NO INSTANCE SHALL THE DETECTABLE WARNING BE CLOSER THAN 12' MEASURED PERPENDICULAR TO THE NEAREST RAIL.
⑬ WHEN PEDESTRIAN GATES ARE PROVIDED, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE SIDE OF THE GATES OPPOSITE THE RAIL, 2' FROM THE APPROACHING SIDE OF THE GATE ARM. THIS CRITERIA GOVERNS OVER NOTE ⑫.
⑭ CROSSING SURFACE SHALL EXTEND 2' MINIMUM PAST THE OUTSIDE EDGE OF WALK OR SHARED-USE PATH.
⑮ 3' FOR MEDIANS AND SPLITTER ISLANDS. NOSE CAN BE REDUCED TO 2' ON FREE RIGHT ISLANDS.
⑯ SIDEWALK TO BE PLACED 8.75' MIN. FROM THE FACE OF CURB/PROJECTED FACE OF CURB. THIS ENSURES MIN. CLEARANCE BETWEEN THE SIDEWALK AND GATE ARM COUNTERWEIGHT SUPPORTS.

REVISION:
APPROVED: JANUARY 23, 2017
OPERATIONS ENGINEER

REVISED:
APPROVED: 1-23-2017
STATE DESIGN ENGINEER

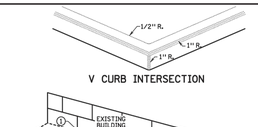
PEDESTRIAN CURB RAMP DETAILS
STANDARD PLAN 5-297.250 | 4 OF 6



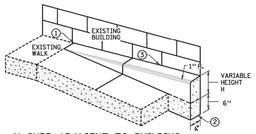
V CURB ADJACENT TO LANDSCAPE
CURB WITHIN SIDEWALK LIMITS



V CURB ADJACENT TO LANDSCAPE
CURB OUTSIDE SIDEWALK LIMITS

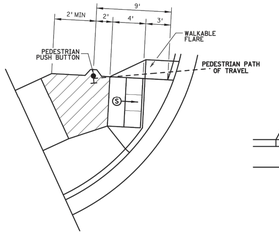


V CURB INTERSECTION



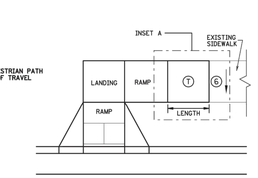
V CURB ADJACENT TO BUILDING OR BARRIER

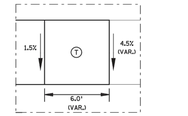
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
<6"	4"
≥6"	6"



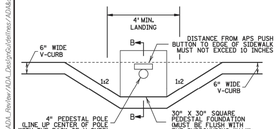
SEMI-DIRECTIONAL RAMP (3,4,9)
3' DOME SETBACK, 4' LONG RAMP AND PUSH BUTTON 9' FROM THE BACK OF CURB

PRIMARILY USED FOR APS APPLICATIONS WHERE THE PAR DOES NOT CONTINUE PAST THE PUSH BUTTON (DEAD-END SIDEWALK)

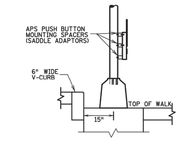




TRANSITION PANEL ④ ⑤

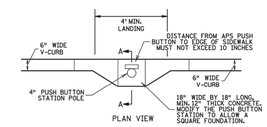


PLAN VIEW

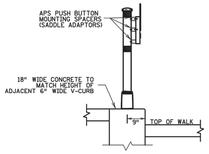


SECTION B-B

SIGNAL PEDESTAL & PUSH BUTTON (V-CURB)



PLAN VIEW



SECTION A-A

PUSH BUTTON STATION (V-CURB)

NOTES:
A WALKABLE FLARE IS AN 8-10% CONCRETE FLARE THAT IS REQUIRED WHEN THE FLARE IS ADJACENT TO A WALKABLE SURFACE, OR WHEN THE PEDESTRIAN PATH OF TRAVEL OF A PUSH BUTTON TRAVERSES THE FLARE.

ALL V CURB CONTRACTION JOINTS SHALL MATCH CONCRETE WALK JOINTS.

WHERE RIGHT-OF-WAY ALLOWS, USE OF V CURB SHOULD BE MINIMIZED. GRADING ADJACENT TURF OR SLOPING ADJACENT PAVEMENT IS PREFERRED.

V CURB SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS.

V CURB NEXT TO BUILDING SHALL BE A 4" WIDTH AND SHALL MATCH PREVIOUS TOP OF SIDEWALK ELEVATIONS.

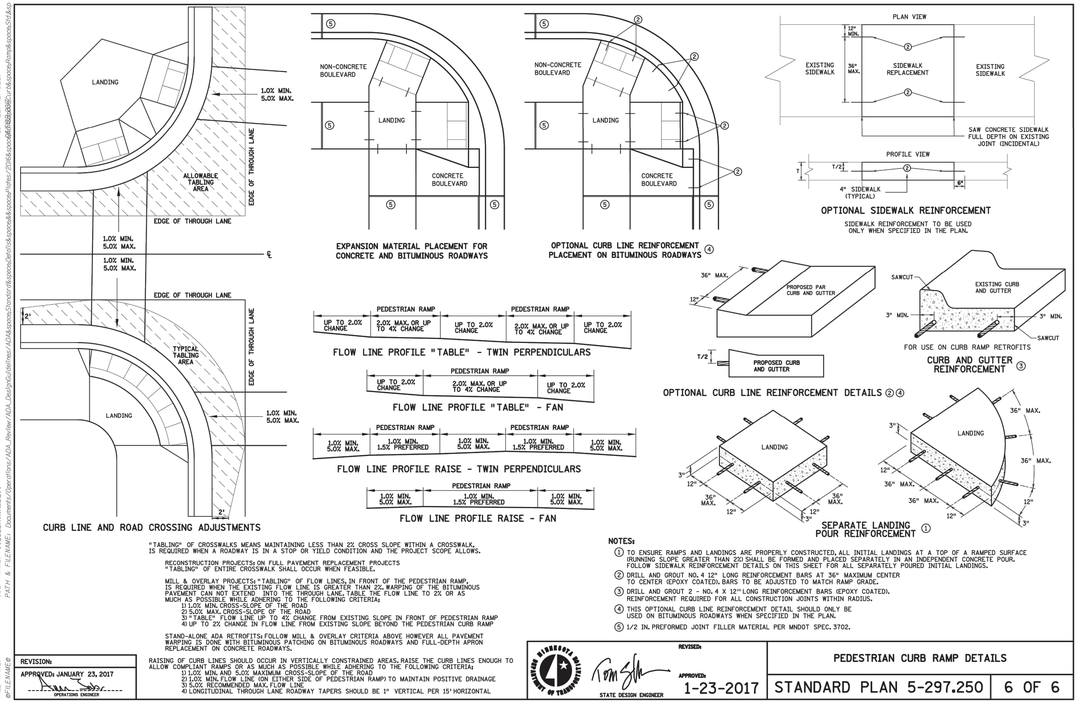
① END TAPERS AT TRANSITION SECTION SHALL MATCH INPLACE SIDEWALK GRADES.
② ALL V CURB SHALL MATCH BOTTOM OF ADJACENT WALK.
③ EDGE BETWEEN NEW V CURB AND INPLACE STRUCTURE SHALL BE SEALED AND EXPANSION BREAKER SHALL BE USED BETWEEN EXISTING STRUCTURE AND PLACED V-CURB.
④ THE MAX. RATE OF CROSS SLOPE TRANSITIONING IS 1'LINEAR FOOT OF SIDEWALK PER HALF PERCENT CROSS SLOPE, WHEN PAR WIDTH IS GREATER THAN 8'OR THE RUNNING SLOPE IS GREATER THAN 5%, DOUBLE THE CALCULATED TRANSITION LENGTH.
⑤ TRANSITION PANELS ARE TO ONLY BE USED AFTER THE RAMP, OR IF NEEDED, LANDING ARE AT THE FULL CURB HEIGHT (TYPICAL SECTION).
⑥ EXISTING CROSS SLOPE GREATER THAN 2.0%.

LEGEND
THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.
⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
LANDING AREA - 4' X 4' MIN. IS 5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PARS.
T TRANSITION PANEL(S) - TO BE USED FOR TRANSITIONING THE CROSS-SLOPE OF A RAMP TO THE EXISTING WALK CROSS-SLOPE, RATE OF TRANSITION SHOULD BE 0.5% PER 1 LINEAR FOOT OF WALK. SEE THIS SHEET FOR ADDITIONAL INFORMATION.

REVISION:
APPROVED: JANUARY 23, 2017
OPERATIONS ENGINEER

REVISED:
APPROVED: 1-23-2017
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS
STANDARD PLAN 5-297.250 | 5 OF 6



CURB LINE AND ROAD CROSSING ADJUSTMENTS

EXPANSION MATERIAL PLACEMENT FOR CONCRETE AND BITUMINOUS ROADWAYS

OPTIONAL CURB LINE REINFORCEMENT PLACEMENT ON BITUMINOUS ROADWAYS ④

OPTIONAL SIDEWALK REINFORCEMENT
SIDEWALK REINFORCEMENT TO BE USED ONLY WHEN SPECIFIED IN THE PLAN.

FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS

FLOW LINE PROFILE "TABLE" - FAN

FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS

FLOW LINE PROFILE RAISE - FAN

OPTIONAL CURB LINE REINFORCEMENT DETAILS ②④

FOR USE ON CURB RAMP RETROFITS

CURB AND GUTTER REINFORCEMENT ③

SEPARATE LANDING POUR REINFORCEMENT ①

NOTES:
① TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONSTRUCTED, ALL INITIAL LANDINGS AT A TOP OF A RAMPED SURFACE (RUNNING SLOPE GREATER THAN 2%) SHALL BE FORMED AND PLACED SEPARATELY IN AN INDEPENDENT CONCRETE POUR. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON THIS SHEET FOR ALL SEPARATELY POURED INITIAL LANDINGS.
② DRILL AND GROUT NO. 4 12" LONG REINFORCEMENT BARS AT 36" MAXIMUM CENTER TO CENTER (EPOXY COATED). BARS TO BE ADJUSTED TO MATCH RAMP GRADE.
③ DRILL AND GROUT 2 - NO. 4 X 12"LONG REINFORCEMENT BARS (EPOXY COATED). REINFORCEMENT REQUIRED FOR ALL CONSTRUCTION JOINTS WITHIN RADIUS.
④ THIS OPTIONAL CURB LINE REINFORCEMENT DETAIL SHOULD ONLY BE USED ON BITUMINOUS ROADWAYS WHEN SPECIFIED IN THE PLAN.
⑤ 1/2 IN. PREFORMED JOINT FILLER MATERIAL PER MNDOT SPEC. 3702.

"TABLING" OF CROSSWALKS MEANS MAINTAINING LESS THAN 2% CROSS SLOPE WITHIN A CROSSWALK, IS REQUIRED WHEN A ROADWAY IS IN A STOP OR YIELD CONDITION AND THE PROJECT SCOPE ALLOWS.

RECONSTRUCTION PROJECTS: ON FULL PAVEMENT REPLACEMENT PROJECTS "TABLING" OF ENTIRE CROSSWALK SHALL OCCUR WHEN FEASIBLE.

MILL & OVERLAY PROJECTS: "TABLING" OF FLOW LINES IN FRONT OF THE PEDESTRIAN RAMP, IS REQUIRED WHEN THE EXISTING FLOW LINE IS GREATER THAN 2%. WARPING OF THE BITUMINOUS PAVEMENT CAN NOT EXCEED 2% CROSS SLOPE THROUGH LANE. TABLE THE FLOW LINE TO 2% OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA:
1) 1.0% MIN. CROSS-SLOPE OF THE ROAD
2) 5.0% MAX. CROSS-SLOPE OF THE ROAD
3) "TABLE". FLOW LINE UP TO 4% CHANGE FROM EXISTING SLOPE IN FRONT OF PEDESTRIAN RAMP
4) UP TO 2% CHANGE IN FLOW LINE FROM EXISTING SLOPE BEYOND THE PEDESTRIAN CURB RAMP

STAND-ALONE ADA RETROFITS: FOLLOW MILL & OVERLAY CRITERIA ABOVE HOWEVER ALL PAVEMENT WARPING IS DONE WITH BITUMINOUS PATCHING ON BITUMINOUS ROADWAYS AND FULL-DEPTH APRON REPLACEMENT ON CONCRETE ROADWAYS.

RAISING OF CURB LINES SHOULD OCCUR IN VERTICALLY CONSTRAINED AREAS. RAISE THE CURB LINES ENOUGH TO ALLOW COMPLIANT RAMPS OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA:
1) 1.0% MIN. AND 5.0% MAXIMUM CROSS-SLOPE OF THE ROAD
2) 1.0% MIN. FLOW LINE ON EITHER SIDE OF PEDESTRIAN RAMP) TO MAINTAIN POSITIVE DRAINAGE
3) 5.0% RECOMMENDED MAX. FLOW LINE
4) LONGITUDINAL THROUGH LANE ROADWAY TAPERS SHOULD BE 1" VERTICAL PER 15' HORIZONTAL

REVISION:
APPROVED: JANUARY 23, 2017
OPERATIONS ENGINEER

REVISED:
APPROVED: 1-23-2017
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS
STANDARD PLAN 5-297.250 | 6 OF 6

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: JOSEPH D. BAILEY

Date 03/28/2025 License # 58645

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

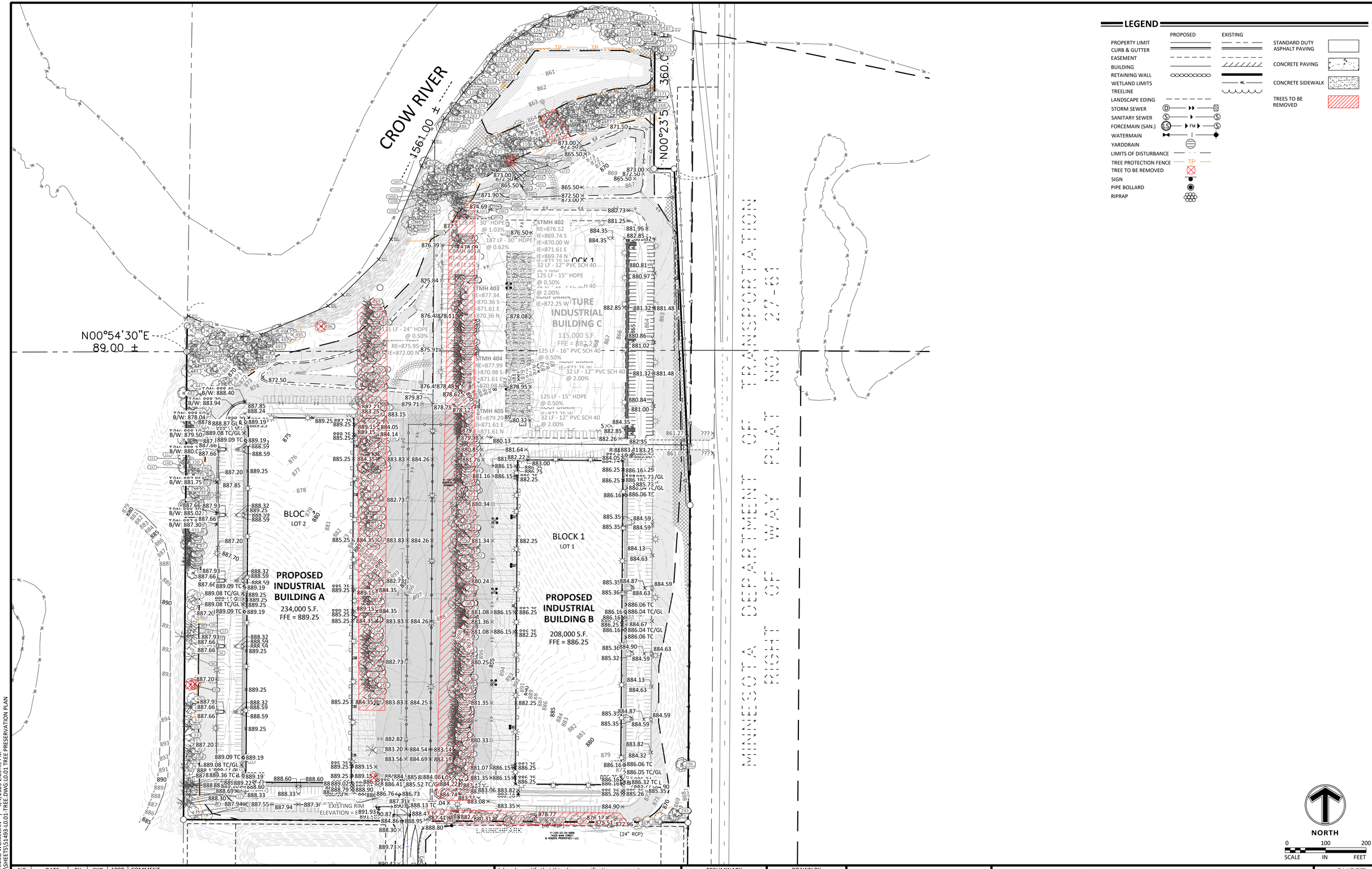
DRAWN BY	TPK
DESIGNED BY	JDB
CHECKED BY	JDB
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

DETAILS

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
C9.07
38 OF 45
REV.



LEGEND

	PROPOSED	EXISTING
PROPERTY LIMIT		
CURB & GUTTER		
EASEMENT		
BUILDING		
RETAINING WALL		
WETLAND LIMITS		WL
TREELINE		
LANDSCAPE EDING		
STORM SEWER	D	
SANITARY SEWER	S	S
FORCEMAIN (SAN.)	LS	FM S
WATERMAIN		
YARDDRAIN		
LIMITS OF DISTURBANCE		
TREE PROTECTION FENCE		TP
TREE TO BE REMOVED		
SIGN		
PIPE BOLLARD		
RIPRAP		

STANDARD DUTY ASPHALT PAVING	
CONCRETE PAVING	
CONCRETE SIDEWALK	
TREES TO BE REMOVED	

NORTH

0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.

Print Name: JOHN R. WORKMAN

Date 03/28/2025 License # 59119

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	

DRAWN BY

DESIGNED BY

CHECKED BY JRW

PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

TREE PRESERVATION PLAN

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
L0.01
39 OF 45
REV.

24.15 (LMS TECH) | JOHNNIE WORKMAN | 4/4/2025 2:09:49 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-L0.01-TREE DWG L0.01 TREE PRESERVATION PLAN

A-Tag	DBH	B-Species	STATUS
1	6	Siberian Elm (Ulmus pumila)	REMOVE
2	35'	Red Pine (Pinus resinosa)	
3	6	American Elm (Ulmus americana)	
4	35'	Red Pine (Pinus resinosa)	
5	40'	Red Pine (Pinus resinosa)	
6	35'	Red Pine (Pinus resinosa)	
7	35'	Red Pine (Pinus resinosa)	
8	40'	Red Pine (Pinus resinosa)	
9	40'	Red Pine (Pinus resinosa)	
10	30'	Red Pine (Pinus resinosa)	
11	15	Siberian Elm (Ulmus pumila)	
12	35'	Red Pine (Pinus resinosa)	
13	35'	Red Pine (Pinus resinosa)	
14	35'	Red Pine (Pinus resinosa)	
15	35'	Red Pine (Pinus resinosa)	
16	35'	Red Pine (Pinus resinosa)	
17	40'	Red Pine (Pinus resinosa)	
18	25'	Red Pine (Pinus resinosa)	
19	35'	Red Pine (Pinus resinosa)	
20	35'	Red Pine (Pinus resinosa)	
21	20'	Red Pine (Pinus resinosa)	
22	11	Red Oak (Quercus rubra)	
23	25'	Red Pine (Pinus resinosa)	
24	6	Hackberry (Celtis occidentalis)	
25	15'	Red Pine (Pinus resinosa)	
26	25'	Red Pine (Pinus resinosa)	
27	35'	Red Pine (Pinus resinosa)	
28	9	Red Oak (Quercus rubra)	
29	35'	Red Pine (Pinus resinosa)	
30	35'	Red Pine (Pinus resinosa)	
31	12'	Red Cedar (Juniperous virginiana)	
32	10	Siberian Elm (Ulmus pumila)	
33	6	Hackberry (Celtis occidentalis)	
34	30'	Red Pine (Pinus resinosa)	
35	35'	Red Pine (Pinus resinosa)	
36	8	Siberian Elm (Ulmus pumila)	
37	30'	Red Pine (Pinus resinosa)	
38	25'	Red Pine (Pinus resinosa)	
39	30'	Red Pine (Pinus resinosa)	
40	35'	Red Pine (Pinus resinosa)	
41	13	American Elm (Ulmus americana)	
42	9	American Elm (Ulmus americana)	
43	12	Green Ash (Fraxinus pennsylvanica)	REMOVE
44	7	Hackberry (Celtis occidentalis)	REMOVE
45	35'	Red Pine (Pinus resinosa)	
46	9	American Elm (Ulmus americana)	
47	40'	Red Pine (Pinus resinosa)	
48	40'	Red Pine (Pinus resinosa)	
49	40'	Red Pine (Pinus resinosa)	
50	40'	Red Pine (Pinus resinosa)	
51	40'	Red Pine (Pinus resinosa)	
52	40'	Red Pine (Pinus resinosa)	
53	40'	Red Pine (Pinus resinosa)	
54	40'	Red Pine (Pinus resinosa)	
55	12	Siberian Elm (Ulmus pumila)	
56	6	Hackberry (Celtis occidentalis)	
57	7	Hackberry (Celtis occidentalis)	
58	6	Hackberry (Celtis occidentalis)	
59	7	Hackberry (Celtis occidentalis)	
60	40'	Red Pine (Pinus resinosa)	
61	40'	Red Pine (Pinus resinosa)	
62	15'	Red Pine (Pinus resinosa)	
63	40'	Red Pine (Pinus resinosa)	
64	40'	Red Pine (Pinus resinosa)	
65	40'	Red Pine (Pinus resinosa)	
66	35'	Red Pine (Pinus resinosa)	
67	35'	Red Pine (Pinus resinosa)	
68	40'	Red Pine (Pinus resinosa)	
69	40'	Red Pine (Pinus resinosa)	
70	20'	Red Pine (Pinus resinosa)	
71	40'	Red Pine (Pinus resinosa)	
72	40'	Red Pine (Pinus resinosa)	
73	40'	Red Pine (Pinus resinosa)	
74	40'	Red Pine (Pinus resinosa)	
75	25'	Red Pine (Pinus resinosa)	
76	40'	Red Pine (Pinus resinosa)	
77	6	American Elm (Ulmus americana)	
78	40'	Red Pine (Pinus resinosa)	
79	40'	Red Pine (Pinus resinosa)	
80	40'	Red Pine (Pinus resinosa)	
81	40'	Red Pine (Pinus resinosa)	
82	25'	Red Pine (Pinus resinosa)	
83	20'	Red Pine (Pinus resinosa)	
84	40'	Red Pine (Pinus resinosa)	
85	40'	Red Pine (Pinus resinosa)	
86	15'	Red Cedar (Juniperous virginiana)	
87	12	Box Elder (Acer negundo)	
88	40'	Red Pine (Pinus resinosa)	
89	30'	Red Pine (Pinus resinosa)	
90	40'	Red Pine (Pinus resinosa)	
91	14	American Elm (Ulmus americana)	
92	40'	Red Pine (Pinus resinosa)	
93	40'	Red Pine (Pinus resinosa)	
94	40'	Red Pine (Pinus resinosa)	
95	40'	Red Pine (Pinus resinosa)	
96	35'	Red Pine (Pinus resinosa)	
97	35'	Red Pine (Pinus resinosa)	
98	40'	Red Pine (Pinus resinosa)	
99	40'	Red Pine (Pinus resinosa)	
100	40'	Red Pine (Pinus resinosa)	
101	6	American Elm (Ulmus americana)	
102	40'	Red Pine (Pinus resinosa)	
103	6	American Elm (Ulmus americana)	
104	40'	Red Pine (Pinus resinosa)	
105	40'	Red Pine (Pinus resinosa)	
106	40'	Red Pine (Pinus resinosa)	
107	13	American Elm (Ulmus americana)	
108	35'	Red Pine (Pinus resinosa)	
109	10	American Elm (Ulmus americana)	
110	40'	Red Pine (Pinus resinosa)	
111	6	American Elm (Ulmus americana)	
112	40'	Red Pine (Pinus resinosa)	
113	35'	Red Pine (Pinus resinosa)	
114	6	American Elm (Ulmus americana)	
115	40'	Red Pine (Pinus resinosa)	
116	35'	Red Pine (Pinus resinosa)	
117	35'	Red Pine (Pinus resinosa)	
118	18	American Elm (Ulmus americana)	
119	6	American Elm (Ulmus americana)	
120	40'	Red Pine (Pinus resinosa)	
121	8	Box Elder (Acer negundo)	
122	6	Box Elder (Acer negundo)	
123	8	Box Elder (Acer negundo)	
124	7	Box Elder (Acer negundo)	
125	6	Box Elder (Acer negundo)	
126	6	Box Elder (Acer negundo)	
127	8	Box Elder (Acer negundo)	
128	8	American Elm (Ulmus americana)	
129	11	Box Elder (Acer negundo)	
130	6	Box Elder (Acer negundo)	
131	8	American Elm (Ulmus americana)	
132	6	Box Elder (Acer negundo)	
133	6	Box Elder (Acer negundo)	
134	40'	Red Pine (Pinus resinosa)	
135	40'	Red Pine (Pinus resinosa)	
136	6	American Elm (Ulmus americana)	REMOVE
137	6	American Elm (Ulmus americana)	
138	6	American Elm (Ulmus americana)	
139	19	Hackberry (Celtis occidentalis)	
140	7	American Elm (Ulmus americana)	
141	6	Box Elder (Acer negundo)	
142	6	Box Elder (Acer negundo)	
143	7	Box Elder (Acer negundo)	
144	6	Box Elder (Acer negundo)	
145	6	Hackberry (Celtis occidentalis)	
146	7	American Elm (Ulmus americana)	
147	7	Hackberry (Celtis occidentalis)	
148	6	Hackberry (Celtis occidentalis)	
149	7	Hackberry (Celtis occidentalis)	
150	25	Hackberry (Celtis occidentalis)	
151	7	Hackberry (Celtis occidentalis)	
152	7	Hackberry (Celtis occidentalis)	
153	14	Box Elder (Acer negundo)	
154	6	Hackberry (Celtis occidentalis)	
155	8	American Elm (Ulmus americana)	
156	14	American Elm (Ulmus americana)	
157	40'	Red Pine (Pinus resinosa)	
158	8	American Elm (Ulmus americana)	
159	40'	Red Pine (Pinus resinosa)	
160	8	Box Elder (Acer negundo)	
161	20	Box Elder (Acer negundo)	
162	40'	Red Pine (Pinus resinosa)	
163	40'	Red Pine (Pinus resinosa)	
164	40'	Red Pine (Pinus resinosa)	
165	6	American Elm (Ulmus americana)	
166	40'	Red Pine (Pinus resinosa)	
167	40'	Red Pine (Pinus resinosa)	
168	40'	Red Pine (Pinus resinosa)	
169	40'	Red Pine (Pinus resinosa)	
170	10	American Elm (Ulmus americana)	
171	7	Box Elder (Acer negundo)	
172	40'	Red Pine (Pinus resinosa)	
173	10	Box Elder (Acer negundo)	
174	6	Hackberry (Celtis occidentalis)	
175	12	Box Elder (Acer negundo)	
176	8	Box Elder (Acer negundo)	
177	12	Box Elder (Acer negundo)	
178	8	American Elm (Ulmus americana)	
179	12	American Elm (Ulmus americana)	
180	6	Box Elder (Acer negundo)	
181	27	Box Elder (Acer negundo)	
182	7	Hackberry (Celtis occidentalis)	
183	6	Hackberry (Celtis occidentalis)	
184	7	Box Elder (Acer negundo)	
185	10	Box Elder (Acer negundo)	
186	27	American Elm (Ulmus americana)	
187	7	Box Elder (Acer negundo)	
188	7	Box Elder (Acer negundo)	
189	16	Siberian Elm (Ulmus pumila)	
190	8	Siberian Elm (Ulmus pumila)	
191	9	Siberian Elm (Ulmus pumila)	
192	7	Siberian Elm (Ulmus pumila)	
193	13	Box Elder (Acer negundo)	
194	7	Hackberry (Celtis occidentalis)	
195	8	Box Elder (Acer negundo)	
196	8	Box Elder (Acer negundo)	
197	7	Hackberry (Celtis occidentalis)	
198	9	American Elm (Ulmus americana)	
199	14	American Elm (Ulmus americana)	
200	7	American Elm (Ulmus americana)	
201	6	Siberian Elm (Ulmus pumila)	REMOVE
202	20'	Red Pine (Pinus resinosa)	REMOVE
203	40'	Red Pine (Pinus resinosa)	REMOVE
204	40'	Red Pine (Pinus resinosa)	REMOVE
205	40'	Red Pine (Pinus resinosa)	REMOVE
206	40'	Red Pine (Pinus resinosa)	REMOVE
207	40'	Red Pine (Pinus resinosa)	REMOVE
208	25'	Red Pine (Pinus resinosa)	REMOVE
209	13	Siberian Elm (Ulmus pumila)	REMOVE
210	20'	Red Pine (Pinus resinosa)	REMOVE
211	35'	Red Pine (Pinus resinosa)	REMOVE
212	35'	Red Pine (Pinus resinosa)	REMOVE
213	35'	Red Pine (Pinus resinosa)	REMOVE
214	40'	Red Pine (Pinus resinosa)	REMOVE
215	40'	Red Pine (Pinus resinosa)	REMOVE
216	40'	Red Pine (Pinus resinosa)	REMOVE
217	11	Siberian Elm (Ulmus pumila)	REMOVE
218	6	Siberian Elm (Ulmus pumila)	REMOVE
219	40'	Red Pine (Pinus resinosa)	REMOVE
220	35'	Red Pine (Pinus resinosa)	REMOVE
221	35'	Red Pine (Pinus resinosa)	REMOVE
222	40'	Red Pine (Pinus resinosa)	REMOVE
223	25	Siberian Elm (Ulmus pumila)	REMOVE
224	40'	Red Pine (Pinus resinosa)	REMOVE
225	40'	Red Pine (Pinus resinosa)	REMOVE
226	35'	Red Pine (Pinus resinosa)	REMOVE
227	40'	Red Pine (Pinus resinosa)	REMOVE
228	35'	Red Pine (Pinus resinosa)	REMOVE
229	35'	Red Pine (Pinus resinosa)	REMOVE
230	35'	Red Pine (Pinus resinosa)	REMOVE
231	40'	Red Pine (Pinus resinosa)	REMOVE
232	25'	Red Pine (Pinus resinosa)	REMOVE
233	35'	Red Pine (Pinus resinosa)	REMOVE
234	20'	Red Pine (Pinus resinosa)	REMOVE
235	35'	Red Pine (Pinus resinosa)	REMOVE
236	35'	Red Pine (Pinus resinosa)	REMOVE
237	35'	Red Pine (Pinus resinosa)	REMOVE
238	40'	Red Pine (Pinus resinosa)	REMOVE
239	40'	Red Pine (Pinus resinosa)	REMOVE
240	40'	Red Pine (Pinus resinosa)	REMOVE
241	40'	Red Pine (Pinus resinosa)	REMOVE
242	15'	Red Pine (Pinus resinosa)	REMOVE
243	40'	Red Pine (Pinus resinosa)	REMOVE
244	40'	Red Pine (Pinus resinosa)	REMOVE
245	40'	Red Pine (Pinus resinosa)	REMOVE
246	35'	Red Pine (Pinus resinosa)	REMOVE
247	35'	Red Pine (Pinus resinosa)	REMOVE
248	35'	Red Pine (Pinus resinosa)	REMOVE
249	24	Siberian Elm (Ulmus pumila)	REMOVE
250	35'	Red Pine (Pinus resinosa)	REMOVE
251	35'	Red Pine (Pinus resinosa)	REMOVE
252	35'	Red Pine (Pinus resinosa)	REMOVE
253	35'	Red Pine (Pinus resinosa)	REMOVE
254	35'	Red Pine (Pinus resinosa)	REMOVE
255	35'	Red Pine (Pinus resinosa)	REMOVE
256	35'	Red Pine (Pinus resinosa)	REMOVE
257	30'	Red Pine (Pinus resinosa)	REMOVE
258	35'	Red Pine (Pinus resinosa)	REMOVE
259	35'	Red Pine (Pinus resinosa)	REMOVE
260	25'	Red Pine (Pinus resinosa)	REMOVE
261	30'	Red Pine (Pinus resinosa)	REMOVE
262	13	Siberian Elm (Ulmus pumila)	REMOVE
263	14	Siberian Elm (Ulmus pumila)	REMOVE
264	9	Box Elder (Acer negundo)	REMOVE
265	15	Box Elder (Acer negundo)	REMOVE
266	35'	Red Pine (Pinus resinosa)	REMOVE
267	35'	Red Pine (Pinus resinosa)	REMOVE
268	35'	Red Pine (Pinus resinosa)	REMOVE
269	30'	Red Pine (Pinus resinosa)	REMOVE
270	12	Box Elder (Acer negundo)	REMOVE
271	12	Box Elder (Acer negundo)	REMOVE
272	13	Box Elder (Acer negundo)	REMOVE
273	7	Box Elder (Acer negundo)	REMOVE
274	9	Box Elder (Acer negundo)	REMOVE
275	20	Box Elder (Acer negundo)	REMOVE
276	8	American Elm (Ulmus americana)	REMOVE
277	6	Siberian Elm (Ulmus pumila)	REMOVE
278	6	Box Elder (Acer negundo)	REMOVE
279	7	Box Elder (Acer negundo)	REMOVE
280	8	American Elm (Ulmus americana)	REMOVE
281	15	Siberian Elm (Ulmus pumila)	REMOVE
282	14	Siberian Elm (Ulmus pumila)	REMOVE
283	6	Siberian Elm (Ulmus pumila)	REMOVE
284	9	Siberian Elm (Ulmus pumila)	REMOVE
285	9	Box Elder (Acer negundo)	
286	15	Box Elder (Acer negundo)	REMOVE
287	11	American Elm (Ulmus americana)	
288	10	Box Elder (Acer negundo)	
289	10	Siberian Elm (Ulmus pumila)	
290	12	Siberian Elm (Ulmus pumila)	
291	12	Siberian Elm (Ulmus pumila)	
292	6	Siberian Elm (Ulmus pumila)	REMOVE
293	10	Siberian Elm (Ulmus pumila)	REMOVE
294	9	Siberian Elm (Ulmus pumila)	
295	10	Siberian Elm (Ulmus pumila)	
296	12	Siberian Elm (Ulmus pumila)	
297	20'	Red Cedar (Juniperous virginiana)	REMOVE
298	35'	Red Pine (Pinus resinosa)	REMOVE
299	35'	Red Pine (Pinus resinosa)	REMOVE
300	40'	Red Pine (Pinus resinosa)	REMOVE
301	7	Hackberry (Celtis occidentalis)	REMOVE
302	35'	Red Pine (Pinus resinosa)	REMOVE
303	40'	Red Pine (Pinus resinosa)	REMOVE
304	35'	Red Pine (Pinus resinosa)	REMOVE
305	40'	Red Pine (Pinus resinosa)	REMOVE
306	25'	Red Pine (Pinus resinosa)	REMOVE
307	7	Basswood (Tilia americana)	REMOVE
308	12	Box Elder (Acer negundo)	REMOVE
309	11	Box Elder (Acer negundo)	REMOVE
310	40'	Red Pine (Pinus resinosa)	REMOVE
311	7	Box Elder (Acer negundo)	REMOVE
312	22	Box Elder (Acer negundo)	REMOVE
313	40'	Red Pine (Pinus resinosa)	REMOVE
314	8	Box Elder (Acer negundo)	REMOVE
315	40'	Red Pine (Pinus resinosa)	REMOVE
316	8	Box Elder (Acer negundo)	REMOVE
317	8	Box Elder (Acer negundo)	REMOVE
318	6	Hackberry (Celtis occidentalis)	REMOVE
319	7	Green Ash (Fraxinus pennsylvanica)	REMOVE
320	11	Box Elder (Acer negundo)	REMOVE
321	17	Box Elder (Acer negundo)	REMOVE
322	6	Box Elder (Acer negundo)	REMOVE
323	6	Hackberry (Celtis occidentalis)	REMOVE
324	11	Hackberry (Celtis occidentalis)	REMOVE
325	6	American Elm (Ulmus americana)	REMOVE
326	6	Box Elder (Acer negundo)	REMOVE
327	6	American Elm (Ulmus americana)	REMOVE
328	10	American Elm (Ulmus americana)	REMOVE
329	13	Box Elder (Acer negundo)	REMOVE
330	14	Box Elder (Acer negundo)	REMOVE
331	10	Box Elder (Acer negundo)	REMOVE
332	11	Box Elder (Acer negundo)	REMOVE
333	12	Box Elder (Acer negundo)	REMOVE
334	11	Box Elder (Acer negundo)	REMOVE
335	6	Box Elder (Acer negundo)	REMOVE
336	9	Box Elder (Acer negundo)	REMOVE
337	8	Box Elder (Acer negundo)	REMOVE
338	6	Box Elder (Acer negundo)	REMOVE
339	6	Box Elder (Acer negundo)	REMOVE
340	8	Hackberry (Celtis occidentalis)	REMOVE
341	12	Box Elder (Acer negundo)	REMOVE
342	19	American Elm (Ulmus americana)	REMOVE
343	9	American Elm (Ulmus americana)	REMOVE
344	40'	Red Pine (Pinus resinosa)	REMOVE
345	40'	Red Pine (Pinus resinosa)	REMOVE
346	40'	Red Pine (Pinus resinosa)	REMOVE
347	14	Siberian Elm (Ulmus pumila)	REMOVE
348	9	American Elm (Ulmus americana)	REMOVE
349	13	Box Elder (Acer negundo)	REMOVE
350	7	Box Elder (Acer negundo)	REMOVE
351	11	Box Elder (Acer negundo)	REMOVE
352	7	Box Elder (Acer negundo)	REMOVE
353	10	Box Elder (Acer negundo)	REMOVE
354	8	Box Elder (Acer negundo)	REMOVE
355	14	Box Elder (Acer negundo)	REMOVE
356	8	Siberian Elm (Ulmus pumila)	REMOVE
357	6	Box Elder (Acer negundo)	REMOVE
358	6	Box Elder (Acer negundo)	REMOVE
359	14	Box Elder (Acer negundo)	REMOVE
360	6	Hackberry (Celtis occidentalis)	REMOVE
361	14	Box Elder (Acer negundo)	REMOVE
362	40'	Red Pine (Pinus resinosa)	REMOVE
363	10	Box Elder (Acer negundo)	REMOVE
364	15	Box Elder (Acer negundo)	REMOVE
365	11	Box Elder (Acer negundo)	REMOVE
366	16	Box Elder (Acer negundo)	REMOVE
367	6	Siberian Elm (Ulmus pumila)	REMOVE
368	12	Box Elder (Acer negundo)	REMOVE
369	14	Box Elder (Acer negundo)	REMOVE
370	6	American Elm (Ulmus americana)	REMOVE
371	8	Box Elder (Acer negundo)	REMOVE
372	11	Box Elder (Acer negundo)	REMOVE
373	7	Siberian Elm (Ulmus pumila)	REMOVE
374	9	Box Elder (Acer negundo)	REMOVE
375	6	Box Elder (Acer negundo)	REMOVE
376	6	Box Elder (Acer negundo)	REMOVE
377	16	Box Elder (Acer negundo)	REMOVE
378	11	Box Elder (Acer negundo)	REMOVE
379	11	Box Elder (Acer negundo)	REMOVE
380	7	Box Elder (Acer negundo)	REMOVE
381	8	Box Elder (Acer negundo)	REMOVE
382	8	American Elm (Ulmus americana)	REMOVE
383	11	Box Elder (Acer negundo)	REMOVE
384	18	Box Elder (Acer negundo)	REMOVE
385	8	American Elm (Ulmus americana)	REMOVE
386	10	Siberian Elm (Ulmus pumila)	REMOVE
387	8	Hackberry (Celtis occidentalis)	REMOVE
388	11	Box Elder (Acer negundo)	REMOVE
389	13	Box Elder (Acer negundo)	REMOVE
390	12	Box Elder (Acer negundo)	REMOVE
391	7	Box Elder (Acer negundo)	REMOVE
392	13	Box Elder (Acer negundo)	REMOVE
393	7	Box Elder (Acer negundo)	REMOVE
394	6	Box Elder (Acer negundo)	REMOVE
395	6	Box Elder (Acer negundo)	REMOVE
396	7	Box Elder (Acer negundo)	REMOVE
397	12	Box Elder (Acer negundo)	REMOVE
398	11	American Elm (Ulmus americana)	REMOVE
399	6	Box Elder (Acer negundo)	REMOVE
400	40'	Red Pine (Pinus resinosa)	REMOVE
401	15	Box Elder (Acer negundo)	REMOVE
402	11	Box Elder (Acer negundo)	REMOVE
403	6	Box Elder (Acer negundo)	REMOVE
404	35'	Red Pine (Pinus resinosa)	REMOVE
405	35'	Red Pine (Pinus resinosa)	REMOVE
406	9	Box Elder (Acer negundo)	REMOVE
407	9	Box Elder (Acer negundo)	REMOVE
408	6	Box Elder (Acer negundo)	REMOVE
409	6	Box Elder (Acer negundo)	REMOVE
410	40'	Red Pine (Pinus resinosa)	REMOVE
411	40'	Red Pine (Pinus resinosa)	REMOVE
412	40'	Red Pine (Pinus resinosa)	REMOVE

24.15 (LMS TECH) | JOHNNIE WORKMAN | 4/4/2025 2:09:49 PM
L:\PROJECTS\5149\3-CAD\SHEETS\5149-L0.01-TREE INVENTORY 1.DWG,L0.02 TREE INVENTORY 1

© 2021 Sambatek

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.

Print Name: JOHN R. WORKMAN

Date 03/28/2025 License # 59119

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY
DESIGNED BY
CHECKED BY JRW
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

TREE INVENTORY 1

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
L0.02
40 OF 45
REV.

413	35'	Red Pine (Pinus resinosa)	REMOVE
414	10	Siberian Elm (Ulmus pumila)	REMOVE
415	7	American Elm (Ulmus americana)	REMOVE
416	40'	Red Pine (Pinus resinosa)	REMOVE
417	35'	Red Pine (Pinus resinosa)	REMOVE
418	35'	Red Pine (Pinus resinosa)	REMOVE
419	30'	Red Pine (Pinus resinosa)	REMOVE
420	40'	Red Pine (Pinus resinosa)	REMOVE
421	40'	Red Pine (Pinus resinosa)	REMOVE
422	40'	Red Pine (Pinus resinosa)	REMOVE
423	40'	Red Pine (Pinus resinosa)	REMOVE
424	40'	Red Pine (Pinus resinosa)	REMOVE
425	35'	Red Pine (Pinus resinosa)	REMOVE
426	30'	Red Pine (Pinus resinosa)	REMOVE
427	40'	Red Pine (Pinus resinosa)	REMOVE
428	40'	Red Pine (Pinus resinosa)	REMOVE
429	40'	Red Pine (Pinus resinosa)	REMOVE
430	6	American Elm (Ulmus americana)	
431	6	American Elm (Ulmus americana)	
432	15	American Elm (Ulmus americana)	
433	29	Box Elder (Acer negundo)	
434	6	Basswood (Tilia americana)	
435	16	Box Elder (Acer negundo)	
436	6	Hackberry (Celtis occidentalis)	
437	23	Box Elder (Acer negundo)	
438	12	American Elm (Ulmus americana)	
439	6	Hackberry (Celtis occidentalis)	
440	13	Hackberry (Celtis occidentalis)	
441	9	American Elm (Ulmus americana)	
442	17	Box Elder (Acer negundo)	
443	13	American Elm (Ulmus americana)	
444	12	Box Elder (Acer negundo)	
445	10	Box Elder (Acer negundo)	
446	14	Box Elder (Acer negundo)	
447	12	Box Elder (Acer negundo)	
448	11	Box Elder (Acer negundo)	
449	12	Basswood (Tilia americana)	
450	19	Hackberry (Celtis occidentalis)	
451	6	White Oak (Quescus alba)	
452	11	Hackberry (Celtis occidentalis)	
453	16	White Oak (Quescus alba)	
454	7	Box Elder (Acer negundo)	
455	6	Box Elder (Acer negundo)	
456	16	White Oak (Quescus alba)	
457	12	American Elm (Ulmus americana)	
458	7	Hackberry (Celtis occidentalis)	
459	20	White Oak (Quescus alba)	
460	7	Hackberry (Celtis occidentalis)	
461	12	White Oak (Quescus alba)	
462	7	Hackberry (Celtis occidentalis)	
463	6	Hackberry (Celtis occidentalis)	
464	7	Hackberry (Celtis occidentalis)	
465	16	American Elm (Ulmus americana)	
466	14	Box Elder (Acer negundo)	
467	20	Box Elder (Acer negundo)	
468	13	American Elm (Ulmus americana)	
469	6	Hackberry (Celtis occidentalis)	
470	22	Hackberry (Celtis occidentalis)	
471	18	Hackberry (Celtis occidentalis)	
472	17	White Oak (Quescus alba)	
473	13	Hackberry (Celtis occidentalis)	
474	9	Box Elder (Acer negundo)	
475	13	American Elm (Ulmus americana)	
476	13	Box Elder (Acer negundo)	
477	10	Hackberry (Celtis occidentalis)	
478	11	Hackberry (Celtis occidentalis)	
479	12	Hackberry (Celtis occidentalis)	
480	6	Hackberry (Celtis occidentalis)	
481	7	Hackberry (Celtis occidentalis)	
482	8	Box Elder (Acer negundo)	
483	11	Box Elder (Acer negundo)	
484	6	Box Elder (Acer negundo)	
485	8	Box Elder (Acer negundo)	
486	6	Box Elder (Acer negundo)	
487	8	Box Elder (Acer negundo)	
488	7	Box Elder (Acer negundo)	
489	8	Box Elder (Acer negundo)	
490	8	Box Elder (Acer negundo)	
491	9	Box Elder (Acer negundo)	
492	12	Box Elder (Acer negundo)	
493	8	Siberian Elm (Ulmus pumila)	
494	7	American Elm (Ulmus americana)	
495	7	Siberian Elm (Ulmus pumila)	
496	8	Green Ash (Fraxinus pennsylvanica)	REMOVE
497	6	American Elm (Ulmus americana)	REMOVE
498	12	Box Elder (Acer negundo)	REMOVE
499	13	American Elm (Ulmus americana)	REMOVE
500	13	American Elm (Ulmus americana)	REMOVE
501	6	Siberian Elm (Ulmus pumila)	REMOVE
502	6	Siberian Elm (Ulmus pumila)	REMOVE
503	6	Siberian Elm (Ulmus pumila)	REMOVE
504	6	Siberian Elm (Ulmus pumila)	REMOVE
505	6	Siberian Elm (Ulmus pumila)	REMOVE
506	13	American Elm (Ulmus americana)	REMOVE
507	8	Box Elder (Acer negundo)	REMOVE
508	22	American Elm (Ulmus americana)	REMOVE
509	8	Siberian Elm (Ulmus pumila)	REMOVE
510	6	Siberian Elm (Ulmus pumila)	REMOVE
511	6	American Elm (Ulmus americana)	REMOVE
512	10	American Elm (Ulmus americana)	REMOVE
513	7	Box Elder (Acer negundo)	REMOVE
514	9	Box Elder (Acer negundo)	REMOVE
515	6	American Elm (Ulmus americana)	REMOVE
516	18	American Elm (Ulmus americana)	REMOVE
517	13	Box Elder (Acer negundo)	REMOVE
518	10	Siberian Elm (Ulmus pumila)	REMOVE
519	7	American Elm (Ulmus americana)	REMOVE
520	17	Siberian Elm (Ulmus pumila)	REMOVE
521	6	American Elm (Ulmus americana)	REMOVE
522	13	American Elm (Ulmus americana)	REMOVE
523	28	Siberian Elm (Ulmus pumila)	REMOVE
524	40'	Red Pine (Pinus resinosa)	REMOVE
525	40'	Red Pine (Pinus resinosa)	REMOVE
526	40'	Red Pine (Pinus resinosa)	REMOVE
527	40'	Red Pine (Pinus resinosa)	REMOVE
528	40'	Red Pine (Pinus resinosa)	REMOVE
529	40'	Red Pine (Pinus resinosa)	REMOVE
530	7	American Elm (Ulmus americana)	REMOVE
531	10	Siberian Elm (Ulmus pumila)	REMOVE
532	13	Siberian Elm (Ulmus pumila)	REMOVE
533	8	Siberian Elm (Ulmus pumila)	REMOVE
534	40'	Red Pine (Pinus resinosa)	REMOVE
535	40'	Red Pine (Pinus resinosa)	REMOVE
536	20'	Red Pine (Pinus resinosa)	REMOVE
537	8	American Elm (Ulmus americana)	REMOVE
538	40'	Red Pine (Pinus resinosa)	REMOVE
539	20'	Red Pine (Pinus resinosa)	REMOVE
540	12	Siberian Elm (Ulmus pumila)	REMOVE
541	40'	Red Pine (Pinus resinosa)	REMOVE
542	13	Siberian Elm (Ulmus pumila)	REMOVE
543	7	Siberian Elm (Ulmus pumila)	REMOVE
544	40'	Red Pine (Pinus resinosa)	REMOVE
545	40'	Red Pine (Pinus resinosa)	REMOVE
546	40'	Red Pine (Pinus resinosa)	REMOVE
547	40'	Red Pine (Pinus resinosa)	REMOVE
548	6	Siberian Elm (Ulmus pumila)	REMOVE
549	11	Siberian Elm (Ulmus pumila)	REMOVE
550	11	Siberian Elm (Ulmus pumila)	REMOVE
551	30'	Red Pine (Pinus resinosa)	REMOVE
552	35'	Red Pine (Pinus resinosa)	REMOVE
553	35'	Red Pine (Pinus resinosa)	REMOVE
554	35'	Red Pine (Pinus resinosa)	REMOVE
555	7	Siberian Elm (Ulmus pumila)	REMOVE
556	7	Siberian Elm (Ulmus pumila)	REMOVE
557	25'	Red Pine (Pinus resinosa)	REMOVE
558	25'	Red Pine (Pinus resinosa)	REMOVE
559	40'	Red Pine (Pinus resinosa)	REMOVE
560	30	Siberian Elm (Ulmus pumila)	REMOVE
561	11	Siberian Elm (Ulmus pumila)	REMOVE
562	30'	Red Pine (Pinus resinosa)	REMOVE
563	35'	Red Pine (Pinus resinosa)	REMOVE
564	40'	Red Pine (Pinus resinosa)	REMOVE
565	40'	Red Pine (Pinus resinosa)	REMOVE
566	40'	Red Pine (Pinus resinosa)	REMOVE
567	35'	Red Pine (Pinus resinosa)	REMOVE
568	40'	Red Pine (Pinus resinosa)	REMOVE
569	40'	Red Pine (Pinus resinosa)	REMOVE
570	35'	Red Pine (Pinus resinosa)	REMOVE
571	40'	Red Pine (Pinus resinosa)	REMOVE
572	40'	Red Pine (Pinus resinosa)	REMOVE
573	40'	Red Pine (Pinus resinosa)	REMOVE
574	8	Siberian Elm (Ulmus pumila)	REMOVE
575	40'	Red Pine (Pinus resinosa)	REMOVE
576	6	Siberian Elm (Ulmus pumila)	REMOVE
577	6	Siberian Elm (Ulmus pumila)	REMOVE
578	7	Siberian Elm (Ulmus pumila)	REMOVE
579	6	Siberian Elm (Ulmus pumila)	REMOVE
580	40'	Red Pine (Pinus resinosa)	REMOVE
581	40'	Red Pine (Pinus resinosa)	REMOVE
582	40'	Red Pine (Pinus resinosa)	REMOVE
583	40'	Red Pine (Pinus resinosa)	REMOVE
584	40'	Red Pine (Pinus resinosa)	REMOVE
585	40'	Red Pine (Pinus resinosa)	
586	40'	Red Pine (Pinus resinosa)	
587	40'	Red Pine (Pinus resinosa)	
588	40'	Red Pine (Pinus resinosa)	
589	40'	Red Pine (Pinus resinosa)	
590	40'	Red Pine (Pinus resinosa)	
591	13	Siberian Elm (Ulmus pumila)	
592	20'	Red Pine (Pinus resinosa)	
593	25'	Red Pine (Pinus resinosa)	
594	15'	Red Pine (Pinus resinosa)	
595	15'	Red Pine (Pinus resinosa)	
596	20'	Red Pine (Pinus resinosa)	
597	40'	Red Pine (Pinus resinosa)	
598	14	Siberian Elm (Ulmus pumila)	REMOVE
599	8	Siberian Elm (Ulmus pumila)	
600	7	Siberian Elm (Ulmus pumila)	
601	6	Basswood (Tilia americana)	
602	9	Basswood (Tilia americana)	
603	11	Green Ash (Fraxinus pennsylvanica)	
604	9	White Oak (Quescus alba)	
605	6	Basswood (Tilia americana)	
606	15	Basswood (Tilia americana)	
607	21	Basswood (Tilia americana)	
608	6	White Oak (Quescus alba)	
609	6	Ironwood (Ostrya virginiana)	
610	8	Basswood (Tilia americana)	
611	6	White Oak (Quescus alba)	
612	6	White Oak (Quescus alba)	
613	6	Ironwood (Ostrya virginiana)	
614	6	Ironwood (Ostrya virginiana)	
615	6	Ironwood (Ostrya virginiana)	
616	12	Basswood (Tilia americana)	
617	6	Ironwood (Ostrya virginiana)	
618	6	Basswood (Tilia americana)	
619	6	Bitternut Hickory (Carya cordiformis)	
620	9	Basswood (Tilia americana)	
621	13	Basswood (Tilia americana)	
622	6	Ironwood (Ostrya virginiana)	
623	12	Basswood (Tilia americana)	
624	11	Red Oak (Quercus rubra)	
625	10	Green Ash (Fraxinus pennsylvanica)	
626	7	Green Ash (Fraxinus pennsylvanica)	
627	10	Basswood (Tilia americana)	
628	13	Green Ash (Fraxinus pennsylvanica)	
629	6	Hackberry (Celtis occidentalis)	
630	6	Hackberry (Celtis occidentalis)	
631	6	Box Elder (Acer negundo)	
632	14	Green Ash (Fraxinus pennsylvanica)	
633	10	Green Ash (Fraxinus pennsylvanica)	
634	7	Green Ash (Fraxinus pennsylvanica)	
635	10	Green Ash (Fraxinus pennsylvanica)	
636	13	Hackberry (Celtis occidentalis)	
637	10	American Elm (Ulmus americana)	
638	9	American Elm (Ulmus americana)	
639	19	American Elm (Ulmus americana)	
640	6	American Elm (Ulmus americana)	
641	13	Green Ash (Fraxinus pennsylvanica)	
642	13	Box Elder (Acer negundo)	
643	15	Box Elder (Acer negundo)	
644	13	Green Ash (Fraxinus pennsylvanica)	
645	7	American Elm (Ulmus americana)	
646	9	Box Elder (Acer negundo)	
647	13	Box Elder (Acer negundo)	
648	12	Green Ash (Fraxinus pennsylvanica)	
649	12	White Oak (Quescus alba)	
650	6	Basswood (Tilia americana)	
651	6	Green Ash (Fraxinus pennsylvanica)	
652	12	Green Ash (Fraxinus pennsylvanica)	
653	18	Hackberry (Celtis occidentalis)	
654	9	Box Elder (Acer negundo)	
655	6	Box Elder (Acer negundo)	
656	13	Hackberry (Celtis occidentalis)	
657	14	Green Ash (Fraxinus pennsylvanica)	
658	13	Box Elder (Acer negundo)	
659	9	Green Ash (Fraxinus pennsylvanica)	
660	11	American Elm (Ulmus americana)	
661	16	Green Ash (Fraxinus pennsylvanica)	REMOVE
662	7	Hackberry (Celtis occidentalis)	
663	9	Green Ash (Fraxinus pennsylvanica)	REMOVE
664	8	Green Ash (Fraxinus pennsylvanica)	
665	9	Green Ash (Fraxinus pennsylvanica)	REMOVE
666	14	Green Ash (Fraxinus pennsylvanica)	REMOVE
667	9	Green Ash (Fraxinus pennsylvanica)	REMOVE
668	6	American Elm (Ulmus americana)	REMOVE
669	7	Green Ash (Fraxinus pennsylvanica)	REMOVE
670	9	Green Ash (Fraxinus pennsylvanica)	
671	7	Green Ash (Fraxinus pennsylvanica)	
672	14	Hackberry (Celtis occidentalis)	
673	22	Green Ash (Fraxinus pennsylvanica)	REMOVE
674	6	Green Ash (Fraxinus pennsylvanica)	
675	9	Box Elder (Acer negundo)	
676	8	Box Elder (Acer negundo)	
677	11	Green Ash (Fraxinus pennsylvanica)	
678	12	Green Ash (Fraxinus pennsylvanica)	
679	9	Green Ash (Fraxinus pennsylvanica)	
680	6	Box Elder (Acer negundo)	
681	11	American Elm (Ulmus americana)	
682	6	American Elm (Ulmus americana)	
683	12	Green Ash (Fraxinus pennsylvanica)	
684	27	Green Ash (Fraxinus pennsylvanica)	
685	6	American Elm (Ulmus americana)	
686	11	Box Elder (Acer negundo)	
687	7	American Elm (Ulmus americana)	
688	8	American Elm (Ulmus americana)	
689	6	Green Ash (Fraxinus pennsylvanica)	
690	10	Green Ash (Fraxinus pennsylvanica)	
691	11	Hackberry (Celtis occidentalis)	
692	6	Box Elder (Acer negundo)	REMOVE
693	15	Green Ash (Fraxinus pennsylvanica)	REMOVE
694	6	Box Elder (Acer negundo)	REMOVE
695	12	Hackberry (Celtis occidentalis)	REMOVE
696	12	Hackberry (Celtis occidentalis)	REMOVE
697	10	Box Elder (Acer negundo)	
698	7	Hackberry (Celtis occidentalis)	
699	6	Hackberry (Celtis occidentalis)	
700	8	Hackberry (Celtis occidentalis)	REMOVE
701	6	Siberian Elm (Ulmus pumila)	
702	40'	Red Pine (Pinus resinosa)	
703	40'	Red Pine (Pinus resinosa)	
704	35'	Red Pine (Pinus resinosa)	
705	35'	Red Pine (Pinus resinosa)	
706	35'	Red Pine (Pinus resinosa)	
707	30'	Red Pine (Pinus resinosa)	
708	22	Siberian Elm (Ulmus pumila)	
709	15'	Red Pine (Pinus resinosa)	
710	40'	Red Pine (Pinus resinosa)	
711	15'	Red Pine (Pinus resinosa)	
712	40'	Red Pine (Pinus resinosa)	
713	40'	Red Pine (Pinus resinosa)	
714	12'	Red Pine (Pinus resinosa)	
715	40'	Red Pine (Pinus resinosa)	
716	12'	Red Pine (Pinus resinosa)	
717	12'	Red Pine (Pinus resinosa)	
718	15'	Red Pine (Pinus resinosa)	
719	40'	Red Pine (Pinus resinosa)	
720	40'	Red Pine (Pinus resinosa)	
721	40'	Red Pine (Pinus resinosa)	
722	35'	Red Pine (Pinus resinosa)	
723	20'	Red Pine (Pinus resinosa)	
724	40'	Red Pine (Pinus resinosa)	
725	11	Siberian Elm (Ulmus pumila)	
726	40'	Red Pine (Pinus resinosa)	
727	40'	Red Pine (Pinus resinosa)	
728	40'	Red Pine (Pinus resinosa)	
729	20'	Red Pine (Pinus resinosa)	
730	15'	Red Pine (Pinus resinosa)	
731	15'	Red Pine (Pinus resinosa)	
732	15'	Red Pine (Pinus resinosa)	
733	20'	Red Pine (Pinus resinosa)	
734	25'	Red Pine (Pinus resinosa)	
735	25'	Red Pine (Pinus resinosa)	
736	40'	Red Pine (Pinus resinosa)	
737	25'	Red Pine (Pinus resinosa)	
738	35'	Red Pine (Pinus resinosa)	
739	40'	Red Pine (Pinus resinosa)	
740	40'	Red Pine (Pinus resinosa)	
741	40'	Red Pine (Pinus resinosa)	
742	40'	Red Pine (Pinus resinosa)	
743	40'	Red Pine (Pinus resinosa)	
744	40'	Red Pine (Pinus resinosa)	
745	30'	Red Pine (Pinus resinosa)	
746	20'	Red Pine (Pinus resinosa)	
747	40'	Red Pine (Pinus resinosa)	
748	25'	Red Pine (Pinus resinosa)	
749	25'	Red Pine (Pinus resinosa)	
750	40'	Red Pine (Pinus resinosa)	
751	40'	Red Pine (Pinus resinosa)	
752	25'	Red Pine (Pinus resinosa)	
753	30'	Red Pine (Pinus resinosa)	
754	25'	Red Pine (Pinus resinosa)	
755	6	Siberian Elm (Ulmus pumila)	
756	40'	Red Pine (Pinus resinosa)	
757	40'	Red Pine (Pinus resinosa)	
758	35'	Red Pine (Pinus resinosa)	
759	40'	Red Pine (Pinus resinosa)	
760	35'	Red Pine (Pinus resinosa)	
761	35'	Red Pine (Pinus resinosa)	
762	7	Box Elder (Acer negundo)	
763	30'	Red Pine (Pinus resinosa)	
764	35'	Red Pine (Pinus resinosa)	
765	30'	Red Pine (Pinus resinosa)	
766	20'	Red Pine (Pinus resinosa)	
767	35'	Red Pine (Pinus resinosa)	
768	30'	Red Pine (Pinus resinosa)	
769	25'	Red Pine (Pinus resinosa)	
770	35'	Red Pine (Pinus resinosa)	
771	35'	Red Pine (Pinus resinosa)	
772	25'	Red Pine (Pinus resinosa)	
773	25'	Red Pine (Pinus resinosa)	
774	25'	Red Pine (Pinus resinosa)	
775	25'	Red Pine (Pinus resinosa)	
776	20'	Red Pine (Pinus resinosa)	
777	15'	Red Pine (Pinus resinosa)	
778	25'	Red Pine (Pinus resinosa)	
779	30'	Red Pine (Pinus resinosa)	
780	7	Box Elder (Acer negundo)	
781	25'	Red Pine (Pinus resinosa)	
782	30'	Red Pine (Pinus resinosa)	
783	7	Hackberry (Celtis occidentalis)	
784	6	Hackberry (Celtis occidentalis)	
785	20'	Red Pine (Pinus resinosa)	
786	6	American Elm (Ulmus americana)	
787	20'	Red Pine (Pinus resinosa)	
788	6	American Elm (Ulmus americana)	
789	12	Siberian Elm (Ulmus pumila)	
790	10	Box Elder (Acer negundo)	
791	8	Box Elder (Acer negundo)	
792	6	Siberian Elm (Ulmus pumila)	
793	35'	Red Pine (Pinus resinosa)	
794	30'	Red Pine (Pinus resinosa)	
795	35'	Red Pine (Pinus resinosa)	
796	35'	Red Pine (Pinus resinosa)	
797	7	Siberian Elm (Ulmus pumila)	
798	40'	Red Pine (Pinus resinosa)	
799	6	American Elm (Ulmus americana)	
800	40'	Red Pine (Pinus resinosa)	
801	40'	Red Pine (Pinus resinosa)	
802	25'	Red Pine (Pinus resinosa)	
803	35'	Red Pine (Pinus resinosa)	
804	20'	Red Pine (Pinus resinosa)	
805	6	American Elm (Ulmus americana)	
806	6	Hackberry (Celtis occidentalis)	
807	40'	Red Pine (Pinus resinosa)	

24.15 (LIMS TECH) | JOHNNIE WORKMAN | 4/4/2025 2:09:49 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-L0.01-TREE INVENTORY 2.DWG

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.

Print Name: JOHN R. WORKMAN

Date 03/28/2025 License # 59119

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY
DESIGNED BY
CHECKED BY JRW
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

TREE INVENTORY 2

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
L0.03
41 OF 45
REV.

808	35'	Red Pine (Pinus resinosa)	
809	35'	Red Pine (Pinus resinosa)	
810	35'	Red Pine (Pinus resinosa)	
811	30'	Red Pine (Pinus resinosa)	
812	30'	Red Pine (Pinus resinosa)	
813	6	Box Elder (Acer negundo)	
814	7	Siberian Elm (Ulmus pumila)	
815	9	Siberian Elm (Ulmus pumila)	
816	8	Siberian Elm (Ulmus pumila)	
817	6	Siberian Elm (Ulmus pumila)	
818	6	Box Elder (Acer negundo)	
819	7	Siberian Elm (Ulmus pumila)	
820	20'	Red Pine (Pinus resinosa)	
821	40'	Red Pine (Pinus resinosa)	
822	30'	Red Pine (Pinus resinosa)	
823	30'	Red Pine (Pinus resinosa)	
824	6	Siberian Elm (Ulmus pumila)	
825	10	Siberian Elm (Ulmus pumila)	
826	35'	Red Pine (Pinus resinosa)	
827	25'	Red Pine (Pinus resinosa)	
828	30'	Red Pine (Pinus resinosa)	
829	25'	Red Pine (Pinus resinosa)	
830	20'	Red Pine (Pinus resinosa)	
831	30'	Red Pine (Pinus resinosa)	
832	35'	Red Pine (Pinus resinosa)	
833	7	Siberian Elm (Ulmus pumila)	
834	8	Siberian Elm (Ulmus pumila)	
835	7	Siberian Elm (Ulmus pumila)	REMOVE
836	40'	Red Pine (Pinus resinosa)	
837	20'	Red Pine (Pinus resinosa)	
838	25'	Red Pine (Pinus resinosa)	
839	23	Siberian Elm (Ulmus pumila)	
840	35'	Red Pine (Pinus resinosa)	
841	6	Siberian Elm (Ulmus pumila)	
842	8	Siberian Elm (Ulmus pumila)	REMOVE
843	30'	Red Pine (Pinus resinosa)	
844	35'	Red Pine (Pinus resinosa)	
845	35'	Red Pine (Pinus resinosa)	
846	35'	Red Pine (Pinus resinosa)	
847	40'	Red Pine (Pinus resinosa)	
848	40'	Red Pine (Pinus resinosa)	
849	40'	Red Pine (Pinus resinosa)	
850	40'	Red Pine (Pinus resinosa)	
851	35'	Red Pine (Pinus resinosa)	
852	6	Siberian Elm (Ulmus pumila)	
853	30'	Red Pine (Pinus resinosa)	
854	10	Siberian Elm (Ulmus pumila)	
855	8	Siberian Elm (Ulmus pumila)	
856	7	Siberian Elm (Ulmus pumila)	
857	8	Siberian Elm (Ulmus pumila)	
858	35'	Red Pine (Pinus resinosa)	
859	40'	Red Pine (Pinus resinosa)	
860	40'	Red Pine (Pinus resinosa)	
861	8	Siberian Elm (Ulmus pumila)	
862	35'	Red Pine (Pinus resinosa)	
863	30'	Red Pine (Pinus resinosa)	
864	30'	Red Pine (Pinus resinosa)	
865	8	American Elm (Ulmus americana)	
866	40'	Red Pine (Pinus resinosa)	
867	40'	Red Pine (Pinus resinosa)	
868	40'	Red Pine (Pinus resinosa)	
869	40'	Red Pine (Pinus resinosa)	
870	40'	Red Pine (Pinus resinosa)	
871	40'	Red Pine (Pinus resinosa)	
872	40'	Red Pine (Pinus resinosa)	
873	40'	Red Pine (Pinus resinosa)	
874	40'	Red Pine (Pinus resinosa)	
875	40'	Red Pine (Pinus resinosa)	
876	40'	Red Pine (Pinus resinosa)	
877	40'	Red Pine (Pinus resinosa)	
878	40'	Red Pine (Pinus resinosa)	
879	40'	Red Pine (Pinus resinosa)	
880	40'	Red Pine (Pinus resinosa)	
881	30'	Red Pine (Pinus resinosa)	
882	30'	Red Pine (Pinus resinosa)	
883	25'	Red Pine (Pinus resinosa)	
884	25'	Red Pine (Pinus resinosa)	
885	25'	Red Pine (Pinus resinosa)	
886	25'	Red Pine (Pinus resinosa)	
887	9	Siberian Elm (Ulmus pumila)	
888	15'	Red Pine (Pinus resinosa)	
890	15'	Red Pine (Pinus resinosa)	
891	15'	Red Pine (Pinus resinosa)	
892	6	Siberian Elm (Ulmus pumila)	
893	15'	Red Pine (Pinus resinosa)	
894	15'	Red Pine (Pinus resinosa)	
895	25'	Red Pine (Pinus resinosa)	
896	30'	Red Pine (Pinus resinosa)	
897	30'	Red Pine (Pinus resinosa)	
898	30'	Red Pine (Pinus resinosa)	
899	25'	Red Pine (Pinus resinosa)	
900	25'	Red Pine (Pinus resinosa)	
901	30'	Red Pine (Pinus resinosa)	
902	15'	Red Pine (Pinus resinosa)	
903	30'	Red Pine (Pinus resinosa)	
904	30'	Red Pine (Pinus resinosa)	
905	30'	Red Pine (Pinus resinosa)	
906	20'	Red Pine (Pinus resinosa)	
907	20'	Red Pine (Pinus resinosa)	
908	20'	Red Pine (Pinus resinosa)	
909	20'	Red Pine (Pinus resinosa)	
910	25'	Red Pine (Pinus resinosa)	
911	40'	Red Pine (Pinus resinosa)	
912	40'	Red Pine (Pinus resinosa)	
913	30'	Red Pine (Pinus resinosa)	
914	40'	Red Pine (Pinus resinosa)	
915	40'	Red Pine (Pinus resinosa)	
916	40'	Red Pine (Pinus resinosa)	
917	40'	Red Pine (Pinus resinosa)	
918	40'	Red Pine (Pinus resinosa)	
919	30'	Red Pine (Pinus resinosa)	
920	40'	Red Pine (Pinus resinosa)	
921	40'	Red Pine (Pinus resinosa)	
922	40'	Red Pine (Pinus resinosa)	
923	40'	Red Pine (Pinus resinosa)	
924	40'	Red Pine (Pinus resinosa)	
925	40'	Red Pine (Pinus resinosa)	
926	40'	Red Pine (Pinus resinosa)	
927	6	American Elm (Ulmus americana)	
928	40'	Red Pine (Pinus resinosa)	
929	40'	Red Pine (Pinus resinosa)	
930	40'	Red Pine (Pinus resinosa)	
931	40'	Red Pine (Pinus resinosa)	
932	40'	Red Pine (Pinus resinosa)	
933	40'	Red Pine (Pinus resinosa)	
934	40'	Red Pine (Pinus resinosa)	
935	40'	Red Pine (Pinus resinosa)	
936	40'	Red Pine (Pinus resinosa)	
937	40.8	Siberian Elm (Ulmus pumila)	
938	40'	Red Pine (Pinus resinosa)	
939	30'	Red Pine (Pinus resinosa)	
940	25'	Red Pine (Pinus resinosa)	
941	25'	Red Pine (Pinus resinosa)	
942	25'	Red Pine (Pinus resinosa)	
943	30'	Red Pine (Pinus resinosa)	
944	15'	Red Pine (Pinus resinosa)	
945	20'	Red Pine (Pinus resinosa)	
946	20'	Red Pine (Pinus resinosa)	
947	25'	Red Pine (Pinus resinosa)	
948	30'	Red Pine (Pinus resinosa)	
949	30'	Red Pine (Pinus resinosa)	
950	15'	Red Pine (Pinus resinosa)	
951	25'	Red Pine (Pinus resinosa)	
952	20'	Red Pine (Pinus resinosa)	
953	40'	Red Pine (Pinus resinosa)	
954	30'	Red Pine (Pinus resinosa)	
955	30'	Red Pine (Pinus resinosa)	
956	25'	Red Pine (Pinus resinosa)	
957	30'	Red Pine (Pinus resinosa)	
958	30'	Red Pine (Pinus resinosa)	
959	30'	Red Pine (Pinus resinosa)	
960	40'	Red Pine (Pinus resinosa)	
961	40'	Red Pine (Pinus resinosa)	
962	35'	Red Pine (Pinus resinosa)	
963	15'	Red Pine (Pinus resinosa)	
964	40'	Red Pine (Pinus resinosa)	
965	15'	Red Pine (Pinus resinosa)	
966	40'	Red Pine (Pinus resinosa)	
967	30'	Red Pine (Pinus resinosa)	
968	15'	Red Cedar (Juniperous virginiana)	
969	30'	Red Pine (Pinus resinosa)	
970	35'	Red Pine (Pinus resinosa)	
971	25'	Red Pine (Pinus resinosa)	
972	35'	Red Pine (Pinus resinosa)	
973	40'	Red Pine (Pinus resinosa)	
974	25'	Red Pine (Pinus resinosa)	
975	25'	Red Pine (Pinus resinosa)	
976	30'	Red Pine (Pinus resinosa)	
977	30'	Red Pine (Pinus resinosa)	
978	30'	Red Pine (Pinus resinosa)	
979	40'	Red Pine (Pinus resinosa)	
980	40'	Red Pine (Pinus resinosa)	
981	30'	Red Pine (Pinus resinosa)	
982	15'	Red Pine (Pinus resinosa)	
983	30'	Red Pine (Pinus resinosa)	
984	13	Siberian Elm (Ulmus pumila)	
985	25'	Red Pine (Pinus resinosa)	
986	15'	Red Pine (Pinus resinosa)	
987	25'	Red Pine (Pinus resinosa)	
988	30'	Red Pine (Pinus resinosa)	
989	40'	Red Pine (Pinus resinosa)	
990	40'	Red Pine (Pinus resinosa)	
991	40'	Red Pine (Pinus resinosa)	
992	40'	Red Pine (Pinus resinosa)	
993	30'	Red Pine (Pinus resinosa)	
994	20'	Red Pine (Pinus resinosa)	
995	20'	Red Pine (Pinus resinosa)	
996	7	Box Elder (Acer negundo)	
997	40'	Red Pine (Pinus resinosa)	
998	40'	Red Pine (Pinus resinosa)	
999	15'	Red Pine (Pinus resinosa)	
1000	30'	Red Pine (Pinus resinosa)	
1001	40'	Red Pine (Pinus resinosa)	
1002	40'	Red Pine (Pinus resinosa)	
1003	40'	Red Pine (Pinus resinosa)	
1004	30'	Red Pine (Pinus resinosa)	
1005	40'	Red Pine (Pinus resinosa)	
1006	40'	Red Pine (Pinus resinosa)	
1007	35'	Red Pine (Pinus resinosa)	
1008	35'	Red Pine (Pinus resinosa)	
1009	35'	Red Pine (Pinus resinosa)	
1010	30'	Red Pine (Pinus resinosa)	
1011	35'	Red Pine (Pinus resinosa)	
1012	35'	Red Pine (Pinus resinosa)	
1013	40'	Red Pine (Pinus resinosa)	
1014	40'	Red Pine (Pinus resinosa)	
1015	40'	Red Pine (Pinus resinosa)	
1016	40'	Red Pine (Pinus resinosa)	
1017	40'	Red Pine (Pinus resinosa)	
1018	30'	Red Pine (Pinus resinosa)	
1019	40'	Red Pine (Pinus resinosa)	
1020	40'	Red Pine (Pinus resinosa)	
1021	40'	Red Pine (Pinus resinosa)	
1022	40'	Red Pine (Pinus resinosa)	
1023	35'	Red Pine (Pinus resinosa)	
1024	40'	Red Pine (Pinus resinosa)	
1025	40'	Red Pine (Pinus resinosa)	
1026	40'	Red Pine (Pinus resinosa)	
1027	40'	Red Pine (Pinus resinosa)	
1028	40'	Red Pine (Pinus resinosa)	
1029	40'	Red Pine (Pinus resinosa)	
1030	30'	Red Pine (Pinus resinosa)	
1031	40'	Red Pine (Pinus resinosa)	
1032	25'	Red Pine (Pinus resinosa)	
1033	40'	Red Pine (Pinus resinosa)	
1034	40'	Red Pine (Pinus resinosa)	
1035	40'	Red Pine (Pinus resinosa)	
1036	8	Box Elder (Acer negundo)	
1037	12	Siberian Elm (Ulmus pumila)	
1038	40'	Red Pine (Pinus resinosa)	
1039	40'	Red Pine (Pinus resinosa)	
1040	40'	Red Pine (Pinus resinosa)	
1041	20'	Red Pine (Pinus resinosa)	
1042	20'	Red Pine (Pinus resinosa)	REMOVE
1043	6	Green Ash (Fraxinus pennsylvanica)	REMOVE
1044	7	Siberian Elm (Ulmus pumila)	REMOVE
1045	40'	Red Pine (Pinus resinosa)	REMOVE
1046	40'	Red Pine (Pinus resinosa)	REMOVE
1047	8	Box Elder (Acer negundo)	REMOVE
1048	40'	Red Pine (Pinus resinosa)	REMOVE
1049	8	Box Elder (Acer negundo)	REMOVE
1050	6	Basswood (Tilia americana)	REMOVE
1051	19	Box Elder (Acer negundo)	REMOVE
1052	23	Silver Maple (Acer saccharinum)	REMOVE
1053	8	Box Elder (Acer negundo)	REMOVE
1054	6	Silver Maple (Acer saccharinum)	REMOVE
1055	7	Box Elder (Acer negundo)	REMOVE
1056	8	Green Ash (Fraxinus pennsylvanica)	REMOVE
1057	6	Box Elder (Acer negundo)	REMOVE
1058	15	Box Elder (Acer negundo)	REMOVE
1059	40'	Red Pine (Pinus resinosa)	REMOVE
1060	10	Hackberry (Celtis occidentalis)	REMOVE
1061	10	Box Elder (Acer negundo)	REMOVE
1062	7	Box Elder (Acer negundo)	REMOVE
1063	7	Box Elder (Acer negundo)	REMOVE
1064	11	Green Ash (Fraxinus pennsylvanica)	REMOVE
1065	9	Box Elder (Acer negundo)	REMOVE
1066	7	Box Elder (Acer negundo)	REMOVE
1067	8	Hackberry (Celtis occidentalis)	REMOVE
1068	6	Green Ash (Fraxinus pennsylvanica)	REMOVE
1069	40'	Red Pine (Pinus resinosa)	REMOVE
1070	40'	Red Pine (Pinus resinosa)	REMOVE
1071	40'	Red Pine (Pinus resinosa)	REMOVE
1072	6	Box Elder (Acer negundo)	REMOVE
1073	40'	Red Pine (Pinus resinosa)	REMOVE
1074	6	Box Elder (Acer negundo)	REMOVE
1075	6	American Elm (Ulmus americana)	REMOVE
1076	35'	Red Pine (Pinus resinosa)	
1077	30'	Red Pine (Pinus resinosa)	
1078	7	American Elm (Ulmus americana)	
1079	40'	Red Pine (Pinus resinosa)	
1080	35'	Red Pine (Pinus resinosa)	
1081	12	Box Elder (Acer negundo)	
1082	30'	Red Pine (Pinus resinosa)	
1083	40'	Red Pine (Pinus resinosa)	
1084	30'	Red Pine (Pinus resinosa)	
1085	6	Green Ash (Fraxinus pennsylvanica)	
1086	40'	Red Pine (Pinus resinosa)	
1087	10	Basswood (Tilia americana)	
1088	6	Red Oak (Quercus rubra)	
1089	6	White Oak (Quescus alba)	
1090	6	White Oak (Quescus alba)	
1091	10	White Oak (Quescus alba)	
1092	6	White Oak (Quescus alba)	
1093	10	White Oak (Quescus alba)	
1094	8	Basswood (Tilia americana)	
1095	8	Basswood (Tilia americana)	
1096	13	Basswood (Tilia americana)	
1097	15	Red Oak (Quercus rubra)	
1098	9	Basswood (Tilia americana)	
1099	8	Basswood (Tilia americana)	
1100	7	Hackberry (Celtis occidentalis)	
1101	6	Hackberry (Celtis occidentalis)	REMOVE
1102	16	Green Ash (Fraxinus pennsylvanica)	
1103	9	Hackberry (Celtis occidentalis)	
1104	21	Green Ash (Fraxinus pennsylvanica)	
1105	13	Green Ash (Fraxinus pennsylvanica)	
1106	7	Green Ash (Fraxinus pennsylvanica)	
1107	13	Green Ash (Fraxinus pennsylvanica)	
1108	24	Box Elder (Acer negundo)	
1109	13	American Elm (Ulmus americana)	
1110	8	American Elm (Ulmus americana)	
1111	13	Green Ash (Fraxinus pennsylvanica)	REMOVE
1112	8	Hackberry (Celtis occidentalis)	REMOVE
1113	7	Hackberry (Celtis occidentalis)	
1114	6	Box Elder (Acer negundo)	
1115	13	Box Elder (Acer negundo)	
1116	7	Hackberry (Celtis occidentalis)	
1117	9	Box Elder (Acer negundo)	
1118	7	Hackberry (Celtis occidentalis)	
1119	6	Hackberry (Celtis occidentalis)	
1120	7	Hackberry (Celtis occidentalis)	
1121	12	American Elm (Ulmus americana)	
1122	7	Hackberry (Celtis occidentalis)	
1123	23	Green Ash (Fraxinus pennsylvanica)	
1124	7	Hackberry (Celtis occidentalis)	
1125	8	Box Elder (Acer negundo)	
1126	16	Hackberry (Celtis occidentalis)	
1127	7	Hackberry (Celtis occidentalis)	
1128	40	Red Oak (Quercus rubra)	
1129	6	Box Elder (Acer negundo)	
1130	9	American Elm (Ulmus americana)	
1131	6	Hackberry (Celtis occidentalis)	
1132	13	Box Elder (Acer negundo)	
1133	13	Box Elder (Acer negundo)	
1134	13	American Elm (Ulmus americana)	
1135	11	Hackberry (Celtis occidentalis)	
1136	7	Green Ash (Fraxinus pennsylvanica)	
1137	12	Silver Maple (Acer saccharinum)	
1138	6	Green Ash (Fraxinus pennsylvanica)	
1139	7	Basswood (Tilia americana)	
1140	6	Hackberry (Celtis occidentalis)	
1141	11	Box Elder (Acer negundo)	
1142	6	Hackberry (Celtis occidentalis)	
1143	8	Box Elder (Acer negundo)	
1144	7	Hackberry (Celtis occidentalis)	
1145	6	Hackberry (Celtis occidentalis)	
1146	8	Hackberry (Celtis occidentalis)	
1147	8	Box Elder (Acer negundo)	REMOVE
1148	11	Box Elder (Acer negundo)	
1149	9	American Elm (Ulmus americana)	
1150	17	Box Elder (Acer negundo)	
1151	8	American Elm (Ulmus americana)	
1152	9	American Elm (Ulmus americana)	
1153	7	Box Elder (Acer negundo)	
1154	8	Hackberry (Celtis occidentalis)	
1155	8	Box Elder (Acer negundo)	
1156	17	Box Elder (Acer negundo)	
1157	10	American Elm (Ulmus americana)	
1158	6	Silver Maple (Acer saccharinum)	
1159	13	Box Elder (Acer negundo)	
1160	12	American Elm (Ulmus americana)	
1161	7	Green Ash (Fraxinus pennsylvanica)	
1162	9	Hackberry (Celtis occidentalis)	
1163	9	Box Elder (Acer negundo)	
1164	8	American Elm (Ulmus americana)	
1165	14	Box Elder (Acer negundo)	
1166	15	Green Ash (Fraxinus pennsylvanica)	
1167	13	Box Elder (Acer negundo)	
1168	14	Box Elder (Acer negundo)	
1169	23	Box Elder (Acer negundo)	
1170	27	Silver Maple (Acer saccharinum)	
1171	6	American Elm (Ulmus americana)	
1172	6	Box Elder (Acer negundo)	
1173	26	Silver Maple (Acer saccharinum)	
1174	6	Hackberry (Celtis occidentalis)	
1175	6	Box Elder (Acer negundo)	
1176	11	Hackberry (Celtis occidentalis)	
1177	7	Hackberry (Celtis occidentalis)	
1178	10	Hackberry (Celtis occidentalis)	
1179	11	Hackberry (Celtis occidentalis)	
1180	14	Hackberry (Celtis occidentalis)	
1181	6	Hackberry (Celtis occidentalis)	
1182	11	Hackberry (Celtis occidentalis)	
1183	28	Hackberry (Celtis occidentalis)	
1184	31	Basswood (Tilia americana)	
1185	9	Hackberry (Celtis occidentalis)	
1186	17	Green Ash (Fraxinus pennsylvanica)	
1187	16	Silver Maple (Acer saccharinum)	
1188	27	Silver Maple (Acer saccharinum)	
1189	10	Green Ash (Fraxinus pennsylvanica)	
1190	20	Green Ash (Fraxinus pennsylvanica)	
1191	9	Green Ash (Fraxinus pennsylvanica)	
1192	33	Silver Maple (Acer saccharinum)	
1193	28	Green Ash (Fraxinus pennsylvanica)	
1194	8	American Elm (Ulmus americana)	
1195	12	American Elm (Ulmus americana)	
1196	8	Box Elder (Acer negundo)	
1197	8	Hackberry (Celtis occidentalis)	
1198	10	Hackberry (Celtis occidentalis)	
1199	19	Green Ash (Fraxinus pennsylvanica)	
1200	29	Silver Maple (Acer saccharinum)	
1201	8	Box Elder (Acer negundo)	
1202	14	Hackberry (Celtis occidentalis)	
1203	14	White Oak (Quescus alba)	
1204	10	Box Elder (Acer negundo)	
1205	32	Hackberry (Celtis occidentalis)	
1206	31	Silver Maple (Acer saccharinum)	
1207	6	Green Ash (Fraxinus pennsylvanica)	
1208	15	Silver Maple (Acer saccharinum)	
1209	11	Green Ash (Fraxinus pennsylvanica)	
1210	10	Green Ash (Fraxinus pennsylvanica)	
1211	8	Green Ash (Fraxinus pennsylvanica)	
1212	6	Green Ash (Fraxinus pennsylvanica)	
1213	10	Green Ash (Fraxinus pennsylvanica)	
1214	7	Green Ash (Fraxinus pennsylvanica)	
1215	6	Green Ash (Fraxinus pennsylvanica)	
1216	31	Silver Maple (Acer saccharinum)	
1217	17	Hackberry (Celtis occidentalis)	
1218	10	Hackberry (Celtis occidentalis)	
1219	11	American Elm (Ulmus americana)	
1220	32	Silver Maple (Acer saccharinum)	
1221	32	Silver Maple (Acer saccharinum)	
1222	7	Green Ash (Fraxinus pennsylvanica)	
1223	13	Silver Maple (Acer saccharinum)	
1224	17	Silver Maple (Acer saccharinum)	
1225	12	Silver Maple (Acer saccharinum)	
1226	18	Hackberry (Celtis occidentalis)	
1227	12	Box Elder (Acer negundo)	
1228	14	Hackberry (Celtis occidentalis)	
1229	9	Box Elder (Acer negundo)	
1230	12	Hackberry (Celtis occidentalis)	
1231	7	Hackberry (Celtis occidentalis)	
1232	10	Box Elder (Acer negundo)	
1233	6	Hackberry (Celtis occidentalis)	
1234	26	Green Ash (Fraxinus pennsylvanica)	
1235	15	American Elm (Ulmus americana)	

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.

Print Name: JOHN R. WORKMAN

Date 03/28/2025 License # 59119

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

DRAWN BY
DESIGNED BY
CHECKED BY JRW
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

TREE INVENTORY 3

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET L0.04
42 OF 45
REV.

24.15 (LMS TECH) | JOHNNIE WORKMAN | 4/4/2025 2:09:49 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-L0.04-TREE.DWG-L0.04-TREE INVENTORY 3

1236	32	Silver Maple (Acer saccharinum)	
1237	17	Hackberry (Celtis occidentalis)	
1238	13	American Elm (Ulmus americana)	
1239	33	Hackberry (Celtis occidentalis)	
1240	12	Hackberry (Celtis occidentalis)	
1241	13	Hackberry (Celtis occidentalis)	
1242	30	Silver Maple (Acer saccharinum)	
1243	17	Green Ash (Fraxinus pennsylvanica)	
1244	13	Hackberry (Celtis occidentalis)	
1245	8	Box Elder (Acer negundo)	
1246	7	Box Elder (Acer negundo)	
1247	22	Silver Maple (Acer saccharinum)	
1248	27	Silver Maple (Acer saccharinum)	
1249	25	Silver Maple (Acer saccharinum)	
1250	7	Green Ash (Fraxinus pennsylvanica)	
1251	42	Silver Maple (Acer saccharinum)	
1252	8	Hackberry (Celtis occidentalis)	
1253	15	Box Elder (Acer negundo)	
1254	7	Hackberry (Celtis occidentalis)	
1255	12	American Elm (Ulmus americana)	
1256	9	Hackberry (Celtis occidentalis)	
1257	14	Green Ash (Fraxinus pennsylvanica)	
1258	8	American Elm (Ulmus americana)	
1259	23	Basswood (Tilia americana)	
1260	12	Box Elder (Acer negundo)	
1261	8	Box Elder (Acer negundo)	
1262	10	Box Elder (Acer negundo)	
1263	8	Hackberry (Celtis occidentalis)	
1264	7	American Elm (Ulmus americana)	
1265	14	Silver Maple (Acer saccharinum)	
1266	14	Hackberry (Celtis occidentalis)	
1267	7	Hackberry (Celtis occidentalis)	
1268	9	Hackberry (Celtis occidentalis)	
1269	6	Box Elder (Acer negundo)	
1270	9	Box Elder (Acer negundo)	
1271	7	Silver Maple (Acer saccharinum)	
1272	8	Silver Maple (Acer saccharinum)	
1273	12	Silver Maple (Acer saccharinum)	
1274	35	Silver Maple (Acer saccharinum)	
1275	10	Box Elder (Acer negundo)	
1276	14	Silver Maple (Acer saccharinum)	
1277	10	Hackberry (Celtis occidentalis)	
1278	11	Hackberry (Celtis occidentalis)	
1279	10	Hackberry (Celtis occidentalis)	
1280	9	Green Ash (Fraxinus pennsylvanica)	
1281	10	Box Elder (Acer negundo)	
1282	7	Box Elder (Acer negundo)	
1283	7	American Elm (Ulmus americana)	
1284	10	Box Elder (Acer negundo)	
1285	10	Box Elder (Acer negundo)	
1286	7	Box Elder (Acer negundo)	
1287	12	Hackberry (Celtis occidentalis)	
1288	15	Green Ash (Fraxinus pennsylvanica)	
1289	10	Hackberry (Celtis occidentalis)	

24.1S (LMS TECH) | JOHNNIE WORKMAN | 4/4/2025 2:09:49 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-L0.01-TREE.DWG L0.05 TREE INVENTORY 4

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.

Print Name: JOHN R. WORKMAN

Date 03/28/2025 License # 59119

PRELIMINARY 08/07/2024
DESIGN REVIEW 11/14/2024
PERMIT SUBMITTAL 03/28/2025
CONSTRUCTION DOCUMENTS

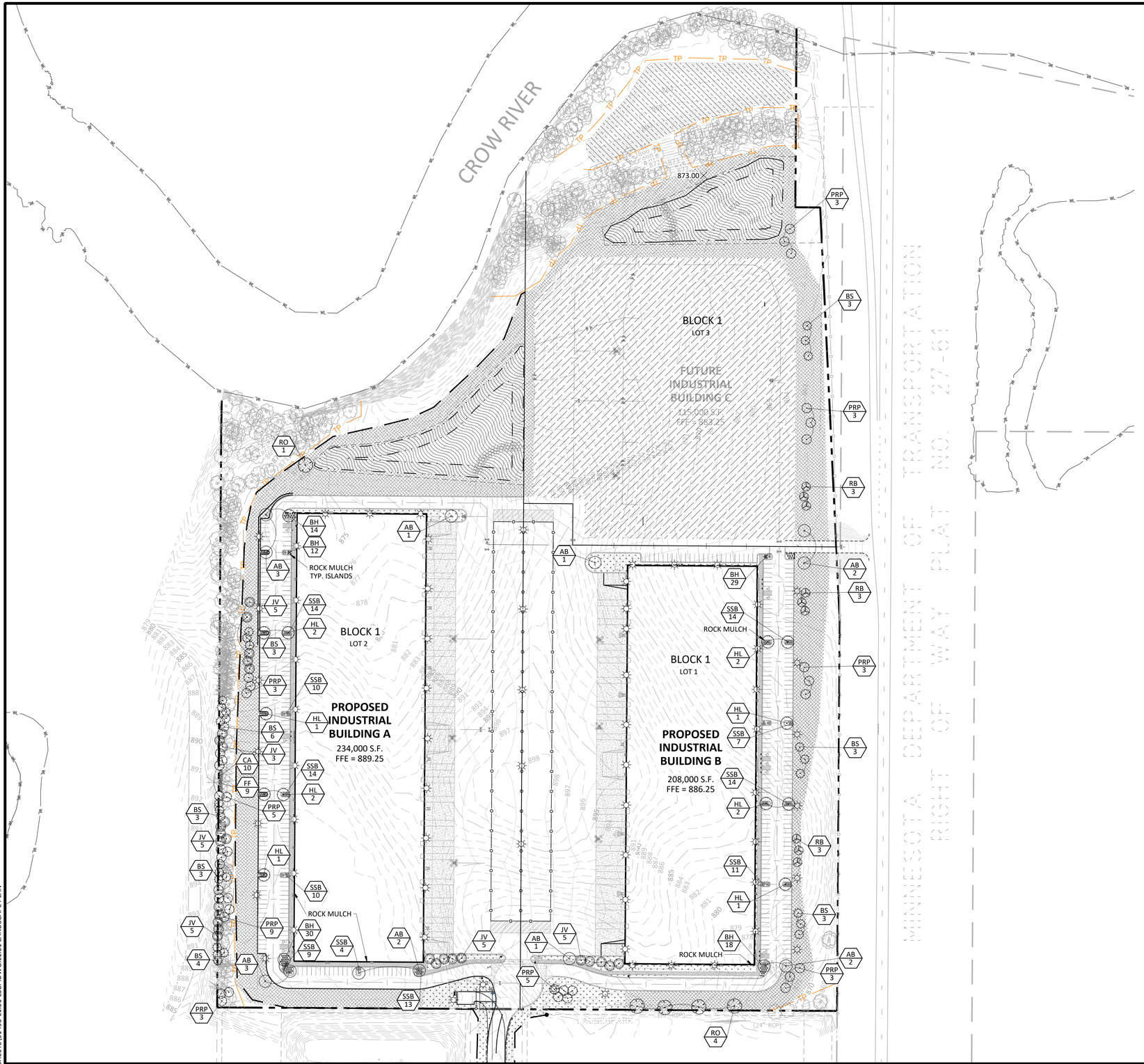
DRAWN BY
DESIGNED BY
CHECKED BY JRW
PROJECT NO. 51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

TREE INVENTORY 4

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET
L0.05
43 OF 45
REV.



LEGEND

	PROPOSED	EXISTING
PROPERTY LIMIT		
CURB & GUTTER		
EASEMENT		
BUILDING		
RETAINING WALL		
WETLAND LIMITS		WL
TREELINE		
LANDSCAPE EDING		
STORM SEWER	D	
SANITARY SEWER	S	S
FORCEMAIN (SAN.)	LS	FM S
WATERMAIN		
YARDDRAIN		
LIMITS OF DISTURBANCE		
TREE PROTECTION FENCE	TP	
SIGN		
PIPE BOLLARD		
RIPRAP		

STANDARD DUTY ASPHALT PAVING	
CONCRETE PAVING	
CONCRETE SIDEWALK	

ROGERS LANDSCAPE CODE

SITE DEVELOPMENT REGULATIONS
(1) A 30-FOOT WIDE, IRRIGATED, LANDSCAPED AREA MUST BE INSTALLED ADJACENT TO ALL STREET RIGHTS-OF-WAY

PARKING
(1) FOR EVERY 17 PARKING SPOTS, A LANDSCAPED ISLAND SHALL BE PROVIDED, UNLESS LOT IS LESS THAN 2 ACRES. EACH REQUIRED LANDSCAPE ISLAND TO CONTAIN AT LEAST ONE TREE, AND IS REQUIRED TO BE A MIN OF 9X18', SHRUBS GRASSES AND OTHER PLANTS

SCREENING
(1) LOADING DOCKS AND TRUCK PARKING AREAS SHALL BE SCREENED FROM VIEW FROM ANY PUBLIC WAY BY A FENCE OR LANDSCAPE SCREEN

PLANT SCHEDULE

PLANT SCHEDULE

SYMBOL	CODE	BOTANICAL / COMMON NAME	CONT	SIZE	QTY
TREES					
	AB	Acer freemanii `Autumn Blaze` / Autumn Blaze Maple	B & B	2.5"Cal	15
	RB	Betula nigra `Cully` TM / Heritage Birch	B & B	2.5"Cal	9
	HL	Gleditsia triacanthos `Skyline` / Skyline Honey Locust	B & B	2.5"Cal	12
	RO	Quercus rubra / Red Oak	B & B	2.5"Cal	5
CONIFERS					
	JV	Juniperus virginiana / Eastern Redcedar	B & B	6`	28
	BS	Picea glauca densata / Black Hills Spruce	B & B	6`	28
	PRP	Pinus resinosa / Red Pine	B & B	6`	37
SHRUBS					
	CA	Corylus americana / American Hazelnut	5 gal		10
	BH	Diervilla lonicera / Dwarf Bush Honeysuckle	5 gal		90
	FF	Forsythia x `Fiesta` / Fiesta Forsythia	5 gal		9
	SSB	Spiraea sorbifolia / False Spirea	5 gal		120
SYMBOL	CODE	BOTANICAL / COMMON NAME	CONT		
GROUND COVERS					
	OP	MNDOT Seed Mix Oats & Peas / Formerly MNDOT Seed Mix 21-113	Seed		
	SB	MNDOT Seed Mix Southern Boulevard / Formerly MNDOT Seed Mix 25-131	Seed		
	STR	MNDOT Seed Mix Southern Tallgrass / Formerly MNDOT seed mix 35-221	Seed		
	WD	MNDOT Seed Mix Wet Ditch / Fromerly MNDOT Seed Mix 33-261	Seed		
	TUR HIG	Turf Sod Highland Sod / Sod	Sod		

NORTH
0 100 200
SCALE IN FEET

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.
Print Name: JOHN R. WORKMAN
Date 03/28/2025 License # 59119

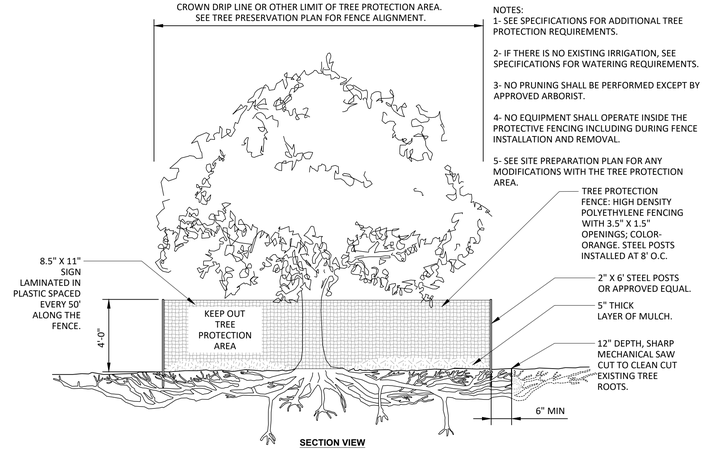
PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	
DESIGNED BY	
CHECKED BY	JRW
PROJECT NO.	51493

Sambatek
www.sambatek.com
Engineering | Surveying | Planning | Environmental

LANDSCAPE PLAN
CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

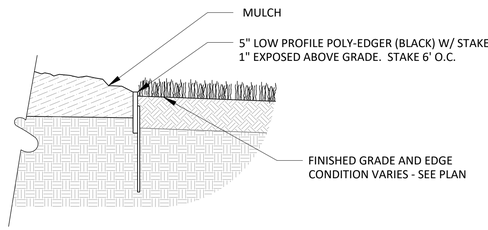
SHEET
L1.01
44 OF 45
REV.

24.15 \LMS TECH1 | JOHNNIE WORKMAN | 4/4/2025 2:09:34 PM
J:\PROJECTS\51493\CAD\SHEETS\51493-L1.01-LSCP.DWG:L1.01 LANDSCAPE PLAN



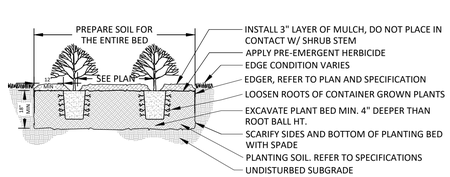
1 L1.02 CLEAN ROOT CUT DETAIL

1/4" = 1'-0" P-58



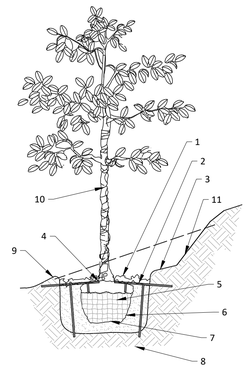
2 L1.02 LOW PROFILE POLY EDGER

1 1/2" = 1'-0" P-30



3 L1.02 SHRUB PLANTING DETAIL

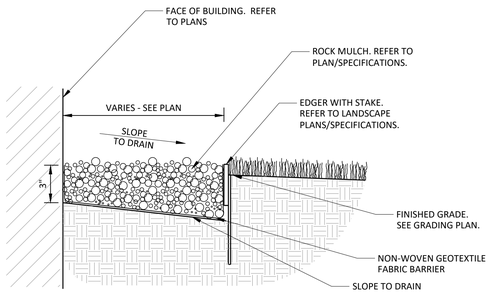
3/8" = 1'-0" P-02



1. 3" MINIMUM OF HARDWOOD BARK MULCH OR AS SPECIFIED.
2. STATE SIZE SHALL BE ONE SIZE HIGHER THAN REQUIRED FOR SIZE OF TREE. REFER TO SITEWORK SPECIFICATIONS FOR APPROVED MATERIALS AND INSTALLATION REQUIREMENTS.
3. 6" MINIMUM OF TOPSOIL TO BRING TO FINISHED GRADE (SEE GRADING PLAN).
4. TOP OF ROOTBALL MIN. 1" ABOVE FINISHED GRADE.
5. B&B OR CONTAINERIZED (SEE SPECIFICATIONS FOR ROOTBALL REQUIREMENTS)
6. PREPARE PLANTING SOIL AS SPECIFIED.
7. ROOTBALLS GREATER THAN 24" IN DIAMETER MAY SITE ON COMPACTED EARTH.
8. UNDISTURBED SOIL.
9. 3" HIGH BERM TO HOLD WATER.
10. TREE WRAP.
11. CUT BACK SLOPE TO PROVIDE A FLAT SURFACE FOR PLANTING.

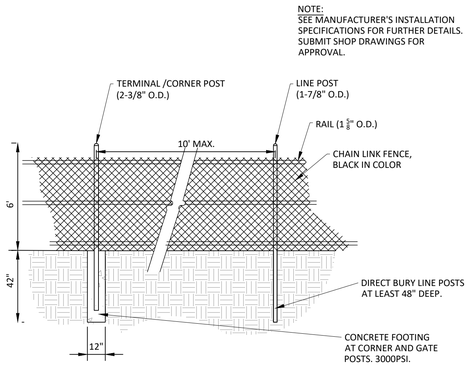
4 L1.02 TREE PLANTING ON SLOPE

3/8" = 1'-0" P-40



5 L1.02 MAINTENANCE STRIP - ROCK MULCH

1 1/2" = 1'-0" P-13



6 L1.02 6' CHAIN LINK FENCE

1/4" = 1'-0" P-77

NOTES

GENERAL NOTES:

1. THE CONTRACTOR SHALL INSPECT THE SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS RELATING TO THE NATURE AND SCOPE OF THE WORK.
2. THE CONTRACTOR SHALL VERIFY PLAN LAYOUT AND BRING TO THE ATTENTION OF THE LANDSCAPE ARCHITECT DISCREPANCIES WHICH MAY COMPROMISE THE DESIGN OR INTENT OF THE LAYOUT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE CODES, REGULATIONS, AND PERMITS GOVERNING THE WORK.
4. THE CONTRACTOR SHALL PROTECT EXISTING ROADS, CURBS/GUTTERS, TRAILS, TREES, LAWNS AND SITE ELEMENTS DURING CONSTRUCTION. DAMAGE TO SAME SHALL BE REPAIRED AND/OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
5. LOCATE AND VERIFY ALL UTILITIES, INCLUDING IRRIGATION LINES, WITH THE OWNER FOR PROPRIETARY UTILITIES AND GOPHER STATE ONE CALL 48 HOURS BEFORE DIGGING. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND REPAIR OF ANY DAMAGES TO SAME. NOTIFY THE LANDSCAPE ARCHITECT OF ANY CONFLICTS TO FACILITATE PLANT RELOCATION.
6. **THE LANDSCAPE CONTRACTOR SHALL COORDINATE THE PHASES OF CONSTRUCTION AND PLANTING INSTALLATION WITH OTHER CONTRACTORS WORKING ON SITE.**
7. THE CONTRACTOR SHALL REVIEW THE SITE FOR DEFICIENCIES IN SITE CONDITIONS WHICH MIGHT NEGATIVELY AFFECT PLANT ESTABLISHMENT, SURVIVAL OR WARRANTY. UNDESIRABLE SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT PRIOR TO BEGINNING OF WORK.
8. THE PLAN TAKES PRECEDENCE OVER THE LANDSCAPE LEGEND IF DISCREPANCIES EXIST. QUANTITIES SHOWN IN THE PLANTING SCHEDULE ARE FOR THE CONTRACTOR'S CONVENIENCE. CONTRACTOR TO VERIFY QUANTITIES SHOWN ON THE PLAN.
9. THE SPECIFICATIONS TAKE PRECEDENCE OVER THE PLANTING NOTES AND GENERAL NOTES.
10. EXISTING TREES AND SHRUBS TO REMAIN SHALL BE PROTECTED TO THE DRIP LINE FROM ALL CONSTRUCTION TRAFFIC, STORAGE OF MATERIALS ETC. WITH 4' HT. ORANGE PLASTIC SAFETY FENCING ADEQUATELY SUPPORTED BY STEEL FENCE POSTS 6' O.C. MAXIMUM SPACING.
11. LONG-TERM STORAGE OF MATERIALS OR SUPPLIES ON-SITE WILL NOT BE ALLOWED.
12. CONTRACTOR SHALL REQUEST IN WRITING, A FINAL ACCEPTANCE INSPECTION.

PLANTING NOTES:

1. NO PLANTS SHALL BE INSTALLED UNTIL FINAL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
2. A GRANULAR PRE-EMERGENT HERBICIDE SHALL BE APPLIED TO ALL PLANT BEDS AT THE MANUFACTURERS RECOMMENDED RATE PRIOR TO PLANT INSTALLATION.
3. ALL PLANTING STOCK SHALL CONFORM TO THE "AMERICAN STANDARD FOR NURSERY STOCK," ANSI-Z60, LATEST EDITION, OF THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. AND SHALL CONSTITUTE MINIMUM QUALITY REQUIREMENTS FOR PLANT MATERIALS.
4. OVERSTORY TREES SHALL BEGIN BRANCHING NO LOWER THAN 6' ABOVE PAVED SURFACES.
5. ALL PLANTS MUST BE HEALTHY, VIGOROUS MATERIAL, FREE OF PESTS AND DISEASE AND BE CONTAINER GROWN OR BALLED AND BURLAPPED AS INDICATED IN THE LANDSCAPE LEGEND.
6. PLANT MATERIALS TO BE INSTALLED PER PLANTING DETAILS.
7. ALL TREES MUST BE STRAIGHT TRUNKED AND FULL HEADED AND MEET ALL REQUIREMENTS SPECIFIED.
8. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANTS WHICH ARE DEEMED UNSATISFACTORY BEFORE, DURING, OR AFTER INSTALLATION.
9. NO SUBSTITUTIONS OF PLANT MATERIAL SHALL BE ACCEPTED UNLESS APPROVED IN WRITING BY THE LANDSCAPE ARCHITECT.
10. ALL PLANT MATERIAL QUANTITIES, SHAPES OF BEDS AND LOCATIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE COVERAGE OF ALL PLANTING BEDS AT SPACING SHOWN AND ADJUSTED TO CONFORM TO THE EXACT CONDITIONS OF THE SITE. THE LANDSCAPE ARCHITECT SHALL APPROVE THE STAKING LOCATION OF ALL PLANT MATERIALS PRIOR TO INSTALLATION.
11. ALL PLANTING AREAS MUST BE COMPLETELY MULCHED AS SPECIFIED.
12. MULCH: DOUBLE SHREDDED HARDWOOD MULCH, CLEAN AND FREE OF NOXIOUS WEEDS OR OTHER DELETERIOUS MATERIAL, IN ALL MASS PLANTING BEDS AND FOR TREES, UNLESS INDICATED AS ROCK MULCH ON DRAWINGS. SUBMIT SAMPLE TO LANDSCAPE ARCHITECT PRIOR TO DELIVERY ON-SITE FOR APPROVAL. DELIVER MULCH ON DAY OF INSTALLATION. USE 3" FOR SHRUB BEDS, TREE RINGS, AND 3" FOR PERENNIAL/GROUND COVER BEDS, UNLESS OTHERWISE DIRECTED.
13. BUILDING MAINTENANCE STRIP: WHERE NO LANDSCAPE PLANTING BEDS EXIST ADJACENT TO A BUILDING FOUNDATION, CONTRACTOR SHALL INSTALL A DECORATIVE ROCK MAINTENANCE STRIP PER PLAN. DECORATIVE ROCK SHALL BE 1.5" LIMESTONE, BUFF IN COLOR.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MULCHES AND PLANTING SOIL QUANTITIES TO COMPLETE THE WORK SHOWN ON THE PLAN.
15. USE ANTI-DESICCANT (WILTPRUF OR APPROVED EQUAL) ON DECIDUOUS PLANTS MOVED IN LEAF AND FOR EVERGREENS MOVED ANYTIME. APPLY AS PER MANUFACTURER'S INSTRUCTION. ALL EVERGREENS SHALL BE SPRAYED IN THE LATE FALL FOR WINTER PROTECTION DURING WARRANTY PERIOD.
16. WRAP ALL SMOOTH-BARKED DECIDUOUS TREES PLANTED IN THE FALL PRIOR TO DECEMBER 1 AND REMOVE WRAPPING AFTER MAY 1. TREE WRAPPING MATERIAL SHALL BE WHITE TWO-WALLED PLASTIC SHEETING APPLIED FROM TRUNK FLARE TO THE FIRST BRANCH.
17. ALL DECIDUOUS, PINE, AND LARCH PLANTINGS SHALL RECEIVE RODENT PROTECTION PER MNDOT 2571.31.2
18. PLANTING SOIL FOR TREES, SHRUBS AND GROUND COVERS: FERTILE FRIABLE LOAM CONTAINING A LIBERAL AMOUNT (4% MIN.) OF HUMUS AND CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH. IT SHALL COMPLY WITH MNDOT SPECIFICATION 3877 TYPE B SELECT TOPSOIL. MIXTURE SHALL BE FREE FROM HARDPACK SUBSOIL, STONES, CHEMICALS, NOXIOUS WEEDS, ETC. SOIL MIXTURE SHALL HAVE A PH BETWEEN 6.1 AND 7.5 AND 10-0-10 FERTILIZER AT THE RATE OF 3 POUNDS PER CUBIC YARD. IN PLANTING BEDS INCORPORATE THIS MIXTURE THROUGHOUT THE ENTIRE BED IN A 6" LAYER AND ROTO-TILLING IT INTO THE TOP 12" OF SOIL AT A 1:1 RATIO.ANY PLANT STOCK NOT PLANTED ON DAY OF DELIVERY SHALL BE HEELED IN AND WATERED UNTIL INSTALLATION. PLANTS NOT MAINTAINED IN THIS MANNER WILL BE REJECTED.
19. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THAT EACH EXCAVATED TREE AND SHRUB PIT WILL PERCOLATE PRIOR TO INSTALLING PLANTING MEDIUM AND PLANTS. THE CONTRACTOR SHALL FILL THE BOTTOM OF SELECTED HOLES WITH SIX INCHES OF WATER AND CONFIRM THAT THIS WATER WILL PERCOLATE WITHIN A 24-HOUR PERIOD. IF THE SOIL AT A GIVEN AREA DOES NOT DRAIN PROPERLY, A PVC DRAIN OR GRAVEL SUMP SHALL BE INSTALLED OR THE PLANTING SHALL BE RELOCATED IF DIRECTED BY THE LANDSCAPE ARCHITECT.
20. ALL PLANTS SHALL BE GUARANTEED FOR ONE COMPLETE GROWING SEASONS (APRIL 1 - NOVEMBER 1), UNLESS OTHERWISE SPECIFIED. THE GUARANTEE SHALL COVER THE FULL COST OF REPLACEMENT INCLUDING LABOR AND PLANTS.
21. CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT AT LEAST 3 DAYS PRIOR TO PLANNED DELIVERY. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT AT LEAST 24 HOURS IN ADVANCE OF BEGINNING PLANT INSTALLATION.
22. SEASONS/TIME OF PLANTING AND SEEDING: NOTE: THE CONTRACTOR MAY ELECT TO PLANT IN OFF-SEASONS ENTIRELY AT HIS/HER RISK.

22.1.	POTTED PLANTS:	4/1 - 6/1; 9/21 - 11/1
22.2.	DECIDUOUS /B&B:	4/1 - 6/1; 9/21 - 11/1
22.3.	EVERGREEN POTTED PLANTS:	4/1 - 6/1; 9/21-11/1
22.4.	EVERGREEN B&B:	4/1 - 5/1; 9/21 - 11/1
22.5.	TURF/LAWN SEEDING:	4/1 - 6/1; 7/20 - 9/20
22.6.	NATIVE MIX SEEDING:	4/15 - 7/20; 9/20-10/20

23. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER EACH PORTION OF THE WORK IS IN PLACE. PLANT MATERIAL SHALL BE PROTECTED AND MAINTAINED UNTIL THE INSTALLATION OF THE PLANTS IS COMPLETE, INSPECTION HAS BEEN MADE, AND PLANTINGS ARE ACCEPTED EXCLUSIVE OF THE GUARANTEE. MAINTENANCE SHALL INCLUDE WATERING, CULTIVATING, MULCHING, REMOVAL OF DEAD MATERIALS, RE-SETTING PLANTS TO PROPER GRADE AND KEEPING PLANTS IN A PLUMB POSITION. AFTER ACCEPTANCE, THE OWNER SHALL ASSUME MAINTENANCE RESPONSIBILITIES. HOWEVER, THE CONTRACTOR SHALL CONTINUE TO BE RESPONSIBLE FOR KEEPING THE TREES PLUMB THROUGHOUT THE GUARANTEE PERIOD.
24. ANY PLANT MATERIAL WHICH DIES, TURNS BROWN, OR DEFOLIATES (PRIOR TO TOTAL ACCEPTANCE OF THE WORK) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY, AND SIZE AND MEETING ALL LANDSCAPE LEGEND SPECIFICATIONS.
25. WATERING: MAINTAIN A WATERING SCHEDULE WHICH WILL THOROUGHLY WATER ALL PLANTS ONCE A WEEK. IN EXTREMELY HOT, DRY WEATHER, WATER MORE OFTEN AS REQUIRED BY INDICATIONS OF HEAT STRESS SUCH AS WILTING LEAVES. CHECK MOISTURE UNDER MULCH PRIOR TO WATERING TO DETERMINE NEED. CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS FOR WATER.

TURF NOTES:

TURF ESTABLISHMENT SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE PROVISIONS OF THE MN/DOT 2105 AND 2575 EXCEPT AS MODIFIED BELOW:

1. ALL AREAS TO RECEIVE SOD SHALL ALSO RECEIVE 6" OF TOPSOIL PRIOR TO INSTALLING SOD. TOPSOIL SHALL BE FREE OF TREE ROOTS, STUMPS, BUILDING MATERIAL, AND TRASH, AND SHALL BE FREE OF STONES LARGER THAN 1 ½" INCHES IN ANY DIMENSION.
2. WHERE SOD ABUTS PAVED SURFACES, FINISHED GRADE OF SOD/SEED SHALL BE HELD 1" BELOW SURFACE ELEVATION OF TRAIL, SLAB, CURB, ETC.
3. SOD SHALL BE LAID PARALLEL TO THE CONTOURS AND SHALL HAVE STAGGERED JOINTS. ON SLOPES STEEPER THAN 3:1 OR IN DRAINAGE SWALES, SOD SHALL BE STAKED SECURELY.
4. TURF ON ALL OTHER AREAS DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY SEEDING, MULCHING AND FERTILIZING. SEED MIXTURE MNDOT SOUTHERN BOULEVARD WILL BE PLACED AT THE RATE OF 160 POUNDS PER ACRE.
5. ALL DISTURBED AREAS TO BE TURF SEEDED, ARE TO RECEIVE 6" TOP SOIL, SEED, MULCH, AND WATER UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. FOR SLOPES STEEPER THAN 3:1 OR IN DRAINAGE SWALES INSTALL EROSION CONTROL BLANKET.
6. ALL DISTURBED AREAS TO RECEIVE NATIVE SEED, ARE TO RECEIVE PLANTING SOIL, SEED, MULCH, AND WATER UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. FOR SLOPES STEEPER THAN 3:1 OR IN DRAINAGE SWALES INSTALL EROSION CONTROL BLANKET.

GENERAL TREE SPECIFICATIONS:

1. ALL STREET AND PARKING LOT TREES SHALL BE LIMBED UP TO THE FOLLOWING HEIGHTS:
   - 1.1. 2" CAL. TREES: LOWEST BRANCH 6' HT.
   - 1.2. 3" CAL.+ TREES: LOWEST BRANCH 7' HT.
2. TREE CANOPY WIDTH SHALL BE RELATIVE TO HEIGHT/CALIPER OF TREE AND TYPE OF TREE.
   - 2.1. 1" CALIPER/6-8' HT: 3-4' WIDTH MIN.
   - 2.2. 2" CALIPER/12-14' HT: 4-5' WIDTH MIN.
   - 2.3. 3" CALIPER/14-16' HT: 6-7' WIDTH MIN.
3. CANOPY TREES SHALL NOT HAVE CO-DOMINATE LEADERS IN LOWER HALF OF TREE CROWN.
4. ALL TREES SHALL HAVE SYMMETRICAL OR BALANCED BRANCHING ON ALL SIDES OF THE TREE.
5. TREES SHALL NOT BE TIPPED PRUNED.
6. TREES SHALL BE FREE OF PHYSICAL DAMAGE FROM SHIPPING AND HANDLING. DAMAGED TREES SHALL BE REJECTED.
7. SUMMER DUG TREES SHALL HAVE ROOTBALL SIZE INCREASED BY 20%
8. TREES WHICH EXCEED RECOMMENDED CALIPER TO HEIGHT RELATIONSHIP SHALL BE REJECTED.

IRRIGATION NOTES:

1. IRRIGATION SYSTEM TO BE DESIGN/BUILD. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL OF SYSTEM LAYOUT PRIOR TO INSTALLATION.
2. ALL SOD TO RECEIVE SPRAY OR ROTOR IRRIGATION HEADS WITH MINIMUM DESIGN OF 1" IRRIGATION PER WEEK.
3. ALL PLANT BEDS TO RECEIVE DRIP LINE IRRIGATION , WITH A MINIMUM DESIGN OF .25" IRRIGATION PER WEEK.

LOW MAINTENANCE FESCUE NOTES:

1. DURING GROWING SEASON NEVER MOW SHORTER THAN 3.5 INCHES, PREFERRED MAINTENANCE IS MOW ONCE PER MONTH AT 5" HEIGHT
2. DO NOT USE HIGH NITROGEN FERTILIZER ON FESCUE LAWN
3. OVERSEED THIN,BARE SPOTS IN FALL
4. ALWAYS USE SHARP BLADE WHEN MOWING TO AVOID TEARING LEAF BLADE
5. SET MOWER TO 3" FOR BAGGING AND MOWING IN LATE FALL AFTER GROWING SEASON

NATIVE SEED MIX NOTES:

1. ESTABLISHMENT AND YEAR ONE: MOW THREE(3) TIMES FIRST YEAR ON 30-DAY INTERVALS TO A HEIGHT BETWEEN FIVE AND EIGHT INCHES. DO NOT USE FERTILIZERS. SPOT TREAT INVASIVE WOODY PLANTS OR HAND WEED INDIVIDUAL NOXIOUS WEEDS.
2. YEAR TWO: PERFORM ONE MOWING BETWEEN MID-JUNE AND MID-AUGUST. SPOT SPRAY WEEDS AS NEEDED WHERE THEY ARE ESPECIALLY DOMINATE.
3. YEAR THREE (AND BEYOND): CUT ONE TIME PER YEAR AS A CLEAN UP PROCEDURE (EITHER IN EARLY MAY OR LATE NOVEMBER). PRESCRIBED BURNS MAY BE USED AS WELL IN PLACE OF MOWING. CHECK LOCAL REGULATIONS AND PERMIT PROCEDURES.

NO	DATE	BY	CKD	APPR	COMMENT
	07/07/2024	TPK	JDB	JDB	SITE PLAN APPLICATION
	11/14/2024	TPK	JDB	JDB	SITE PLAN RESUBMITTAL
	03/28/2025	TPK	JDB	JDB	PERMIT SET
	04/07/2025	TPK	JDB	JDB	FINAL PLAT SUBMITTAL

© 2021 Sambatek

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.

Print Name: JOHN R. WORKMAN

Date 03/28/2025 License # 59119

PRELIMINARY	08/07/2024
DESIGN REVIEW	11/14/2024
PERMIT SUBMITTAL	03/28/2025
CONSTRUCTION DOCUMENTS	
DRAWN BY	
DESIGNED BY	
CHECKED BY	JRW
PROJECT NO.	51493

Sambatek www.sambatek.com
Engineering | Surveying | Planning | Environmental

LANDSCAPE NOTES & DETAILS

CP WEST, LLC
NORTHDALE BOULEVARD INDUSTRIAL
PERMIT PLANS
ROGERS, MINNESOTA

SHEET L1.02 45 OF 45 REV.

24.15 (LMS TECH) | JOHNNIE WORKMAN | 4/4/2025 2:09:34 PM
L:\PROJECTS\51493\CAD\SHEETS\51493-L1.01-LSCP.DWG L1.02 LANDSCAPE NOTES & DETAILS

Luminaire Schedule								
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Lum. Lumens	Tag
	6	II-NEW	Single	0.900	GARDCO GWM-A14-740-T3M MOUNTED AT 28FT	77.4	12768	
	10	HH-NEW	Single	0.900	GARDCO GWM-A06-740-T3M MOUNTED AT 12.5FT	16.3	2968	
	9	AA4W-HS	Single	0.900	GARDCO OPF-S-A02-740-T4w-AR1-UNV-XX-HIS-MS W/ REMOTE REQURED FINISH TBD MOUNTED ON 17FT SSS POLE 3FT BASE FOR CALC	54.129	6061	SOFT FADE/RAMP - 30% STANDBY
	10	AA3	Single	0.900	GARDCO OPF-S-A04-740-T3M-AR1-UNV-XX FINISH TBD MOUNTED ON 30FT SSS POLE WITH 3FT BASE	90.68	15171	
	7	BB4	Single	0.900	GARDCO OPF-S-A07-740-T4M-AR1-UNV-XX-FINISH TBD MOUNTED ON 30FT SSS POLE WITH 3FT BASE	136.2	21294	
	6	BB5	Back-Back	0.900	GARDCO OPF-S-A07-740-T5W-AR1-UNV-XX FINISH TBD MOUNTED ON 30FT SSS POLE WITH 3FT BASE	272.4	20984	
	25	CC	Single	0.900	NLS NV-W2-T4-64L-1-40K7-UNV-XXX FINISH TBD WALL MOUNTED @ 28FT	205	22951	
	26	DD	Single	0.900	NLS NV-W-T3-32L-1A-40K7-UNV-XXX FNISH TBD WALL MOUNTED @ 28FT	100.1	11544	
	57	EE	Single	0.870	ELITE RL643-3ML-DIM10-MVOLT-5CCT-90-W-WH(2000L-4000K) - RL643-RT-XXX/XXX FINISH TBD - RL-UNV-4/5/6	17.1	1974	

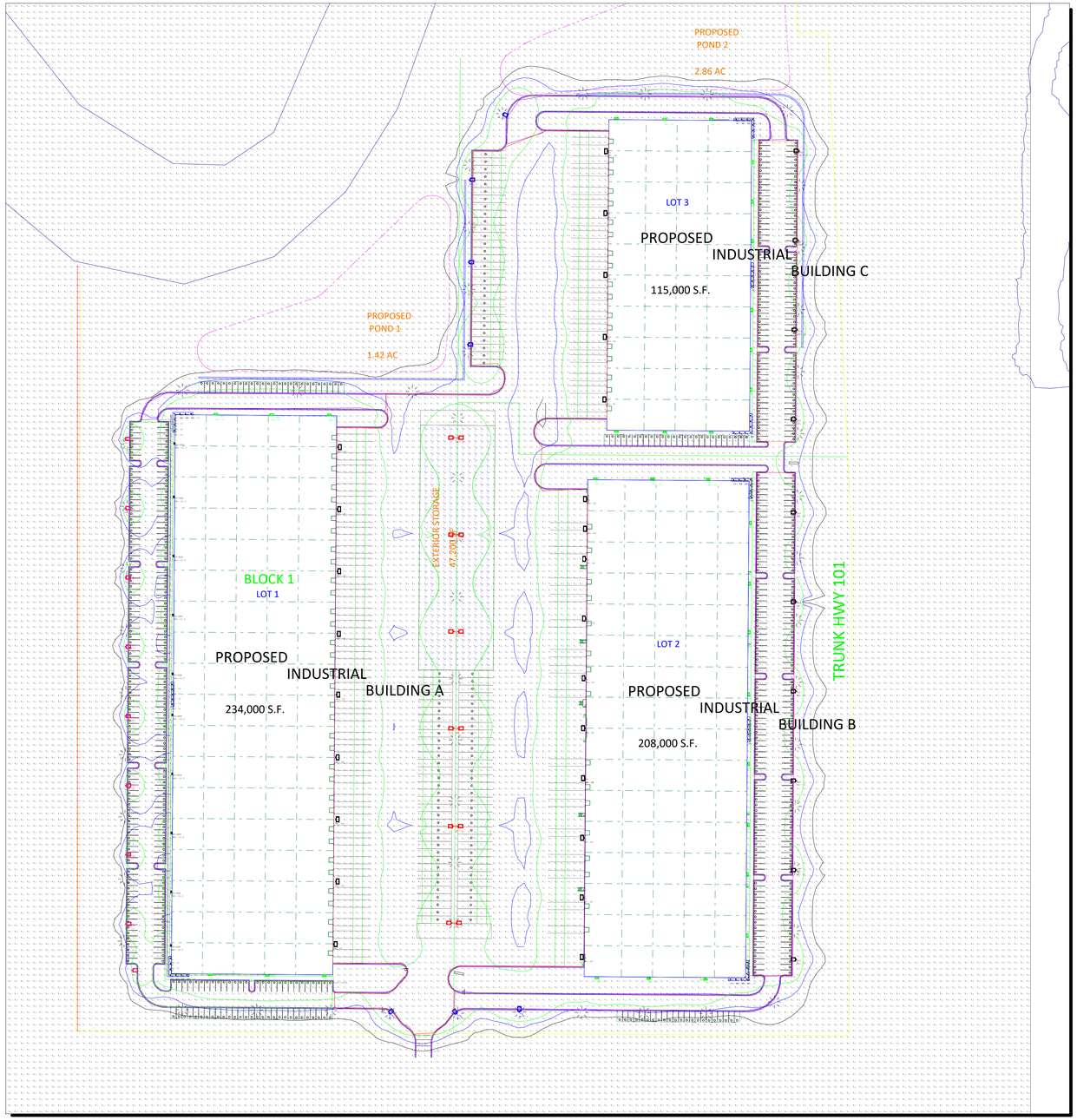
Calculation Summary								
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CALC POINTS	Illuminance	Fc	0.36	13.6	0.0	N.A.	N.A.
EXT STORAGE	Illuminance	Fc	1.38	2.5	0.7	1.97	3.57
RES PROPERTY LINE	Illuminance	Fc	0.00	0.01	0.00	N.A.	N.A.
sidewalk	Illuminance	Fc	2.20	9.9	0.3	7.33	33.00
BUILDING A PARKING	Illuminance	Fc	0.90	5.0	0.3	3.00	16.67
DOCK LOTS - ENTRANCE	Illuminance	Fc	1.47	9.7	0.2	7.35	48.50
DRIVE SOUTH BLDG A	Illuminance	Fc	1.33	6.0	0.3	4.43	20.00
DRIVE SOUTH BLDG B	Illuminance	Fc	1.43	3.3	0.5	2.86	6.60
DRIVE SOUTH BLDG C	Illuminance	Fc	1.65	4.3	0.6	2.75	7.17
PARKING BUILD B	Illuminance	Fc	1.93	4.7	0.7	2.76	6.71
PARKING BUILD C	Illuminance	Fc	2.29	5.1	0.6	3.82	8.50

GENERAL NOTES:

A. PULSE PRODUCTS DOES NOT ASSUME RESPONSIBILITY FOR THE INTERPRETATION OF THIS CALCULATION OR COMPLAINCE TO THE LOCAL, STATE, OR FEDERAL LIGHTING CODES OR ORDINANCES.

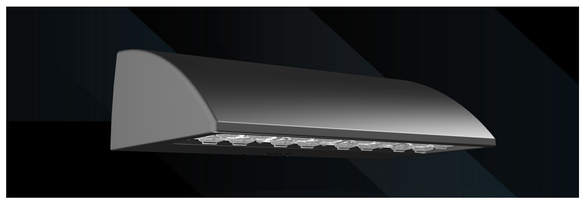
B. LIGHTING LAYOUT IS NOT INTENDED FOR CONSTRUCTION DOCUMENTS BUT ONLY TO ILLUSTRATE THE PERFORMANCE OF THE PRODUCT.

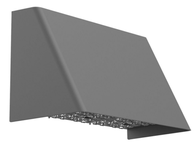
C. ALL READINGS/CALCULATIONS SHOWN ARE SHOWN ON WORKPLANE OR FLOOR DEPENDING ON SPACE ACTIVITY.



Plan View
Scale: 1 inch= 100 Ft.







rv3

PULSE never ordinary

#	Date	Comments

Revisions

Drawn By: JILL BJORNBERG LC
Checked By: JILL
Date:1/31/2025
Scale: AS NOTED

ROGERS NORHTDALE INDUSTRIAL

ROGERS, MN

PAGE 1 OF 1

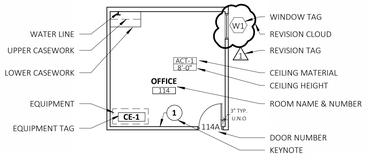
ROGERS NORTHDALE INDUSTRIAL

BUILDING #1
NORTHDALE BLVD AND HWY 101
ROGERS, MN 55374

PROJ. NO.	ISSUE DATE	PROJECT PHASE
23017	08/07/2024	SCHEMATIC DESIGN

MOHAGEN HANSEN
Architecture | Interiors

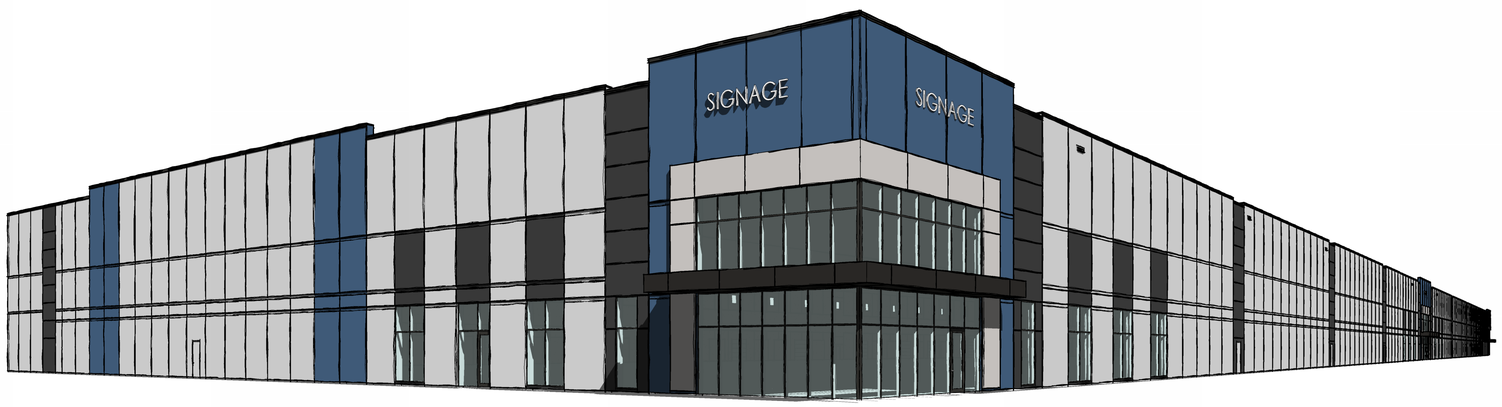
- ℄ CENTERLINE INDICATOR
- 1 / A1 DETAIL / SECTION INDICATOR
- 1 / A1 ELEVATION SYMBOL INDICATING DIRECTION OF VIEW
- ELEVATION INDICATOR
- 1 GRID BUBBLE INDICATING EXISTING GRID LINES
- 1 GRID BUBBLE INDICATING NEW GRID LINES
- SCREENED ARROW INDICATES EXISTING FLOORING
  SOLID ARROW INDICATES NEW FLOORING
- NEW CONSTRUCTION
- NEW DOOR/ FRAME IN NEW OR EXISTING WALL
- PARTIAL HEIGHT PARTITION



AREA PLAN



SHEET #	SHEET DESCRIPTION	CITY SUBMITTAL 08/07/2024
GENERAL		
A000	SHEET COVER	•
ARCHITECTURAL		
A200	FLOOR PLAN OVERALL	•
A300	EXTERIOR BUILDING ELEVATIONS	•



1 / A000 **ENTRY AT CORNER**

1000 Twelve Oaks Center Drive
Suite 200, Wayzata, MN 55391
T: 952-426-7400
F: 952-426-7440

MohagenHansen.com

CERTIFICATION

NOT FOR CONSTRUCTION

PROJECT TEAM

CLIENT

WEST DEVELOPMENT
5402 PARKDALE DRIVE, SUITE 105
SAINT LOUIS PARK, MN 55416

THOMAS NOBLE
952-224-2500
TNOBLE@WESTREINC.COM

CIVIL ENGINEER

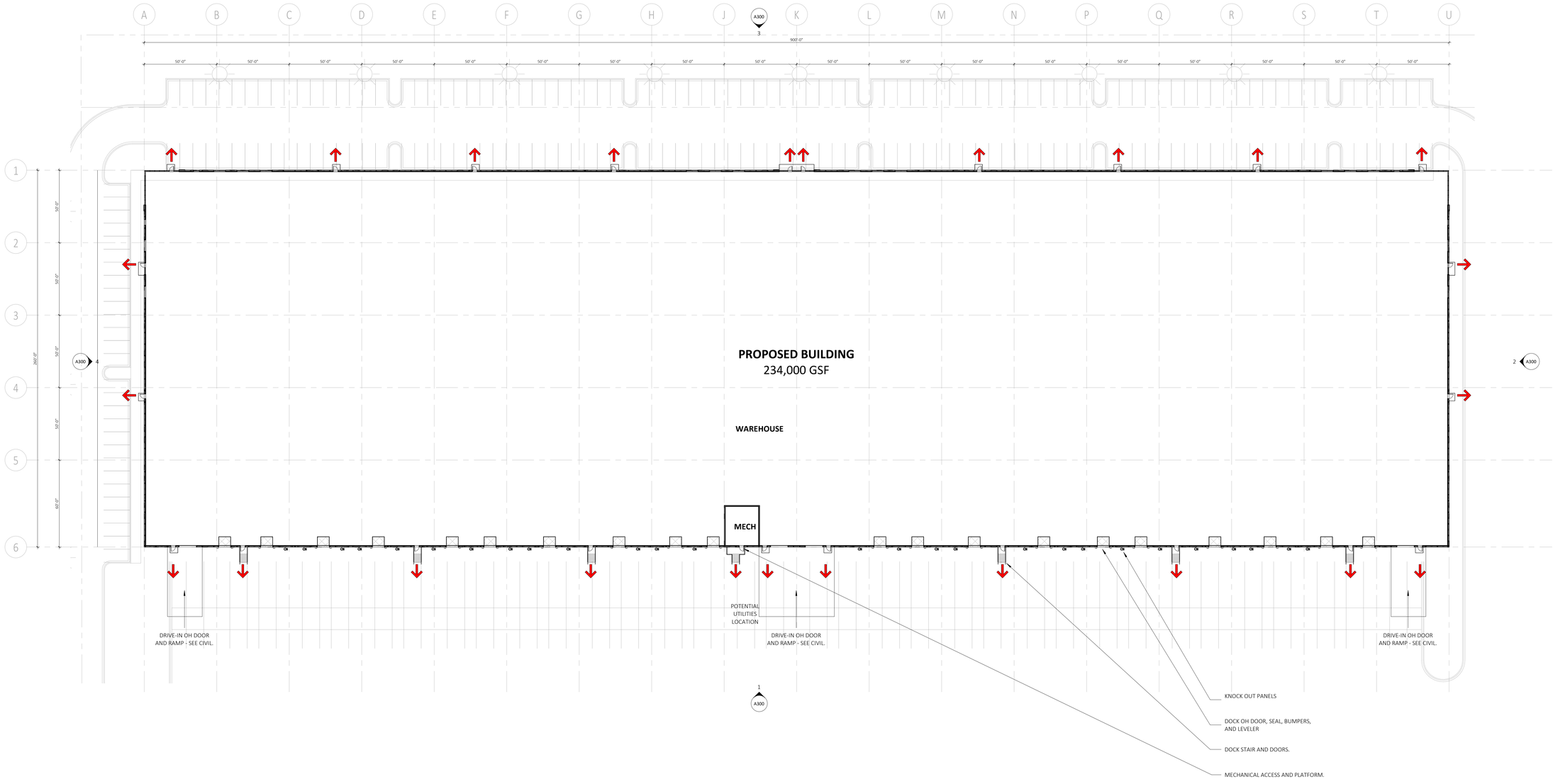
SAMBATEK
12800 WHITEWATER DR #300,
MINNETONKA, MN 55343

JOSEPH BAILEY
763-746-1606
JBAILEY@SAMBATEK.COM

ARCHITECT

MOHAGEN HANSEN
ARCHITECTURE | INTERIORS
1000 TWELVE OAKS CENTER DRIVE, STE 200
WAYZATA, MN 55391
PHONE: 952-426-7400

NEIL MISSLING
NMISSLING@MOHAGENHANSEN.COM



1 A200 **FLOOR PLAN**
1" = 30'-0"

C:\Revit Projects\23017_RogersNorthdale_Shell1_Master_jjohnson@mohagenhansen.com.rvt

MOHAGEN HANSEN
Architecture | Interiors

1000 Twelve Oaks Center Drive
Suite 200, Wayzata, MN 55391
T: 952-426-7400
F: 952-426-7440

MohagenHansen.com

NOT FOR CONSTRUCTION

THE ARCHITECT SHALL BE DEEMED THE AUTHORS AND OWNERS OF THEIR RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS OF THE ATTACHED DOCUMENTS.

ROGERS NORTHDALE INDUSTRIAL

BUILDING #1
NORTHDALE BLVD AND HWY 101
ROGERS, MN 55374

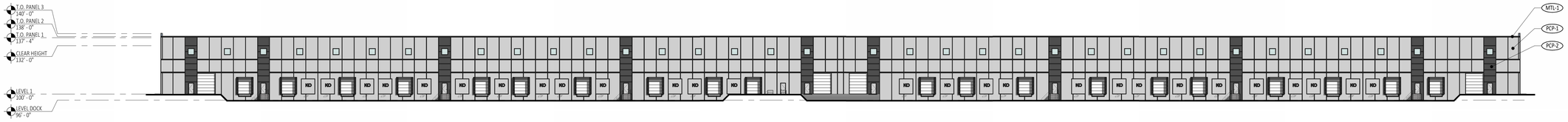
NO.	DESCRIPTION	DATE
	CITY SUBMITTAL	08/07/2024

PROJECT NUMBER: 23017
DRAWN BY: J.JOHNSON
CHECKED BY: N.MISSLING/ S.OLIVER
DATE: 08/07/2024
COMPUTER DIRECTORY:
West_Real_Estate\Rogers\23017_ShellAndCoreCampus

FLOOR PLAN OVERALL

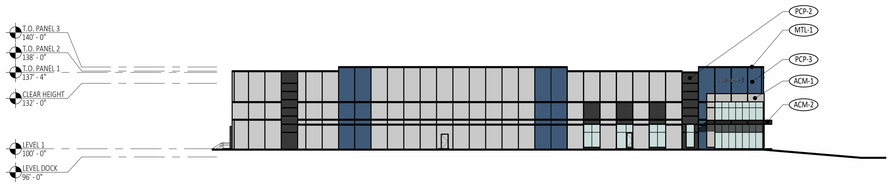
N

A200



1 A300 ELEVATION - EAST

1" = 30'-0"



2 A300 ELEVATION - NORTH

1" = 30'-0"

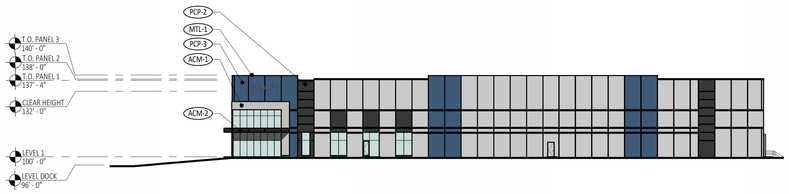
SIGNAGE - TYPICAL FOR TENANT SIGNS
SECTION: 113-9
OVERLAY: RB REGIONAL BUSINESS
MAX AREA: 800' L X 2 SF = 1600 SF > 80 SF MAX = 80 SF.
MAX HT: NA.
LIGHTING: INT/EXT.

SECTION: 113-10
MULTI TENANT: ALLOWED 2.0 SF PER LINEAR FOOT.
STREETS: SIGN CAN BE SPLIT ON CORNERS IF ADJACENT TO STREETS ON EACH SIDE.



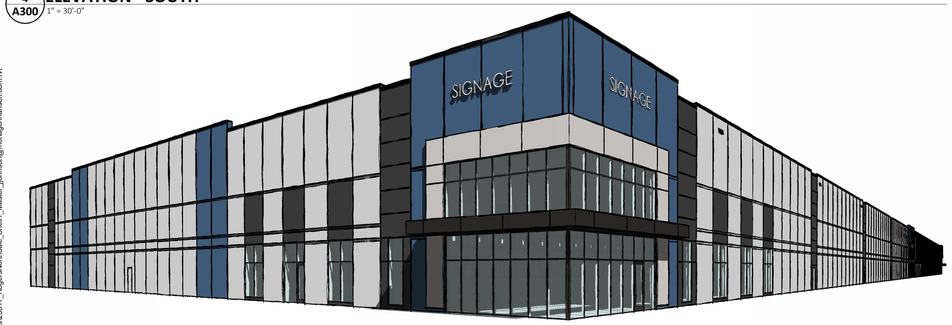
3 A300 ELEVATION - WEST

1" = 30'-0"

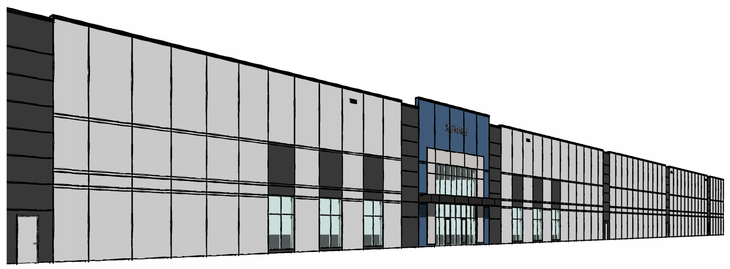


4 A300 ELEVATION - SOUTH

1" = 30'-0"



5 A300 3D VIEW - ENTRY AT CORNER



6 A300 3D VIEW - ENTRY AT CENTER

EXTERIOR MATERIALS LEGEND

PCP-1 INSULATED PRE-CAST PANEL
COMPANY: FABCON.
FINISH: STEEL FORM FINISH PRECAST PANEL - PAINTED.
COLOR: **FRENCH GREY (TBD).**

PCP-2 INSULATED PRE-CAST PANEL
COMPANY: FABCON.
FINISH: STEEL FORM FINISH PRECAST PANEL - PAINTED.
COLOR: **CHARCOAL GREY (TBD).**

PCP-3 INSULATED PRE-CAST PANEL
COMPANY: FABCON.
FINISH: STEEL FORM FINISH PRECAST PANEL - PAINTED.
COLOR: **BLUE HUE (TBD).**

MTL-1 PRE-FINISHED METAL COPING AND TRIM
COMPANY: FIRESTONE.
FINISH: UNICLAD.
COLOR: **MATTE BLACK.**

ACM-1 PRE-FINISHED ALUMINUM COMPOSITE METAL PANEL
COMPANY: ALUCOBOND OR EQ.
COLOR: **DEEP BLACK.**

ACM-2 PRE-FINISHED ALUMINUM COMPOSITE METAL PANEL
COMPANY: ALUCOBOND OR EQ.
COLOR: **FRENCH GREY.**

P-1 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: **TO MATCH PAINT PCP-1 PAINT COLOR.**

P-2 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: **TO MATCH PAINT PCP-2 PAINT COLOR.**

P-3 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: **TO MATCH PAINT PCP-3 PAINT COLOR.**

NOTES:
1. ALUMINUM STOREFRONT FRAMES/ MULLIONS: **BLACK ANODIZED ALUMINUM.**
2. GLAZING: **CLEAR OR GREY TINT W/ LOW E.**
3. PRECAST OPENING AT STOREFRONT: **PAINT TO MATCH CLOSEST ADJACENT MATERIAL: EITHER PRECAST FACE, MTL, OR ACM.**
4. OVERHEAD DOCK DOORS: **PRE-FINISHED WHITE.**
5. PRECAST OPENING AT OVERHEAD DOCK DOORS: **PAINT TO MATCH CLOSEST ADJACENT PRECAST FACE.**
6. HM DOORS: **ALL DOORS TO BE PAINTED P-1, U.N.O.**
7. CANOPY SOFFIT: **ACM-1.**
8. BOLLARDS: PAINTED: **"OSHA YELLOW".**
9. SIGNAGE: **BACKLIT SIGNAGE BY TENANT PERMIT.**
10. SAMPLES: PROVIDE SAMPLES FOR CLIENT AND ARCHITECT TO REVIEW BEFORE CONSTRUCTION.
11. MOCK-UP: PROVIDE MOCK-UP OF EACH PAINT COLOR FOR CLIENT AND ARCHITECT TO REVIEW ONSITE.

MOHAGEN HANSEN
Architecture | Interiors

1000 Twelve Oaks Center Drive
Suite 200, Wayzata, MN 55391
T: 952-426-7400
F: 952-426-7440

MohagenHansen.com

NOT FOR CONSTRUCTION

THE ARCHITECT SHALL BE DEEMED THE AUTHORS AND OWNERS OF THEIR RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS OF THE ATTACHED DOCUMENTS.

ROGERS NORTHDALE INDUSTRIAL

BUILDING #1
NORTHDALE BLVD AND HWY 101
ROGERS, MN 55374

NO.	DESCRIPTION	DATE
	CITY SUBMITTAL	08/07/2024

PROJECT NUMBER: 23017
DRAWN BY: J.JOHNSON
CHECKED BY: N.MISSLING/ S.OLIVER
DATE: 08/07/2024
COMPUTER DIRECTORY:
West_Real_Estate\Rogers\23017_ShellAndCoreCampus

EXTERIOR BUILDING ELEVATIONS

A300

C:\Revit Projects\23017_RogersNorthdale_Shell1_Master_jjohnson@mohagenhansen.com.rvt

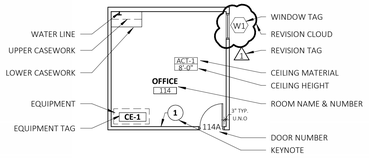
ROGERS NORTHDALE INDUSTRIAL

BUILDING #2
NORTHDALE BLVD AND HWY 101
ROGERS, MN 55374

PROJ. NO.	ISSUE DATE	PROJECT PHASE
23017	08/07/2024	SCHEMATIC DESIGN

MOHAGEN HANSEN
Architecture | Interiors

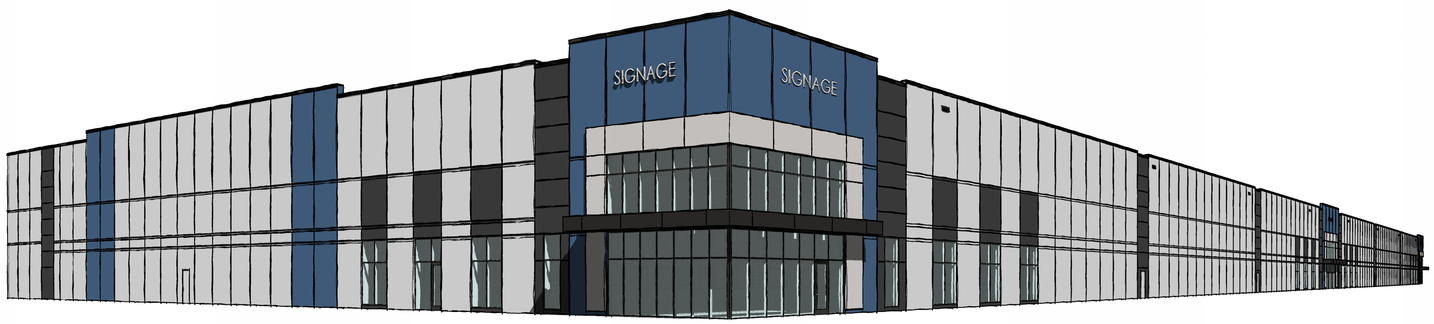
- ℄ CENTERLINE INDICATOR
- 1 / A1 DETAIL / SECTION INDICATOR
- 1 / A1 ELEVATION SYMBOL INDICATING DIRECTION OF VIEW
- ELEVATION INDICATOR
- 1 GRID BUBBLE INDICATING EXISTING GRID LINES
- 1 GRID BUBBLE INDICATING NEW GRID LINES
- SCREENED ARROW INDICATES EXISTING FLOORING
  SOLID ARROW INDICATES NEW FLOORING
- NEW CONSTRUCTION
- NEW DOOR/ FRAME IN NEW OR EXISTING WALL
- PARTIAL HEIGHT PARTITION



AREA PLAN



SHEET #	SHEET DESCRIPTION	CITY SUBMITTAL 08/07/2024
GENERAL		
A000	SHEET COVER	•
ARCHITECTURAL		
A200	FLOOR PLAN OVERALL	•
A300	EXTERIOR BUILDING ELEVATIONS	•



1 / A000 **ENTRY AT CORNER**

1000 Twelve Oaks Center Drive
Suite 200, Wayzata, MN 55391
T: 952-426-7400
F: 952-426-7440

MohagenHansen.com

CERTIFICATION

NOT FOR CONSTRUCTION

PROJECT TEAM

CLIENT

WEST DEVELOPMENT
5402 PARKDALE DRIVE, SUITE 105
SAINT LOUIS PARK, MN 55416

THOMAS NOBLE
952-224-2500
TNOBLE@WESTREINC.COM

CIVIL ENGINEER

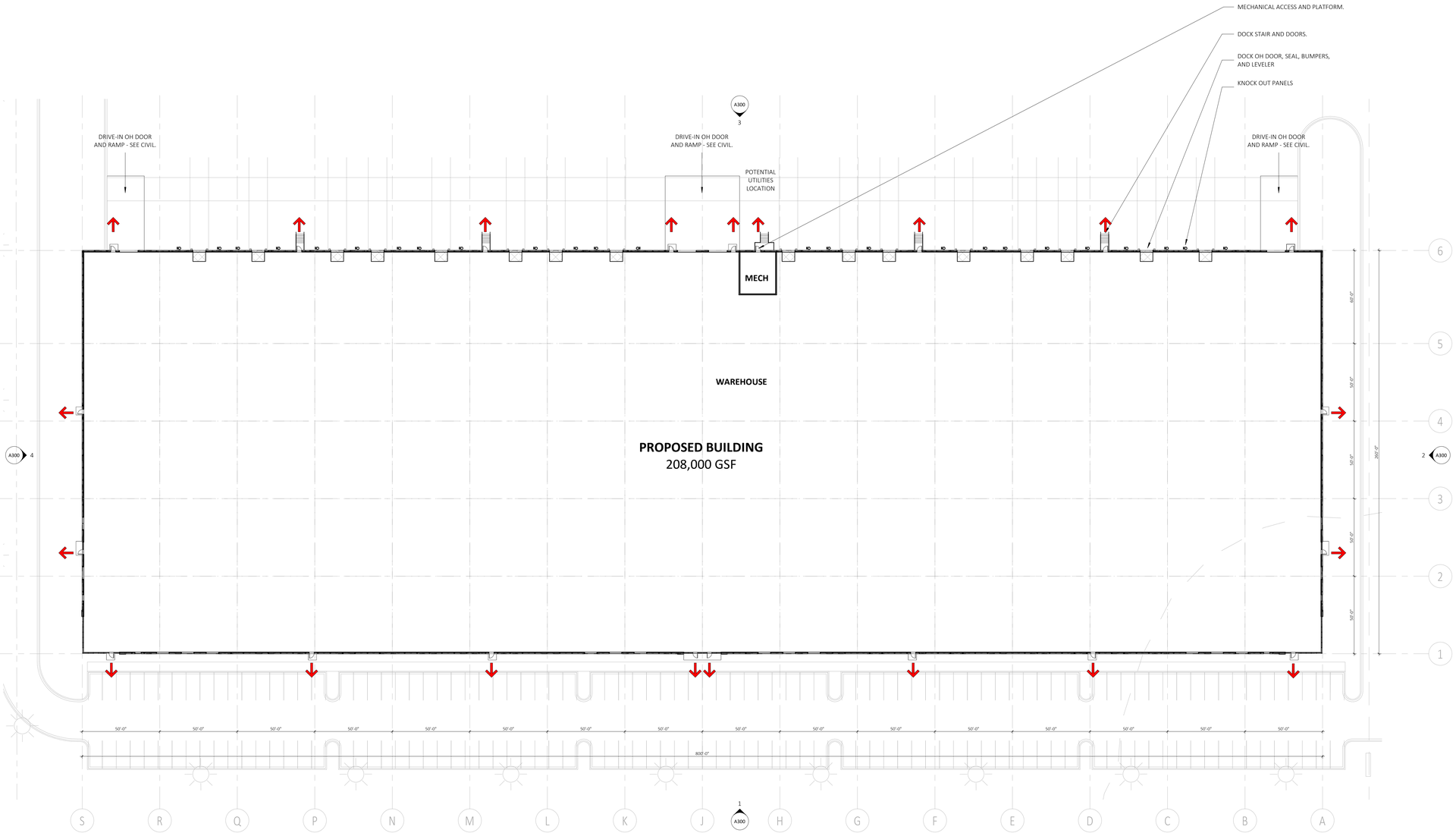
SAMBATEK
12800 WHITEWATER DR #300,
MINNETONKA, MN 55343

JOSEPH BAILEY
763-746-1606
JBAILEY@SAMBATEK.COM

ARCHITECT

MOHAGEN HANSEN
ARCHITECTURE | INTERIORS
1000 TWELVE OAKS CENTER DRIVE, STE 200
WAYZATA, MN 55391
PHONE: 952-426-7400

NEIL MISSLING
NMISSLING@MOHAGENHANSEN.COM



1 A200 FLOOR PLAN
1" = 30'-0"

C:\Revit Projects\23017_RogersNorthdale_Shell2_Master_jjohnson@mohagenhansen.com.rvt

MOHAGEN HANSEN
Architecture | Interiors

1000 Twelve Oaks Center Drive
Suite 200, Wayzata, MN 55391
T: 952-426-7400
F: 952-426-7440

MohagenHansen.com

NOT FOR CONSTRUCTION

THE ARCHITECT SHALL BE DEEMED THE AUTHORS AND OWNERS OF THEIR RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS OF THE ATTACHED DOCUMENTS.

ROGERS NORTHDALE INDUSTRIAL

BUILDING #2
NORTHDALE BLVD AND HWY 101
ROGERS, MN 55374

NO.	DESCRIPTION	DATE
	CITY SUBMITTAL	08/07/2024

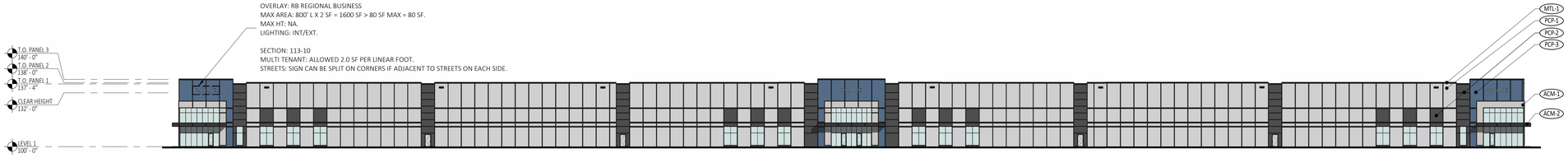
PROJECT NUMBER: 23017
DRAWN BY: J.JOHNSON
CHECKED BY: N.MISSLING/ S.OLIVER
DATE: 08/07/2024
COMPUTER DIRECTORY:
West_Real_Estate\Rogers\23017_ShellAndCoreCampus

FLOOR PLAN OVERALL

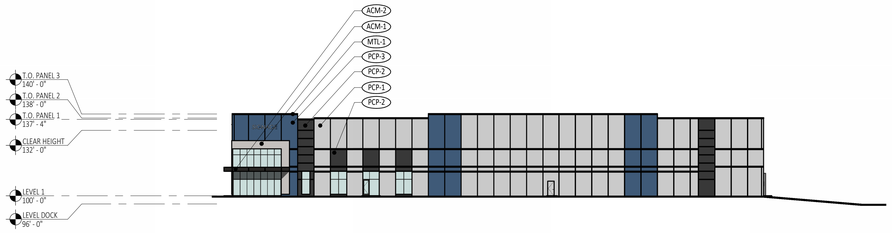
A200

SIGNAGE - TYPICAL FOR TENANT SIGNS
SECTION: 113-9
OVERLAY: RB REGIONAL BUSINESS
MAX AREA: 800' L X 2 SF = 1600 SF > 80 SF MAX = 80 SF.
MAX HT: NA.
LIGHTING: INT/EXT.

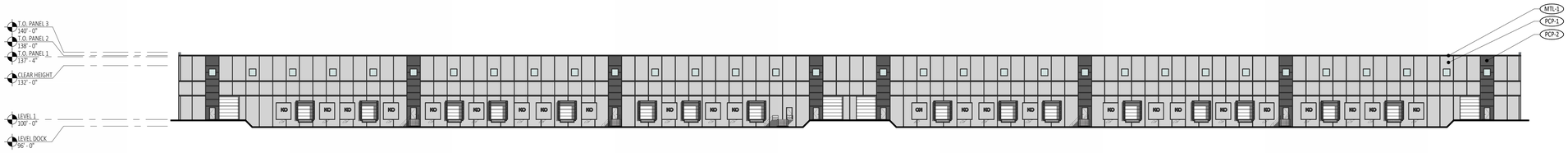
SECTION: 113-10
MULTI TENANT: ALLOWED 2.0 SF PER LINEAR FOOT.
STREETS: SIGN CAN BE SPLIT ON CORNERS IF ADJACENT TO STREETS ON EACH SIDE.



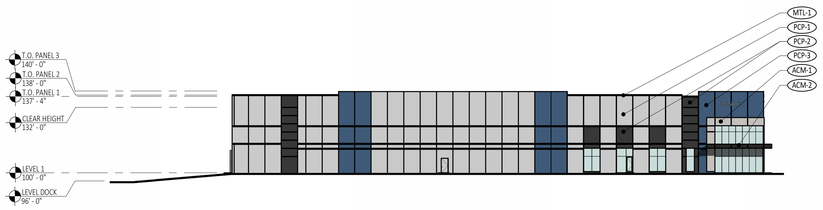
1 A300 ELEVATION - EAST
1" = 30'-0"



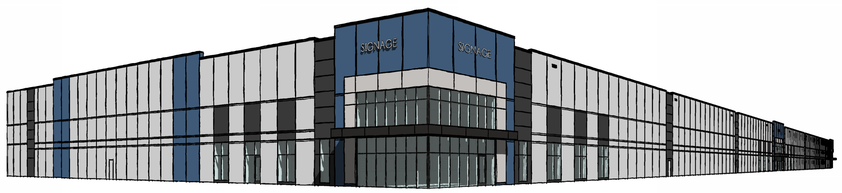
2 A300 ELEVATION - NORTH
1" = 30'-0"



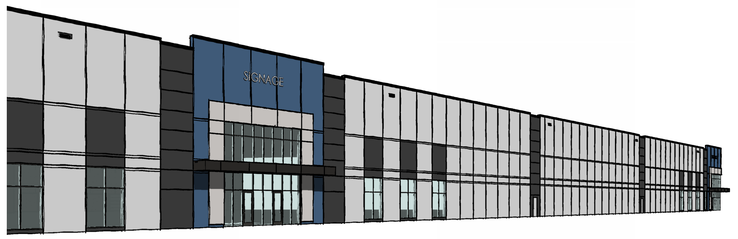
3 A300 ELEVATION - WEST
1" = 30'-0"



4 A300 ELEVATION - SOUTH
1" = 30'-0"



5 A300 3D VIEW - ENTRY AT CORNER



6 A300 3D VIEW - ENTRY AT CENTER

EXTERIOR MATERIALS LEGEND

PCP-1 INSULATED PRE-CAST PANEL
COMPANY: FABCON.
FINISH: STEEL FORM FINISH PRECAST PANEL - PAINTED.
COLOR: **FRENCH GREY (TBD).**

PCP-2 INSULATED PRE-CAST PANEL
COMPANY: FABCON.
FINISH: STEEL FORM FINISH PRECAST PANEL - PAINTED.
COLOR: **CHARCOAL GREY (TBD).**

PCP-3 INSULATED PRE-CAST PANEL
COMPANY: FABCON.
FINISH: STEEL FORM FINISH PRECAST PANEL - PAINTED.
COLOR: **BLUE HUE (TBD).**

MTL-1 PRE-FINISHED METAL COPING AND TRIM
COMPANY: FIRESTONE.
FINISH: UNICLAD.
COLOR: **MATTE BLACK.**

ACM-1 PRE-FINISHED ALUMINUM COMPOSITE METAL PANEL
COMPANY: ALUCOBOND OR EQ.
COLOR: **DEEP BLACK.**

ACM-2 PRE-FINISHED ALUMINUM COMPOSITE METAL PANEL
COMPANY: ALUCOBOND OR EQ.
COLOR: **FRENCH GREY.**

P-1 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: **TO MATCH PAINT PCP-1 PAINT COLOR.**

P-2 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: **TO MATCH PAINT PCP-2 PAINT COLOR.**

P-3 PAINT
COMPANY: SHERWIN-WILLIAMS OR EQ.
COLOR: **TO MATCH PAINT PCP-3 PAINT COLOR.**

NOTES:
1. ALUMINUM STOREFRONT FRAMES/ MULLIONS: **BLACK ANODIZED ALUMINUM.**
2. GLAZING: **CLEAR OR GREY TINT W/ LOW E.**
3. PRECAST OPENING AT STOREFRONT: **PAINT TO MATCH CLOSEST ADJACENT MATERIAL: EITHER PRECAST FACE, MTL, OR ACM.**
4. OVERHEAD DOCK DOORS: **PRE-FINISHED WHITE.**
5. PRECAST OPENING AT OVERHEAD DOCK DOORS: **PAINT TO MATCH CLOSEST ADJACENT PRECAST FACE.**
6. HM DOORS: **ALL DOORS TO BE PAINTED P-1, U.N.O.**
7. CANOPY SOFFIT: **ACM-1.**
8. BOLLARDS: PAINTED: **"OSHA YELLOW".**
9. SIGNAGE: **BACKLIT SIGNAGE BY TENANT PERMIT.**
10. SAMPLES: PROVIDE SAMPLES FOR CLIENT AND ARCHITECT TO REVIEW BEFORE CONSTRUCTION.
11. MOCK-UP: PROVIDE MOCK-UP OF EACH PAINT COLOR FOR CLIENT AND ARCHITECT TO REVIEW ONSITE.

MOHAGEN HANSEN
Architecture | Interiors

1000 Twelve Oaks Center Drive
Suite 200, Wayzata, MN 55391
T: 952-426-7400
F: 952-426-7440

MohagenHansen.com

NOT FOR CONSTRUCTION

THE ARCHITECT SHALL BE DEEMED THE AUTHORS AND OWNERS OF THEIR RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS OF THE ATTACHED DOCUMENTS.

ROGERS NORTHDALE INDUSTRIAL

BUILDING #2
NORTHDALE BLVD AND HWY 101
ROGERS, MN 55374

NO.	DESCRIPTION	DATE
	CITY SUBMITTAL	08/07/2024

PROJECT NUMBER: 23017
DRAWN BY: J.JOHNSON
CHECKED BY: N.MISSLING/ S.OLIVER
DATE: 08/07/2024
COMPUTER DIRECTORY:
West_Real_Estate\Rogers\23017_ShellAndCoreCampus

EXTERIOR BUILDING ELEVATIONS

A300

C:\Revit Projects\23017_RogersNorthdale_Shell2_Master_jjohnson@mohagenhansen.com.rvt

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.6

Subject: Approve Items related to Northview Preserve Final Plat:

- Approve Resolution 2025-41, Approval of Final Plat for Northview Preserve.
- Authorize Execution of Subdivision Agreement and Stormwater Maintenance Agreements related to Northview Preserve.

Prepared By: Alec Henderson, City Planner

Recommended Council Action

Approve Resolution 2025-41, Approving the Final Plat for Northview Preserve, subject to the completion of all agreements, fee payments, and recording requirements as outlined in Resolution 2025-41.

Authorize the execution of the Subdivision Agreement and Stormwater Maintenance Agreement.

Overview / Background / Analysis

Summergate Development has submitted a Final Plat application for the Northview Preserve subdivision, which includes 75 single-family residential lots and three outlots on approximately 31.27 acres. The property is zoned R2 – Single-Family Residential and is guided as Low Density Residential under the City's 2040 Comprehensive Plan. The proposed subdivision conforms to the land use guidance and zoning district standards, including minimum lot dimensions, setbacks, and density requirements.

All public infrastructure plans, including grading, drainage, utility connections, and road improvements, have been reviewed and found to comply with City engineering requirements and the Elm Creek Watershed Commission's stormwater standards. Notably, turn lane and access improvements along Territorial Road have been included per coordination with Hennepin County. Landscaping plans include appropriate boulevard tree plantings.

The Final Plat is consistent with the Preliminary Plat approved by Resolution 2025-07 and meets all conditions. A Subdivision Agreement, Stormwater Maintenance Agreement, and required financial securities must be executed prior to recording the plat. Additionally, the City will collect $79,040 in sanitary sewer fees from the developer for remittance to Forestar (USA) Real Estate Group, Inc., based on prior trunk infrastructure installation (see draft resolution).

Staff Recommendation

Staff recommends approving Resolution 2025-41, Approving the Final Plat for Northview Preserve, subject to the completion of all agreements, fee payments, and recording requirements as outlined in Resolution 2025-41.

Staff recommends authorizing the execution of the Subdivision Agreement and Stormwater Maintenance Agreement.

Financial Impact: NA **Source Fund**: NA

Budgeted? N/A

Supporting Documentation

A. Resolution No. 2025-41 Final Plat DA_NORTHVIEW PRESERVE
B. Northview Preserve Subdivision Agreement 5-22-25
C. Northview Preserve Stormwater Maintenance Agreement 5-22-25
D. 25-03-22 0033874-NorthviewPreserve
E. 25-04-02 Northview Preserve Final Landscape
F. 2025-04-02 Northview Preserve Territorial Road Turn Lane Plans
G. 2025-04-02 Northview Preserve Final Street & Utilities

RESOLUTION NO. 2025 - 41

A RESOLUTION GRANTING APPROVAL OF THE FINAL PLAT FOR NORTHVIEW PRESERVE

WHEREAS, the Summergate Development/Summergate Companies LLC ("Developer") submitted an application requesting approval of a Preliminary Plat for NORTHVIEW PRESERVE ("Plat") for the approximate 31-acre parcel at with the PID 27-120-23-22-0004 and legally described on Exhibit A (the "Subject Property/Property"); and,

WHEREAS, the Developer is proposing to plat the property into 75 single-family lots and three outlots to accommodate a single-family residential development of the area as shown in Exhibit B; and,

WHEREAS, the Subject Property contains approximately 31.27 gross acres is guided as Low Density Residential in the 2040 Comprehensive Plan and within the Single-Family Residential (R2) zoning district; and,

WHEREAS, the Northview Preserve development received preliminary plat approval through Resolution 2025-07 on February 11th, 2025 and the Final Plat is consistent with previous approvals; and,

WHEREAS, the public sanitary sewer and watermain to serve Northview Preserve were installed and paid for by Forestar (USA) Real Estate Group, Inc. with Big Woods Crossing; and,

WHEREAS, the sanitary sewer costs incurred by Forestar (USA) Real Estate Group, Inc. with Big Woods Crossing exceeded the credits available to them; and,

WHEREAS, the Development Subdivision Agreement and Stormwater Agreement must be approved by the City Council and executed before any building permits may be issued.

NOW THEREFORE, BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF ROGERS, MINNESOTA, that the Final Plat for Northview Preserve is hereby approved for and is conditioned upon the Developer complying with the plat opinion and complete revisions to the Plat and development plans as may be required by the City Attorney and/or City Engineer.

BE IT FURTHER RESOLVED, the City of Rogers and Summergate Development/Summergate Companies LLC shall execute a Subdivision Agreement for the Development, identifying the terms and conditions of the development and fees, escrows and financial security obligations of the Developer, including payment of assessments levied against the Subject Property. The Agreement shall be filed with Hennepin County for recording.

BE IT FURTHER RESOLVED, the Final Plat shall be not be released for recording until the Developer's Agreement is executed by both parties and all fees, escrows, financial security obligations and assessments due with Northview Preserve are received by the City; recording of the Final Plat with the land records office of Hennepin County must occur within 30 days of its release by the City to Developer.

BE IT FURTHER RESOLVED, a portion of the Northview Preserve development fees for sanitary sewer in the amount of $79,040 shall be collected by the City and paid to Forestar (USA) Real Estate Group, Inc. and the Finance Director is hereby authorized to make such payment.

Moved by Councilmember , seconded by Councilmember

The following voted in favor of said resolution:

The following voted against the same:

The following abstained:

Whereupon said resolution was declared duly passed and adopted, and was signed by the Mayor, and attested by the Clerk dated this May 27th, 2025.

_____
Shannon Klick, Mayor

ATTEST:

_____
Stacie Brown, City Clerk

EXHIBIT A

LEGAL DESCRIPTION

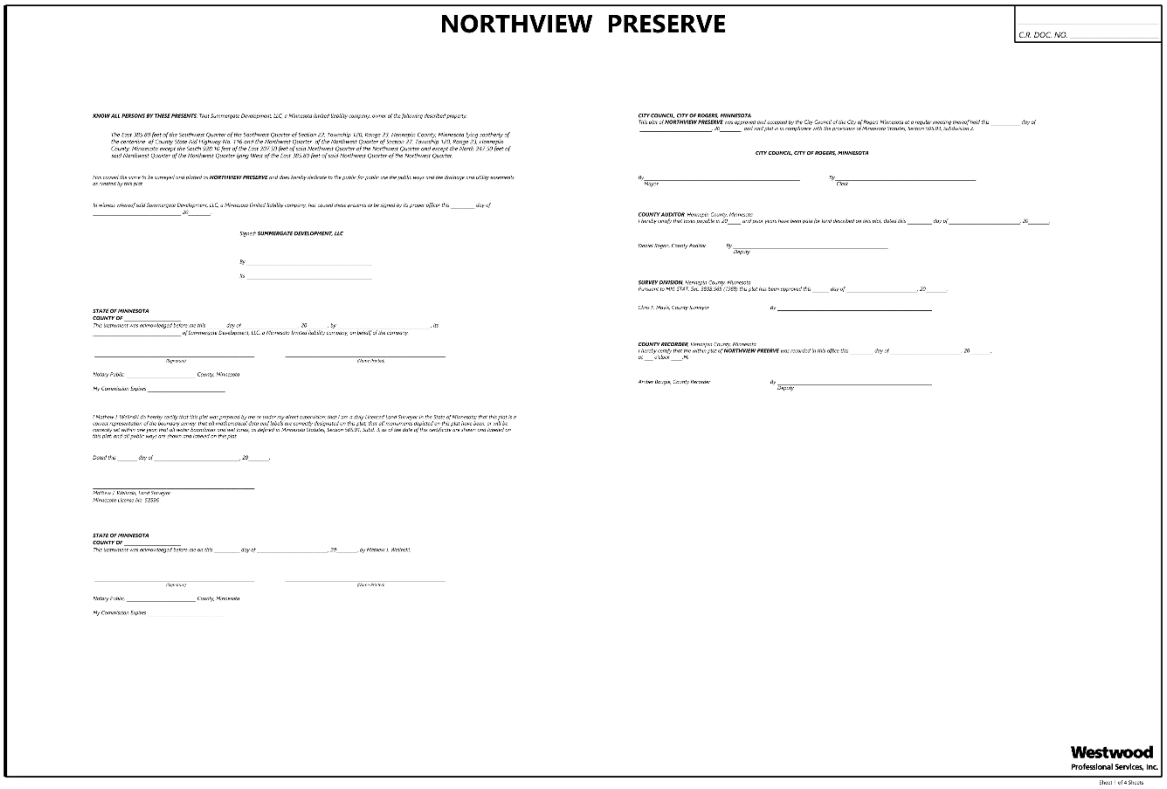
Existing Legal Description

The East 385.80 feet of the Southwest Quarter of the Southwest Quarter of Section 22, Township 120, Range 23, Hennepin County, Minnesota lying southerly of the centerline of County State Aid Highway No. 116 and the Northwest Quarter of the Northwest Quarter of Section 27, Township 120, Range 23, Hennepin County, Minnesota except the South 928.10 feet of the East 207.50 feet of said Northwest Quarter of the Northwest Quarter and except the North 247.50 feet of said Northwest Quarter of the Northwest Quarter lying West of the East 385.80 feet of said Northwest Quarter of the Northwest Quarter.

Abstract Property

EXHIBIT B

FINAL PLAT



NORTHVIEW PRESERVE

C.R. DOC. NO.

KNOW ALL PERSONS BY THESE PRESENTS: That Summergate Development, LLC, a Minnesota limited liability company, owner of the following described property:

The East 305.69 feet of the Southwest Quarter of the Northwest Quarter of Section 22, Township 120, Range 23, Hennepin County, Minnesota lying northerly of the centerline of County State Aid Highway No. 116 and the Northwest Quarter of the Northwest Quarter of Section 22, Township 120, Range 23, Hennepin County, Minnesota except the South 628.92 feet of the East 305.69 feet of said Northwest Quarter of the Northwest Quarter and except the North 367.50 feet of said Northwest Quarter of the Northwest Quarter lying West of the East 305.69 feet of said Northwest Quarter of the Northwest Quarter.

Has caused the same to be surveyed and platted as NORTHVIEW PRESERVE and does hereby dedicate to the public for public use the public ways and the drainage and utility easements as created by this plat.

In Witness Whereof said Summergate Development, LLC, a Minnesota limited liability company, has caused these presents to be signed by its proper officer this _____ day of _____, 20____.

Signed: SUMMERGATE DEVELOPMENT, LLC

By _____

Its _____

STATE OF MINNESOTA
COUNTY OF _____

The foregoing was acknowledged before me this _____ day of _____, 20____, by _____, the _____ of Summergate Development, LLC, a Minnesota limited liability company, on behalf of the company.

_____ (Signature) _____ (Printed Name)

Notary Public: _____ County, Minnesota

My Commission Expires: _____

I Matthew J. Wetstein do hereby certify that this plat was prepared by me or under my direct supervision; that I am a duly Licensed Land Surveyor in the State of Minnesota; that this plat is a correct representation of the boundary survey; that all mathematical data and labels are correctly designated on the plat; that all monuments depicted on the plat have been, or will be correctly set within one year; that all water boundaries and wet lands, as defined in Minnesota Statutes, Section 505.01, Subd. 3, as of the date of this certificate are shown and labeled on this plat; and all public ways are shown and labeled on this plat.

Dated the _____ day of _____, 20____.

_____
Matthew J. Wetstein, Land Surveyor
Minnesota License No. 53506

STATE OF MINNESOTA
COUNTY OF _____

The foregoing was acknowledged before me this _____ day of _____, 20____, by Matthew J. Wetstein.

_____ (Notarial) _____ (Printed Name)

Notary Public: _____ County, Minnesota

My Commission Expires: _____

CITY COUNCIL, CITY OF ROGERS, MINNESOTA
This plat of NORTHVIEW PRESERVE was approved and accepted by the City Council of the City of Rogers, Minnesota at a regular meeting thereof held this _____ day of _____, 20____, and said plat is in compliance with the provisions of Minnesota Statutes, Section 505.03, Subdivision 2.

CITY COUNCIL, CITY OF ROGERS, MINNESOTA

By _____ (Mayor) By _____ (Clerk)

COUNTY AUDITOR Hennepin County, Minnesota
I hereby certify that taxes payable in 20____ and prior years have been paid for land described on this plat, dated this _____ day of _____, 20____.

Dennis Hegna, County Auditor By _____ Deputy

SURVEY DIVISION Hennepin County, Minnesota
Pursuant to MN STAT. Sec. 383B.565 (1969) this plat has been approved this _____ day of _____, 20____.

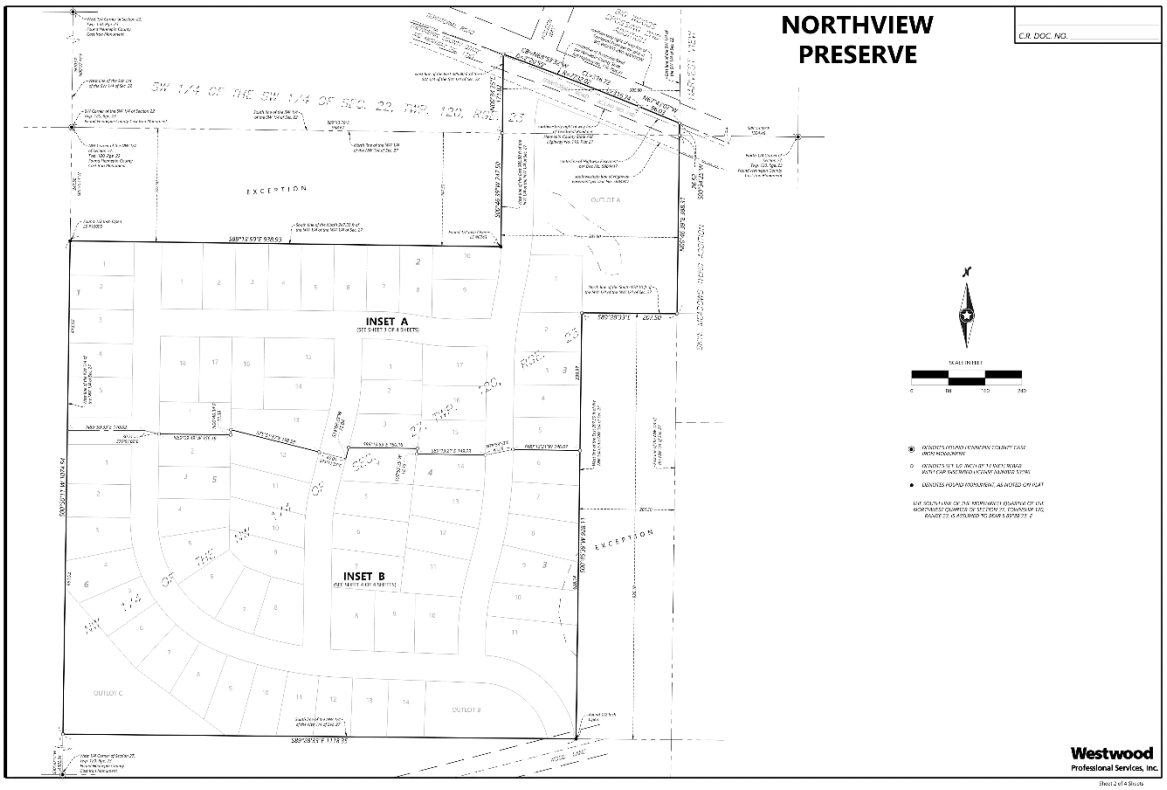
Chris T. Meek, County Surveyor By _____

COUNTY RECORDER Hennepin County, Minnesota
I hereby certify that the within plat of NORTHVIEW PRESERVE was recorded in this office this _____ day of _____, 20____, at _____ o'clock ____M.

Amber Bougie, County Recorder By _____ Deputy

Westwood Professional Services, Inc.

Sheet 1 of 4 Sheets



NORTHVIEW PRESERVE

C.R. DOC. NO.

EXCEPTION

OUTLOT A

INSET A

INSET B

OUTLOT B

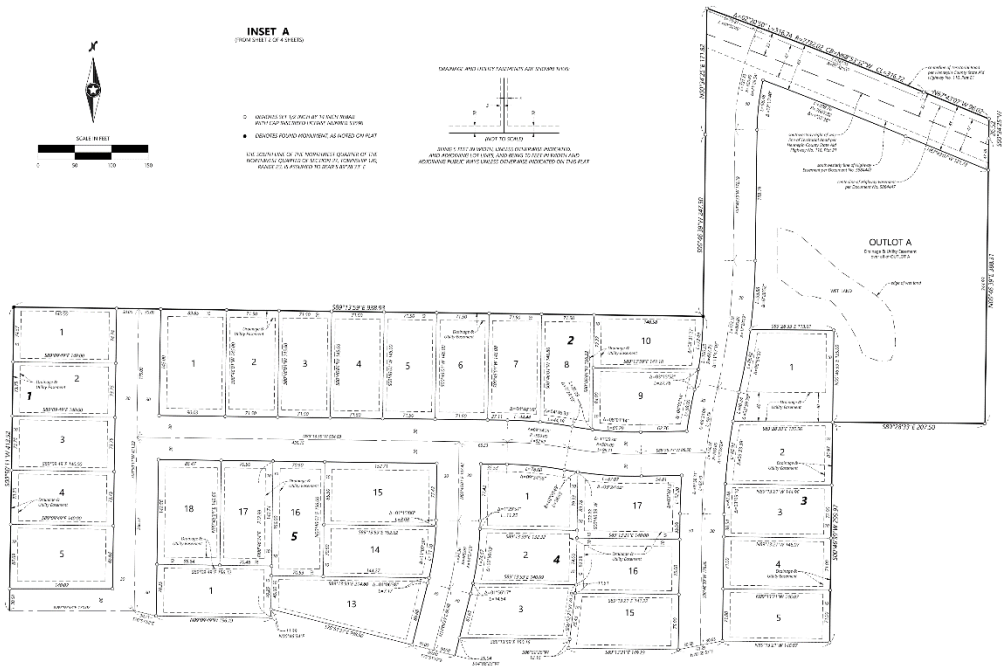
OUTLOT C

Westwood Professional Services, Inc.

Sheet 2 of 4 Sheets

NORTHVIEW PRESERVE

C.R. DOC. NO.



Westwood
Professional Services, Inc.

Sheet 3 of 4 Sheets

NORTHVIEW PRESERVE

C.R. DOC. NO.



Westwood
Professional Services, Inc.

Sheet 4 of 4 Sheets

Abstract Property

SUBDIVISION AGREEMENT

NORTHVIEW PRESERVE

THIS DEVELOPER'S AGREEMENT ("Agreement") is made this _____ day of _____, 2025, by and between the City of Rogers, a municipal corporation under the laws of Minnesota ("City"), located at 22350 Diamond Lake Road, Rogers, Minnesota 55374, and Summergate Development LLC, a Minnesota Limited Liability Company, located at 17505 Cedar Ave S, Lakeville, MN 55044, Ste 200 ("Developer").

RECITALS

A. The purpose of this Agreement is to set forth the general rights, obligations and duties of the City and the Developer with respect to the development in the City of a residential subdivision, commonly known as "*NORTHVIEW PRESERVE*." Each phase of the subdivision will enter into a separate agreement.

B. This Subdivision Agreement applies to NORTHVIEW PRESERVE ("Development") which consists of approximately 31.27 acres described as, according to the recorded plat thereof ("Subject Property") and legally described as attached in Exhibit A.

C. Development of the Subject Property consists of a total of 75 total residential units.The Final Plat also includes three (3) outlots. The Development will occur in a single phase.

D. Pursuant to an approved Preliminary Plat for development of Northview Preserve by Resolution No. 2025-07, adopted by the City Council February 11, 2025 and Final Plat for Northview Preserve by Resolution No. 2025-41 on May 27, 2025 (collectively, the "City Approvals"). The terms and conditions of the City Approvals incorporated into this Subdivision Agreement by reference. Development of the Property shall be in conformance with City Code, City Approvals, and this Subdivision Agreement.

F. The City and the Developer now desire to enter into this Agreement setting forth certain requirements and obligations relating to the development of the Subject Property, including but not limited to the execution and recording of certain instruments. This Agreement replaces and supersedes any previous oral agreements, understandings, or previous negotiations between the parties in relation to the Subject Property.

G. The City requires that the Developer perform work and install certain on and off-site improvements within the Subject Property, which work and improvements typically consist of the grading and erosion control, public utilities (sewer, water and storm sewer), streets, private utilities (gas, electric, and communications), sidewalks and trails, street signs and traffic control signs, lighting, boulevard landscaping, drainage swales, street cleaning, front yard trees, and wetland buffers, which improvements to the Subject Property shall be referred to herein as the "Improvements."

AGREEMENT

In consideration of each party's promise as set forth in this Agreement, it is mutually agreed as follows:

ARTICLE ONE
CONSTRUCTION OF IMPROVEMENTS; EASEMENTS & RIGHTS OF ENTRY

1.01. Developer Responsible. The Developer has submitted its plans and specifications for the Development to the City for the City's review and approval. Developer agrees to construct and pay for the Improvements required for development of the Subject Property, as described in plans and specifications approved by of the City Engineer or designee ("Approved Plans"). For the purpose of this Agreement, the Approved Plans shall include the Grading, Erosion Control, Storm Water/SWPPP and Street and Utility Plan Sets dated_____ with a final revision on _____ , and approved by the City Engineer on _____ as more specifically set forth in Exhibit C. The Improvements shall be constructed in accordance with City specifications and the Approved Plans. Prior to beginning construction, the Developer or the Developer's engineer shall submit a copy of the Approved Plans to the Public Works Director and shall schedule a preconstruction meeting with all concerned parties, including City staff and engineers to review the program for construction work. All labor and work will be in strict conformance with the Approved Plans. Any deviation from the Approved Plans must be preapproved in writing by the Public Works Director, which shall not be unreasonably withheld. Developer shall pay for Improvements which costs are estimated and listed in the attached Exhibit B.

1.02. Staking, Surveying and Inspections. Developer must provide all required staking and surveying for the Improvements in order to ensure that the completed Improvements conform to the Approved Plans. The Developer will provide for construction inspection and material testing for the Improvements. The Developer shall instruct its engineer to provide full-time field inspection personnel in order for the Developer's engineer to be able to certify that the construction work meets the approved City standards as a condition of City acceptance. In addition, the City may, at the City's discretion and at the Developer's expense, have one or more City inspectors and a soil engineer inspect the work on a full or part-time basis. The designated City inspectors must be notified and present to witness all utility tests. This includes watermain (hydrostatic testing, conductivity testing, disinfection testing), sanitary sewer (trace wire, leakage testing, deflection testing), and any other utility testing as

deemed necessary by the City Engineer. The Developer, its contractors and subcontractors, shall follow all instructions received from the City's inspectors. The Developer and/or the Developer's engineer shall provide for on-site project management. The Developer's engineer is responsible for design changes and contract administration between the Developer and the Developer's contractor. The Developer or his or her engineer shall schedule a pre-construction meeting at a mutually agreeable time at City Hall with all parties concerned, including the City staff, to review the program for the construction work.

All labor and work shall be done and performed in the best and most workmanlike manner and in strict conformance with the approved plans and specifications. The Developer agrees to furnish to the City a list of contractors being considered for retention by the Developer for the performance of the work required by the contract. The Developer shall not do any work or furnish any materials not covered by the plans and specifications and special conditions of this contract, for which reimbursement is expected from the City, unless such work is first approved in writing by the City Engineer or designee. Costs incurred by the City for the additional inspection activities will be recovered through the Escrow described in Article Two and shall be calculated at 3% of the estimated cost of proposed public improvements, as shown in the attached Exhibit B.

1.03. Unsatisfactory Labor or Material. The Public Works Director shall not reject as defective and/or unsuitable any material or labor delivered consistent with the Approved Plans. In the event that the Public Works Director reasonably rejects as defective or unsuitable material, then such material must be removed and replaced with approved material at the sole cost and expense of the Developer. In the event the Public Works Director reasonably rejects as defective or unsuitable any material supplied by the Developer, then the labor must be completed again to the specifications and approval of the Public Works Director at the sole cost and expense of the Developer.

1.04. Records. Upon request by the Public Works Director, Developer will provide requested copies of bids, change orders, suppliers, subcontractors, or related matters, relating to the Improvements.

1.05. Time of Performance. The Developer shall install all required public improvements by May 27, 2025, with the exception of the final wear course of asphalt on streets. Failure to perform may result in the City drawing upon the Developer's financial guarantees. The developer may, however, request an extension of time from the City. If an extension is granted, it will be conditions upon updating security posted by the Developer to reflect cost increases and the extended completion May 27, 2025. Final wear course placement will be allowed in a new housing development only after one freeze - thaw cycle and after a certificate of occupancy has been issued for 75% of the dwelling units. An inspection of the roadway will be performed by the City Engineer or designee prior to wear course placement. From this inspection, any deficiencies or damage to the street, sidewalk and curb will be noted and will need to be corrected prior to the placement of the wear course.

1.06. Final Inspection/Acceptance. Upon completion of the Improvements and any work required following inspection(s) by the Public Works Director, the Public Works Director and the Developer's contractor and/or engineer will promptly make a final inspection of the Improvements to determine that the Improvements were installed pursuant to the Approved Plans. Before final payment is made to the contractor by the Developer, the Public Works Director shall be satisfied that all work is satisfactorily completed in accordance with the Approved Plans, and the Developer's engineer shall submit a written statement attesting to the same. Final approval and acceptance of the Development

and Improvements shall be in writing from the City to Developer ("Final Approval"), and shall include acceptance of any Improvements which are to be transferred to the City.

1.07. As-built Plans. Upon completion of the Improvements, the Developer shall provide the City with: (i) a full set of as-built plans in a digital PDF and AutoCAD.DWG format, and (ii) an as-built survey in a AutoCAD.DWG format for City records in accordance with the City's most recent Engineering Guidelines. Utility profiles are not required to be included in the as-built plans.

1.08. Maintenance Bond. The Developer and/or its contractor shall be required to furnish the City a two (2) year maintenance bond guaranteeing the Improvements that are transferred to the City. The maintenance bond shall be provided to the City upon final inspection and acceptance of said Improvements.

1.09 Landscaping Bond. The Developer shall be required to furnish the City a two (2) year warranty bond or letter of credit guaranteeing the landscaping work in the amount of the landscaping improvement associated with this phase of the development. The landscaping bond shall be provided to the City and commence upon final inspection and acceptance of said landscaping improvements.

1.10. Maintenance of Public Property. Developer agrees to assume full financial responsibility for any damage which may occur to public property with the development of Subject Property, including, but not limited to, streets, street sub-base, base, bituminous surface, curb, utility system including, but not limited to water main, sanitary sewer or storm sewer when said damage occurs as a result of the activity which takes place during the development of the Subject Property by the Developer, its contractors or subcontractors or assigns. The Developer further agrees to pay all costs required to repair the streets or utility systems, or both, damaged or cluttered with debris when occurring as a direct or indirect result of the construction that takes place by said Developer, its contractors or subcontractors or assigns during the course of the Development. In the event the Developer fails to maintain or repair the damaged public property within a reasonable period after receipt of written notice of the nature of the default or damage, but not to exceed 14 days, the City may undertake making or causing it to be repaired or maintained. The City may draw down on the escrow, Letter of Credit or any other cash deposits made by Developer to pay such costs, if Developer fails to complete the repairs.

1.11. Maintenance of Improvements. Developer shall be responsible for all maintenance, upkeep and repair (including, but not limited to snow plowing, mowing, weed control, and grading) of the Improvements until issuance of the Final Approval. Developer shall remain responsible for all maintenance and upkeep of Improvements that are not transferred to the City. Developer hereby agrees to indemnify and hold the City harmless from any and all claims for damages of any nature whatsoever arising out of Developer's acts or omissions in performing the obligations imposed upon Developer by this paragraph.

1.12. Street Maintenance During Construction. The Developer shall be responsible for all street maintenance until the streets are accepted by the City. Warning signs shall be placed when hazards develop in streets to prevent the public from traveling on same and to direct attention to detours.

If and when streets become impassable, such streets shall be barricaded and closed. In the event residences are occupied prior to completing streets, the Developer shall maintain a smooth surface and provide proper surface drainage to ensure that the streets are passable to traffic and emergency vehicles. The Developer shall be responsible for keeping streets within and without the subdivision swept clean of dirt and debris that may spill, track, or wash onto the street from the Developer's operation. The Developer may request, in writing, that the City keep the streets open during the winter months by plowing snow from the streets prior to final acceptance of said streets if all of the following conditions are meet and verified by the City by October 1st:

- The street has concrete curb and is paved with first lift of asphalt.
- At least one house on the street is occupied.
- All the manholes and valve boxes (iron) is set below the paved surface so not to cause damage to the snow removal equipment.

If any one of these conditions is not met by October 1st snow removal for the entire season will be the responsibility of the developer. If the conditions are not met, the developer shall be responsible for plowing all streets within the development in accordance with the City's Snow Removal Policy and shall be completed within 12 hours after snowfall has ended. If the Developer does not comply with the policy or if the streets are not plowed within the specified time, the City will plow the streets and bill the Developer plus a penalty of $500 each time the City plows the streets. If the Developer does not reimburse the City for any cost the City incurred for such work within ten days, the City may draw down the security to pay any costs.

The City shall not be responsible for repairing damage in the development because of snow plowing operations. Providing snow plowing service does not constitute final acceptance of the streets by the City. The Developer shall contract for street cleaning within and immediately adjacent to the development. At a minimum, scraping and sweeping shall take place on a weekly basis. A copy of this contract shall be approved by the City before grading is started. The contract shall provide that the City may direct the contractor to clean the streets and bill the Developer.

1.13. Demolition. The Developer shall obtain all required permits and approvals and thereafter remove any existing structures on the Subject Property prior to commencement of the Improvements.

1.14. Easement to the Developer. The City, at no charge to Developer, grants to the Developer a Temporary Construction Easement ("Easement") over, under and across the rights-of-way dedicated to the public in the Northview Preserve Final Plat for purpose of construction of the Improvements. The Easement will commence with the filing of this Agreement with Hennepin County, and shall terminate upon the acceptance City's issuance of the Final Approval.

1.15. Easement to the City. The Developer grants to the City, its agents, representatives, employees, officers, and contractors, a right of entry to access all areas of the Subject Property to perform any and all work and inspections necessary or deemed appropriate by the City or to take any corrective actions deemed necessary by the City in conjunction with this Agreement. The right of entry conveyed by the Developer to the City shall continue until the City's issuance of the Final Approval. The City will provide the Developer with reasonable notice prior to exercising its rights hereunder, except in the case of an emergency.

ARTICLE TWO
FINANCIAL GUARANTY & REQUIRED PAYMENTS

2.01. Development Costs. All fees and costs as further set out in Exhibit B must be paid in full to the City prior to the delivery of the Final Plat to Developer for recording.

2.02. Financial Guaranty, Improvements. Prior to commencement of construction of the Improvements, the Developer will furnish the City an irrevocable Letter of Credit or cash escrow deposit in the same amount equal to 125 percent of non-public Improvements and 150 percent of the Improvements to be dedicated to the City (collectively referred hereafter as "Security"), approved by the City Attorney, in the amount as set forth in Exhibit B. If by Letter of Credit, the Security must contain a provision that prohibits the issuer or surety from terminating the Security without first giving 45 days' written notice to the City of the proposed termination or expiration of the Security. In the event, the Security provided by developer does not conform with the requirements of Section 3.02, then the Developer, following notice from the City, shall provide a substitute Security. Failure of the Developer to post a substitute Security within five (5) business days after notice by the City shall constitute a default that shall be grounds for drawing on the Security. The City Administrator may grant a reduction in the Security upon written request by the Developer based upon the value of the completed work at the time of the requested reduction. The Security may not be reduced to less than 10 percent of the original amount until all work required of the Developer by this Agreement has been completed and accepted by the City. The Security shall be released upon the City's issuance of the Final Approval. Upon failure of the Developer to complete the Improvements in accordance with this Agreement or otherwise perform under this Agreement, the City may declare the Developer to be in default and the amount of the Security shall be paid over to the City. From the proceeds of the Security, the City shall be reimbursed for any attorneys' fees, engineering fees or other technical or professional assistance, including the work of the City staff and employees, and the remainder thereof shall be used by the City to complete the Improvements. The Developer shall be liable to the City to the extent that the Security is inadequate to reimburse the City its costs and pay for the completion of the work. The Security provided by Developer in the form of a Letter of Credit shall comply with the City's Letter of Credit policy which Developer hereby acknowledges receipt of a copy thereof.

	Reduction	Release*
Site grading and erosion control	50-percent after rough grading and soil stabilization, 90-percent after testing, inspection, acceptance and approval of submitted as-builts	Project completion and removal of erosion control
Watermain improvements	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	After testing, inspection, acceptance and approval of submitted as-builts
Sanitary sewer improvements	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	After testing, inspection, acceptance and approval of submitted as-builts

Stormwater management facilities	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	After functionality is observed by city staff and approval of submitted as-builts
Street improvements	75-percent after first lift installed and all curbing installed and backfilled	After acceptance
Parking lot improvements	75-percent after first lift installed and all curbing installed and backfilled	Project completion
Sidewalk/trail improvements	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	After acceptance
Wetland and buffer restoration	Value of the completed work at the time of the requested reduction (not to exceed 90-percent)	Restoration complete
Wetland monitoring	1/5th at submittal of each annual report	After 5 years of annual reports
Landscaping and tree mitigation	20-percent after full installation	After one full growing season following installation
Subdivision iron monuments		Project completion and land surveyor certifies that all irons have been set following site grading and utility and street construction

2.03. Escrow. The Developer shall submit an Escrow Receipt Form and escrow for the Development as required by Exhibit B ("Escrow"). This Escrow is to be used by the City staff to charge costs of services or materials in connection activities required under this Agreement as set forth on the attached Exhibit B. If, at any time prior to completion of the development contract administration process, the balance in the Escrow is depleted to less than 10 percent of the originally required Escrow amount, the Developer shall deposit additional funds in the cash escrow account as determined by the City. Developer shall pay additional escrow as reasonably determined by the City within 10 days of written demand. Failure to make payment of the additional escrow amount will permit the City to supplement those amounts from the Security pursuant to Section 3.02 or to issue the Developer a stop work order. A new Escrow Receipt Form must be completed when replenishing the escrow and to ensure that contact information on the new Escrow Receipt Form is the same as the original escrow form. The City shall return the unused escrow balance to the Developer no sooner than six (6) months after the acceptance of the Improvements by the City at the contact information provided on the Escrow Receipt Form(s).

ARTICLE THREE
OTHER REQUIREMENTS

3.01. Indemnification. Notwithstanding anything to the contrary in this Agreement, the City, its officials, agents and employees shall not be personally liable or responsible in any manner to the

Developer, the Developer's contractor or subcontractor, material suppliers, laborers or to any other person or persons and Developer shall hold the City, its officials, agents and employees harmless from any claim, demand, damages, actions or causes of action of any kind or character, including the costs, disbursements, and expenses of defending the same, which costs may include but are not limited to, attorneys' fees, consulting engineering services, and other technical or professional assistance arising from or related to this Agreement, Developer's performance or non-performance under this Agreement, or the completion of or failure to complete the work required by this Agreement. The Developer further agrees that it will indemnify, defend, and hold harmless the City and its governing body members, officers, and employees, from any claims or actions arising out of the presence, if any, of hazardous wastes or pollutants on the Subject Property, except to the extent caused by the acts or omissions of the City. Nothing in this section will be construed to limit or affect any limitations on liability of the City under State or federal law, including without limitation Minnesota Statutes Sections 466.04 and 604.02.

3.02. Insurance. The Developer must keep the insurance in force at all times that construction on the Development is in progress. The insurance must name the City as an additional insured. The Developer shall furnish proof of insurance acceptable to the City, covering any public liability or property damage by reason of the operation of the Developer's equipment, laborers, and hazard caused by the Improvements, and include at least the following:

a. Comprehensive general liability insurance (including operations, contingent liability, operations of subcontractors, competed operations and contractual liability insurance) together with an Owner's Contractor's Policy with limits against bodily injury, including death, and property damage (to include, but not be limited to damages caused by erosion or flooding) which may arise out of Developer's work or the work of any of its subcontractors. The exclusion for underground collapse shall be removed.

b. Limits for bodily injury or death shall not be less than $500,000.00 for one person and $1,500,000.00 for each occurrence; limits for property damage shall not be less than $2,000,000.00 for each occurrence.

c. Worker's compensation insurance, with statutory coverage, if applicable.

d. Developer shall file a Certificate of Insurance with the City Clerk prior to commencing site grading. Developer shall be responsible for insuring that the Certificate bear the following wording.

"Should any of the above policies be canceled or terminated before the expiration May 27, 2025 thereof, the issuing company shall give thirty (30) days written notice of cancellation or termination to the Certificate Holder."

3.03. Private Easements. Developer shall provide to the City evidence of all executed private easements between the Developer and adjacent property owner(s). Private easements shall be recorded with Hennepin County; a copy of said recording shall be provided to the City with a copy of the private easement.

3.04. Building Permits and Occupancy. Building permits shall only be issued upon execution of this Agreement by the City and Developer and all amounts due and securities required under this Agreement are paid to the City, the Final Plat is recorded and a receipt of said recording is provided to the City, and the streets (including curb and gutter installation) needed for access to lots where permits are requested are paved with the base course of bituminous, and the sewer and water service utilities are tested and approved by the City Engineer or designee. Prior to recording of the Final Plat, permits for grading and erosion control may be issued in conjunction with an approved grading permit and payment of the required Security and Escrow by Developer to the City as identified in Exhibit B. The Developer may apply for building permit(s) to construct up to construct *two* model homes prior to the completion of the public roads serving the development. For purposes of calculating the number of building permits that can be issued for this phase, each structure containing townhomes shall be considered one (1) building. Model home sites must be approved by the City Planner and may be no greater 350 feet from a paved bituminous road. Developer shall maintain access for vehicle traffic and parking during construction of the model homes and access for emergency personnel and equipment, as determined by the City. No occupancy of any newly constructed building in said Final Plat shall occur until the base course of bituminous is in place and a certificate of occupancy has been issued by the City Building Official. The Developer shall use the model home only for real estate sales purposes and no other purposes.

3.05. Underground Utilities. The Developer shall contact the electric, telephone, gas and cable companies that are authorized to provide service to the Subject Property for the purpose of ascertaining whether any of those utility providers intend to install underground lines within the Development. The placement of private underground utilities shall be designed and constructed according to City standards and specifications, and coordinated with the placement of public underground utilities. Underground utility plans shall be reviewed and approved by the Public Works Director. Any costs associated with the installation of underground utilities required by the utility companies shall be solely borne by the Developer. The Developer agrees to comply with applicable requirements of franchise ordinances in effect in the City, copies of which are available from the City Clerk.

3.06. Street Cleaning. Developer shall contract with a street cleaning firm to provide street cleaning services within and immediately adjacent to the Property. A copy of said contract shall be submitted to and approved by City prior to the issuance of a grading permit. This contract shall name City as an authorized agent to order street cleaning services as City deems necessary. The cost of the street cleaning under the contract shall be paid for by Developer. During development of the Property, the Developer shall clean dirt and debris from streets adjoining or within its development on a weekly basis that has resulted from construction work by the Developer, its contractors, subcontractors, agents or assigns. The City will inspect the Subject Property not less than on a weekly basis to determine whether it is necessary to take additional measures to clean dirt and debris from the streets. After 24 hours' telephone notice to the Developer's owner's representative, the City may complete or contract to complete the clean-up at the Developer's expense. The City may draw down on the Escrow or Security to pay such costs.

3.07. Construction Hours; Noise; Dust. Developer will comply with all requirements of the City pertaining to the hours and days during which construction activities may take place. Unless otherwise approved in writing by the City Administrator, construction hours shall be 7:00 a.m. to 7:00 p.m.

Monday through Friday and 9:00 a.m. to 5:00 p.m. on Saturday, and upon request, due to construction delays out of the Developer's control, extended Saturday hours and Sunday hours established by the City Administrator. The Developer shall not be permitted to work on construction of the Improvements on holidays, except in the case of emergencies. The Developer shall provide dust control to the satisfaction of the City Engineer. Developer shall be responsible for coordinating special work hours with the City Engineer and City Inspectors.

3.09. Lighting. The Developer shall be financially responsible for the cost of street lighting (Lighting Plan) for the Development. The Lighting Plan shall be designed and constructed according to City standards and specifications. The Developer shall submit a final Lighting Plan for review and approval to the Public Works Director prior to commencing construction.

3.10. Erosion Control. Developer shall be responsible for compliance with an approved erosion control plan. The Developer will be given a telephone notice when an unsatisfactory condition exists that is determined to be a Developer's responsibility. Work to correct said unsatisfactory condition shall commence within 72 hours from the time of the telephone notice to Developer's owner's representative. If work is not commenced within 72 hours of said telephone notice, City will proceed to do the required work at the expense of the Developer. If it is determined that the unsatisfactory condition could result in degradation of downstream water quality, Developer shall, upon telephone notice, immediately proceed to correct said unsatisfactory condition. If Developer does not, within the stated time period, respond to said unsatisfactory condition, City has the right to enter upon the Subject Property and correct said condition. City shall be entitled to reimbursement and may draw on the Escrow or Security to cover its costs and expenses including, but not limited to legal, fiscal and engineering related to correction of the condition. City may draw on Developer's financial escrow and Security.

3.11. Other Approvals. In addition to the City Approvals, other governmental agencies have reviewed and approved components of the Plans, if required. It is the responsibility of the Developer to ensure that all permits from appropriate governmental agencies are received prior to beginning construction of any Improvements.

3.12. Final Plat. The Developer shall record the Final Plat for Northview Preserve in the land records office for Hennepin County, Minnesota within 30 days of its release by the City to the Developer. Developer shall provide a copy of said recording to the City.

3.13. Additional Work or Materials. All Improvements the Developer is required to complete pursuant to this Agreement shall be designed and constructed according to City standards and specifications and completed at no expense to the City, including, without limitation, any reimbursement by the City for work paid for by the Developer. The Developer agrees that it will make no claim for compensation for work or materials so done or furnished.

3.14. Miscellaneous Obligations. Developer shall comply with the terms and conditions set forth in this Agreement and following ordinances and resolutions pertaining to the Development: *Resolution 2025-41 and Resolution 2025-07.*

3.15 Special Provisions. The following special provisions shall apply to all developments:

A. The Developer must obtain a sign permit from the City building official prior to installation of any subdivision identification signs.
B. The Developer shall supply a complete set of the approved construction plans in an AutoCAD.DWG electronic file format before the preconstruction conference.
C. The Developer shall include the "City of Rogers Standard Details and Specifications" (all applicable sections) in the contract documents of their improvement project.
D. Additional Special Provisions:

1. Encroachment agreements will be required for retaining walls in a drainage and utility easement.

2. Encroachment agreements will be required for monument signs proposed in drainage and utility easements.

3. No retaining walls are permitted in trail easements.

4. All retaining walls over four feet shall require issuance of a building permit and a three-foot fence installed on top of the wall.

5. Obtain all required Hennepin County right-of-way construction permits.

6. Obtain all Elm Creek Watershed Commission approval.

7. Obtain MDH, MPCA & MCES permits.

ARTICLE FOUR
DEFAULT AND REMEDIES

4.01. Default by Developer. In the event of default by the Developer as to any of the work to be completed by the Developer, its successors or assigns, the City may, at its option perform the work and the Developer shall promptly reimburse the City for any expense incurred by the City, provided the Developer is first given notice of the work in default, not less than 72 hours in advance and does not, within that 72-hour period, diligently proceed to remedy such default. In the event of such unremedied default, the City may immediately bring legal action against the Developer and/or draw upon the Security sums that exceed the costs or damage to the City, the City will return such excess amounts. In addition to its other remedies provided herein, the City may levy the cost in whole or in part as a special assessment against the Subject Property. Developer waives its rights to notice of hearing and hearing on such assessments and its right to appeal such assessments pursuant to Minnesota Statutes §429.081.

4.02. Complete Improvements-Right of Entry. In addition to the City's other remedies under this Agreement, if the Developer's breach involves failure to complete the Improvements, the City is hereby authorized, at its option, following 30 days written notice to Developer, to enter on to all portions of the Subject Property it deems necessary to complete the installation of any or all of the Improvements to which the default relates.

4.03. Denial of Permits. Breach of any term of this Agreement by the Developer or failure to comply with City ordinances shall be grounds for denial of building or occupancy permits for buildings within the Final Plat until such breach is corrected by the Developer.

4.04. Rights Cumulative. No remedy conferred in this Agreement is intended to be exclusive and each shall be cumulative and shall be in addition to every other remedy. The election of any one or more remedies shall not constitute a waiver of any other remedy.

4.05. Attorney Fees. The Developer will pay the City's costs and expenses, including attorneys' fees, in the event a suit or action is brought to enforce the terms of this Agreement or in the event an action is brought upon a bond or letter of credit furnished by the Developer as provided herein.

ARTICLE FIVE
MISCELLANEOUS PROVISIONS

5.01. Amendment. Any amendment to this Agreement must be in writing and signed by both parties.

5.02. Assignment. The Developer may not transfer or assign any of its obligations under this Agreement without the prior written consent of the City, which shall not be unreasonably withheld.

5.03. Agreement to Run with Land. The Developer agrees to record this Agreement among the land records of Hennepin County, Minnesota contemporaneously with recording the Final Plat of Northview Preserve and corresponding Final Plat Resolution No. 2025-41. The provisions of this Agreement shall run with the land and be binding upon the Developer and its successors in interest. Notwithstanding the foregoing, no conveyance of the Subject Property or any part thereof shall relieve the Developer of its personal liability for full performance of this Agreement unless the City expressly so releases the Developer in writing.

5.04. Release. Upon completion of Improvements, the City's issuance of the Final Approval, and satisfaction of all of the Developer's obligations under this Agreement, which shall be evidenced by the expiration of the maintenance bond required by Section 1.07 of this Agreement, the City agrees to execute Certificate of Completion or other recordable instrument releasing the Subject Property from the terms of this Agreement.

5.05. Severability. The provisions of this Agreement are severable, and in the event that any provision of this Agreement is found invalid, the remaining provisions shall remain in full force and effect.

5.06. Notices. All notices, certificates or other communications required to be given to City or Developer hereunder shall be deemed given i) on the same day of personally delivered, ii) one (1) day after being deposited with a nationally recognized overnight air courier, or iii) two (2) business days after mailing by certified or registered mail, return receipt requested, with postage fully pre-paid and addressed as follows:

CITY:
City of Rogers
22350 South Diamond Lake Road
Rogers, MN 55374
Telephone: (763) 428-2253
Attn: Steve Stahmer, City Administrator

DEVELOPER:
Summergate Development LLC
17505 Cedar Ave S; STE 200
Lakeville, MN 55044
Telephone: (XXX) XXX-XXXX
Attn: Casey Wollschlager, Manager

The City and Developer, by notice given hereunder, may designate different addresses to which subsequent notice, certificate or other communications should be sent.

5.07. No Third-Party Beneficiary. This Agreement and any financial guarantees required pursuant to its terms are not intended for the benefit of any third party.

5.08. Consent. The Developer represents and warrants that there are no other persons or entities with interests in the Property, except the interest of a mortgagee, if required. The consent of such mortgagee is attached hereto as Exhibit D.

5.09. Applicable Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Minnesota. The Developer agrees to comply with all laws, ordinances, and regulations of Minnesota and the City that are applicable to the Subject Property.

5.10. Counterparts. This Agreement may be executed simultaneously in any number of counterparts, each of which shall be an original and shall constitute one and the same Agreement.

5.11. Non-waiver. Each right, power or remedy conferred upon the City or the Developer by this Agreement is cumulative and in addition to every other right, power or remedy, express or implied, now or hereafter arising, or available to the City or the Developer at law or in equity, or under any other agreement. Each and every right, power and remedy set forth in this Agreement or otherwise so existing may be exercised from time to time as often and in such order as may be deemed expedient by the City or the Developer and shall not be a waiver of the right to exercise at any time thereafter any other right, power or remedy. If either party waives in writing any default or nonperformance by the other party, such waiver shall be deemed to apply only to such event and shall not waive any other prior or subsequent default.

5.12 Supersedes and Replaces. The parties understand and agreed that this Agreement supersedes and replaces all oral agreements, previous development agreements, and negotiations between the parties in relation thereto.

[This page was intentionally left blank.]

IN WITNESS OF THE ABOVE, the duly authorized representatives of the parties have caused this Agreement to be executed in duplicate on the date and year written above.

SUMMERGATE DEVELOPMENT LLC

_____

Casey Wollschlager

Its *Manager*

STATE OF MINNESOTA)
) ss.
COUNTY OF)

The foregoing instrument was acknowledged before me this _____ day of _____ 2025, Casey Wollschlager, Manager, of Summergate Development LLC, a Minnesota Limited Liability Company, on behalf of the Company.

_____
Notary Public

CITY OF ROGERS

_____
Shannon Klick
Its Mayor

_____
Stacie Brown
Its City Clerk

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

The foregoing instrument was acknowledged before me this _____ day of _____, 2025 by Shannon Klick and by Stacie Brown, the Mayor and City Clerk, respectively, of the City of Rogers, a Minnesota municipal corporation, on behalf of the corporation.

_____
Notary Public

THIS INSTRUMENT WAS DRAFTED BY:
City of Rogers
22350 South Diamond Lake Road
Rogers MN 55374
(763) 428-2253

EXHIBIT A

NORTHVIEW PRESERVE
LEGAL DESCRIPTION OF THE PROPERTY

Existing Legal Description
The East 385.80 feet of the Southwest Quarter of the Southwest Quarter of Section 22, Township 120, Range 23, Hennepin County, Minnesota lying southerly of the centerline of County State Aid Highway No. 116 and the Northwest Quarter of the Northwest Quarter of Section 27, Township 120, Range 23, Hennepin County, Minnesota except the South 928.10 feet of the East 207.50 feet of said Northwest Quarter of the Northwest Quarter and except the North 247.50 feet of said Northwest Quarter of the Northwest Quarter lying West of the East 385.80 feet of said Northwest Quarter of the Northwest Quarter.

Abstract Property

Proposed Plat
Lots 1 through 5 inclusive, Block 1; Lots 1 through 10 inclusive, Block 2; Lots 1 through 11 inclusive Block 3; Lots 1 through 17 inclusive, Block 4; Lots 1 through 18 inclusive, Block 5; Lots 1 through 14 inclusive, Block 6; and Outlots A, B and C; NORTHVIEW PRESERVE, Hennepin County, Minnesota.

EXHIBIT B

NORTHVIEW PRESERVE
FEES, IMPROVEMENT COSTS & FINANCIAL SECURITIES

2025 EXHIBIT B
NORTHVIEW PRESERVE

DEVELOPMENT INFORMATION	
Acres (Net)	30.40
Units	75.00
Lots (75 Units + 3 Outlot)	78.00

SECTION 1: PLATTING FEES OWED (CREDITS)	COST	PER ACRE/UNIT/LOT	AMOUNT DUE	NOTES
Water Trunk	$3,000.00	Per Acre	$ 91,200.00	
Sanitary Sewer Trunk	$2,600.00	Per Acre	$ 79,040.00	
Storm Sewer Trunk	$2,400.00	Per Acre	$ 72,960.00	
Park Dedication	$6,000.00	Per Unit	$ 450,000.00	
Subdivision GIS Data Entry Fee	$ 50.00	Per Acre	$ 1,520.00	
Lot Origination Fee	$ 350.00	Per Lot	$ 27,300.00	
Subtotal Platting Fees			**$ 722,020.00**	
Total Platting Fees			**$ 722,020.00**	

SECTION 2: ADMINISTRATIVE AND DEVELOPMENT RELATED COSTS	AMOUNT DUE	NOTES
Administrative	$ 120,278.00	3% of Construction - Public Improvements
Total Administrative and Development Related Costs	**$ 120,278.00**	

SECTION 3: IMPROVEMENT COSTS	LETTER OF CREDIT	ESCROW	NOTES
Engineering - Onsite Field Inspection		$ 288,994.00	6.5% of Total Improvements - Engineering
Legal		$ 2,500.00	City Attorney - Contract
Planning		$ 4,000.00	City Planner
Non-Public Improvements			
Landscaping	$ 75,000.00		
Construction - Site (Grading & Erosion Control)	$ 361,783.00		Grading agreement - Separate
Public Improvements Dedicated to the City			
Construction - Road Improvements	$ 1,347,412.00		
Construction - Utility Improvements (Storm Sewer)	$ 1,053,294.00		
Construction - Utility Improvements (Water Main)	$ 638,664.00		
Construction - Utility Improvements (Sanitary Sewer)	$ 969,910.00		
Total Improvement Costs	**$ 4,084,280.00**	**$ 295,494.00**	

SECTION 4: LOC / ESCROW / FEES REQUIRED	LETTER OF CREDIT	ESCROW	NOTES
Escrow			
Section 1: Platting Fees		$ 722,020.00	
Section 2: Administrative Fees		$ 120,278.00	
Section 3: Cash Escrow		$ 325,043.00	110% of Cash Escrow Subtotal
Security			
Section 3: Letter of Credit	$ 6,107,670.00		125% Non Public Improvements / 150% Improvements Dedicated to City
Total Letter of Credit and Cash Required	**$ 6,107,670.00**	**$ 1,167,341.00**	

EXHIBIT C

NORTHVIEW PRESERVE
APPROVED PLANS

EXHIBIT D

NORTHVIEW PRESERVE
CONSENT

_____ ("Bank") holds a mortgage encumbering the Property.

The Property is subject to the foregoing Developer's Agreement and, accordingly, Bank hereby consents to the Developer's Agreement; provided, that in doing so, Bank shall not be liable to the City or any other person for the performance or non-performance of the Agreement by the Developer; provided further, that in the event that Bank acquires fee title to the Property by foreclosure or sale in lieu of foreclosure, Bank shall not be required to perform any of the obligations required of the Developer in said Agreement during the Bank's term of ownership so long as Bank is actively marketing the Property for sale and maintaining the Property in compliance with applicable ordinances.

_____

Dated:_____, 20__

By: _____

Its: _____

ACKNOWLEDGEMENT FOR BANK

STATE OF MINNESOTA)
)ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 2025, by _____, the _____ of _____, a _____ under the laws of _____, on behalf of the _____.

_____
Notary Public

[Developer to provide the required consents]

STORMWATER MAINTENANCE AGREEMENT
NORTHVIEW PRESERVE

THIS AGREEMENT ("Agreement") is made this ___ day of _____, 2025 by and between the City of Rogers, a municipal corporation under the laws of Minnesota ("City"), located at 22350 Diamond Lake Road, Rogers, Minnesota 55374, and Summergate Development LLC, located at 17305 Cedar Avenue, Suite 200, Lakeville, MN 55044 ("Developer").

RECITALS

A. The purpose of this Agreement is to set forth the general rights, obligations and duties of the City and the Developer with respect to the development's Stormwater Maintenance in the City of a residential subdivision, commonly known as "*NORTHVIEW PRESERVE*" (the "Development")

B. The Development site encompasses 31.27 gross acres, of which the Development is a 75-unit residential development located on one property (PID 2712023220004), located between Territorial Road and Wood Lane, hereafter referred to collectively as "Subject Property;", located in the City of Rogers, Minnesota, which is legally described in Exhibit A ("Subject Property").

C. The City Council approved the Preliminary Plat for Northview Preserve, a 75-unit residential development ("Development") by Resolution No. 2025-07 on February 11, 2025. The Final Plat for Northview Preserve was approved by Resolution No. 2025-41 on May 27, 2025 (collectively, "City Approvals").

D. The Developer intends to construct within the Drainage and Utility Easement area ("Easement Area"), as described in Exhibit B and illustrated in the Final Plat document, certain stormwater improvements ("Stormwater Improvements") for the benefit of the Subject Property.

E. The City has entered into a Subdivision Agreement with the Developer for the construction and maintenance of the Stormwater Improvements.

F. The Elm Creek Watershed Management Commission requires permanent provisions for handling of storm runoff, including provisions for operation and maintenance of all stormwater runoff facilities and ponds, and such provisions are to be set forth in an agreement to be recorded in the real estate records.

G. The City and the Developer intend to comply with certain conditions, including entering into a maintenance agreement regarding the Stormwater Improvements.

H. In consideration of mutual covenants of the parties set forth herein and other valuable considerations, the City and the Developer now desire to enter into this Stormwater Maintenance Agreement ("Agreement") setting forth certain requirements and obligations relating to the Stormwater Improvements of the Subject Property.

AGREEMENT

1. Maintenance of the Stormwater Improvements. The Developer, and its successor or assigns, as fee owner of the Subject Property shall be responsible for maintaining the Stormwater Improvements and for observing all drainage laws governing the operation and maintenance of the Stormwater Improvements. The Developer shall inspect Stormwater Improvements as scheduled in Exhibit C. The Developer shall make all such scheduled inspections, keep record of all inspections and maintenance activities, and submit such records annually to the City. The cost of all inspections and maintenance, including skimming and cleaning of the Stormwater Improvements, shall be the obligation of the Developer and its successors or assigns as the fee owner of the Subject Property.

2. City's Maintenance Rights. The City may maintain the Stormwater Improvements, as provided in this paragraph, if the City reasonably believes that the Developer or its successors or assigns has failed to maintain the Stormwater Improvements in accordance with applicable drainage laws and other requirements and such failure continues for 60 days after the City gives the Developer written notice of such failure. The Developer shall accept and adequately maintain and inspect the Stormwater management facilities located within the City of Rogers drainage and utility easements. This includes all pipes and ditches built to convey Stormwater to the facility, as well as structures, improvements, and vegetation provided to control the quantity and quality of the Stormwater. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions. The City's notice shall specifically state which maintenance tasks are to be performed. If the Developer does not complete the maintenance tasks within 60 days after such notice is given by the City, the City shall have the right to enter upon the Easement Area to perform such maintenance tasks. In such case, the City shall send an invoice of its reasonable maintenance costs to the Developer or its successors or assigns, which shall include all staff time, engineering and legal and other costs and expenses incurred by the City. If the Developer or its assigns fails to reimburse the City for its costs and expenses in maintaining the Stormwater Improvements within 30 days of receipt of an invoice for such costs, the City shall have the right to assess the full cost thereof against all of the lots within the Subject Property. Notwithstanding the foregoing, in the event of an emergency, as determined by the City Engineer

in its reasonable opinion, the 60-day notice requirement to the Developer for failure to perform maintenance tasks shall be and hereby is waived in its entirety by the Developer, and the Developer shall reimburse the City and be subject to assessment for any expense so incurred by the City in the same manner as if written notice as described above has been given.

3. Hold Harmless. The Developer hereby agrees to indemnify and hold harmless the City and its agents and employees against any and all claims, demands, losses, damages, and expenses (including reasonable attorneys' fees) arising out of or resulting from the Developer's or the Developer's agents or employee's negligent or intentional acts, or any violation of any safety law, regulation or code in the performance of this Agreement, without regard to any inspection or review made or not made by the City, its agents or employees or failure by the City, its agents or employees to take any other prudent precautions. In the event the City, upon the failure of the Developer to comply with any conditions of this Agreement, performs said conditions pursuant to its authority in this Agreement, the Developer shall indemnify and hold harmless the City, its employees, agents and representatives for its own negligent acts in the performance of the Developer's required work under this Agreement, but this indemnification shall not extend to intentional or grossly negligent acts.

4. Costs of Enforcement. The Developer agrees to reimburse the City for all costs incurred by the City in the enforcement of this Agreement, or any portion thereof, including court costs and reasonable attorneys' fees.

5. Notice. All notices required under this Agreement shall either be personally delivered or be sent by certified or registered mail and addressed as follows:

CITY:
City of Rogers
22350 South Diamond Lake Road
Rogers, MN 55374
Telephone: (763) 428-2253
Attn: Steve Stahmer, City Administrator

DEVELOPER:
Summergate Development LLC
17505 Cedar Ave S; STE 200
Lakeville, MN 55044
Telephone: (XXX) XXX-XXXX
Attn: Casey Wollschlager, Manager

All notices given hereunder shall be deemed given when personally delivered or two (2) business days after being placed in the mail properly addressed as provided herein.

6. Successors. All duties and obligations of Developer under this Agreement shall also be duties and obligations of Developer's successors and assigns. The terms and conditions of this Agreement shall run with the Subject Property.

7. Effective Date. This Agreement shall be binding and effective as of the date hereof.

[Balance of this page intentionally left blank.]

IN WITNESS OF THE ABOVE, the duly authorized representatives of the parties have caused this Agreement to be executed in duplicate on the date and year written above.

SUMMERGATE DEVELOPMENT LLC

_____
Casey Wollschlager
Its *Manager*

STATE OF MINNESOTA)
) ss.
COUNTY OF)

The foregoing instrument was acknowledged before me this _____ day of _____ 2025, Casey Wollschlager, Manager, of Summergate Development LLC, a Minnesota Limited Liability Company, on behalf of the Company.

_____
Notary Public

CITY OF ROGERS

_____
Shannon Klick
Its Mayor

_____
Stacie Brown
Its Clerk

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

The foregoing instrument was acknowledged before me this _____ day of _____, 2025 by Shannon Klick and by Stacie Brown, the Mayor and Clerk, respectively, of the City of Rogers, a Minnesota municipal corporation, on behalf of the corporation.

_____
Notary Public

THIS INSTRUMENT WAS DRAFTED BY:
City of Rogers
22350 South Diamond Lake Road
Rogers MN 55374
(763) 428-2253

EXHIBIT A

NORTHVIEW PRESERVE
LEGAL DESCRIPTION OF THE PROPERTY

Legal Descriptions

Lots 1 through 5 inclusive, Block 1; Lots 1 through 10 inclusive, Block 2; Lots 1 through 11 inclusive Block 3; Lots 1 through 17 inclusive, Block 4; Lots 1 through 18 inclusive, Block 5; Lots 1 through 14 inclusive, Block 6; and Outlots A, B and C; NORTHVIEW PRESERVE, Hennepin County, Minnesota.

EXHIBIT B

NORTHVIEW PRESERVE
LEGAL DESCRIPTION OF DRAINAGE AND UTILITY EASEMENTS

Legal Description

Outlot A, B and C; NORTHVIEW PRESERVE, Hennepin County, Minnesota.

EXHIBIT C

NORTHVIEW PRESERVE
STORMWATER MAINTENANCE AGREEMENT

Inspection Schedule for Stormwater Improvements

1. Debris clean-out	Monitor and clean out annually.
2. Sediment removal in basin	Monitor annually and clean out when sediment occupies 50% of storage volume.
3. Vegetation	Monitor annually remove undesirable vegetation as needed.
4. Inlet	Media filters that have a grass cover will be mowed as needed during the growing season to maintain maximum grass heights less than 12 inches.
5. Outlet	Monitor annually and repair as needed. When the filtering capacity of the filter diminishes substantially (i.e., when water ponds on the surface of the filter bed for more than 48 hours), the top few inches of discolored material will be removed and replaced with fresh material. The removed sediments will be disposed in an acceptable manner (i.e., landfill).
6. Sump manholes	Monitor annually and repair as needed.

NORTHVIEW PRESERVE

C.R. DOC. NO. _____

KNOW ALL PERSONS BY THESE PRESENTS: *That Summergate Development, LLC, a Minnesota limited liability company, owner of the following described property:*

The East 385.80 feet of the Southwest Quarter of the Southwest Quarter of Section 22, Township 120, Range 23, Hennepin County, Minnesota lying southerly of the centerline of County State Aid Highway No. 116 and the Northwest Quarter of the Northwest Quarter of Section 27, Township 120, Range 23, Hennepin County, Minnesota except the South 928.10 feet of the East 207.50 feet of said Northwest Quarter of the Northwest Quarter and except the North 247.50 feet of said Northwest Quarter of the Northwest Quarter lying West of the East 385.80 feet of said Northwest Quarter of the Northwest Quarter.

Has caused the same to be surveyed and platted as ***NORTHVIEW PRESERVE*** *and does hereby dedicate to the public for public use the public ways and the drainage and utility easements as created by this plat.*

In witness whereof said Summergate Development, LLC, a Minnesota limited liability company, has caused these presents to be signed by its proper officer this _____ day of _____ 20_____.

Signed: ***SUMMERGATE DEVELOPMENT, LLC***

By _____

Its _____

STATE OF MINNESOTA
COUNTY OF _____
This instrument was acknowledged before me this _____ day of _____, 20_____, by _____, its _____ of Summergate Development, LLC, a Minnesota limited liability company, on behalf of the company.

_____ _____
(Signature) *(Name Printed)*

Notary Public, _____ County, Minnesota

My Commission Expires _____

I Mathew J. Welinski do hereby certify that this plat was prepared by me or under my direct supervision; that I am a duly Licensed Land Surveyor in the State of Minnesota; that this plat is a correct representation of the boundary survey; that all mathematical data and labels are correctly designated on this plat; that all monuments depicted on this plat have been, or will be correctly set within one year; that all water boundaries and wet lands, as defined in Minnesota Statutes, Section 505.01, Subd. 3, as of the date of this certificate are shown and labeled on this plat; and all public ways are shown and labeled on this plat.

Dated this _____ day of _____, 20_____.

_____
Mathew J. Welinski, Land Surveyor
Minnesota License No. 53596

STATE OF MINNESOTA
COUNTY OF _____
This instrument was acknowledged before me on this _____ day of _____, 20_____, by Mathew J. Welinski.

_____ _____
(Signature) *(Name Printed)*

Notary Public, _____ County, Minnesota

My Commission Expires _____

CITY COUNCIL, CITY OF ROGERS, MINNESOTA
This plat of ***NORTHVIEW PRESERVE*** *was approved and accepted by the City Council of the City of Rogers Minnesota at a regular meeting thereof held this _____ day of _____, 20_____ and said plat is in compliance with the provisions of Minnesota Statutes, Section 505.03, Subdivision 2.*

CITY COUNCIL, CITY OF ROGERS, MINNESOTA

By _____ *By* _____
Mayor *Clerk*

COUNTY AUDITOR, *Hennepin County, Minnesota*
I hereby certify that taxes payable in 20_____ and prior years have been paid for land described on this plat, dated this _____ day of _____, 20_____.

Daniel Rogan, County Auditor *By* _____
Deputy

SURVEY DIVISION, *Hennepin County, Minnesota*
Pursuant to MN. STAT. Sec. 383B.565 (1969) this plat has been approved this _____ day of _____, 20_____.

Chris F. Mavis, County Surveyor *By* _____

COUNTY RECORDER, *Hennepin County, Minnesota*
I hereby certify that the within plat of ***NORTHVIEW PREERVE*** *was recorded in this office this _____ day of _____, 20_____, at ___ o'clock ____.M.*

Amber Bougie, County Recorder *By* _____
Deputy

Westwood
Professional Services, Inc.

NORTHVIEW PRESERVE

C.R. DOC. NO. _____

West 1/4 Corner of Section 22, Twp. 120, Rge. 23 Found Hennepin County Cast Iron Monument

261.03' N00°37'43"E

West line of the SW 1/4 of the SW 1/4 of Sec. 22

SW 1/4 OF THE SW 1/4 OF SEC. 22, TWP. 120, RGE. 23

SW Corner of the SW 1/4 of Section 22, Twp. 120, Rge. 23 Found Hennepin County Cast Iron Monument

South line of the SW 1/4 of the SW 1/4 of Sec. 22

S89°13'59"E 938.67

North line of the NW 1/4 of the NW 1/4 of Sec. 27

NW Corner of the NW 1/4 of Section 27, Twp. 120, Rge. 23 Found Hennepin County Cast Iron Monument

247.50 S00°50'11"W

247.50

EXCEPTION

247.50

Found 1/2 Inch Open LS #16095

South line of the North 247.50 ft of the NW 1/4 of the NW 1/4 of Sec. 27

S89°13'59"E 938.93

Found 1/2 Inch Open LS #6743

S00°46'39"W 247.50

West line of the East 385.80 ft of the NW 1/4 of the NW 1/4 of Sec. 27

TERRITORIAL ROAD (HENNEPIN COUNTY STATE AID HIGHWAY NO. 116)

HOLDEN WAY

BIG WOODS CROSSING 2ND ADDITION

northeasterly right of way line of Territorial Road per the plat of BIG WOODS CROSSING 2ND ADDITION

centerline of Territorial Road per Hennepin County State Aid Highway No. 116, Plat 21

CB=N68°53'32"W
Δ=2°20'50"
R=7732.02
CL=316.72
L=316.14

west line of the East 385.80 ft of the SW 1/4 of the SW 1/4 of Sec. 22

N00°34'25"E 171.82

385.80

East line of the SW 1/4 of the SW 1/4 of Sec. 22

HARVEST VIEW

N67°43'07"W 96.03

TERRITORIAL ROAD (C.S.AH. NO. 116)

southwesterly right of way line of Territorial Road per Hennepin County State Aid Highway No. 116, Plat 21

centerline of Highway Easement per Doc No. 5884447

southwesterly line of Highway Easement per Doc No. 5884447

S89°13'59"E 1324.48

North 1/4 Corner of Section 27, Twp. 120, Rge. 23 Found Hennepin County Cast Iron Monument

OUTLOT A

26.52 S00°34'25"W

N00°46'39"E 388.31

385.80

North line of the South 928.10 ft of the NW 1/4 of the NW 1/4 of Sec. 27

S89°28'33"E 207.50

SKYE MEADOWS THIRD ADDITION

INSET A
(SEE SHEET 3 OF 4 SHEETS)

413.52

West line of the NW 1/4 of the NW 1/4 of Sec. 27

N89°59'33"E 170.02

30.71 S76°51'02"E

N89°09'49"W 156.19

N00°46'34"E 11.39

S75°51'37"E 198.50

60.00 S75°51'37"E

S14°08'23"W 25.04

S89°13'59"E 150.16

S89°13'21"E 149.23

S06°52'25"W 12.15

N78°59'53"E 61.29

N89°13'21"W 146.07

299.97

TWP. 120, RGE. 23

SEC. 4

West line of the East 207.50 ft of the NW 1/4 of the NW 1/4 of Sec. 27

East line of the NW 1/4 of the NW 1/4 of Sec. 27

S00°50'11"W 1074.54

661.02

207.50

S00°46'39"W 928.11

628.14

928.10

EXCEPTION

INSET B
(SEE SHEET 4 OF 4 SHEETS)

OUTLOT C

OUTLOT B

South line of the NW 1/4 of the NW 1/4 of Sec. 27

Found 1/2 Inch Open

S89°28'33"E 1118.35

S00°50'11"W 1322.74

West 1/4 Corner of Section 27, Twp. 120, Rge. 23 Found Hennepin County Cast Iron Monument

WOOD LANE

SCALE IN FEET

0 80 160 240

- DENOTES FOUND HENNEPIN COUNTY CAST IRON MONUMENT
- DENOTES SET 1/2 INCH BY 14 INCH REBAR WITH CAP INSCRIBED LICENSE NUMBER 53596
- DENOTES FOUND MONUMENT, AS NOTED ON PLAT

THE SOUTH LINE OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 27, TOWNSHIP 120, RANGE 23, IS ASSUMED TO BEAR S 89°28'33" E

Westwood
Professional Services, Inc.

NORTHVIEW PRESERVE

C.R. DOC. NO. _____

INSET A
(FROM SHEET 2 OF 4 SHEETS)

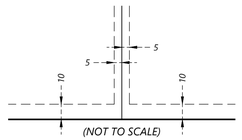
SCALE IN FEET
0 50 100 150

○ DENOTES SET 1/2 INCH BY 14 INCH REBAR WITH CAP INSCRIBED LICENSE NUMBER 53596

● DENOTES FOUND MONUMENT, AS NOTED ON PLAT

THE SOUTH LINE OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 27, TOWNSHIP 120, RANGE 23, IS ASSUMED TO BEAR S 89°28'33" E

DRAINAGE AND UTILITY EASEMENTS ARE SHOWN THUS:



(NOT TO SCALE)

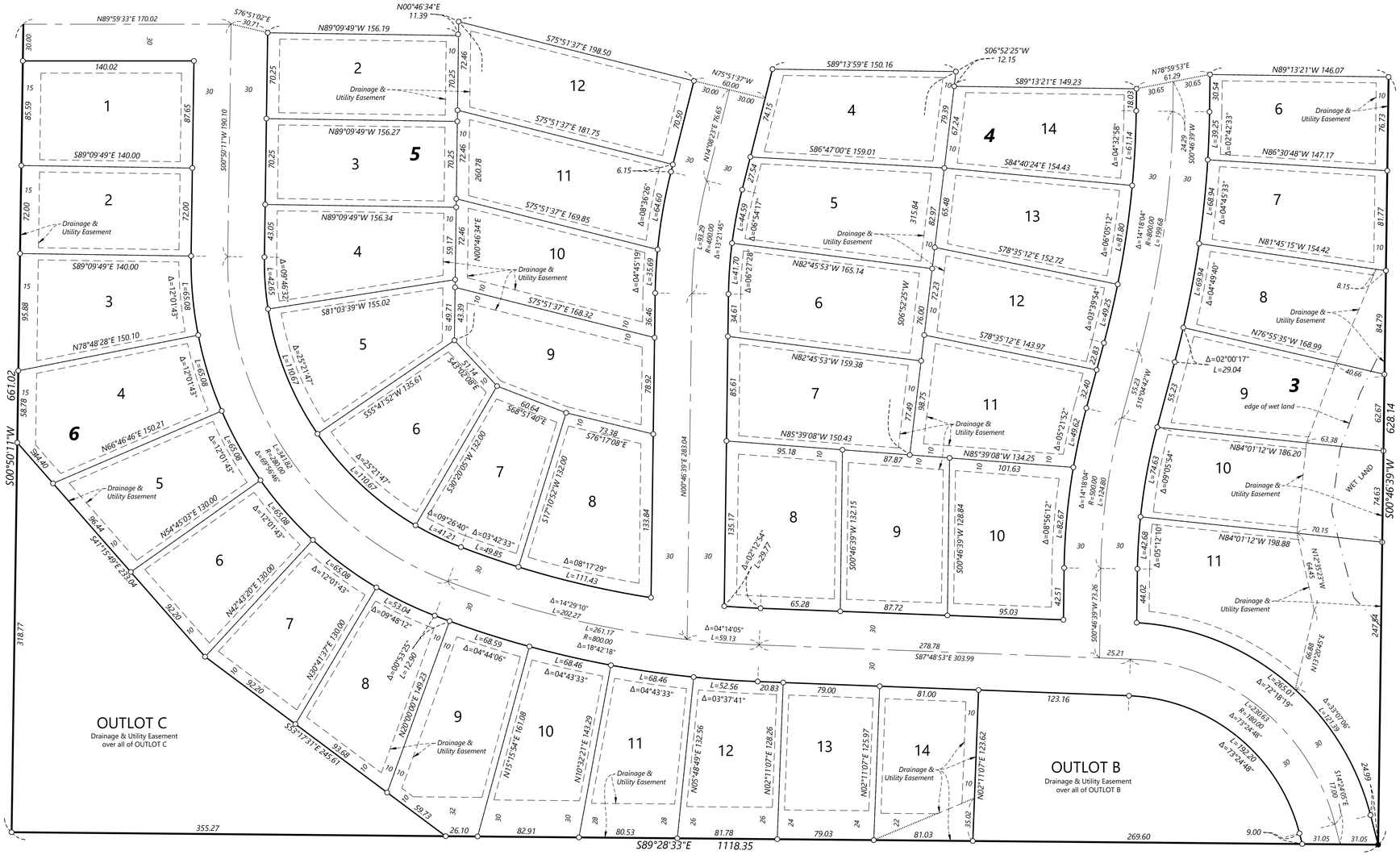
BEING 5 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, AND ADJOINING LOT LINES, AND BEING 10 FEET IN WIDTH AND ADJOINING PUBLIC WAYS UNLESS OTHERWISE INDICATED ON THIS PLAT

Westwood
Professional Services, Inc.

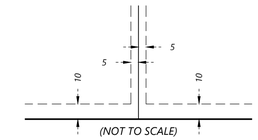
NORTHVIEW PRESERVE

C.R. DOC. NO. _____

INSET B
(FROM SHEET 2 OF 4 SHEETS)



DRAINAGE AND UTILITY EASEMENTS ARE SHOWN THUS:

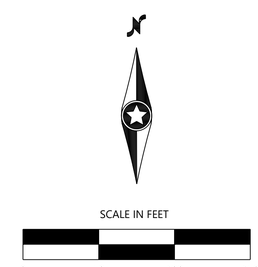


BEING 5 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, AND ADJOINING LOT LINES, AND BEING 10 FEET IN WIDTH AND ADJOINING PUBLIC WAYS UNLESS OTHERWISE INDICATED ON THIS PLAT

○ DENOTES SET 1/2 INCH BY 14 INCH REBAR WITH CAP INSCRIBED LICENSE NUMBER 53596

● DENOTES FOUND MONUMENT, AS NOTED ON PLAT

THE SOUTH LINE OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 27, TOWNSHIP 120, RANGE 23, IS ASSUMED TO BEAR S 89°28'33" E



Westwood
Professional Services, Inc.

© 2025 Westwood Professional Services, Inc.

CONSTRUCTION PLANS

FOR

FINAL LANDSCAPE PLANS

FOR

NORTHVIEW PRESERVE

ROGERS, MN



Vicinity Map
(NOT TO SCALE)

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044
CONTACT: BRYAN TUCKER
PHONE: 612-490-0982
EMAIL: BRYANT@SUMMER-GATE.COM

PREPARED BY:

Westwood

Phone (952) 937-5150
Fax (952) 937-5822
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka, MN 55343
westwoodps.com

Westwood Professional Services, Inc.

PROJECT NUMBER: 0033874.00
CONTACT: THOMAS D. DESUTTER

SHEET INDEX

SHEET NUMBER	SHEET TITLE
01	COVER
02	OVERALL FINAL LANDSCAPE PLAN
03	FINAL LANDSCAPE PLAN, PLANTING NOTES & DETAILS
04	FINAL LANDSCAPE PLAN
05	FINAL LANDSCAPE PLAN

NO.	DATE	REVISION	SHEETS
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	

CONSTRUCTION PLANS

FOR

FINAL LANDSCAPE PLANS

FOR

NORTHVIEW PRESERVE
ROGERS, MN

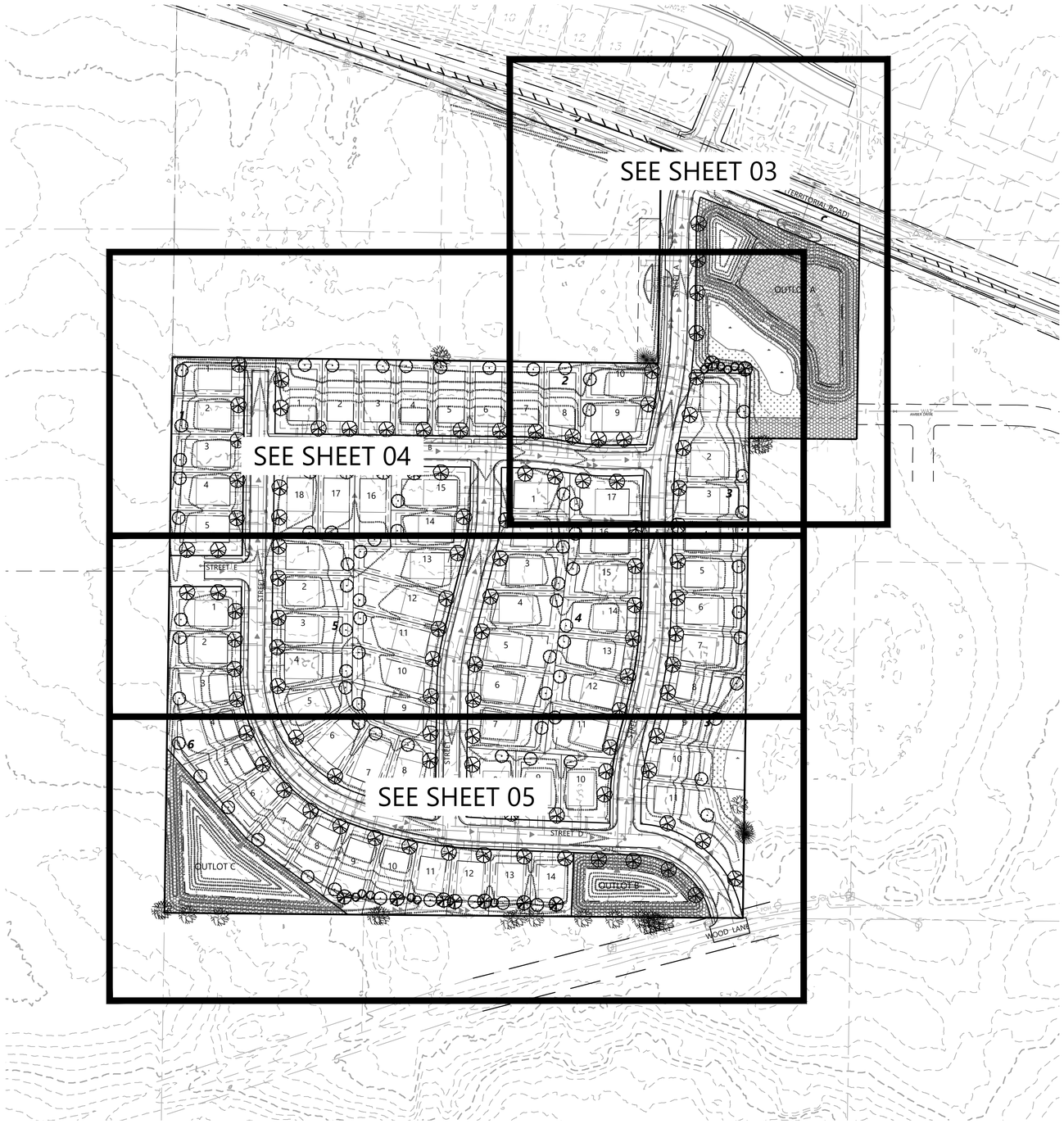
INITIAL SUBMITTAL DATE: 04/02/25 SHEET: 01 OF 05

N:\0033874.00\DWG\CIVIL\FINAL\LANDSCAPE\0033874.00C-CVLF01.DWG

NORTHVIEW PRESERVE

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



FINAL LANDSCAPE SCHEDULE - DEVELOPER

CODE	QTY	COMMON / BOTANICAL NAME	SIZE	ROOT	SPACING O.C.	MATURE SIZE
DECIDUOUS TREES - 119						
FFM^	22	FALL FIESTA MAPLE / ACER SACCHARUM 'BAILSTA'	2.5" CAL.	B&B	AS SHOWN	H 50`-75` W 50`
FYL^	23	FRONTYARD LINDEN / TILIA AMERICANA 'BAILYARD'	2.5" CAL.	B&B	AS SHOWN	H 60`-70` W 30`-40`
PRE	3	PRINCETON ELM / ULMUS AMERICANA 'PRINCETON'	2.5" CAL.	B&B	AS SHOWN	H 60`-80` W 40`-60`
PRE^	6	PRINCETON ELM / ULMUS AMERICANA 'PRINCETON'	2.5" CAL.	B&B	AS SHOWN	H 60`-80` W 40`-60`
REO	1	RED OAK / QUERCUS RUBRA	2.5" CAL.	B&B	AS SHOWN	H 50`-70` W 40`-50`
REO^	24	RED OAK / QUERCUS RUBRA	2.5" CAL.	B&B	AS SHOWN	H 50`-70` W 40`-50`
RSM^	16	RED SUNSET MAPLE / ACER RUBRUM 'FRANKSRED'	2.5" CAL.	B&B	AS SHOWN	H 45` W 35`
REL	3	REDMOND LINDEN / TILIA AMERICANA 'REDMOND'	2.5" CAL.	B&B	AS SHOWN	H 40`-60` W 30`-40`
RVB	2	RIVER BIRCH / BETULA NIGRA	2.5" CAL.	B&B	AS SHOWN	H 50`-75` W 50`
SKH^	19	SKYLINE HONEY LOCUST / GLEDITSIA TRIACANTHOS INERMIS 'SKYCOLE'	2.5" CAL.	B&B	AS SHOWN	H 50` W 30`-35`
EVERGREEN TREES - 10						
CCF	2	CONCOLOR FIR / ABIES CONCOLOR	6` HT.	B&B	AS SHOWN	H 40`-50` W 15`-30`
NOS	5	NORWAY SPRUCE / PICEA ABIES	6` HT.	B&B	AS SHOWN	H 50`-70` W 25`-30`
WHP	3	WHITE PINE / PINUS STROBUS	6` HT.	B&B	AS SHOWN	H 50`-80` W 25`-40`

FINAL LANDSCAPE SCHEDULE - HOME BUILDER

CODE	QTY	COMMON / BOTANICAL NAME	SIZE	ROOT	SPACING O.C.	MATURE SIZE
DECIDUOUS TREES - 75						
ACE*	8	ACCOLADE ELM / ULMUS JAPONICA X WILSONIANA 'MORTON' TM	2.5" CAL	B&B	AS SHOWN	H 70` W 40`-50`
ASL*	7	AMERICAN SENTRY LINDEN / TILIA AMERICANA 'MCKSENTRY'	2.5" CAL.	B&B	AS SHOWN	H 60` W 30`-40`
AGG*	4	AUTUMN GOLD GINKGO / GINKGO BILOBA 'AUTUMN GOLD'	2.5" CAL	B&B	AS SHOWN	H 50` W 30`
HAK*	9	HACKBERRY / CELTIS OCCIDENTALIS	2.5" CAL.	B&B	AS SHOWN	H 50`-75` W 50`
NRM*	6	NORTHWOOD RED MAPLE / ACER RUBRUM 'NORTHWOOD'	2.5" CAL.	B&B	AS SHOWN	H 40`-60` W 40`
REO*	7	RED OAK / QUERCUS RUBRA	2.5" CAL.	B&B	AS SHOWN	H 50`-70` W 40`-50`
REL*	9	REDMOND LINDEN / TILIA AMERICANA 'REDMOND'	2.5" CAL.	B&B	AS SHOWN	H 40`-60` W 30`-40`
RVB*	6	RIVER BIRCH / BETULA NIGRA	2.5" CAL.	B&B	AS SHOWN	H 50`-75` W 50`
SGM*	8	SIENNA GLEN MAPLE / ACER X FREEMANII 'SIENNA'	2.5" CAL.	B&B	AS SHOWN	H 40`-50` W 35`-40`
SKH*	6	SKYLINE HONEY LOCUST / GLEDITSIA TRIACANTHOS INERMIS 'SKYCOLE'	2.5" CAL.	B&B	AS SHOWN	H 50` W 30`-35`
SWO*	5	SWAMP WHITE OAK / QUERCUS BICOLOR	2.5" CAL.	B&B	AS SHOWN	H 50`-60` W 60`-80`

ABBREVIATIONS: B.B. = BALLED AND BURLAPPED CAL. = CALIPER HT. = HEIGHT MIN. =MINIMUM O.C. = ON CENTER SP. = SPREAD QTY .= QUANTITY CONT. = CONTAINER
NOTES: 1) QUANTITIES ON PLAN SUPERSEDE LIST QUANTITIES IN THE EVENT OF A DISCREPANCY.
2) LABELS WITH ^ INDICATE STREET TREE. NO CHANGE IN SIZE FROM OTHER OVERSTORY DECIDUOUS TREES
3) LABELS WITH * INDICATE YARD TREE (BY HOME BUILDER), NO CHANGE IN SIZE FROM OTHER OVERSTORY DECIDUOUS TREES

PLANT LEGEND

- OVERSTORY DECIDUOUS STREET TREES
- DECIDUOUS YARD TREES (BY HOME BUILDER)
- DECIDUOUS OVERSTORY TREES
- EVERGREEN TREES
- SMALL OVERSTORY TREES
- EXISTING CONIFEROUS TREE TO REMAIN
- EXISTING DECIDUOUS TREE TO REMAIN

LANDSCAPE REQUIREMENTS & PROVISIONS

LANDSCAPING DESIGN REQUIREMENTS - CITY OF ROGERS, MINNESOTA			
SITE DESCRIPTION			
ZONING DISTRICT: R-2 (PROPOSED)			
TOTAL GROSS ACRES: 31.28 AC			
SINGLE FAMILY RESIDENTIAL REQUIREMENTS:	**REQUIRED**	**PROVIDED**	**NOTES**
B. THE FRONT, SIDE, AND REAR YARDS OF EACH SITE NOT UTILIZED FOR BUILDING, PARKING (WHERE PERMITTED) OR OTHER IMPROVEMENTS SHALL BE LANDSCAPED UTILIZING AN EFFECTIVE COMBINATION OF STREET TREES, GRASS, GROUND COVER AND SHRUBBERY. UNDEVELOPED AREAS IN THE INTERIOR OF THE SITE SHALL BE SEEDED WITH APPROPRIATE GRASSES AND MAINTAINED NEAT AND ORDERLY SO AS TO CONTROL DUST ON SITES. ALL TREE TRIMMINGS, STUMPS, AND CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED AND NOT BE ACCUMULATED OR STORED ON SITE.	NA	204 TOTAL TREES 110 OVERSTORY STREET TREES 9 OVERSTORY DECIDUOUS TREES 10 EVERGREEN TREES 75 DECID. YARD TREES (BY HOME BUILDER)	TREES TO BE DISTRIBUTED BETWEEN FRONT YARD & REAR YARDS OF SINGLE FAMILY LOTS, IN ADDITION TO OUTLOTS FOR STREET TREE & BUFFERING PURPOSES
SCREENING REQUIREMENTS:	**REQUIRED**	**PROVIDED**	**NOTES**
(7) THERE SHALL BE NO RESTRICTIONS ON NATURAL HEDGES OR PLANTINGS UTILIZED AS FENCES IN ANY RESIDENTIAL ZOING DISTRICT (R1, R2, R3, R4, R5), EXCEPT THAT NO SUCH HEDGES OR PLANTINGS SHALL BE LOCATED WITHIN THE SIGHT VISABILITY TRIANGLE AND THE SPECIES SHALL NOT BE AN INVASIVE SPECIES.	NA	NA	TREES TO BE LOCATED OUTSIDE THE 50' VISABILITY TRIANGLE AS NOTED ON THE PLANS.
REFORESTATION & LANDSCAPING	**REQUIRED**	**PROVIDED**	**NOTES**
TREE REFORESTATION SHALL BE RESTORE THE DENSITY OF TREES TO THAT WHICH EXISTED BEFORE DEVELOPMENT BUT IN NO CASE SHALL THE PERSON BE COMPELLED TO RAISE THE DENSITY ABOVE TEN TREES PER ACRE.	6.3 TREES/AC.	207 TOTAL TREES 3 SAVED EXISTING TREES 204 PROPOSED TREES	PROPOSED REFOREST TREES PART OF SINGLE FAMILY RESIDENTIAL REQUIREMENTS. TREES TO PLANTED IN INDIVIDUAL LOTS & OUTLOTS.
TOTAL SITE AREA: 31.28 AC. TOTAL NUMBER OF EXISTING TREES ON SITE: 198 TREES CURRENT TREE DENSITY: (198 TREES / 31.28 AC.) = 6.3 TREE/AC.		6.3 TREES/AC. (196 TREES / 31.28 AC.)	

NOTES

1. STREET TREE LOCATIONS AND SPACING ARE SUBJECT TO CHANGE BASED ON CONSTRUCTED DRIVEWAY AND UTILITY LOCATIONS.
2. STREET TREES TO BE PLANTED 25' FROM BACK OF CURB, AND OUTSIDE THE D&U EASEMENT. NO TREES ARE ALLOWED WITHIN THE RIGHT-OF-WAY.
3. NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. TREES LOCATED AT FRONT OF INDIVIDUAL LOTS SHALL BE PLANTED IN A LOCATION THAT DOES NOT INTERFERE WITH CURBSTOPS OR INDIVIDUAL SEWER & WATER CONNECTIONS.
5. LOT YARD TREES WILL BE PLANTED BY BUILDER AFTER CONSTRUCTION ON LOTS IS COMPLETE. TIMING OF INSTALLATION WILL BE DEPENDENT UPON SEASON AND PLANT AVAILABILITY.
6. NO STREET TREES OR YARD TREES ARE ALLOWED WITHIN THE 50' SIGHT TRIANGLES.

NATIVE SEEDING LEGEND

- MNDOT SOUTHERN TALLGRASS ROADSIDE (STR) SEED MIX TOTAL AREA (1.3 AC)
- MNDOT WET DITCH (WD) SEED MIX TOTAL AREA (1.3 AC)
- MNDOT WET MEADOW S & W SEED MIX (34-271) TOTAL AREA (0.7 AC)

* ALL DISTURBED AREAS TO BE SODDED UNLESS NOTED OTHERWISE

* ALL DISTURBED AREAS WITHIN CITY ROW ALONG TERRITORIAL ROAD & WOOD LANE TO BE SEEDED WITH MESIC GENERAL ROADSIDE MIX (25-141)

1" = 120'

0' 120' 240' 360'

FOR CONSTRUCTION

N:\0033874.00\DWG\CIVIL\FINAL\LANDSCAPE\0033874.00C-FLP01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 120'
VERTICAL SCALE: 24' OR 12'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA

CORY L. MEYER
DATE: 04/02/25 LICENSE NO. 26971

NORTHVIEW PRESERVE
ROGERS, MN

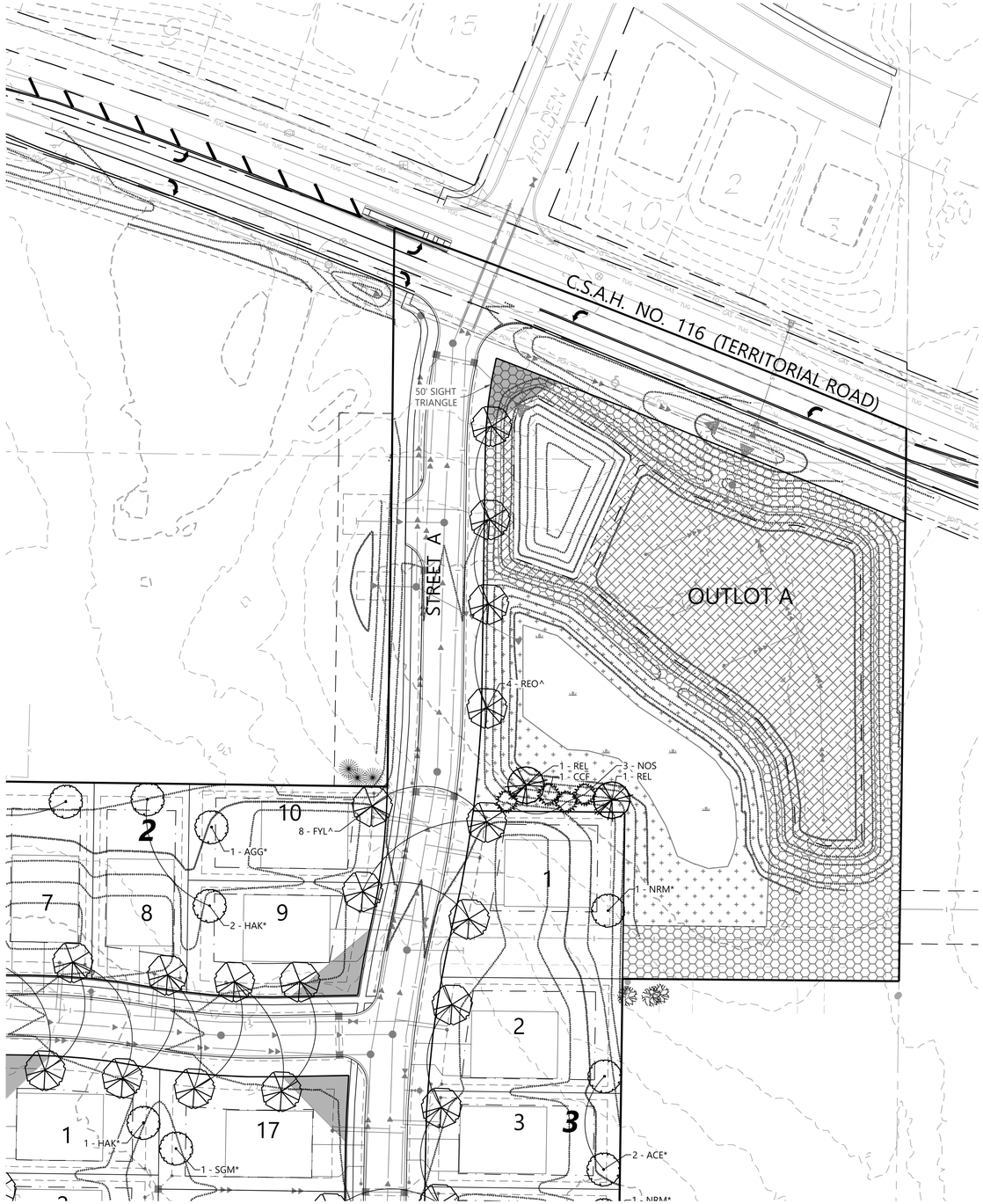
Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

OVERALL FINAL LANDSCAPE PLAN

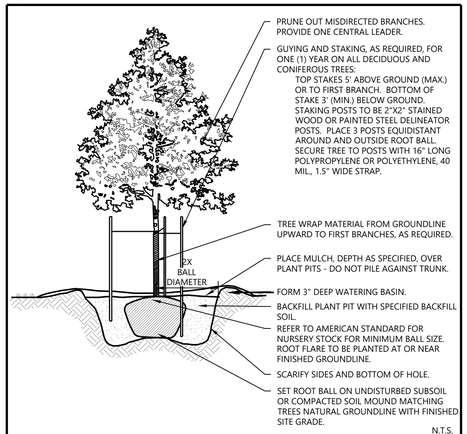
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 02 OF 05
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

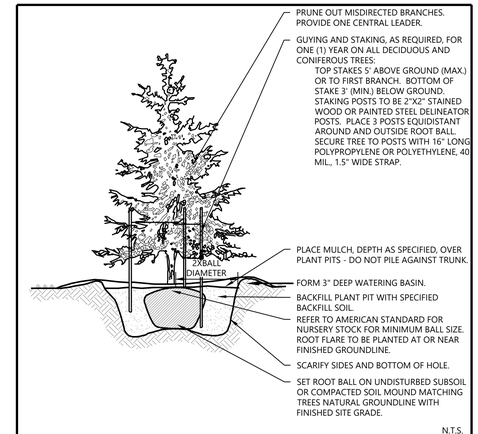


PLANTING DETAILS



N.T.S.

Westwood	DECIDUOUS TREE PLANTING	LAST REVISED: 10/19/18 LA28



N.T.S.

Westwood	EVERGREEN TREE PLANTING	LAST REVISED: 10/19/18 LA29

PLANTING NOTES

1. CONTRACTOR SHALL CONTACT COMMON GROUND ALLIANCE AT 811 OR CALL811.COM TO VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY PLANTS OR LANDSCAPE MATERIAL.
2. ACTUAL LOCATION OF PLANT MATERIAL IS SUBJECT TO FIELD AND SITE CONDITIONS.
3. NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SUBMISSION OF ANY BID AND/OR QUOTE BY THE LANDSCAPE CONTRACTOR.
5. CONTRACTOR SHALL PROVIDE TWO YEAR GUARANTEE OF ALL PLANT MATERIALS. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNER'S WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
6. ALL PLANTS TO BE SPECIMEN GRADE, MINNESOTA-GROWN AND/OR HARDY. SPECIMEN GRADE SHALL ADHERE TO, BUT IS NOT LIMITED BY, THE FOLLOWING STANDARDS:
   ALL PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, SCARS, ETC.
   ALL PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES.
   ALL PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES.
   ALL PLANTS SHALL HAVE HEAVY, HEALTHY BRANCHING AND LEAFING.
   CONIFEROUS TREES SHALL HAVE AN ESTABLISHED MAIN LEADER AND A HEIGHT TO WIDTH RATIO OF NO LESS THAN 5:3.
7. PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
8. PLANTS TO BE INSTALLED AS PER MNLA & ANSI STANDARD PLANTING PRACTICES.
9. PLANTS SHALL BE IMMEDIATELY PLANTED UPON ARRIVAL AT SITE. PROPERLY HEEL-IN MATERIALS IF NECESSARY; TEMPORARY ONLY.
10. PRIOR TO PLANTING, FIELD VERIFY THAT THE ROOT COLLAR/ROOT FLAIR IS LOCATED AT THE TOP OF THE BALLED & BURLAP TREE. IF THIS IS NOT THE CASE, SOIL SHALL BE REMOVED DOWN TO THE ROOT COLLAR/ROOT FLAIR. WHEN THE BALLED & BURLAP TREE IS PLANTED, THE ROOT COLLAR/ROOT FLAIR SHALL BE EVEN OR SLIGHTLY ABOVE FINISHED GRADE.
11. OPEN TOP OF BURLAP ON BB MATERIALS; REMOVE POT ON POTTED PLANTS; SPLIT AND BREAK APART PEAT POTS.
12. PRUNE PLANTS AS NECESSARY - PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
13. WRAP ALL SMOOTH-BARKED TREES - FASTEN TOP AND BOTTOM. REMOVE BY APRIL 1ST.
14. STAKING OF TREES AS REQUIRED; REPOSITION, PLUMB AND STAKE IF NOT PLUMB AFTER ONE YEAR.
15. THE NEED FOR SOIL AMENDMENTS SHALL BE DETERMINED UPON SITE SOIL CONDITIONS PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT FOR THE NEED OF ANY SOIL AMENDMENTS.
16. BACKFILL SOIL AND TOPSOIL TO ADHERE TO MN/DOT STANDARD SPECIFICATION 3877 (SELECT TOPSOIL BORROW) AND TO BE EXISTING TOP SOIL FROM SITE FREE OF ROOTS, ROCKS LARGER THAN ONE INCH, SUBSOIL DEBRIS, AND LARGE WEEDS UNLESS SPECIFIED OTHERWISE. MINIMUM 4" DEPTH TOPSOIL FOR ALL LAWN GRASS AREAS AND 12" DEPTH TOPSOIL FOR TREE, SHRUBS, AND PERENNIALS.
17. MULCH TO BE AT ALL TREE, SHRUB, PERENNIAL, AND MAINTENANCE AREAS. TREE AND SHRUB PLANTING BEDS SHALL HAVE 4" DEPTH OF SHREDDED HARDWOOD MULCH. SHREDDED HARDWOOD MULCH TO BE USED AROUND ALL PLANTS WITHIN TURF AREAS. PERENNIAL AND ORNAMENTAL GRASS BEDS SHALL HAVE 2" DEPTH SHREDDED HARDWOOD MULCH. MULCH TO BE FREE OF DELETERIOUS MATERIAL. ROCK MULCH TO BE BUFF LIMESTONE, 1 1/2" TO 3" DIAMETER, AT MINIMUM 3" DEPTH, OR APPROVED EQUAL. ROCK MULCH TO BE ON COMMERCIAL GRADE FILTER FABRIC, BY TYPAR, OR APPROVED EQUAL WITH NO EXPOSURE. MULCH AND FABRIC TO BE APPROVED BY OWNER PRIOR TO INSTALLATION. MULCH TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).
18. EDGING TO BE COMMERCIAL GRADE VALLEY-VIEW BLACK DIAMOND (OR EQUAL) POLY EDGING OR SPADED EDGE, AS INDICATED. POLY EDGING SHALL BE PLACED WITH SMOOTH CURVES AND STAKED WITH METAL SPIKES NO GREATER THAN 4 FOOT ON CENTER WITH BASE OF TOP BEAD AT GRADE, FOR MOWERS TO CUT ABOVE WITHOUT DAMAGE. UTILIZE CURBS AND SIDEWALKS FOR EDGING WHERE POSSIBLE. SPADED EDGE TO PROVIDE V-SHAPED DEPTH AND WIDTH TO CREATE SEPARATION BETWEEN MULCH AND GRASS. INDIVIDUAL TREE, SHRUB, OR RAIN-GARDEN BEDS TO BE SPADED EDGE, UNLESS NOTED OTHERWISE. EDGING TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).
19. ALL DISTURBED AREAS TO BE SODDED OR SEEDED, UNLESS OTHERWISE NOTED. PARKING LOT ISLANDS TO BE SODDED WITH SHREDDED HARDWOOD MULCH AROUND ALL TREES AND SHRUBS. SOD TO BE STANDARD MINNESOTA GROWN AND HARDY BLUEGRASS MIX, FREE OF LAWN WEEDS. ALL TOPSOIL AREAS TO BE RAKED TO REMOVE DEBRIS AND ENSURE DRAINAGE. SLOPES OF 3:1 OR GREATER SHALL BE STAKED. SEED AS SPECIFIED AND PER MN/DOT SPECIFICATIONS. IF NOT INDICATED ON LANDSCAPE PLAN, SEE EROSION CONTROL PLAN.
20. PROVIDE IRRIGATION TO ALL PLANTED AREAS ON SITE. IRRIGATION SYSTEM TO BE DESIGN/BUILD BY LANDSCAPE CONTRACTOR. LANDSCAPE CONTRACTOR TO PROVIDE SHOP DRAWINGS TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION OF IRRIGATION SYSTEM. CONTRACTOR TO PROVIDE OPERATION MANUALS, AS-BUILT PLANS, AND NORMAL PROGRAMMING. SYSTEM SHALL BE WINTERIZED AND HAVE SPRING STARTUP DURING FIRST YEAR OF OPERATION. SYSTEM SHALL HAVE ONE-YEAR WARRANTY ON ALL PARTS AND LABOR. ALL INFORMATION ABOUT INSTALLATION AND SCHEDULING CAN BE OBTAINED FROM THE GENERAL CONTRACTOR.
21. CONTRACTOR SHALL PROVIDE NECESSARY WATERING OF PLANT MATERIALS UNTIL THE PLANT IS FULLY ESTABLISHED OR IRRIGATION SYSTEM IS OPERATIONAL. OWNER WILL NOT PROVIDE WATER FOR CONTRACTOR.
22. REPAIR, REPLACE, OR PROVIDE SOD/SEED AS REQUIRED FOR ANY ROADWAY BOULEVARD AREAS ADJACENT TO THE SITE DISTURBED DURING CONSTRUCTION.
23. REPAIR ALL DAMAGE TO PROPERTY FROM PLANTING OPERATIONS AT NO COST TO OWNER.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

PLANT LEGEND

- OVERSTORY DECIDUOUS STREET TREES
- DECIDUOUS YARD TREES (BY HOME BUILDER)
- DECIDUOUS OVERSTORY TREES
- EVERGREEN TREES
- SMALL OVERSTORY TREES
- EXISTING CONIFEROUS TREE TO REMAIN
- EXISTING DECIDUOUS TREE TO REMAIN

NATIVE SEEDING LEGEND

- MNDOT SOUTHERN TALLGRASS ROADSIDE (STR) SEED MIX TOTAL AREA (1.3 AC)
- MNDOT WET DITCH (WD) SEED MIX TOTAL AREA (1.3 AC)
- MNDOT WET MEADOW S & W SEED MIX (34-271) TOTAL AREA (0.7 AC)

* ALL DISTURBED AREAS TO BE SODDED UNLESS NOTED OTHERWISE
* ALL DISTURBED AREAS WITHIN CITY ROW ALONG TERRITORIAL ROAD & WOOD LANE TO BE SEEDED WITH MESIC GENERAL ROADSIDE MIX (25-141)

NORTH

1" = 50'

0' 50' 100' 150'

FOR CONSTRUCTION

N:\0033874.00\DWG\CIVIL\FINAL\LANDSCAPE\0033874.00C-FLP01.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	1"=50'
VERTICAL SCALE:	

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA

CORY L. MEYER
DATE: 04/02/25 LICENSE NO. 26971

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

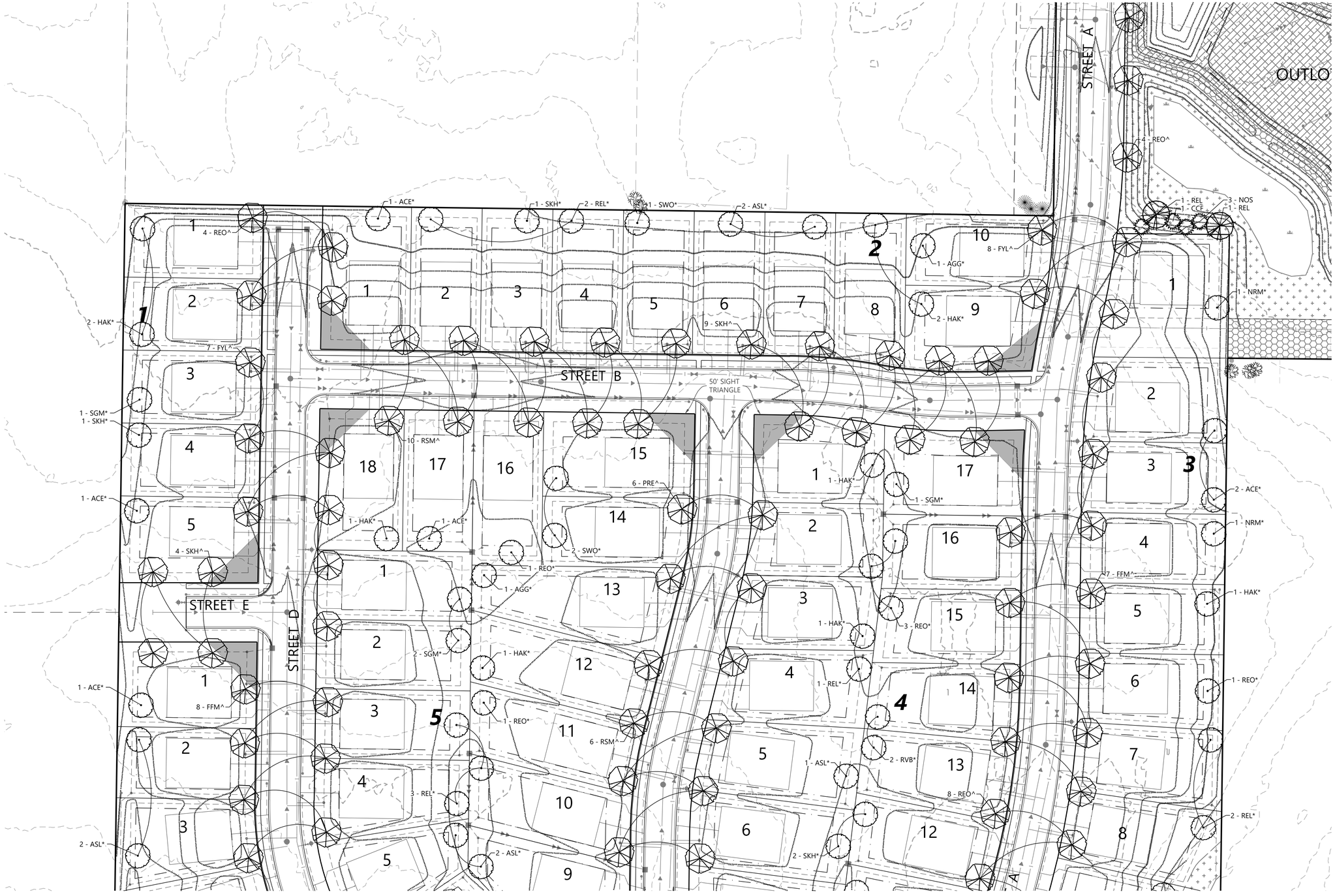
FINAL LANDSCAPE PLAN, PLANTING NOTES & DETAILS

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 03 OF 05
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



PLANT LEGEND

- OVERSTORY DECIDUOUS STREET TREES
- DECIDUOUS YARD TREES (BY HOME BUILDER)
- DECIDUOUS OVERSTORY TREES
- EVERGREEN TREES
- SMALL OVERSTORY TREES
- EXISTING CONIFEROUS TREE TO REMAIN
- EXISTING DECIDUOUS TREE TO REMAIN

NATIVE SEEDING LEGEND

- MNDOT SOUTHERN TALLGRASS ROADSIDE (STR) SEED MIX TOTAL AREA (1.3 AC)
- MNDOT WET DITCH (WD) SEED MIX TOTAL AREA (1.3 AC)
- MNDOT WET MEADOW S & W SEED MIX (34-271) TOTAL AREA (0.7 AC)

* ALL DISTURBED AREAS TO BE SODDED UNLESS NOTED OTHERWISE

* ALL DISTURBED AREAS WITHIN CITY ROW ALONG TERRITORIAL ROAD & WOOD LANE TO BE SEEDED WITH MESIC GENERAL ROADSIDE MIX (25-141)

1" = 50'

0' 50' 100' 150'

FOR CONSTRUCTION

N:\0033874.00\DWG\CIVIL\FINAL\LANDSCAPE\0033874.00C-FLP01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 04/02/25
REVISIONS:
1 .
2 .
3 .
4 .
5 .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA

CORY L. MEYER
DATE: 04/02/25 LICENSE NO. 26971

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Fax (952) 937-5822
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka, MN 55343
westwoodps.com
Westwood Professional Services, Inc.

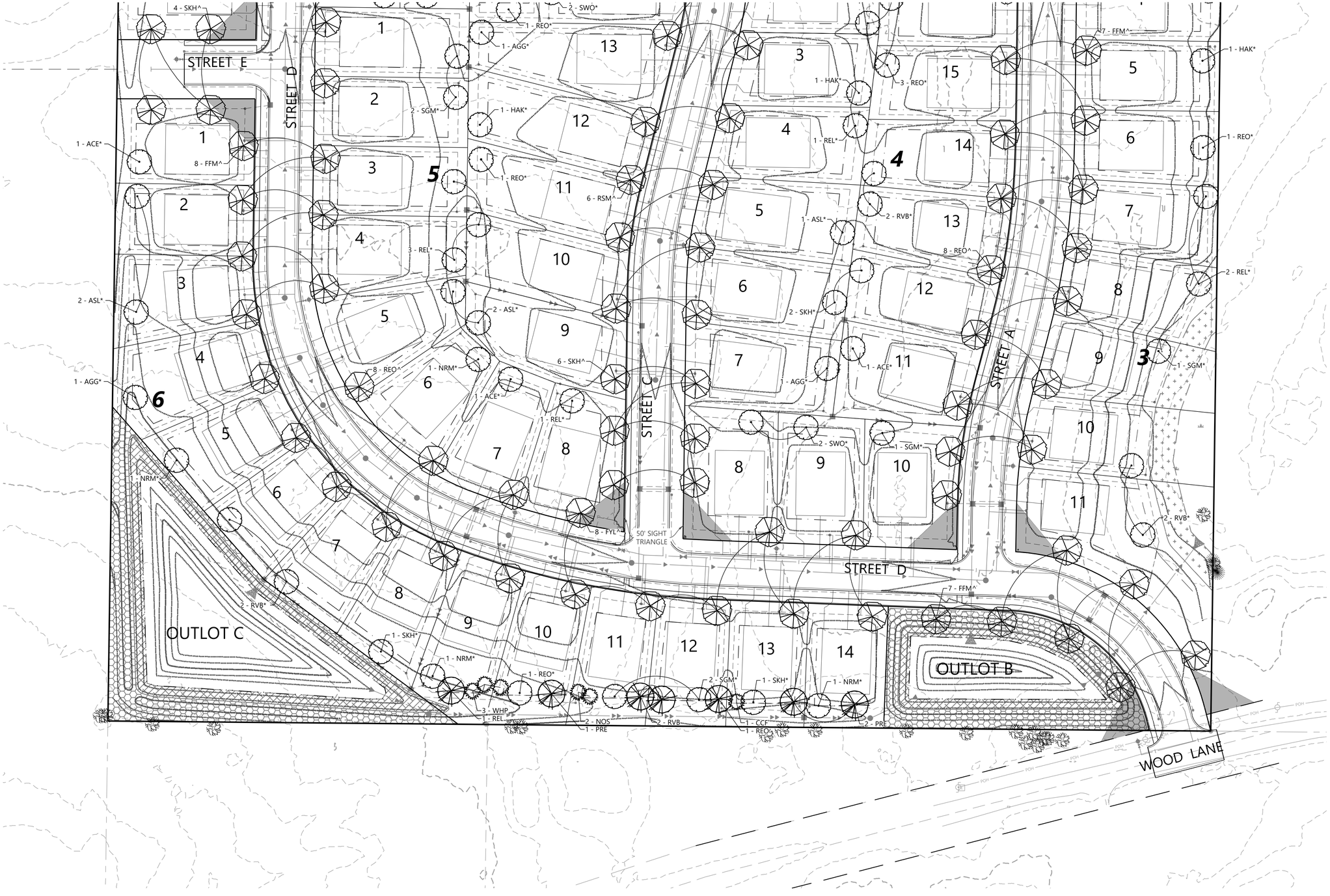
FINAL LANDSCAPE PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 04 OF 05
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



PLANT LEGEND

- OVERSTORY DECIDUOUS STREET TREES
- DECIDUOUS YARD TREES (BY HOME BUILDER)
- DECIDUOUS OVERSTORY TREES
- EVERGREEN TREES
- SMALL OVERSTORY TREES
- EXISTING CONIFEROUS TREE TO REMAIN
- EXISTING DECIDUOUS TREE TO REMAIN

NATIVE SEEDING LEGEND

- MNDOT SOUTHERN TALLGRASS ROADSIDE (STR) SEED MIX TOTAL AREA (1.3 AC)
- MNDOT WET DITCH (WD) SEED MIX TOTAL AREA (1.3 AC)
- MNDOT WET MEADOW S & W SEED MIX (34-271) TOTAL AREA (0.7 AC)

* ALL DISTURBED AREAS TO BE SODDED UNLESS NOTED OTHERWISE

* ALL DISTURBED AREAS WITHIN CITY ROW ALONG TERRITORIAL ROAD & WOOD LANE TO BE SEEDED WITH MESIC GENERAL ROADSIDE MIX (25-141)

1" = 50'

0' 50' 100' 150'

FOR CONSTRUCTION

N:\0033874.00\DWG\CIVIL\FINAL\LANDSCAPE\0033874.00C-FLP01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA

CORY L. MEYER
DATE: 04/02/25 LICENSE NO. 26971

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

FINAL LANDSCAPE PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 05 OF 05
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

CONSTRUCTION PLANS

FOR

CSAH 116 TERRITORIAL ROAD IMPROVEMENTS

FOR

NORTHVIEW PRESERVE

ROGERS, MN



Vicinity Map
(NOT TO SCALE)

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044
CONTACT: BRYAN TUCKER
PHONE: 612-490-0982
EMAIL: BRYANT@SUMMER-GATE.COM

PREPARED BY:

Westwood

Phone (952) 937-5150
Fax (952) 937-5822
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka, MN 55343
westwoodps.com

Westwood Professional Services, Inc.

PROJECT NUMBER: 0033874.00
CONTACT: THOMAS D. DESUTTER

SHEET INDEX

Sheet List Table

SHEET NUMBER	SHEET TITLE
01	COVER
02	TURN LANE IMPROVEMENTS
03	REMOVALS PLAN
04	SIGNAGE & STRIPING PLAN
05	GRADING & UTILITIES PLAN
06	CROSS SECTIONS
07	DETAILS
08	DETAILS
09	DETAILS
10	DETAILS
11	DETAILS
12	DETAILS
13	DETAILS
14	DETAILS
15	DETAILS

NO.	DATE	REVISION	SHEETS
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	

CONSTRUCTION PLANS

FOR

CSAH 116 TERRITORIAL ROAD IMPROVEMENTS

FOR

NORTHVIEW PRESERVE
ROGERS, MN

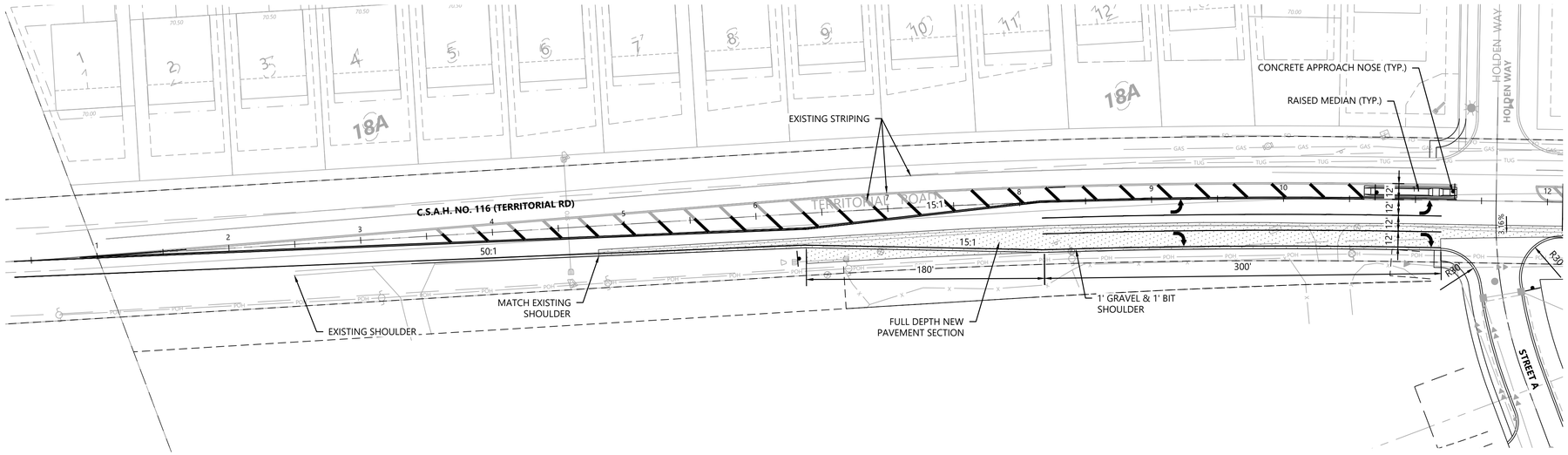
INITIAL SUBMITTAL DATE: 03/28/25 SHEET: 01 OF 15

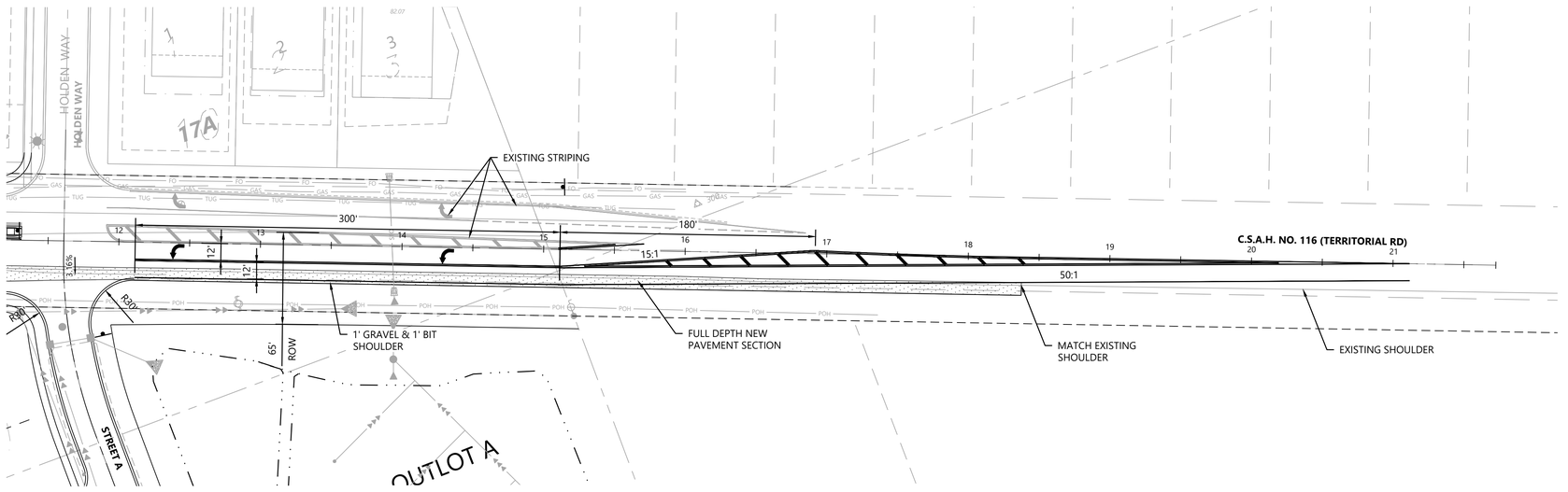
N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-CVF01-TL.DWG

NORTHVIEW PRESERVE

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



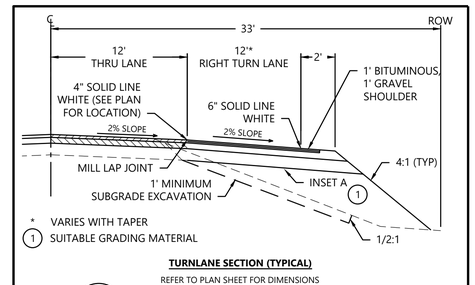


LEGEND

FULL DEPTH NEW PAVEMENT SECTION

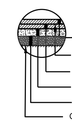
GENERAL NOTES

1. LOCATIONS AND ELEVATIONS OF EXISTING TOPOGRAPHY AND UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY SITE CONDITIONS AND UTILITY LOCATIONS PRIOR TO EXCAVATION/CONSTRUCTION. IF ANY DISCREPANCIES ARE FOUND, THE ENGINEER SHOULD BE NOTIFIED IMMEDIATELY.
2. REFER TO BOUNDARY SURVEY FOR LOT BEARINGS, DIMENSIONS, AND AREAS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING SIGNS, DIRECTIONAL SIGNS, FLAGGERS, AND LIGHTS TO CONTROL THE MOVEMENT OF TRAFFIC WHERE NECESSARY. PLACEMENT OF THESE DEVICES SHALL BE APPROVED BY THE CITY AND ENGINEER PRIOR TO PLACEMENT. TRAFFIC CONTROL DEVICES SHALL CONFORM TO APPROPRIATE MNDOT STANDARDS.
4. BITUMINOUS PAVEMENT AND CONCRETE SECTIONS TO BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.
5. PAVEMENT REMOVALS SHALL INCLUDE EXISTING SHOULDER



* VARIES WITH TAPER
(1) SUITABLE GRADING MATERIAL

TURNLANE SECTION (TYPICAL)
REFER TO PLAN SHEET FOR DIMENSIONS



- 4" WEARING COURSE (2-2" LIFTS) SPWEA440C, MNDOT 2360
- MNDOT SPEC. 2357 BITUMINOUS TACK COAT
- 4" NON-WEARING COURSE (2-2" LIFTS) SPNWB430C, MNDOT 2360
- 7" AGGREGATE BASE, CLASS 5
- 15" SELECT GRANULAR
- COMPACTED SAND SUBGRADE (100% STANDARD PROCTOR)

** SUBGRADE TESTED AND APPROVED IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS **
(CONTRACTOR SHALL MATCH EXISTING PAVEMENT SECTION)
INSET A

Westwood	TURNLANE DETAIL	LAST REVISED: 03/07/19
		SI26A



1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-STF01.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	##########
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

TURN LANE IMPROVEMENTS
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 02 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

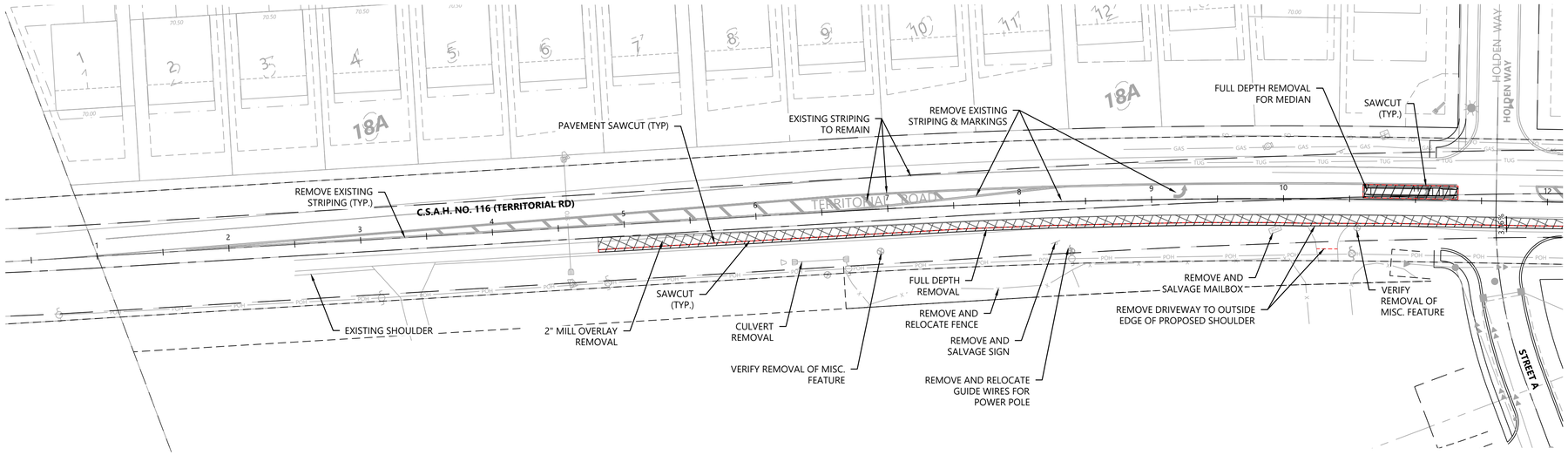
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

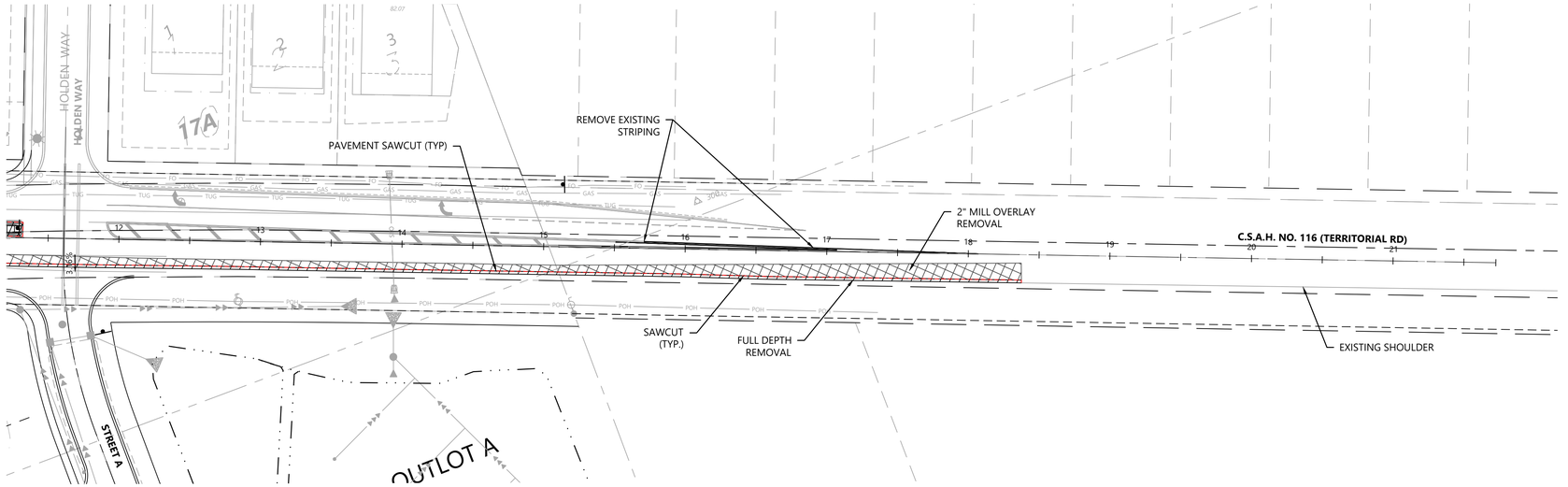
REMOVAL LEGEND

EXISTING	PROPOSED	
		PROPERTY LINE
		SAW CUT PAVEMENT
		FULL DEPTH REMOVAL
		2" MILL OVERLAY REMOVAL
		EXISTING STRIPING REMOVAL

REMOVAL NOTES

1. LOCATIONS AND ELEVATIONS OF EXISTING TOPOGRAPHY AND UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY SITE CONDITIONS AND UTILITY LOCATIONS PRIOR TO EXCAVATION/CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IF ANY DISCREPANCIES ARE FOUND.
2. CONTRACTOR SHALL COORDINATE LIMITS OF REMOVALS WITH PROPOSED IMPROVEMENTS AND FIELD VERIFY CONDITION OF EXISTING APPURTENANCES TO REMAIN. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING OR REPLACING MISCELLANEOUS ITEMS (SUCH AS FENCES, SIGNS, IRRIGATION HEADS, ETC.) THAT MAY BE DAMAGED BY CONSTRUCTION.
3. CONTRACTOR SHALL PLACE ALL NECESSARY EROSION CONTROL MEASURES REQUIRED TO MAINTAIN SITE STABILITY PRIOR TO EXECUTING ANY SITE REMOVALS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH UTILITY PROVIDERS FOR REMOVAL AND/OR RELOCATION OF EXISTING UTILITIES AFFECTED BY SITE DEVELOPMENT. ALL PERMITS, APPLICATIONS AND FEES ARE THE RESPONSIBILITY OF THE CONTRACTOR.





1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-STF01.DWG

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: ##########
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

REMOVALS PLAN
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 03 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

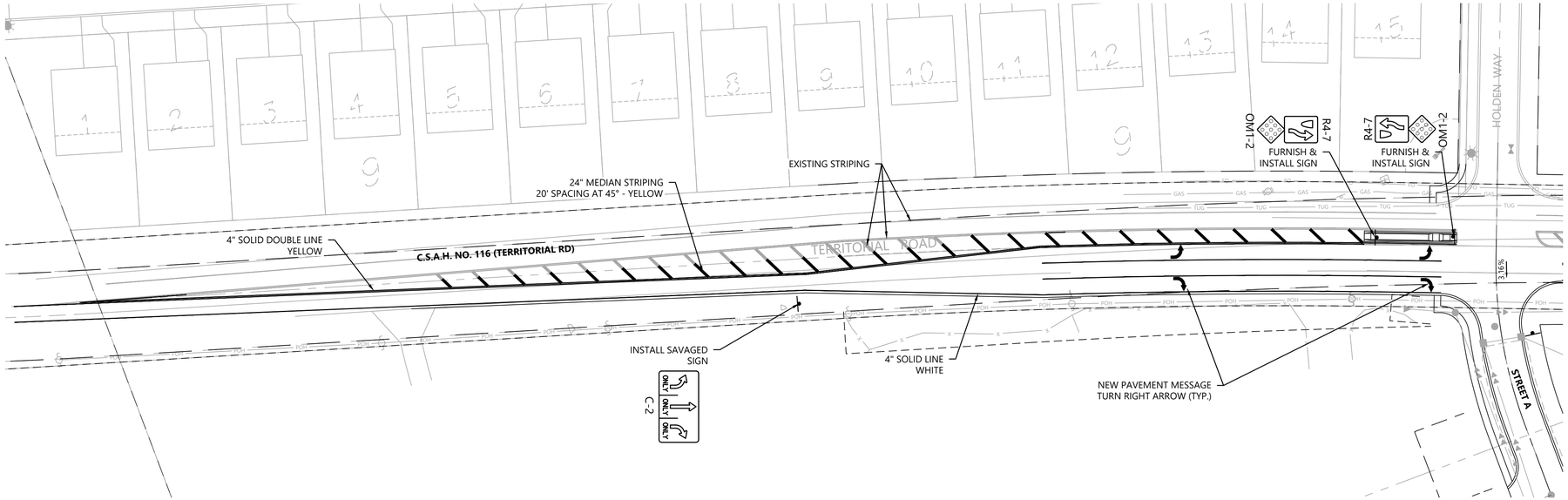
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

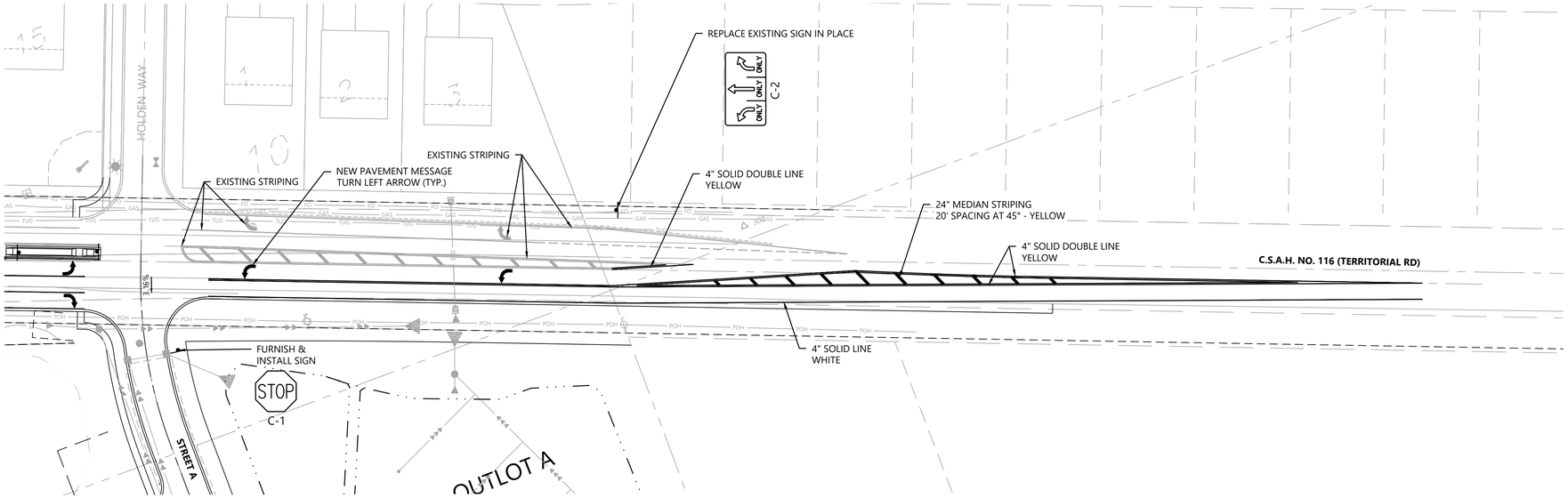
STRIPING AND SIGNAGE LEGEND

EXISTING	PROPOSED	
		SIGN (SINGLE POST)
MBX	MBX	MAILBOX

STRIPING AND SIGNAGE NOTES

1. ALL LANE LINES SHALL BE GROUND-IN & MULTI-COMPONENT. ALL PAVEMENT MARKINGS AND 24" MEDIAN STRIPING SHALL BE GROUND-IN & PREFORM THERMOPLASTIC. ALL LANE LINES, STRIPING, AND MESSAGES TO BE APPLIED AFTER PLACEMENT OF FINAL WEARING COURSE
2. FURNISH AND INSTALL ALL TYPE C SIGN WITH SQUARE-TUBE THREE-WALL SIGN BASE, UNLESS NOTED OTHERWISE.
3. ALL SIGNS TO BE RELOCATED SHALL BE SALVAGED AND INSTALLED OUTSIDE OF THE CLEAR ZONE OF THE PROPOSED ROADWAY.
4. REFER TO COUNTY STRIPING DETAILS FOR PAVEMENT MARKING PLACEMENT.





INSTALL SIGN TYPE C											
SIGN NUMBER	QUANTITY	POSTS			MOUNTING HEIGHT	PANELS			PANEL CODE NUMBER	LEGEND	NOTES
		"QUANTITY AND TYPE"	KNEE BRACES	LENGTH		SIZE	AREA	TOTAL			
			EACH	LIN FT	LIN FT	INCH	SQ FT	SQ FT			
C-4	2	2-S	-	13	7	18X18	2.25	4.5	OM1-2	OM	2" FIN BASE
C-3	2	2-S	-	13	7	18X24	3	6	R4-7	CR-ML	2" FIN BASE
C-2	1	1-S	-	13	7	54X30	11.25	11.25	R3-8ACA	R-T-L	2" FIN BASE
C-2	1	1-S	-	13	7	54X30	11.25	11.25	R3-8ACA	R-T-L	2" FIN BASE
C-1	1	1-S	-	13	7	36X36	9.0	9.0	R1-1	STOP	2" FIN BASE
TOTALS								31.5			



1" = 50'

0' 50' 100' 150'

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINALLTURN LANE\0033874.00C-STF01.DWG

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: ##########
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

SIGNAGE & STRIPING PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 04 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

GRADING LEGEND

EXISTING	PROPOSED	
980	980	INDEX CONTOUR
982	982	INTERVAL CONTOUR
▷▷	▶▶ ■	STORM SEWER
SF	SF	SILT FENCE
		EROSION CONTROL BLANKET

GRADING & DRAINAGE NOTES

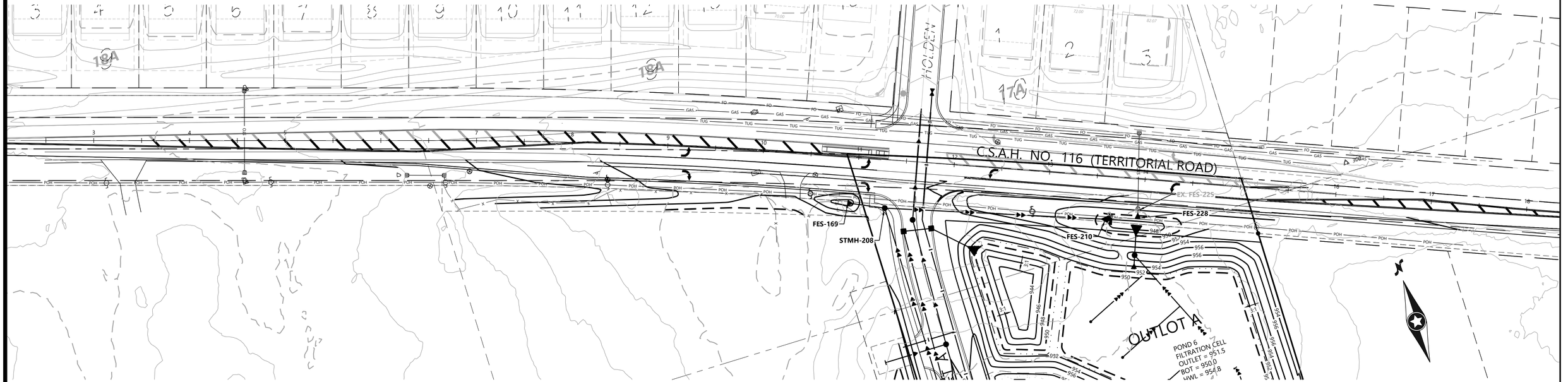
1. ALL CONTOURS AND SPOT ELEVATIONS ARE SHOWN TO FINISHED SURFACE/GUTTER GRADES UNLESS OTHERWISE NOTED.
2. REFER TO THE SITE PLAN/RECORD PLAT FOR MOST CURRENT HORIZONTAL SITE DIMENSIONS AND LAYOUT.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING UTILITIES AND TOPOGRAPHICAL FEATURES WITH THE OWNERS AND FIELD-VERIFY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
4. ALL CONSTRUCTION SHALL CONFORM TO LOCAL RULES.
5. POSITIVE DRAINAGE FROM THE SITE MUST BE PROVIDED AT ALL TIMES.

EROSION CONTROL NOTES

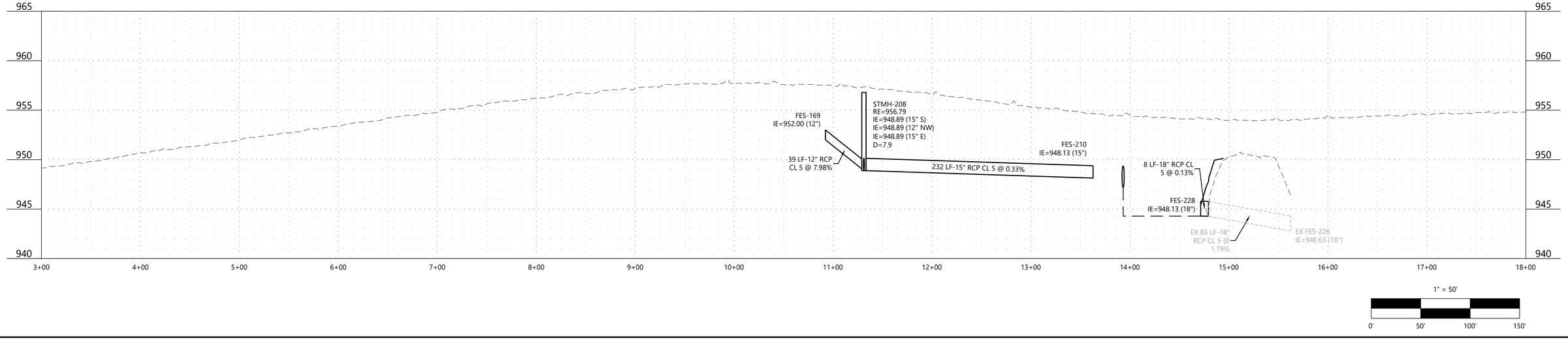
1. ALL SILT FENCE AND OTHER EROSION CONTROL FEATURES SHALL BE IN-PLACE PRIOR TO ANY EXCAVATION/CONSTRUCTION AND SHALL BE MAINTAINED UNTIL VIABLE TURF OR GROUND COVER HAS BEEN ESTABLISHED. EXISTING SILT FENCE ON-SITE SHALL BE MAINTAINED AND OR REMOVED AND SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONTRACT. IT IS OF EXTREME IMPORTANCE TO BE AWARE OF CURRENT FIELD CONDITIONS WITH RESPECT TO EROSION CONTROL. TEMPORARY PONDING, DIKES, HAY BALES, ETC., REQUIRED BY THE CITY SHALL BE INCIDENTAL TO THE GRADING CONTRACT.
2. ALL STREETS DISTURBED DURING WORKING HOURS MUST BE CLEANED AT THE END OF EACH WORKING DAY. A ROCK ENTRANCE TO THE SITE MUST BE PROVIDED ACCORDING TO DETAILS TO REDUCE TRACKING OF DIRT ONTO PUBLIC STREETS.
3. REDUNDANT PERIMETER SEDIMENT CONTROLS ARE NECESSARY WHEN SOIL DISTURBANCE IS WITHIN 50 FEET OF SURFACE WATERS. REDUNDANT SEDIMENT CONTROLS COULD INCLUDE:
   - 3.1. TWO ROWS OF SILT FENCE (SEPARATED BY 8 FEET); OR
   - 3.2. SILT FENCE AND A TOPSOIL BERM (STABILIZE BERM WITH MULCH); OR
   - 3.3. SILT FENCE AND FIBER LOGS; OR
   - 3.4. TOPSOIL BERM AND FIBER LOGS (STABILIZE BERM WITH MULCH).
4. REDUNDANT SEDIMENT CONTROLS MUST BE INSTALLED PRIOR TO DISTURBING WITHIN 50 FEET OF THE SURFACE WATER.
5. ALL STORM SEWER JOINTS SHALL BE TIED PER MNDOT STANDARDS

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

CONSTRUCTION PLANS



TERRITORIAL RD



1" = 50'
0' 50' 100' 150'

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-GDP01-TL.DWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50.000007'
VERTICAL SCALE:	10' OR 5'

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
Thomas H. Schutter
THOMAS H. SCHUTTER
DATE: 04/02/25 LICENSE NO. 58630

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

GRADING & UTILITIES PLAN

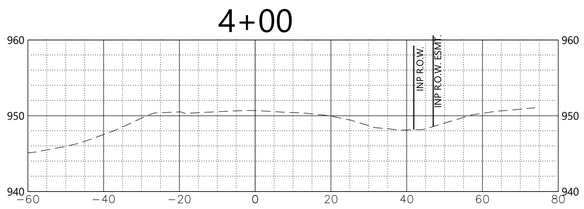
PROJECT NUMBER: 0033874.00

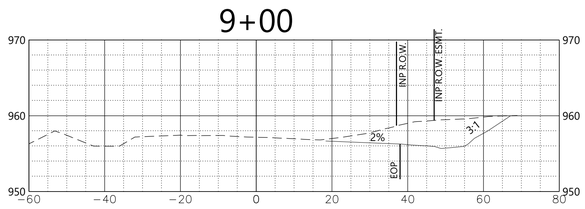
SHEET NUMBER: 05 OF 15
DATE: 04/02/25

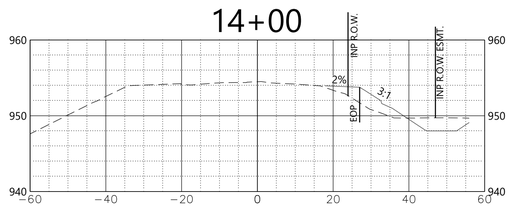
© 2025 Westwood Professional Services, Inc.

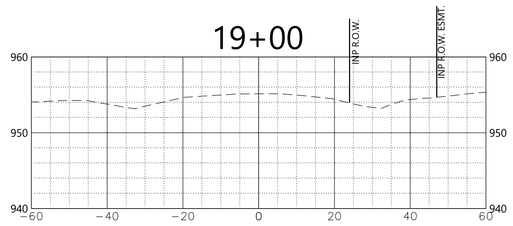
CONSTRUCTION PLANS

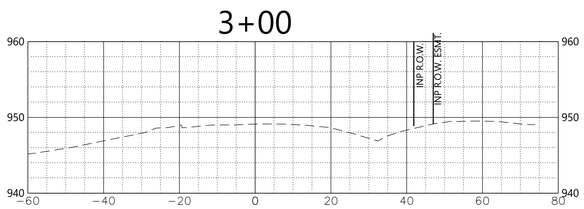
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

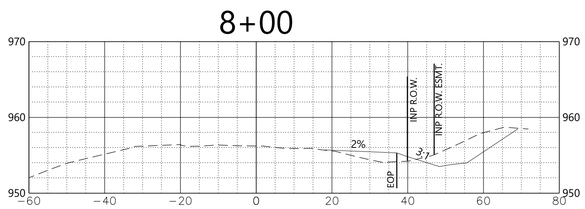




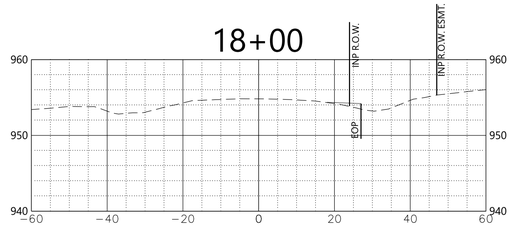


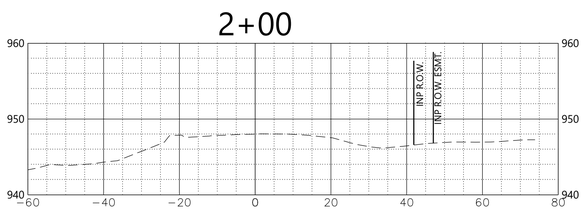


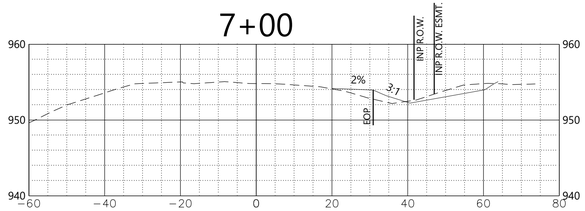


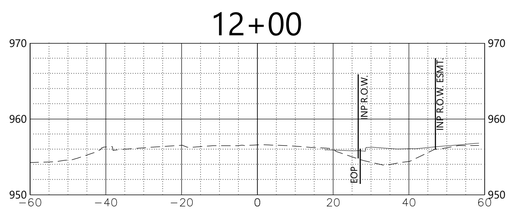


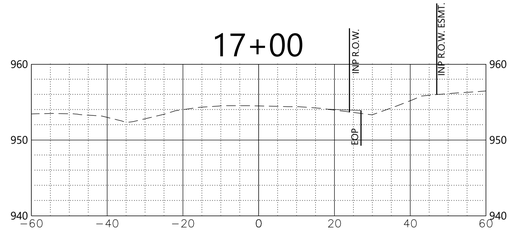


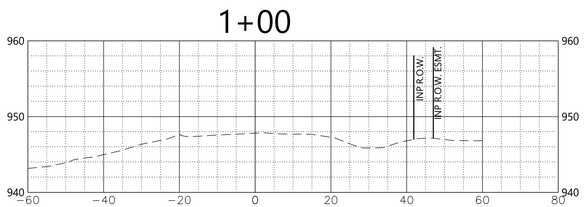


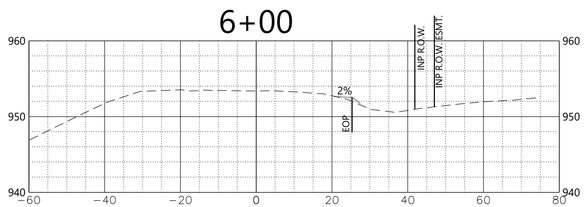


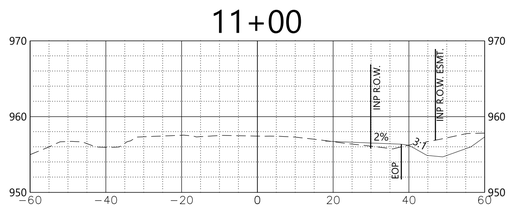


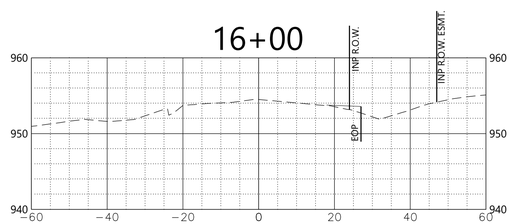


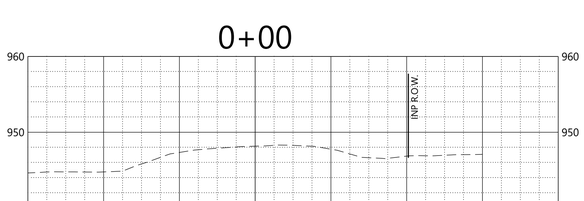


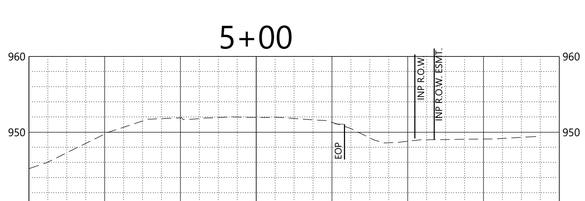


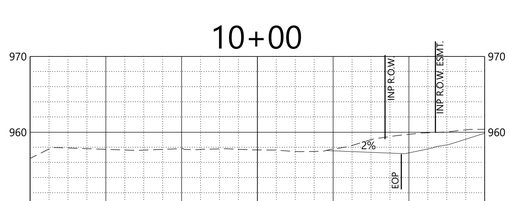


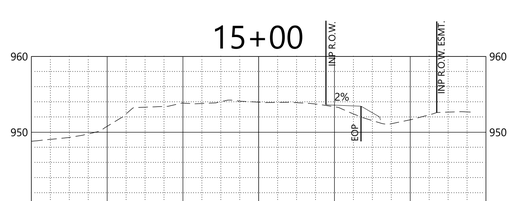












N:\0033874.00\DWG\0033874C-X-SEC.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	20.000002'
VERTICAL SCALE:	4' OR 2'

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

CROSS SECTIONS

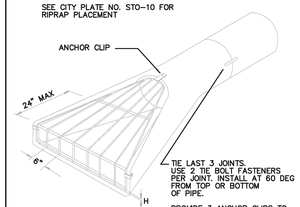
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 06 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

SEE CITY PLATE NO. STO-10 FOR RIPRAP PLACEMENT

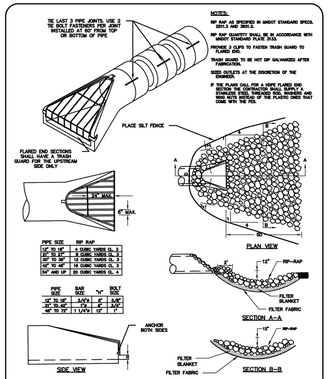


TRASH GUARD SIZING

PIPE SIZE	BARS	"H"	BOLTS
12"–18"	¾" DIA	4"	¾"
21"–42"	1" DIA	6"	¾"
48"–72"	1–1/4" DIA	12"	1"

CITY OF ROGERS | FLARED END SECTION AND TRASH GUARD | Standard Details | Date: SEPTEMBER, 2020 | Revised: | STO–7

NOTES:
RIP RAP AS SPECIFIED IN MNDOT STANDARD SPECS. 3371.4 AND 3601.5.
RIP RAP QUANTITY SHALL BE IN ACCORDANCE WITH MNDOT STANDARD PLATE 3101.
FENCING CLIPS TO FASTEN TRASH GUARD TO FLARED END.
TRASH GUARD TO BE HOT DIP GALVANIZED AFTER FABRICATION.
WIRE DIAMETER AT THE DISCRETION OF THE CONTRACTOR.
IF RIP RAP SLOPE FALL FOR A LIGHT FLARED END SECTION, THE CONTRACTOR SHALL INSTALL STAINLESS STEEL STANDARD ROD, WASHERS AND NUTS WITH THE TOP OF THE PLACING ONES THAT LOCAL WITH THE FELL.

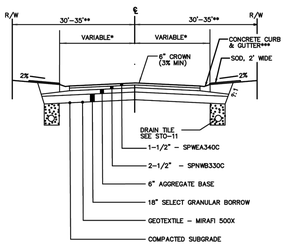


PIPE SIZE	RIP RAP
12" TO 18"	1 CUBIC YARDS CL. 3
21" TO 30"	3 CUBIC YARDS CL. 3
33" TO 36"	12 CUBIC YARDS CL. 3
42" TO 48"	20 CUBIC YARDS CL. 4
54" AND UP	30 CUBIC YARDS CL. 4

PIPE SIZE	BAR SIZE	"L"	BOLT SIZE
12" TO 24"	#4(13 mm)	4"	¾"
30" TO 36"	#5(16 mm)	6"	¾"
42" TO 72"	#6(19 mm)	8"	1"

CITY OF ROGERS | RIPRAP AT OUTLETS | Standard Details | Date: SEPTEMBER, 2020 | Revised: | STO–10

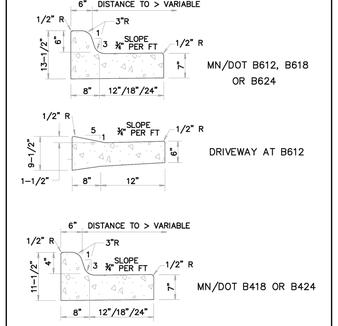
NOTE: ALL ORGANIC OR OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM BENEATH THE ROADWAY.



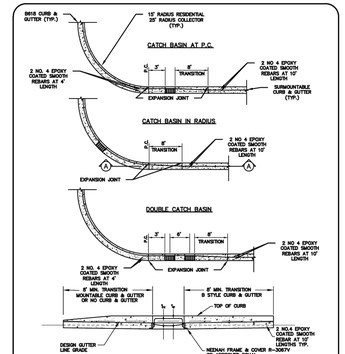
* 16' FOR RESIDENTIAL URBAN
19.5' FOR LOW VOLUME MINOR COLLECTOR
24' FOR RESIDENTIAL URBAN COLLECTOR
** 30' FOR RESIDENTIAL URBAN
35' FOR MINOR COLLECTORS
*** SURMOUNTABLE FOR RESIDENTIAL URBAN
B618 OR SURMOUNTABLE FOR MINOR COLLECTORS

BITUMINOUS STREET WITH CONCRETE CURB AND GUTTER

CITY OF ROGERS | TYPICAL SECTION FOR COLLECTOR & RESIDENTIAL STREETS –URBAN SECTION | Standard Details | Date: SEPTEMBER, 2019 | Revised: | STR–7A

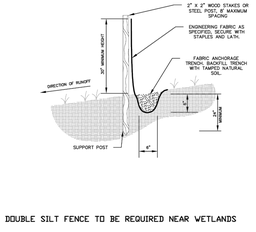


CITY OF ROGERS | CURB SECTIONS | Standard Details | Date: SEPTEMBER, 2020 | Revised: | CON–1



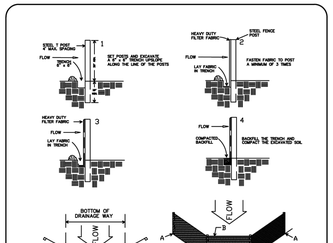
NOTES:
EXPANSION JOINT MATERIAL SHALL BE CLOSED CELL POLYETHYLENE

CITY OF ROGERS | CURB RADIUS | Standard Details | Date: SEPTEMBER, 2020 | Revised: | CON–2



DOUBLE SILT FENCE TO BE REQUIRED NEAR WETLANDS

CITY OF ROGERS | STANDARD SILT FENCE | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–1

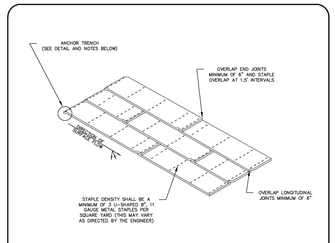


NO SCALE

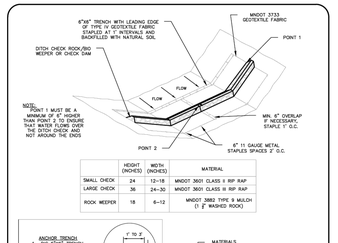
Maintenance

1. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY 1/2 HEIGHT OF THE BARRIER, OR AS DIRECTED BY THE ENGINEER.
4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DISPOSED OF OR SMOOTHED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
5. WETLANDS ARE TO BE PROTECTED BY TWO ROWS OF H.D. SILT FENCE. DOUBLE H.D. SILT FENCE IS REQUIRED AROUND WATER BODIES, STEEP SLOPES AND HIGHLY ERODIBLE SOILS.
6. ALL MATERIAL & INSTALLATION MUST CONFORM TO THE REQUIREMENTS OF THE CURRENT EDITION OF THE MNDOT CONSTRUCTION SPECIFICATIONS TABLE 3886–1.

CITY OF ROGERS | SILT FENCE ALONG WETLAND | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–4

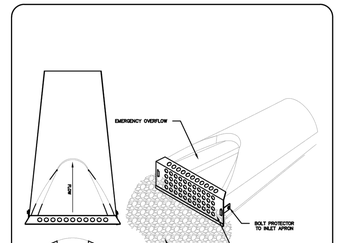


CITY OF ROGERS | EROSION CONTROL BLANKET INSTALLATION | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–5



	HEIGHT (INCHES)	WIDTH (INCHES)	MATERIAL
SMALL CHECK	24	12–18	MNDOT 3601 CLASS II RIP RAP
LARGE CHECK	36	24–30	MNDOT 3601 CLASS III RIP RAP
ROCK WEEPER	18	6–12	MNDOT 3882 TYPE 9 MULCH (1 ¼" WASHED ROCK)

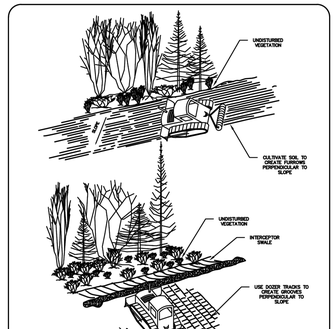
CITY OF ROGERS | ROCK DITCH CHECK / WEEPER SIZING AND MATERIALS | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS 6



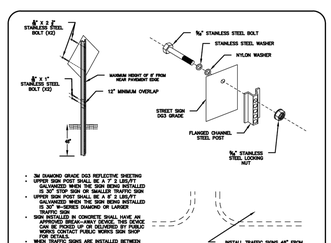
NOTE:
FILTER FABRIC MAY BE REPLACED AS REQUIRED BY REMOVING BOLTS/RIVETS CONNECTING HDPE LAYERS OF DUCTING/PIPE/RING BACK TOGETHER.

DENOTES SHOWN ARE AS MANUFACTURED BY ROYAL ENVIRONMENTAL SYSTEMS. INFRASAFE – CULVERT INLET PROTECTOR

CITY OF ROGERS | INFRASAFE – CULVERT INLET PROTECTOR | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–9



CITY OF ROGERS | SLOPE TRACKING | Standard Details | Date: SEPTEMBER, 2020 | Revised: | EROS–12



- 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING
- UPPER SIGN POST SHALL BE A 7' 2 LBS/FT GALVANIZED W/6# THE SIGN BEING INSTALLED 4'6 3/4" STEEL SIGN ON MALLOR SHAPES SIGN
- LOWER SIGN POST SHALL BE A 8' 2 LBS/FT GALVANIZED W/6# THE SIGN BEING INSTALLED 2.30" W–SERIES DIAMOND OR LARGER
- SIGN INSTALLED IN CONCRETE SHALL HAVE AN APPROVED BREAK–AWAY DEVICE. THIS DEVICE SHALL BE INSTALLED PER MANUFACTURER'S USE & CONSULT PUBLIC WORKS DEPT. FOR DETAILS
- WHEN TRAFFIC SIGNS ARE INSTALLED BETWEEN CURB AND SIDEWALK, ADD 1' AS SAG TO CURB SPLIT DIMENSION
- KEEP ALL TRAFFIC SIGNS 4' AWAY IN ALL DIRECTIONS FROM PEDESTRIAN RAMPS

INSTALL TRAFFIC SIGNS 48" FROM BACK OF CURB TO CENTER OF POST

48" FROM BACK OF CURB TO CENTER OF POST OR 12" FROM BACK OF CURB TO NEAR SIDE OF SIGN WHERE SIDEWALK IS PRESENT. SIGNS CAN BE LOCATED AT THE BACK OF A SIDEWALK WHERE THE SIDEWALK IS WIDER THAN 6'. SIGNS SHALL NOT BE PLACED WITHIN THE SIDEWALK WITHIN 6' FROM CURBLINE EDGE AND BACK OF CURB.

NOTES:
ALL REGULATORY AND STREET SIGNS MUST BE MAINTAINED THROUGHOUT CONSTRUCTION. TEMPORARY SIGNAGE MAY BE REQUIRED AND IS CONSIDERED INCIDENTAL.

ALL IN–PLACE SIGNS NOT SHOWN IN PLANS SHALL BE MAINTAINED IN–PLACE THROUGHOUT CONSTRUCTION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

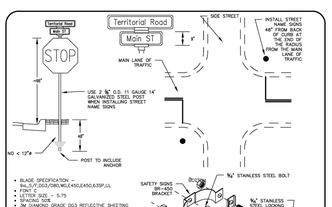
LOCATION OF ALL PROPOSED SIGNS ARE APPROXIMATE AND SHALL BE LOCATED BY THE ENGINEER IN THE FIELD PRIOR TO INSTALLATION.

SIGN PANELS–REFLECTIVE SHEETING WILL BE DG3 MATERIAL.

ALL TYPE C SIGN PANELS SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE THE SIGN, SIGN POST, MOUNTING HARDWARE, SIGN AND LABOR FOR THE INSTALLATION OF ALL TYPE C SIGNS.

A SIGN PLAN SHOWING SIGN COLORS, SIZES AND LETTERING MUST BE SUBMITTED TO THE CITY OF ROGERS PUBLIC WORKS DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO SIGN INSTALLATION.

CITY OF ROGERS | TRAFFIC SIGN INSTALLATION | Standard Details | Date: SEPTEMBER, 2020 | Revised: | SGN–1



- BLADE SPECIFICATION = R44_D_P_D12_F_D50_MC_L450_E450_E450_E450_E30_U_L
- FONT = CLEARVIEW
- LETTER SIZE = 5.75
- BORDER = 0.5
- 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING
- WHITE ON MNDOT GREEN BACKGROUND FOR PUBLIC STREETS
- WHITE ON MNDOT BLUE BACKGROUND FOR PRIVATE STREETS
- RADIUS 'R' TRIM CORNERS, WIDTH: .375, RADIUS: 1.5, INSENT: .5, BORDER COLOR: WHITE
- STREET NAMES SHALL BE SPELLED COMPLETELY EXCEPT FOR THE STREET TYPE (AVE, LN, CT, PKWY, ETC.) WHICH MAY BE ABBREVIATED AS SHOWN IN MN/DOT 2D
- FIRST LETTER OF EACH WORD TO BE "CAPITAL" LETTERS, REMAINING LETTERS OF EACH WORD TO BE LOWER CASE
- MAXIMUM OF 3 STREET NAME BLADES PER POLE, IF MORE THAN 3 ARE NEEDED, ANOTHER POLE SHALL BE USED
- NEED TO INSTALL ANOTHER POLE ON OPPOSITE CORNER
- ALWAYS INSTALL THE CROSS STREET NAME BLADE ON THE

NOTES:
ALL REGULATORY AND STREET SIGNS MUST BE MAINTAINED THROUGHOUT CONSTRUCTION. TEMPORARY SIGNAGE MAY BE REQUIRED AND IS CONSIDERED INCIDENTAL.

ALL IN–PLACE SIGNS NOT SHOWN IN PLANS SHALL BE MAINTAINED IN–PLACE THROUGHOUT CONSTRUCTION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

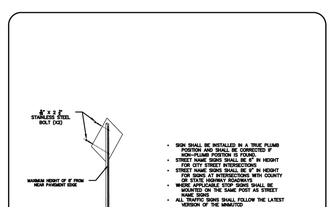
LOCATION OF ALL PROPOSED SIGNS ARE APPROXIMATE AND SHALL BE LOCATED BY THE ENGINEER IN THE FIELD PRIOR TO INSTALLATION.

SIGN PANELS–REFLECTIVE SHEETING WILL BE DG3 MATERIAL.

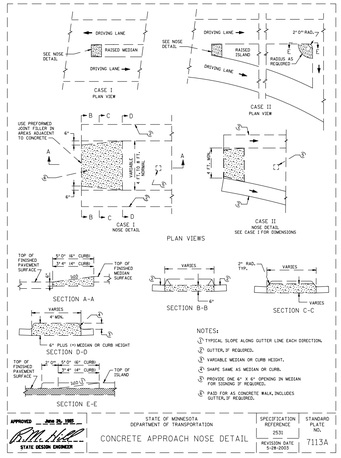
ALL TYPE C SIGN PANELS SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE THE SIGN, SIGN POST, MOUNTING HARDWARE, SIGN AND LABOR FOR THE INSTALLATION OF ALL TYPE C SIGNS.

A SIGN PLAN SHOWING SIGN COLORS, SIZES AND LETTERING MUST BE SUBMITTED TO THE CITY OF ROGERS PUBLIC WORKS DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO SIGN INSTALLATION.

CITY OF ROGERS | STREET NAME BLADE INSTALLATION W/ TRAFFIC SIGN | Standard Details | Date: AUGUST, 2021 | Revised: | SGN–2



CITY OF ROGERS | SURFACE MOUNT SIGN | Standard Details | Date: SEPTEMBER, 2020 | Revised: | SGN–4

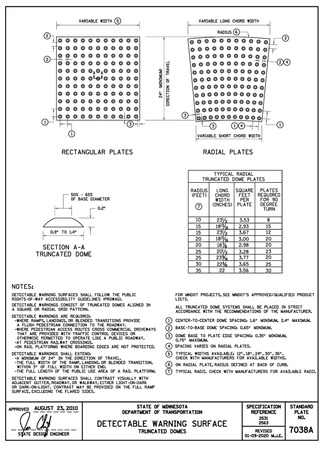


NOTES:
1. TYPICAL SLOPE ALONG GUTTER LINE EACH DIRECTION.
2. GUTTER, 9" REQUIRED.
3. VARIABLE WIDTH OF CURB HEIGHT.
4. SHAPE SAME AS MEDIAN OF CURB.
5. PROVIDE ONE 6" X 6" OPENING IN MEDIAN FOR SIGNING 9" REQUIRED.
6. PAID FOR AS CONCRETE WALK, INCLUDES GUTTER, 9" REQUIRED.

APPROVED: JOHN D. LYNCH — STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
CONCRETE APPROACH NOSE DETAIL

SPECIFICATION REFERENCE	STANDARD PLATE NO.
2531	7113A
REVISION DATE 5-28-2003	



RADIUS (FEET)	LONG CHORD WIDTH (INCHES)	SQUARE FEET PER PLATE	PLATES REQUIRED FOR 90 DEGREE TURN
10	23½	3.53	8
15	18⅞	2.35	15
15	23½	3.67	12
20	18⅞	3.00	20
20	18¾	2.98	20
25	20½	3.28	23
25	23½	3.67	20
30	22⅝	3.65	25
30	23½	3.96	20

NOTES:
DETECTABLE WARNING SURFACES SHALL FOLLOW THE PUBLIC RIGHT–OF–WAY ACCESSIBILITY GUIDELINES (PROWAG).
DETECTABLE WARNINGS CONSIST OF TRUNCATED DOMES ALIGNED IN A SQUARE OR RADIAL GRID PATTERN.
DETECTABLE WARNINGS ARE REQUIRED:
① AT PEDESTRIAN STREET CROSSINGS, TRANSITIONS PROVIDE A FLUSH PEDESTRIAN CONNECTION TO THE ROADWAY.
② AT PEDESTRIAN ACCESS ROUTES WHERE THE PEDESTRIAN WAY THAT ARE PROVIDED WITH TRAFFIC CONTROL DEVICES OR OTHERWISE PERMITTED TO OPERATE LIKE A PUBLIC ROADWAY, ON RAIL TRANSIT PLATFORMS.
ON RAIL PLATFORMS WHERE BOARDING EDGES ARE NOT PROTECTED.
DETECTABLE WARNINGS SHALL EXTEND:
• A MINIMUM OF 24" IN THE DIRECTION OF TRAVEL.
• THE FULL WIDTH OF THE PEDESTRIAN OR BLENDED TRANSITION, WITHIN 3" OF FLAT, WIDTH ON EITHER END.
• THE FULL LENGTH OF THE PUBLIC USE AREA OF A RAIL PLATFORM.
DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES EITHER LIGHTER OR DARKER.
OR DARK–ON–LIGHT). CONTRAST MAY BE PROVIDED ON THE FILL RAMP SURFACES, EXCLUDING THE FLARED SIDES.
FOR MNDOT PROJECTS, SEE MNDOT'S APPROVED/QUALIFIED PRODUCT LIST.
ALL TRUNCATED DOME SYSTEMS SHALL BE PLACED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER.
① CENTER–TO–CENTER DOME SPACING 1.64" MINIMUM, 2.4" MAXIMUM.
② BASE–TO–BASE DOME SPACING 0.65" MINIMUM.
③ DOME BASE TO PLATE EDGE SPACING 0.35" MINIMUM.
④ DOME HEIGHT 0.2".
⑤ SPACING VARIES ON RADIAL PLATES.
⑥ TYPICAL WIDTHS AVAILABLE 12", 18", 24", 30", 36", ONES WITH MANUFACTURERS FOR AVAILABLE WIDTHS.
⑦ ON RADIAL PLATE, RADIUS DEFINED AT BASE OF CURB.
⑧ TYPICAL RADIUS, CHECK WITH MANUFACTURERS FOR AVAILABLE RADII.

APPROVED: AUGUST 23, 2010 — STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
DETECTABLE WARNING SURFACE
TRUNCATED DOMES

SPECIFICATION REFERENCE NO.	STANDARD PLATE NO.
REVISED 2021	7038A
REVISED 02-09-2020 MJLC	

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-DT01-TLDWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

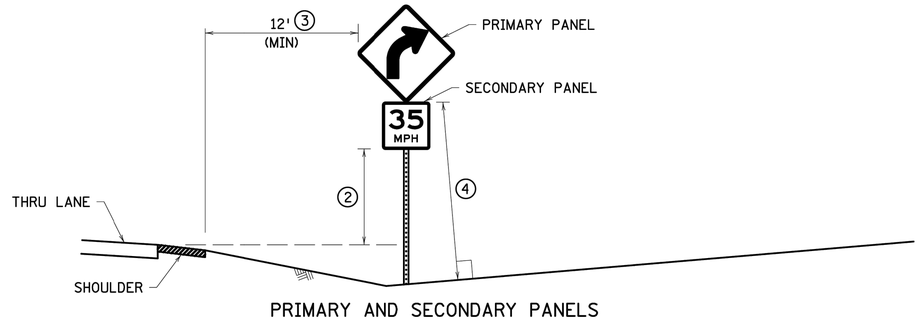
DETAILS

PROJECT NUMBER: 0033874.00

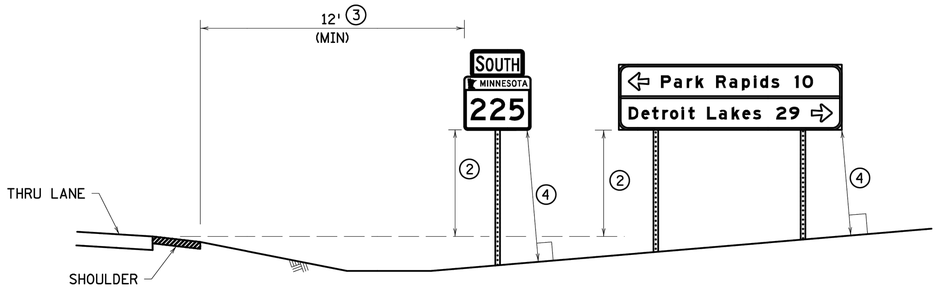
SHEET NUMBER: 07 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

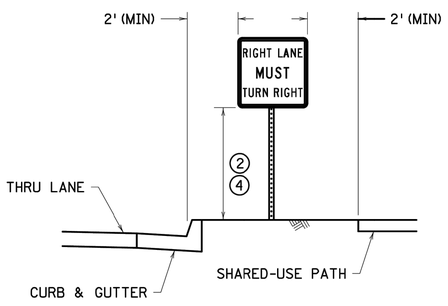
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



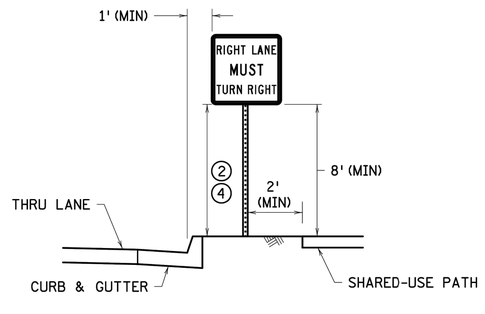
PRIMARY AND SECONDARY PANELS



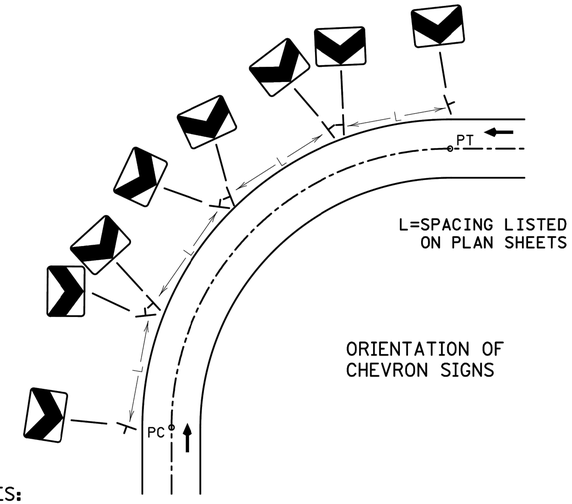
STANDARD LOCATIONS



BOULEVARD LOCATIONS
6' TO 12' WIDE



BOULEVARD LOCATIONS (1)
LESS THAN 6' WIDE



ORIENTATION OF
CHEVRON SIGNS

NOTES:

PLACE SIGNS AND ORIENT THEM APPROXIMATELY AS SHOWN IN THE PLAN, AT RIGHT ANGLES TO THE DIRECTION OF, AND FACING THE TRAFFIC THEY ARE INTENDED TO SERVE, UNLESS OTHERWISE SPECIFIED. TO AVOID SPECULAR GLARE, TURN SIGNS APPROXIMATELY THREE DEGREES AWAY FROM APPROACHING TRAFFIC.

IF A SIGN NEEDS TO BE REPOSITIONED FROM THE PROPOSED PLAN LOCATION IN ORDER TO AVOID CONFLICTS WITH UTILITIES OR OBSTACLES, CONTACT THE PROJECT ENGINEER.

MOUNT SIGN FACES PLUMB.

LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND/OR LEFT SIDE INSTALLATION.

ERECT OR CONSTRUCT SIGN SUPPORT SO THAT NO PORTION OF THE SIGN PANEL IS WITHIN 15' OF THE RAIL OF A RAILROAD TRACK.

PLACE SIGNS SUCH THAT OBSTACLES DO NOT BLOCK THEM FROM BEING VIEWED BY THE APPROACHING TRAFFIC.

PLACE SIGNS A MINIMUM OF 10' FROM THE NEAREST OBSTACLE. OBSTACLES MAY INCLUDE, BUT ARE NOT LIMITED TO, LIGHT POLES, TREES, SIGNS, AND BUILDINGS. SIGNS MAY BE PLACED CLOSER TO SIGNS IN TIGHT AREAS, BUT NO MORE THAN TWO POSTS IN A 7' DIAMETER CIRCLE.

AVOID PLACING SIGNS IN DITCH BOTTOMS.

(1) ONLY USE WHEN BOULEVARD IS TOO NARROW TO OBTAIN ADEQUATE CURBED LOCATION SIGN OFFSETS.

(2) ALL SIGN MOUNTING HEIGHTS ARE MEASURED VERTICALLY FROM THE BOTTOM OF THE LOWEST SIGN PANEL TO THE TOP OF THE CURB, OR IN ABSENCE OF CURB, TO THE NEAR EDGE OF THE THRU-LANE PAVEMENT. SEE SIGN TABULATIONS.

(3) MINIMUM OFFSET MAY BE REDUCED TO AT LEAST 6' FROM SHOULDER AND AT LEAST 12' FROM THRU LANE IF SITE CONDITIONS PROHIBIT A 12' OFFSET FROM SHOULDER.

(4) CRASHWORTHY HEIGHT IS AT LEAST 7' FOR BREAKAWAY STRUCTURES AND AT LEAST 4' FOR BENDABLE STRUCTURES. SEE SPECIFIC SQUARE TUBE BASE STRUCTURE PLAN FOR CRASH RESPONSE TYPE. THE CRASHWORTHY HEIGHT IS MEASURED TO THE BOTTOM OF THE PRIMARY SIGN PANEL EXCLUDING ANY SECONDARY SIGN PANELS, MARKERS, DELINEATORS, AND REFERENCE LOCATION SIGN PANELS. ANY SECONDARY SIGN PANELS MOUNTED TO MORE THAN ONE POST ARE CONSIDERED PRIMARY SIGN PANELS FOR CRASHWORTHY PURPOSES.

LEAD EXPERT OFFICE	BRIAN SORENSON STATE TRAFFIC ENGINEER OFFICE OF TRAFFIC ENGINEERING	STANDARD SIGN PLACEMENT	APPROVED: 08-09-2023 REVISED:	THOMAS STYRBICKI STATE DESIGN ENGINEER	STANDARD PLAN 5-297.701	1 OF 1
DEPARTMENT OF TRANSPORTATION		STANDARD PLAN	STATE PROJ. NO.		SHEET NO.	
			TRUNK HWY.		TOTAL SHEETS	

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-DT01-TL.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

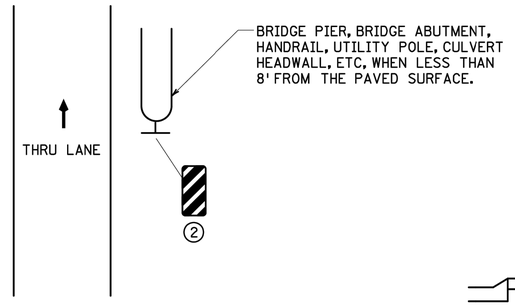
DETAILS

PROJECT NUMBER: 0033874.00

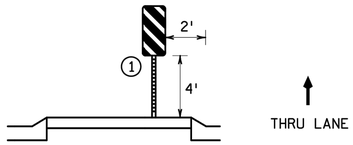
SHEET NUMBER: 08 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

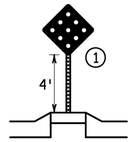
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



OBSTRUCTION
TYPE 3 OBJECT MARKER

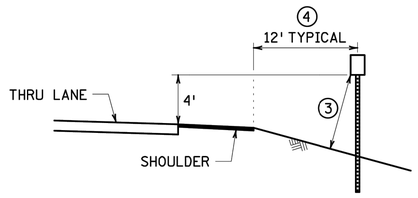


RAISED ISLAND
TYPE 3 OBJECT MARKER

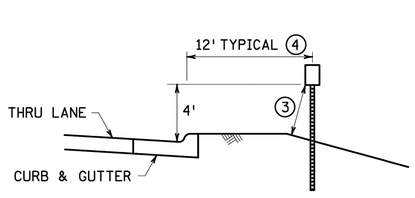


RAISED ISLAND
TYPE 1 OBJECT MARKER

MARKER TYPICAL PLACEMENT



LOCATIONS WITHOUT CURB



LOCATIONS WITH CURB

DELINEATOR TYPICAL PLACEMENT

NOTES:

FOR DELINEATOR OFFSETS AT RAMP GORES, SEE STANDARD PLAN 5-297.703.

(1) PLACE MARKER AS CLOSE TO THE BEGINNING OF MEDIAN AS POSSIBLE.

(2) PLACE THE EDGE OF THE OBJECT MARKER THAT IS CLOSEST TO THE ROAD USER IN LINE WITH THE CLOSEST EDGE OF THE OBSTRUCTION. ANGLE THE STRIPES DOWNWARD TOWARDS THE SIDE TRAFFIC IS TO PASS THE OBSTRUCTION.

(3) THE CRASHWORTHY HEIGHT FROM THE GROUND TO ANY PORTION OF THE SIGN PANEL IS AT LEAST 7' FOR BREAKAWAY STRUCTURES AND AT LEAST 4' FOR BENDABLE STRUCTURES. SEE SPECIFIC SQUARE TUBE BASE STRUCTURE PLAN FOR CRASH RESPONSE TYPE.

(4) ADJUST OFFSET TO MATCH OTHER SIGN OFFSETS ALONG ROADWAY CORRIDOR, BUT NOT MORE THAN 12' NOR LESS THAN 2'.

REVISION:
APPROVED: 02-28-2022
BRIAN SOBERNSON
STATE TRAFFIC ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.702 | 1 OF 1

APPROVED: 02-28-2022
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

DELINEATOR AND MARKER PLACEMENT

STATE PROJ. NO. | (T.H.) | SHEET NO. OF SHEETS

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-DT01-TL.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: ###
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

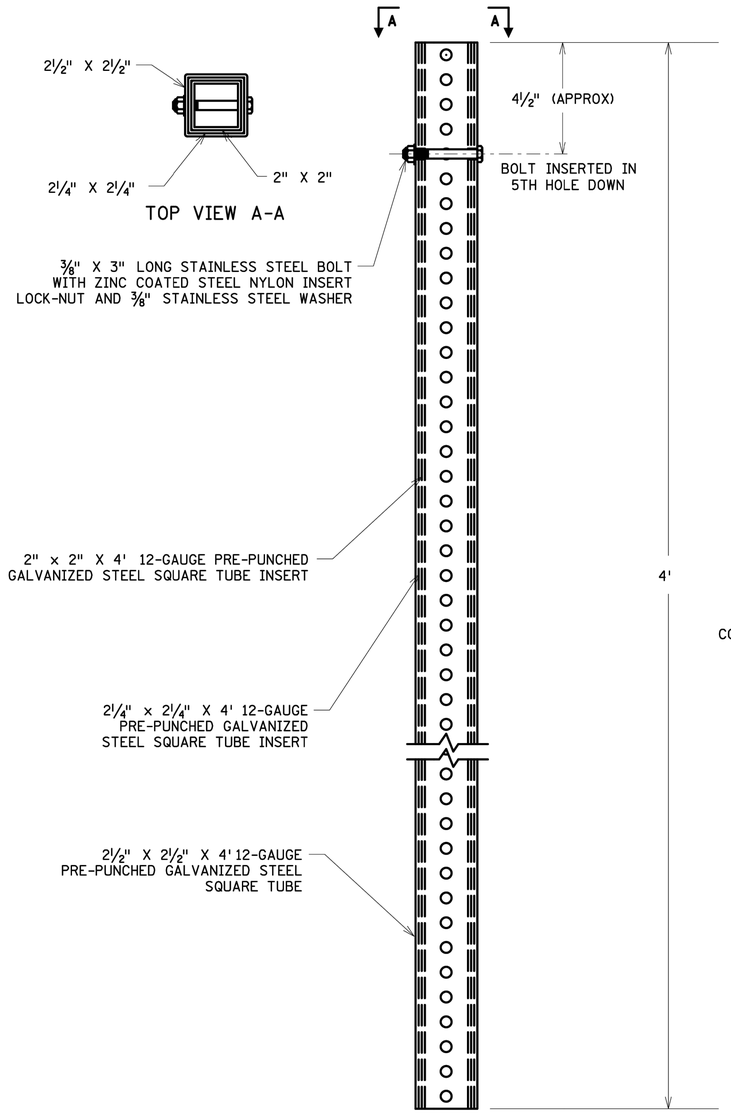
DETAILS

PROJECT NUMBER: 0033874.00

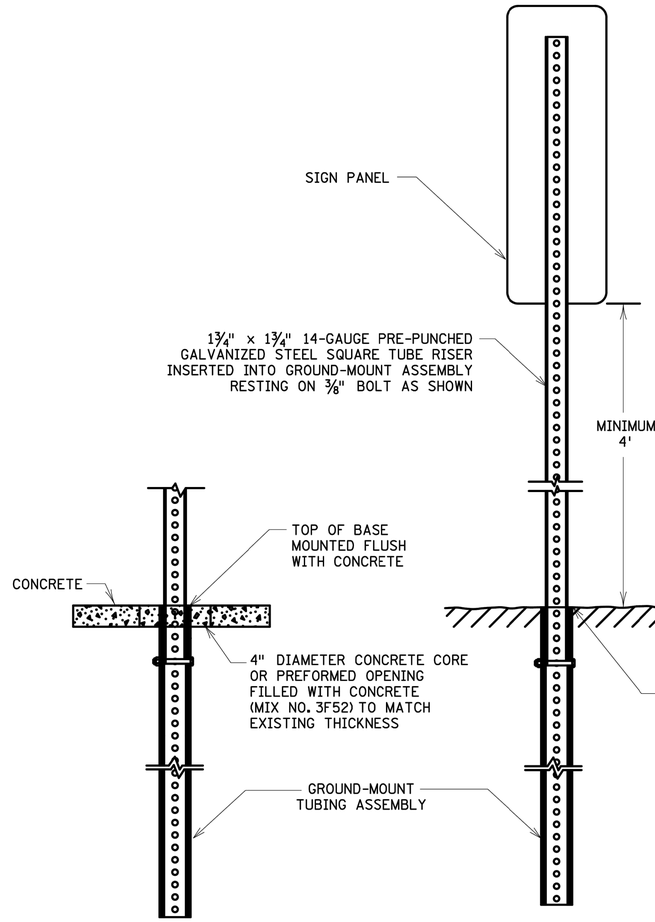
SHEET NUMBER: 09 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

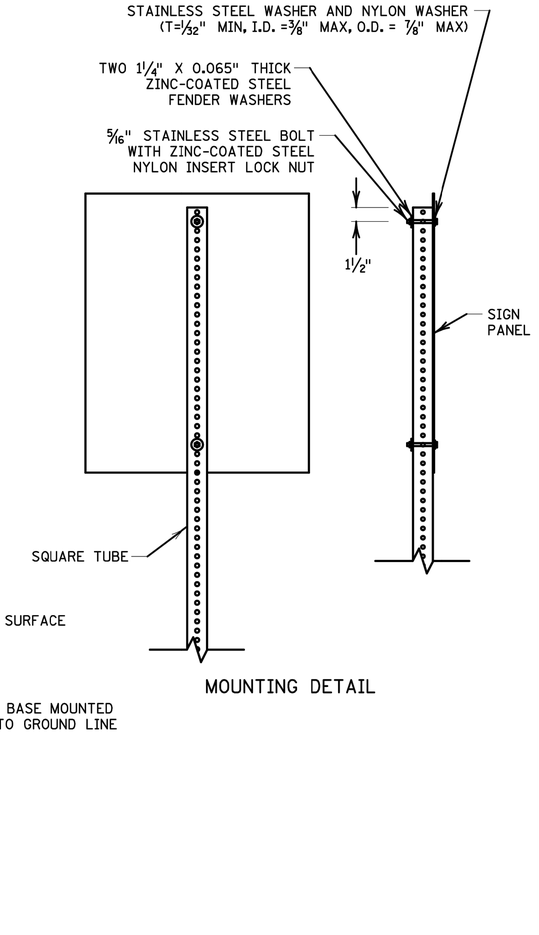


GROUND MOUNT TUBING ASSEMBLY



THREE-WALL BASE CORED THROUGH CONCRETE

THREE-WALL BASE IN SOIL



MOUNTING DETAIL

NOTES:

THE CRASH RESPONSE FOR THIS STRUCTURE IS BENDABLE.

TO MEET CRASHWORTHY REQUIREMENTS THE DISTANCE BETWEEN THE BOTTOM OF THE SIGN PANEL AND THE GROUND SURFACE BELOW ANY PORTION OF THE SIGN PANEL SHALL BE A MINIMUM OF 4'. SEE TABULATIONS FOR MOUNTING HEIGHT.

SQUARE TUBE SIGN POSTS PER MnDOT SPEC. 3402.

REVISION:

APPROVED: 05-03-2021

BRIAN SOBINSON
STATE TRAFFIC ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.721 | 1 OF 1

APPROVED: 05-03-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

THREE-WALL BASE
FOR 1¾" SQUARE-TUBE RISER POST

STATE PROJ. NO. | (TH) | SHEET NO. OF SHEETS

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C_DT01-TL.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: ###
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

DETAILS

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 10 OF 15
DATE: 04/02/25

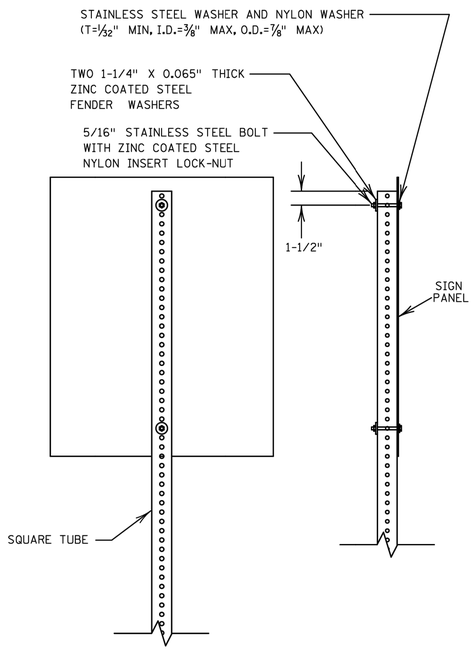
© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

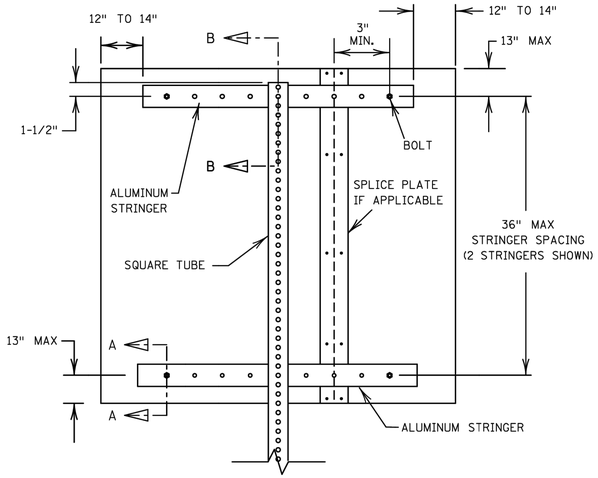
PLOTTED/REVISED: 29-DEC-2021

PLOT NAME: SQUARE TUBE SIGN MOUNTING DETAIL
PATH & FILENAME: 0TST\Signing\Typicals\Standard Plans\DETAIL Versions\SQUARE TUBE SIGN MOUNTING DETAILS.dgn

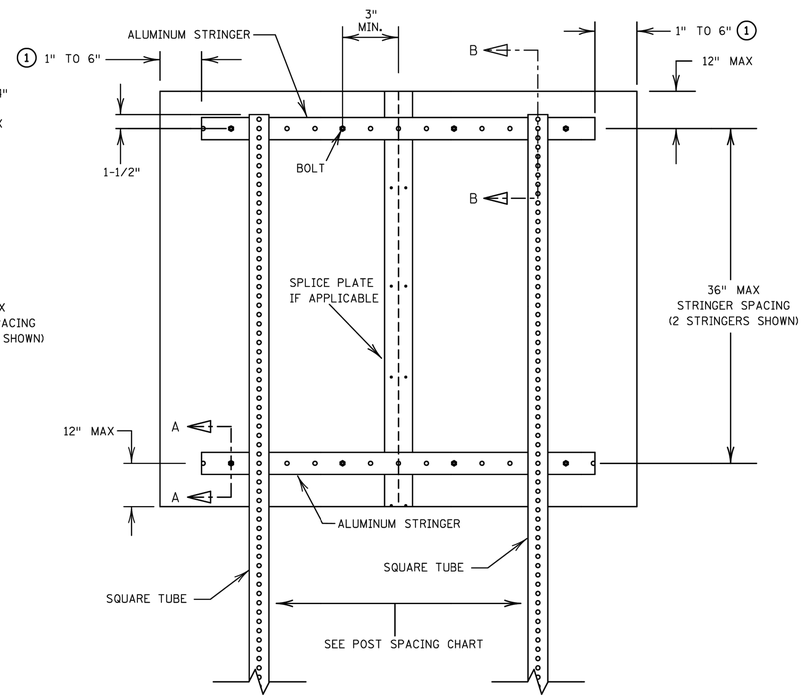
N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-DT01-TLDWG



FOR SIGN PANELS UP TO 30" WIDE

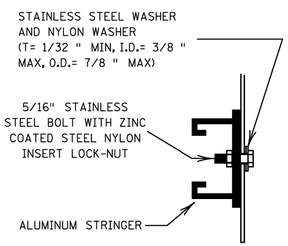


FOR SIGN PANELS 36" WIDE
OR GREATER ON ONE POST

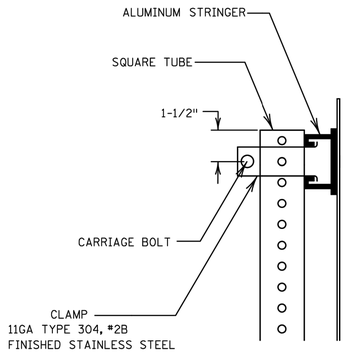


FOR SIGN PANELS ON TWO OR MORE POSTS

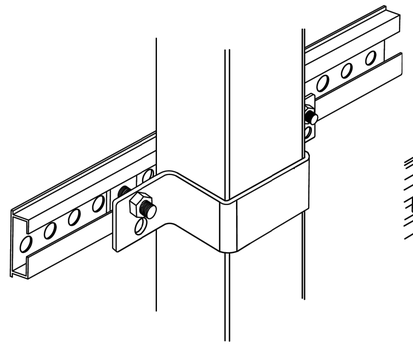
(1) IF POST SPACING REQUIRES PLACEMENT OF A POST WITHIN THIS AREA, EXTEND STRINGERS AS NEEDED TO ACCOMMODATE THE STRINGER TO POST CLAMP.



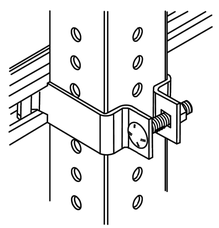
VIEW A-A



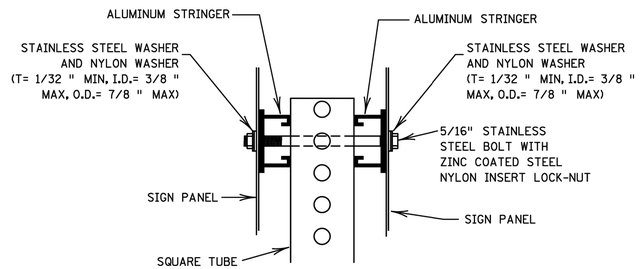
VIEW B-B



CLAMP DETAIL
4" SQUARE TUBE



CLAMP DETAIL
2" AND 2 ½" SQUARE TUBE



BACK TO BACK
SIGN MOUNTING WITH STRINGERS

NOTES:
1. BOLT SIGN PANELS TO STRINGERS OR RISER POSTS AT NO GREATER THAN 24 INCH SPACING OR ACCORDING TO THE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR MOUNTING HOLES (PUNCH CODES) INFORMATION.
2. STRINGERS SHALL BE CENTERED ON SIGN PANEL.

REV 7/01/21

SQUARE TUBE SIGN MOUNTING DETAILS

1 OF 3

DRAWN BY:	CHECKED BY:	CERTIFIED BY _____ (LICENSED PROFESSIONAL ENGINEER) LIC. NO. _____ DATE _____	STATE PROJ. NO.	(T.H.)	SHEET NO. OF SHEETS

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Toll Free (888) 937-5150 Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

DETAILS

SHEET NUMBER: 11 OF 15

PROJECT NUMBER: 0033874.00 DATE: 04/02/25

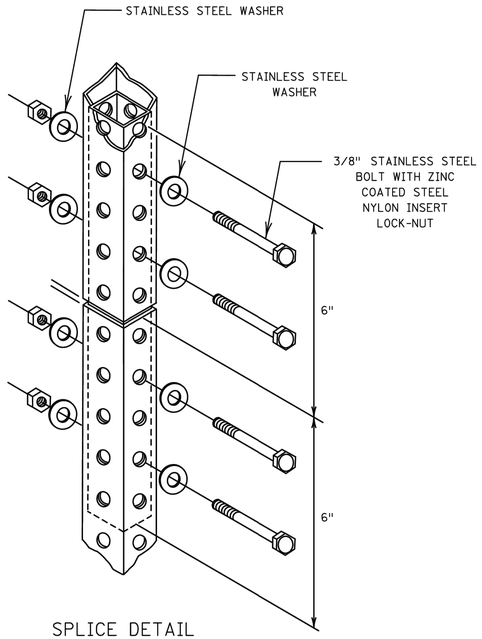
© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

PLOTTED/REVISED: 29-DEC-2021

PLOT NAME: SQUARE TUBE SIGN MOUNTING DETAIL
PATH & FILENAME: O:\ST\Signing\Typicals\Standard Plans\DETAIL Versions\SQUARE TUBE SIGN MOUNTING DETAILS.dgn

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-DT01-TL.DWG



SPLICE DETAIL

NO MORE THAN ONE SPLICE PER POST.

WHEN USED MUST BE PLACED AT LEAST 8 FEET ABOVE GROUND. THE PREFERRED PLACEMENT LOCATION IS BEHIND THE SIGN PANEL.

INTERIOR POST STUD SHALL BE ONE SIZE SMALLER FOR A TIGHT FIT. IF RISER POST IS 2-1/2", INTERIOR POST IS 2-3/16". IF RISER POST IS 2", INTERIOR POST IS 1-3/4".

PANEL WIDTH	SQUARE TUBE POST SPACING						
	2 POSTS	3 POSTS	4 POSTS	5 POSTS	6 POSTS	7 POSTS	8 POSTS
(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
42	15						
48	21						
54	30						
60	36						
66	36						
72	42						
78	42						
84	48						
90	48	42					
96	48	42					
102	54	42					
108	54	42					
114	60	42					
120	60	48					
126	66	48					
132	66	48	42				
138	72	48	42				
144	72	48	42				
150	78	54	42				
156	78	54	42				
162	84	54	42				
168	84	60	48				
174	90	60	48	42			
180	90	60	48	42			
186	96	66	48	42			
192	96	66	48	42			
198	102	66	54	42			
204	102	72	54	42			
210	108	72	54	42			
216	108	72	54	48	42		
222	114	78	60	48	42		
228	114	78	60	48	42		
234	120	78	60	48	42		
240	120	84	60	48	42		
246		84	66	54	42		
252		84	66	54	42		
258		90	66	54	42	42	
264		90	66	54	48	42	
270		90	72	54	48	42	
276		96	72	60	48	42	
282		96	72	60	48	42	
288		96	72	60	48	42	
294		102	78	60	54	42	
300		102	78	60	54	42	42
306		102	78	66	54	42	42
312		108	78	66	54	48	42
318		108	84	66	54	48	42
324		108	84	66	54	48	42
330		114	84	66	60	48	42
336		114	84	72	60	48	42

DISTANCES ARE CENTER-TO-CENTER OF POSTS

REV 7/01/21

DRAWN BY:	CHECKED BY:	CERTIFIED BY _____ (LICENSED PROFESSIONAL ENGINEER) LIC. NO. _____ DATE _____	2 OF 3	SQUARE TUBE SIGN MOUNTING DETAILS
			STATE PROJ. NO.	(T.H.) SHEET NO. OF SHEETS

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: ###
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

DETAILS

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 12 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

NUMBER OF ALUMINUM STRINGERS FOR 2-1/2 INCH OR SMALLER POSTS

PANEL HEIGHT (INCHES)

	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336
120	0	0	0	0	4	4	4	4	4					4																																													
114	0	0	0	0	4	4	4	4	4	4				4	4																																											
108	0	0	0	0	4	4	4	4	4	4	4			4	4	4					4	4																																					
102	0	0	0	0	4	4	4	4	4	4	4			4	4	4	4	4			4	4	4	4				4	4	4						4	4																					
96	0	0	0	0	3	3	3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3																	
90	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3												
84	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3								
78	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			
72	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
66	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
60	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
54	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
48	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
42	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
36	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
30	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
24	0	0	0	0	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	0	0	0	0	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	0	0	0	0	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

1 POST | 2 POST | 3 POST | 4 POST | 5 POST | 6 POST

PANEL WIDTH (INCHES)

NUMBER OF STRINGERS FOR 4 INCH POSTS

PANEL HEIGHT (INCHES)

	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336
144																																																								
138																																																								
132																																																							
126																																																							
120																																																							
114																																																							
108																																																							
102																																																							
96																																																							
90																																																							
84																																																							
78																																																							
72																																																							
66																																																							
60																																																							
54																																																							
48																																																							
42																																																							
36																																																							
30																																																							
24																																																							
18																																																							
12																																																							

1 POST | 2 POST | 3 POST

PANEL WIDTH (INCHES)

REV 7/01/21

PLOT NAME: SQUARE TUBE SIGN MOUNTING DETAIL
PATH & FILENAME: DTST\Signing\Typicals\Standard Plans\DETAIL Versions\SQUARE TUBE SIGN MOUNTING DETAILS.dgn

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-DT01-TL.DWG

PLOTTED/REVISED: 29-DEC-2021

DRAWN BY:	CHECKED BY:	CERTIFIED BY _____ (LICENSED PROFESSIONAL ENGINEER) LIC. NO. _____ DATE _____	3 OF 3

SQUARE TUBE SIGN MOUNTING DETAILS

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

DETAILS

PROJECT NUMBER: 0033874.00

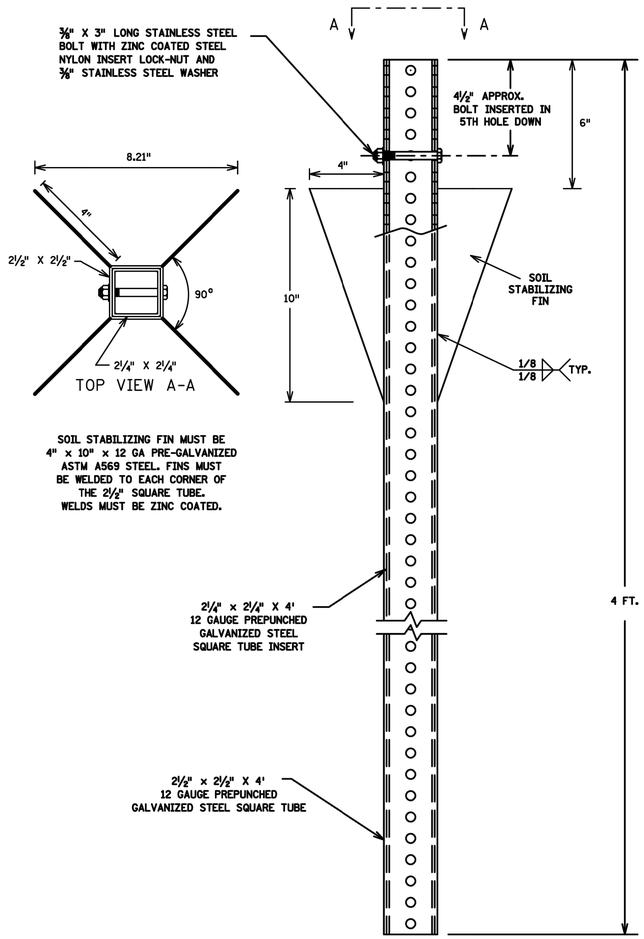
SHEET NUMBER: 13 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

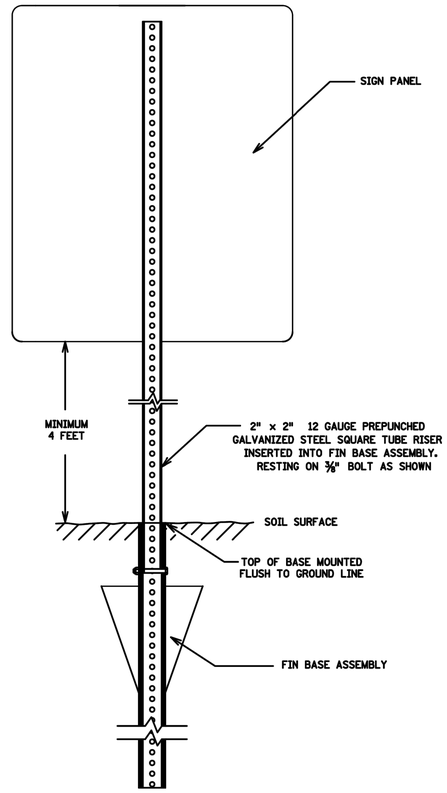
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

PLOTTED/REVISED: 20-APR-2021

PLOT NAME: FIN BASE DETAIL VERSION
PATH & FILENAME: O:\ST\Signing\Typicals\Standard Plans\DETAIL Versions of Std Plans\FIN BASE DETAIL VERSION.dgn



FIN BASE ASSEMBLY



FIN BASE IN SOIL

NOTES:

1. THE CRASH RESPONSE TYPE FOR THIS STRUCTURE IS BENDABLE.
2. TO MEET CRASHWORTHY REQUIREMENTS THE DISTANCE BETWEEN THE BOTTOM OF THE SIGN PANEL AND THE GROUND SURFACE BELOW ANY PORTION OF THE SIGN PANEL MUST BE A MINIMUM OF 4 FEET. SEE TABULATIONS FOR MOUNTING HEIGHT.
3. FOR SIGN PANEL MOUNTING DETAILS SEE SQUARE TUBE SIGN MOUNTING DETAILS.
4. SQUARE TUBE SIGN POSTS PER MnDOT SPEC. 3402.

REV 4/20/21

FIN BASE
FOR 2 INCH SQUARE TUBE RISER POST IN SOIL

DRAWN BY:	CHECKED BY:	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC. NO. _____ DATE 4/20/2021	STATE PROJ. NO.	(T.H.)	SHEET NO.	OF	SHEETS

N:\0033874.00\DWG\CIVIL\FINALLTURN LANE\0033874.00C-DT01-TLDWG

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

DETAILS

PROJECT NUMBER: 0033874.00

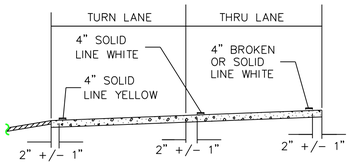
SHEET NUMBER: 14 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

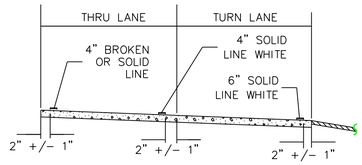
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

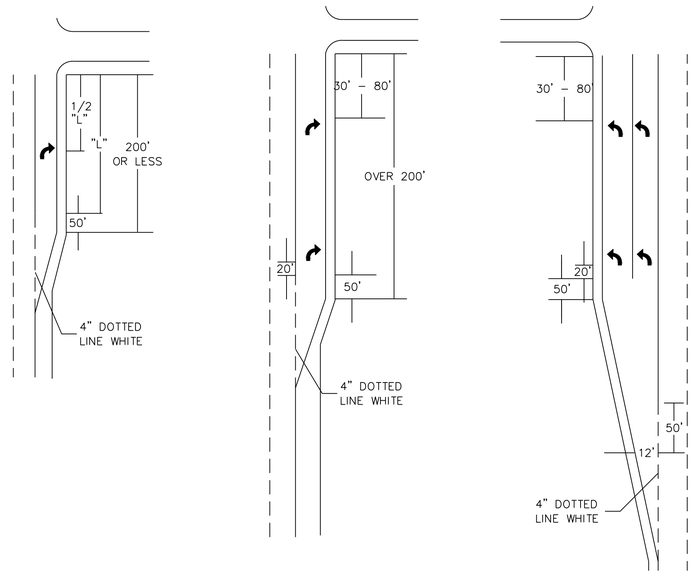
TURN LANE WITH ARROW MESSAGE

LEFT TURN LANE



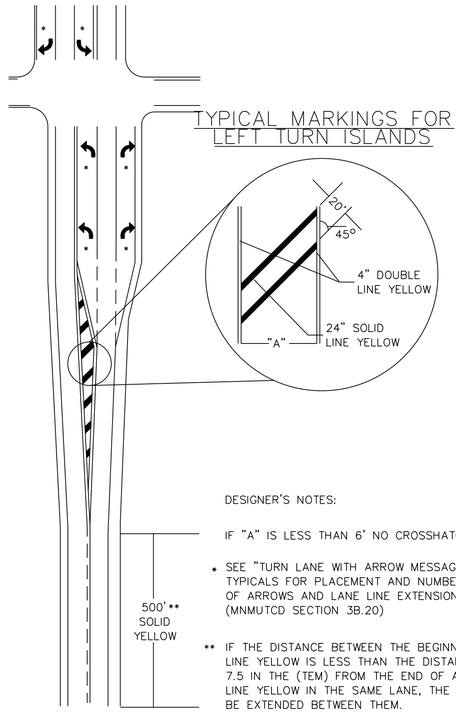
RIGHT TURN LANE





LEFT TURN LANE ISLAND

NOTE:
END PAVEMENT MARKINGS AT BEGINNING OF RADIUS



DESIGNER'S NOTES:

IF "A" IS LESS THAN 6' NO CROSSHATCHING REQUIRED.

* SEE "TURN LANE WITH ARROW MESSAGE TYPICALS FOR PLACEMENT AND NUMBER OF ARROWS AND LANE LINE EXTENSIONS. (MNMUTCD SECTION 3B.20)

** IF THE DISTANCE BETWEEN THE BEGINNING OF THE SOLID LINE YELLOW IS LESS THAN THE DISTANCES IN TABLE 7.5 IN THE (TEM) FROM THE END OF A PRECEDING SOLID LINE YELLOW IN THE SAME LANE, THE SOLID LINE SHALL BE EXTENDED BETWEEN THEM.

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\TURN LANE\0033874.00C-DT01-TL.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: ###
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 03/28/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

DETAILS

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 15 OF 15
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

CONSTRUCTION PLANS

FOR

SANITARY SEWER, WATERMAIN, STORM SEWER AND STREETS

FOR

NORTHVIEW PRESERVE

ROGERS, MN



Vicinity Map
(NOT TO SCALE)

SHEET INDEX

Sheet List Table

Sheet Number	Sheet Title
01	Cover
02	Overall Utility Plan
03	Sanitary Sewer & Watermain Construction Plan
04	Sanitary Sewer & Watermain Construction Plan
05	Sanitary Sewer & Watermain Construction Plan
06	Sanitary Sewer & Watermain Construction Plan
07	Sanitary Sewer & Watermain Construction Plan
08	Sanitary Sewer & Watermain Construction Plan
09	Street & Storm Sewer Construction Plan
10	Street & Storm Sewer Construction Plan
11	Street & Storm Sewer Construction Plan
12	Street & Storm Sewer Construction Plan
13	Street & Storm Sewer Construction Plan
14	Street & Storm Sewer Construction Plan
15	Backyard Storm Sewer Construction Plan
16	Street Signage & Lighting Plan
17	Intersection Details
18	Intersection Details
19	Intersection Details
20	Details
21	Details
22	Details
23	Details
24	Details

PREPARED FOR:

SUMMERGATE COMPANIES LLC

17305 CEDAR AVENUE, SUITE 200

LAKEVILLE, MN 55044

CONTACT: BRYAN TUCKER

PHONE: 612-490-0982

EMAIL: BRYANT@SUMMER-GATE.COM

PREPARED BY:

Westwood

Phone (952) 937-5150
Fax (952) 937-5822
Toll Free (888) 937-5150

12701 Whitewater Drive, Suite #300
Minnetonka, MN 55343
westwoodps.com

Westwood Professional Services, Inc.

PROJECT NUMBER: 0033874.00

CONTACT: THOMAS D. DESUTTER

NO.	DATE	REVISION	SHEETS
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	

CONSTRUCTION PLANS

FOR

SANITARY SEWER, WATERMAIN, STORM SEWER AND STREETS

FOR

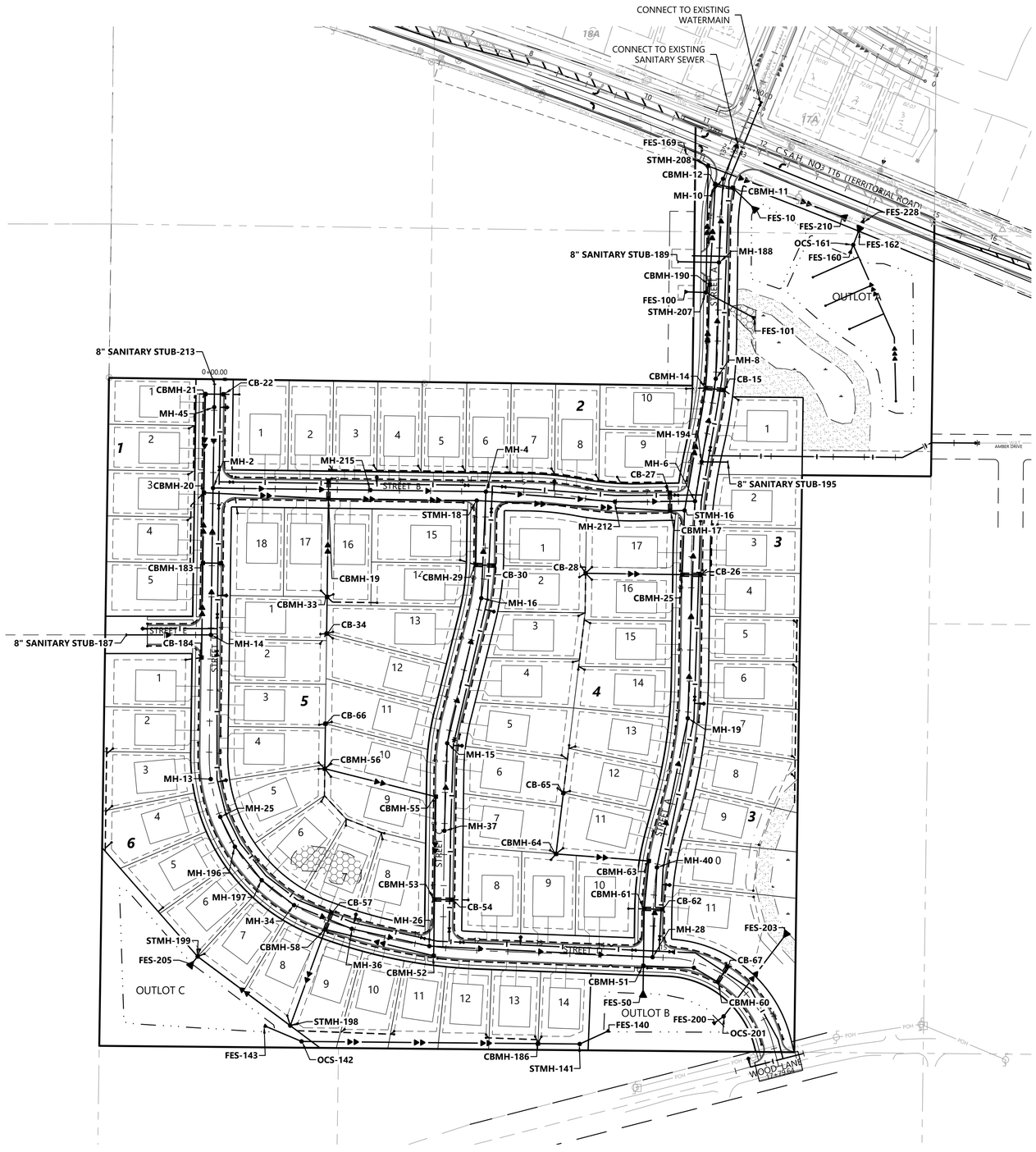
NORTHVIEW PRESERVE
ROGERS, MN

INITIAL SUBMITTAL DATE: 04/02/25 SHEET: 01 OF 24

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-CVF01.DWG

NORTHVIEW PRESERVE

© 2025 Westwood Professional Services, Inc.



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

GENERAL UTILITY NOTES

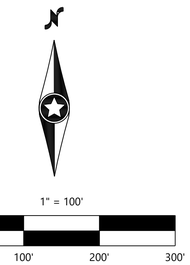
1. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY THE OWNER OF ANY DIFFERENCES.
2. UNLESS OTHERWISE NOTED, ALL MATERIALS, CONST. TECHNIQUES AND TESTING SHALL CONFORM TO THE 2023 ED. OF THE "STANDARD UTILITIES SPECIFICATIONS FOR WATER MAIN AND SERVICE LINE INSTALLATION AND SANITARY SEWER AND STORM SEWER INSTALLATION BY THE CITY ENGINEERING ASSOCIATION OF MINN." AND TO THE "STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION" MINN. DEPT. OF TRANS., 2020 EDITION AND SUPPLEMENTAL SPECIFICATIONS SEPTEMBER 2022. THE CONTRACTOR SHALL BE REQUIRED TO FOLLOW ALL PROCEDURES AS OUTLINED BY THE LOCAL AGENCY.
3. THE CONTRACTOR SHALL RECEIVE THE NECESSARY PERMITS FOR ALL WORK OUTSIDE OF THE PROPERTY LIMITS.
4. VERIFY EXISTING INVERT LOCATION & ELEVATION PRIOR TO BEGINNING CONSTRUCTION.
5. THE CONTRACTOR SHALL CONTACT "GOPHER STATE ONE CALL" FOR FOR UTILITY LOCATIONS PRIOR TO UTILITY INSTALLATION.

UTILITY LEGEND

EXISTING	PROPOSED	
SAN		SANITARY SEWER
STO		STORM SEWER
DT		DRAIN TILE
WAT		WATER MAIN
WAT		HYDRANT
		STREET LIGHT

STORM SEWER CASTING SCHEDULE

Structure			Casting Type
Number	Type	Dia.	
10	FES	27"	w/TRASHGUARD
11	CBMH	48"	R-3067-V
12	CBMH	60"	R-3067-V
14	CBMH	60"	R-3067-V
15	CB	2'x 3'	R-3067-V
16	STMH	60"	R-1642B
17	CBMH	60"	R-3067-VB
18	STMH	60"	R-1642B
19	CBMH	60"	R-3067-V
20	CBMH	60"	R-3067-V
21	CBMH	48"	R-3067-V
22	CB	2'x 3'	R-3067-V
25	CBMH	48"	R-3067-V
26	CB	2'x 3'	R-3067-V
27	CB	2'x 3'	R-3067-VB
28	CB	27"	R-4342
29	CBMH	48"	R-3067-VB
30	CB	2'x 3'	R-3067-VB
33	CBMH	48"	R-4342
34	CB	27"	R-4342
36	CBMH	60"	R-3067-V
37	CB	2'x 3'	R-3067-V
38	CBMH	48"	R-3067-V
50	FES	21"	w/TRASHGUARD
51	CBMH	60"	R-3067-VB
52	CBMH	60"	R-3067-V
53	CBMH	48"	R-3067-VB
54	CB	2'x 3'	R-3067-VB
55	CBMH	48"	R-3067-V
56	CBMH	48"	R-4342
57	CB	2'x 3'	R-3067-V
58	CBMH	60"	R-3067-V
59	CB	2'x 3'	R-3067-VB
60	CBMH	72"	R-3067-V
61	CBMH	48"	R-3067-VB
62	CB	2'x 3'	R-3067-VB
63	CBMH	48"	R-3067-V
64	CBMH	48"	R-4342
65	CB	27"	R-4342
66	CB	27"	R-4342
67	CB	2'x 3'	R-3067-V
100	FES	18"	w/TRASHGUARD
101	FES	12"	w/TRASHGUARD
140	FES	24"	w/TRASHGUARD
141	STMH	48"	R-1642B
142	OCS	60"	SEE DETAIL
143	FES	24"	w/TRASHGUARD
160	FES	24"	w/TRASHGUARD
161	OCS	60"	SEE DETAIL
162	FES	18"	w/TRASHGUARD
169	FES	12"	w/TRASHGUARD
170	FES	12"	w/TRASHGUARD
183	CBMH	48"	R-3067-VB
184	CB	2'x 3'	R-3067-VB
185	STMH	48"	R-1642B
186	CBMH	48"	R-3067-V
190	CBMH	48"	R-3067-V
198	STMH	72"	R-1642B
199	STMH	60"	R-1642B
200	FES	24"	w/TRASHGUARD
201	OCS	60"	SEE DETAIL
202	STMH	60"	R-1642B
203	FES	30"	w/TRASHGUARD
205	FES	24"	w/TRASHGUARD
207	STMH	48"	R-1642B
208	STMH	60"	R-1642B
210	FES	15"	w/TRASHGUARD



CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-OAF01.DWG

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE:

INITIAL ISSUE: 04/02/25
REVISIONS:

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

OVERALL UTILITY PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 02 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

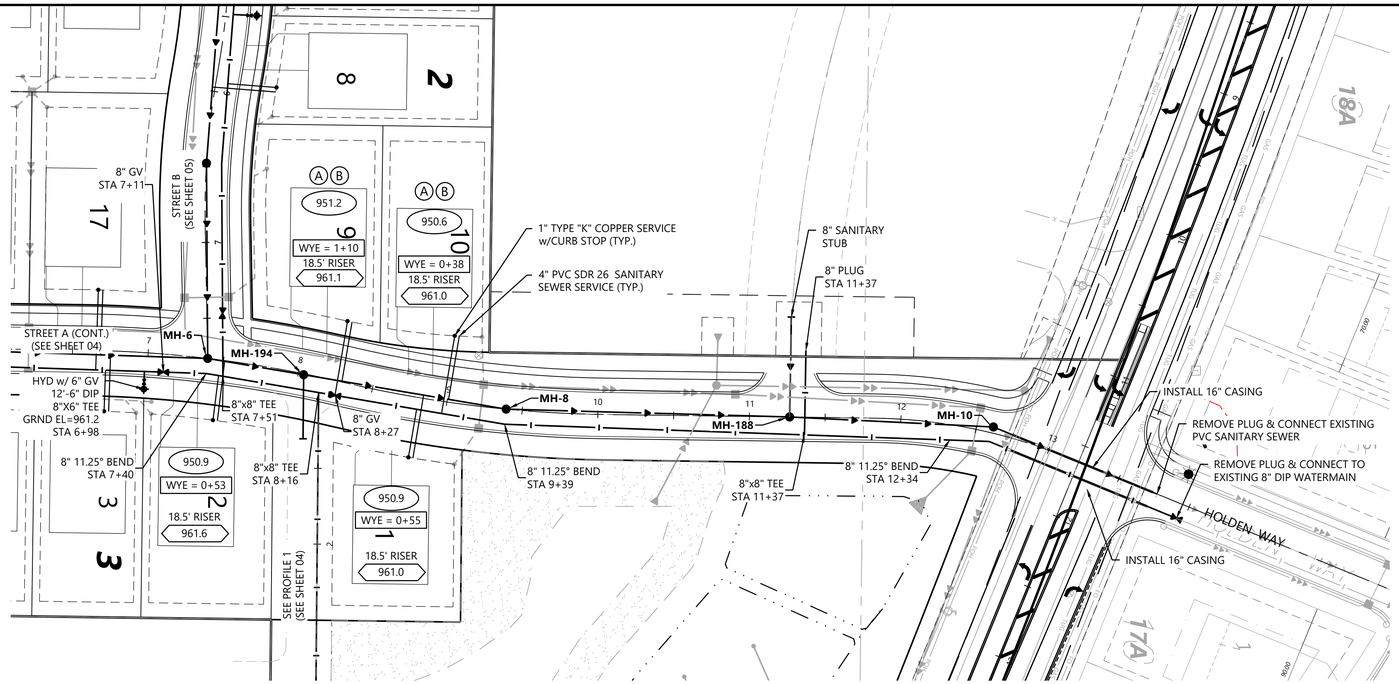
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

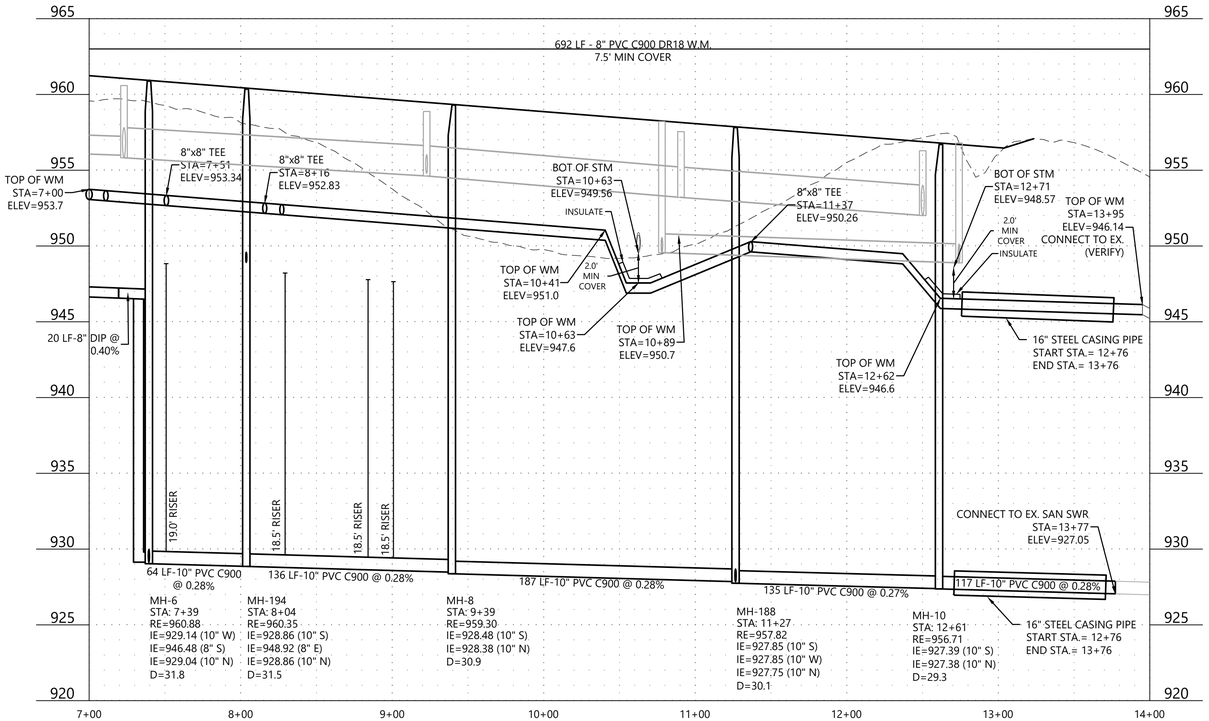
- (XXX.X) — SANITARY SEWER SERVICE INVERT ELEVATION @ EASEMENT LINE
- WYE = X+XX / X.X' RISER — SANITARY SEWER SERVICE WYE LOCATION ON MAIN LINE FROM DOWNSTREAM MANHOLE
- XXX.X — DENOTES ELEVATION OF THE TOP OF WATER SERVICE STOP BOX
- (A) — WATER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER & SHALL MAINTAIN A MINIMUM VERTICAL SEPARATION FROM STORM PIPE OF 2.0 FEET
- (B) — SANITARY SEWER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER - INSTALL RISER AT PROPERTY LINE

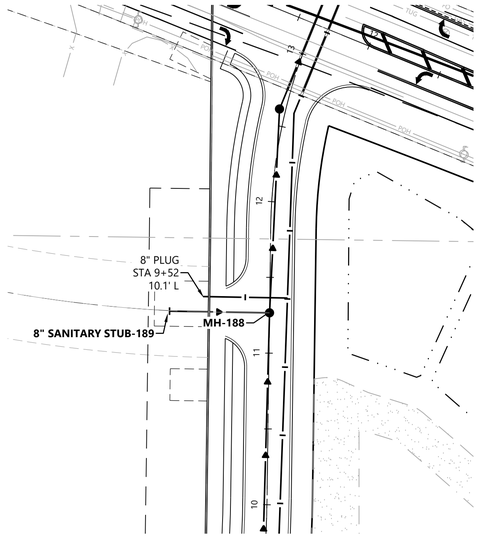
GENERAL NOTES

1. FLAG HYDRANTS.
2. EXTEND RODS ON DEEP VALVES.
3. ALL DROP MANHOLES TO BE CONSTRUCTED USING OUTSIDE DROPS.
4. ALL SANITARY SERVICES CONNECTING TO C90X SANITARY SEWER SHALL USE ROMAC CB SEWER SADDLE.

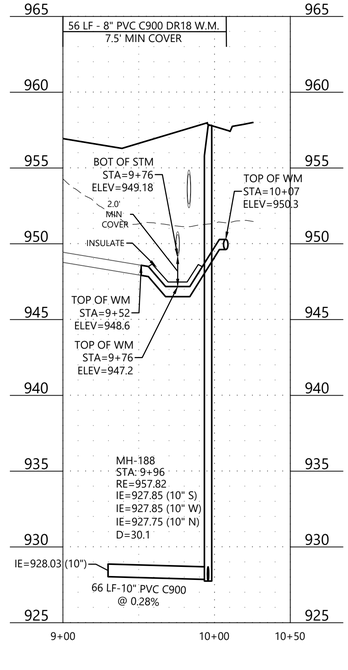


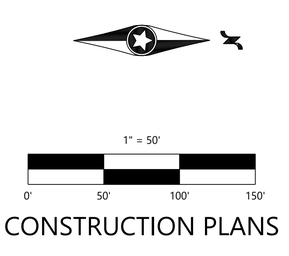
STREET A





STREET F (FUTURE)





CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-UTF01.DWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50'
VERTICAL SCALE:	10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

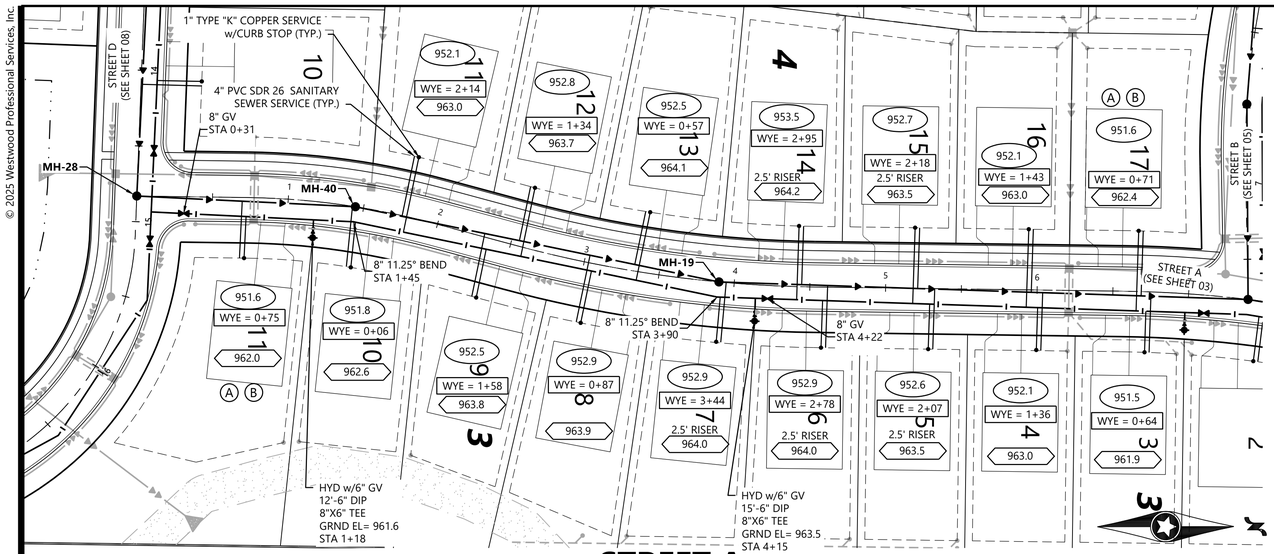
Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Toll Free (888) 937-5150 Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

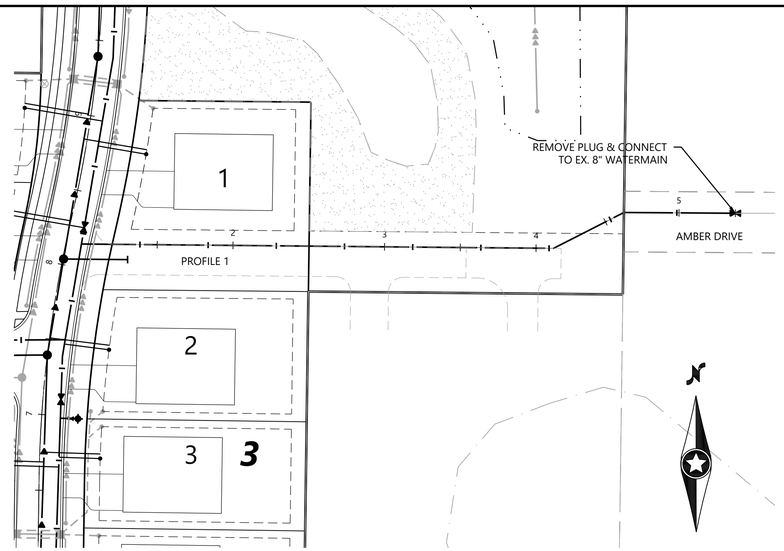
SANITARY SEWER & WATERMAIN CONSTRUCTION PLAN
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 03 OF 24
DATE: 04/02/25

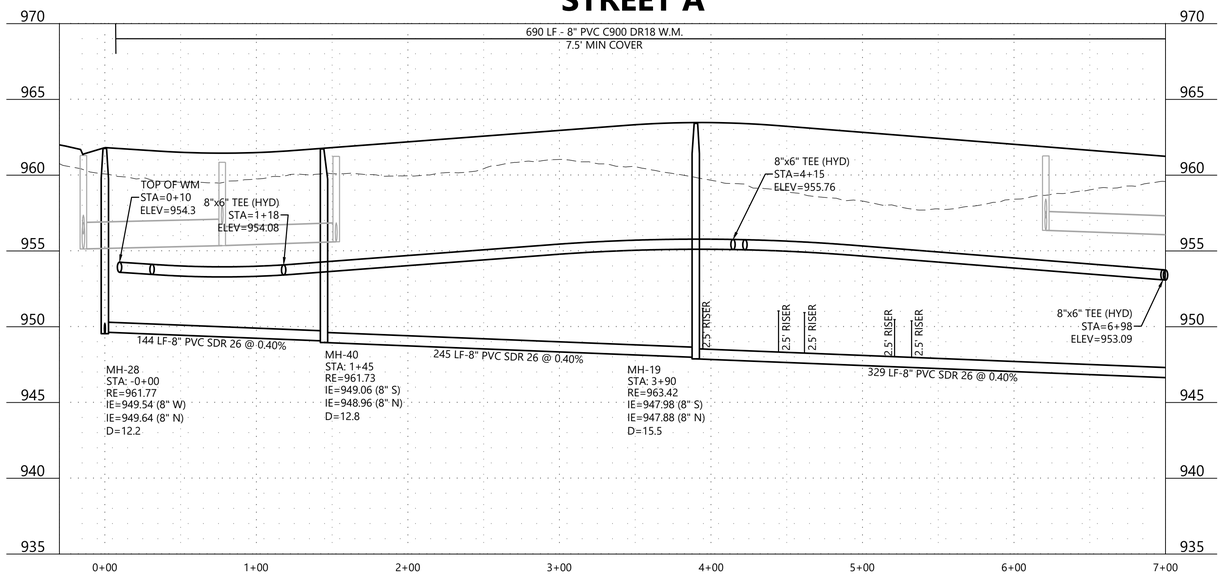
© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

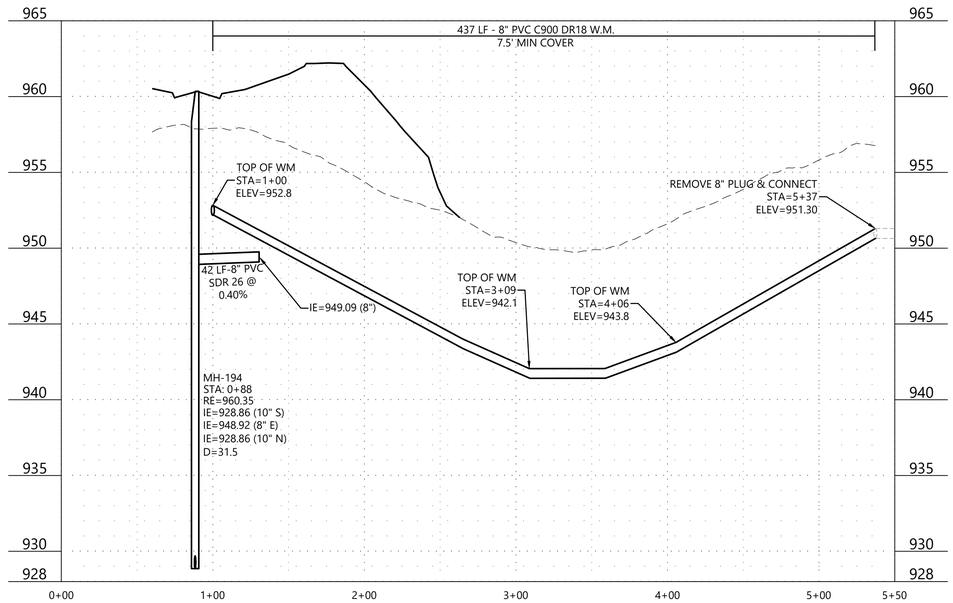




STREET A



PROFILE 1



LEGEND

XXX.X	SANITARY SEWER SERVICE INVERT ELEVATION @ EASEMENT LINE
WYE = X+XX X.X' RISER	SANITARY SEWER SERVICE WYE LOCATION ON MAIN LINE FROM DOWNSTREAM MANHOLE
XXX.X	DENOTES ELEVATION OF THE TOP OF WATER SERVICE STOP BOX
A	WATER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER & SHALL MAINTAIN A MINIMUM VERTICAL SEPARATION FROM STORM PIPE OF 2.0 FEET
B	SANITARY SEWER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER - INSTALL RISER AT PROPERTY LINE

GENERAL NOTES

1. FLAG HYDRANTS.
2. EXTEND RODS ON DEEP VALVES.
3. ALL DROP MANHOLES TO BE CONSTRUCTED USING OUTSIDE DROPS.
4. ALL SANITARY SERVICES CONNECTING TO C90X SANITARY SEWER SHALL USE ROMAC CB SEWER SADDLE.

1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-UTF01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 50'
VERTICAL SCALE: 10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

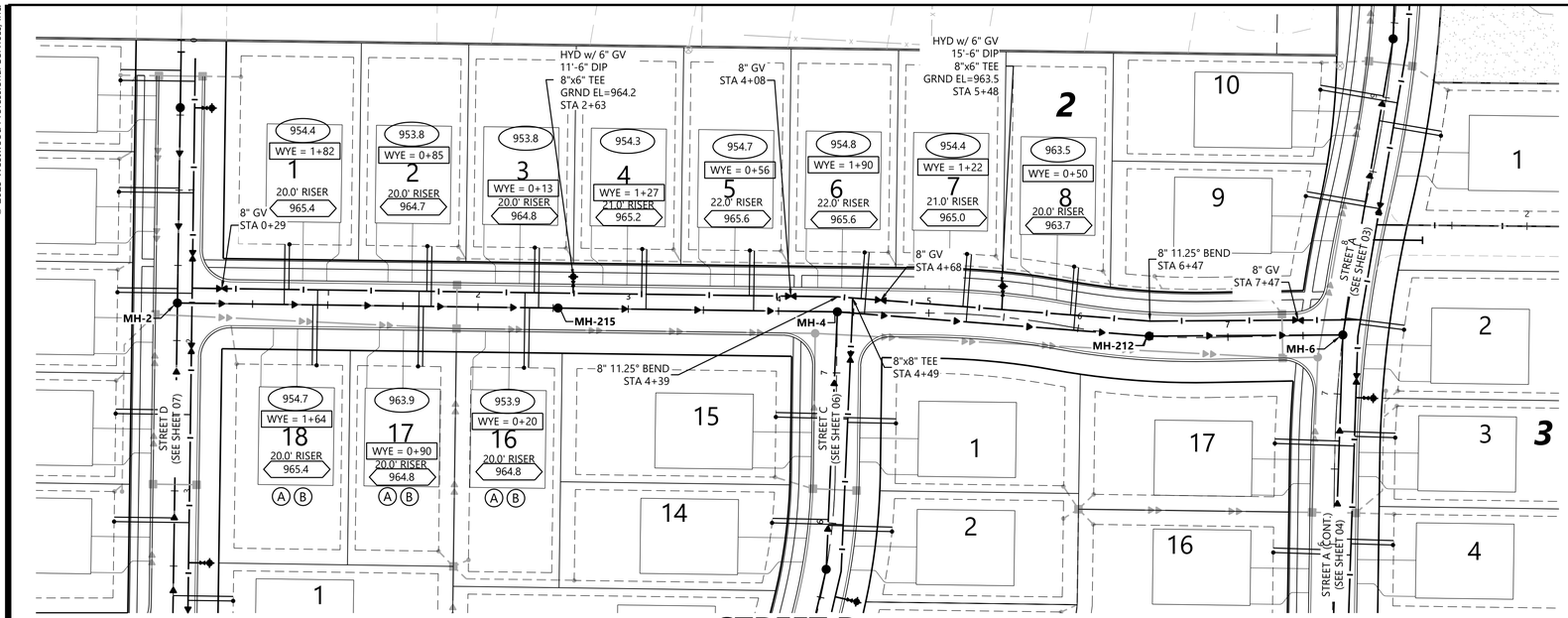
NORTHVIEW PRESERVE
ROGERS, MN

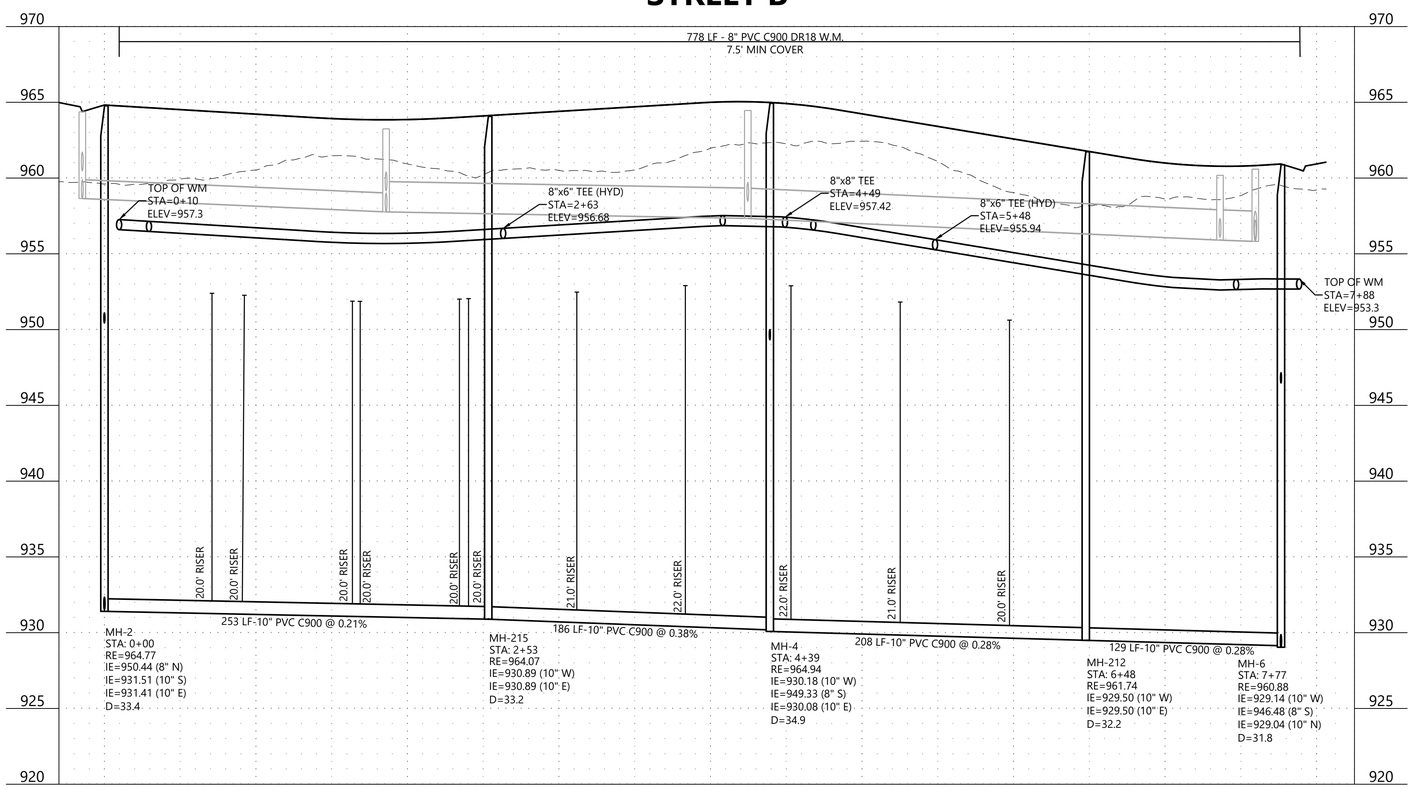
Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Toll Free (888) 937-5150 Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

SANITARY SEWER & WATERMAIN CONSTRUCTION PLAN
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 04 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.





Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

XXX.X	SANITARY SEWER SERVICE INVERT ELEVATION @ EASEMENT LINE
WYE = X+XX / X.X' RISER / XXX.X	SANITARY SEWER SERVICE WYE LOCATION ON MAIN LINE FROM DOWNSTREAM MANHOLE; DENOTES ELEVATION OF THE TOP OF WATER SERVICE STOP BOX
(A)	WATER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER & SHALL MAINTAIN A MINIMUM VERTICAL SEPARATION FROM STORM PIPE OF 2.0 FEET
(B)	SANITARY SEWER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER - INSTALL RISER AT PROPERTY LINE

GENERAL NOTES

1. FLAG HYDRANTS.
2. EXTEND RODS ON DEEP VALVES.
3. ALL DROP MANHOLES TO BE CONSTRUCTED USING OUTSIDE DROPS.
4. ALL SANITARY SERVICES CONNECTING TO C90X SANITARY SEWER SHALL USE ROMAC CB SEWER SADDLE.

NORTH

1" = 50'

0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C_UTF01.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50'
VERTICAL SCALE:	10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

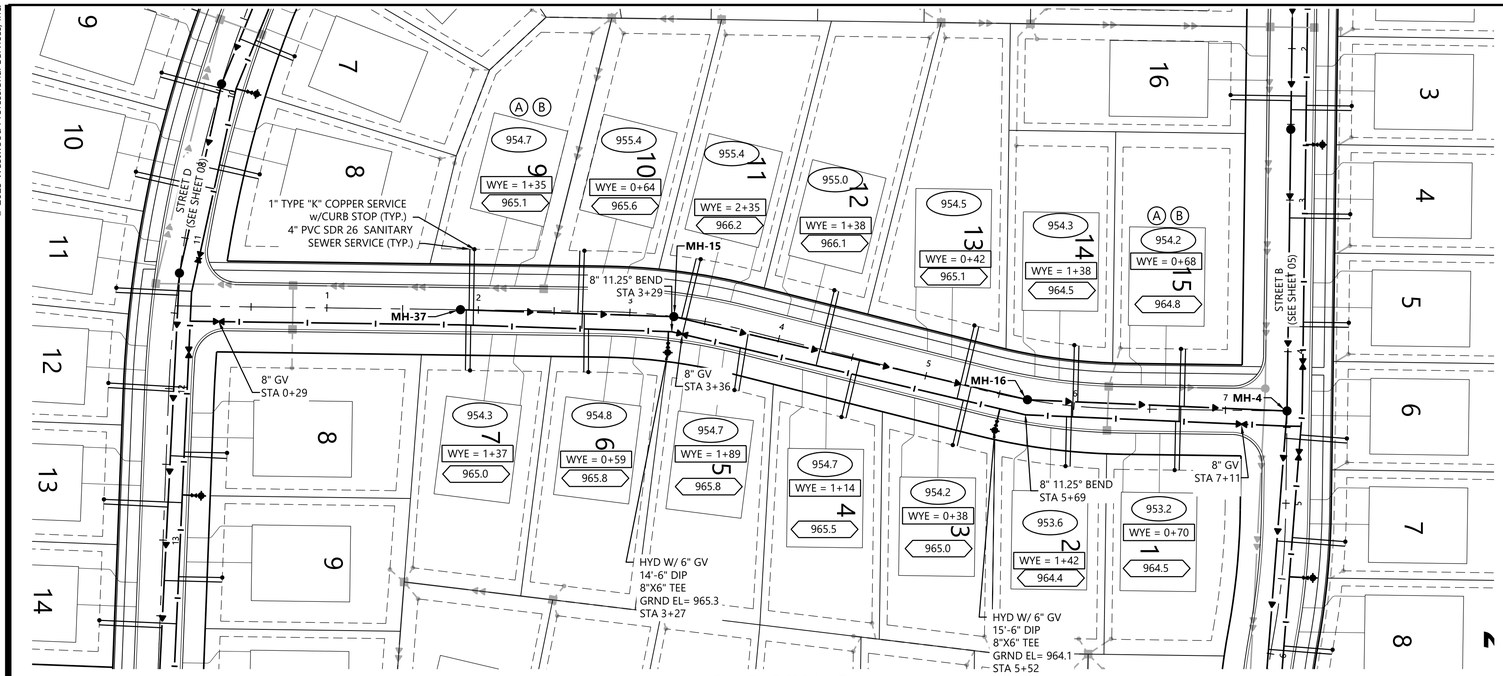
NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

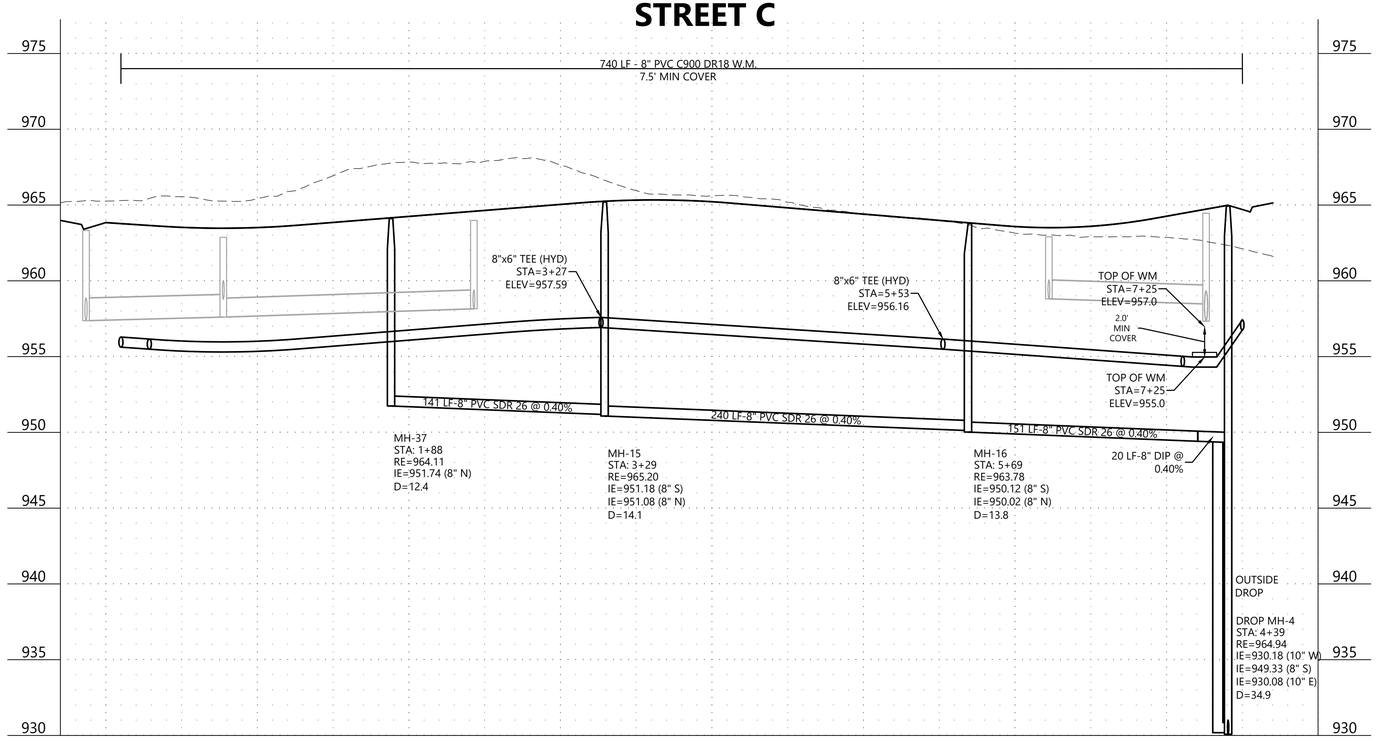
SANITARY SEWER & WATERMAIN CONSTRUCTION PLAN
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 05 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.



STREET C



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

XXX.X	SANITARY SEWER SERVICE INVERT ELEVATION @ EASEMENT LINE
WYE = X+XX	SANITARY SEWER SERVICE WYE LOCATION ON MAIN LINE FROM DOWNSTREAM MANHOLE
X.X' RISER	
XXX.X	DENOTES ELEVATION OF THE TOP OF WATER SERVICE STOP BOX
(A)	WATER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER & SHALL MAINTAIN A MINIMUM VERTICAL SEPARATION FROM STORM PIPE OF 2.0 FEET
(B)	SANITARY SEWER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER - INSTALL RISER AT PROPERTY LINE

GENERAL NOTES

1. FLAG HYDRANTS.
2. EXTEND RODS ON DEEP VALVES.
3. ALL DROP MANHOLES TO BE CONSTRUCTED USING OUTSIDE DROPS.
4. ALL SANITARY SERVICES CONNECTING TO C90X SANITARY SEWER SHALL USE ROMAC CB SEWER SADDLE.

1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-UTF01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 50'
VERTICAL SCALE: 10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

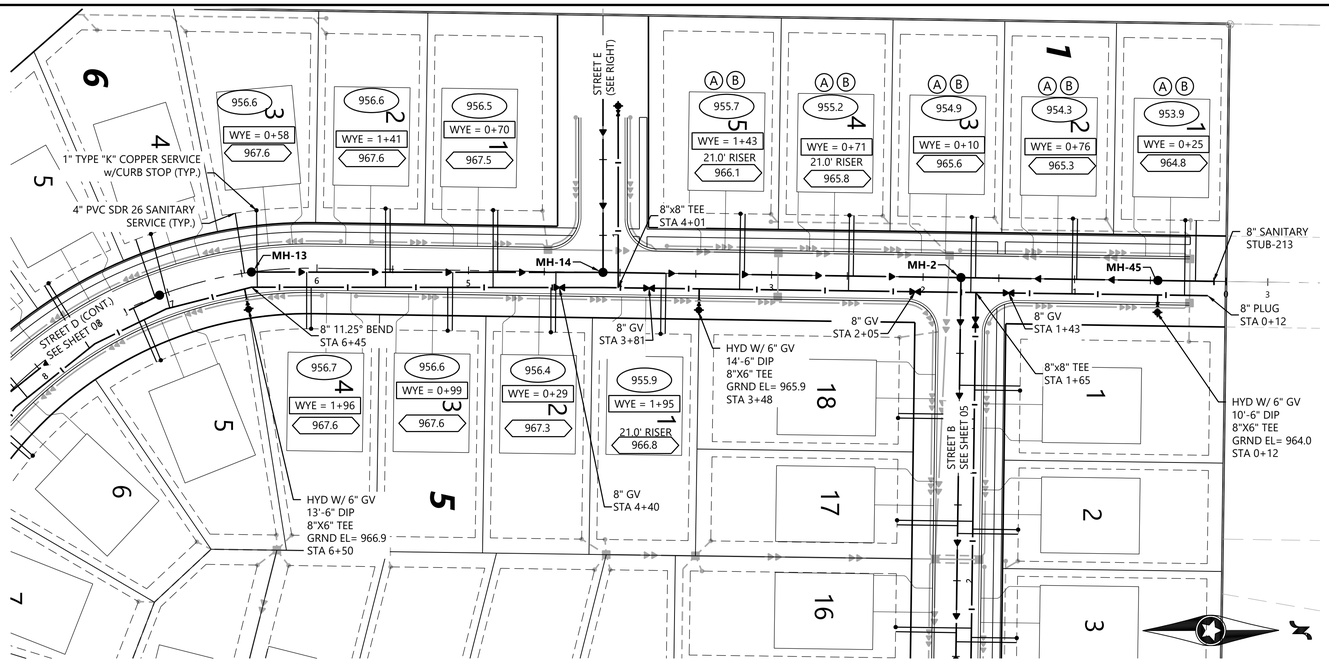
NORTHVIEW PRESERVE
ROGERS, MN

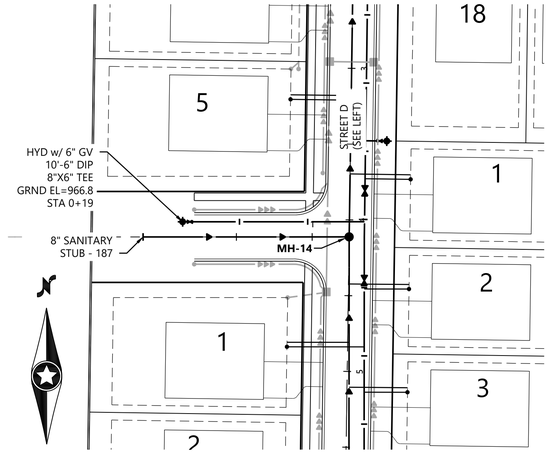
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

SANITARY SEWER & WATERMAIN CONSTRUCTION PLAN
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 06 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.





Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

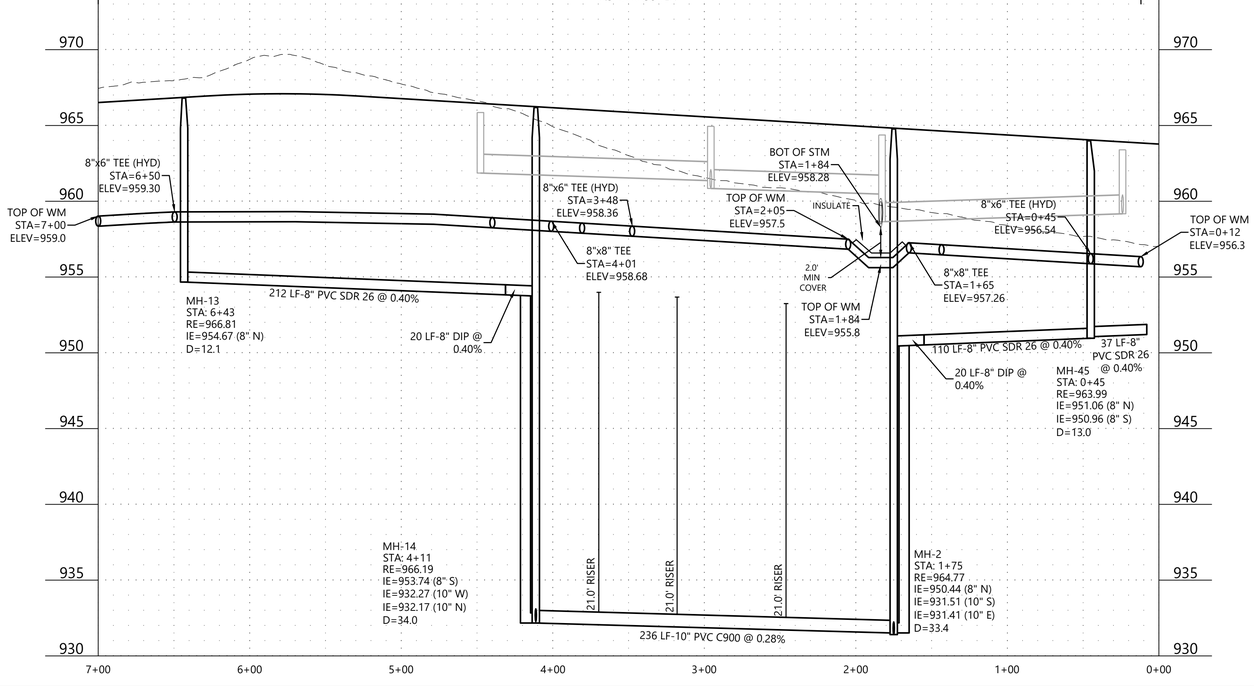
LEGEND

XXX.X	SANITARY SEWER SERVICE INVERT ELEVATION @ EASEMENT LINE
WYE = X+XX / X.X' RISER / XXX.X	SANITARY SEWER SERVICE WYE LOCATION ON MAIN LINE FROM DOWNSTREAM MANHOLE / DENOTES ELEVATION OF THE TOP OF WATER SERVICE STOP BOX
(A)	WATER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER & SHALL MAINTAIN A MINIMUM VERTICAL SEPARATION FROM STORM PIPE OF 2.0 FEET
(B)	SANITARY SEWER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER - INSTALL RISER AT PROPERTY LINE

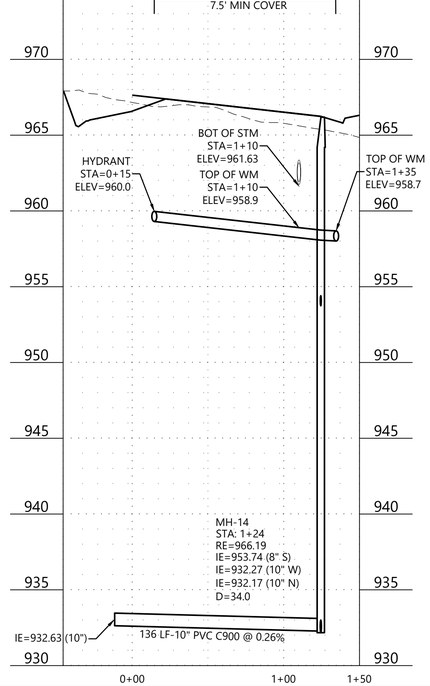
GENERAL NOTES

1. FLAG HYDRANTS.
2. EXTEND RODS ON DEEP VALVES.
3. ALL DROP MANHOLES TO BE CONSTRUCTED USING OUTSIDE DROPS.
4. ALL SANITARY SERVICES CONNECTING TO C90X SANITARY SEWER SHALL USE ROMAC CB SEWER SADDLE.

STREET D



STREET E



1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-UTF01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 50'
VERTICAL SCALE: 10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

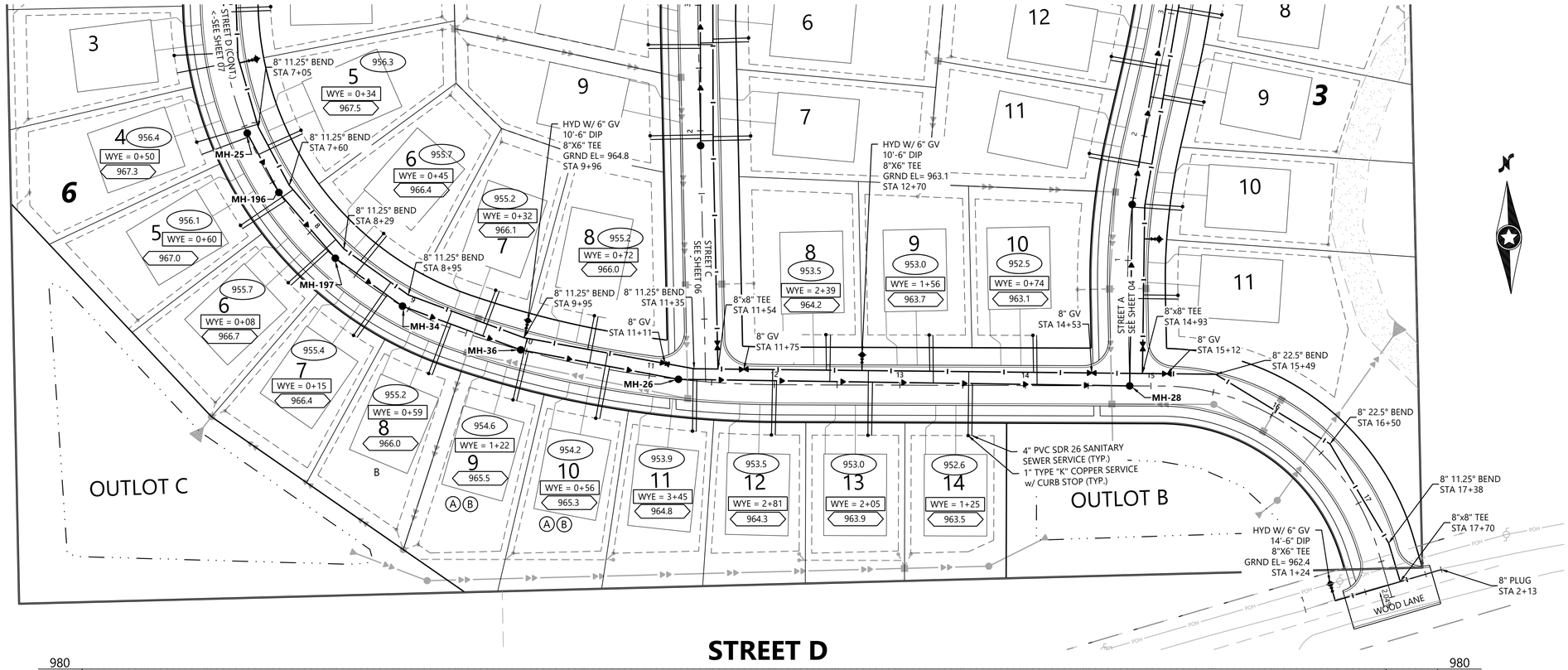
NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Toll Free (888) 937-5150 Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

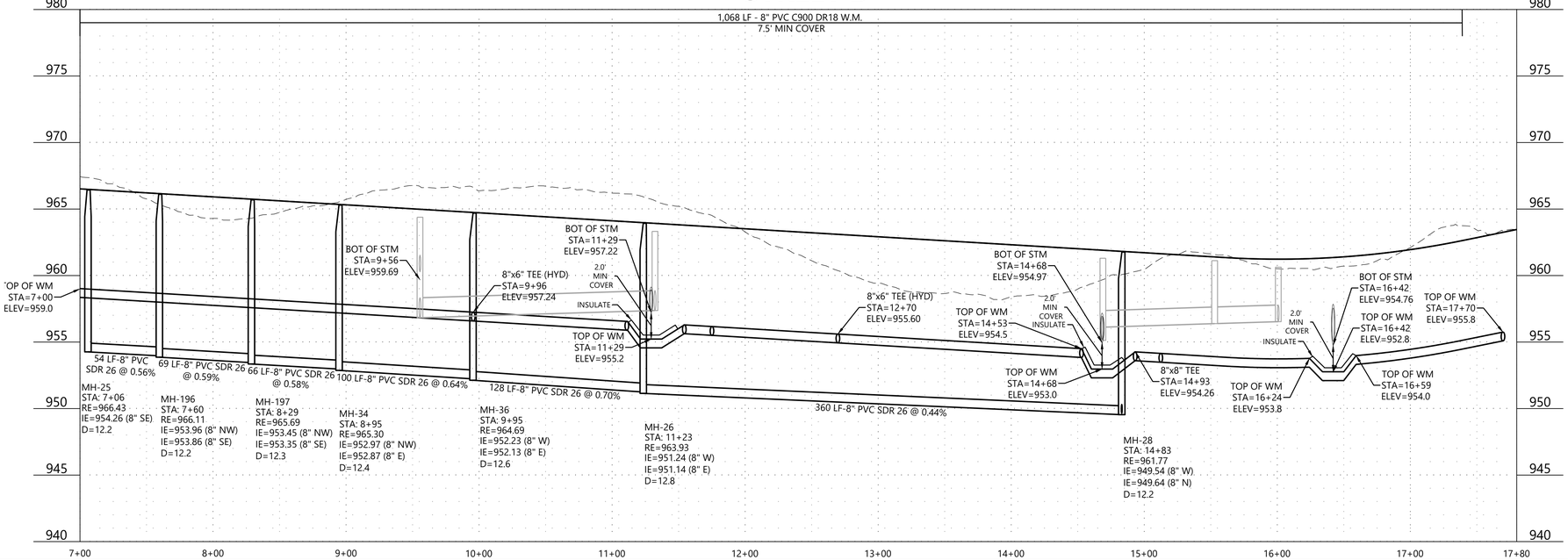
SANITARY SEWER & WATERMAIN CONSTRUCTION PLAN
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 07 OF 24
DATE: 04/02/25

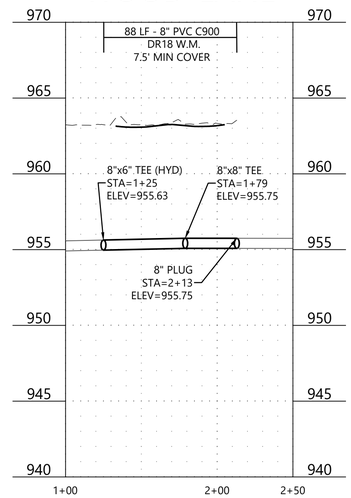
© 2025 Westwood Professional Services, Inc.



STREET D



WOOD-LANE



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

- SANITARY SEWER SERVICE INVERT ELEVATION @ EASEMENT LINE
- SANITARY SEWER SERVICE WYE LOCATION ON MAIN LINE FROM DOWNSTREAM MANHOLE
- DENOTES ELEVATION OF THE TOP OF WATER SERVICE STOP BOX
- WATER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER & SHALL MAINTAIN A MINIMUM VERTICAL SEPARATION FROM STORM PIPE OF 2.0 FEET
- SANITARY SEWER SERVICE TO THIS LOT SHALL BE INSTALLED UNDER PROPOSED STORM SEWER - INSTALL RISER AT PROPERTY LINE

GENERAL NOTES

1. FLAG HYDRANTS.
2. EXTEND RODS ON DEEP VALVES.
3. ALL DROP MANHOLES TO BE CONSTRUCTED USING OUTSIDE DROPS.
4. ALL SANITARY SERVICES CONNECTING TO C90X SANITARY SEWER SHALL USE ROMAC CB SEWER SADDLE.

1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-UTF01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 50'
VERTICAL SCALE: 10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

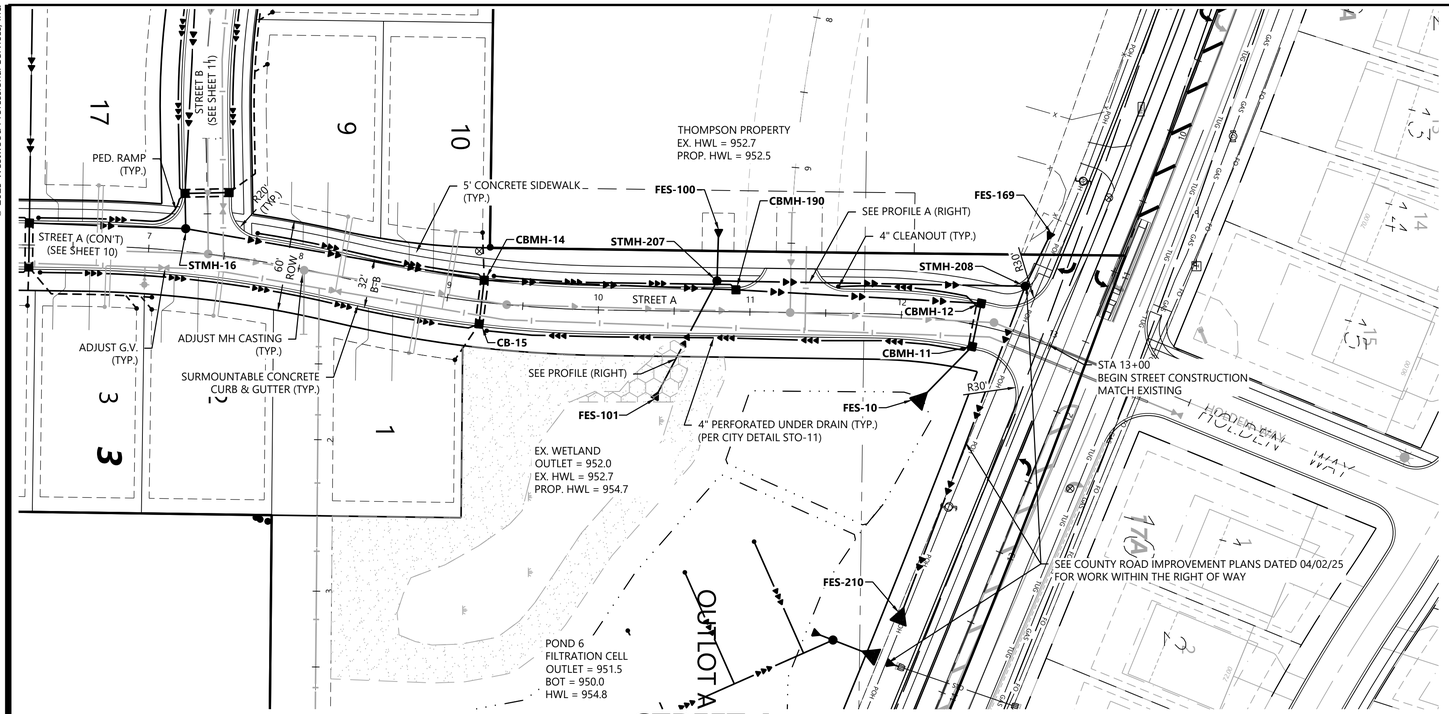
NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

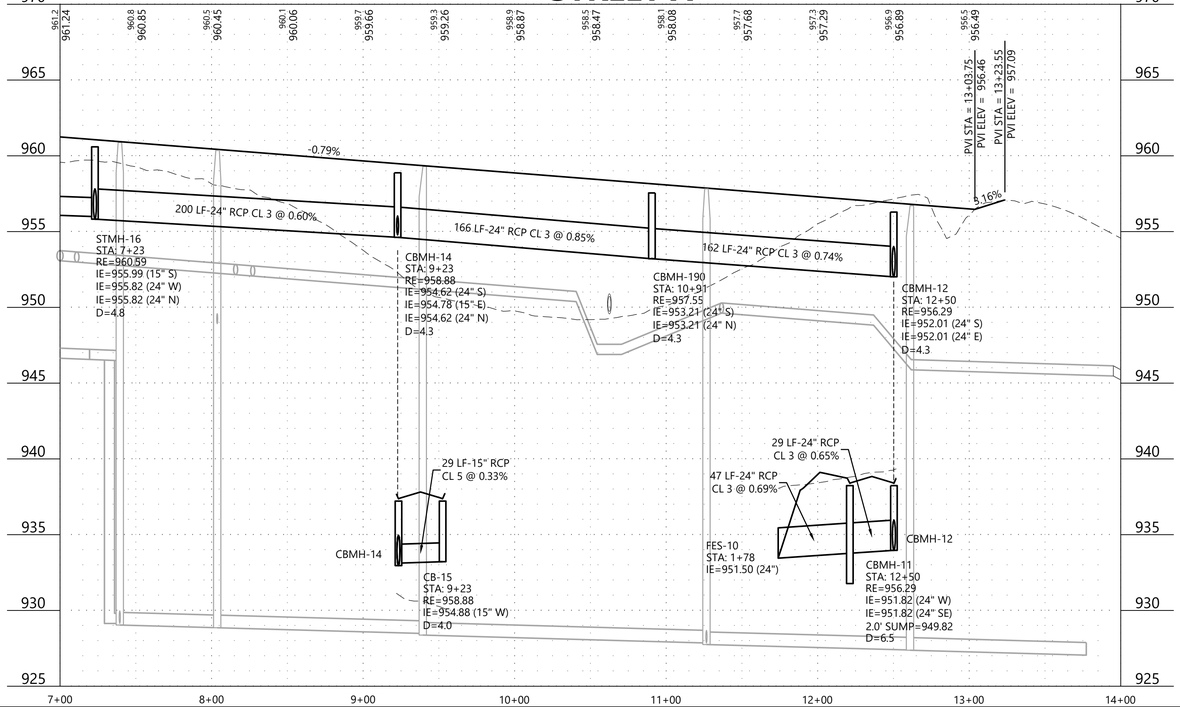
SANITARY SEWER & WATERMAIN CONSTRUCTION PLAN
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 08 OF 24
DATE: 04/02/25

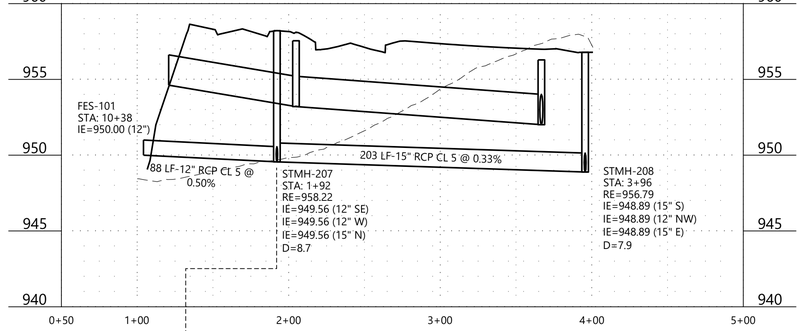
© 2025 Westwood Professional Services, Inc.

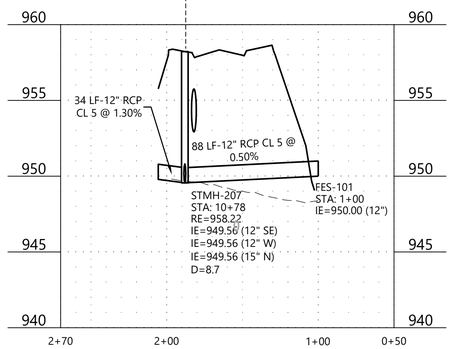


STREET A



PROFILE A





Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

EXISTING	PROPOSED	
900.00	× 900.00	GUTTER ELEVATION

GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS 5, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.

1" = 50'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-STF03.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50'
VERTICAL SCALE:	10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

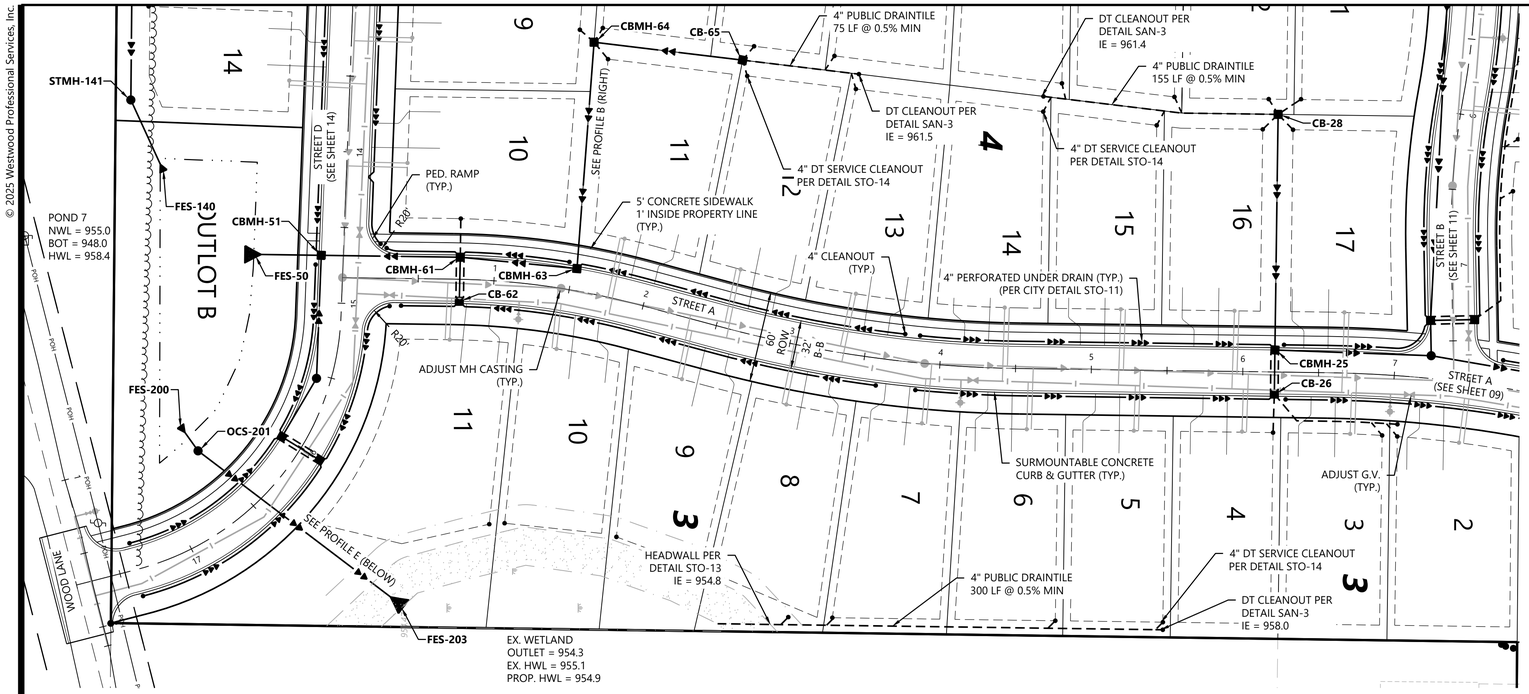
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

STREET & STORM SEWER CONSTRUCTION PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 09 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.



GENERAL NOTES

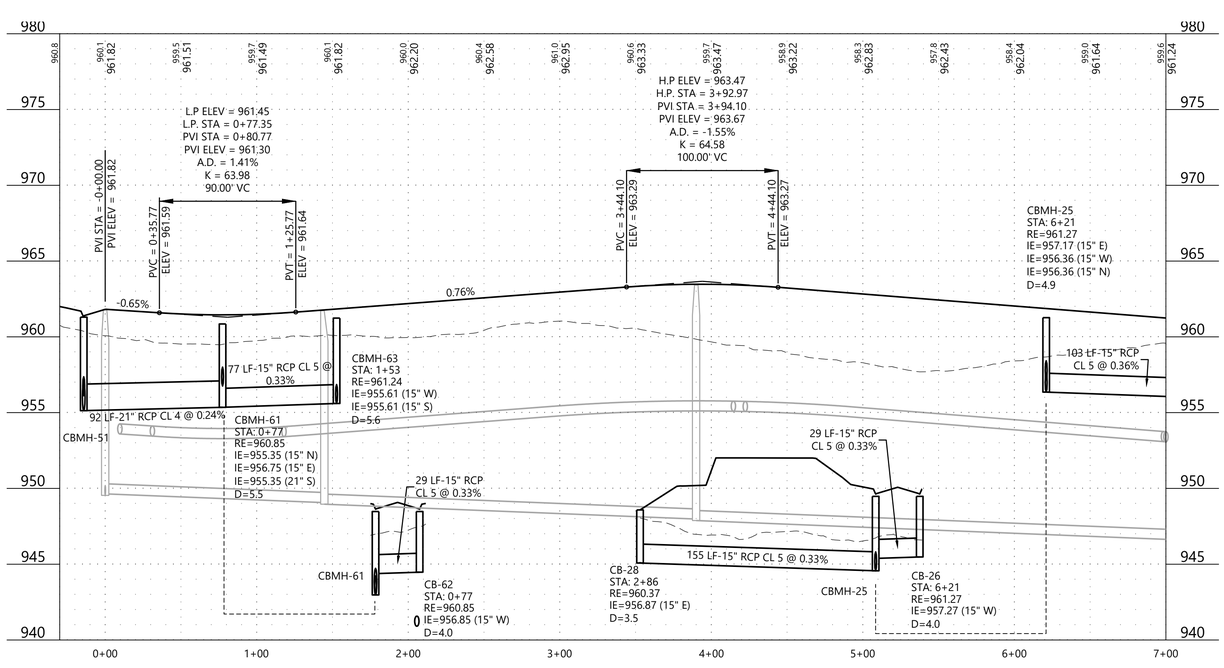
1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS 5, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.

LEGEND

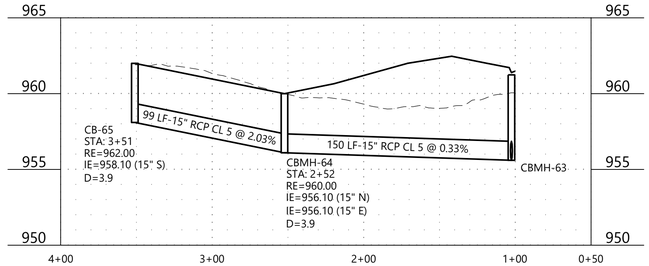
EXISTING	PROPOSED	
900.00	LANGLEY AVE)	GUTTER ELEVATION

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

STREET A



PROFILE B



1" = 50'

0' 50' 100' 150'

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-STF03.DWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50'
VERTICAL SCALE:	10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

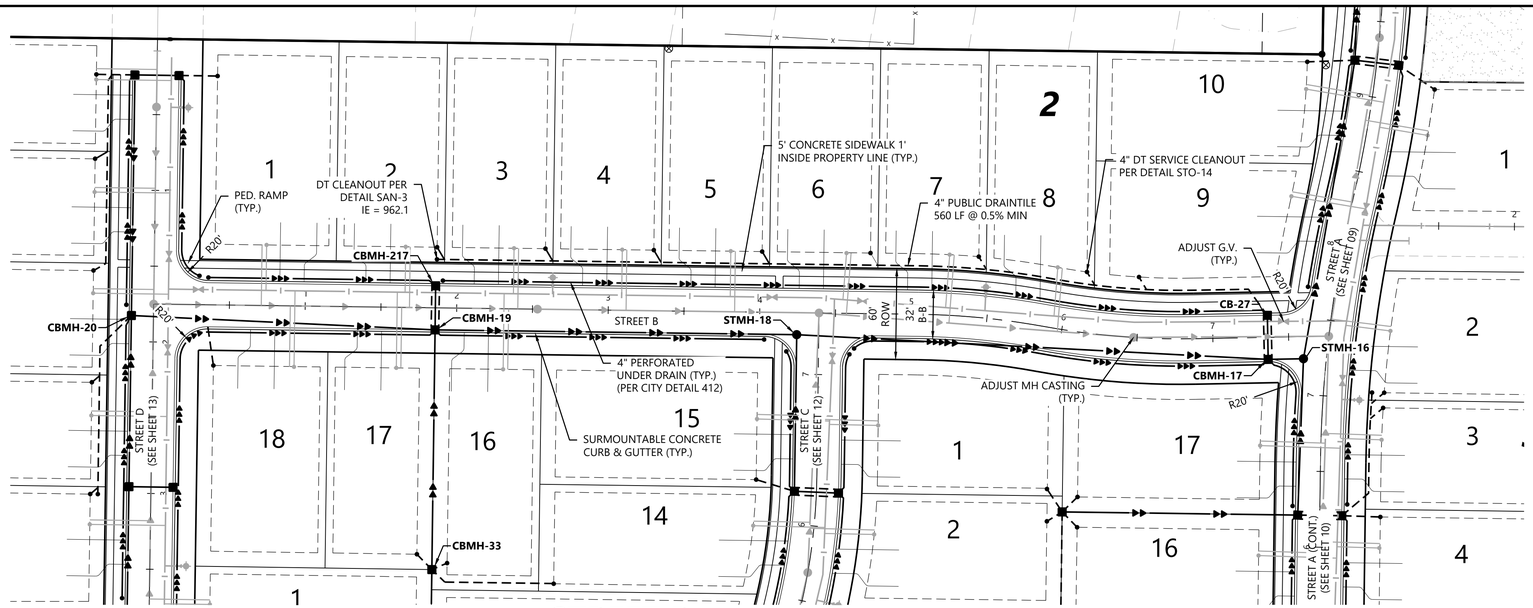
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

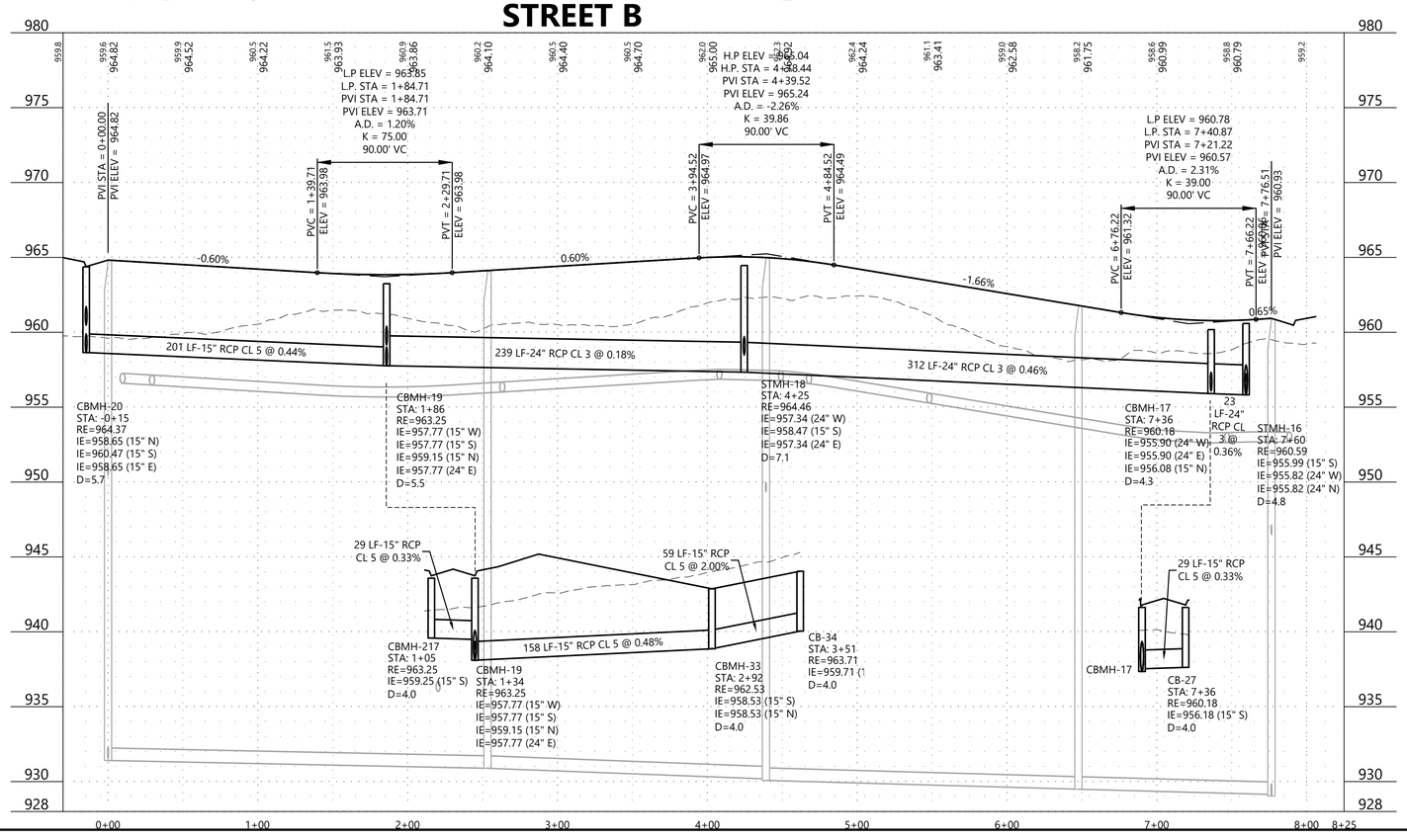
STREET & STORM SEWER CONSTRUCTION PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 10 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.





Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

EXISTING	PROPOSED	
900.00	× 900.00	GUTTER ELEVATION

GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS 5, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.

1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-STF03.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 50'
VERTICAL SCALE: 10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

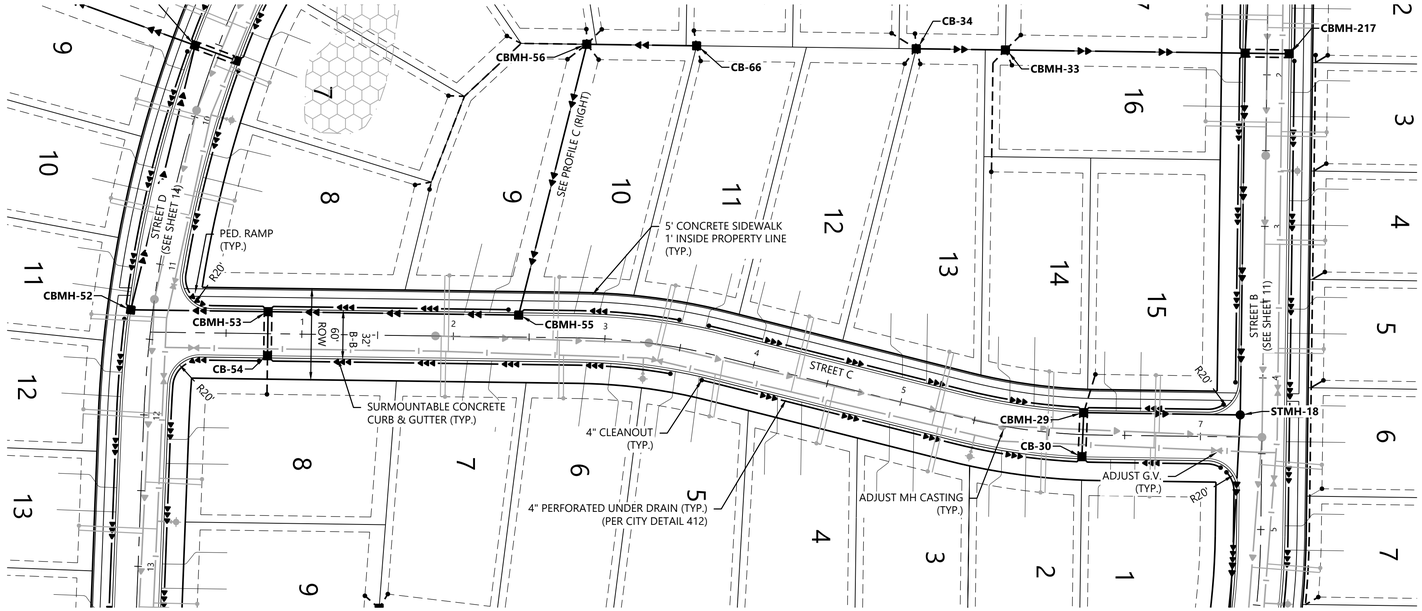
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

STREET & STORM SEWER CONSTRUCTION PLAN

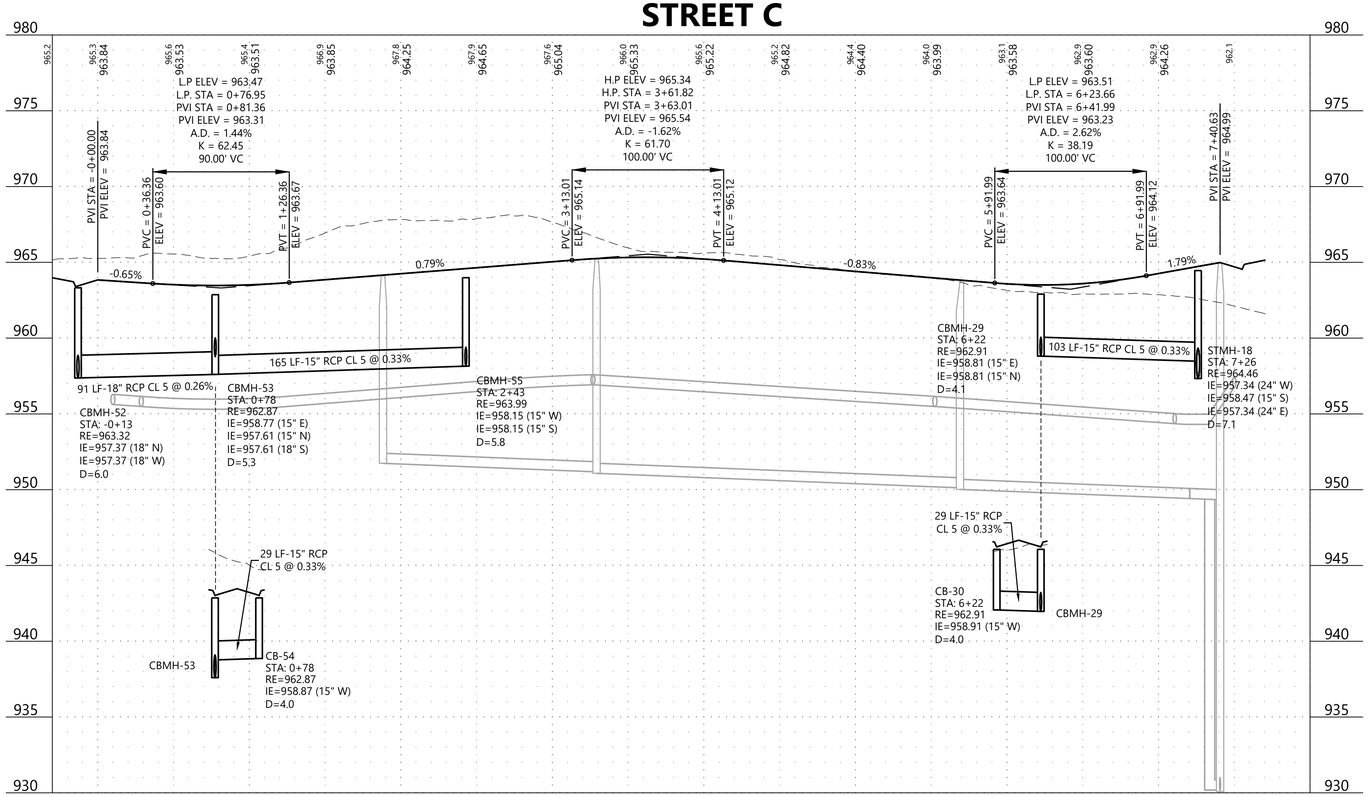
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 11 OF 24
DATE: 04/02/25

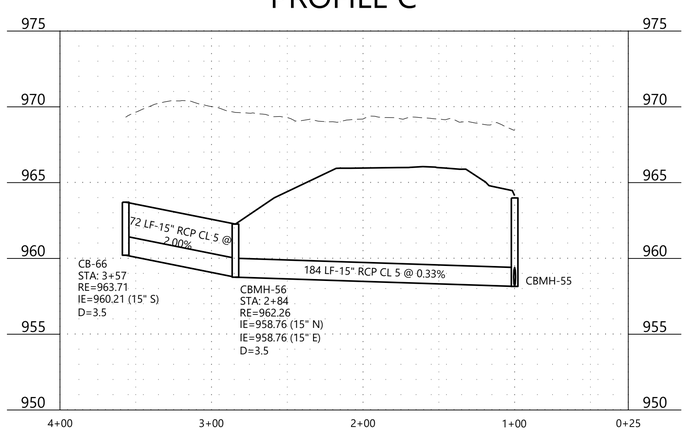
© 2025 Westwood Professional Services, Inc.



STREET C



PROFILE C



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

EXISTING	PROPOSED	
900.00	× 900.00	GUTTER ELEVATION

GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS 5, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.

1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\C\VIL\FINAL\UTILITY\0033874.00C-STF03.DWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50'
VERTICAL SCALE:	10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

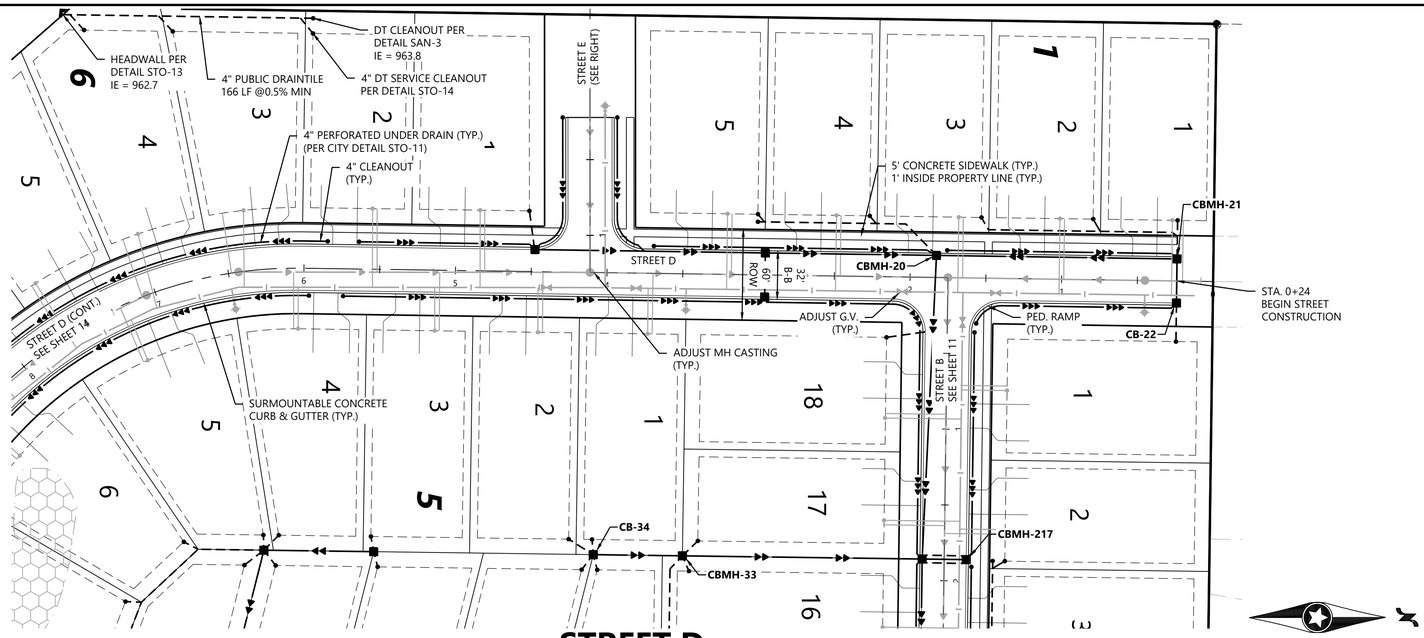
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

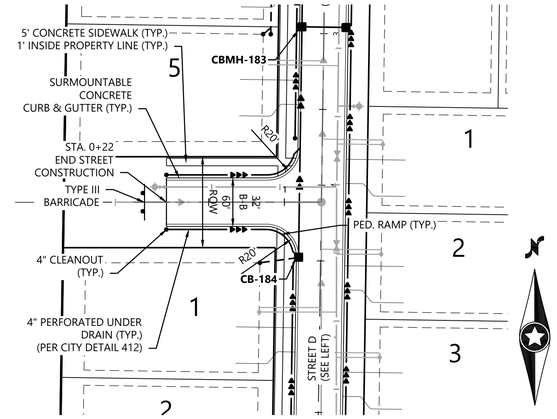
STREET & STORM SEWER CONSTRUCTION PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 12 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.





Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

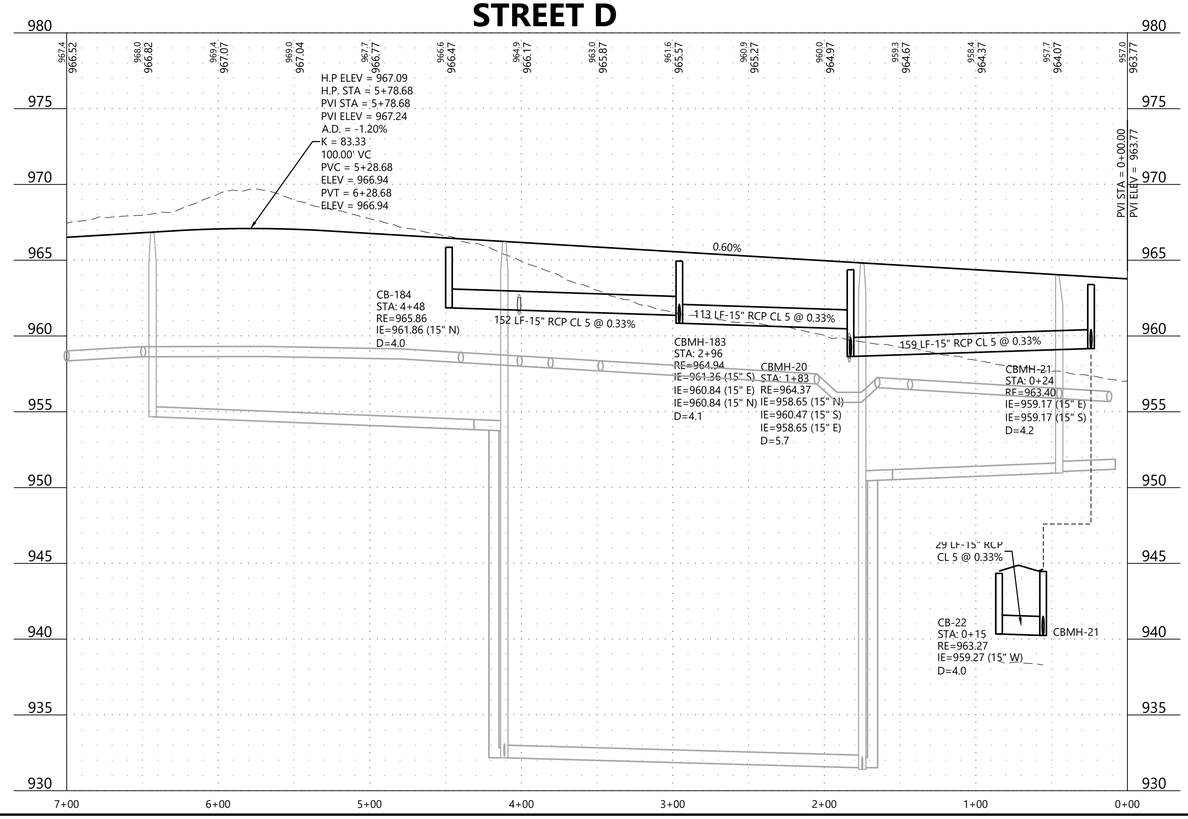
LEGEND

EXISTING	PROPOSED	
900.00	× 900.00	GUTTER ELEVATION

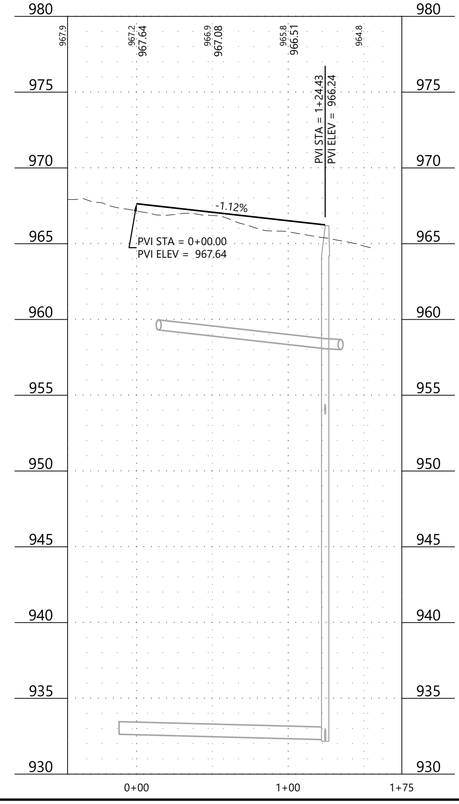
GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS X, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.

STREET D



STREET E



1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C_STF03.DWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50'
VERTICAL SCALE:	10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

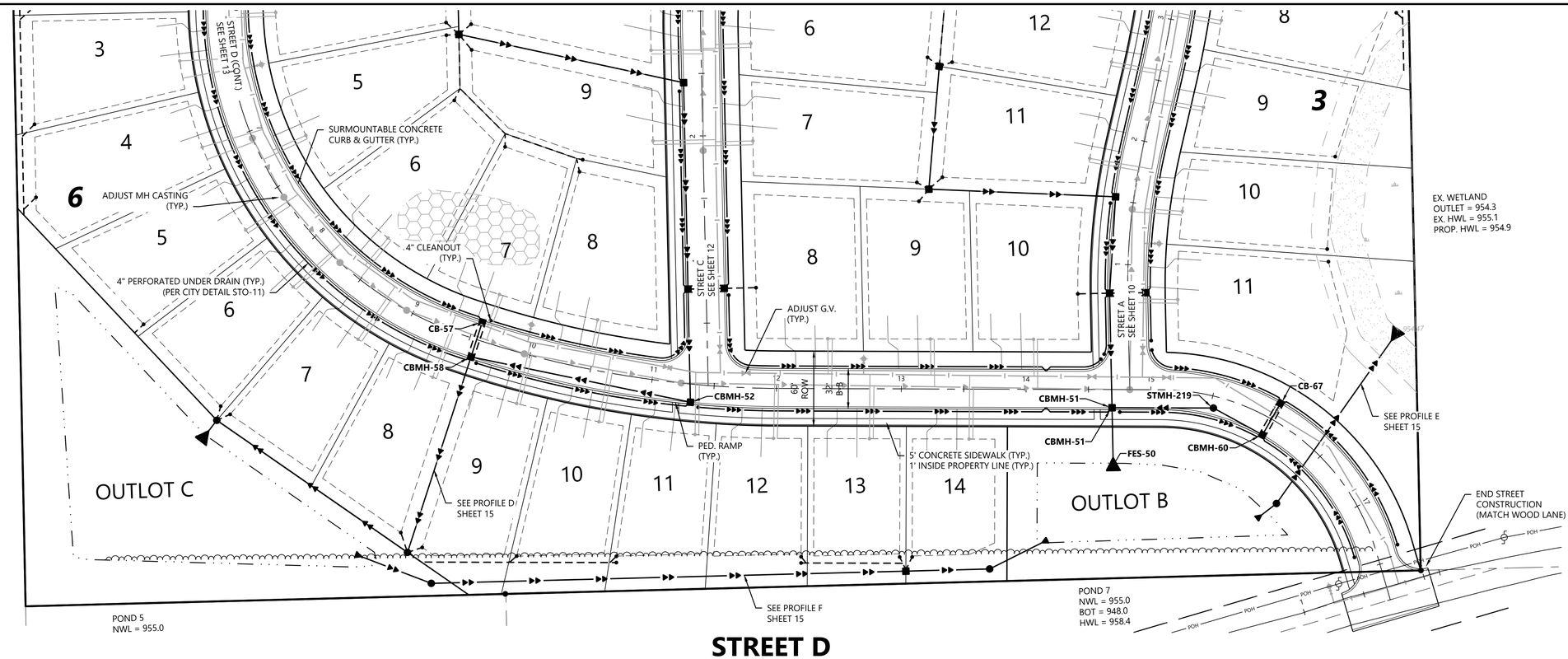
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

STREET & STORM SEWER CONSTRUCTION PLAN

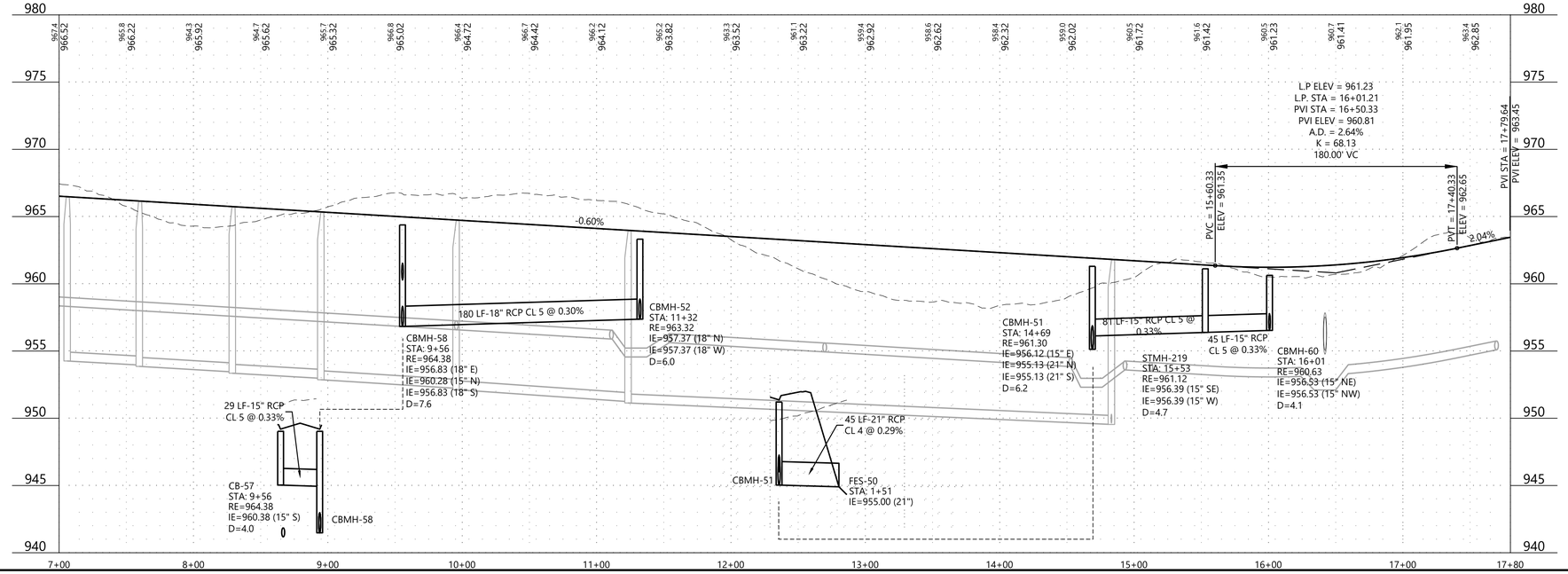
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 13 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.



STREET D



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

EXISTING	PROPOSED	
900.00	× 900.00	GUTTER ELEVATION

GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS X, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.

1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-STF03.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50'
VERTICAL SCALE:	10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

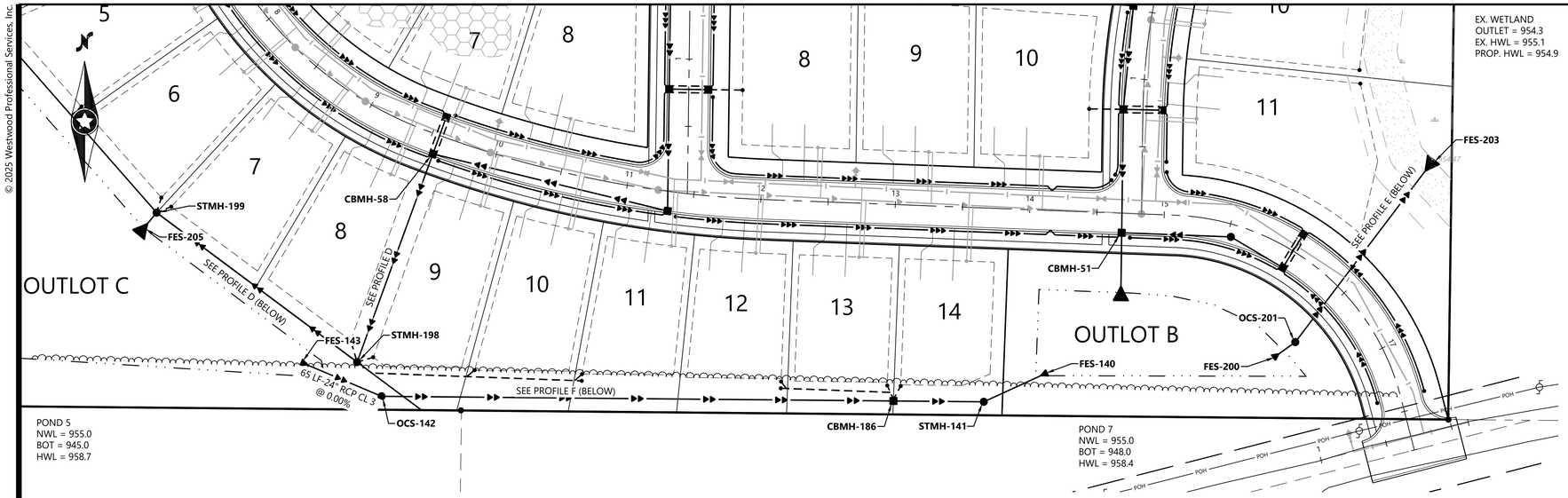
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

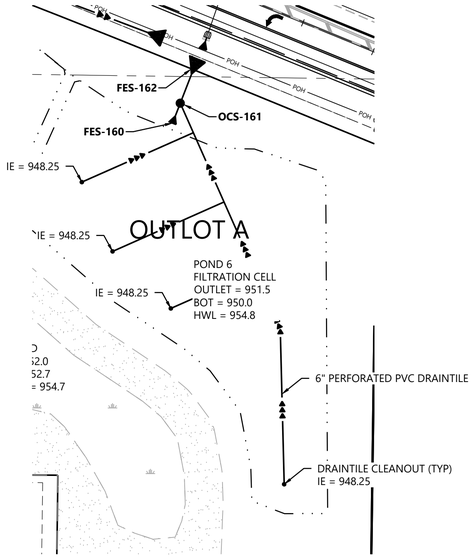
STREET & STORM SEWER CONSTRUCTION PLAN

PROJECT NUMBER: 0033874.00

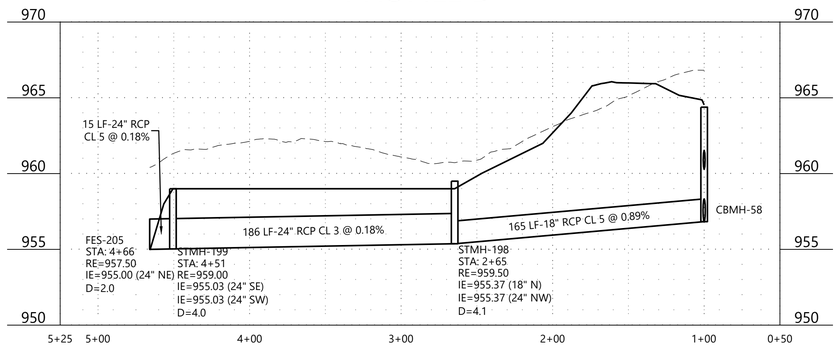
SHEET NUMBER: 14 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

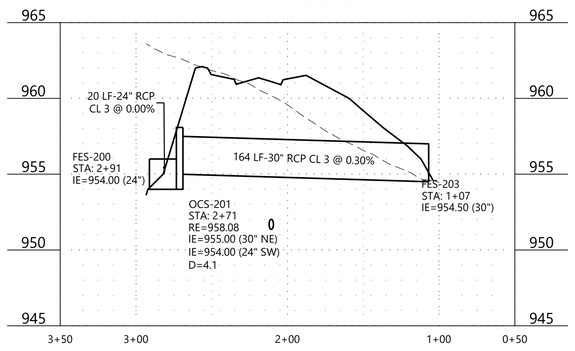




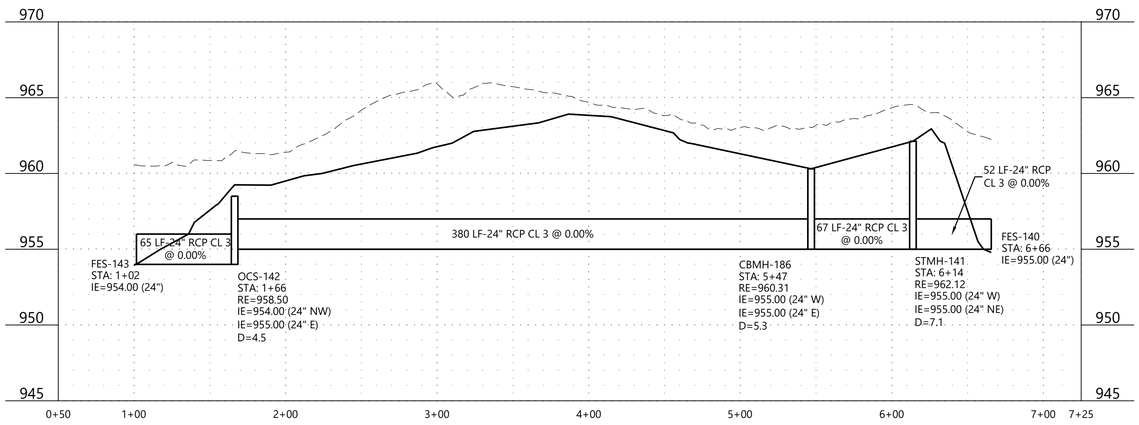
PROFILE D



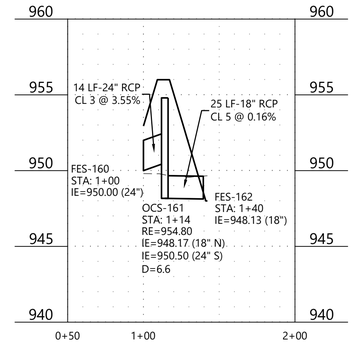
PROFILE E



PROFILE F



OCS-161



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

LEGEND

EXISTING	PROPOSED	
900.00	× 900.00	GUTTER ELEVATION

GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS 5, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.

1" = 50'
0' 50' 100' 150'

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-STF03.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	50'
VERTICAL SCALE:	10' or 5'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

BACKYARD STORM SEWER CONSTRUCTION PLAN
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 15 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

COBRA HEAD STREET LIGHT (TYP.)
STREET/TRAFFIC SIGN (TYP.)
STOP
TEMP BARRICADES PER DETAIL SGN-3
STREET A
STREET B
STREET C
STREET D
STREET E
CSAH 116 (TERRITORIAL ROAD)
OUTLOT A
OUTLOT B
OUTLOT C
WETLAND BUFFER SIGN
WOOD LANE
POH
GAS
TELE
FIRE
TUG
1" = 80'
0' 80' 160' 240'

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-STF02.DWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	80'
VERTICAL SCALE:	16' OR 8'

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

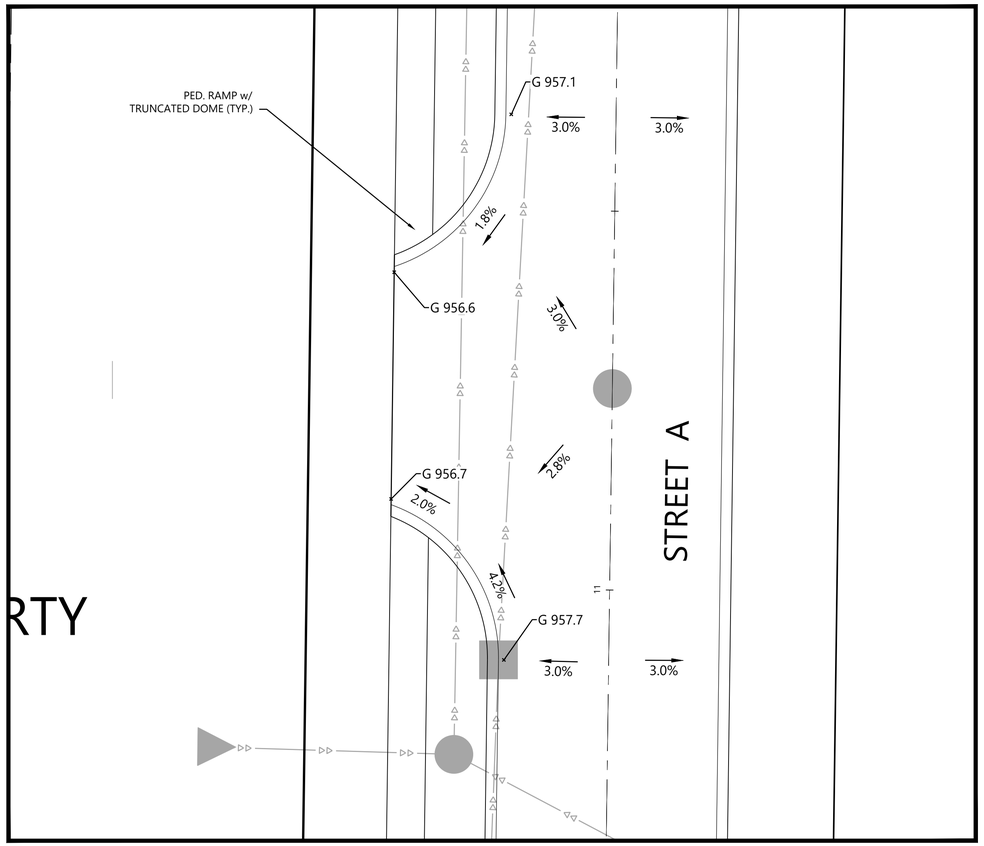
NORTHVIEW PRESERVE
ROGERS, MN

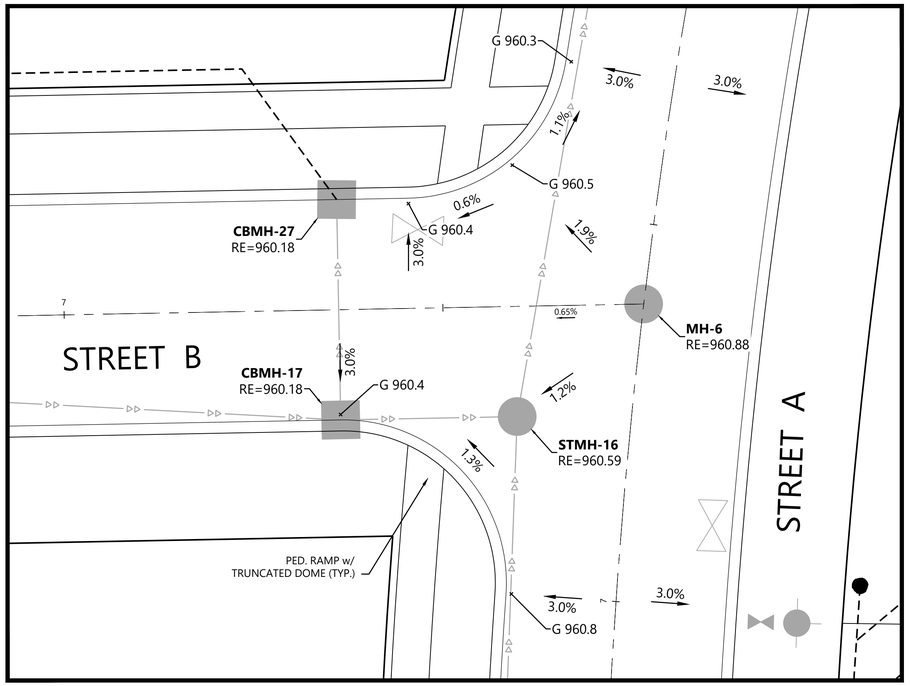
STREET SIGNAGE & LIGHTING PLAN

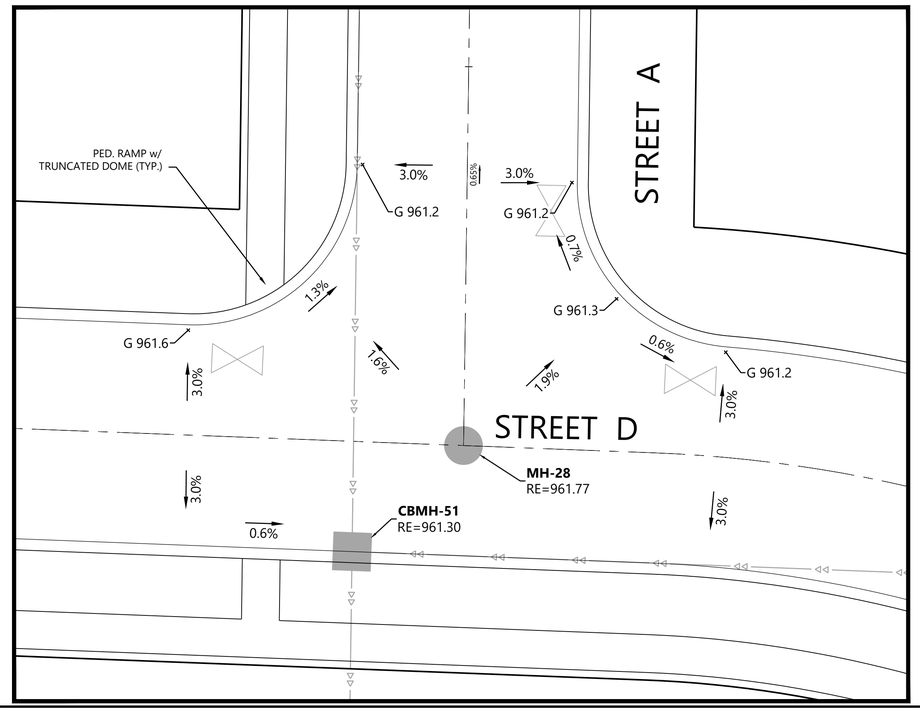
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 16 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.







Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



1" = 10'

0' 10' 20' 30'

CONSTRUCTION PLANS

LEGEND

EXISTING	PROPOSED	
× 900.00	× 900.00	GUTTER ELEVATION
	× TC 900.00	TOP OF CURB ELEVATION
	0.00%	FLOW DIRECTION
		FLOW LINE
		BACK OF CURB
		STORM SEWER

GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS 5, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.
4. UNLESS OTHERWISE NOTED, ALL MATERIALS, CONST. TECHNIQUES AND TESTING SHALL CONFORM TO THE CITY OF COTTAGE GROVE'S STANDARD SPECIFICATIONS FOR STREET & UTILITY CONSTRUCTION - 2024.

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-INF01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 10'
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

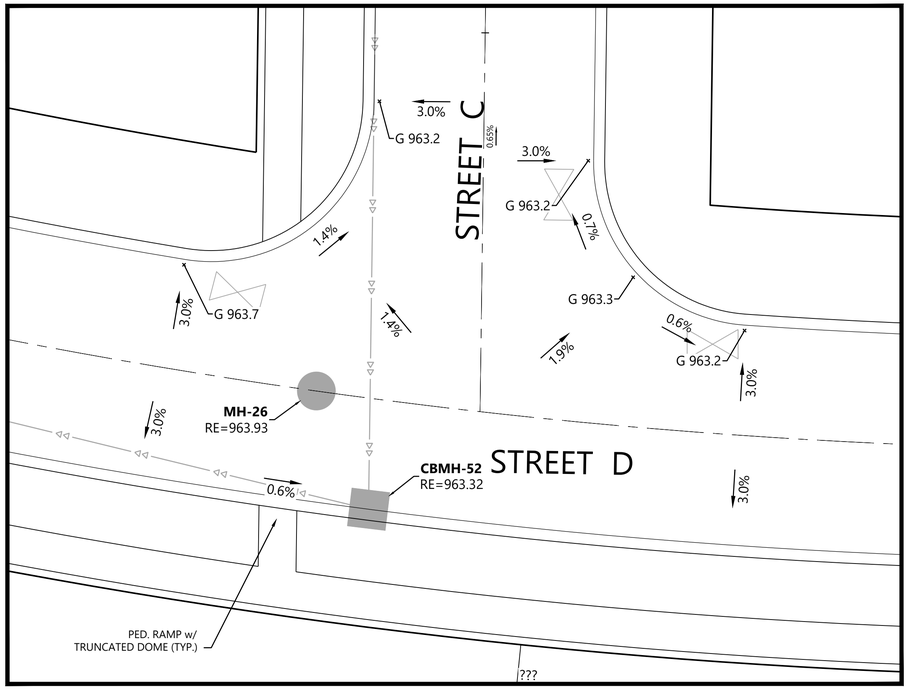
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

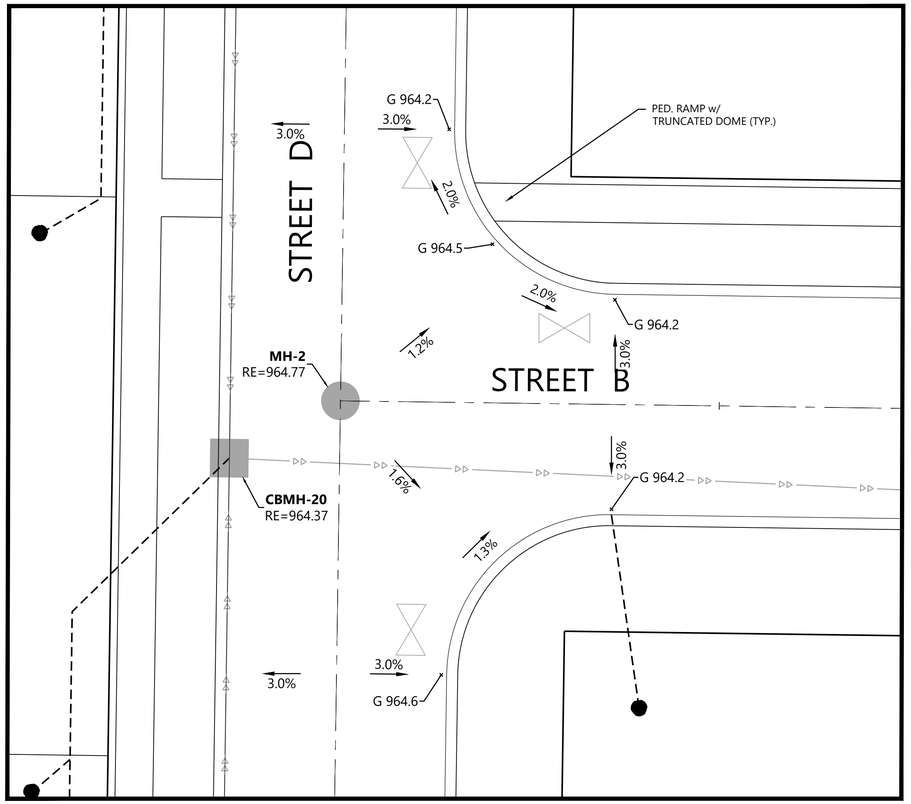
INTERSECTION DETAILS

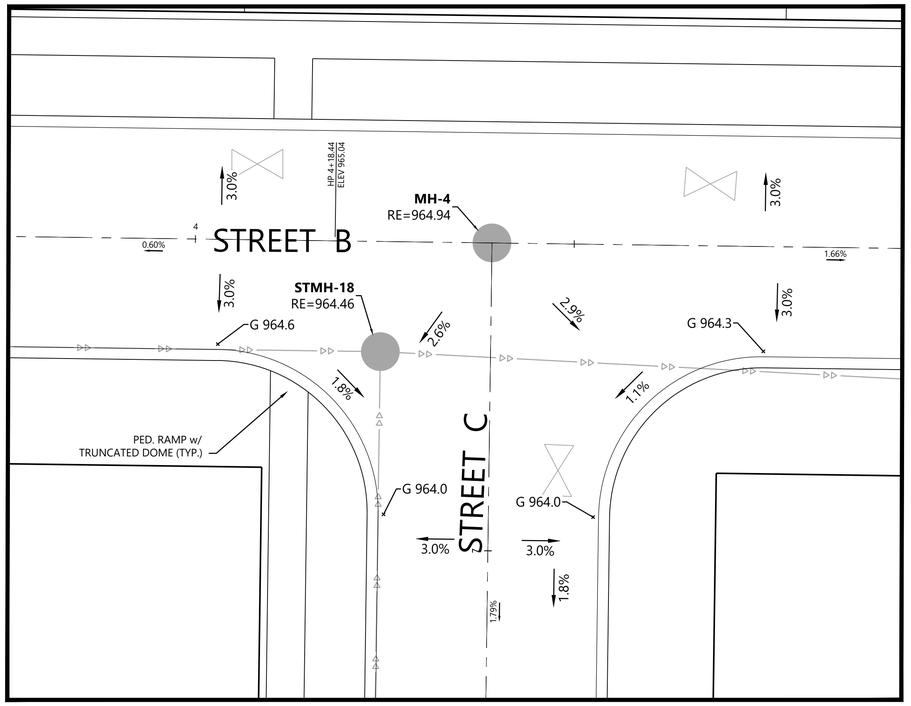
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 17 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.







Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

1" = 10'
0' 10' 20' 30'

CONSTRUCTION PLANS

LEGEND

EXISTING	PROPOSED	
× 900.00	× 900.00	GUTTER ELEVATION
	× TC 900.00	TOP OF CURB ELEVATION
	0.00%	FLOW DIRECTION
		FLOW LINE
		BACK OF CURB
		STORM SEWER

GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS 5, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.
4. UNLESS OTHERWISE NOTED, ALL MATERIALS, CONST. TECHNIQUES AND TESTING SHALL CONFORM TO THE CITY OF COTTAGE GROVE'S STANDARD SPECIFICATIONS FOR STREET & UTILITY CONSTRUCTION - 2024.

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-INF01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 10'
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

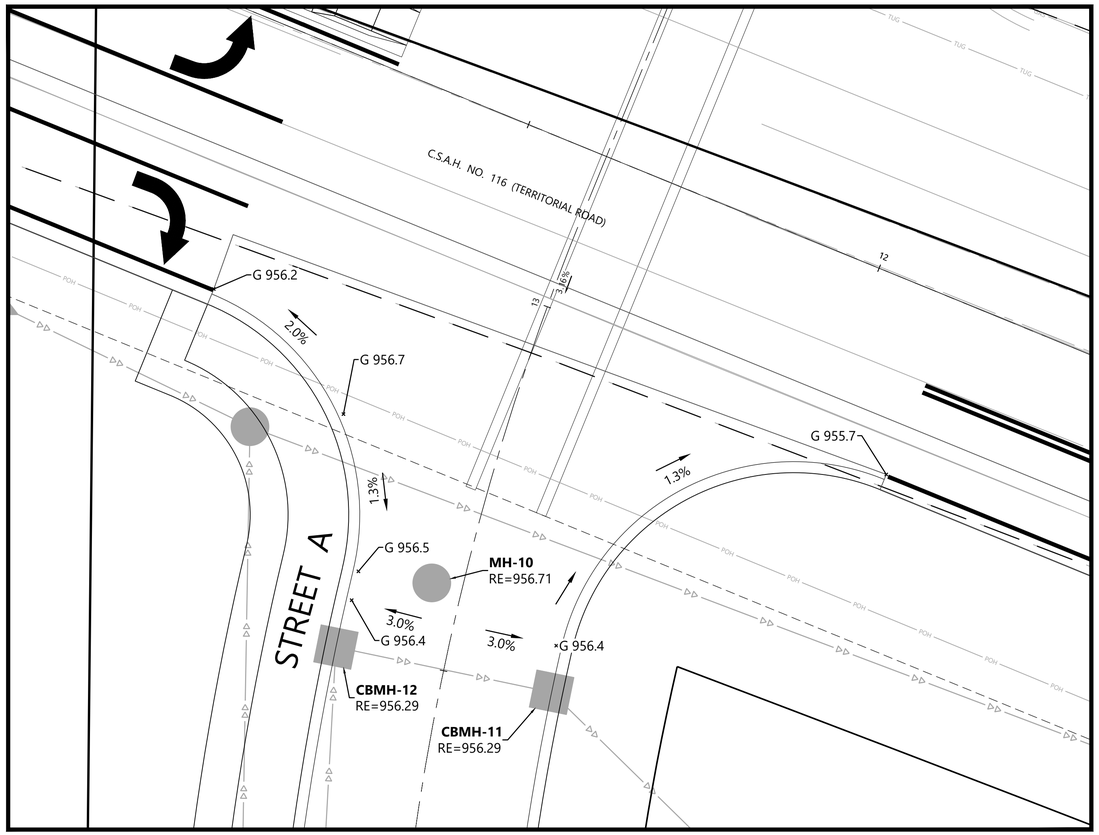
INTERSECTION DETAILS

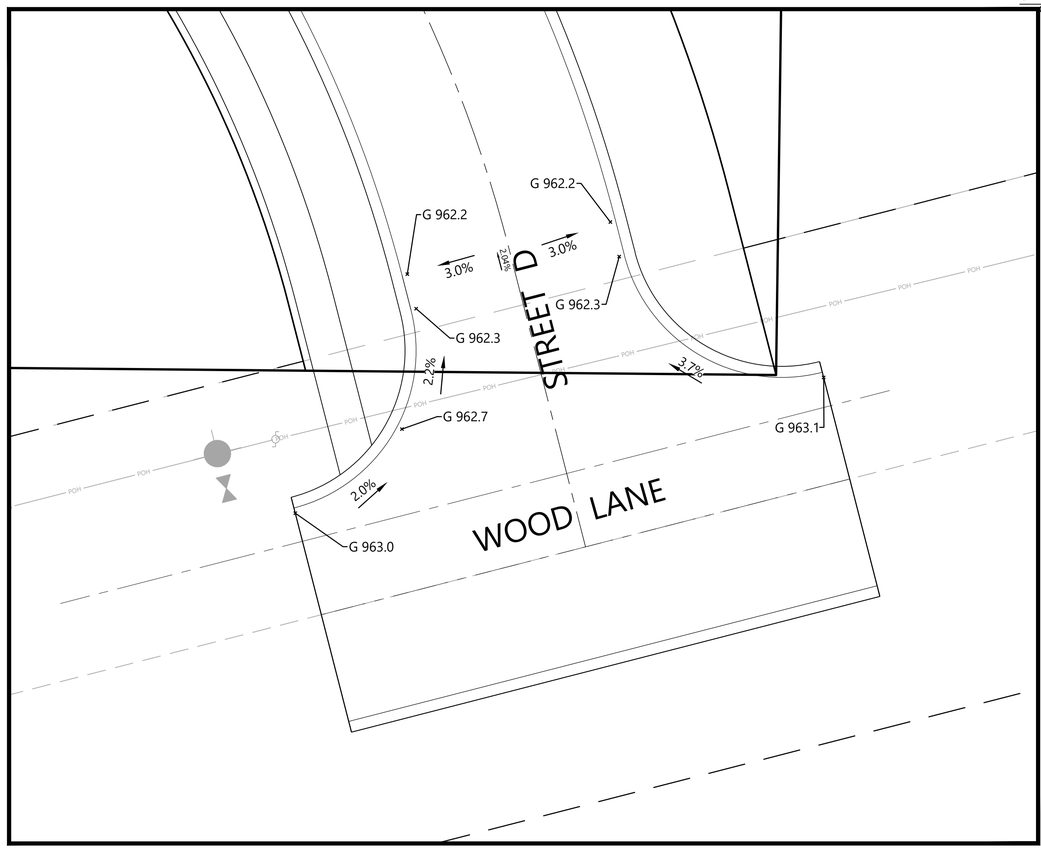
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 18 OF 24
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance





LEGEND

EXISTING	PROPOSED	
× 900.00	× 900.00	GUTTER ELEVATION
	× TC 900.00	TOP OF CURB ELEVATION
	0.00%	FLOW DIRECTION
		FLOW LINE
		BACK OF CURB
		STORM SEWER

GENERAL NOTES

1. RADIUS TO BE B618 CURB & GUTTER WITH 10' TRANSITIONS FROM SURMOUNTABLE CURB & GUTTER.
2. ALL RCP SHALL BE CLASS 5, UNLESS OTHERWISE NOTED.
3. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET. MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS SHOWN ON THE PROFILES REFLECT THE SUMPED ELEVATIONS.
4. UNLESS OTHERWISE NOTED, ALL MATERIALS, CONST. TECHNIQUES AND TESTING SHALL CONFORM TO THE CITY OF COTTAGE GROVE'S STANDARD SPECIFICATIONS FOR STREET & UTILITY CONSTRUCTION - 2024.

1" = ###
0' ### ### ###

CONSTRUCTION PLANS

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874.00C-INF01.DWG

NORTHVIEW PRESERVE

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: ###
VERTICAL SCALE: ## OR ##

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

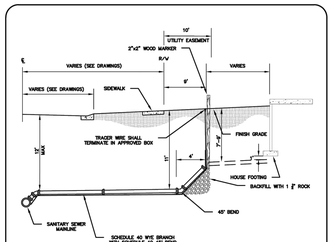
Westwood
Phone (952) 937-5150
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka MN, 55343
westwoodps.com
Westwood Professional Services, Inc.

INTERSECTION DETAILS

SHEET NUMBER: 19 OF 24
PROJECT NUMBER: 0033874.00
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



NOTES:

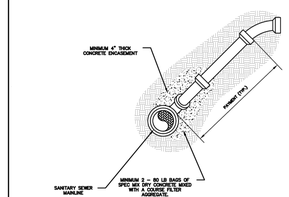
SEWER SERVICE, PVC SCHEDULE 40 4" OR 6" AS SPECIFIED

2% MINIMUM SLOPE OR 12% MAXIMUM SLOPE, 2" PER FOOT

ALL PIPE SHALL BE BEDDED IN GRANULAR BORROW 3149 B.1 OR COURSE FILTER AGGREGATE 3149H

END OF SERVICE SHALL BE 7' TO 8' DEEP AT END OF SERVICE. THE END SHALL BE A FACTORY JOINT WITH PLUG USING A FACTORY MANUFACTURED ADAPTOR WHERE NECESSARY

	SANITARY SEWER SERVICE	Standard Details	SAN-1



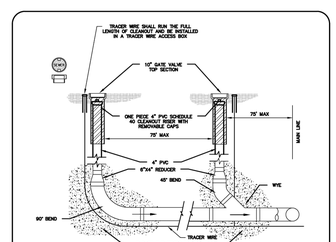
NOTES:

SERVICE CONNECTION TO BE AT 3:00 OR 10:00 WITH APPROVED FACTORY INSTALLED SCHEDULE 40 WYE.

4" OR 6" SANITARY SEWER SERVICE RISER SUPPORT ON TRENCH SLOPE 5:1 MAX

SCHEDULE 40 PVC SERVICES

	SANITARY SEWER SERVICE RISER	Standard Details	SAN-2



END OF LINE CLEANOUT IN LINE CLEANOUT

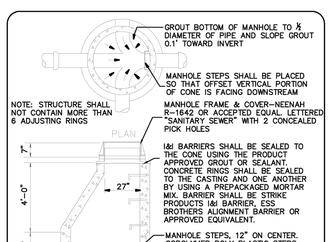
NOTES:

10" GATE VALVE BOX TOP SECTION WITH DROP LID (SEWER) SHALL BE INSTALLED WITH ALL CLEANOUTS 1" BELOW FINISHED GRADE.

4" PVC SCHEDULE 40 CLEANOUT RISER WITH REMOVABLE CAP 4'-6" BELOW FINISH GRADE.

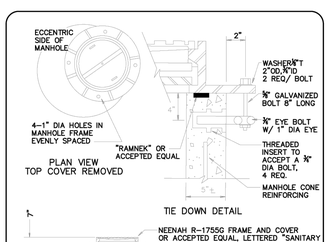
ENCLOSE LONG SWEEP BEND OR COMBINATION WYE IN 4" CONCRETE AS SHOWN

	SANITARY SEWER CLEANOUT	Standard Details	SAN-3

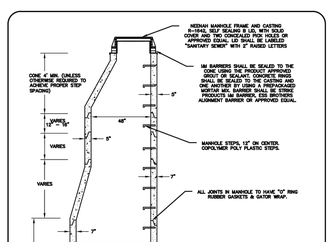


NOTE: ALL CONNECTIONS TO EXISTING MANHOLE WILL BE CORE CUT WITH GASKET PER SAN–7, NO JACK–HAMMER ALLOWED

	STANDARD SANITARY MANHOLE	Standard Details	SAN-4



	WATERTIGHT MANHOLE	Standard Details	SAN-5



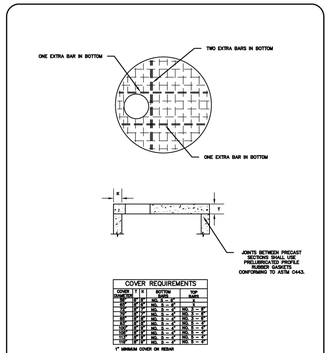
NOTES:

ALL WATER TIGHT PIPE CONNECTIONS SHALL CONFORM TO ASTM C923 FOR CONNECTIONS BETWEEN MANHOLE/CB HOLE STRUCTURES AND PIPES.

POSITIVE MECHANICAL SEALS SHALL BE KOR–N–SEAL FOR PIPES 24" AND SMALLER, GREATER THAN 24" SHALL BE A–LOK A–GEL.

PRECAST INVERT SHOULD BE ½ Ø OF PIPE SLOPED .1" TOWARD INVERT

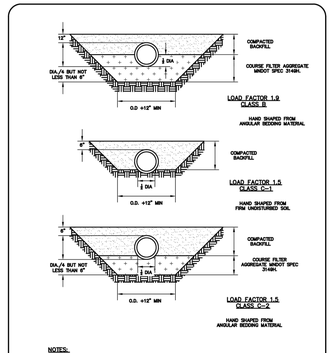
	REDUCING MANHOLE 78" TO 48" OR 60" TO 48"	Standard Details	SAN-7



COVER REQUIREMENTS				
DIAMETER	TYPE	WALL THICKNESS	REINFORCEMENT	
			INNER CAGE	OUTER CAGE
48"	RC	B	NO	NO
48"	RC	C	NO	NO
48"	RC	D	NO	NO
60"	RC	B	NO	NO
60"	RC	C	NO	NO
60"	RC	D	NO	NO
72"	RC	B	NO	NO
72"	RC	C	NO	NO
72"	RC	D	NO	NO

1" MINIMUM COVER ON REBAR

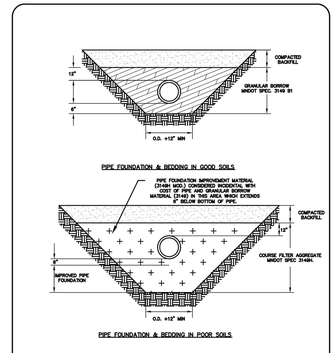
	MANHOLE TOP SLAB	Standard Details	SAN-8



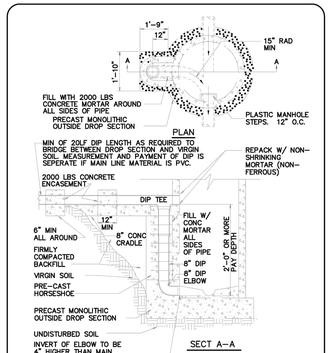
NOTES:

"DIA" DENOTES OUTSIDE DIAMETER OF PIPE

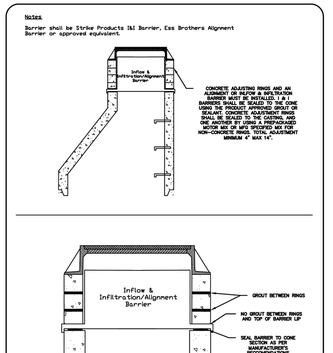
	PIPE BEDDING METHODS FOR RCP OR DIP	Standard Details	SAN-11



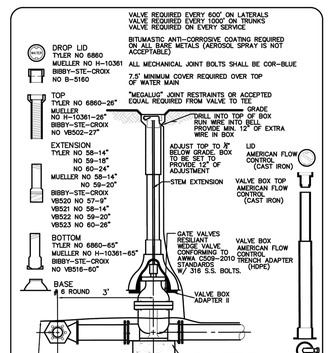
	PIPE BEDDING METHODS FOR PVC	Standard Details	SAN-12



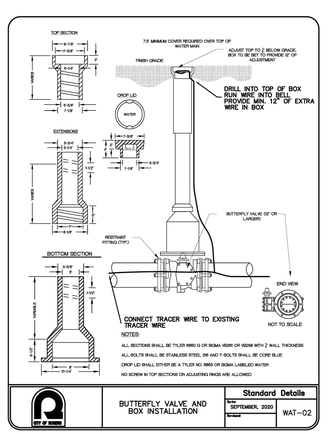
	SANITARY MANHOLE OUTSIDE DROP SECTION	Standard Details	SAN-13



	PIPE TO NEW MANHOLE CONNECTION	Standard Details	SAN-14



	GATE VALVE AND BOX INSTALLATION	Standard Details	WAT-01



NOTES:

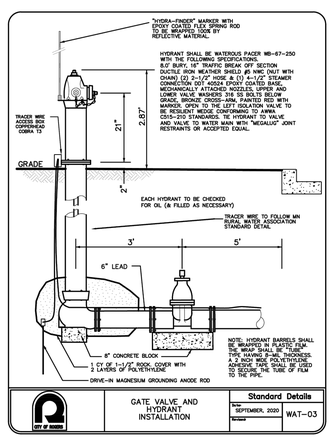
ALL SECTIONS SHALL BE TYLER 6860 G OR BIGMA 9508R OR V8508 WITH 2" WALL THICKNESS

ALL BOLTS SHALL BE STAINLESS STEEL 316 AND T–BOLTS SHALL BE CORE BLUE

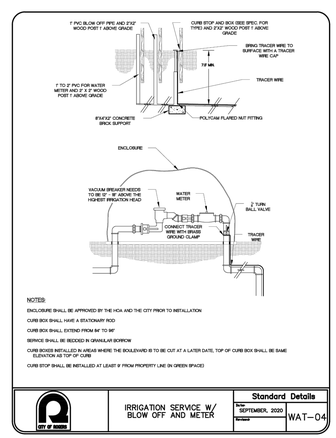
DROP LID SHALL BOTH BE A TYLER NO. 6860 OR BIGMA LABELED WATER

NO SCREW IN TOP SECTIONS OR ADJUSTING RINGS ARE ALLOWED

	BUTTERFLY VALVE AND BOX INSTALLATION	Standard Details	WAT-02



	GATE VALVE AND HYDRANT INSTALLATION	Standard Details	WAT-03



NOTES:

ENCLOSURE SHALL BE APPROVED BY THE HOA AND THE CITY PRIOR TO INSTALLATION

CURB BOX SHALL HAVE A STATIONARY ROD

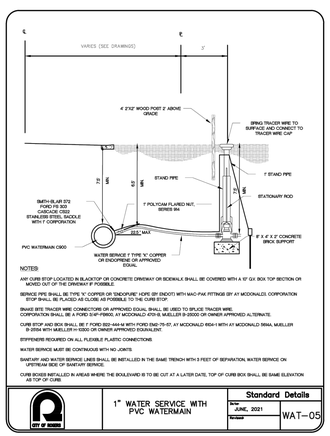
CURB BOX SHALL EXTEND FROM 84" TO 96"

SERVICE SHALL BE BEDDED IN GRANULAR BORROW

CURB BOXES INSTALLED IN AREAS WHERE THE BOULEVARD IS TO BE CUT AT A LATER DATE, TOP OF CURB BOX SHALL BE SAME ELEVATION AS TOP OF CURB

CURB STOP SHALL BE INSTALLED AT LEAST 5' FROM PROPERTY LINE (IN GREEN SPACE)

	IRRIGATION SERVICE W/ BLOW OFF AND METER	Standard Details	WAT-04



NOTES

ANY CURB STOP LOCATED IN BLACKTOP OR CONCRETE DRIVEWAY OR SIDEWALK SHALL BE CENTERED WITH A 10" G.V. BOX TOP SECTION OR MOVED OUT OF THE DRIVEWAY IF POSSIBLE.

SERVICE PIPE SHALL BE TYPE 'K' COPPER OR 'ENDOPURE' HDPE (BY ENDOT) WITH MAC–PAK FITTINGS (BY AT MCDONALDS). CORPORATION STOP SHALL BE PLACED AS CLOSE AS POSSIBLE TO THE CURB STOP.

BRASS SITE TRACER WIRE CONNECTORS OR APPROVED EQUAL SHALL BE USED TO SPLICE TRACER WIRE. CORPORATION SHALL BE A FORD S14F–PBKNG AT MCDONALD 4701–B, MUELLER B–25000 OR OWNER APPROVED ALTERNATE.

CURB STOP AND BOX SHALL BE 1" FORD B22–444–M WITH FORD ENO 76–57, AT MCDONALD 6904–1 WITH AT MCDONALD 984A, MUELLER B–20264 WITH MUELLER H–10302 OR OWNER APPROVED EQUIVALENT.

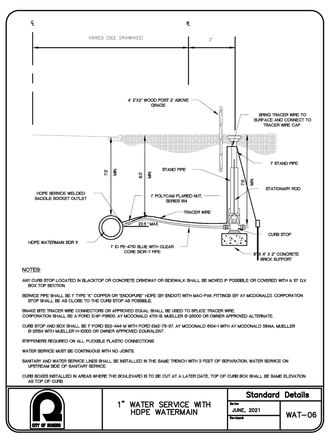
STIFFENERS REQUIRED ON ALL FLEXIBLE PLASTIC CONNECTIONS.

WATER SERVICE MUST BE CONTINUOUS WITH NO JOINTS.

SANITARY AND WATER SERVICE LINES SHALL BE INSTALLED IN THE SAME TRENCH WITH 3 FEET OF SEPARATION. WATER SERVICE ON UPSTREAM SIDE OF SANITARY SERVICE.

CURB BOXES INSTALLED IN AREAS WHERE THE BOULEVARD IS TO BE CUT AT A LATER DATE, TOP OF CURB BOX SHALL BE SAME ELEVATION AS TOP OF CURB

	1" WATER SERVICE WITH PVC WATERMAIN	Standard Details	WAT-05



NOTES

ANY CURB STOP LOCATED IN BLACKTOP OR CONCRETE DRIVEWAY OR SIDEWALK SHALL BE MOVED IF POSSIBLE OR COVERED WITH A 10" G.V. BOX TOP SECTION.

SERVICE PIPE SHALL BE 1" TYPE 'K' COPPER OR 'ENDOPURE' HDPE (BY ENDOT) WITH MAC–PAK FITTINGS (BY AT MCDONALDS). CORPORATION STOP SHALL BE AS CLOSE TO THE CURB STOP AS POSSIBLE.

BRASS SITE TRACER WIRE CONNECTORS OR APPROVED EQUAL SHALL BE USED TO SPLICE TRACER WIRE. CORPORATION SHALL BE A FORD S14F–PBKNG AT MCDONALD 4701–B, MUELLER B–25000 OR OWNER APPROVED ALTERNATE.

CURB STOP AND BOX SHALL BE 1" FORD B22–444–M WITH FORD ENO 76–57, AT MCDONALD 6904–1 WITH AT MCDONALD 984A, MUELLER B–20264 WITH MUELLER H–10302 OR OWNER APPROVED EQUIVALENT.

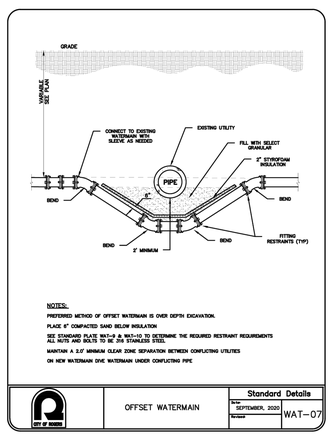
STIFFENERS REQUIRED ON ALL FLEXIBLE PLASTIC CONNECTIONS.

WATER SERVICE MUST BE CONTINUOUS WITH NO JOINTS.

SANITARY AND WATER SERVICE LINES SHALL BE INSTALLED IN THE SAME TRENCH WITH 3 FEET OF SEPARATION. WATER SERVICE ON UPSTREAM SIDE OF SANITARY SERVICE.

CURB BOXES INSTALLED IN AREAS WHERE THE BOULEVARD IS TO BE CUT AT A LATER DATE, TOP OF CURB BOX SHALL BE SAME ELEVATION AS TOP OF CURB

	1" WATER SERVICE WITH HDPE WATERMAIN	Standard Details	WAT-06



NOTES:

PREFERRED METHOD OF OFFSET WATERMAIN IS OVER DEPTH EXCAVATION.

PLACE 6" COMPACTED SAND BELOW INSULATION

SEE STANDARD PLATE WAT–4 & WAT–10 TO DETERMINE THE REQUIRED RESTRAINT REQUIREMENTS

ALL NUTS AND BOLTS TO BE 316 STAINLESS STEEL

MAINTAIN A 3.0' MINIMUM CLEAR ZONE SEPARATION BETWEEN OTHER CONFLICTING UTILITIES

ON NEW WATERMAIN DIVE WATERMAIN UNDER CONFLICTING PIPE

	OFFSET WATERMAIN	Standard Details	WAT-07

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874C_DTF01.DWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 04/02/25

REVISIONS:

1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC

17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER

DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE

ROGERS, MN

Westwood

Phone (952) 937-5150
Fax (952) 937-5822
Toll Free (888) 937-5150
12701 Whitewater Drive, Suite #300
Minnetonka, MN 55343
westwoodps.com

Westwood Professional Services, Inc.

DETAILS

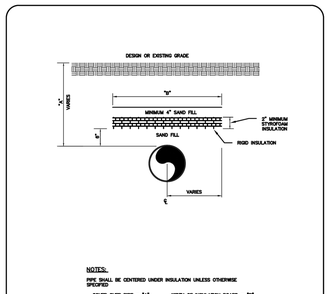
PROJECT NUMBER: 0033874.00

SHEET NUMBER: 20 OF 24

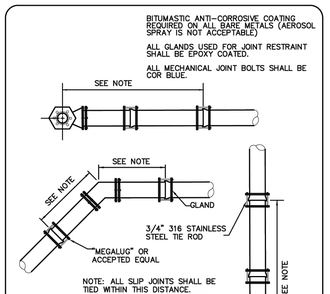
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

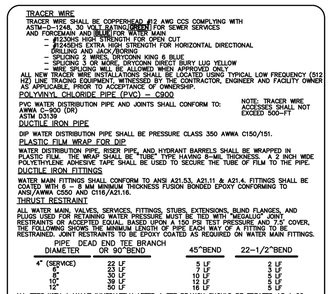
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



INSULATION DETAIL — Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-08



WATERMAIN TYING DETAIL — Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-09



TRACER WIRE
TRACER WIRE SHALL BE COPPER-HEAD #12 AWG CCS COMPLYING WITH ASTM-D-1248, 30 VOLT RATING, INSULATION FOR SEWER SERVICES AND FORCEMAIN AND BLUE FOR WATER MAIN
- #12SOLID HIGH STRENGTH FOR OPEN CUT
- #12SOLID COPPER CLAD STEEL FOR HORIZONTAL DIRECTIONAL DRILLING (HDD) OR DIRECTIONAL BORING
- SPLICING 3 WIRES: DRYCONN KING & BLUE
- SPLICING 2 OR MORE: DRYCONN DIRECT BURY LUG YELLOW
- WIRE SPLICING WILL BE ALLOWED WHEN APPROVED ONLY

ALL NEW TRACER WIRE INSTALLATIONS SHALL BE LOCATED USING TYPICAL LOW FREQUENCY (512 HZ) LINE TRACING EQUIPMENT, WITNESSED BY THE CONTRACTOR, ENGINEER AND FACILITY OWNER AS APPLICABLE, PRIOR TO ACCEPTANCE OF OWNERSHIP.

POLYVINYL CHLORIDE PIPE (PVC) – C900
PVC WATER DISTRIBUTION PIPE AND JOINTS SHALL CONFORM TO: AWWA C-900 (DR) ASTM D3139
NOTE: TRACER WIRE ACCESSIBILITY SHALL NOT EXCEED 500'-FT

DUCTILE IRON PIPE
DIP WATER DISTRIBUTION PIPE SHALL BE PRESSURE CLASS 350 AWWA C150/151.

PLASTIC FILM WRAP FOR DIP
WATER DISTRIBUTION PIPE, RISER PIPE, AND HYDRANT BARRELS SHALL BE WRAPPED IN POLYETHYLENE FILM, 8 MIL MINIMUM THICKNESS, TUBE TYPE. MANNER OF INSTALLATION: A 2 INCH WIDE POLYETHYLENE ADHESIVE TAPE SHALL BE USED TO SECURE THE TUBE OF FILM TO THE PIPE.

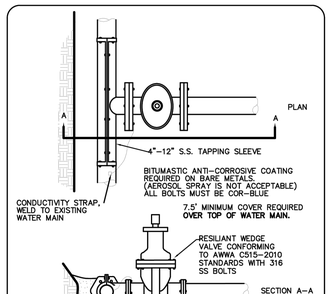
DUCTILE IRON FITTINGS
WATER MAIN FITTINGS SHALL CONFORM TO ANSI A21.53, A21.11 & A21.6. FITTINGS SHALL BE COATED WITH 6 – 8 MM MINIMUM THICKNESS FUSION BONDED EPOXY CONFORMING TO ANSI/AWWA C550 AND C116/A21.16.

THRUST RESTRAINT
ALL WATER MAIN, VALVES, SERVICES, FITTINGS, STUBS, EXTENSIONS, BLIND FLANGES, AND PLUGS USED FOR RETAINING WATER PRESSURE MUST BE TIED WITH "MEGALUG" JOINT RESTRAINTS OR ACCEPTED EQUAL BASED UPON A 150 PSI TEST PRESSURE AND 7.5' COVER, THE FOLLOWING SHOWS THE MINIMUM LENGTH OF PIPE EACH WAY OF A FITTING TO BE RESTRAINED. JOINT RESTRAINTS TO BE EPOXY COATED AS REQUIRED ON WATER MAIN FITTINGS.

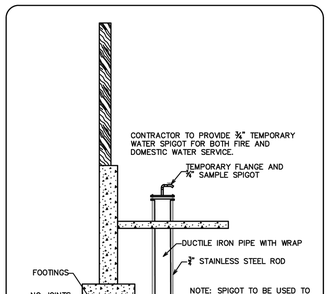
PIPE DIAMETER	DEAD END TEE BRANCH OR 90°BEND	45°BEND	22-1/2°BEND
4" (SERVICE)	22 LF	5 LF	3 LF
6"	33 LF	7 LF	3 LF
8"	290 LF	10 LF	5 LF
12"	30 LF	16 LF	8 LF

ALL TEES WITH A VALVE IMMEDIATELY AFTER A TEE BRANCH SHOULD BE TREATED AS A 90 DEGREE BEND.
WHERE RESTRAINED JOINTS ARE REQUIRED AND THE PIPE IS IN A CASING NEAR THE FITTING TO BE RESTRAINED, THE LENGTH OF PIPE IN THE CASING SHALL NOT BE INCLUDED IN THE LENGTH OF PIPE NECESSARY TO DEVELOP SUFFICIENT SOIL FRICTION TO OVERCOME THRUST.
ALL BARE METALS SHALL HAVE TWO COATS OF BITUMASTIC OR ACCEPTED EQUAL (AEROSOL SPRAY IS NOT ACCEPTABLE) ALL MECHANICAL JOINT BOLTS SHALL BE COR-BLUE.
ALL JOINT TIE RODS AND NUTS SHALL BE 316 STAINLESS STEEL.

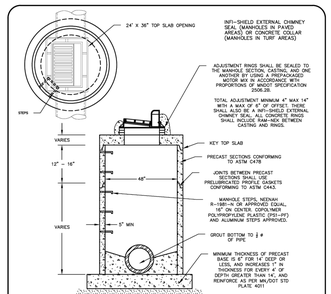
WATER MAIN DETAILS AND TIE SCHEDULE TABLE — Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-10



WATERMAIN WET TAP — Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-11

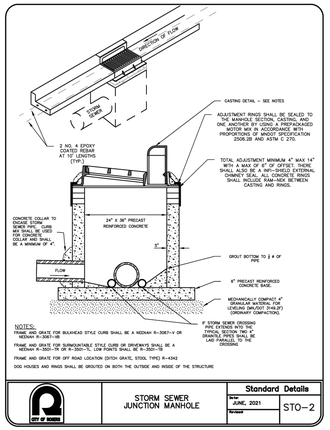


COMMERCIAL WATER SERVICE TESTING DETAIL — Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-12



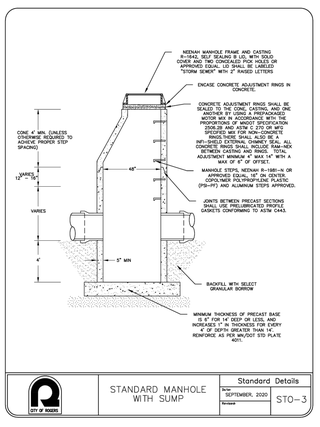
NOTES:
FRAME AND GRATE FOR BULKHEAD STYLE CURB SHALL BE A NEENAH R-3067-V OR NEENAH R-3067-W
FRAME AND GRATE FOR SURMOUNTABLE STYLE CURB OR DRIVEWAYS SHALL BE A NEENAH R-3501-TR OR R-3501-TL LOW POINTS 3501-TR
FRAME AND GRATE FOR OFF ROAD LOCATION (DITCH GRATE, STOOL TYPE) R-4342
ALL MANHOLES WITH FRAME AND LID IN A PAVED AREA SHALL USE A NEENAH R-1642 WITH SOLID 3 LID WITH 2 CONCEALED PICK HOLES OR APPROVED EQUAL. LID SHALL BE LETTERED "STORM SEWER" WITH 2" RAISED LETTERS
DOG HOUSES SHALL BE GROUTED ON BOTH THE OUTSIDE AND INSIDE OF THE STRUCTURE
DRAINTILE OPENING MUST BE CORE-DRILLED OR PRECAST AND GROUTED INSIDE AND OUTSIDE OF THE STRUCTURE.

STORM SEWER MANHOLE — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-1

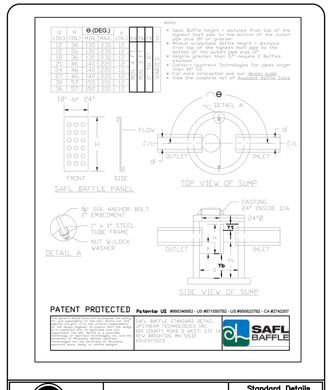


NOTES:
FRAME AND GRATE FOR BULKHEAD STYLE CURB SHALL BE A NEENAH R-3067-V OR NEENAH R-3067-W
FRAME AND GRATE FOR SURMOUNTABLE STYLE CURB OR DRIVEWAYS SHALL BE A NEENAH R-3501-TR OR R-3501-TL LOW POINTS 3501-TR
FRAME AND GRATE FOR OFF ROAD LOCATION (DITCH GRATE, STOOL TYPE) R-4342
ALL MANHOLES WITH FRAME AND LID IN A PAVED AREA SHALL USE A NEENAH R-1642 WITH SOLID 3 LID WITH 2 CONCEALED PICK HOLES OR APPROVED EQUAL. LID SHALL BE LETTERED "STORM SEWER" WITH 2" RAISED LETTERS
DOG HOUSES SHALL BE GROUTED ON BOTH THE OUTSIDE AND INSIDE OF THE STRUCTURE.

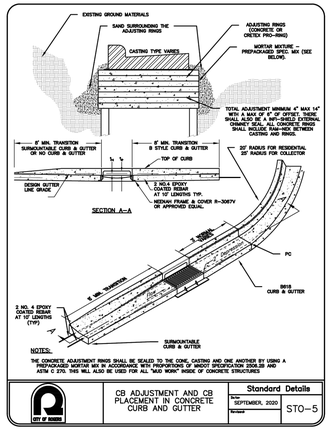
STORM SEWER JUNCTION MANHOLE — Standard Details — Date: JUNE, 2021 — Revised: — STO-2



STANDARD MANHOLE WITH SUMP — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-3

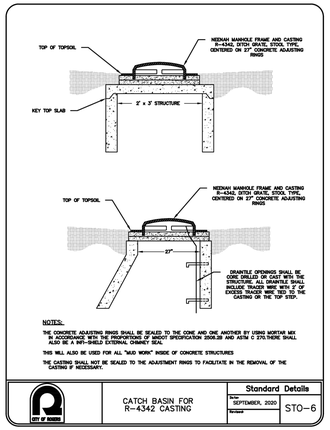


SAFL BAFFLE — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-4



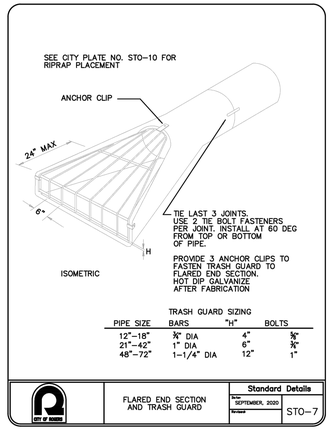
NOTES:
THE CONCRETE ADJUSTMENT RINGS SHALL BE SEALED TO THE CONE, CASTING AND ONE ANOTHER BY USING A PREPACKAGED MORTAR MIX IN ACCORDANCE WITH PROPORTIONS OF MNDOT SPECIFICATION 2506.2E AND ASTM C 270. THIS WILL ALSO BE USED FOR ALL "MUD WORK" INSIDE OF CONCRETE STRUCTURES

CB ADJUSTMENT AND CB PLACEMENT IN CONCRETE CURB AND GUTTER — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-5



NOTES:
THE CONCRETE ADJUSTING RINGS SHALL BE SEALED TO THE CONE AND ONE ANOTHER BY USING MORTAR MIX IN ACCORDANCE WITH THE PROPORTIONS OF MNDOT SPECIFICATION 2506.2E AND ASTM C 270.THERE SHALL ALSO BE A INFI-SHIELD EXTERNAL CHIMNEY SEAL
THIS WILL ALSO BE USED FOR ALL "MUD WORK" INSIDE OF CONCRETE STRUCTURES
THE CASTING SHALL NOT BE SEALED TO THE ADJUSTMENT RINGS TO FACILITATE IN THE REMOVAL OF THE CASTING IF NECESSARY.

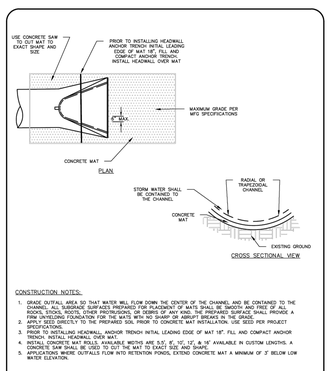
CATCH BASIN FOR R-4342 CASTING — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-6



TRASH GUARD SIZING

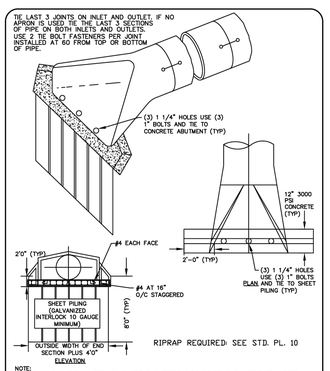
PIPE SIZE	BARS	"H"	BOLTS	
12"–18"	¾" DIA	4"	¾"	
21"–42"	1" DIA	6"	¾"	
48"–72"	1–1/4" DIA	12"	1"	

FLARED END SECTION AND TRASH GUARD — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-7



CONSTRUCTION NOTES:
1. GRADE OUTFALL AREA SO THAT WATER WILL FLOW DOWN THE CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. REMOVE ALL OBSTRUCTIONS, INCLUDING BUT NOT LIMITED TO, ROCKS, LOGS, STUMPS, BRUSH, TRASH, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS WITH NO SHARP OR ABRUPT BREAKS IN THE GRADE.
2. APPLY FERTILIZER DIRECTLY TO THE PREPARED SOIL PRIOR TO CONCRETE MAT INSTALLATION. SEED PER PROJECT SPECIFICATIONS.
3. PRIOR TO INSTALLING HEADWALL, ANCHOR TRENCH INITIAL LEADING EDGE OF MAT 18". FILL AND COMPACT ANCHOR TRENCH. INSTALL HEADWALL OVER MAT.
4. INSTALL CONCRETE MAT ROLLS, AVAILABLE WIDTHS ARE 5.5', 8', 10', 12', & 16' AVAILABLE IN CUSTOM LENGTHS, A MINIMUM OF 3' OF OVERLAP IS REQUIRED AT ALL JOINTS. SEE MAT LAYOUT PLAN.
5. APPLICATIONS WHERE OUTFALLS FLOW INTO RETENTION PONDS, EXTEND CONCRETE MAT A MINIMUM OF 3' BELOW LOW WATER ELEVATION.

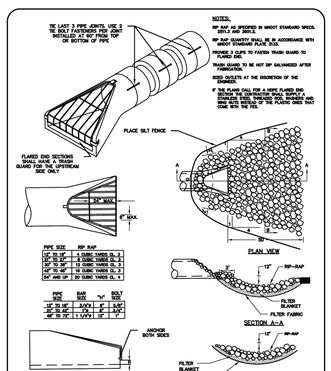
CONCRETE EROSION MAT OUTLET INSTALLATION DETAIL — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-8



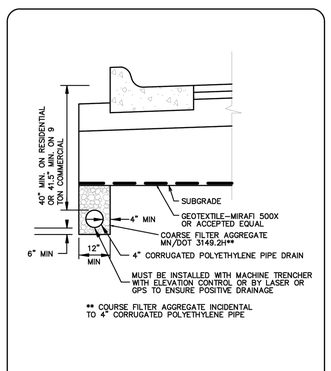
RIPRAP REQUIRED: SEE STD. PL. 10

NOTE:
THIS DRAWING IS TYPICAL FOR ALL FLARED END SECTIONS 30 INCHES IN DIAMETER OR LARGER.

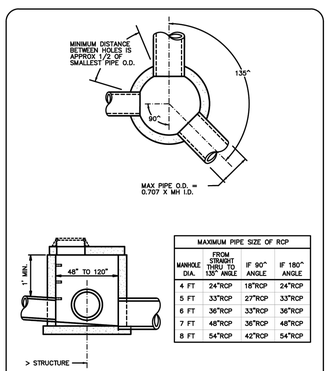
OUTLET SHEET PILING — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-9



RIPRAP AT OUTLETS — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-10

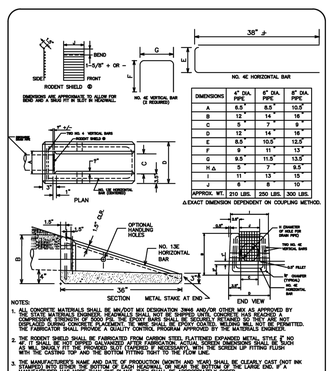


POLYETHYLENE PERFORATED PIPE — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-11



MANHOLE DIA.	MAXIMUM PIPE SIZE OF RCP FROM STRAIGHT THRU TO 135° ANGLE	IF 90° ANGLE	IF 180° ANGLE
4 FT	24"RCP	18"RCP	24"RCP
5 FT	33"RCP	27"RCP	33"RCP
6 FT	36"RCP	33"RCP	36"RCP
7 FT	48"RCP	36"RCP	48"RCP
8 FT	54"RCP	42"RCP	54"RCP

MANHOLE SIZING CHART — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-12



DIMENSIONS	6" DIA. PIPE	8" DIA. PIPE	10" DIA. PIPE
A	6.5 "	8.5 "	10.5"
B	12 "	14 "	16 "
C	5 "	7 "	9 "
D	12 "	14 "	16 "
E	8.5 "	10.5 "	12.5"
F	9 "	11 "	13 "
G	9.5 "	11.5"	13.5"
H Δ	5 "	7 "	9.5 "
I	11 "	13 "	15 "
J	6 "	8 "	10 "
APPROX. WT.	210 LBS.	250 LBS.	300 LBS.

Δ EXACT DIMENSION DEPENDENT ON COUPLING METHOD.

NOTES:
1. ALL CONCRETE MATERIALS SHALL BE MN/DOT MIX DESIGNATION 3946 AND/OR OTHER MIX AS APPROVED BY THE ENGINEER. STRENGTH TO BE 4000 PSI AT 28 DAYS. CONCRETE SHALL NOT BE POURED UNTIL REINFORCEMENT HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER. CONCRETE SHALL BE CURED AND PROTECTED AS PER MN/DOT 2461.3F. CONCRETE SHALL NOT BE PLACED IN FREEZING OR FROST CONDITIONS UNLESS PROTECTION IS PROVIDED. THE FABRICATOR SHALL PROVIDE A QUALITY CONTROL PROGRAM APPROVED BY THE MATERIALS ENGINEER.
2. THE RODENT SHIELD SHALL BE FABRICATED FROM CARBON STEEL FLATTENED EXPANDED METAL, STYLE 8 AND AT 18 SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION. INTERNAL SCREEN DIMENSIONS SHALL BE SUCH THAT THE SCREEN WILL FIT SNUGLY AGAINST THE INSIDE OF THE PIPE WALL. THE SCREEN LIP FITTING FLUSH WITH THE CASTING TOP AND THE BOTTOM FITTING TIGHT TO THE FLOW LINE.
3. THE MANUFACTURER'S NAME AND DATE OF PRODUCTION (MONTH AND YEAR) SHALL BE CLEARLY CAST (NOT INK STAMPED) INTO EITHER TOP BOTTOM OF EACH HEADWALL OR HEAD. THE BOTTOM OF THE "LARGE END" IF A MANUFACTURER HAS MORE THAN ONE PLANT, THEY SHALL BE APPROPRIATELY CODED.

PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS — Standard Details — Date: SEPTEMBER, 2020 — Revised: — STO-13

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874C-DTF01.DWG

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

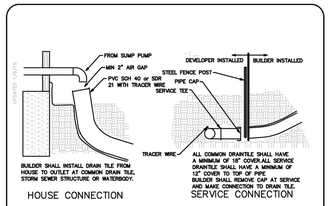
Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

DETAILS

SHEET NUMBER: 21 OF 24
PROJECT NUMBER: 0033874.00
DATE: 04/02/25

© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



SUMP PUMP DISCHARGE REQUIREMENTS	Standard Details	STO-14
	Date: SEPTEMBER, 2020	
	Revised:	

CITY OF ROGERS MINIMUM DRAIN TILE REQUIREMENTS

(REQUIREMENTS FOR ALL NEW HOMES AS OF JANUARY, 2016)

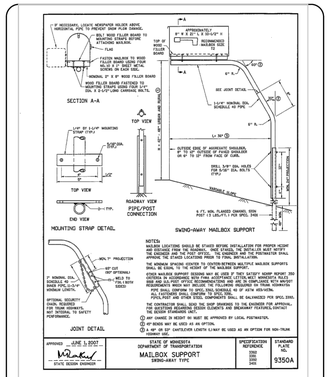
- PIPE SIZE – 4" PVC
- TYPE OF PIPE – SCH 40 OR ASTM 1785, OR SDR 21
- DEPTH OF PIPE – 12" TO TOP OF PIPE FROM FINISH GRADE
- TRACER WIRE – MINIMUM GAUGE #12 COPPERHEAD COPPER CLAD STEEL TRACER WIRE, GREEN IN COLOR.

NOTE: ALL STORM SEWER PIPE CROSSINGS THAT PENETRATE THE TYPICAL SECTION SHALL INCLUDE DRAINTILE THAT RUNS PARALLEL TO THE CROSSING. THIS DRAINTILE SHALL TIE INTO BOTH DRAINAGE STRUCTURES AND BE PLACED AT THE BOTTOM OF THE PIPE TRENCH.

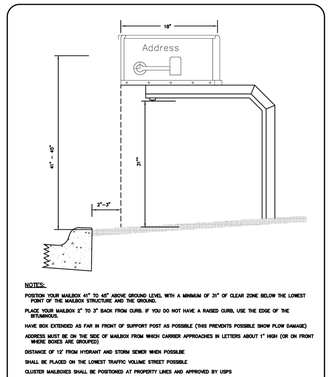
NOTE: CORRECT FITTINGS MUST BE USED WITH ALL PIPE, NO TAPING OR SPLICING WILL BE ACCEPTED. A TRACER WIRE SHALL BE INSTALLED ALONG WITH THE PIPE, THIS WIRE MUST BE COPPERHEAD #12 AWG CCS @230HS COMPLYING WITH ASTM–D–1248, 30 VOLT RATING BE EXPOSED A MINIMUM LENGTH OF 12 INCHES AT THE HOUSE AND SHALL DEAD END AT THE CONNECTION OR TILE DISCHARGE. NO WIRE SHALL BE ACCEPTED EXCEPT AS SPECIFIED ABOVE.

NOTE: THE TRENCH MUST BE LEFT OPEN AT ALL CONNECTIONS FOR INSPECTION PURPOSES. IF A TILE LINE IS TO DEAD END INTO A POND OR WET LAND A FENCE POST SHALL CLEARLY MARK ITS END. ALL INSPECTIONS SHALL REQUIRE A 24 HOUR NOTICE. ALL TRENCHES MUST BE BACK FILLED WITHIN 24 HOURS. IT IS RECOMMENDED THAT A REPRESENTATIVE OF THE BUILDER BE PRESENT AT ALL INSPECTIONS.

SUMP PUMP DISCHARGE REQUIREMENTS	Standard Details	STO-14A
	Date: SEPTEMBER, 2020	
	Revised:	



RURAL MAILBOX INSTALLATION	Standard Details	STR-1
	Date: SEPTEMBER, 2020	
	Revised:	



NOTES:

POSITION YOUR MAILBOX 41" TO 45" ABOVE GROUND LEVEL WITH A MINIMUM OF 21" OF CLEAR ZONE BELOW THE LOWEST POINT OF THE MAILBOX STRUCTURE AND THE GROUND.

PLACE YOUR MAILBOX 2" TO 3" BACK FROM CURB. IF YOU DO NOT HAVE A RAISED CURB, USE THE EDGE OF THE SHOULDER.

HAVE BOX EXTENDED AS FAR IN FRONT OF SUPPORT POST AS POSSIBLE (THIS PREVENTS POSSIBLE SNOW PLOW DAMAGE)

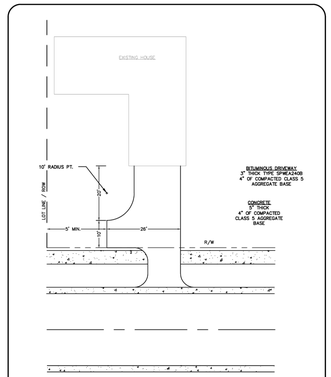
ADDRESS MUST BE ON THE SIDE OF MAILBOX FROM WHICH CARRIER APPROACHES IN LETTERS ABOUT 1" HIGH (OR ON FRONT WHERE BOXES ARE GROUPED)

DISTANCE OF 10' FROM HYDRANT AND STORM SEWER WHEN POSSIBLE

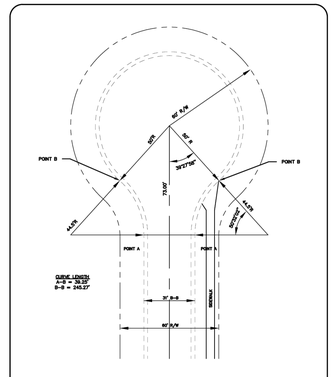
SHALL BE PLACED ON THE LOWEST TRAFFIC VOLUME STREET POSSIBLE

CLUSTER MAILBOXES SHALL BE POSITIONED AT PROPERTY LINES AND APPROVED BY USPS

URBAN MAILBOX INSTALLATION	Standard Details	STR-2
	Date: SEPTEMBER, 2020	
	Revised:	



TURN–AROUND DRIVEWAY	Standard Details	STR-3
	Date: SEPTEMBER, 2020	
	Revised:	



CUL–DE–SAC 60' ROW	Standard Details	STR-4
	Date: SEPTEMBER, 2020	
	Revised:	

OFFSET CUL–DE–SAC 60' ROW	Standard Details	STR–5
	Date: SEPTEMBER, 2020	
	Revised:	

CUL–DE–SAC WITH ISLAND	Standard Details	STR–6
	Date: SEPTEMBER, 2020	
	Revised:	

TYPICAL SECTION FOR COLLECTOR & RESIDENTIAL STREETS –URBAN SECTION	Standard Details	STR–7A
	Date: SEPTEMBER, 2019	
	Revised:	

TYPICAL SECTION FOR RESIDENTIAL STREET – RURAL SECTION	Standard Details	STR–7B
	Date: DECEMBER, 2020	
	Revised:	

TYPICAL SECTION COMMERCIAL – INDUSTRIAL, 9 TON DESIGN	Standard Details	STR–7C
	Date: SEPTEMBER, 2020	
	Revised:	

NOTES:

PLACE ALL ASPHALT IN ONE LIFT TO PROVIDE A MINIMUM OF 3.0" COMPACTED DEPTH.

PROVIDE A MINIMUM BASE OF 6" COMPACTED AGGREGATE. IMPORT ADDITIONAL MATERIALS IF MILLING FAILS TO PRODUCE ADEQUATE BASE MATERIAL.

TAMP ALL TRAIL EDGES AT A 45° BEVEL.

CONTRACTOR IS RESPONSIBLE FOR ROUGH GRADING EDGES OF TRAIL CORRIDOR WITH ON–SITE MATERIAL. HOLD GRADES 2" LOWER THAN FINISHED TRAIL SURFACE TO ALLOW FOR ADDITIONAL TOPSOIL PLACEMENT AND SEED.

SLOPE OF BITUMINOUS TRAIL SHALL BE A MINIMUM OF 1% TO A MAXIMUM OF 2% TO THE DOWNHILL EDGE.

SIDEWALKS OR TRAIL CROSSING COMMERCIAL OR INDUSTRIAL DRIVEWAYS SHALL BE CONSTRUCTED TO DRIVEWAY REQUIREMENTS.

SUBGRADE MUST BE APPROVED BY THE ENGINEER.

SUBCUT WHERE UNSUITABLE MATERIALS EXIST AS DIRECTED BY THE ENGINEER IN THE FIELD. SUBCUT AREAS SHALL BE BACKFILLED WITH SUITABLE MATERIAL AS DETERMINED BY THE ENGINEER.

BITUMINOUS TRAIL TYPICAL SECTION	Standard Details	STR–8
	Date: SEPTEMBER, 2020	
	Revised:	

TYPICAL INTERSECTION	Standard Details	STR–9
	Date: SEPTEMBER, 2020	
	Revised:	

MANHOLE CASTING ADJUSTMENT DETAIL	Standard Details	STR–10
	Date: SEPTEMBER, 2020	
	Revised:	

PRIVATE UTILITY CONDUIT CROSSING	Standard Details	STR–11
	Date: SEPTEMBER, 2020	
	Revised:	

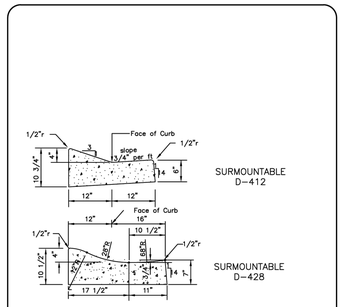
NOTES:
SAW CUT ENTIRE DEPTH OF CURB BOTH SIDES OF DAMAGED AREA AS DIRECTED BY ENGINEER.

CURB REPLACEMENT DETAIL	Standard Details	STR–12
	Date: SEPTEMBER, 2020	
	Revised:	

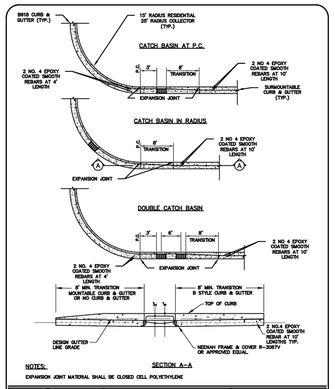
MaxiForce™ Collapsible Bollard
Standard Body, Wrench Operated, Standard Slide 3 Head, Simple Base
Removable Pin for bollard removal operation with key or tool. Pin is captured loosely by a spring for ease of operation. Pin is retained by the Head. Pin is NOT a lock and cannot be used to secure bollard.
Optional Lock cores may be ordered for locking bollard in place. Lock cores are keyed alike and provided with 2 keys.
Push surface when locked to release Head. Head will pop up for mechanical engagement.
Simple Base
Low Maintenance, Flexible steel construction
No concrete required for set up. Bollard is flexible to facility movement
No complex assembly required at the time of installation
Bollard can be removed and replaced when required
Finish colour must be paid only at the start of the order number.
Any changes will incur extra charges
Additional stock available upon request
Bollard Body & Base
Bollard Head
Pin
Lock Core
Push surface when locked to release Head. Head will pop up for mechanical engagement.
Simple Base
Bollard Body

© 2025 Westwood Professional Services, Inc.

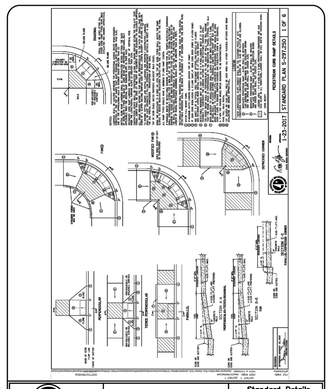
Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



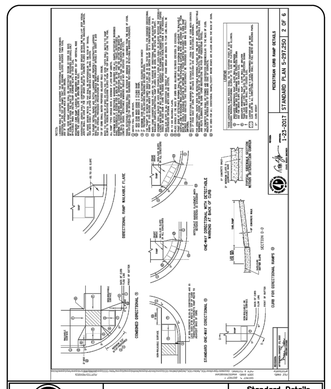
CURB RADIUS — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-1A



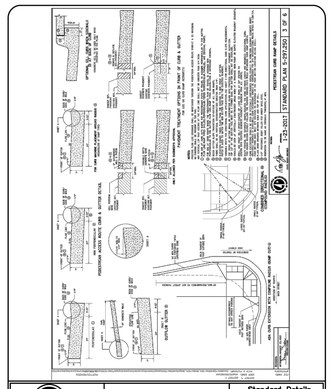
CURB RADIUS — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-2



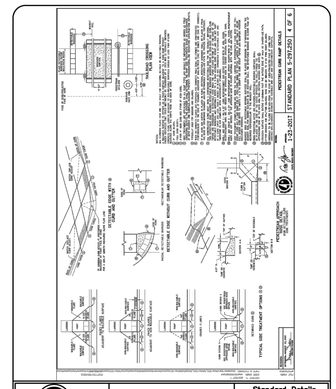
PEDESTRIAN CURB RAMP FOR SIDEWALK OR TRAIL — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-3



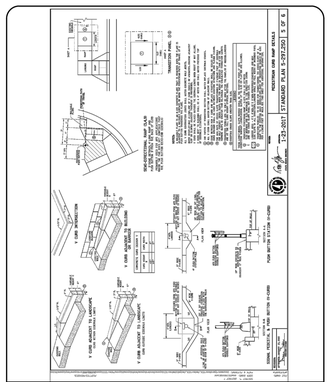
PEDESTRIAN CURB RAMP FOR SIDEWALK AND TRAILS — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-4



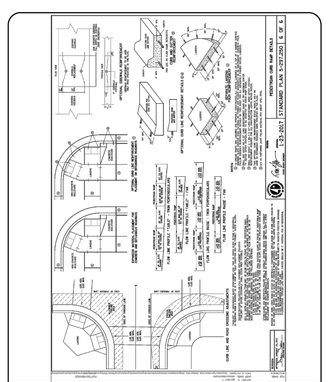
TYPICAL SECTION FOR RESIDENTIAL STREETS RURAL SECTION — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-5



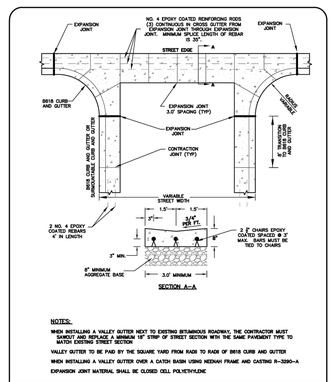
PEDESTRIAN CURB RAMP FOR SIDEWALK OR TRAIL — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-6



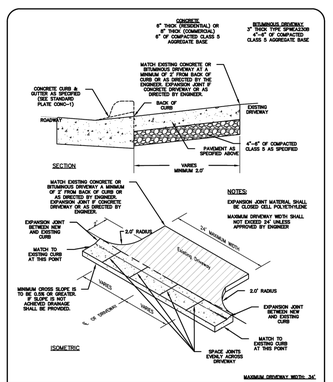
PEDESTRIAN CURB RAMP FOR SIDEWALK OR TRAIL — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-7



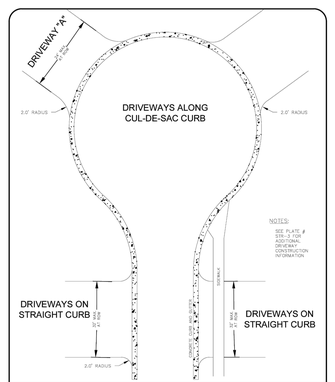
PEDESTRIAN CURB RAMP FOR SIDEWALK OR TRAIL — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-8



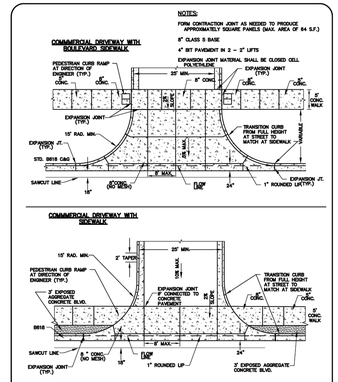
CONCRETE VALLEY GUTTER — Standard Details — Date: JUNE, 2021 — Revised — CON-9



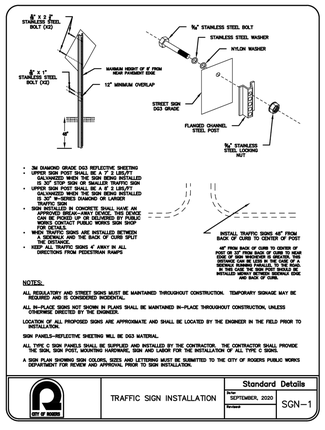
RESIDENTIAL AND COMMERCIAL DRIVEWAY — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-10



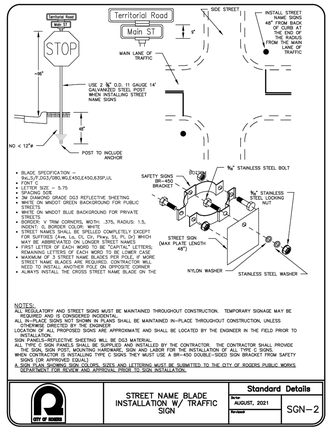
RESIDENTIAL AND COMMERCIAL DRIVEWAY ALONG CUL-DE-SAC — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-11



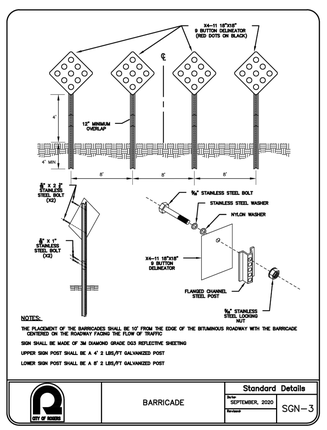
INDUSTRIAL / COMMERCIAL DRIVEWAY APRON — Standard Details — Date: SEPTEMBER, 2020 — Revised — CON-12



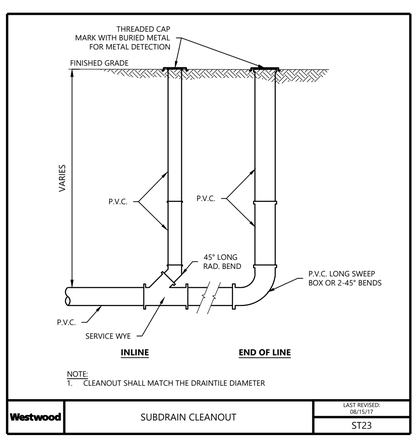
TRAFFIC SIGN INSTALLATION — Standard Details — Date: SEPTEMBER, 2020 — Revised — SGN-1



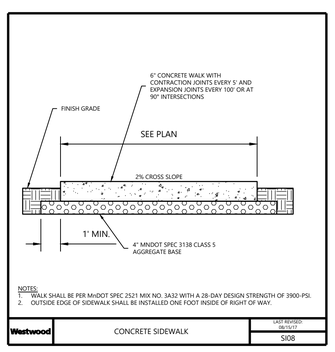
STREET NAME BLADE INSTALLATION W/ TRAFFIC SIGN — Standard Details — Date: AUGUST, 2021 — Revised — SGN-2



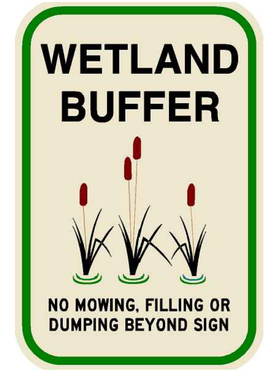
BARRICADE — Standard Details — Date: SEPTEMBER, 2020 — Revised — SGN-3



Westwood — SUBDRAIN CLEANOUT — LAST REVISED: 08/15/17 — ST23



Westwood — CONCRETE SIDEWALK — LAST REVISED: 08/15/17 — SI08



WETLAND BUFFER SIGN (8"X12")

CONSTRUCTION PLANS

NORTHVIEW PRESERVE

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874C_DTF01.DWG

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: ###
VERTICAL SCALE: ### OR ##

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

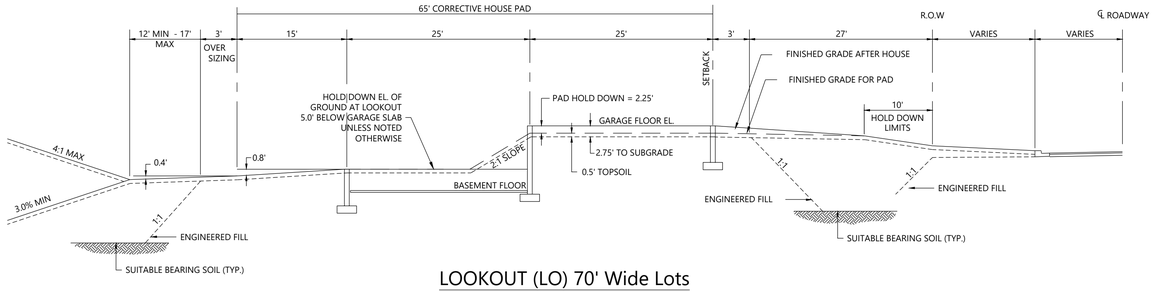
DETAILS

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 23 OF 24
DATE: 04/02/25

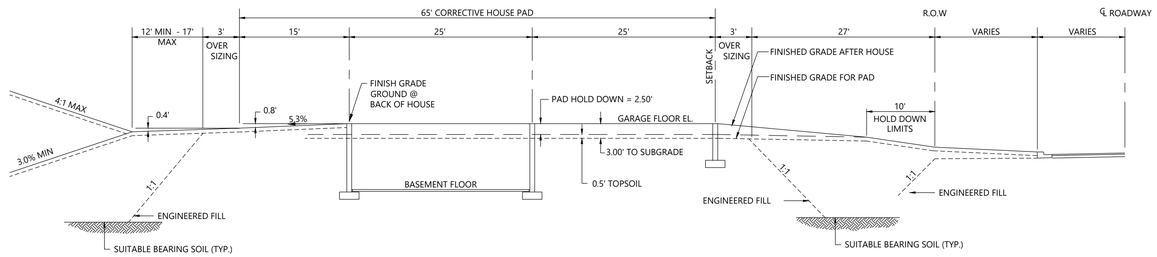
© 2025 Westwood Professional Services, Inc.

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



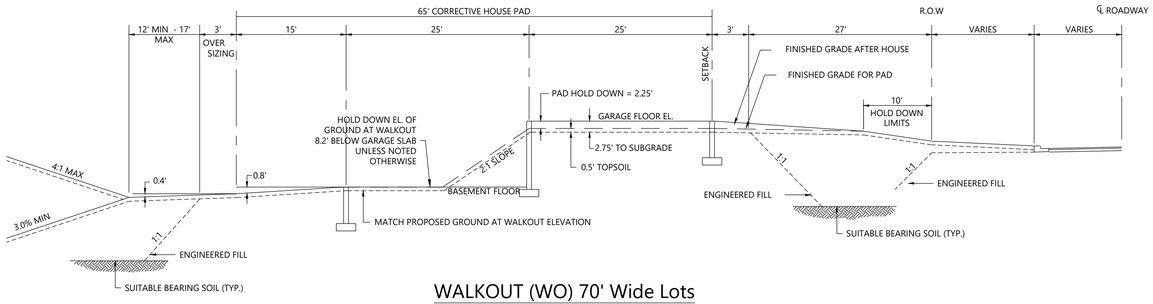
LOOKOUT (LO) 70' Wide Lots

N.T.S.



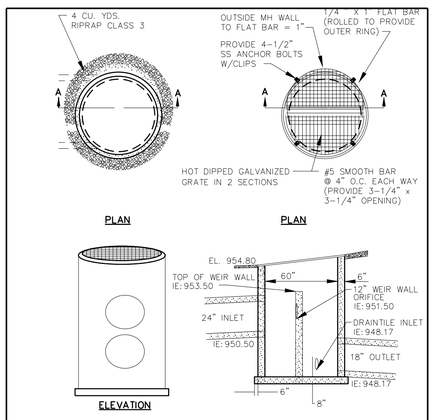
RAMBLER (R) 70' Wide Lots

N.T.S.

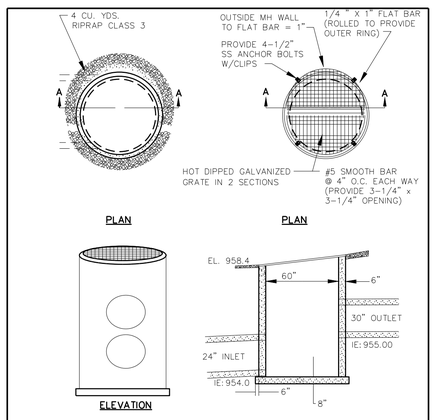


WALKOUT (WO) 70' Wide Lots

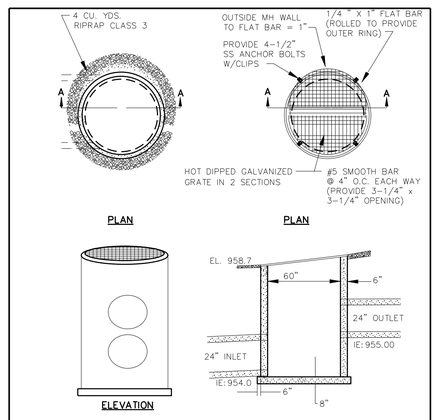
N.T.S.



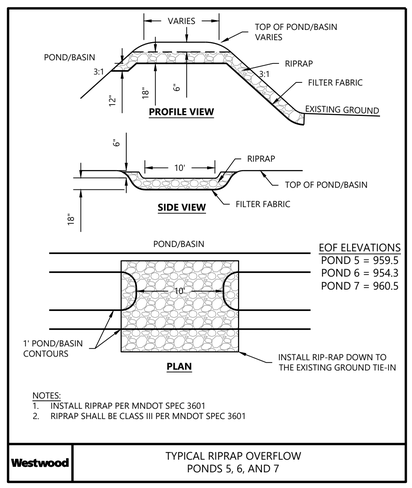
Westwood | OUTLET CONTROL STRUCTURE (OCS) POND 6 (OCS-161)



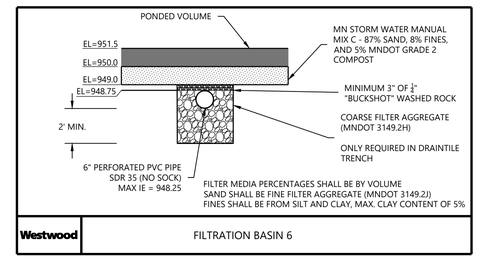
Westwood | OUTLET CONTROL STRUCTURE (OCS) POND 7 (OCS-201)



Westwood | OUTLET CONTROL STRUCTURE (OCS) POND 5 (OCS-142)



Westwood | TYPICAL RIPRAP OVERFLOW PONDS 5, 6, AND 7



Westwood | FILTRATION BASIN 6

N:\0033874.00\DWG\CIVIL\FINAL\UTILITY\0033874C-DTF01.DWG

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE: 04/02/25
REVISIONS:
1 . .
2 . .
3 . .
4 . .
5 . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 04/02/25 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

DETAILS

PROJECT NUMBER: 0033874.00

SHEET NUMBER: 24 OF 24
DATE: 04/02/25

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.7

Subject: Approve Change Order No. 1, South Community Park Buildings, City Project No. 2104
Prepared By: Doran Cote, Public Works Director/City Engineer

Recommended Council Action
Motion to Approve Change Order No. 1, South Community Park Buildings, City Project No. 2104

Overview / Background / Analysis
On August 15, 2024, the City Council approved Resolution No. 2024-75 accepting bids, awarding contracts and assigning the contracts to Terra Construction for the South Community Park Warming House and Maintenance Building in the amount of $1,328,829.00. That resolution included bid alternates for FinnDoors brand bifold doors for the maintenance building and tongue-in-groove siding in the concession and warming house.

Change Order No. 1 in the amount of $105,176.46 is primarily for permit costs ($45,212.17), adding plumbing to the maintenance building for filling the Zamboni ($21,440.00), adding electric strikes and panic hardware to the doors ($5,887.52), changing from wet and dry fire suppression to dry only ($8,146.40), minor soil corrections at the warming house ($7,150.40) and adding fire alarm monitoring ($14,534.00). The remaining items can be found on the attached Change Order No. 1.

The total estimated contract cost for this portion of the project, including Change Order No. 1 is $1,434,005.46 or 7.9% over the original contract amount. ISD 728 has agreed to pay for half of the maintenance building upon completion, thus reducing the city's cost by approximately $150,000.00 bringing the city's total project cost for this portion of the project to $1,284,005.46 or 3.4% under the original contract amount.

The total estimated cost for the grounds portion of the project was $3,050,864.88 which is $50,864.88 or 1.7% over the total estimated cost of $3,000,000 at the time of bid award. The total estimated cost of the buildings portion of the project is $1,284,005.46 which is $44,823.54 or 3.4% under the total estimated cost at the time of bid award.

The total estimated project cost including the grounds, warming house and maintenance building, was $6,000,000 when the LOST was extended. The total project cost, including the grounds, buildings, park shelter, furnishings, fixtures, power, gas, fiber optics, security, engineering and administration, is now estimated to be $4,640,000.00 or $1,360,000.00 under the revised LOST project amount.

Once the project is complete and the fields are playable we expect to receive a $300,000.00 grant from Hennepin County Youth Sports and we are expecting a $50,000.00 donation from ROYBA or the dugouts bringing the total project cost to $4,290,200.00 or $1,710,000 under the revised LOST amount.

Staff Recommendation
Motion to Approve Change Order No. 1, South Community Park Buildings, City Project No. 2104

Financial Impact: $105,176.46 **Source Fund**: LOST

Budgeted? Yes

Supporting Documentation
A. Change Order No. 1 - RSCP Buildings

CHANGE ORDER NO. OCO-001

TITLE: OCO#001 - RSCP Buildings **Date: May 21, 2025**

PROJECT NO: 24-844

PROJECT:
Rogers SCP Warming House and Heated Storage

TO CONTRACTOR:
Terra Construction
21025 Commerce Blvd., Suite 1000
Rogers MN 55374

THE CONTRACT IS CHANGED AS FOLLOWS:

(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

COR001	Permit Costs	$45,212.17
COR002	Added Utilities for Storage Building - Labor	$0.00
COR003	Added Utilities for Storage Building - Materials	$0.00
COR004	Added Plumbing in the Storage Building - Labor	$14,120.00
COR005	Added Plumbing in the Storage Building - Materials	$7,320.00
COR006	Door 100 Steel vs Aluminum Change - Labor	-998.30
COR007	Door 100 Steel vs Aluminum Change - Materials	-1,856.50
COR008	Door 103 - Add 1/2 Glass - Labor	$312.96
COR009	Door 103 - Add 1/2 Glass - Materials	$100.00
COR010	Added Door at Mechanical Room 106B - Labor	$1,265.23
COR011	Added Door at Mechanical Room 106B - Materials	$606.58
COR012	New Footing Needed at Storage Building - Labor	$0.00
COR013	Added Floor Drain - Warming House - Labor	$1,700.00
COR014	Added Floor Drain - Warming House - Materials	$576.00
COR015	Grease Int. and Water Bottle Filler - Labor	$200.00
COR016	Grease Int. and Water Bottle Filler - Materials	-470.00
COR017	E-Strikes and Panic Hardware - Labor	$200.00
COR018	E-Strikes and Panic Hardware - Materials	$5,687.52
COR019	Fire Suppression System Change - Labor	$3,526.40
COR020	Fire Suppression System Change - Materials	$4,620.00
COR021	Soil Correction at Warming House - Labor	$4,876.40
COR022	Soil Correction at Warming House - Materials	$2,274.00
COR023	Fire Alarm System and Monitoring - Labor	$7,526.00
COR024	Fire Alarm System and Monitoring - Materials	$7,008.00
COR025	Added Valves in Unisex Restroom - Labor	$200.00
COR026	Added Valves in Unisex Restroom - Materials	$1,170.00

CHANGE ORDER NO. OCO-001

The original Contract Sum was	**$1,328,829.00**
The net change by previously authorized Change Orders	**$0.00**
The Contract Sum prior to this Change Order was	**$1,328,829.00**
The Contract Sum will be increased by this Change Order in the amount of	**$105,176.46**
The New Contract Sum Including This Change Order	**$1,434,005.46**
The Contract Time Will Not Be Changed	
The date of Substantial Completion as of the date of this Change Order	

ARCHITECT *(Firm name)*	**CONTRACTOR** *(Firm name)*	**OWNER** *(Firm name)*
ADDRESS	**ADDRESS**	**ADDRESS**
(Typed Name)	*(Typed Name)*	*(Typed Name)*
BY *(Signature)*	**BY** *(Signature)*	**BY** *(Signature)*
DATE	**DATE**	**DATE**

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.8

Subject: Approve Change Orders No. 5 (Labor), 6 (Materials), 7 (Labor) and 8 (Materials), Indoor Turf Facility, City Project No. 2201
Prepared By: Doran Cote, Public Works Director/City Engineer

Recommended Council Action
Motion to Approve Change Orders No. 5 (Labor), 6 (Materials), 7 (Labor) and 8 (Materials), Indoor Turf Facility, City Project No. 2201

Overview / Background / Analysis
The City of Rogers is constructing a multi-purpose year around synthetic turf athletic facility that will be used for soccer, baseball, softball, lacrosse, football, walking and exercise. On August 27, 2024, the City Council awarded a contract for Bid Package 1 for the turf structure to Legacy Building Solutions for $4,375,902 with two alternates totaling $144,895 for a total construction cost of $4,420,391 and an estimated total project cost of $4,800,000.

On October 22, 2024, The City Council awarded a contract for Bid Package 2 for the site work, entrance, restrooms, programming areas, electrical, mechanical, plumbing and the artificial turf for $7,313,336 including Alternates #01 (precast mezzanine) and #06 (winter conditions) at an estimated total project cost of $8,800,000. The total estimated project cost at the time of bid award including engineering, architecture, administration, CM contingency, permits, insurance, bonds, testing and fees was $13,600,000.

On February 11, 2025, the City Council approved Change Order No. 1 (Labor) a credit in the amount of -$19,567.00 and Change Order No. 2 (Material) in the amount of $59,896.46. On April 8, 2025, the City Council approved Change Order No. 3 (Labor) in the amount of $26,747.00 and Change Order No. 4 (Material) in the amount of $40,445.00.

Change Order No. 5 (Labor) in the amount of $50,153.48 is for the following items (parenthesis indicates a credit):
COR003 Owner Requested Overhead Coiling Door Size Change - $0.00
COR025 Legacy Temporary Bracing - $0.00
COR037 Owner Requested Mezzanine Gate - $1,492.00
COR039 Owner Requested Utility Changes to Accommodate RAC Expansion - $10,758.54**
COR043 Three-Phase Wiring for Divider Curtain - $4,253.55
COR045 Added/Revised Wi-fi, Camera, and Card Readers - $5,577.59

COR051 Legacy Added ARV - Labor $0.00
COR062 Owner Requested Watermain Removal - Labor $4,314.00
COR065 Added Cast-in-Place Footings for Exterior Mechanical Pads - $23,757.80

Change Order No. 6 (Material) in the amount of $31,666.09 is for the following items (parenthesis indicates a credit):
COR004 Owner Requested Overhead Coiling Door Size Change - $0.00
COR026 Legacy Temporary Bracing - $0.00
COR038 Owner Requested Mezzanine Gate - $1,470.00
COR040 Owner Requested Utility Changes to Accommodate RAC Expansion - $2,493.57**
COR044 Three-Phase Wiring for Divider Curtain - $1,170.29
COR046 Added/Revised Wi-fi, Camera, and Card Readers - ($3,214.03)
COR052 Legacy Added ARV - Labor $0.00
COR066 Added Cast-in-Place Footings for Exterior Mechanical Pads - $14,508.00

Note: The CORs covered by Change Order No. 6 do not total $31,666.09 but rather $16,427.83, a net difference of $15,238.26 which was actually a Material contingency cost. However, the original contract did not have any Material contingencies, but rather, it was all "housed" in Labor in the Terra cost accounting system. The following Change Orders correct both of these situations.

Change Order No. 7 (Labor) in the amount of -$250,000.00 is for the following item (parenthesis indicates a credit):
COR 69 Transfers a portion of the Labor contingency to Material - $250,000.00

Change Order No. 8 (Material) in the amount of $250,000.00 is for the following item (parenthesis indicates a credit):
COR 68 Addition of contingency from Labor to Material - ($250,000.00)
COR 70 Reconciles Change Order No. 6 (Material) above - ($15,238.26) and $15,238.26

Approval of this Change Order will not negatively impact the remaining contingency for the project which is now $533,853.74 including Change Order No.5, Change Order No. 6, Change Order No. 7 and Change Order No. 8.

** COR039 and COR040 above represent underground utility changes requested in order to accommodate the RAC Expansion and will be funded by the RAC Expansion project thus lessening the burden on the contingency for this project.

Staff Recommendation
Motion to Approve Change Orders No. 5 (Labor), 6 (Materials), 7 (Labor) and 8 (Materials), Indoor Turf Facility, City Project No. 2201

Financial Impact: $81,819.57

Source Fund: LOST - Sales Tax

Budgeted? Yes

Supporting Documentation

A. Change Order No. 5 - Labor
B. Change Order No. 6 - Material
C. Change Order No. 7 - Labor
D. Change Order No. 8 - Material

CHANGE ORDER NO. OCO-005

TITLE: 24.818 - OCO #005 - Labor

Date: Apr 25, 2025

PROJECT NO: 24-818

PROJECT:
Rogers Indoor Turf Facility

TO CONTRACTOR:
Terra Construction
21025 Commerce Blvd., Suite 1000
Rogers MN 55374

THE CONTRACT IS CHANGED AS FOLLOWS:

(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

COR003	Overhead Coiling Door Size - Labor	$0.00
COR025	Legacy Temporary Bracing Labor price	$0.00
COR037	Mezzanine Gate - labor	$1,492.00
COR039	PR007R - Labor	$10,758.54
COR043	PR006 - Labor	$4,253.55
COR045	PR-008 - Labor	$5,577.59
COR051	Legacy Added ARV - Labor	$0.00
COR062	Watermain Removal - Labor	$4,314.00
COR065	PR#10 - Labor	$23,757.80

The original Contract Sum was	**$6,675,628.34**
The net change by previously authorized Change Orders	**$7,179.74**
The Contract Sum prior to this Change Order was	**$6,682,808.08**
The Contract Sum will be increased by this Change Order in the amount of	**$50,153.48**
The New Contract Sum Including This Change Order	**$6,732,961.56**
The Contract Time Will Not Be Changed	
The date of Substantial Completion as of the date of this Change Order	

	Terra Construction	City of Rogers
ARCHITECT *(Firm name)*	**CONTRACTOR** *(Firm name)*	**OWNER** *(Firm name)*
	21025 Commerce Blvd., Suite 1000 Rogers MN 55374	22350 South Diamond Lake Road Rogers MN 55374
ADDRESS	**ADDRESS**	**ADDRESS**
	Jake Dahlheimer	Doran Cote
(Typed Name)	*(Typed Name)*	*(Typed Name)*
BY *(Signature)*	**BY** *(Signature)*	**BY** *(Signature)*
DATE	**DATE**	**DATE**

CHANGE ORDER NO. OCO-006

TITLE: 24.818 - OCO #006 - Material

Date: Apr 25, 2025

PROJECT NO: 24-818

PROJECT:
Rogers Indoor Turf Facility

TO CONTRACTOR:
Terra Construction
21025 Commerce Blvd., Suite 1000
Rogers MN 55374

THE CONTRACT IS CHANGED AS FOLLOWS:

(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

COR004	Overhead Coiling Door Size - Material	$0.00
COR026	Legacy Temporary Bracing Material Price	$0.00
COR038	Mezzanine Gate - Material	$1,470.00
COR040	PR007R - Material	$2,493.57
COR044	PR006 - Material	$1,170.29
COR046	PR-008 - Material	-3,214.03
COR052	Legacy Added ARV - Material	$0.00
COR066	PR#10 - Material	$14,508.00

The original Contract Sum was	**$6,861,067.12**
The net change by previously authorized Change Orders	**$100,341.46**
The Contract Sum prior to this Change Order was	**$6,961,408.58**
The Contract Sum will be increased by this Change Order in the amount of	**$31,666.09**
The New Contract Sum Including This Change Order	**$6,993,074.67**
The Contract Time Will Not Be Changed	
The date of Substantial Completion as of the date of this Change Order	

	Terra Construction	City of Rogers
ARCHITECT *(Firm name)*	**CONTRACTOR** *(Firm name)*	**OWNER** *(Firm name)*
	21025 Commerce Blvd., Suite 1000 Rogers MN 55374	22350 South Diamond Lake Road Rogers MN 55374
ADDRESS	**ADDRESS**	**ADDRESS**
	Jake Dahlheimer	Doran Cote
(Typed Name)	*(Typed Name)*	*(Typed Name)*
BY *(Signature)*	**BY** *(Signature)*	**BY** *(Signature)*
DATE	**DATE**	**DATE**

CHANGE ORDER NO. OCO-007

TITLE: 24.818 - OCO#007 - Labor

Date: May 05, 2025

PROJECT NO: 24-818

PROJECT:
Rogers Indoor Turf Facility

TO CONTRACTOR:
Terra Construction
21025 Commerce Blvd., Suite 1000
Rogers MN 55374

THE CONTRACT IS CHANGED AS FOLLOWS:

(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

COR069	Addition of Contingency to Material Portion of Job - Labor Deduct	-250,000.00

The original Contract Sum was	**$6,675,628.34**
The net change by previously authorized Change Orders	**$42,094.96**
The Contract Sum prior to this Change Order was	**$6,717,723.30**
The Contract Sum will be increased by this Change Order in the amount of	**-250,000.00**
The New Contract Sum Including This Change Order	**$6,467,723.30**
The Contract Time Will Not Be Changed	
The date of Substantial Completion as of the date of this Change Order	

	Terra Construction	City of Rogers
ARCHITECT *(Firm name)*	**CONTRACTOR** *(Firm name)*	**OWNER** *(Firm name)*
	21025 Commerce Blvd., Suite 1000 Rogers MN 55374	22350 South Diamond Lake Road Rogers MN 55374
ADDRESS	**ADDRESS**	**ADDRESS**
	Jake Dahlheimer	Doran Cote
(Typed Name)	*(Typed Name)*	*(Typed Name)*
BY *(Signature)*	**BY** *(Signature)*	**BY** *(Signature)*
DATE	**DATE**	**DATE**

CHANGE ORDER NO. OCO-008

TITLE: 24.818 - OCO#008 - Materials

Date: May 05, 2025

PROJECT NO: 24-818

PROJECT:
Rogers Indoor Turf Facility

TO CONTRACTOR:
Terra Construction
21025 Commerce Blvd., Suite 1000
Rogers MN 55374

THE CONTRACT IS CHANGED AS FOLLOWS:

(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

COR068	Addition of Contingency to Material Portion of Job - Material	$250,000.00
COR070	Reconcile Material Contract Amount	$0.00

The original Contract Sum was	**$6,861,067.12**
The net change by previously authorized Change Orders	**$132,007.55**
The Contract Sum prior to this Change Order was	**$6,993,074.67**
The Contract Sum will be increased by this Change Order in the amount of	**$234,761.74**
The New Contract Sum Including This Change Order	**$7,227,836.41**
The Contract Time Will Not Be Changed	
The date of Substantial Completion as of the date of this Change Order	

	Terra Construction	City of Rogers
ARCHITECT *(Firm name)*	**CONTRACTOR** *(Firm name)*	**OWNER** *(Firm name)*
	21025 Commerce Blvd., Suite 1000 Rogers MN 55374	22350 South Diamond Lake Road Rogers MN 55374
ADDRESS	**ADDRESS**	**ADDRESS**
	Jake Dahlheimer	Doran Cote
(Typed Name)	*(Typed Name)*	*(Typed Name)*
BY *(Signature)*	**BY** *(Signature)*	**BY** *(Signature)*
DATE	**DATE**	**DATE**

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.9

Subject: Approve Purchase of Tennant Floor Scrubber for Public Works Maintenance Facility
Prepared By: Doran Cote, Public Works Director/City Engineer

Recommended Council Action
Motion to Approve Purchase of Tennant Floor Scrubber for Public Works Maintenance Facility

Overview / Background / Analysis
The approved 2025-2029 Capital Equipment Plan (CEP) includes the purchase of a replacement floor scrubber for the Public Works Maintenance Facility. The current floor scrubber was purchased used in 2015 and is no longer serviceable. While the mechanics have done their best to keep the floor scrubber operational, it needs frequent repairs and does not adequately clean the floors, leaving slip and trip hazards.





Staff worked with Tennant to have a floor scrubber demonstration to determine the best size for the facility. The CEP included $80,000 for the floor scrubber replacement. The best-fit floor scrubber is $62,026 off the State Contract (Contract #186080) and will be funded by the Capital Equipment Fund ($30,026), the Water Fund ($10,000), Sewer Fund ($10,000) and the Storm Sewer Fund ($10,000). This item is before the City Council because it was added to the CEP after the 2024-2025 Equipment List was approved.

Staff Recommendation
Motion to Approve Purchase of Tennant Floor Scrubber for Public Works Maintenance

Facility

Financial Impact: $62,076

Source Fund: 400, 601, 602 and 603

Budgeted? Yes

Supporting Documentation
A. Tennant Quote

Tennant Sales and Service Company
10400 Clean Street
Eden Prairie, MN 55344-2650 USA
Tel: 1-800-553-8033
Fax: 1-763-513-2142

Quotation

Ship-To

CITY OF ROGERS
PUBLIC WORKS
22350 S DIAMOND LAKE RD
ROGERS MN 55374-4773

Customer Number 4351849

CITY OF ROGERS
PUBLIC WORKS
22350 S DIAMOND LAKE RD
ROGERS MN 55374-4773

Quotation Number **24903969**

Quotation Date	05/05/2025
Valid Until	05/16/2025
PO Number	T17-C QUOTE
Buyer	PETE MOEN
Tel	763-428-8580

Delivery Terms
FOB SHIPPING PT FRT PPD & ADD
Payment Terms
Net 30 Days
Currency US Dollars

Bill-To

CITY OF ROGERS
PUBLIC WORKS
22350 S DIAMOND LAKE RD
ROGERS MN 55374-4773

Qty	Unit	Material	Description	Unit Price	Extended Value

Notes
MN STATE CONTRACT # 186080

1	PC	M-T17	MODEL T17 RIDER SCRUBBER		

Machine Warranty: Parts 36 m/ Labor 24m / Trip 6m/ 2000 hr

Reference Number: T17-C

Machine as equipped

Source Plant	**3200 Plant**
Trim Level	**Pro Membrane Panel**
Cleaning Type	**Cylindrical**
Cleaning Technology	**Conventional**
Squeegee Material	**Linatex**
Power Source	**Battery**
Battery	**Wet 750AH C/6**
Battery Watering System	**Yes**
Charger Location	**Off-Board**
Charger	**80A 200-240VAC 50/60Hz 3Ph**
UL/ETL Rating	**UL Type E**
Productivity Package	**Yes**
Safety Light Package	**Yes**
Side Brush Type	**Scrubbing**
Side Brush Location	**Right Hand**
Power Wand/Vacuum Wand	**Vacuum Wand**

Prepared By: Matthew Leneau, Customer Service Representative

TENNANT COMPANY
Tennant Sales and Service Company
10400 Clean Street
Eden Prairie, MN 55344-2650 USA
Tel: 1-800-553-8033
Fax: 1-763-513-2142

Quotation

Ship-To
CITY OF ROGERS
PUBLIC WORKS
22350 S DIAMOND LAKE RD
ROGERS MN 55374-4773

Customer Number 4351849
CITY OF ROGERS
PUBLIC WORKS
22350 S DIAMOND LAKE RD
ROGERS MN 55374-4773

Quotation Number **24903969**

Quotation Date	05/05/2025
Valid Until	05/16/2025
PO Number	T17-C QUOTE
Buyer	PETE MOEN
Tel	763-428-8580
Delivery Terms	FOB SHIPPING PT FRT PPD & ADD
Payment Terms	Net 30 Days
Currency	US Dollars

Bill-To
CITY OF ROGERS
PUBLIC WORKS
22350 S DIAMOND LAKE RD
ROGERS MN 55374-4773

Qty	Unit	Material	Description	Unit Price	Extended Value
		Spray Nozzle with Hose	**Yes**		
		Recovery Tank Drain	**Telescopic**		
		Heavy Duty Squeegee Protection	**Yes**		
		Power Steering	**Yes**		
		Seat	**Deluxe Seat with Armrests**		
		Front Tire(s)	**Non-Marking**		
		Rear Tire(s)	**Non-Marking**		
		Headlight(s)	**Yes**		
		Warning Lights and Alarms	**AV BU Alarm-Strobe on Tank**		
		Cleaning Tool	**Polypropylene Brush**		
		Side Cleaning Tool	**Polypropylene Brush**		
		Warranty	**Standard Warranty**		
		Ultimate Performance Guarantee	**Yes**		
		Operator Manual	**English**		
		Parts Manual	**Yes**		
		Packaging	**Pad Wrap**		
			Gov Price Adjustment	-6.00 %	-3,962.34
			Price	62,076.66	62,076.66
			Net Value	62,076.66	62,076.66

Subtotal 62,076.66
Total 62,076.66

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.10

Subject: Approve an Easement Encroachment Agreement for 22238 138th Ave N
Prepared By: Mike Albers, Assistant City Engineer

Recommended Council Action
Motion to Approve an Easement Encroachment Agreement for 22238 138th Ave N.

Overview / Background / Analysis
Alden Peterson and Elizabeth Peterson, the property owners, have requested approval of a Drainage and Utility Easement Encroachment Agreement for 22238 138th Ave N. The property owners have submitted a grading permit application to replace the three failing wood retaining walls in the rear yard of 22238 138th Ave N with a two tiered retaining wall (the “Improvements”). The existing retaining walls and the proposed Improvements are within the drainage and utility easement on the subject property. Upon completion of the installation of the Improvements, the property owners shall be responsible for ongoing maintenance, repair and replacement of the Improvements.

The City has determined by engineering review that construction of the Improvements by the property owners will not adversely impact the function of the drainage and utility easement area

A draft of the agreement is attached to this memorandum. Following full execution of the agreement, it will be recorded against the property with Hennepin County.

Staff Recommendation
Motion to Approve an Easement Encroachment Agreement for 22238 138th Ave N.

Financial Impact: **Source Fund**:

Budgeted? N/A

Supporting Documentation
A. Easement Encroachment Agreement

EASEMENT ENCROACHMENT AGREEMENT

This Easement Encroachment Agreement is entered into on the 27th day of May, 2025, between the City of Rogers, a Minnesota municipal corporation with its principle office at 22350 South Diamond Lake Road, Rogers, Minnesota, 55374 ("**City**") and Alden Peterson and Elizabeth Peterson, husband and wife, of 22238 138th Ave N, Rogers, Minnesota, 55374 ("**Owners**").

RECITALS

1. The Owners are the fee owners of the real property located at 22238 138th Ave N, Rogers, Minnesota, 55374 ("**Subject Property**") which property is legally described as follows:

   Legal Description
   Lot 18, Block 4, Sunnyside Estates, according to the recorded plat thereof, County of Hennepin, State of Minnesota.

2. The plat of Sunnyside Estates contains a drainage and utility easement as shown on said plat; a portion of said drainage and utility easement encumbers the Subject Property (together, the "**Easement Area**").

3. The Owners have requested that they be permitted to construct or have constructed retaining wall and landscape stair improvements within the Easement Area; as shown on the site plan attached hereto as Exhibit A (the "**Improvement**"), which is incorporated into and made part of this Agreement.

4. The Owners have indicated a willingness to accept all risks and liabilities associated with the construction of the Improvement within the Easement Area.

5. The City has determined, by engineering review, that construction of the Improvement by the Owners will not adversely impact the function of the Easement Area.

6. The City Council is willing to grant the Owner's request subject to certain conditions.

NOW, THEREFORE, the parties hereto agree as follows:

1. The Owners are allowed to construct the Improvement on the Subject Property as approved by the City as part of the Owner's site plan review, in accordance with Exhibit A.

2. The size of the easement encroachment is shown on the site plan in Exhibit A and described on the attached Exhibit B ("**Easement Encroachment Area**"). The Easement Encroachment Area is limited to that portion of the drainage and utility easement needed to install and maintain the Improvement as shown on the approved site plan.

3. The Improvement shall be installed and maintained such that it does not interfere with the drainage way or maintenance of the drainage and utility Easement Area.

4. The Owners accepts all risk and responsibility of constructing, using, maintaining, repairing, and improving the Improvement and agrees hereby to defend and indemnify the City from any and all damages or causes of action, whatsoever, to themselves or others, occurring as a result of the Improvement construction.

5. The City may, at its sole discretion, terminate this Agreement at any time by giving the then Owner of the Subject Property thirty (30) days advance written notice, except that no notice period will be required in the case of an emergency condition as determined solely by the City and the Agreement may then be terminated immediately. The Owner shall remove the Improvement to the extent it impacts the easement areas to the effective date of the termination of this Agreement. If the owner fails to do so, the City may remove the Improvement to the extent it impacts the easement areas and charge the cost of removal back to the Owner for reimbursement.

6. The City will be allowed to work and to maintain the area within the drainage and utility easement on the Subject Property if such need should arise for the easement to function properly.

7. This Agreement shall run with the land and shall be recorded against the title to the Subject Property.

[Remainder of Page Intentionally Left Blank]

OWNERS

_____
Name: Alden Peterson

_____
Name: Elizabeth Peterson

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

The foregoing instrument was acknowledged before me this _____ day of May, 2025 by Alden Peterson and Elizabeth Peterson, husband and wife.

_____
Notary Public

CITY OF ROGERS

_____
Shannon Klick

Its: Mayor

_____
Stacie Brown

Its: Clerk

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

The foregoing instrument was acknowledged before me this _____ day of May, 2025 by Shannon Klick and Stacie Brown, the Mayor and Clerk, respectively, for the City of Rogers.

_____
Notary Public

THIS INSTRUMENT WAS DRAFTED BY:
City of Rogers,
22350 South Diamond Lake Road
Rogers, Minnesota, 55374

EXHIBIT A

Depiction of the Easement Encroachment Area and the Improvement

[See attached.]

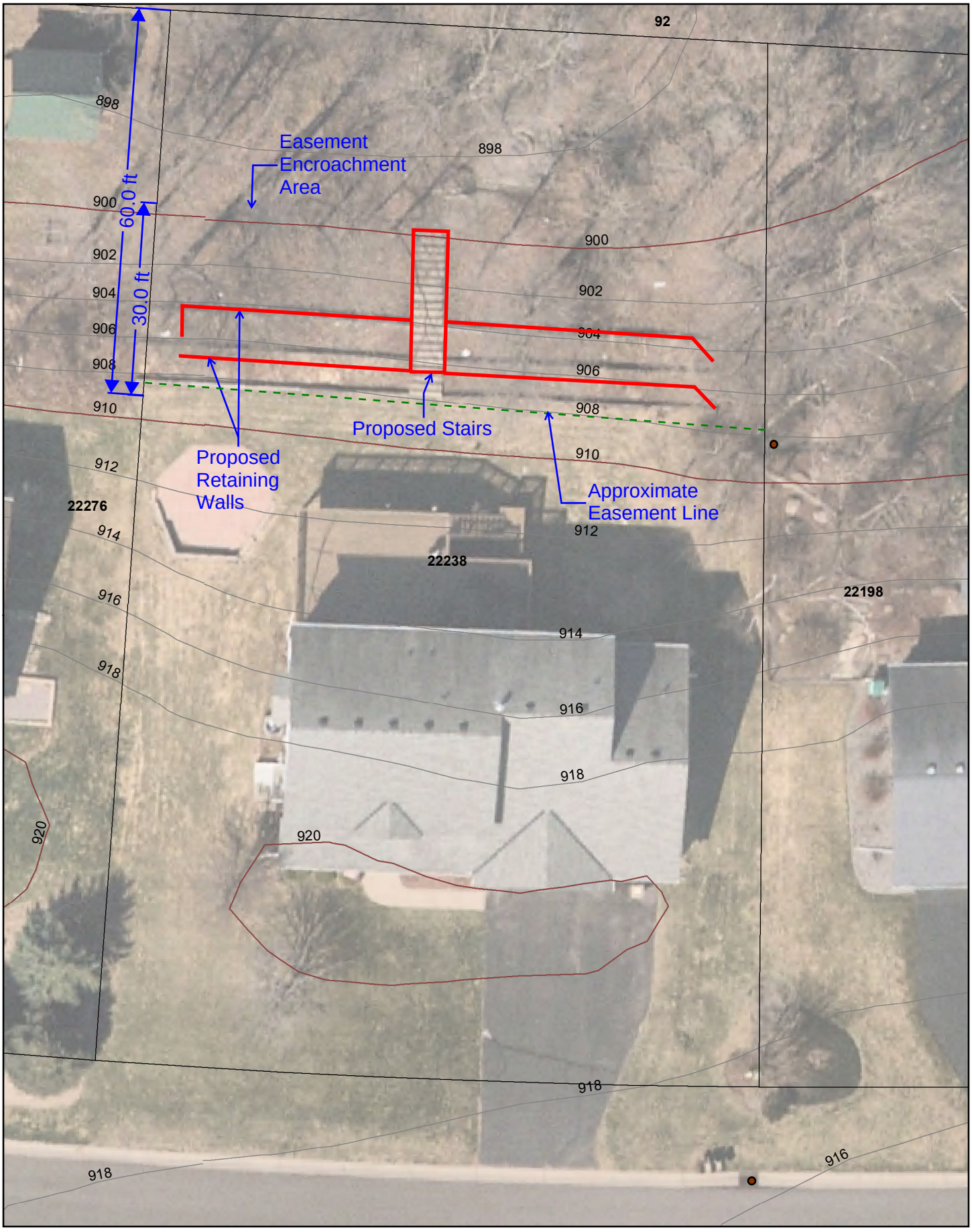

92
898
Easement
Encroachment
Area
898
900
60.0 ft
902
30.0 ft
904
906
908
910
912
22276
914
916
918
920
900
902
904
906
908
910
912
22238
914
916
918
920
Proposed Stairs
Proposed
Retaining
Walls
Approximate
Easement Line
22198
918
916
918
N
0
10
20
40 Feet

EXHIBIT B

Description of the Easement Encroachment Area

The south 30.00 feet of the north 60.00 feet of Lot 18, Block 4, Sunnyside Estates, Hennepin County, Minnesota, according to the recorded plat thereof.

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.11

Subject: Approve Professional Services Agreement with Leo A Daly for City Hall/Police Department Architecture and Engineering, City Project No. 2202
Prepared By: Doran Cote, Public Works Director/City Engineer

Recommended Council Action
Motion to Approve Professional Services Agreement with Leo A Daly for City Hall/Police Department Architecture and Engineering, City Project No. 2202

Overview / Background / Analysis
This item was the subject of a discussion at the May 27, 2025, City Council Work Session.

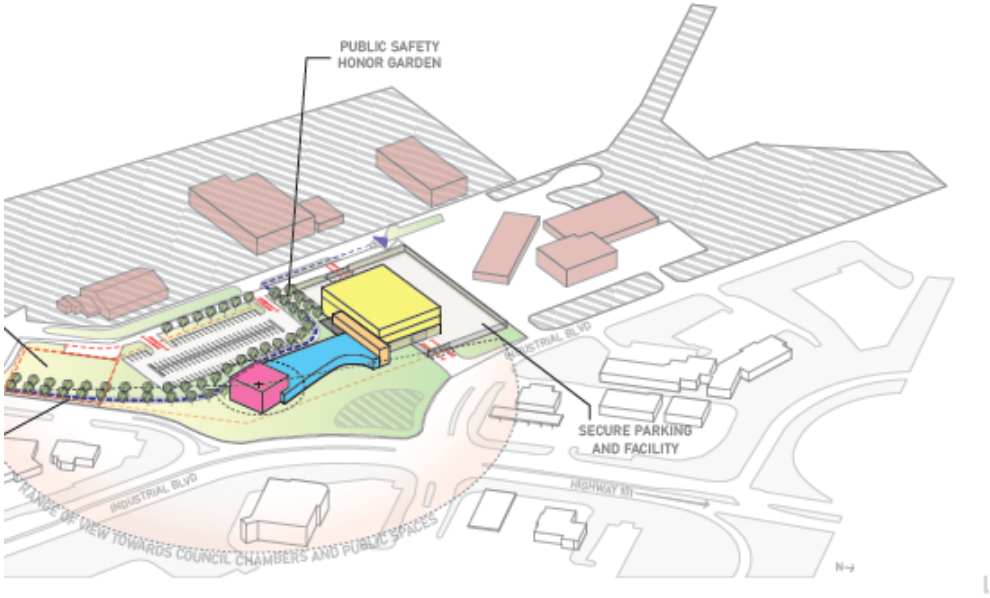
On February 25, 2025, the City Council approved a Request for Proposals (RFP) and authorized the solicitation of proposal for architecture and engineering services for a new City Hall and Police Department campus. It was prepared with the following concept in mind:

• Schematic Design/Concept Plans
• Design Development
• Detailed Plans/Specifications
• Definition of Bid Packages
• Construction Services

The RFP advised proposers that the project may be constructed in phases, such as Police Department first with a future expansion of City Hall. Cost estimating must consider a potential phased approach with separate estimates for each phase. The proposals were to be submitted without the costs of services. The cost proposals were requested in a separate, password-protected document. The draft Professional Services Agreement included with the RFP advised proposers that the contract may be terminated during any phase of the design. The RFP was issued to eight design firms known to have at least some background in campus design. The following three proposals were submitted:

- BKV Group
- Leo A Daly
- Wold Architects and Engineers

A proposal selection team comprised of the City Administrator and department directors reviewed and rated the proposals without the benefit of knowing the cost proposals. All seven reviewers rated the Leo A Daly proposal the top proposal and cited the most relevant work (200+ City Hall and Police Departments). The Leo A Daly proposal also discussed doing the project in phases and the potential outcomes of that course of action and included a site plan option for consideration:



The cost proposals were then revealed to the reviewers:

- BKV Group - $1,657,500
- Leo A Daly - $2,400,241
- Wold Architects and Engineers - $1,488,600

A Facilities Task Force meeting with department directors and Councilmembers Brockman and Eiden was held on May 5, 2025 to discuss the proposals, the rankings and the proposed costs. Representatives from the Leo A Daly design team were then interviewed by the Task Force, and it was concluded that Leo A Daly had the best proposal, exhibiting the most thoughtful content and the best grasp of the issues. It was also discussed that the cost difference was relatively small when compared to the total project/construction cost and that hiring the correct architect could very well deliver benefits well beyond that differential. Task Force members suggested that the whole City Council should discuss the matter at a Work Session.

After the meeting, staff met with Leo A Daly to discuss the variances in cost proposals between the three firms. It was agreed that before the design development phase begins that we will revisit the cost proposal for the remaining phases and possibly renegotiate the fees. In addition, the Professional Services Agreement is written such that it may be terminated by the city by seven (7) day's written notice to consultant

delivered to the address written above. Upon termination under this provision, the consultant will be paid for services rendered and reimbursable expenses incurred prior to the effective date of termination.

It should be noted that the City continues to pursue funding for this project via the state bonding bill and the federal community project funding through our congressional delegation.

Staff Recommendation
Motion to Approve Professional Services Agreement with Leo A Daly for City Hall/Police Department Architecture and Engineering, City Project No. 2202

Financial Impact: $2,400,241 **Source Fund**: 401 (Facilities Fund)

Budgeted?

Supporting Documentation
A. LEO A DALY Consultant Professional Services Agreement
B. BKV Group Proposal
C. Leo A Daly Proposal
D. Wold Proposal

PROFESSIONAL SERVICES AGREEMENT

This Agreement is made on the 27th day of May, 2025, between the **CITY OF ROGERS, 22350 S. Diamond Lake Road, Rogers MN 55374** ("City") and **LEO A DALY, LLC. 730 Second Avenue South, Suite 1300, Minneapolis, MN 55402** (“Consultant”).

Preliminary Statement

The purpose of this Agreement is to set forth terms and conditions for the provision of architectural and engineering services by the Consultant for the City.

The City and Consultant agree as follows:

1. **Consultant's Services**. The Consultant agrees to provide professional services as described in Exhibit A, Scope of Work, attached hereto and incorporated herein. Consultant agrees to use the City's standard specifications in any bidding documents prepared under this Agreement. The requirements of this section may be waived by the City if the City Engineer determines that they are not necessary for the successful completion of the project. Consultants requesting a requirement to be waived must have written authorization from the City Engineer. Consultant will perform its professional services consistent with the degree of care and skill ordinarily exercised under similar circumstances by reputable members of Consultant's profession practicing at the same time and in the same locality.

2. **Time for Performance of Services**. The Consultant will perform the services outlined in Exhibit A, Scope of Work within the prescribed days from the date of the contract award. Any changes in this schedule must be approved in writing by the City.

3. **Compensation for Services**. City agrees to pay the Consultant for services as described in Exhibit A, Scope of Work as may be amended from time to time by mutual written agreement by City and Consultant.

4. **Method of Payment**. The Consultant must submit itemized bills for services provided to the City on a monthly basis. Bills submitted will be paid in the same manner as other claims made to the City.

   For work reimbursed on an hourly basis, the Consultant must indicate for each employee, his or her classification, the number of hours worked, rate of pay for each employee, a computation of amounts due for each employee, the total amount due, the original contracted amount, the current requested amount and the total amount. Consultant must verify all statements submitted for payment in compliance with Minnesota Statutes Sections 471.38 and 471.391. For reimbursable expenses, the Consultant must provide such documentation as reasonably required by the City.

5. **Audit Disclosure**. The Consultant must allow the City or its duly authorized agents reasonable access to such of the Consultant's books and records as are pertinent to all services provided under this Agreement.
   Any reports, information, data, etc. given to, or prepared or assembled by the Consultant, under this Agreement which the City requests to be kept confidential must not be made available to any individual or organization without the City's prior written approval. All finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs and reports prepared by the Consultant will become the property of the City upon termination of this Agreement, but Consultant may retain copies of such documents as records of the services provided and may reuse standard portions of such documents in the normal course of its business.

6. **Term**. The term of this Agreement will be from May 27, 2025 through final project closeout by the City Council and receipt of all Consultant deliverables, the date of signature by the parties notwithstanding. This Agreement may be extended upon the written mutual consent of the parties for such additional period as they deem appropriate, and upon the terms and conditions as herein stated. The anticipated duration of construction (bid award to substantial completion) is 13 months.

7. **Termination**. This Agreement may be terminated by City by seven (7) day's written notice to Consultant delivered to the address written above. Upon termination under this provision, the Consultant will be paid for services rendered and reimbursable expenses incurred prior to the effective date of termination.

8. **Subcontractor**. The Consultant must not enter into subcontracts for any of the services provided for in this Agreement without the express written consent of the City other than those defined in Exhibit A.

9. **Independent Contractor**. At all times and for all purposes hereunder, the Consultant is an independent contractor and not an employee of the City. No statement herein shall be construed so as to find the Consultant an employee of the City.

10. **Assignment**. Neither party will assign this Agreement, nor any interest arising herein, without the written consent of the other party.

11. **Services Not Provided For**. No claim for services furnished by the Consultant not specifically provided for herein will be honored by the City.

12. **Severability**. The provisions of this Agreement are severable. If any portion hereof is, for any reason, held by a court of competent jurisdiction to be contrary to law, such decision will not affect the remaining provisions of the Agreement.

13. **Entire Agreement**. The entire Agreement of the parties is contained herein. This Agreement supersedes all oral agreements and negotiations between the parties

relating to the subject matter hereof, as well as any previous agreements presently in effect between the parties relating to the subject matter hereof. Any alterations, amendments, deletions or waivers of the provisions of this Agreement will be valid only when expressed in writing and duly signed by the parties unless otherwise provided herein.

14. **Compliance with Laws and Regulations**. In providing services hereunder, the Consultant must abide by all statutes, ordinances, rules and regulations pertaining to the provision of services to be provided. Any violation will constitute a material breach of this Agreement and entitle the City to immediately terminate this Agreement.

15. **Waiver**. Any waiver by either party of a breach of any provisions of this Agreement will not affect, in any respect, the validity of the remainder of this Agreement.

16. **Indemnification**. The Consultant must indemnify and hold harmless the City, its employees and agents, for all claims, damages, losses and expenses, including but not limited to attorney's fees which they may suffer or for which they may be held liable, as a result of, and to the extent of, the negligent or wrongful acts of the Consultant, his or her employees or anyone else for whom he or she is legally responsible in the performance of this Agreement.

17. **Insurance**. During the term of this Agreement, Consultant must maintain a general liability insurance policy with limits of $1,500,000 for each occurrence and $2,000,000 aggregate, for both personal injury and property damage.

    This policy shall name the City as an additional insured for the services provided under this Agreement and shall provide, as between the City and the Consultant, that the Consultant's coverage shall be the primary coverage in the event of a loss. If the Consultant is providing either architectural or engineering services, the Consultant must also maintain during the term of this Agreement a professional liability insurance policy with the same limits as for general liability. A certificate of insurance on the City's approved form which verifies the existence of these insurance coverages must be provided to the City before work under this Agreement is begun.

18. **Governing Law**. This Agreement will be controlled by the laws of the State of Minnesota.

19. **Whole Agreement**. This Agreement embodies the entire Agreement between the parties including all prior understanding and agreements, and may not be modified except in writing signed by all parties.

20. **Limitation of Liability.** It is agreed that City’s sole, exclusive remedy, and maximum recovery against Consultant for any claims, damages, costs, or expenses including, without limitation, reasonable attorneys’ fees and costs, of any

nature whatsoever, shall not exceed Consultant's applicable and required insurance under this Agreement.

21. **Opinions of Probable Cost.** Any and all estimates provided by Consultant are opinions of probable costs based on information that is reasonably available to Consultant. Actual project costs may, and probably will, vary from the estimates and opinions of probable costs provided by Consultant under this Agreement.

22. **Means, Methods and Safety.** Consultant is not responsible for supervising, directing, controlling, or otherwise being in charge of the construction activities, means, or methods at the project site; or supervising, directing, controlling, or otherwise being in charge of the actual work of the construction contractor, its sub-contractors, or other materialmen or service providers not engaged by Consultant.

Executed as of the day and year first written above.

CITY OF ROGERS

By:_____
Shannon Klick, Mayor

Date:_____

By:_____
Steven Stahmer, City Administrator

Date:_____

LEO A DALY

By:_____
Cindy McCleary, AIA

Its: Vice President, Managing Principal

Date:_____



LEO A DALY

City of Rogers

Rogers City Hall and Police Department

AE SERVICES RFP

APRIL 25, 2025

Contents

1 COVER LETTER

2 TEAM OVERVIEW

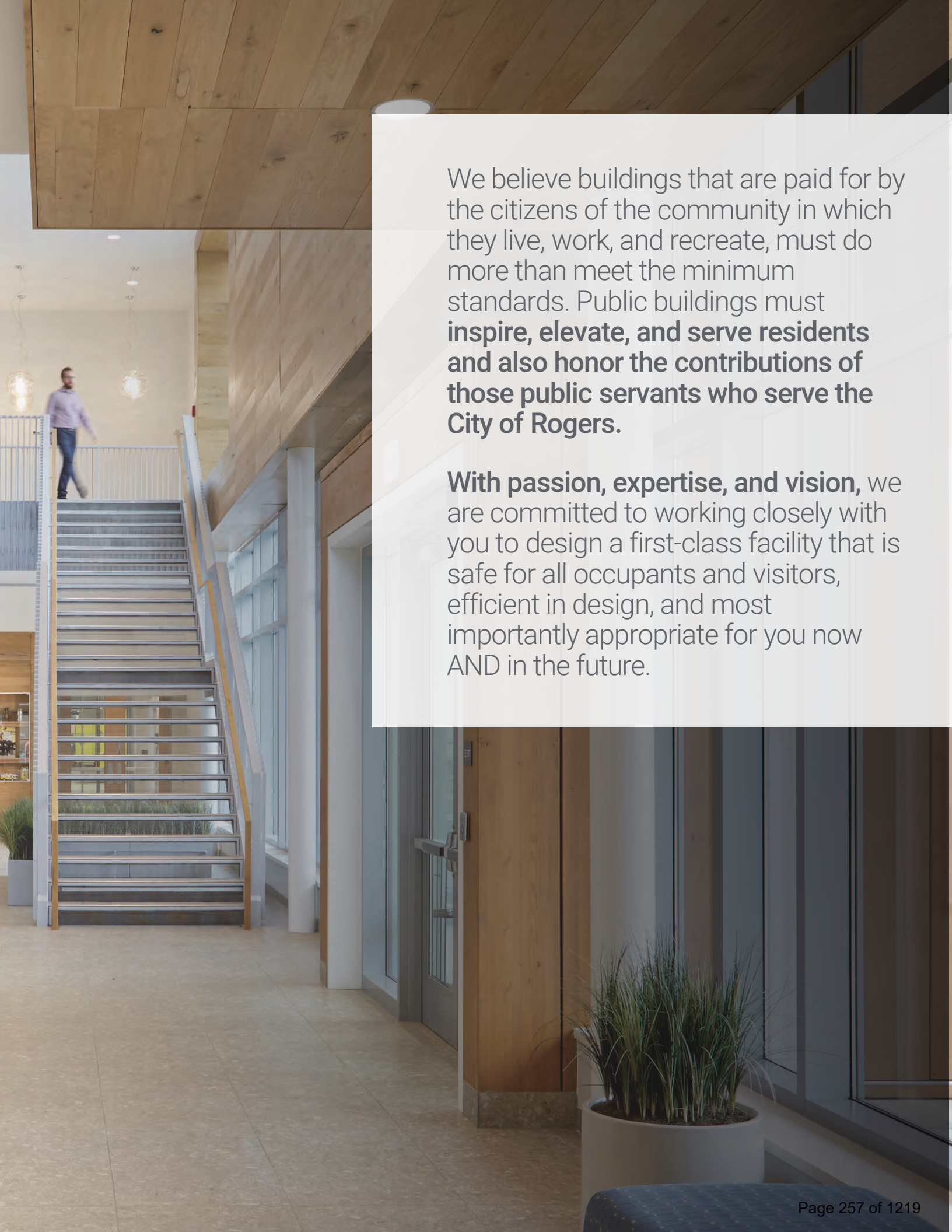
12 PROJECT EXPERIENCE

19 PROJECT APPROACH

24 SCHEDULE

LEO A DALY





We believe buildings that are paid for by the citizens of the community in which they live, work, and recreate, must do more than meet the minimum standards. Public buildings must **inspire, elevate, and serve residents and also honor the contributions of those public servants who serve the City of Rogers.**

With passion, expertise, and vision, we are committed to working closely with you to design a first-class facility that is safe for all occupants and visitors, efficient in design, and most importantly appropriate for you now AND in the future.


Designing for those who serve & protect our communities
200+ PUBLIC SAFETY AND MUNICIPAL FACILITIES
100+ POLICE / LAW ENFORCEMENT FACILITIES
70+ ADMINISTRATIVE / OFFICE FACILITIES
27+ TACTICAL TRAINING FACILITIES FOR POLICE, FIRE, & EMS
INFORMATION
OPD
LEO A DALY

LEO A DALY

PLANNING
ARCHITECTURE
ENGINEERING
INTERIORS

We acknowledge that LEO A DALY meets the min requirements outlined in the solicitation and affirm that proposed team members are available and will be assigned to the project if shortlisted.

April 25, 2025

Doran Cote, Public Works Director/City Engineer
22350 S. Diamond Lake Road
Rogers, MN 55374

Dear Doran,

LEO A DALY has studied, programmed, and designed over 200 public safety and municipal facilities over the last decade. Our extensive experience with police station and city hall design will help your team propel the city of Rogers into the next generation of municipal and law enforcement facilities. This project will address community growth, and the corresponding city staff and law enforcement increases necessary to provide the services expected of its citizens. It will incorporate the latest public safety facility operations and technologies while being forward thinking ensuring your facility and staff will be able to thrive in the future. It will address spaces for the wellness of first responders, foster engagement with the community, and seamlessly blend the safety and protections required of critical city operations and assets, with the transparency, accessibility, and openness desired by the community.

LEO A DALY is the public safety and civically minded architecture firm to get you there.

We listen and incorporate your ideas. Our local team members work on local, regional and national projects, which provide us with extensive knowledge of the best practices and operations of police and civic administration operations. Simultaneously, **we count on the expertise of your personnel to provide insight into how your facility needs to work for you.**

Our latest law enforcement design (Hennepin County Sheriff's Office Patrol Division HQ in Plymouth) is slated for a grand opening next month. It is the largest secure vehicle garage in the state with the capacity to accommodate further vehicle electrification. Last month, we saw the grand opening of Miami Beach PD's Real Time Intelligence Center and drone program (Miami Beach Real-Time Intelligence Center News Story)

We are tested in the entire range of public safety operations, able to apply the specialized best practices we've learned from professionals across the country and apply to your project. Our team members have completed local law enforcement training facilities at the HERO Center and North Metro Regional Public Safety Training Facility, with the Lakeville FiRST Center slated to open next July. We've consulted on the largest evidence facility in the Twin Cities (Minneapolis PD), designed the most innovative forensic lab in the nation (Hennepin County Medical Examiner). We are beginning design for the MN State Patrol's first-ever purpose-built headquarters facility. With only one public safety project on the horizon, **our specialized and assigned staff for your project are eager and available to start working with you today.** From the very small police department (Elko New Market PD) to major metropolitan PD's (Omaha Police and Fire Department HQ), we have design expertise in all aspects of police departments.

Additionally, City Hall design can be a significant piece of architecture, and a strong contributor to community culture. We know best practices have evolved enabling City's to consider new ways to delivery necessary information to residents. Consolidating service points, streaming city operations online, and increased interest in the use of touchscreen and self-service points have impacted lobby spaces. Community need for public spaces, training spaces and meeting spaces have evolved, and the sophistication of the spaces must keep up with today's expectations. Community and staff expectations for security and work from home models have evolved affecting physical space.

We guide, advocate, or substantiate competing interests when needed. Law enforcement and city departments have great opportunities to share certain amenities, and they have many spaces that absolutely cannot, either for reasons of operations, confidentiality or regulating bodies. We bring the critical eye to guide these conversations and advocate or substantiate best practices for bonding between departments, and for autonomy, where necessary.

We listen, navigate, and design facilities that are secure yet accessible, innovative yet judicious with tax dollars, and reflective of the health, safety, and welfare of the first responders who protect us.

On behalf of LEO A DALY, we thank you for this opportunity. We look forward to working with your team on your combined police station and city hall endeavor.

Sincerely,

Todd LaVold, AIA
Project Manager, Market Sector Leader P+ I **Main Point of Contact**
TBLavold@leoadaly.com| 612.359.4656

Cindy McCleary, AIA, NCARB, LEED AP
Vice President, Managing Principal

730 SECOND AVENUE SOUTH
SUITE 1300
MINNEAPOLIS, MN 55402
612.338.9741

leoadaly.com

TEAM OVERVIEW

We are passionate about public safety! Our team brings extensive experience in delivering public safety projects, grounded in a long-standing history of collaboration across Minnesota.

The **LEO A DALY Minneapolis team has led the design of 200+ public safety facilities from as small as 3,400 GSF to as large as 600,000 GSF**. We provide police, fire, mission-critical, and public safety training design expertise to our nine other offices across LEO A DALY. This provides exposure to and knowledge of all facets of first responder operations and incident responses. Designing police and fire stations, detention facilities, real-time information centers, and Emergency Operations Centers with our other offices keeps us on top of public safety trends across the country.

Our team members continually immerse themselves in the industry, **sitting on foundation boards, speaking at Homeland Security conferences, practicing trauma-informed design, and participating in cybersecurity conferences**, to name a few. Our public safety design leadership is proud to have learned from some of the best and brightest people in your industries to develop our fire and police station design principles.

ELAN DESIGN LAB - CIVIL ENGINEER

Élan Design Lab, Inc. (Élan) is a team of civil engineers and landscape architects that specialize in site design and development. Élan is a service provider to the construction and development marketplace. Clients include regional, state and federal agencies, counties and municipalities, state and local school systems, national corporations, developers, property owners and other architectural and engineering firms. Élan is certified as a TG small business firm based on its women-owned status through the State of MN Department of Administration, a DBE/WBE through the MNUCP, and a S/WBE through the CERT Program.

DAMON FARBER - LANDSCAPE ARCHITECT

Damon Farber is a landscape architecture and planning studio with roots in Minnesota and Wisconsin. Their portfolio embodies the breadth of the landscape architecture profession, and they approach design through a process that is deeply collaborative, curious, and caring. Damon Farber's studio was founded on the idea that the best solutions are created through teamwork.

TRUE NORTH- AUDIO VISUAL | IT | SECURITY

True North Consulting Group (TNCG) started in Stillwater, MN in 1984 as Elert & Associates. TNCG is a professional technology consulting firm serving clients with public and private sector projects, as well as architects and design professionals. The firm is comprised of several multi-disciplinary teams with a depth of experience in Audio/Video, Security, Data, Voice, and Telecommunication systems. TNCG carefully tailors each project team to meet the specific technology and professional consulting needs of their clients. This helps to ensure the highest level of accountability and quality control for work designed, specified, and administered through implementation.

ROCKWISE STRATEGIES- COST ESTIMATING

Rockwise Strategies was founded by Doug Loeffler after he saw an opportunity to bring even more to the built environment. Expanding upon the team's construction management expertise, he sought to support project stakeholders with cost consulting and owners representation services. Today we remain closely connected to the Loeffler Construction team, sharing expertise to improve every build and bringing great value to our clients.

EXAMPLE LEO A DALY PROJECTS TEAM HAS WORKED ON TOGETHER

Firm Name	Projects completed with LEO A DALY	DPS MN State Patrol HQ Pre-Design	MN BCA Reg Office + Lab	Arden Hills Readiness Center	Hennepin County Medical Examiner	Hennepin County Sheriff's HQ
Elan Design Lab	9	●	●	●	●	●
Damon Farber	30	●	●	●	●	●
True North	18	●	●	●	●	●
Rockwise Strategies (Formerly Loeffler)	11	●	●			●

Project Executive Committee

Dan Willis, Police Chief
Doran Cote, Public Works Dir./City Engineer

City Administration | Police Department | Public Works Department | Planning Department



Todd LaVold
AIA
Project Manager/ Market Sector Leader, Public & Institutional
LEO A DALY



Matthew Keenan
P+I Project Director/QC Holding Specialist
LEO A DALY



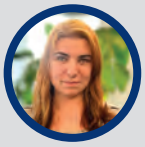
Daniel Yudchitz
AIA, NCARB, LEO AP
Project Designer
LEO A DALY



Mike Heller
AIA
Project Architect
LEO A DALY



Gina Shuck
NCIDQ
Interior Designer
LEO A DALY



Ana Boehm
AIA, NCARB
Project Architect
LEO A DALY



Mark Bradby
PE
Mechanical Engineer
LEO A DALY



Jeff Besel
PE, CET, LEED AP
Electrical Engineer
LEO A DALY



Thomas Kendrick
PE
Structural Engineer
LEO A DALY



Dan Olig
PE, SET
Fire Protection
LEO A DALY

Marcie Weslock
ÉLAN DESIGN LAB CIVIL ENGINEERING

Jesse Symynkywicz
DAMON FARBER - LANDSCAPE ARCHITECTURE

Nick Weber + Brandon Frazier
TRUE NORTH - IT/AUDIO VISUAL/SECURITY

Talon DeWitz
ROCKWISE- COST ESTIMATING



Todd LaVold AIA

MARKET SECTOR LEADER, PUBLIC AND INSTITUTIONAL

ROLE: PROJECT MANAGER

Todd will serve as the primary point of contact and client advocate for the City of Rogers Police Department and City Hall project. He will lead the team with a focus on clear communication, strategic alignment, and project excellence. He will establish consistent touch-points and facilitate leadership coordination to ensure expectations, schedules, and milestones are clearly defined and met. With 26 years of experience designing and managing public safety facilities, including police stations, fire stations, first responder training centers, and justice facilities, Todd brings the expertise needed to synchronize project teams and deliver cohesive, successful outcomes .

LEO A DALY

EDUCATION

Master of Architecture
University of Minnesota

Bachelor of Architecture
University of Minnesota

EXPERIENCE

26 years

REGISTRATIONS

Registered Architect: MN #48181

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

City of Bismarck, Police Station Location Study and Facility Assessment, and Public Works Expansion and Remodel
BISMARCK, NORTH DAKOTA

City of Coon Rapids Police Department Needs Assessment
COON RAPIDS, MINNESOTA

Lake Elmo City Hall and Fire Station
LAKE ELMO, MINNESOTA

City of Forest Lake City Center, New City Hall and Public Safety Facility
FOREST LAKE, MINNESOTA

City of Maple Grove, North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

City of Minneapolis Police Department, Property and Evidence Warehouse Space Needs Assessment
MINNEAPOLIS, MINNESOTA

City of Oakdale, City Hall, Police, Public Works Facility Assessment
OAKDALE, MINNESOTA

City of Cottage Grove and Woodbury, HERO Center
COTTAGE GROVE, MINNESOTA

City of Richfield, Fire Station #2 Renovation
RICHFIELD, MINNESOTA

City of Oakdale, Police Remodel and PD Training Expansion
OAKDALE, MINNESOTA

Elko New Market Police Station
ELKO NEW MARKET, MINNESOTA

City of Centerville City Hall
CENTERVILLE, MINNESOTA

Minnesota Army National Guard, Arden Hills Readiness Center
ARDEN HILLS, MINNESOTA

Pennington County, Police Evidence and Administration Building
RAPID CITY, SOUTH DAKOTA

Pennington County Jail/ Courthouse/Administration Building Renovation
RAPID CITY, SOUTH DAKOTA

Dickinson Public Safety Training Center Facility Assessment
DICKINSON, NORTH DAKOTA

Winnebago Tribe of Nebraska, Fire & EMS Planning & Programming
WINNEBAGO, NEBRASKA

Confidential Community College Public Safety Training Facility
MIDWEST U.S.

Hennepin County, Sheriff's Office, Court Holding Area Assessment, Multiple Locations
MINNEAPOLIS, MINNESOTA

City of Omaha Joint Police & Fire Headquarters
OMAHA, NEBRASKA

City of Sterling, City Hall and Police Department Renovation
STERLING, ILLINOIS

Wake Technical Community College, Public Safety Simulation Complex
RALEIGH, NORTH CAROLINA

City of Henderson Citywide and Fire Stations 81 and 84 Master Plans
HENDERSON, NEVADA

Confidential Federal Training Facility
NORTHEAST U.S.

South Miami Police Department New HQ
SOUTH MIAMI, FLORIDA

Miami Beach Police Department Headquarters Renovation
MIAMI BEACH, FLORIDA

Henderson Fire Station 81
HENDERSON, NEVADA

Henderson Fire Station 84
HENDERSON, NEVADA

Miami-Dade College, School of Justice Tactical Training Facility Renovation
MIAMI, FLORIDA

Palm Beach Sheriff's Office Forensic Sciences & Technology Facility
WEST PALM BEACH, FLORIDA

City of Plantation Fire Station #1 Replacement
PLANTATION, FLORIDA

Confidential Community College Public Safety Training Facility
SOUTHEAST U.S.



LEO A DALY

EDUCATION
Master of Architecture
University of Minnesota

Bachelor of Fine Arts, Art/ Industrial Design
University of Wisconsin-Stout

EXPERIENCE
22 years

REGISTRATIONS
Registered Architect: MN #48986

Daniel Yudchitz AIA, NCARB, LEED AP

VICE PRESIDENT, DESIGN DIRECTOR
ROLE: PROJECT DESIGNER

Daniel's career has focused on the design of public, workplace, institutional, and educational facilities. He is dedicated and devoted to pursuing challenging projects that are both pragmatic and creative. Daniel believes that good design reinforces the client's mission, enhances perception, and improves operations. He does this through a collaborative process, listening to the users and stakeholders while focusing on outreach, education, and engagement. Daniel is dedicated to community outreach and is a co-creator of LAD Groundwork Studio, a LEO A DALY initiative that provides pro-bono services to undeserved communities.

Minnesota State Patrol New HQ
TWIN CITIES, MINNESOTA

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

Hennepin County Sheriff's Office Public Safety Services Division HQ
PLYMOUTH, MINNESOTA

City of Omaha, Omaha Police Department, West Precinct
ELKHORN, NEBRASKA

City of Omaha Joint Police & Fire Headquarters
OMAHA, NEBRASKA

City of Cottage Grove and Woodbury, HERO Center, New Regional Police, Fire, & EMS Training Facility
COTTAGE GROVE, MINNESOTA

City of Maple Grove, North Metro Regional Public Safety Training Facility Assessment
MAPLE GROVE, MINNESOTA

Dickinson Public Safety Training Center Facility Assessment
DICKINSON, NORTH DAKOTA

Minnesota Dept. of Military Affairs, New Ulm Readiness Center
NEW ULM, MINNESOTA

City of Oakdale, City Hall, Police, Public Works Facility Assessment
OAKDALE, MINNESOTA

South Miami Police Department HQ
MIAMI, FLORIDA

City of Henderson Forensic Crime Lab
HENDERSON, NEVADA

North Dakota Army National Guard Williston Readiness Center
WILLISTON, NORTH DAKOTA

City of Bismarck New Public Health and Police Facilities, Public Works Expansion
BISMARCK, NORTH DAKOTA

City of Lake Elmo, City Hall Renovation/ Expansion, New Fire Station
LAKE ELMO, MINNESOTA

City of Columbia Heights City Hall
COLUMBIA HEIGHTS, MINNESOTA

City of Waconia New Fire Station Design
WACONIA, MINNESOTA

Broward County Medical Examiner and Crime Lab Combined Facility
FORT LAUDERDALE, FLORIDA

South Miami Police Department HQ
MIAMI, FLORIDA

Miami-Dade College, School of Justice Tactical Training Facility Renovation
MIAMI, FLORIDA



LEO A DALY

EDUCATION
Master of Architecture, Washington University

EXPERIENCE
19 years

REGISTRATIONS
Architect MN # 56941

Michael Heller AIA

ARCHITECT
ROLE: PROJECT ARCHITECT

Michael will lead the design vision and technical implementation of the project. Mike has a background in municipal police, fire stations and libraries. He is experienced in leading projects from concept to completion with the objective of solving challenging problems while finding innovative ways to meet the needs of the client.

Hennepin County Sheriff's Office Public Safety Services Division HQ
PLYMOUTH, MINNESOTA

Wake Technical Community College, Public Safety Simulation Complex
RALEIGH, NORTH CAROLINA

City of Lake Elmo, City Hall Renovation/ Expansion, New Fire Station
LAKE ELMO, MINNESOTA

State of Minnesota Bureau of Criminal Apprehension; Mankato Forensic Sciences Center
MANKATO, MINNESOTA

North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

Hennepin County Medical Examiner Facility
MINNETONKA, MINNESOTA

South Miami Police Department HQ
MIAMI, FLORIDA

United States Marshals Service - Training Space*
MINNEAPOLIS, MINNESOTA

**Project completed prior to joining LEO A DALY*



LEO A DALY

EDUCATION
Master of Architecture, University of Minnesota

Bachelor of Science in Architecture, Moscow College of Architecture and Construction Management

EXPERIENCE
13 years

REGISTRATIONS
Registered Architect: MN #57612; MI #1301072286

Ana Boehm AIA, NCARB

PROJECT ARCHITECT, PUBLIC & INSTITUTIONAL
ROLE: PROJECT ARCHITECT

Ana is a design professional with over 13 years of experience in delivering design excellence across various sectors, including public safety, municipal, and mixed-use projects. Her meticulous attention to detail, innovative approach, and technical proficiency ensure exceptional client satisfaction and outstanding designs. She is passionate about overseeing projects from inception to completion, crafting spaces that resonate with the human experience. Her efficiency and organizational skills help her consistently meet client needs promptly. Ana's work leaves a lasting, positive impact on the communities she serves.

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

Minnesota Bureau of Criminal Apprehension, Southern Regional Office and Laboratory
MANKATO, MINNESOTA

Keweenaw Bay Indian Community Tribal Police Station Renovation and Remodel*
VILLAGE OF BARAGA, MICHIGAN

Keweenaw County Emergency Operations Center Master Planning and Programming*
MOHAWK, MICHIGAN

Houghton County Courthouse Planning and Programming*
HOUGHTON, MICHIGAN

Ishpeming National Guard Armory*
ISHPEMING, MICHIGAN

North Loop Green, Mixed Use Office*
MINNEAPOLIS, MINNESOTA

Excelsior Offices, Corporate & Commercial*
HOPKINS, MINNESOTA

**Project completed prior to joining LEO A DALY*



Matthew Keenan NCIDQ

PUBLIC & INSTITUTIONAL PROJECT DIRECTOR

ROLE: HOLDING SPECIALIST/QC

LEO A DALY

EDUCATION
Bachelor of Science, Architecture, University of Minnesota

EXPERIENCE
20 years

REGISTRATIONS
National Council for Interior Design Qualification #417525

Matthew brings 20 years of experience in government facility design and construction. Matthew's work history spans county and municipal facilities with experience in public safety, detention and headquarters facilities, as well as municipal office building.

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

MN Department of Public Safety State Patrol HQ Predesign
ST PAUL, MINNESOTA

City of Bismarck Municipal Center, Public Safety Center, and Public Health
BISMARCK, NORTH DAKOTA

North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

Wake Technical Community College, Public Safety Simulation Complex
RALEIGH, NORTH CAROLINA

Hennepin County Medical Examiner Facility
MINNETONKA, MINNESOTA

City of Columbia Heights, New City Hall
COLUMBIA HEIGHTS, MINNESOTA

Elko New Market Police Station
ELKO NEW MARKET, MINNESOTA

Miami Beach Police Department Headquarters Renovation
MIAMI BEACH, FLORIDA

City of Omaha Fire Station Design Concept
OMAHA, NEBRASKA

Dakota County Law Enforcement,
HASTINGS, MINNESOTA

South Miami Police Department New HQ
SOUTH MIAMI, FLORIDA

Hennepin County Sheriff's Office Public Safety Services Division HQ
PLYMOUTH, MINNESOTA



Gina Shuck NCIDQ

INTERIOR DESIGNER

ROLE: INTERIOR DESIGNER

LEO A DALY

EDUCATION
Bachelor of Science, Interior Design
University of Minnesota

EXPERIENCE
9 years

REGISTRATIONS
National Council for Interior Design Qualification #417525

Gina has nine years of interior design experience in many market sectors including commercial, medical, federal, hospitality, corporate, and warehouse design. She has guided clients through all design phases, from programming, space planning, and design development to construction administration. Gina is skilled at communicating design ideas through 3D visualizations and is passionate about interpreting them into functional, buildable applications. She is open and honest with clients and values deliberate communication that helps achieve the project goals effectively and efficiently. Her recent work has been on facilities for first responders and mission-critical clients to which she brings a wellness-oriented perspective to creating spaces that are durable and support the human condition.

City of Bismarck Municipal Center, Public Safety Center, and Public Health
BISMARCK, NORTH DAKOTA

Minnesota Army National Guard, Arden Hills Readiness Center
ARDEN HILLS, MINNESOTA

City of Lake Elmo, City Hall Renovation/Expansion, New Fire Station
LAKE ELMO, MINNESOTA

City of Woodbury/City of Cottage Grove, HERO Public Safety Training Facility
COTTAGE GROVE, MINNESOTA

Hennepin County Medical Examiner Facility
MINNETONKA, MINNESOTA

North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

Hennepin County Sheriff's Office, Public Safety Services Headquarters
PLYMOUTH, MINNESOTA

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

City of Henderson Crime Lab
HENDERSON, NEVADA

Broward County Forensic Science Center
FORT LAUDERDALE, FLORIDA

Miami-Dade College, School of Justice Tactical Training Facility Renovation
MIAMI, FLORIDA



Mark Bradby PE

STUDIO LEAD, MECHANICAL ENGINEERING

ROLE: MECHANICAL ENGINEER

LEO A DALY

EDUCATION
Bachelor of Science, Engineering
Brunel University

EXPERIENCE
25 years

REGISTRATIONS
Registered Professional Engineer: MN# 44226

Mark is a seasoned mechanical engineer with 25 years of experience in the construction industry, specializing in high performance systems to drive project success. His expertise in project management enables him to effectively oversee and implement meaningful projects that enhance environmental sustainability, optimize project and life-cycle costs, and set benchmarks for high-performance buildings. Mark finds fulfillment in collaborating with teams from the conceptual phase through to construction, ensuring that each project exemplifies best-in-class standards. His dedication to creating impactful, real-world solutions underscores his commitment to advancing the field of sustainable construction.

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

City of Fridley, Civic Complex (New City Hall, Fire, Police Facilities)*
FRIDLEY, MINNESOTA

Minnesota Zoo Waterfront Restoration Project
APPLE VALLEY, MINNESOTA

Hennepin County, Multiple Recommissioning Projects*
HENNPIN COUNTY, MINNESOTA

Hennepin County Adult Correctional Facility, Admin Building Renovation*
PLYMOUTH, MINNESOTA

Pennington County Courthouse, Renovation,*
THIEF RIVER FALLS, MINNESOTA

Minnesota Dept. of Military Affairs, Army Combat Fitness Test Field House
NEW ULM, MINNESOTA

Henrico County, Fire House #19*
HENRICO, VIRGINIA

Wright County Courthouse*
BUFFALO, MINNESOTA

**Project completed prior to joining LEO A DALY*



Jeff Besel PE, CET, LEED AP

SENIOR ELECTRICAL ENGINEER / STUDIO LEAD - ELECTRICAL ENGINEERING

ROLE: ELECTRICAL ENGINEERING

LEO A DALY

EDUCATION
Bachelor of Architectural Engineering
Kansas State University

EXPERIENCE
25 years

REGISTRATIONS
Registered Professional Engineer: MN #44225

NCEES Records Program

NICET Fire Alarm Systems Level II

With 25 years of experience designing electrical systems for buildings, Jeff's experience includes designing power device layouts and motor connections, power distribution, electrical vehicle chargers (EVSE), photovoltaic (PV) systems, lighting and lighting controls, and low-voltage system layouts. He has extensive engineering experience on a wide variety of project types. Jeff is active in several professional organizations and has served as a technical committee member for the NFPA 99 HEA-FUN committee and served as a board member and president of Minnesota Automatic Fire Alarm Association (MNAFAA).

Hennepin County, Sheriff's Headquarters
PLYMOUTH, MINNESOTA

Hennepin County Medical Examiner Facility
MINNETONKA, MINNESOTA

City of Bismarck Municipal Center, Public Safety Center, and Public Health
BISMARCK, NORTH DAKOTA

City of Columbia Heights, City Hall
COLUMBIA HEIGHTS, MINNESOTA

Anoka Ramsey Community College Business and Nursing
COON RAPIDS, MINNESOTA

Anoka Ramsey Community College, Science Building Pre-Design
COON RAPIDS, MINNESOTA

North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

Xcel Chestnut Service Center
MINNEAPOLIS, MINNESOTA

Goodhue County Justice Center Improvements*
RED WING, MINNESOTA



Thomas Kendrick PE

SENIOR ENGINEER, STRUCTURAL
ROLE: STRUCTURAL ENGINEER

Thomas is a skilled structural engineer with extensive project experience across healthcare, industrial, residential, public, and federal sectors. He is drawn to the challenge of taking unique architectural concepts and developing creative, efficient structural solutions that meet both aesthetic and functional requirements.

LEO A DALY

EDUCATION
Master of Science Civil Engineering, Michigan Technological University

EXPERIENCE
9 years

REGISTRATIONS
Registered Professional Engineer: MN# 57790

State of Minnesota Bureau of Criminal Apprehension; Mankato Forensic Sciences Center
MANKATO, MINNESOTA

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

Xcel Chestnut Service Center
MINNEAPOLIS, MINNESOTA

Air Reserve Station Vehicle Inspection Facility
MINNEAPOLIS, MINNESOTA

Suwon Air Base, Aircraft General Purpose Shop Repair
SUWON AIR BASE, REPUBLIC OF KOREA

University of Minnesota, Hormel Arctics Room
AUSTIN, MINNESOTA

Sam's Club New Conceptual Floor Plan
BENTONVILLE, ARKANSAS



Dan Olig, PE, SET

SENIOR ENGINEER, FIRE PROTECTION
ROLE: FIRE PROTECTION

Dan has 20 years of experience in the management, planning, and design of fire protection systems. He has a diverse knowledge base with unique understanding, training and leadership experience. With a strong background in both the contractor realm as well as engineer-led design, and his experience includes water-based and special hazard fire suppression systems for a multitude of occupancies; new and upgraded fire alarm systems; and determining building code and life safety requirements.

LEO A DALY

EDUCATION
Bachelor of Mechanical Engineering
Iowa State University

EXPERIENCE
20 years

REGISTRATIONS
Registered Professional Engineer: MN # 57942

NICET Water-Based Systems Layout Level IV

City of Columbia Heights, New City Hall
COLUMBIA HEIGHTS, MINNESOTA

Department of Veterans Affairs West LA Police Station
LOS ANGELES, CALIFORNIA

Bismarck Public Works, Building 2 Renovation and Addition
BISMARCK, NORTH DAKOTA

City of Omaha Joint Police & Fire HQ
OMAHA, NEBRASKA

Duluth Maintenance, Repair and Overhaul (MRO) Hangar Fire Alarm Replacement
DULUTH, MINNESOTA

Vance AFB
VANCE AFB, OKLAHOMA

Nebraska Army National Guard, Community Fire Safety Plans
MULTIPLE LOCATIONS, NEBRASKA

Anoka-Ramsey Community COllege School of Business & Nursing Renovation
COON RAPIDS, MINNESOTA

Winnebago Tribe of Nebraska Emergency Management / Fire Department Facility
WINNEBAGO, NEBRASKA

Minneapolis Federal Courthouse Remodeling
MINNEAPOLIS, MINNESOTA

Tulsa City/County Library and Parking Garage (5-story + parking)*
TULSA, OKLAHOMA

**Project completed prior to joining LEO A DALY*



Marcie Weslock, PE, LEED AP

PRESIDENT/PRINCIPAL CIVIL ENGINEER, ÉLAN DESIGN LAB

ROLE: CIVIL ENGINEERING

EDUCATION

Bachelor of Science, Civil Engineering
Michigan Technological College

Associate of Applied Science, Interior Design
Art Institute International

EXPERIENCE

27 years

REGISTRATIONS

Registered Architect: MN #48181

As President of Élan Design Lab, Marcie Weslock is responsible for every aspect of the firm's business plan, technical design standards, design direction, staffing, and mentor to the engineers on the team. She brings over 27 years of civil engineering experience working with a broad range of clients and projects including clients with numerous buildings with multiple stakeholders. Her qualifications as a civil engineer and interior designer combined with her project management skills gives Marcie a unique skill set that provides an eye for detail that connects the interior and exterior environments while promoting communication between a multi-faceted team.

Hennepin County Sheriff's Office Public Safety Services HQ
PLYMOUTH, MINNESOTA

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

Hennepin County Medical Examiners Facility
MINNETONKA, MINNESOTA

MN Army National Guard Readiness Center*
ARDEN HILLS, MINNESOTA

East Metro Public Safety Training Facility
MAPLEWOOD, MINNESOTA

State of Minnesota Bureau of Criminal Apprehension; Mankato Forensic Sciences Center
MANKATO, MINNESOTA

MN State Patrol Headquarters Building
EAGAN, MINNESOTA

USFW Sherburne NWR Visitor Center Expansion
ZIMMERMAN, MINNESOTA

MN Army National Guard (MNARNG) Readiness Center
NEW ULM, MINNESOTA

MNARNG Army Combat Fitness Test Fieldhouse
ARDEN HILLS, MINNESOTA



Jesse Symynkywicz ASLA, PLA

Principal Design Landscape Architect, DAMON FARBER

ROLE: LANDSCAPE ARCHITECTURE

EDUCATION

Master of Urban Design Candidate
University Of Colorado At Denver

Bachelor Of Landscape Architecture
University Of Minnesota

EXPERIENCE

30+ years

REGISTRATIONS

Registered Landscape Architect: MN #26970

Jesse creates exceptional, beautiful, sensitive, and inspiring landscapes. His expertise and passion helps every project be the best that it can be. Jesse provides unique and contextually sensitive design solutions while maintaining a focus on delivering quality, cost effective, and functional landscapes. Jesse is fluent through all phases of the design process, and works comfortably with clients and consultants to coordinate projects from concept through construction.

Hennepin County Sheriff's Office Public Safety Services HQ
PLYMOUTH, MINNESOTA

State of Minnesota Bureau of Criminal Apprehension; Mankato Forensic Sciences Center
MANKATO, MINNESOTA

City of Forest Lake City Center, New City Hall and Public Safety Facility
FOREST LAKE, MINNESOTA

Minnesota DHS, St. Peter Regional Treatment Center
ST. PETER, MINNESOTA

City of Cottage Grove and Woodbury, HERO Center
COTTAGE GROVE, MINNESOTA

Minnesota State Office Building
ST. PAUL, MINNESOTA

AHATS Readiness Center
ARDEN HILLS, MINNESOTA

Armed Forces Reserve Center
FARIBAULT, MINNESOTA

Minnesota National Guard Joint Forces Headquarters (JFHQ)
ARDEN HILLS, MINNESOTA

Brookview Elementary School
WOODBURY, MINNESOTA

Stillwater High School
WOODBURY, MINNESOTA



Talon DeWitz

SENIOR COST CONSULTANT - ROCKWISE STRATEGIES

ROLE: COST ESTIMATOR

Talon is an experienced senior cost consultant who has completed hundreds of projects from the estimating phase through job completion. In his history at Rockwise, Talon has worked with hands-on estimating and bidding processes as well as working closely with design firms to develop cost estimates, QA/QC, and scheduling in every market segment across the nation. He and the Rockwise team bring experience working in multiple relevant market segments including public safety, emergency communications, and local government clients.

EDUCATION

Bachelor of Science,
Construction Management
University of Minnesota

Bachelor of Business Administration
Minnesota State University, Mankato

EXPERIENCE

9 years

Minnesota State Patrol New HQ
TWIN CITIES, MINNESOTA

Hennepin County Sheriff's Office Public Safety Services HQ
PLYMOUTH, MINNESOTA

Martin County Public Safety Center
FAIRMONT, MINNESOTA

Hutchinson Police Department
HUTCHINSON, MINNESOTA

City of Wyoming Public Safety Building
WYOMING, MINNESOTA

City of Virginia Public Safety Building
VIRGINIA, MINNESOTA

North End Community Center
ST. PAUL, MINNESOTA

Jackson County Government Building and Law Enforcement Center
JACKSON, MINNESOTA

White Bear Lake Public Safety Building Addition and Renovation
WHITE BEAR LAKE, MINNESOTA



Brandon Frazier CTS, DSCE

DIRECTOR SECURITY TECHNOLOGIES

ROLE: SECURITY

Brandon specializes in security master planning and designing of security systems for law enforcement and public safety mission critical and secure facilities throughout Minnesota and the Upper Midwest.

EXPERIENCE

20 years

Hennepin County Medical Examiners Facility
MINNETONKA, MINNESOTA

Hennepin County Sheriff's Enforcement Services Division Headquarters Relocation
PLYMOUTH, MINNESOTA

Anoka County Jail Security System Upgrade
ANOKA, MINNESOTA



Nick Weber PMP, CTS-D

SENIOR TECHNOLOGY CONSULTANT

ROLE: IT, A/V

Nick has designed audiovisual, physical security, and structured cabling systems. Nick's training and certifications include Project Management Institute PMP (Project Management Professional) and InfoComm CTS (Certified Technology Specialist).

EXPERIENCE

19 years

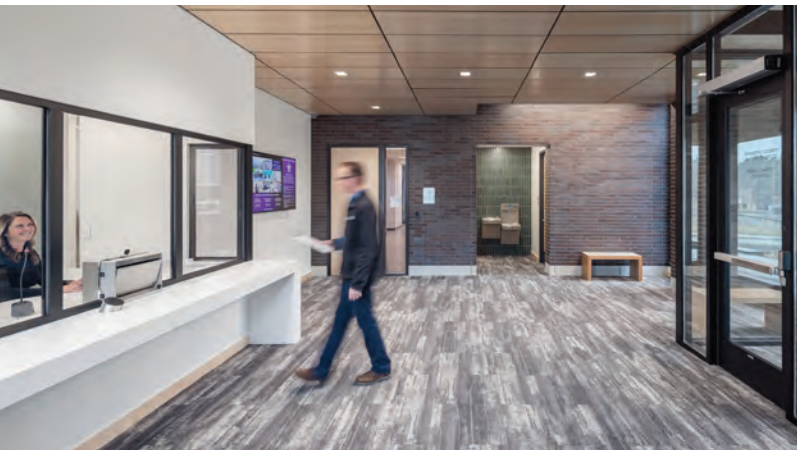
New Civic Campus
CHASSEN, MINNESOTA

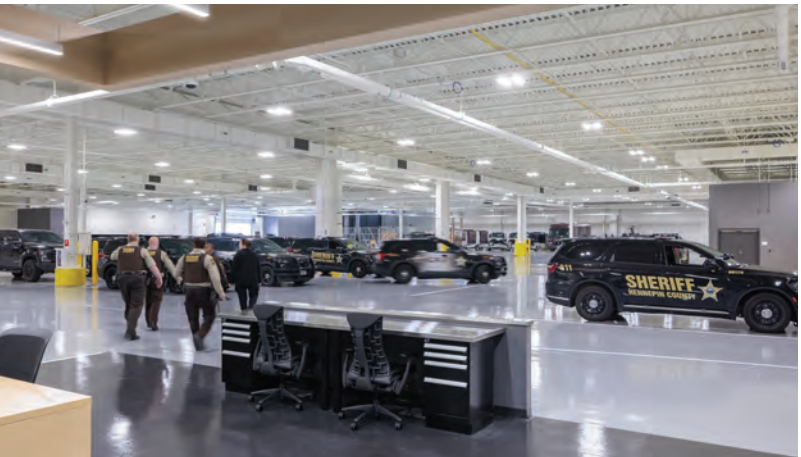
City of Chaska New Public Safety Building
CHASKA, MINNESOTA

Tribal Government Services Building
FLANDREAU SANTEE SIOUX TRIBE









Hennepin County Sheriff Public Safety Services HQ

PLYMOUTH, MINNESOTA

OWNER ▪ HENNEPIN COUNTY **SIZE** ▪ 100,000 SF **COST** ▪ EST: $38.4M / FINAL-$39.1M **COMPLETION** ▪ EST: 3/2025 / FINAL: 4/2025 **REFERENCE** ▪ JOHN RODE, SR. FACILITY PLANNER, HENNEPIN COUNTY, 612.596.7754, JOHN.RODE@HENNEPIN.US

The creation of a new Hennepin County Sheriff's Office Public Safety Services Division Headquarters represents a new patrol headquarters facility for the Sheriff's Office's entire patrol operations and fleet.

The complex is located in Plymouth on a secure campus that is presently home to the Emergency Communications facility and three Hennepin County corrections facilities. This new facility supports various department roles including leadership administration, patrol, investigations, and the crime lab. The new secure facility houses patrol locker rooms, evidence storage, a communications center, armory, SWAT team, and vehicle storage for approximately 120 vehicles — including infrastructure to support integration of an electric fleet.

As a mission-critical project supporting core departmental operations within a unified public safety campus, the site was carefully organized to optimize vehicle response, logistics, safety, and security. LEO A DALY simultaneously balanced these requirements with aspirational goals to provide an environmentally resilient and sustainable project that features the region's largest solar-power-supported secure electric vehicle squad garage and the harvesting of renewable energy on-site.

The project is expected to be net zero.

Team members associated with this project:

Daniel Yudchitz, Designer
Matthew Keenan, Project Manager
Jeff Besel, Electrical Engineer
Daniel Olig, QA/QC
Elan Design Lab, Civil
Damon Farber, Landscape Design
True North Consulting Group, IT/AV/Security
Rockwise Strategies-Cost Estimating (formerly Loeffler)

Forest Lake City Center Joint City Hall, Fire Station, & Police Station

FOREST LAKE, MINNESOTA

OWNER ▪ CITY OF FOREST LAKE **SIZE** ▪ 68,198 SF **COST** ▪ EST: $15.9M / FINAL $13.5M **COMPLETION** ▪ EST: 9/2014 / FINAL: 12/2014 **REFERENCE** ▪ RICHARD PETERSON, CHIEF OF POLICE/DIR OF PUBLIC SAFETY, CITY OF FOREST LAKE, 651.209.9725 RICK.PETERSON@CI.FOREST-LAKE.MN.US

The City of Forest Lake and the Forest Lake Economic Development Authority commissioned LEO A DALY to design a Planned Unit Development campus comprised of a new 65,000 SF municipal service center and future commercial parcels. The project redevelops an underutilized 14-acre brownfield site, anchoring the south stretches of the Highway 61 commercial corridor.

The Forest Lake City Hall and Public Safety facility houses city hall, a police station, and a fire station within a common building. The public safety facility is organized to accommodate full law enforcement operations over two floors including squad operations, investigations, detention, secured squad parking, K-9, and fitness and training spaces. The facility includes administrative offices for municipal staff, fire/dispatch/training spaces, public safety department and the emergency operations center.

The police station contains a public lobby, squad car garage, detention cells and evidence handling. Evidence and lab spaces form a large portion of the behind-the-scenes components and provide secure perimeter and interlocked doors to contain movement and maintain chain of custody.

The evidence spaces include dedicated secure vehicle evidence bays, located with direct secured access from the forensic lab. The forensics lab is outfitted for processing latent prints, biology and toxicology, including dedicated refrigerated storage spaces for biologicals, long and short arms, drug lockers, and long-term evidence storage. Work counters for office functions are provided separately of lab spaces to maintain clean work environments and limit potentials for contamination of evidence.

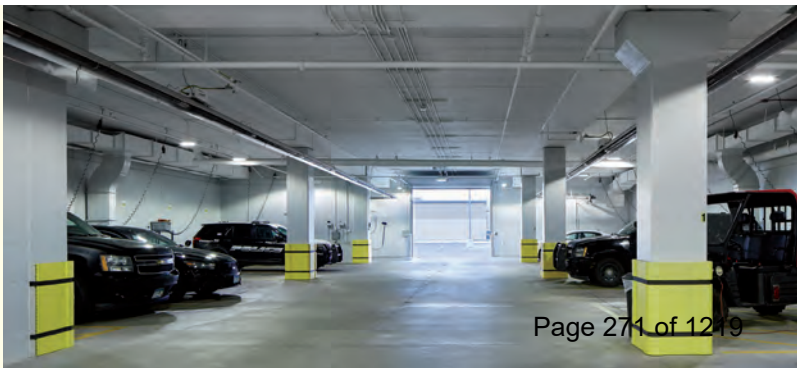
Team members associated with this project:

Todd LaVold, Architect
Damon Farber, Landscape Design

















Omaha Police Department West Precinct

ELKHORN, NEBRASKA

OWNER ▪ CITY OF OMAHA, NEBRASKA **SIZE** ▪ 36,000 SF **COST** ▪ EST: $10M / FINAL $8.2M **COMPLETION** ▪ EST:9/2019 / FINAL 9/2019 **REFERENCE** ▪ MICHAEL OESTMANN, CONTRACT ADMINISTRATION MANAGER, CITY OF OMAHA, 402.444.4575, MICHAEL. OESTMANN@CITYOFOMAHA.ORG

The Omaha Police Department needed to expand its presence in West Omaha as Omaha's population continues to grow westward. **The city sought a modern facility to house a growing police force, and one that promoted OPD's "community policing" philosophy.**

Our expertise and experience in public-safety design helped OPD leadership hone its vision for the facility during a series of pre-design workshops. We led architecture and engineering services for the 36,000-SF facility, which houses three police units, including emergency response, traffic investigations and patrol.

The building is positioned centrally on the site, facilitating the functionality of the building's internal layout. The Emergency Response Unit garage houses the fleet of the city's specialized response vehicles and was strategically located on site for ease of maneuverability of large vehicles. **The foreground of the building consists of public parking and a functional entry plaza that integrates protective barriers, benches, site walls and shade trees to form an outdoor "room" or extension of the public lobby. A gated secure perimeter surrounds the rear portion of the site and provides a secure outdoor space for police vehicle circulation and parking.** Inside, a north/south circulation spine provides a clear circulation path within the building, connecting the divisions and centrally located shared spaces.

DESIGNED FOR COMMUNITY POLICING

Amenities such as a community room, public workstations and Wi-Fi invite press members and neighborhood organizations to share space and engage with police, fostering transparency and partnership. Warm and inviting interior finishes adorn the precinct's public spaces, which are smartly aligned with entrances to provide staff with clear lines of site.

Team members associated with this project:
Daniel Yudchitz, Lead Designer
Gina Shuck, Interior Designer

Lake Elmo Joint City Hall & Public Safety Facility

LAKE ELMO, MINNESOTA

OWNER ▪ CITY OF LAKE ELMO **SIZE** ▪ 17,500 SF REMODEL, 37,500 SF TOTAL **COST** ▪ EST: $12.7M / FINAL:$13.6M **COMPLETION** ▪ EST:5/2023 FINAL: 5/2023 **REFERENCE** ▪ DUSTIN KALIS, FIRE CHIEF, CITY OF LAKE ELMO, DKALIS@LAKEELMO.ORG, 651.770.5006

The new Lake Elmo City Hall and Public Safety Facility combines city hall staff and functions, the entire Lake Elmo Fire Department, and a satellite office for the Washington County Sheriff's Department. **This co-location involved renovating and expanding the city-owned Brookfield office building to concentrate civic resources into a single structure at the historic core of the city** to help spur development and honor the roots of Lake Elmo.

This project consolidated Lake Elmo's two existing fire stations into a single, state-of-the-art station that meets the needs of the community and professional firefighters today and into the future. The building is designed to accommodate increasing call volumes, the transition to full time/career staffing model, meet training demands, and support the city's evolving role as all-hazard responders. The new facility includes staff dorm rooms, day room and kitchen area, fitness room, staff workspaces, and offices.

Lake Elmo City Hall, built in 1986, was 2,806 SF. City staff had long since outgrown this building and moved across the street into the Brookfield building, which required a major overhaul to increase its useful life. This updated facility provides:

- Improved service accessibility
- Community room available for public use
- New council chambers with updated technology
- Additional conference rooms
- Co-location of Washington County Sheriff staff
- Office space for growth of city staff
- Shared fitness room

Team members associated with this project:
Todd LaVold, Project Manager
Daniel Yudchitz, Director of Design
Matthew Keenan, Designer
Gina Shuck, Interior Designer

















Columbia Heights City Hall

COLUMBIA HEIGHTS, MINNESOTA

OWNER ▪ CITY OF COLUMBIA HEIGHTS **SIZE** ▪ 20,000 SF **COST** ▪ EST: $7.5 / FINAL:$6.5M **COMPLETION** ▪ EST:6/2024 / FINAL: 7/2023 **REFERENCE** ▪ KEVIN HANSEN, DIRECTOR OF PUBLIC WORKS, CITY OF COLUMBIA HEIGHTS, , 763.706.3705, KEVIN.HANSEN@CI.COLUMBIA-HEIGHTS.MN.US

The Columbia Heights City Hall is the first of its kind in Minnesota: a city hall constructed within a residential housing development. LEO A DALY designed the new 20,000 SF facility which sits at the prominent corner of Central Avenue.

Located on the ground level, the new city hall maintains a direct and approachable entrance to the highly traveled Central Avenue, making it more accessible to the citizens of Columbia Heights.

LEO A DALY designed the new city hall with large expanses of glass to provide as much natural lighting into the interior as possible. To address the security concern, a fritted film provided on the exterior glazing limits direct views into the work area by the public, but maintains a connection to the exterior.

This new city hall includes space for the city manager, administration, finance, community development and planning, information technology, and surveying departments.

The city hall features large staff meeting spaces, file rooms, work areas, and a break room. Additionally, a fireside community meeting room, and a council chambers with high-end AV systems separated from the greater space with a sliding glass wall that opens directly into the council room for varied uses and flexibility.

Team members associated with this project:

Daniel Yudchitz, Lead Designer
Matthew Keenan, Project Manager
Gina Shuck, Interior Designer
Jeff Besel, Electrical Engineer
Daniel Olig, Fire Protection





Elko New Market Police Department Expansion

ELKO NEW MARKET, MINNESOTA

OWNER ▪ CITY OF ELKO NEW MARKET **SIZE** ▪ 6,100 SF NEW, 11,600 SF SELECT REMODEL **COST** ▪ EST: $1.84 / FINAL: $1.9M **COMPLETION** ▪ EST: 9/2020 / FINAL: 11/2020 **REFERENCE** ▪ BRADY JUELL, POLICE CHIEF, CITY OF SAVAGE, 952.882.2600, POLICEADMIN@CITYOFSAVAGE.COM

After extensive review of use, efficiency, and cost, the city determined a new expansion and remodel to the existing city and fire hall were appropriate based on LEO A DALY's findings. wBy combining these operations into a single facility, the city would see benefit and returns on cost of operation. LEO A DALY ensured the construction documents included an understandable and appropriate phasing plan to alleviate confusion and/or added costs during construction. The phasing plan began with rerouting utilities and services, followed by the construction of the new building shell and interior spaces. Next, the existing fiber optic network was relocated to a new network/IT room, designed to serve as the future hub of the city's operations. Finally, targeted remodeling within the existing City Hall and Fire Hall enhanced and modernized shared departmental areas, improving collaboration and efficiency.

Team members associated with this project:
Todd LaVold, Project Manager; Matthew Keenan, Lead Designer; Daniel Olig, Fire Protection

North Metro Regional Training Center

MAPLE GROVE, MINNESOTA

OWNER ▪ CITY OF MAPLE GROVE **SIZE** ▪ 34,675 SF NEW CONSTRUCTION, 23,185 SF RENOVATION **COST** ▪ EST: $14.7M / FINAL: $14.8M **COMPLETION** ▪ EST: 5/2023 / FINAL:7/2023 **REFERENCE** ▪ ERIC WERNER, CHIEF OF POLICE, CITY OF MAPLE GROVE POLICE DEPARTMENT, 763.494.6100, EWERNER@MAPLEGROVEMN.GOV

LEO A DALY led an effort to complete the Minnesota predesign effort and associated activities required to prepare the project for support from the state. Upon recieving half of their funding request, combined with Hennepin County joining later in the process with $7 million of their own money, LEO A DALY designed additions and renovations that include **additional space for de-escalation and crisis intervention training, simulated ammunition space for a realistic scenario-based training environment, dedicated space for state-of-the-art tactical decision-making virtual reality, additiona firearms training lanes,** and office space to accommodate the nearly 20 regional public safety organizations and future customer organizations which utilize the NMR facility.

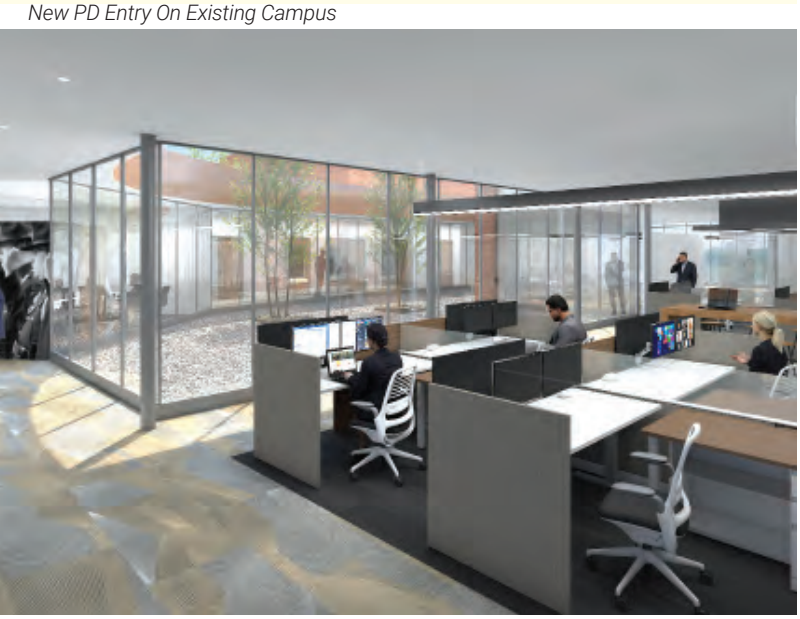
Team members associated with this project:
Todd LaVold, Project Manager; Daniel Yudchitz, Lead Designer; Matthew Keenan,QA/QC; Gina Shuck, Interior Designer; wDaniel Olig, Fire Protection







New PD Entry On Existing Campus



New Internal Courtyard Created Secure/All Access Daylight

Wake Technical Community College, Public Safety Simulation Center

WENDELL, NORTH CAROLINA

OWNER ▪ WAKE TECHNICAL COMMUNITY COLLEGE **SIZE** ▪ 85,000 SF **COST** ▪ EST: $40.29M / FINAL $40.29M **COMPLETION** ▪ EST: 12/2023 / FINAL 11/2023 **REFERENCE** ▪ JKATHY MONTERIO, DIR. OF DESIGN & CONSTRUCTION, WAKE TECHNICAL COMMUNITY COLLEGE, 919.866.5528, KGMONTERIO@WAKETECH.EDU

LEO A DALY designed the new 85,000 SF public safety simulation complex that will lead North Carolina, and likely the U.S., in effective 4D public safety simulation training. The new facility provides training for the College as well as state and local public safety agencies. The PSSC is designed with a full indoor simulation village for first responder real-life scenario and de-escalation training, and the highlight of the center -- a real streetway. **A fully immersive, 3D virtual reality lab provides for de-escalation,** force, mental illness and human judgment training scenarios. There is also a two-story corrections pod to facilitate training scenarios for public safety and detention personnel.

Team members associated with this project:
Todd LaVold, QA/QC SME; Daniel Yudchitz, Arch. Designer; Matthew Keenan, Architectural Advisor-Police

City of Coon Rapids Police Department Needs Assessment

COON RAPIDS, MINNESOTA

OWNER ▪ CITY OF COON RAPIDS **SIZE** ▪ N/A **COST** ▪ $16.4M **SCOPE** ▪ NEEDS ASSESSMENT, PLANNING **COMPLETION** ▪ N/A **REFERENCE** ▪ CHIEF STEINER, 763.767.6401, BSTEINER@COONRAPIDSMN.GOV

LEO A DALY partnered with the police department to assess their existing facility and develop a long-term plan that aligns with their growth and goals. Immediate needs include additional locker rooms for both genders, more private offices, fitness and wellness spaces, secure parking for department vehicles, and larger evidence processing areas. Additionally, the police department is using a portion of the public works facility for training, which is highly sought after for public works expansion.

The department's primary focus is to ensure any renovation or expansion is done correctly the first time, planning for growth and unknown future needs while being responsible with the city budget. Other priorities included allowing all occupied spaces to have access to daylight, easily accessible (mats rooms, VR space, and reality based training) for agency and joint/cross-agency training)

Team members associated with this project:
Todd LaVold, Project Manager; Daniel Yudchitz, Designer





PROJECT APPROACH

CHALLENGES SPECIFIC TO THIS PROJECT AND HOW LEO A DALY WILL ADDRESS THEM

Fast-Growing Community = Fast-Growing Police and City Staff. This Requires Planning for Both Short-Term and Long-Term Growth.

Community growth isn't just numbers; It's about people, quality environments, and the spaces needed to support them.

A decade ago, Rogers grew tremendously with the annexation of Hassan Township. Today, it remains one of the top growing cities in the state with projections showing two times the population 25 years from now. That growth is well within the lifespan of your new building. This will require short-term growth (5-10 years) AND long-term growth (20+ years) prior to the end of the useful life of this facility.

Designing your new police station and city hall to be "future proofed" isn't just about planning for future space, it is also about building in resiliency, flexibility, and durability, in a dignified manner so staff can be responsive well into the future.

People-Focused, Beyond Sworn Officer Counts

Thoughtful design must prioritize the people as well as space requirements. This means integrating access to daylight and connections to the outdoors in a secure manner *(refer to Coon Rapids PD project example on page 18)*, and accounting for acoustics to support confidential or sensitive conversations. It also means creating environments that support the full spectrum of an officer's needs. Even the most highly trained officers require moments of distance and separation from the gravity of the task at hand. They also need spaces to celebrate a case closed or share information informally or areas to bond together *(refer to Hennepin County Medical Examiner image on right)*. We take the need for these spaces seriously and plan spaces for interaction, collaboration, distancing, physical fitness, and mental stability. As we confirm the preliminary space needs program developed by Wold Architects, we will be asking your staff questions about:

- Pre-incident training to prepare and lesson law enforcement officers' susceptibility of developing mental health problems stemming from traumatic experiences.
- Exercise and connections to nature as a means improving employee well-being to better prepare officers for mental and physical situations.
- Post-incident training to cope and learn from an event and its effects on the public safety profession, both collectively and one-on-one in discrete sessions.
- Dorms or quiet rooms which allow flexibility for staff to accommodate long shifts, hectic schedules and mental down time if needed.

Flexibility and Growth That Evolves with Rogers Police Department

The way police departments serve their staff and the community is constantly changing.

- Providing dignified showers and locker rooms with flexibility for changing staff dynamics (continued growth of female officers, general diversity, and younger generations changing expectations) can ensure future staff are not short-changed.
- The use of tactical gear and equipment is growing. **Enough space today is not going to be enough space tomorrow. Agencies couldn't anticipate utilizing drones or body worn cameras 10 years ago.** Providing additional space for electronic forensics operations, real time intelligence centers *(refer to Miami Beach PD image below)*, crime scene unit equipment, or the unknown will make sure future staff are not short-changed.



Miami Beach Police Department-Real Time Intelligence Center



Hennepin County Medical Examiner Facility



Packaging Room, Pennington County Administration and Evidence Building

- Despite evolving laws and procedures, the need for secure property and evidence storage remains constant—and increasingly critical in today's highly litigious environment. Maintaining a clear and unbroken chain of custody is essential, and that starts with having adequate space for intake, packaging, logging, and long-term storage. Even in small to medium-sized departments that may not yet require dedicated evidence staff, conversations and thoughtful planning will help ensure future personnel have the resources and infrastructure they need to do the job right *(refer to Pennington County Administration and Evidence Building above).*
- As sworn officer staffing increases, so too does the demand for secure space to accommodate both patrol and command staff vehicles—critical assets to public safety operations. Additionally, sufficient parking for officers' personal vehicles must be factored in. On a constrained site like yours, this presents a significant challenge. While underground or lower-level parking can conserve surface area, it may limit flexibility as the department continues to grow. **We will work collaboratively with your team to explore a range of secure, indoor parking solutions—balancing short-term efficiency with long-term adaptability** *(refer to phasing diagram on page 23).*

Changing City Service Models, Changing Space Requirements

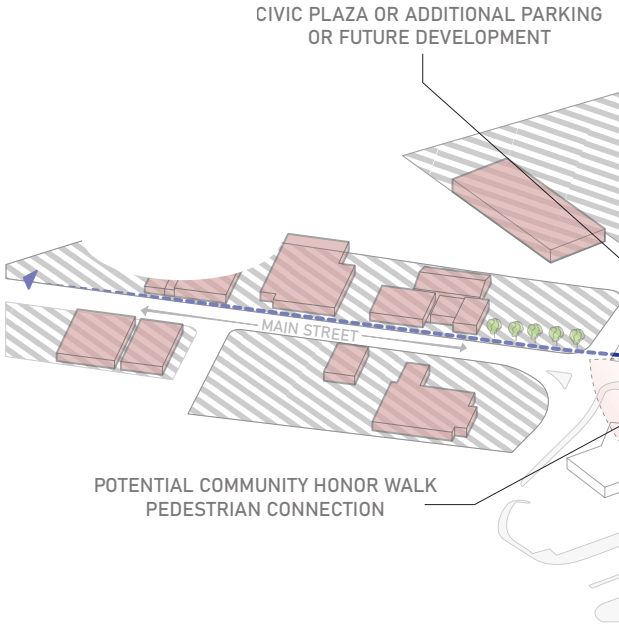
- Community expectations are evolving—some residents prefer the convenience of digital platforms to access city services, while others value in-person interactions. Despite these differences, a shared thread emerges: a growing interest in creative collaboration. Whether it's partnerships between local government and the private sector, engagement with residents, or coordination with non-profit organizations, these connections are vital. Together, we'll explore your current initiatives to strengthen these relationships and assess how they shape staffing needs, technology infrastructure, and the types of physical space required to support meaningful collaboration.
- As the city of Rogers continues to digitize, the need for large-format viewing, physical document storage, and plotting has significantly decreased. Beyond freeing up space for more purposeful use, this evolution enhances efficiency, improves access to information, and strengthens transparency—key drivers of civic engagement. By meeting with department heads and the Information Systems team, we'll gain insights into how digital tools are being used today and identify ways to better align physical space with the City's service delivery goals.

Layers of Security, Site/Building Security Clearly Defined

Police station design requires multiple levels of security to **ensure the safety of police officers, civilians, suspects and detainees, victims and witnesses, and the public.** This starts at the site level by mapping the following movements to ensure safety and security concerns:

PUBLIC MOVEMENTS

- Vehicular traffic visiting the city hall or the police station.
- People parking at the city hall parking lot for events located at the potential city hall plaza or walking to the revived historic downtown.
- People navigating between city hall and the police station.
- Civilian staff working at the city hall or police station.



POLICE MOVEMENTS

- Entering or leaving the site with their personal vehicle.
- Entering or leaving the site with their patrol vehicle with, or without a detainee.

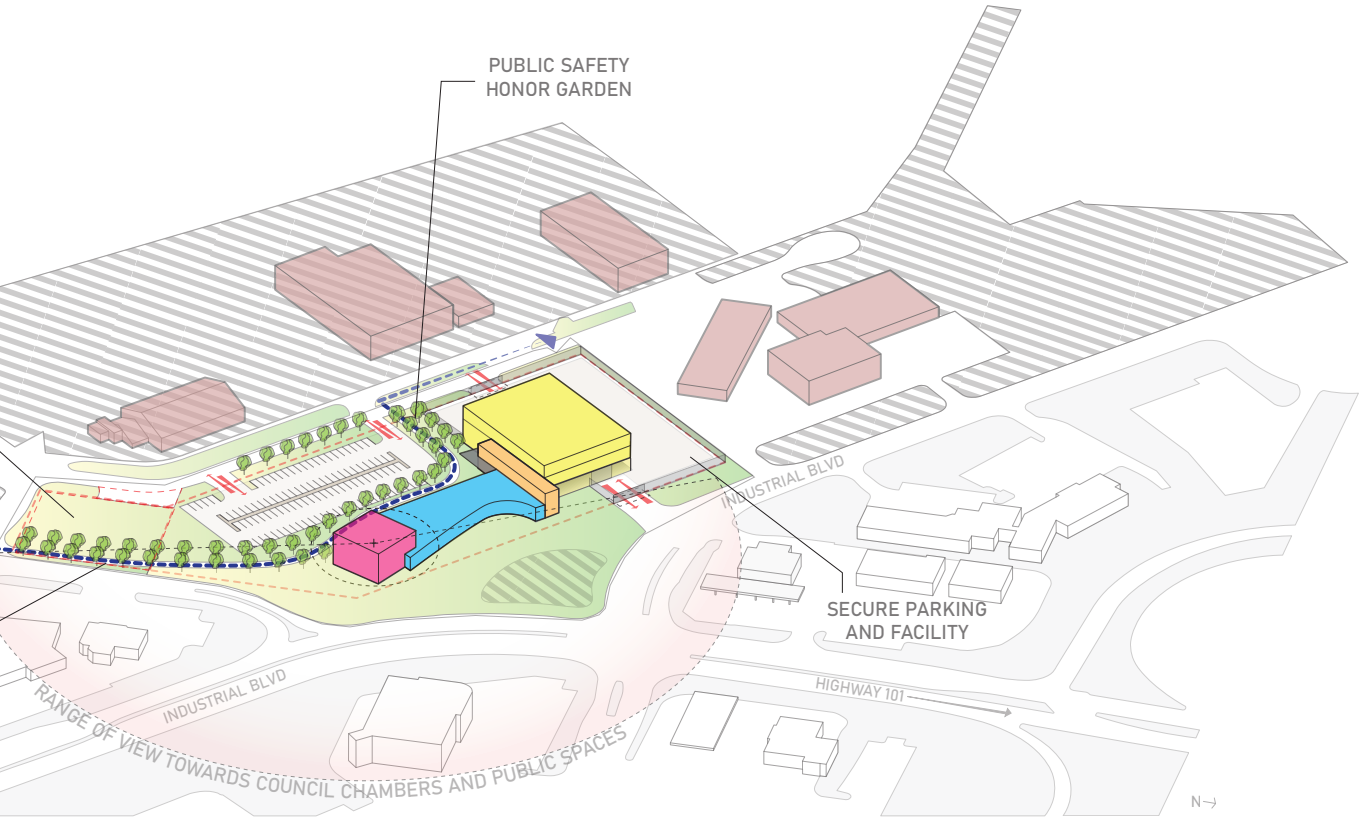
To ensure safe and efficient vehicular access to Industrial Blvd, Main Street, and John Deere Lane, we will collaborate closely with Planning and Engineering, Public Works, Community Development, and the Police Department to evaluate all potential access points and movement across the site. At the same time**, a pedestrian-first mindset must guide site planning if this facility is to truly support and stimulate the revitalization of Rogers' historic downtown** *(refer to Community Honor Walk idea below).* This includes designing walkable, pedestrian-friendly parking areas and thoughtful pathways that connect seamlessly to existing and future developments, reinforcing the building's role as both a civic anchor and a catalyst for community connection.

As the building design progresses, we will engage in detailed discussions around safety and security—addressing key areas such as facades and windows, lobbies, service counters, interview and conference rooms, holding areas, and office spaces. Early and throughout the design process, we will clearly define zones as **Public, Secure but Escorted, Secure, Detention Security, and Evidence Security.** At each point of transition between these zones, we'll evaluate potential threat levels, the desired sense of openness or formality, and the appropriate blend of passive and active security strategies.

Incorporating principles of **CPTED (**Crime Prevention Through Environmental Design), we'll use natural surveillance, territorial reinforcement, and access control to create safer environments.

Forward Thinking Workplace, Design that Confronts Stress Head-On

In parallel, **trauma-informed design** will guide decisions that minimize stress and anxiety, particularly in areas where victims, vulnerable individuals, or community members may engage with the facility. This includes attention to lighting, acoustics separation, and material choices that promote dignity and trust. Together, these frameworks support a facility that is not only secure, but also welcoming and responsive to the needs of all who enter.



Gateway Building with Public and Secure Requirements.

This project is a rare and powerful opportunity to establish a civic anchoring institution—one that not only fulfills the needs of the police and city departments, but also sets the tone and standard for future development in and around Rogers' historic downtown. Thoughtfully designed, this facility can become a landmark of public service, civic pride, and smart growth.

For the city hall, positioning the council chambers to anchor a prominent intersection offers residents a visible window into the inner workings of city government, establishing a strong civic presence and reinforcing the city's connection to its community without jeopardizing safety.

For the police department, windows can be problematic. Here, meaningful symbolism may play a vital role in furthering the service and mission of the Rogers Police Department. No longer housed in a re-purposed tile shop, the department will now occupy a space that visibly reflects its purpose and pride. The prominent display of the department's shield, along with the daily movement of patrol vehicles entering and exiting the facility, can establish a strong civic presence and reinforce its connection to the community.

A Phased Approach, Two Sides of a Fiscal Coin: Build more now, save later; But can the budget bear it?

The primary challenge of this project lies in its potential phased implementation, which introduces a distinct set of planning considerations. A potential phased approach necessitates a more strategic and adaptable Schematic Design process—one that balances multiple potential outcomes. While this adds a layer of complexity, it also presents a valuable opportunity to create a campus design that is both agile and responsive to evolving financial conditions (*The diagrams to the right indicate one way we will be thinking about a phased approach as well as future expansion capabilities).*

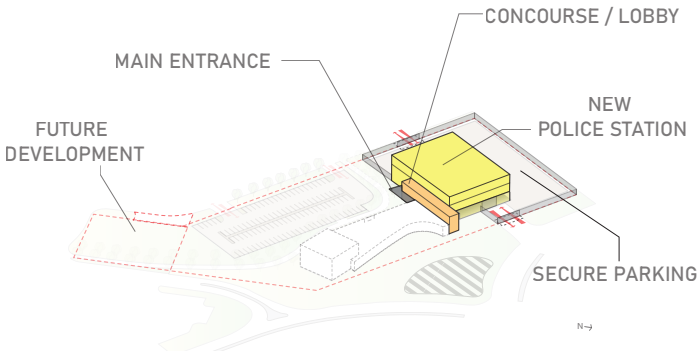
Prior to starting the project we will want to review your best and worst case cash flow scenarios for the construction and project estimates to understand what the implications of a phased approach may be.

The 2025-2029 Capital Improvement Plan indicates that in 2027 $20 million and $18 million is planned for the Police Station and City Hall respectively. Our schedule indicates a construction start date as early as the spring of 2026. This could potentially save about one year of construction escalation or $1.5 million calculated at 5% of $30.99 million. *(See separate Cost file for estimated construction cost calculation).* That represents approximately 3,000 sf or the size of a council chambers. Further, if the City Hall project is pushed out one year after the completion of the Police Station, the escalation cost factored into the City Hall could be as much as $850,000 or approximately the size of the programmed administrative space in City Hall. In other words, in waiting even one year after completing the Police Station to build City Hall in 2027 will mean the city will have paid for the equivalent of two council chambers and two administrative office spaces. The old adage says, "its cheaper to build today than tomorrow" is sadly true.

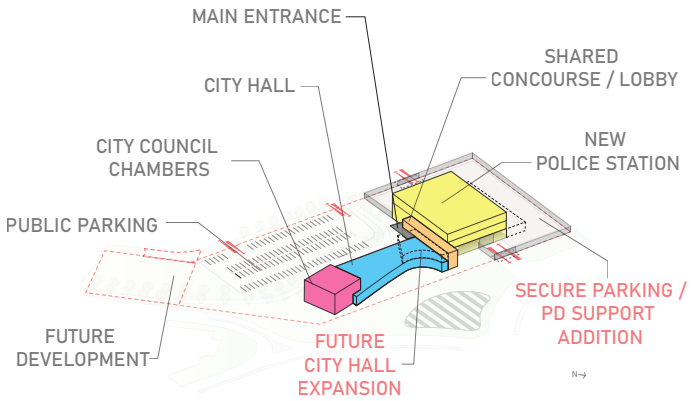
We will work early in the programming / conceptual / budgeting phase of the project to present options with and without a phased approach to understand the pros and cons of each. By the end of the first phase, we will have developed two comprehensive budget models—one reflecting a phased approach and the other assuming a single-phase implementation—providing the Building Task Force with clear, well-informed options as they prepare to enter the Schematic Design phase. Should a definitive path forward not emerge immediately, we will continue to refine the most viable phased strategy. This ensures we remain flexible while maintaining momentum, ultimately presenting a well-considered recommendation to Council once schematic design-level budget updates are available.

Storm Water Management, Seeking Long Term Solutions

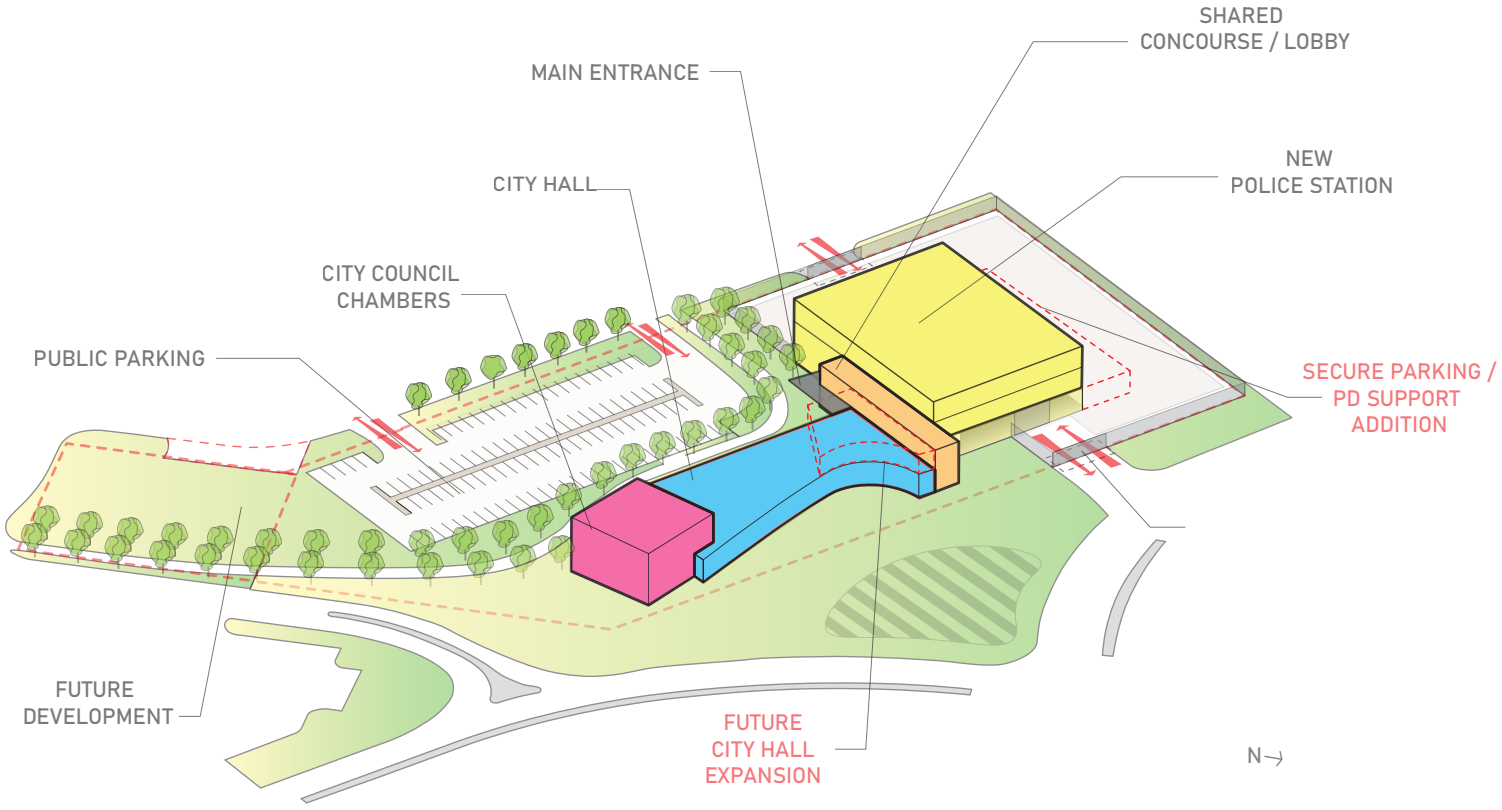
This project falls within the jurisdiction of the Elm Creek Watershed Management Commission, which requires a permit for land disturbances exceeding one acre. As part of compliance, volume abstraction (infiltration) is required for reconstructed impervious surfaces. If on-site soils are not conducive to infiltration (which may likely be the case based upon the general soil types in the area), the Commission provides a clear pathway for alternative solutions—allowing filtration practices to satisfy water quality requirements. Additionally, the use of off-site facilities is permitted, provided there is demonstrated capacity in the system. Planning for full build out on this relatively small site will require the design team to be creative to ensure regulatory requirements are met through the most effective and sustainable means possible.



PHASED APPROACH - POLICE STATION ONLY



FULL BUILD OUT APPROACH OF PHASE 2



FULL BUILD OUT APPROACH OF PHASE 2

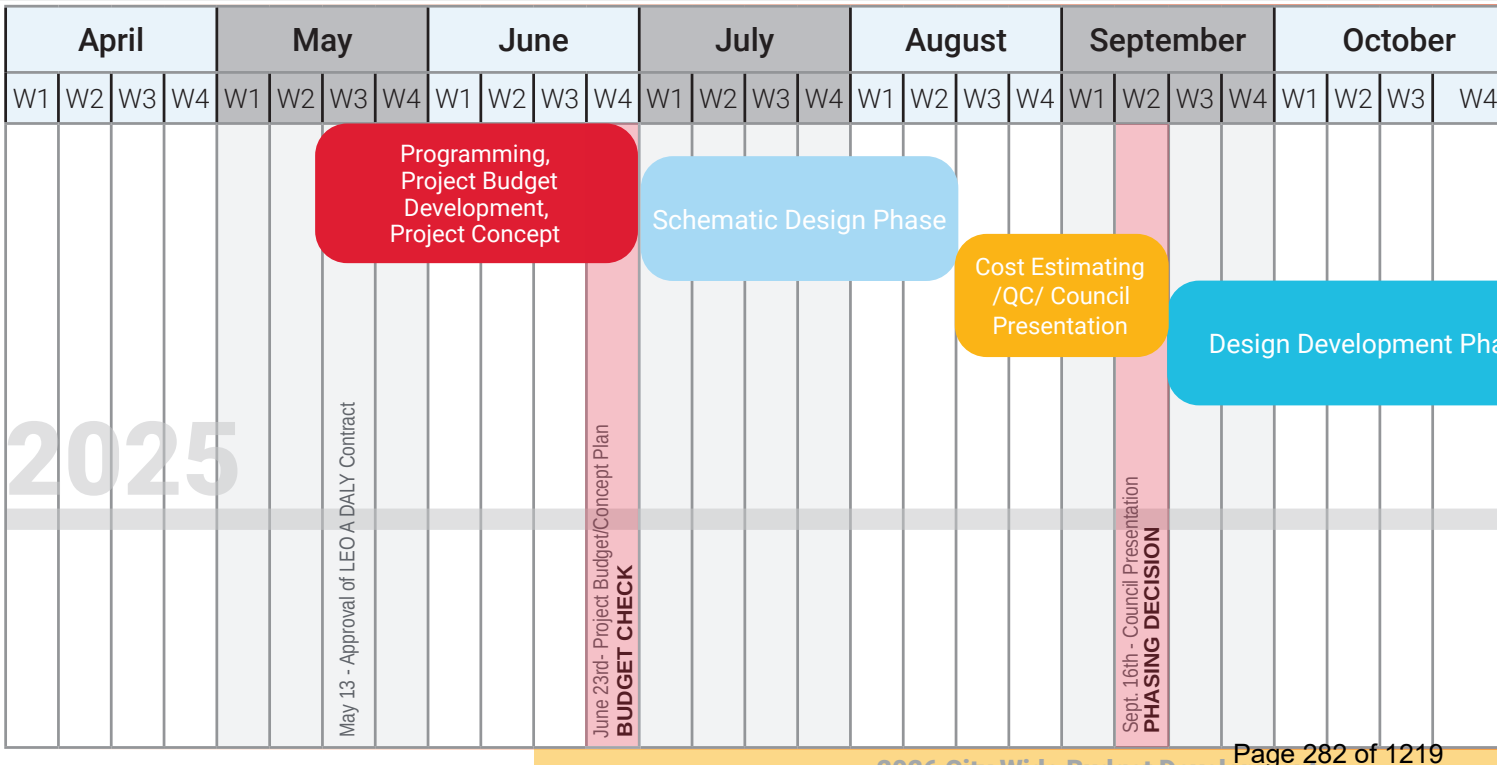
APPROACH-BUDGET

Our creativity, whether design and/or process, is focused on finding the best solutions for your City Hall and Police Department project. We are adept at value engineering and believe it to be part and parcel to the design process. Budgets are not just financial constraints; they are tools for refining priorities.

Our successful budgeting methodology has been centered on the following philosophies:

- On day one, we will establish a full project budget (soft costs and hard costs) consisting of over 70 lines of detail. This is a proven mechanism for cost control as all costs are estimated and allocated at the beginning of the project. This will define the anticipated project costs before design begins. Then the project goals can be reconciled within the the owner's project budget. As documentation is presented and tasks completed, work will be verified by our cost estimator, Talon DeWitz of Rockwise, and eventually your Construction Manager.
- During the project budget establishment, it is critical to establish realistic design, construction and owner contingencies, and know the criteria of use for each. This is more important than ever. Historically, there are always various market fluctuations and disruptions, however, with this project, tariff policy uncertainty looms. Early tariff contingencies must be considered and adjusted as new information becomes available.
- Tariff uncertainty will place even more importance upon developing estimating alternates to assist in budget maintenance at each phase. This is important as the team doesn't want to "hedge our bets" only to potentially see the tariff situation resolve itself which could mean leaving a lot of money "left on the table" with needs not met.
- Never leave a phase (especially schematic design) until the project is reconciled with the project budget.
- Cost estimates, as a design tool keep the design from being "bloated" or inefficient. Efficiently designed builds tend to also be less expensive to build.
- Relying on value engineering exercises at the end of phases, while necessary, can upend quality documentation by having to rework carefully developed designs and drawings. This is at the forefront of our decision-making throughout the process. We don't want to propose and develop the design knowing there is a good chance of it being over budget.

SCHEDULE







We firmly believe that 80% of a project's success occurs in the first 20% of the project. A strong plan is the road map to a project that mitigates surprises and stays on track.

Fiscal Responsibility Through Staff Partnership

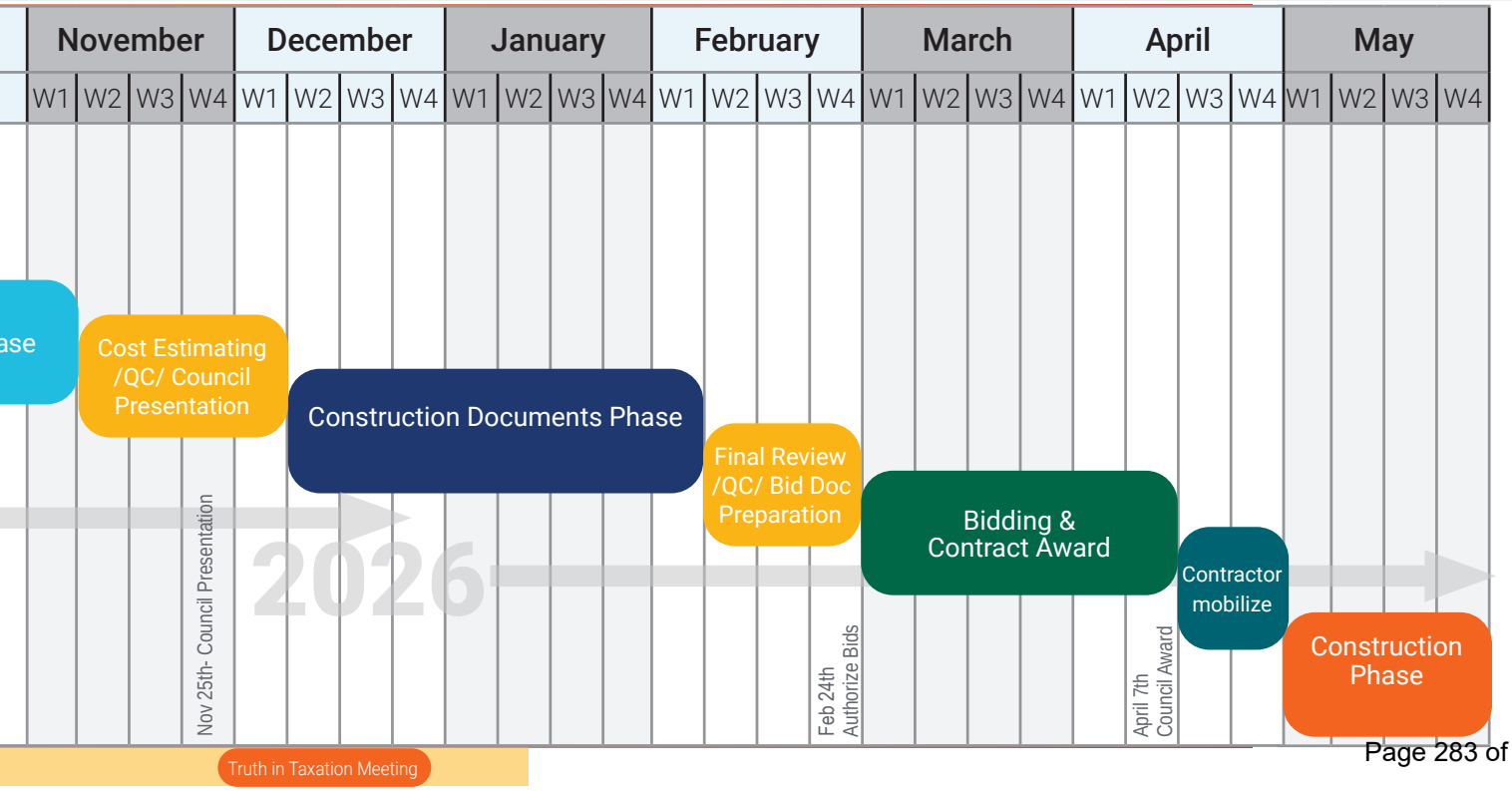
Our design process doesn't happen in a vacuum. Your building is being developed to serve your police officers and city staff. Building consensus through participating in the process creates ownership. This ownership includes understanding the fiscal consequences of every want and need. This makes goal setting at the beginning of the project valuable, because it can be used as a tool later in the process when wants and needs are weighed against the budget.

Our programming sessions with staff in each department focuses not just on finalizing your space requirements, it places a real emphasis trying to understand "the why" behind each conversation about the space needs ask of staff members. The goal of these conversations is to convert "the why" behind the conversation to a series of priorities and goals. This allows the best and highest priorities and ideas rise to the top, while lessor priorities may not fit into the budget. Having staff at the table, knowing not everything is possible while developing common goals gives ownership of the design process AND budget realities.

Quality Control is Cost Control

Our LEO A DALY public safety team believes in raising the design excellence bar for public safety facilities. Not only do we love serving those who serve others, we love doing it well. Our formal quality control implementation plans, insistence upon owner review periods, and consensus building end-of- phase budget reconciliation, all play critical roles in producing quality documents in a timely and steady manner that are on budget.

The schedule below is our approach to a reasonable design process which assumes construction of both the Police Station and City Hall, together. It also assumes no delays with council approval in June and/or September. A Police Station only project will not substantially affect the proposed schedule below.





LEO A DALY

Todd LaVold AIA
Project Manager / Market Sector Leader, P+I
D: 612.359.4656
TBLaVold@leoadaly.com

LEO A DALY

PLANNING
ARCHITECTURE
ENGINEERING
INTERIORS

April 25, 2025

Doran Cote
Public Works Director/City Engineer
City of Rogers, MN
22350 South Diamond Lake Road
Rogers, MN 55374

Dear Doran:

LEO A DALY is pleased to present our fee proposal for the Architectural and Engineering Services for the Rogers City Hall and Police Department project. We have reviewed your RFP and provided our very well-suited qualifications for this project. Our fee for services we believe is competitive and judicious with the marketplace while providing the level of service the City of Rogers and its taxpayers expect from a consulting team that is well-versed in public safety and civic design.

The basis of our fee was developed from information derived from the RFP. However, we noted information presented within the Wold Study that was conflicting, namely the square footage presented in the programming and the square footage listed in the cost estimates were different. For the purposes of developing our fee we utilized a percentage of construction costs of 7.6%. The following square feet were derived from the space program and utilizes round numbers from the 2045 projections.

Space Type	**Square feet**	**Cost / SF**	**Total Cost**
Police Garage/ Support Spaces	12,000	$375	$4,500,000
PD Office/Support Space	36,500	$500	$18,250,000
City Hall Office/Council Chambers	16,000	$515	$8,240,000
	64,000		**$30,990,000**

Based upon the above estimated construction cost we estimate our base fee to be $2,355,240.00. Additionally, we estimate approximately $1,000,000 of furniture, fixtures, and equipment. Our fee for design assistance, assisting in procuring and managing the furniture package is 3% or $30,000.00. Lastly, our maximum reimbursement will be $15,000.00.

Based upon a **one phase project including the Police Station and City Hall Project,** our fee would be broken by design and construction phase as follows:

Programming / Project Budgeting / Concepting	Schematic Design	Design Development	Construction Documents	Bidding	Construction Administration	Close Out
3%	12%	20%	34%	4%	25%	2%
$70,657	$282,629	$471,048	$800,782	$94,210	$588,810	$47,105
$353,286		$2,001,954 *				
$2,355,240						

LEO A DALY
730 Second Avenue South
Suite 1300
Minneapolis, MN 55402-2406
612.338.8741

leoadaly.com

Based upon a **two-phase project with Phase 1 including only the Police Station**, our fee would remain the same through schematic design and revised for theduration of the project based upon the same 7.6% of the construction cost, estimated to be $22,750,000 and broken by design development through close out as follows:

Programming / Project Budgeting / Concepting	Schematic Design	Design Development	Construction Documents	Bidding	Construction Administration	Close Out
3%	12%	20%	34%	4%	25%	2%
$70,657	$282,629	$345,800	$587,860	$69,160	$432,250	$34,580
$353,286		$1,469,650				
$1,822,936						

* If the project becomes a phased construction project where phase 2, the city hall project is constructed 1-2 years later, we will request additional fees to be negotiated based upon remobilizing our design team.

The exact nature of the project will not be known until after Schematic Design and after the City Council approves the direction and scope of work. Consequently, we request all fees be finalized at that point in time based upon 7.6% of the approved cost of construction.

As always, we are open to negotiating our fee in good faith to ensure a fair and equitable agreement for both LEO A DALY and the City of Rogers.

If you have any questions, please don't hesitate to call or follow up via email.

Sincerely,

LEO A DALY



Todd LaVold, AIA
Senior Project Manager & Market Sector Leader
tblavold@leoadaly.com

cc: Cindy McCleary, Vice President – Managing Principal. LEO A DALY

BKV GROUP

CITY HALL AND POLICE DEPARTMENT

PROPOSAL FOR | ARCHITECTURAL AND ENGINEERING SERVICES FOR SITE DESIGN AND CONSTRUCTION

APRIL 25, 2025



ARCHITECTURE | INTERIOR DESIGN | URBAN DESIGN & LANDSCAPE ARCHITECTURE
ENGINEERING | CONSTRUCTION ADMINISTRATION | BRANDED ENVIRONMENTS | SUSTAINABLE DESIGN

BKV GROUP

Doran Cote, Public Works Director/City Engineer
22350 South Diamond Lake Road
Rogers, MN 55374

April 25, 2025

RE: **Proposal for Police Department and City Hall Design**

Dear Doran and Members of the Selection Committee,

On behalf of the BKV Group team, thank you for the opportunity to submit our proposal for architectural and engineering services for the Police Department and City Hall project. We're excited about the potential of this project and the chance to collaborate with the City, Police Department, and stakeholders.

Founded in Minneapolis in 1978, BKV Group was built on the belief that architecture should serve the public good. Our mission remains: to enhance the economic, aesthetic, social, and environmental context of the communities we serve. We align with our clients' goals and values, ensuring responsible stewardship of public funds, and a passion for community success.

Our team brings experience from dozens of civic and public safety projects together. In addition to in-house expertise in engineering, landscape architecture, and interiors, we've assembled trusted partners for the remaining scope: Stantec for civil engineering, True North for security and technology design, and PPM for cost estimating. With an established team, we work efficiently and collaboratively to achieve your goals.

Our Minneapolis-based team has worked with cities and public safety departments across Minnesota and the nation. We are proud of the trust we've built, shown by our repeat clients and the strength of our results. Our approach includes:

Stakeholder-Driven Design. We engage your team and community throughout the process to ensure the project reflects your unique needs. We pledge to bring a fresh look, to listen first, and involve the Police Department and City as active participants throughout the entire project.

Industry-Leading Expertise. With **national** experience in police and city hall projects unparalleled in the region, we bring unmatched insight while tailoring solutions to Rogers' identity. With **200+ police projects** and **100+ city hall projects** we are poised to help Rogers realize their project goals.

Sustainability: We have a history of over 60 LEED projects, numerous projects meeting B3 requirements, and several Net Zero projects. We prioritize practical, energy-efficient, and lasting design solutions—even when certification isn't required.

Responsive Management: Our proven process ensures clear communication, accountability, and coordination at every stage.

Creative Solutions: Our award-winning work across civic and community sectors brings a fresh perspective that balances beauty, functionality, and adaptability.

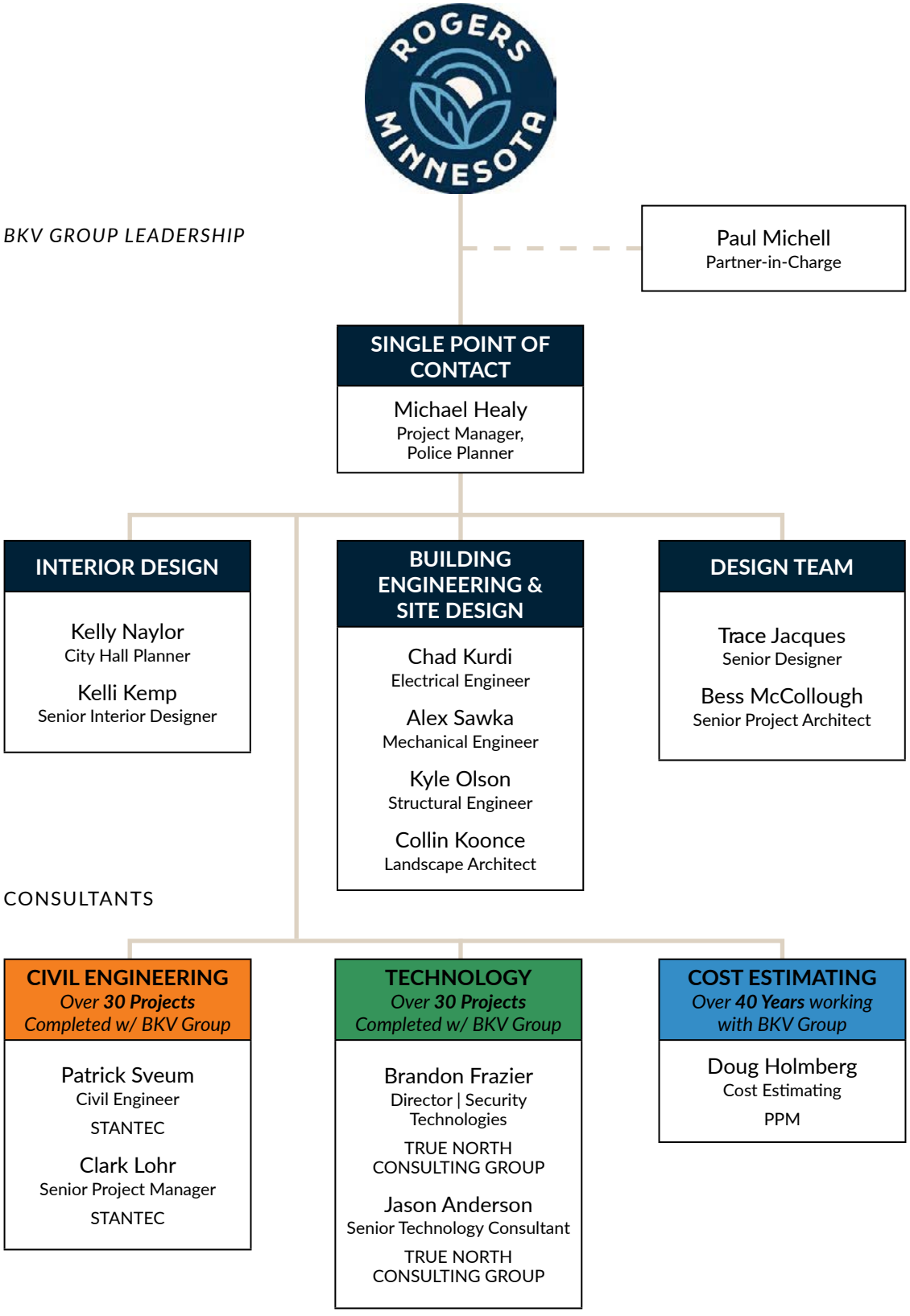
The BKV Group team meets the requirements of the City and we have the right qualifications, experience, and true passion for this project. Our proposed team members have the availability and expertise needed and will be committed to your project from beginning to end. Our friendly, hands-on team is ready to help you bring your vision to life – because we believe in "Enriching Lives and Strengthening Communities" – our mission across every project. We'd be honored to partner with the City of Rogers on this impactful project. Please don't hesitate to reach out with any questions.

Sincerely,
BKV Group



Paul Michell, AIA – Government Managing Partner
816.405.7585 – pmichell@bkvgroup.com

2. TEAM OVERVIEW





Paul Michell, AIA

Partner-in-Charge

Paul brings 26 years in planning and delivering complex public facilities. He demonstrates an unparalleled level of commitment to high-quality design, a team-oriented approach, and influential leadership which contributes to functional, enduring, and purposeful facilities that enrich the community while meeting the client's operational, budgetary, and schedule goals. Paul is passionate about projects for communities and local government, with expertise in public safety facilities. He understands the sensitive nature of local government decision making and delivering value for tax-dollars spent.

EDUCATION
University of Kansas, Bachelor of Architecture, School of Architecture and Urban Design // University of Missouri – Kansas City, School of Architecture and Environmental Design // Marquette University, College of Engineering, Emphasis in Electrical & Mechanical Engineering

REGISTRATIONS
Registered Architect: MN # 61543, among many others // NCARB

YEARS OF EXPERIENCE
26

AWARDS
Pittsburg Police & Court Facility *2010 Associated General Contractors of Kansas*, Award of Excellence Crossland Construction** // ***Daytona Beach Police Headquarters****, 2009 Associated Builders & Contractors (Central Florida Chapter)*, Excellence in Construction*, Eagle Award*, Ajax Building Corporation**

SPEAKING SESSIONS:
"The Station as a Tool for It's Users" – 2024 FIREHOUSE / OFFICER Station Design Conference

RELEVANT EXPERIENCE

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN

Chanhassen Civic Campus City Hall/Senior Center & Park Building, Chanhassen, MN

Eden Prairie Police Department Renovation, Eden Prairie, MN

Lansing Public Safety Facility, Lansing, MI

Great Bend Police & Court Facility, Great Bend, KS*

Bloomington Police Department & City Hall Annex Study, Bloomington, IL

Winona Public Safety Facility, Winona, MN

Willmar City Hall & Community Center Site Design & Assessment, Willmar, MN

Golden Valley Fire Station Location Analysis and Public Safety Pre-Design, Golden Valley, MN

South St. Paul Police Master Plan & Needs Analysis, South St. Paul, MN

Hays Police & Court Facility, Hays, KS

International Falls Municipal Facilities Needs Assessment, International Falls, MN

Red Wing Police Needs Assessment & Feasibility Study, Red Wing, MN

Trenton New Fire Station & Police Station, Trenton, MI

Springfield Police HW Facility Study, Springfield, OH

Fillmore County Law Enforcement Center Renovation & Addition, Preston, MN

Ankeny Police Headquarters, Ankeny, IA*

Bellevue Police Department Study, Bellevue, NE*

Central Police Facility Renovations, Independence, MO*

Andover Fire and Police Study, Andover, KS*

Springfield Police, Fire & City Hall Study, Spring Hill, UT*

Highland Police, Fire and City Hall Study, Highland, IN*

Norfolk Police Headquarters Renovation & Expansion, Norfolk, NE*

O'Fallon Police, Court and City Hall Study, O'Fallon, MO*

O'Fallon Regional Law Enforcement Training Center, O'Fallon, MO*

Wichita East Patrol Station, Wichita, KS*

Wichita East Patrol Site Evaluations, Wichita, KS*

Dade City Police & City Hall Facility, Dade City, FL*

Marion Police Headquarters, Marion, IA*

Lawrence Police Needs Assessment Study, Lawrence, KS*

Clarkville Police Department, Clarkville, AR*

Clayton Police Headquarters, Clayton, MO*

Central Police Facility Renovations, Independence, MO*

Conway Police Headquarters, Conway, AR*

**Experience prior to BKV Group*



Michael Healy, AIA

Project Manager, Police Planner

Michael has focused his career serving municipal clients from the early stages of planning and programming all the way through construction. With his experience, Michael has a full understanding of the operational needs of law enforcement facilities and their spatial requirements. Michael understands that each client's needs are unique and is committed to understanding their goals and providing solutions that are budget conscious, fulfill the specific operational needs, and provide added value to the users.

EDUCATION
Masters of Architecture; University of Minnesota, Bachelor of Science, Architecture, Minor, Construction Management

REGISTRATIONS
Registered Architect: MN #55378 // OSHA 10-Hour Certification

YEARS OF EXPERIENCE
16

AWARDS
Detroit Lakes Police Station: 2021 Officer Magazine Law Enforcement Design Awards - Facilities III, Silver // Rochester Government Service Center & North Police Station, MN: 2020 Finance & Commerce Top Project of 2020 // Fridley Civic Campus, MN: 2019 Firehouse Magazine Station Design Awards - Mixed Use Bronze Award

RELEVANT EXPERIENCE

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN

Rosemount Police Station & Public Works, Rosemount, MN

Chanhassen Civic Campus, Chanhassen, MN

Eden Prairie Police Department Remodel, Eden Prairie MN

Fridley Civic Campus, Fridley, MN

Rochester Police Station Study & Master Plan, Rochester, MN

Rochester North Police Station & Service Center, Rochester, MN

Detroit Lakes Police Department Facility, Detroit Lakes, MN

Wright County Government Center and Justice Center, Buffalo, MN

Wright County / FBI Joint Tactical Training Facility, Buffalo, MN

Pennington County Study and Justice Center, Thief River Falls, MN

Lansing Public Safety Facility, Lansing, MI

Ingham County Justice Complex, Master Plan and Facility, Mason, MI

Bloomington Police Department & Public Works Study, IL

City of Montgomery Public Safety Facility and City Hall Remodeling, Montgomery, MN

Edina Police Station Security Upgrades, Edina, MN

Brooklyn Center Council Chambers Renovation, Brooklyn Center, MN

Elk River Public Safety Building Remodel and Expansion, Elk River, MN

Hays Public Safety Needs Assessment Study, Hays, KS

Lakes Area, Police Station Needs Assessment, MN

Menomonie Police Facility Assessment Study, Menomonie, WI

Montgomery - 4th District Police Station Task Order

Montgomery County Police District Station 6, Gaithersburg, MD

New Town Public Safety Center Planning, New Town, ND

Shakopee City Hall, Shakopee, MN

Red Wing, Police & PW Study/Master Plan, MN

Red Wing Police Study, Red Wing, MN

St. Louis Park-Police Facility/Space Assessment, MN

West Fargo City Hall and Police Station, West Fargo, ND

Winona Public Safety Needs Assessment, Winona, MN

Wayzata Public Safety Needs Assessment & Master Planning, Wayzata, MN

Leech Lake Justice Center and Tribal Police, Leech Lake Band of Ojibwe, Cass Lake, MN

West Fargo City Hall and Police Station, West Fargo, ND



Kelly Naylor, CID, LEED AP

City Hall Planner

Kelly brings over 25 years of experience specializing in city halls, police stations, and government buildings. Her expertise in space standards and layouts ensures effective planning by aligning historical data with modern city and law enforcement needs. Leading BKV Group's interior department, she provides strategic leadership and mentorship while overseeing space planning, material selection, construction documents, and furniture review. With a deep understanding of spatial flow and operations, Kelly integrates sustainable, durable, and attractive design solutions, enhancing functionality and aesthetics in every project.

EDUCATION

University of Minnesota, Bachelor of Science, Interior Design

REGISTRATIONS

NCIDQ Certification #016271
LEED Accredited Professional
Certified Interior Designer (CID): MN #C02169

YEARS OF EXPERIENCE

25+

Relevant experience

Rosemount Police Station & Public Works, Rosemount, MN

Shakopee City Hall, Shakopee, MN

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN

Chanhassen Civic Campus City Hall/Senior Center & Park Building, Chanhassen, MN

Independence City Hall, Independence, MN

Fridley Civic Campus, Fridley, MN

Eden Prairie Police Department Remodel, Eden Prairie MN

West Fargo City Hall and Police Station, West Fargo, ND



Trace Jacques, AIA, CID, LEED AP ND

Senior Designer

With over 35 years of design experience, Trace brings creativity and thoughtful design to every project. He collaborates closely with clients to align their vision and goals with community aspirations and brand standards. Using live digital design charrettes, Trace models alternatives in real time, addressing aesthetics and functionality while creating impactful, tailored experiences.

EDUCATION

University of MN , Bachelor of Architecture w/ Honors, Architecture Thesis Award // 2001 AIA Minnesota Young Architect of the Year

REGISTRATIONS

Licensed Architect:
MN #24227; CID #C02232; LEED AP ND

YEARS OF EXPERIENCE

35

Relevant experience

Chanhassen Bluffs Recreation Center Concepting, Chanhassen, MN

Andrews Recreation Center, Andrews, TX

Edina Community Health & Fire Station #2 Facility, Edina, MN

Chanhassen City Hall, Senior Center & Civic Campus, Chanhassen, MN

Waite Park Public Safety & City Hall Renovation, Waite Park, MN

Rosemount Police & Public Works, Rosemount, MN

Roseville Civic Campus Master Plan, Roseville, MN

Vadnais Heights Fire Station Concept Study, Vadnais Heights, MN

Golden Valley Civic Campus, Golden Valley, MN



Bess McCollough, AIA, LEED AP

Senior Project Architect

Bess is a distinguished Project Architect and Project Manager with a wealth of experience in planning, design, and the preparation of construction documents. Her expertise encompasses code analysis, specifications, project scopes, and schedules. Widely respected for her ability to expertly navigate all facets of project execution—whether administrative, technical, or design-related—she ensures each project is completed efficiently and cost-effectively. A thoughtful and strategic leader, Bess consistently prioritizes her clients' goals and vision, guiding project timelines and decisions with precision and care.

EDUCATION

Montana State University, Billings, MT, Bachelor of Arts; University of Minnesota, Minneapolis, MN, Master of Architecture

REGISTRATIONS

Registered Architect:
MN # 57588

YEARS OF EXPERIENCE

21+

Relevant experience

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN

Maple Grove City Hall - Interior Remodel, Maple Grove, MN

Maple Grove Police Station - Interior Remodel, Maple Grove, MN

Hennepin County Public Safety Facility Improvements, Minneapolis, MN

Hays Police Station & Court Renovation, Hays, KS

Veterans Administration Office, St. Paul, MN



Kelli Kemp, CID, IIDA

Senior Interior Designer

Kelli has over 14 years of experience specializing in government facility design, with a focus on police station renovations, new police stations, city halls, and fire stations. She works closely with municipal clients to develop programming and comprehensive design concepts, ensuring efficient and functional spaces. Kelli excels in creative space planning, finish and furnishing selections, and producing detailed drawings, documents, and renderings that bring interior environments to life. Her expertise supports the unique operational needs of government facilities, enhancing both functionality and aesthetics.

EDUCATION

Brown College, Bachelor of Science Interior Design

REGISTRATIONS

MN Certified Interior Designer #C02472

YEARS OF EXPERIENCE

14

Relevant experience

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN

Rosemount Police Station & Public Works, Rosemount, MN

Eden Prairie Police Department & City Hall Renovation, Eden Prairie MN

Shakopee New City Hall, Shakopee, MN

Ramsey Juvenile Corrections Study, Ramsey, MN

CNS Y – 12 Fire Station Design, Oak Ridge, TN

Henrico Staples Mill Firehouse #20, Henrico, VA

Henrico Newbridge Firehouse #23, Henrico County, VA

Norfolk Fire Station #11 Design – Build, Norfolk, VA



Alex Sawka, PE

Mechanical Engineer

Alex is skilled in offering innovative mechanical design solutions to Projects. He is a highly motivated and resourceful individual who interacts productively with people from diverse backgrounds. Alex is a conscientious team player with excellent problem solving and troubleshooting skills, able to design innovative solutions that promote maximum efficiency while requiring minimal maintenance.

EDUCATION

Bachelor of Science, Mechanical Engineering, University of Minnesota

REGISTRATIONS

Professional Engineer: MN #53200, among many others

YEARS OF EXPERIENCE

16

Relevant experience

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN

Chanhassen Civic Campus City Hall/Senior Center & Park Building, Chanhassen, MN

Eden Prairie Police Department & City Hall Renovation, Eden Prairie MN

Rochester North Police Station & Service Center, Rochester, MN

Independence City Hall, Independence, MN

Detroit Lakes Police Department Facility, Detroit Lakes, MN

Wright County Government Center and Justice Center, Buffalo, MN

Wright County / FBI Joint Tactical Training Facility, Buffalo, MN

Pennington County Study and Justice Center, Thief River Falls, MN



Chad Kurdi, PE

Electrical Engineer

Chad has 35 years of experience in the electrical industry, and he brings in-depth understanding of electrical to each of his projects. Over the years, he has worked as an electrical engineer, electrician, electrical trainer, and manager. His electrical engineering experience includes drafting, designing, and specifying and analyzing electrical engineering projects for public safety facilities, hospitals, data centers, sport arenas, and commercial buildings.

EDUCATION

Bachelor of Electrical Engineering, Birzeit University // Master of Education, University of Minnesota

REGISTRATIONS

Professional Engineer: MN #42678 among many others

YEARS OF EXPERIENCE

35

Relevant experience

Chanhassen Civic Campus City Hall/Senior Center & Park Building, Chanhassen, MN

Eden Prairie Police Department & City Hall Renovation, Eden Prairie MN

Rochester Police Station Study & Master Plan, Rochester, MN

Rochester North Police Station & Service Center, Rochester, MN

Independence City Hall, Independence, MN

Detroit Lakes Police Department Facility, Detroit Lakes, MN

Wright County Government Center and Justice Center, Buffalo, MN

Wright County / FBI Joint Tactical Training Facility, Buffalo, MN

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN



Kyle Olson, PE, MLSE

Senior Structural Engineer

Kyle is responsible for performing and directing others in the design, evaluation, and retrofit of metal, concrete, masonry, and wood structures. Kyle has design experience in the following industries: affordable housing, education, energy, food, government, industrial, senior living, and student housing. Duties include preparation of engineering studies, design documents, building and support structure layouts, technical correspondence, engineering and construction cost estimates, and construction bid documents. He is also responsible for supervision of design personnel, final project checking, and communication with clients pertaining to design and construction issues.

EDUCATION
Civil Engineering degree, Bachelor of Civil Engineering, University of Minnesota

REGISTRATIONS
Model Law Structural Engineer
NCEES
Professional Engineer: MN #48667, among many others

YEARS OF EXPERIENCE
17

Relevant experience

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN

Chanhassen Civic Campus City Hall/Senior Center & Park Building, Chanhassen, MN

Eden Prairie Police Department & City Hall Renovation, Eden Prairie MN

Rochester North Police Station & Service Center, Rochester, MN

Independence City Hall, Independence, MN

Shakopee City Hall, Shakopee, MN



Collin Koonce, PLA, LEED AP, ULI

Landscape Architect

Collin is an urban planner and landscape architect with 15 years of experience transforming spaces globally. He has led projects ranging from mixed-use developments and urban parks to civic plazas and ecological restorations. Known for his collaboration and communication, he creates equitable public spaces while actively engaging in community initiatives. His leadership, research, and writings strengthen both his profession and firm.

EDUCATION
Texas Tech University, Bachelor of Landscape Architecture; University of Georgia, Master of Environmental Planning and Design

REGISTRATIONS
Professional Landscape Architect: MN #63962, among many others

YEARS OF EXPERIENCE
15+

Relevant experience

Waite Park Public Safety Facility & City Hall Renovation, Waite Park, MN

Andrews Recreation Center, Andrews, TX

Danville Masterplan Study, Danville, IL

Broken Arrow New City Hall, Broken Arrow, OK

Stafford Musselman Park Task Order, Stafford, VA

Citywide Park Master Plan, Chickasha, OK

Cedar Run Park, Dallas, TX

Dove Pool & Playground, Grapevine, TX

Downtown Streetscape Enhancement, Denison, TX

Greenville Ave Streetscape, Dallas, TX

Katy Trail Extension Study, Dallas, TX



Larry Farris, CBO

Codes Expert

Larry brings the expertise of a Certified Building Official and a Certified Building Inspector. Larry has a solid background in commercial and residential construction methods. A Certified Code Specialist, Larry closely monitors BKV Group's projects with his extensive knowledge in both national and state wide building codes and enforcement practices. Larry is also a Certified Plumbing Inspector & Certified Mechanical Inspector. Quality Assurance/Quality Control in design and field aspects of construction is critical in Larry's role on BKV Projects.

EDUCATION

Butte College, CA, Certificate of Completion, Building Inspection Technology

REGISTRATIONS

Certified Building Official, State of MN, #B0002653; Certified Building Inspector, ICBO, #36862; Certified Plumbing Inspector, ICBO, #38724; Certified Mechanical Inspector, ICBO, #37679; Certified Code Specialist, ACIA, #C-038724

YEARS OF EXPERIENCE

36

Relevant experience

Waite Park Public Safety Facility, Waite Park, MN

Rosemount Police Station & Public Works, Rosemount, MN

Chanhassen Civic Campus City Hall/Senior Center & Park Building, Chanhassen, MN

Eden Prairie Police Department Remodel, Eden Prairie MN

Rochester North Police Station & Service Center, Rochester, MN

Independence City Hall, Independence, MN

Detroit Lakes Police Department Facility, Detroit Lakes, MN



Patrick Sveum, PE

Civil Engineer | Stantec

EDUCATION

BS, Civil Engineering, Major, University of Minnesota, Twin Cities, College of Science & Engineering, Twin Cities, Minnesota, United States, 2012

REGISTRATIONS

Professional Engineer: MN #54244

CERTIFICATIONS & TRAINING

MnDOT Operation Division – ADA Construction Certification, Shoreview, Minnesota, United States, 2019

MnDOT Operation Division – Accessible Design in the Public Right-of-Way, Shoreview, Minnesota, United States, 2019

UMN Erosion and Stormwater Management Certification – Construction SWPPP, Shoreview, Minnesota, United States, 2022

YEARS OF EXPERIENCE

10

Relevant experience

Seven Lakes Development, Shoreview, MN

Norhart Factory Project, Forest Lake, MN

Impact Apartments and Public Street, Oakdale, MN

OMRY Independent Living, Shakopee, MN

Ryan Property Development South Addition – Magnum LTL Facility, Lakeville, MN

Fortistar Renewable Natural Gas Facility, Inver Grove Height, MN

ISLP North Spec Building, Lakeville, MN

Wings Financial Credit Union, Northfield, MN

Interstate Logistics Park 2020 Public Improvements, Lakeville, MN



Clark Lohr, CSI, LEED AP

Senior Project Manager | Stantec

Clark has over twenty-five years of experience in Civil Engineering and Land Development Project Management. His portfolio of work includes successfully delivering complex projects from conception through entitlements and construction. Clark has been with Stantec for 1 years.

EDUCATION

Bachelor of Science, Civil Engineering, University of Minnesota

REGISTRATIONS

Professional Engineer: MN #48667 // Model Law Structural Engineer // NCEES

YEARS OF EXPERIENCE

25

Relevant experience

Chanhassen Civic Campus, Chanhassen, MN

Edina Fire Station #2, Edina, MN

Wright County Government Center, Buffalo, MN

Rosemount Public Works & Police Station Campus, Rosemount, MN

Banaadir Academy, Minneapolis, MN

Wabasha Kellog ISD #811 Stormwater Improvements, Wabasha, MN

Comunidades Latinas Unidas En Serviicio (CLUES), St. Paul, MN

Minnesota History Center, St. Paul, MN

A-Mill Artists' Lofts, Minneapolis, MN

IBEW Local 292, Brooklyn Park, MN

Olmsted County Government Center Justice Systems Remodeling, Rochester, MN



Brandon Frazier, CTS, DSCE

Director | Security Technologies | TNCG

Brandon joined True North Consulting Group in 2018 and is a skilled technology consultant specializing in audio/visual systems, data networks, and advanced security solutions. He designs and implements integrated technology systems for various institutions, ensuring seamless functionality. His innovative approach and attention to detail make him a trusted advisor and director at True North.

EDUCATION

Dunwoody College of Technology, Minneapolis MN, Sound, Data, and Alarm System Design

YEARS OF EXPERIENCE

20

Relevant experience

Waite Park Public Safety Facility, Waite Park, MN

Bureau of Criminal Apprehension, Mankato, MN

City of Burnsville City Hall & Police Department Renovation, Burnsville, MN

Various Security Projects, Anoka County, MN

Control System Assessment, Metropolitan Council, MN

US Bank (Vikings) Stadium, MN

Minneapolis Public Schools, ISD 1, MN

Moraine Park Technical College, Fond du Lac, WI

Minnesota State Capitol Complex Security, St. Paul, MN

U.S. Bank Stadium (Vikings), Minneapolis, MN



Jason Anderson, CTS

Senior Technology Consultant | TNCG

Jason joined True North Consulting Group (formerly True North Consulting Group-TX) in 2012. Since starting with True North, he has designed audiovisual, physical security, and structured cabling systems. Jason's training and certifications include InfoComm CTS (Certified Technology Specialist), Crestron DMC-D (Digital Media Certified Designer), and Extron's School of Emerging Technologies.

EDUCATION

Carleton College, Northfield, MN - Bachelor of Arts, Physics

YEARS OF EXPERIENCE

20

Relevant experience

New Scott County Government Center, Scott County, MN

Mystic 2020 Expansion, Mystic Lake Casino, Prior Lake, MN

Expo Center, Williamson County, Taylor, TX

Fridley Municipal Complex, Fridley, MN

Pine County, Minnesota Courthouse, Pine City, MN.

Minneapolis Community & Technical College, Minneapolis, MN

University of St. Thomas – STEAM Project, St Paul, MN

Allina Health – New Simulation Lab at Abbott-Northwestern Hospital

Anoka-Ramsey Community College – Nursing & Business Renovation

Brooklyn Park, MN – Small Business Center

Capstone Classical Academy

Hennepin County, MN – Medical Examiner Facility

Lakewood Cemetery – New Welcome Center

Minneapolis American Indian Center



Doug Holmberg, PE, CPE

Cost Estimating | PPM

Doug will serve as Senior Estimator throughout all design phases. A Registered Professional Civil Engineer with dual degrees in Construction and Environmental Engineering, he is also a Certified Professional Estimator (ASPE) in all 16 CSI Divisions. With 42 years of experience and over $11.6 billion in estimated work, Doug has led roles such as Project Director, Construction Manager, and QA/QC Manager across a wide range of sectors.

EDUCATION

University of Wisconsin-Platteville, Bachelor of Science, Civil Engineering // MBA, St. Thomas University

REGISTRATIONS

Professional Engineer WI #E-22230 // Registered Professional Cost Estimator, American Society of Professional Estimators
CPE 1.4-00057 // SBE CERT Registered Firm
NAICS 541330: Construction Engineering Services

YEARS OF EXPERIENCE

44

Relevant experience

Eden Prairie Police Department & City Hall Renovation

Burnsville City Hall & Police Department Renovation & Expansion, Burnsville, MN

Fridley Civil Complex City Hall and Public Works Facility, Fridley, MN

Eden Prairie Police Department & City Hall Renovation & Expansion, Eden Prairie, MN

Rosemount Police Department & Public Works Campus, Rosemount, MN

Detroit Lakes Police Station, Detroit Lakes, MN

Bureau County Law Enforcement Center, Princeton, IL



WAITE PARK PUBLIC SAFETY & CITY HALL FACILITY

Waite Park, Minnesota

BUDGET
Est: $29M
Final: $25M (est.)

SCHEDULE
Est: October 2026 (est.)
Final: On Time

REFERENCE
Bill Schluenz
Public Works Director
p: 320.229.3685
e: Bill.schluenz@ci.waitepark.mn.us

FIRM STAFF
Paul Michell, Michael Healy, Trace Jacques, Kelli Kemp, Kyle Olson, Alex Sawka, Larry Farris, Collin Koonce, Bess McCollogh, True North Consulting Group

LOCKER AND/OR TRAINING ROOM
Yes

BKV Group was selected for full architectural and engineering services for Waite Park's renovated and expanded Public Safety Facility. The project started with confirmation of the city hall, police and fire departments' space needs and the development of a detailed space program for each department projecting their anticipated space needs for 20-years. The planning team then developed concept plans and feasibility studies exploring three different site locations and build options to address the current and future needs of the city. It was determined that the most appropriate option was to renovate and expand the existing city hall and public safety facility. The existing facility is planned to double in size, providing much needed additional operational space for police, fire, and city hall departments while renovating existing spaces to refresh interior finishes and improve operational flow. Additionally, the expanded police area will include a 30 stall squad garage, improved evidence processing and storage facilities, new locker rooms, and fitness center. The fire station will be renovated to provide health and wellness functions, equipping the station with decontamination spaces and implementing the hot and cold zone planning best practices to reduce firefighter exposure to harmful carcinogens. The city hall will be provided with a new multi-purpose council chambers/ community training room and new modern, day-lit public entry and lobby.



ROSEMOUNT POLICE STATION & PUBLIC WORKS

Rosemount, Minnesota

BUDGET
Est: $53M
Final: $44M

SCHEDULE
Est: November 2024
Final: On Time

REFERENCE
Mikael Dahlstrom
Police Chief
p: 651.423.4491
e: mikael.dahlstrom@rosemountmn.gov

FIRM STAFF
Paul Michell, Michael Healy, Kelly Naylor, Kelli Kemp, Kyle Olson, Larry Farris, Professional Project Management, Inc, Stantec, True North Consulting Group

LOCKER AND/OR TRAINING ROOM
Yes

BKV Group was engaged to provide architectural and engineering services to the City of Rosemount, MN for a new combined police and public works facility. The 160,000 GSF facility was planned on a 20-acre site at a highly visible location within the city providing a new civic identity for the police and public works departments.

The facility has a strong presence along Biscayne Avenue and was designed to be a welcoming community asset, including a generous public lobby and community training rooms. The public space is shared between the police and public works departments, located to maintain and provide a secure facility while providing easy wayfinding to city services. The facility was carefully designed to maximize daylighting to the occupied spaces to support staff health and wellness. A landscaped courtyard space was created for staff use within the secure area of the site, with the fitness area and staff break spaces located around the perimeter.

The facility provides centralized public works operations, providing space for public works offices, and staff support space as well as vehicle storage, vehicle maintenance and wash facilities. The police includes staff workspace, interview rooms, temporary holding, evidence processing/storage, indoor gun range, tactical training, and K9 area.



CHANHASSEN CIVIC CAMPUS CITY HALL & SENIOR CENTER

Chanhassen, Minnesota

BUDGET
Est: $33-$35M (est.)
Final: On Budget

SCHEDULE
Est: June, 2025 (Phase 1), June 2026 (Phase 2) *est.*
Final: On Time

REFERENCE
Laurie Hokkanen
City Manager
p: 952.227.1119
e: lhokkanen@chanhassenmn.gov

FIRM STAFF
Paul Michell, Michael Healy, Trace Jacques, Kelly Naylor, Kyle Olson, Alex Sawka, Chad Kurdi, Larry Farris, True North Consulting Group, Stantec

LOCKER AND/OR TRAINING ROOM
Yes

The City of Chanhassen has engaged the BKV Group team to help re-imagine their civic center of their downtown core. The team is currently assisting the City of Chanhassen in reimagining its civic campus as a city center that will attract visitors to the campus and the surrounding downtown area for community events and recreational and cultural activities. The project's purpose is to create a multi-use Civic Campus that includes a City Hall, Senior Center and Park that are welcoming to Chanhassen's diverse community and creates a place of gathering, entertainment and nature. A public open space for celebrating community life will be the highlight of the downtown, creating a center of activity and a focus for the downtown.

The new civic center retains the existing library, skate park, Veterans' Memorial, and parking structure while adding a new city hall; new pickleball courts; a new park pavilion, stage, plaza, fire pit, and upper lawn; an art walk; a splash fountain; a new playground; food truck areas; reflection pool, and a reconfigured intersection.

Surrounding downtown neighborhoods will be linked to the new Civic Campus, strengthening the relationship between the downtown and the community it serves.



ROCHESTER NORTH SERVICE CENTER & POLICE STATION

Rochester, Minnesota

BUDGET
Est: $22M
Final: $16.99M

SCHEDULE
Est: February 2021
Final: July 2021

REFERENCE
Jon Turk
Captain
p: 507.328.6940
e: jturk@rochestermn.gov

FIRM STAFF
Michael Healy, Kelly Naylor, Kyle Olson, Alex Sawka, Chad Kurdi, Larry Farris, True North Consulting Group

LOCKER AND/OR TRAINING ROOM
Yes

The Rochester North Police Station and Government Service Center is an adaptive reuse project combining the Development Services and Infrastructure Center (DSIC) and the Rochester Police Department (RPD) North Station. Faced with space limitations at City Hall and inadequate facilities shared with the County Sheriff, the City of Rochester repurposed a former bank building and land to meet growing needs.

The project began with renovating the 43,200-square-foot building to accommodate DSIC staff and RPD support spaces, such as locker rooms and a shared fitness area. A second phase added a 54,600-square-foot facility for RPD operations, providing spaces like a crime processing room, vehicle evidence bay with an in-ground lift, temporary holding facilities, and a 48-stall secure squad garage. Community resources include a divisible training room for up to 150 people.

Features include kennel spaces with outdoor runs for three K-9s, a wash area, and storage, along with stormwater management practices that created space for outdoor K-9 training. Adjacent to residential areas and a community park, the station enhances RPD's neighborhood policing strategy, while a safe-exchange area with video surveillance serves the community.







INDEPENDENCE CITY HALL RENOVATION

Independence, Minnesota

BUDGET
Est: $2,137,830
Final: $2,130,000

SCHEDULE
Est: July 2021
Final: July 2021

REFERENCE
Mark Kaltsas
City Administrator
p: 612.567.8786
e: mkaltsas@ci.independence.mn.us

FIRM STAFF
Kelly Naylor, Kyle Olson, Alex Sawka, Chad Kurdi, Larry Farris, Professional Project Management, Inc

LOCKER AND/OR TRAINING ROOM
No

The City of Independence, MN lies 25 miles west of Minneapolis, a mix of rural residential and active agricultural development in an area rich with lakes and wetlands. Independence City Hall, originally constructed in 1991, was expanded in 2000 to provide co-location of the West Hennepin Public Safety Department.

BKV Group was originally engaged to provide a feasibility and space needs study to determine how the existing facility might be adapted to more fully accommodate operational needs while also better representing the community with renewed interior and exterior finishes. Two key opportunities were identified: the existing windowless community room was identified as oversized, with missed opportunities for direct views to the wetlands, and the building's entrance and lobby currently opened to another solid wall, also blocking views and daylight.

The final renovation included inserting a formal city council dias, storage, and a meeting room into the community room, where three large windows now connect the space with the landscape beyond. The lobby was dramatically reconfigured with a new vaulted wood roof, with doors that provide pre-function space and a more direct entry into the community room. Wayfinding to both the Public Safety and City Hall service desks was improved by design adjustments, and finishes, furnishings, and lighting were upgraded in the City Hall administrative area and in portions of Public Safety. To address existing building and site infrastructure issues, the project included focused replacement and upgrades to mechanical and electrical equipment, and site and landscape improvements to address drainage at the north side, alongside new public plazas at both the front and rear. The building's exterior was transformed by a new rain screen system of thermally-modified wood battens.



DETROIT LAKES POLICE STATION

Detroit Lakes, Minnesota

BUDGET
Est: $6,364,946
Final: $5,061,839

SCHEDULE
Est: June 2021
Final: June 2021

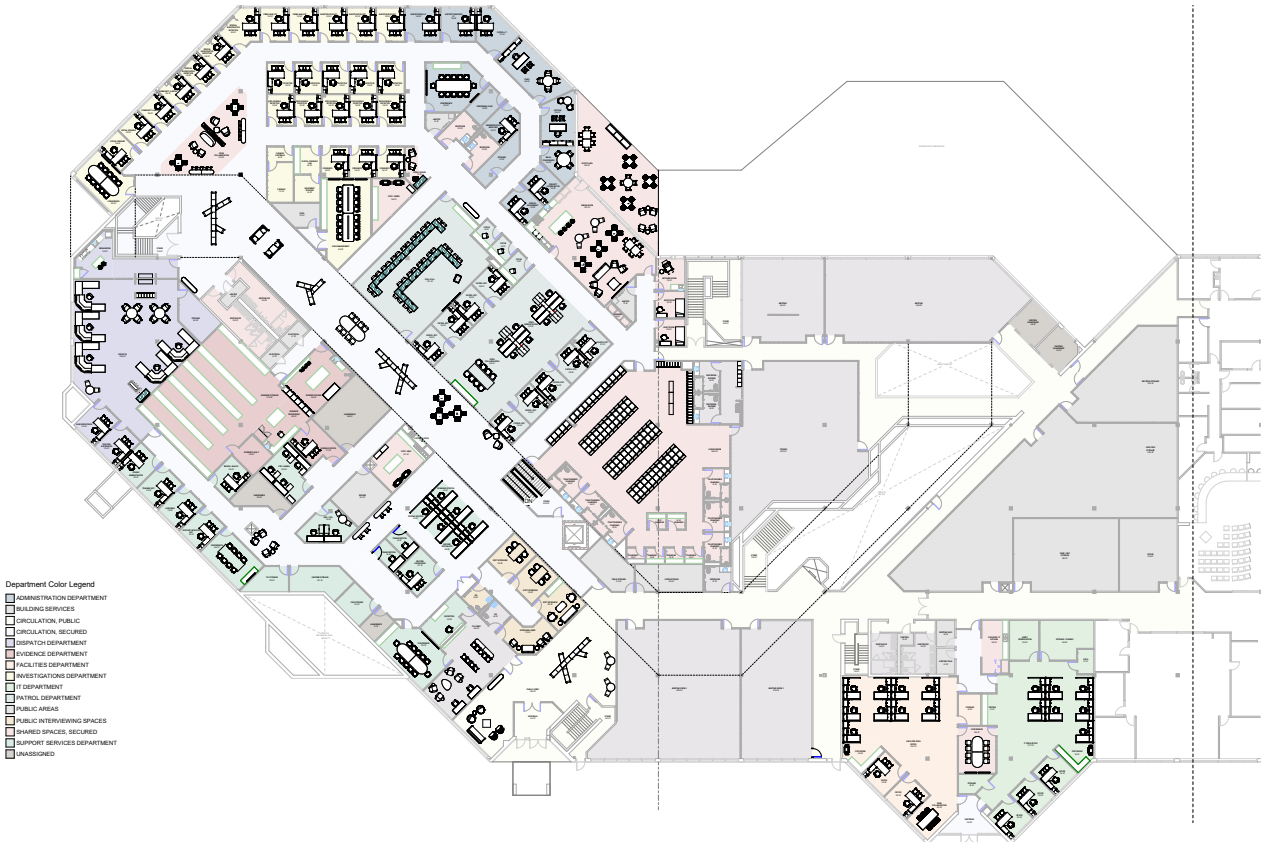
REFERENCE
Steve Todd
Chief of Police
p; 218.846.3203
e: stodd@cityofdetroitlakes.com

FIRM STAFF
Michael Healy, Kyle Olson, Alex Sawka, Chad Kurdi, Larry Farris, True North Consulting Group, Professional Project Management, Inc

LOCKER AND/OR TRAINING ROOM
Yes

Previously, the Detroit Lakes Police Department was operating within a drastically undersized facility that was not designed for law enforcement operations. The existing facility did not provide essential spaces such as locker rooms, evidence processing, interview rooms, nor adequate office space for the department of 16 sworn officers. Additionally, the existing facility did not provide separation or a secure perimeter between staff and public zones placing the department's staff at risk.

At just over 22,000 SF, the new Detroit Lakes Police Station was constructed within the city's downtown district and has become an integral part of the city's redevelopment plan for the downtown area. At this prominent location, the police station was designed to be a community resource and to strengthen the identity of the department within the community. The new station provides a natural-light filled community room open to public-use. Within the public spaces, historical imagery of the department which was collected from the local historical society is displayed proudly. An important aspect of the planning process was to provide a welcoming police facility and stress-reducing environment. Following biophilic design principles, the Detroit Lakes Police Station provides ideal access to natural daylight within public and staff work areas, along with utilizing natural materials and warmer tone finishes selected to reduce occupational related stresses. While at the same time, providing a secure facility using ballistic glazing and masonry materials to reinforce the exterior perimeter and ballistic-resistant materials within the interior lobby space. Overall, the Detroit Lakes Police Station provides the department with a modern facility, thoughtfully designed with ideal operational flow and elements to support the needs of the department while benefiting the community.



EDEN PRAIRIE POLICE DEPARTMENT & CITY HALL REMODEL

Eden Prairie, Minnesota

BUDGET
Est: $17M (est.)
Final: On Budget

SCHEDULE
Est: July 2026
Final: On Time

REFERENCE
Matt Sackett, Chief of Police
p: 952.949.6262
e: msackett@edenprairie.org

FIRM STAFF
Paul Michell, Michael Healy, Kelly Naylor, Kelli Kemp, Kyle Olson, Alex Sawka, Chad Kurdi, Larry Farris, True North Consulting Group

LOCKER AND/OR TRAINING ROOM
Yes

The BKV Group team is working with the Eden Prairie Police Department in programming, planning, and full design services for a 100,000 SF renovation of an existing city owned office building to relocate the police department to provide much needed improvements to their operational space and opportunities for the department to grow in-place.

This project is planned to include an approximate 5,000 SF addition to support the department's special response team operational needs as well as site improvements to provide secure parking for staff. Located within a shared facility with city hall, the renovated station will include an approximate 60 stall squad garage with detention and evidence spaces in the lower level. Staff offices and support areas will be located on the main level with improved wayfinding and public access. Working closely with the department, the operational flow was carefully thought out to maximize efficiencies for day to day operations. The renovation is being planned to maximize daylight to the interior spaces utilizing existing clerestory windows, while activating the circulation spaces to provide opportunities for staff to organically collaborate through thoughtfully placed conversation areas.



MONTGOMERY COUNTY 6TH DISTRICT POLICE STATION

Gaithersburg, Maryland

BUDGET
Est: $37.8M
Final: $37.8M

SCHEDULE
Est: 2025 (est.)
Final: On Time

REFERENCE
Behrooz Alemi
Project Manager
p: 240.777.6123
e: behrooz.alemi@montgomerycountymd.gov

FIRM STAFF
Michael Healy, Chad Kurdi, Larry Farris

LOCKER AND/OR TRAINING ROOM
Yes

BKV Group was commissioned by Montgomery County under the Public Safety Term Contract to provide program validation, design, and construction administration for the new 6th District Police Station in Gaithersburg, MD. Currently in design, the project addresses key challenges, including updating the detention area to meet county and state standards, revising locker layouts for gender flexibility and privacy, and meeting International Green Construction Code (IGCC) sustainability targets.

The two-story, 28,294 SF facility will house public areas, patrol operations, investigative units, and staff support spaces. A 59,526 SF two-level parking garage will accommodate 148 vehicles, including evidence storage, a service bay, and electric fueling stations. Designed for 24/7 operation, the station will serve as the district's command center, supporting 178 staff and volunteers, with a public meeting room.

The facility is designed for net-zero energy, using microgrid technology and on-site solar power to meet Montgomery County's carbon-neutral goals. All building systems will be fully electrified, and the project will comply with IGCC 2018 in collaboration with the Montgomery Office of Energy & Sustainability (OES).



LANSING NEW PUBLIC SAFETY PROJECTS

Lansing, Michigan

BUDGET
Est: $175 M
Final: On Budget

SCHEDULE
Est: 2026
Final: On Time

REFERENCE
Roy Plowman, Project Manager
p: 517.231.0344
e: Roy.Plowman@lansingmi.gov

FIRM STAFF
Paul Michell, Michael Healy, Larry Farris

LOCKER AND/OR TRAINING ROOM
Yes

BKV Group and local partner, was selected after a national search to lead the City of Lansing through the design process for a new Public Safety Building, three Fire Stations, and a Fire Training Facility. The total project budget is $175 M. The project began with helping the City through the bond referendum process and quickly moved on to space needs programming and conceptual planning.

The Public Safety Building includes Fire Headquarters and the Fire Marshall's Office, the City's Police Station (administration, records, patrol, investigations, evidence, squad garage, etc.), large meeting rooms for use by the Police and Fire Departments and by the public, a District Court with four courtrooms and associated offices and support spaces, and a temporary lockup to support booking and arraignment. On the same campus will be located a stand-alone replacement Fire Station #9 (Battalion HQ with 5 apparatus bays and 18 bunks), a heated outbuilding for storage of reserve vehicles and equipment for Police and Fire, and a Fire Training Facility to support 30 cadets per class (drill tower, flashover props, extrication pad, drafting pit, trench rescue, confined space rescue, and EVOC space). Parking is a major constraint on the campus, with separate parking areas for the Public, Court Officials, Firefighters, Cadets, and the Public Safety Building and indoor parking for squad cars and judges, totaling nearly 800 stalls.

The projects are expected to use the LEED rating system as a methodology, but not to pursue Certification. The project will be delivered through a CMc method and will be executed in multiple phases, with construction beginning in fall 2023 and finishing in 2026.

4. PROJECT APPROACH



PROJECT COMMUNICATIONS

The success of this project will be built on collaborative, consensus-driven communication and a clearly defined schedule and work plan shaped by stakeholder input. At project kickoff, our team will work closely with the City and user groups to refine the work plan and ensure critical milestones align with the overall timeline. This process will also clarify all project goals and objectives. Led by experienced senior team members, we bring the expertise needed to address key issues promptly and deliver a well-developed, on-schedule project. Our team includes national leaders in law enforcement and municipal facility planning and design, offering the City innovative, project-specific solutions informed by current industry standards.

PROJECT UNDERSTANDING

Recognizing the importance of this opportunity, we've strategically assembled a team with specialized expertise to address the evolving needs, innovations, and best practices critical to your project. Your community has unique needs and your facility should be tailor-fit.

Our first priority is to listen, then design a solution that responds directly to your goals. Building on the predesign work, we'll translate your priorities into a verified building program that balances practical requirements—such as adjacencies and operations—with the aspiration to create a distinctive, community-centered facility.

With deep experience in projects like the one the City of Rogers is pursuing, our team brings proven strategies, comprehensive resources, and insight into modern challenges and innovative solutions. We are committed to guiding this effort, fostering open dialogue with your leadership and staff to ensure the project reflects your goals and values.

Our management approach is simple, we are joining **YOUR** team. We work seamlessly with you in a collaborative, integrated way that blends our professional expertise with yours. We believe great outcomes emerge when our strengths are united. Our workshop-based process uses 2D and 3D tools to support transparent collaboration and iterative decision-making. Each workshop concludes with approved, actionable progress.

This project demands interdisciplinary coordination. Our locally based team includes architects, engineers, planners, civil and utility specialists, security and technology experts, and cost managers—ensuring full-spectrum support at every stage.

A FACILITY-SPECIFIC APPROACH

We bring a team with specialized expertise in law enforcement and municipal operations, ensuring the project reflects current best practices and evolving service needs. Our facility specialists draw on deep industry knowledge and national standards to guide a responsive, informed process. We're committed to leading this effort through meaningful dialogue with your core team, department leaders, and staff to deliver a project that fully meets your goals.

POLICE FACILITY PLANNING. Our planning process will consider the following critical areas at minimum, informed by national standards and best practices, adapted for Roger's specific needs:

- Critical Adjacencies for Efficient Operations
- Community Engagement & Outreach

- Addressing Changing Gender Ratios
- Supporting Evidence Processing, Chain-of-Custody & Storage
- Separation of Victims, Witnesses & Offenders
- Staff Safety & Wellness Functions
- Trauma-informed Design
- Training Functions
- Security and Surveillance Systems
- Facility Perimeter Stand-off Zones
- Tornado Storm Shelter Requirements
- Technology Integration
- Engineering Systems and Equipment

CITY HALL PLANNING. BKV Group is dedicated to planning city hall buildings that foster connections between the multiple departments, supports efficiency, and is an asset to the greater community. Our planning process will consider the following topics at a minimum:

- Accessibility & Inclusive Design
- Flexibility & Adaptability
- Safety & Security
- Staff Health & Wellbeing
- Community Building
- Civic Image & Identity
- Service Delivery Philosophy
- Technology Integration
- Resiliency & Durability

DESIGN PHASE SERVICES

SCHEMATIC DESIGN

This phase of the work sets the parameters of the project, design, implementation schedule and cost budget for the project. The work begins by reviewing the available information, including, but not limited to, prior studies, operational assessments, and surveys and geotechnical investigations. The following are some of the workshops that typically during this phase:

Workshop 1 – Kickoff & Program Verification. We'll align on the project vision, scope, and communication plan while reviewing operations, space and operational programming, and requirements. Stakeholder interviews will help identify updates from prior planning efforts. Based on program square footage, our cost team will prepare a preliminary cost-per-square-foot estimate.

Workshop 2 – Sustainability and Energy Goals / Objectives. We'll define project sustainability targets and explore strategies for energy efficiency and environmental performance.

Workshop 3 – Visioning. The design team will hold an exterior and interior visioning workshop to welcome stakeholder feedback, engaging them in the process to inform the development of the exterior design.

Workshop 4 – Multiple Concepts. We'll present design options, each outlining spatial organization, functional flow, phasing, and budget. Feedback will guide refinement or blending of preferred elements into a hybrid option.

Workshop 5 – Concept Review. We'll present design options, each outlining spatial organization, functional flow, phasing, and budget. Feedback will guide refinement or blending of preferred elements into a hybrid option. Following concept approval, we will prepare Schematic Design Documents, including architectural and civil site plans, floor plans, elevations, major sections, and a phasing strategy. A design narrative will outline project concepts, schedule, cost, materials, and key sustainability strategies, comparing design outcomes to the final program.

Workshop 6 – Final Review. This meeting will review the final Schematic Design Documents.

DESIGN DEVELOPMENT

The Design Development (DD) phase bridges the initial vision with detailed contract documents, refining both the building's aesthetics and its construction expectations. During this phase, we focus on defining the interior and exterior character, materials, systems, and quality standards.

Our workshop process continues with detailed stakeholder input. We'll define interior finishes, equipment, and building systems—confirming mechanical strategies and facilitating discussions around A/V, security, performance, sustainability, and maintenance goals. This alignment helps ensure clear expectations for use, function, appearance, and quality, supporting a more accurate cost estimate.

Preliminary reviews with code officials, city planners, and other authorities having jurisdiction will be scheduled to identify and resolve potential issues early in the process.

Deliverables will include key components of the contract documents: site and floor plans, reflected ceiling plans, building sections, elevations, interior finishes, key details, and a conceptual furniture plan. We'll also provide a draft project manual outlining preliminary material and assembly selections, as well as cutsheets and product data for proposed equipment and finishes.

CONSTRUCTION DOCUMENTS

The Construction Documents (CD) Phase is technically focused, finalizing the design through fully coordinated drawings and specifications that define scope, details, and quality. Our process ensures the project's vision—function, aesthetics, and performance—is clearly reflected in the contract documents. We maintain regular stakeholder reviews during this phase to confirm alignment with project goals and ensure transparency.

Project management efforts during CDs focus on full integration across disciplines—architectural, interior, structural, mechanical, plumbing, electrical, technology/security, civil, and landscape. We also coordinate with local and state regulatory agencies to support timely permitting and approvals.

To maintain quality, we conduct page-turn meetings and implement rigorous internal reviews. BKV Group's in-house quality assurance team provides third-party reviews during both the Design Development and Construction Document phases, ensuring a complete, coordinated, and buildable set of documents. Additionally, all projects are reviewed by an independent exterior envelope consultant to further strengthen quality and performance assurance.

BIDDING & AWARD

We assist the City to facilitate a smooth bidding process. This includes facilitating a pre-bid conference with interested construction professionals, responding to bid questions, reviewing substitution requests, developing responses and issuing addenda, reviewing the bids, and making recommendations on selection of the contractor.

CONSTRUCTION & POST-OCCUPANCY

The project's contract documents establish and define requirements and expectations for construction quality; our team's construction administration services provide presence and insights into the execution of construction. We will be a ready and responsive partner and will be an advocate for the design intent and objectives reaffirmed with you throughout the design process. Our deep knowledge of the contract documents allows us to serve as a reference for what is intended on the project, and for how it was conceived and coordinated.

We will be the City's advocate during construction and will provide services including site visits, shop drawing / submittal review, RFI responses, payment requests, and punch list review. Post Construction Phase activities would include O&M Manuals to user facility and agency, material stock delivered, training videos submitted, and electronic and hardcopy record documents submitted.

SUSTAINABLE DESIGN

At BKV Group, sustainability is a core value. We actively seek opportunities to align our expertise with each client's goals for performance, value, resilience, and well-being. Our approach spans all scales—from planning and infrastructure to building reuse and adaptation, down to the human scale through indoor environmental quality factors like air quality, daylight, acoustics, and materials. We bring experience with certification pathways such as LEED, Minnesota B3/SB2030, Green Globes, WELL, and GreenStep Cities. Whether pursuing formal certification or using these standards as design benchmarks, we use them to shape sustainable, energy-efficient, high-performing outcomes tailored to your project's objectives.

MITIGATING RISKS THROUGH LESSONS LEARNED

For nearly 50 years, BKV Group has successfully delivered public safety and civic projects both across Minnesota and nationally. We offer a refined process for effective disruption planning and risk mitigation, starting early in the discovery phase and continuing throughout the duration of the project. We have found the most effective tool to mitigate risk is identifying them early and clear communication between all stakeholders.

Stakeholder Involvement. Active involvement of stakeholders throughout planning and design is key to building consensus and minimizing costly changes later. Engaging user groups, City officials, and in many cases, the public, early ensures smoother decision-making.

Application of Expertise. We know that we are hired to bring expertise, and you rely on our experience to deliver a quality project, on-time and on-budget. Our team features deep experience in the detailed requirements of planning a successful police facility and city hall. Involving a team with design expertise and a successful track record minimizes the risk of costly changes during or after construction and brings credibility to the process.

Aligning Design & Budget. Through ongoing dialogue, consideration of alternatives, and an approach informed by industry expertise and local market conditions, we ensure that design decisions align with financial goals. Throughout the process, we engage in open discussions with the City's core team to clarify priorities, distinguish needs from wants, and provide the City with the information needed to make well-informed cost and value decisions. If cost estimates indicate budget concerns, we revisit these discussions to ensure any necessary adjustments preserve the project's core objectives. This is not an exercise limited to end of phase budget check-ins. Our process reviews the project's objectives and design relative to budget at every step.

Maintaining Schedule. One of the largest project risks is schedule. This directly affects project budget as well since construction costs continue to rise through design and construction phases of work. Our project management approach is focused on the schedule with establishment of a detailed schedule at the onset of the project. Through our workshop processes and routine project check-in meetings, the City can understand project progress and know that the project is progressing according to schedule. Our team has a deep bench and the resources needed to scale to meet the demands of the project to ensure that we are delivering quality design that meets the schedule. During construction, responsive communications between all the design team, the City, and the contractor ensure that efficient progress can be made on site. Providing quality construction documents will minimize changes during construction and keep the project on schedule. It is critical to allow enough time for development of the design, but also for quality control and stakeholder review.

Construction Phasing. Planning for this requirement starts early in concept development. The potential for construction phasing and flexibility in implementing future construction means that the design must work around occupied spaces such as a 24/7 police facility during future construction. Without detailed knowledge of the building systems at this point, we can't know how maintaining egress and providing ongoing water/power/heat/sewer will influence the outcome of this project. There are many topics to be discussed around phasing and maintaining operations, a collaborative effort between the police department, City staff, the design team, and the Contractor will be required to ensure a smooth execution.

5. SCHEDULE



PRELIMINARY PROJECT TIMELINE

Our initial steps will involve meeting with your core team to understand your schedule goals, meeting availability, key stakeholder sessions, and City Council meetings. Using this information, we'll create a detailed Gantt schedule that includes all meeting dates, presentations, and key milestones. We aim to utilize our project experience, particularly with projects like yours, to minimize the impact on your time.

In addition to stakeholder engagement through our workshop process, it is essential to maintain regular touchpoints during the design phases and allow stakeholders ample time to review the design documents and provide feedback.

Our estimated schedule is summarized as follows:

Phase One	Schematic Design	5/19/25 to 7/25/25	10 weeks
Phase Two	Design Development	7/28/25 to 10/17/25	12 weeks
Phase Three	Construction Documents[1]	10/20/25 to 1/16/26	16 weeks
Phase Four	Bidding & Contracting[1]	1/19/26 to 3/24/26	8 weeks
Phase Five	Procurement & Construction[2]	3/25/26 to 5/19/27	60 weeks
Phase Six	Project Closeout[2]	5/20/27 to 7/16/27	8 weeks

[1] *Assumes a traditional competitive bid process with no early bid packages.*

[2] *Construction duration dependent on phasing and Contractor schedule and work plan.*

We understand that this may be a phased project with the police department being first and expansion for city hall later. If phased, the project would be designed completely with the ability to have the building fully operational for the police department. Should city hall construction occur later, we would plan for extension of systems and equipment to the expansion when completed.

SCHEDULE EFFICIENCIES

We may be able to refine the schedule to allow a more streamlined process, but we do not want to short change the project's development, stakeholder engagement, quality control processes, or budget management requirements. Should only the police project be constructed initially, we believe that the construction phase will be shorter than what is shown above.

A traditional competitive bid process is assumed. Should the City consider construction management delivery of the project, it would likely be possible to release early bid packages to enhance procurement and mobilization on site. Typically sitework and structural design can be released at approximately 50% completion of Construction Documents. This also can help mitigate long lead time items and could further shorten the construction schedule.

We welcome an opportunity to visit with the City to discuss schedule and delivery method options and determine ways to make the project schedule as efficient as possible.



LEO A DALY

City of Rogers

Rogers City Hall and Police Department

AE SERVICES RFP

APRIL 25, 2025

Contents

1 COVER LETTER

2 TEAM OVERVIEW

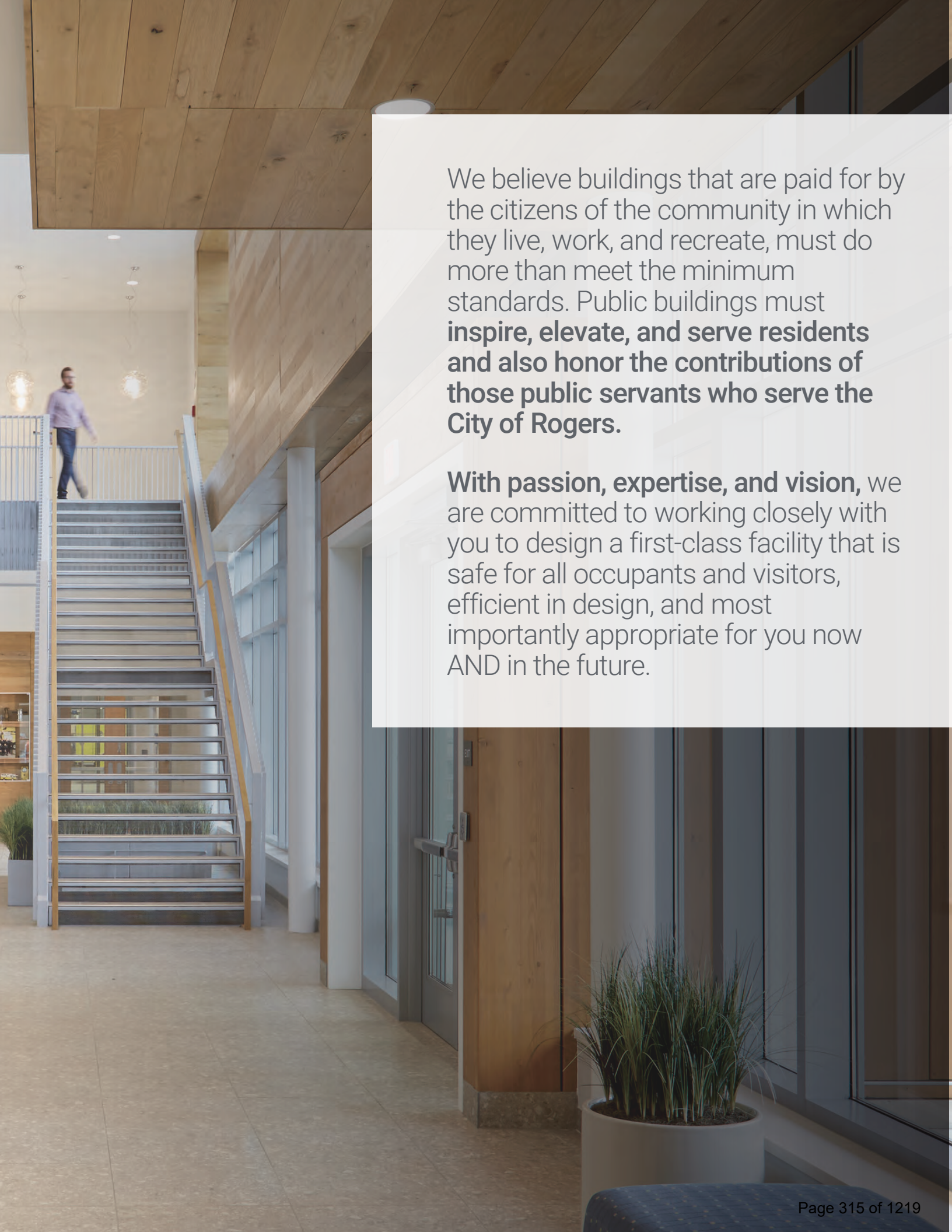
12 PROJECT EXPERIENCE

19 PROJECT APPROACH

24 SCHEDULE

LEO A DALY





We believe buildings that are paid for by the citizens of the community in which they live, work, and recreate, must do more than meet the minimum standards. Public buildings must **inspire, elevate, and serve residents and also honor the contributions of those public servants who serve the City of Rogers.**

With passion, expertise, and vision, we are committed to working closely with you to design a first-class facility that is safe for all occupants and visitors, efficient in design, and most importantly appropriate for you now AND in the future.


Designing for those who serve & protect our communities
200+ PUBLIC SAFETY AND MUNICIPAL FACILITIES
100+ POLICE / LAW ENFORCEMENT FACILITIES
70+ ADMINISTRATIVE / OFFICE FACILITIES
27+ TACTICAL TRAINING FACILITIES FOR POLICE, FIRE, & EMS
INFORMATION
OPD
LEO A DALY

LEO A DALY

PLANNING
ARCHITECTURE
ENGINEERING
INTERIORS

We acknowledge that LEO A DALY meets the min requirements outlined in the solicitation and affirm that proposed team members are available and will be assigned to the project if shortlisted.

April 25, 2025

Doran Cote, Public Works Director/City Engineer
22350 S. Diamond Lake Road
Rogers, MN 55374

Dear Doran,

LEO A DALY has studied, programmed, and designed over 200 public safety and municipal facilities over the last decade. Our extensive experience with police station and city hall design will help your team propel the city of Rogers into the next generation of municipal and law enforcement facilities. This project will address community growth, and the corresponding city staff and law enforcement increases necessary to provide the services expected of its citizens. It will incorporate the latest public safety facility operations and technologies while being forward thinking ensuring your facility and staff will be able to thrive in the future. It will address spaces for the wellness of first responders, foster engagement with the community, and seamlessly blend the safety and protections required of critical city operations and assets, with the transparency, accessibility, and openness desired by the community.

LEO A DALY is the public safety and civically minded architecture firm to get you there.

We listen and incorporate your ideas. Our local team members work on local, regional and national projects, which provide us with extensive knowledge of the best practices and operations of police and civic administration operations. Simultaneously, **we count on the expertise of your personnel to provide insight into how your facility needs to work for you.**

Our latest law enforcement design (Hennepin County Sheriff's Office Patrol Division HQ in Plymouth) is slated for a grand opening next month. It is the largest secure vehicle garage in the state with the capacity to accommodate further vehicle electrification. Last month, we saw the grand opening of Miami Beach PD's Real Time Intelligence Center and drone program (Miami Beach Real-Time Intelligence Center News Story)

We are tested in the entire range of public safety operations, able to apply the specialized best practices we've learned from professionals across the country and apply to your project. Our team members have completed local law enforcement training facilities at the HERO Center and North Metro Regional Public Safety Training Facility, with the Lakeville FiRST Center slated to open next July. We've consulted on the largest evidence facility in the Twin Cities (Minneapolis PD), designed the most innovative forensic lab in the nation (Hennepin County Medical Examiner). We are beginning design for the MN State Patrol's first-ever purpose-built headquarters facility. With only one public safety project on the horizon, **our specialized and assigned staff for your project are eager and available to start working with you today.** From the very small police department (Elko New Market PD) to major metropolitan PD's (Omaha Police and Fire Department HQ), we have design expertise in all aspects of police departments.

Additionally, City Hall design can be a significant piece of architecture, and a strong contributor to community culture. We know best practices have evolved enabling City's to consider new ways to delivery necessary information to residents. Consolidating service points, streaming city operations online, and increased interest in the use of touchscreen and self-service points have impacted lobby spaces. Community need for public spaces, training spaces and meeting spaces have evolved, and the sophistication of the spaces must keep up with today's expectations. Community and staff expectations for security and work from home models have evolved affecting physical space.

We guide, advocate, or substantiate competing interests when needed. Law enforcement and city departments have great opportunities to share certain amenities, and they have many spaces that absolutely cannot, either for reasons of operations, confidentiality or regulating bodies. We bring the critical eye to guide these conversations and advocate or substantiate best practices for bonding between departments, and for autonomy, where necessary.

We listen, navigate, and design facilities that are secure yet accessible, innovative yet judicious with tax dollars, and reflective of the health, safety, and welfare of the first responders who protect us.

On behalf of LEO A DALY, we thank you for this opportunity. We look forward to working with your team on your combined police station and city hall endeavor.

Sincerely,

Todd LaVold, AIA
Project Manager, Market Sector Leader P+ I **Main Point of Contact**
TBLavold@leoadaly.com| 612.359.4656

Cindy McCleary, AIA, NCARB, LEED AP
Vice President, Managing Principal

730 SECOND AVENUE SOUTH
SUITE 1300
MINNEAPOLIS, MN 55402
612.338.9741

leoadaly.com

TEAM OVERVIEW

We are passionate about public safety! Our team brings extensive experience in delivering public safety projects, grounded in a long-standing history of collaboration across Minnesota.

The **LEO A DALY Minneapolis team has led the design of 200+ public safety facilities from as small as 3,400 GSF to as large as 600,000 GSF**. We provide police, fire, mission-critical, and public safety training design expertise to our nine other offices across LEO A DALY. This provides exposure to and knowledge of all facets of first responder operations and incident responses. Designing police and fire stations, detention facilities, real-time information centers, and Emergency Operations Centers with our other offices keeps us on top of public safety trends across the country.

Our team members continually immerse themselves in the industry, **sitting on foundation boards, speaking at Homeland Security conferences, practicing trauma-informed design, and participating in cybersecurity conferences**, to name a few. Our public safety design leadership is proud to have learned from some of the best and brightest people in your industries to develop our fire and police station design principles.

ELAN DESIGN LAB - CIVIL ENGINEER

Élan Design Lab, Inc. (Élan) is a team of civil engineers and landscape architects that specialize in site design and development. Élan is a service provider to the construction and development marketplace. Clients include regional, state and federal agencies, counties and municipalities, state and local school systems, national corporations, developers, property owners and other architectural and engineering firms. Élan is certified as a TG small business firm based on its women-owned status through the State of MN Department of Administration, a DBE/WBE through the MNUCP, and a S/WBE through the CERT Program.

DAMON FARBER - LANDSCAPE ARCHITECT

Damon Farber is a landscape architecture and planning studio with roots in Minnesota and Wisconsin. Their portfolio embodies the breadth of the landscape architecture profession, and they approach design through a process that is deeply collaborative, curious, and caring. Damon Farber's studio was founded on the idea that the best solutions are created through teamwork.

TRUE NORTH- AUDIO VISUAL | IT | SECURITY

True North Consulting Group (TNCG) started in Stillwater, MN in 1984 as Elert & Associates. TNCG is a professional technology consulting firm serving clients with public and private sector projects, as well as architects and design professionals. The firm is comprised of several multi-disciplinary teams with a depth of experience in Audio/Video, Security, Data, Voice, and Telecommunication systems. TNCG carefully tailors each project team to meet the specific technology and professional consulting needs of their clients. This helps to ensure the highest level of accountability and quality control for work designed, specified, and administered through implementation.

ROCKWISE STRATEGIES- COST ESTIMATING

Rockwise Strategies was founded by Doug Loeffler after he saw an opportunity to bring even more to the built environment. Expanding upon the team's construction management expertise, he sought to support project stakeholders with cost consulting and owners representation services. Today we remain closely connected to the Loeffler Construction team, sharing expertise to improve every build and bringing great value to our clients.

EXAMPLE LEO A DALY PROJECTS TEAM HAS WORKED ON TOGETHER

Firm Name	Projects completed with LEO A DALY	DPS MN State Patrol HQ Pre-Design	MN BCA Reg Office + Lab	Arden Hills Readiness Center	Hennepin County Medical Examiner	Hennepin County Sheriff's HQ
Elan Design Lab	9	●	●	●	●	●
Damon Farber	30	●	●	●	●	●
True North	18	●	●	●	●	●
Rockwise Strategies (Formerly Loeffler)	11	●	●			●

Project Executive Committee

Dan Willis, Police Chief
Doran Cote, Public Works Dir./City Engineer

City Administration | Police Department | Public Works Department | Planning Department



Todd LaVold
AIA
Project Manager/ Market Sector Leader, Public & Institutional
LEO A DALY



Matthew Keenan
P+I Project Director/QC Holding Specialist
LEO A DALY



Daniel Yudchitz
AIA, NCARB, LEO AP
Project Designer
LEO A DALY



Mike Heller
AIA
Project Architect
LEO A DALY



Gina Shuck
NCIDQ
Interior Designer
LEO A DALY



Ana Boehm
AIA, NCARB
Project Architect
LEO A DALY



Mark Bradby
PE
Mechanical Engineer
LEO A DALY



Jeff Besel
PE, CET, LEED AP
Electrical Engineer
LEO A DALY



Thomas Kendrick
PE
Structural Engineer
LEO A DALY



Dan Olig
PE, SET
Fire Protection
LEO A DALY

Marcie Weslock
ÉLAN DESIGN LAB CIVIL ENGINEERING

Jesse Symynkywicz
DAMON FARBER - LANDSCAPE ARCHITECTURE

Nick Weber + Brandon Frazier
TRUE NORTH - IT/AUDIO VISUAL/SECURITY

Talon DeWitz
ROCKWISE- COST ESTIMATING



Todd LaVold AIA

MARKET SECTOR LEADER, PUBLIC AND INSTITUTIONAL

ROLE: PROJECT MANAGER

Todd will serve as the primary point of contact and client advocate for the City of Rogers Police Department and City Hall project. He will lead the team with a focus on clear communication, strategic alignment, and project excellence. He will establish consistent touch-points and facilitate leadership coordination to ensure expectations, schedules, and milestones are clearly defined and met. With 26 years of experience designing and managing public safety facilities, including police stations, fire stations, first responder training centers, and justice facilities, Todd brings the expertise needed to synchronize project teams and deliver cohesive, successful outcomes .

LEO A DALY

EDUCATION

Master of Architecture
University of Minnesota

Bachelor of Architecture
University of Minnesota

EXPERIENCE

26 years

REGISTRATIONS

Registered Architect: MN #48181

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

City of Bismarck, Police Station Location Study and Facility Assessment, and Public Works Expansion and Remodel
BISMARCK, NORTH DAKOTA

City of Coon Rapids Police Department Needs Assessment
COON RAPIDS, MINNESOTA

Lake Elmo City Hall and Fire Station
LAKE ELMO, MINNESOTA

City of Forest Lake City Center, New City Hall and Public Safety Facility
FOREST LAKE, MINNESOTA

City of Maple Grove, North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

City of Minneapolis Police Department, Property and Evidence Warehouse Space Needs Assessment
MINNEAPOLIS, MINNESOTA

City of Oakdale, City Hall, Police, Public Works Facility Assessment
OAKDALE, MINNESOTA

City of Cottage Grove and Woodbury, HERO Center
COTTAGE GROVE, MINNESOTA

City of Richfield, Fire Station #2 Renovation
RICHFIELD, MINNESOTA

City of Oakdale, Police Remodel and PD Training Expansion
OAKDALE, MINNESOTA

Elko New Market Police Station
ELKO NEW MARKET, MINNESOTA

City of Centerville City Hall
CENTERVILLE, MINNESOTA

Minnesota Army National Guard, Arden Hills Readiness Center
ARDEN HILLS, MINNESOTA

Pennington County, Police Evidence and Administration Building
RAPID CITY, SOUTH DAKOTA

Pennington County Jail/ Courthouse/Administration Building Renovation
RAPID CITY, SOUTH DAKOTA

Dickinson Public Safety Training Center Facility Assessment
DICKINSON, NORTH DAKOTA

Winnebago Tribe of Nebraska, Fire & EMS Planning & Programming
WINNEBAGO, NEBRASKA

Confidential Community College Public Safety Training Facility
MIDWEST U.S.

Hennepin County, Sheriff's Office, Court Holding Area Assessment, Multiple Locations
MINNEAPOLIS, MINNESOTA

City of Omaha Joint Police & Fire Headquarters
OMAHA, NEBRASKA

City of Sterling, City Hall and Police Department Renovation
STERLING, ILLINOIS

Wake Technical Community College, Public Safety Simulation Complex
RALEIGH, NORTH CAROLINA

City of Henderson Citywide and Fire Stations 81 and 84 Master Plans
HENDERSON, NEVADA

Confidential Federal Training Facility
NORTHEAST U.S.

South Miami Police Department New HQ
SOUTH MIAMI, FLORIDA

Miami Beach Police Department Headquarters Renovation
MIAMI BEACH, FLORIDA

Henderson Fire Station 81
HENDERSON, NEVADA

Henderson Fire Station 84
HENDERSON, NEVADA

Miami-Dade College, School of Justice Tactical Training Facility Renovation
MIAMI, FLORIDA

Palm Beach Sheriff's Office Forensic Sciences & Technology Facility
WEST PALM BEACH, FLORIDA

City of Plantation Fire Station #1 Replacement
PLANTATION, FLORIDA

Confidential Community College Public Safety Training Facility
SOUTHEAST U.S.



LEO A DALY

EDUCATION
Master of Architecture
University of Minnesota

Bachelor of Fine Arts, Art/ Industrial Design
University of Wisconsin-Stout

EXPERIENCE
22 years

REGISTRATIONS
Registered Architect: MN #48986

Daniel Yudchitz AIA, NCARB, LEED AP

VICE PRESIDENT, DESIGN DIRECTOR

ROLE: PROJECT DESIGNER

Daniel's career has focused on the design of public, workplace, institutional, and educational facilities. He is dedicated and devoted to pursuing challenging projects that are both pragmatic and creative. Daniel believes that good design reinforces the client's mission, enhances perception, and improves operations. He does this through a collaborative process, listening to the users and stakeholders while focusing on outreach, education, and engagement. Daniel is dedicated to community outreach and is a co-creator of LAD Groundwork Studio, a LEO A DALY initiative that provides pro-bono services to undeserved communities.

Minnesota State Patrol New HQ
TWIN CITIES, MINNESOTA

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

Hennepin County Sheriff's Office Public Safety Services Division HQ
PLYMOUTH, MINNESOTA

City of Omaha, Omaha Police Department, West Precinct
ELKHORN, NEBRASKA

City of Omaha Joint Police & Fire Headquarters
OMAHA, NEBRASKA

City of Cottage Grove and Woodbury, HERO Center, New Regional Police, Fire, & EMS Training Facility
COTTAGE GROVE, MINNESOTA

City of Maple Grove, North Metro Regional Public Safety Training Facility Assessment
MAPLE GROVE, MINNESOTA

Dickinson Public Safety Training Center Facility Assessment
DICKINSON, NORTH DAKOTA

Minnesota Dept. of Military Affairs, New Ulm Readiness Center
NEW ULM, MINNESOTA

City of Oakdale, City Hall, Police, Public Works Facility Assessment
OAKDALE, MINNESOTA

South Miami Police Department HQ
MIAMI, FLORIDA

City of Henderson Forensic Crime Lab
HENDERSON, NEVADA

North Dakota Army National Guard Williston Readiness Center
WILLISTON, NORTH DAKOTA

City of Bismarck New Public Health and Police Facilities, Public Works Expansion
BISMARCK, NORTH DAKOTA

City of Lake Elmo, City Hall Renovation/ Expansion, New Fire Station
LAKE ELMO, MINNESOTA

City of Columbia Heights City Hall
COLUMBIA HEIGHTS, MINNESOTA

City of Waconia New Fire Station Design
WACONIA, MINNESOTA

Broward County Medical Examiner and Crime Lab Combined Facility
FORT LAUDERDALE, FLORIDA

South Miami Police Department HQ
MIAMI, FLORIDA

Miami-Dade College, School of Justice Tactical Training Facility Renovation
MIAMI, FLORIDA



LEO A DALY

EDUCATION
Master of Architecture, Washington University

EXPERIENCE
19 years

REGISTRATIONS
Architect MN # 56941

Michael Heller AIA

ARCHITECT
ROLE: PROJECT ARCHITECT

Michael will lead the design vision and technical implementation of the project. Mike has a background in municipal police, fire stations and libraries. He is experienced in leading projects from concept to completion with the objective of solving challenging problems while finding innovative ways to meet the needs of the client.

Hennepin County Sheriff's Office Public Safety Services Division HQ
PLYMOUTH, MINNESOTA

Wake Technical Community College, Public Safety Simulation Complex
RALEIGH, NORTH CAROLINA

City of Lake Elmo, City Hall Renovation/ Expansion, New Fire Station
LAKE ELMO, MINNESOTA

State of Minnesota Bureau of Criminal Apprehension; Mankato Forensic Sciences Center
MANKATO, MINNESOTA

North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

Hennepin County Medical Examiner Facility
MINNETONKA, MINNESOTA

South Miami Police Department HQ
MIAMI, FLORIDA

United States Marshals Service - Training Space*
MINNEAPOLIS, MINNESOTA

**Project completed prior to joining LEO A DALY*



LEO A DALY

EDUCATION
Master of Architecture, University of Minnesota

Bachelor of Science in Architecture, Moscow College of Architecture and Construction Management

EXPERIENCE
13 years

REGISTRATIONS
Registered Architect: MN #57612; MI #1301072286

Ana Boehm AIA, NCARB

PROJECT ARCHITECT, PUBLIC & INSTITUTIONAL
ROLE: PROJECT ARCHITECT

Ana is a design professional with over 13 years of experience in delivering design excellence across various sectors, including public safety, municipal, and mixed-use projects. Her meticulous attention to detail, innovative approach, and technical proficiency ensure exceptional client satisfaction and outstanding designs. She is passionate about overseeing projects from inception to completion, crafting spaces that resonate with the human experience. Her efficiency and organizational skills help her consistently meet client needs promptly. Ana's work leaves a lasting, positive impact on the communities she serves.

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

Minnesota Bureau of Criminal Apprehension, Southern Regional Office and Laboratory
MANKATO, MINNESOTA

Keweenaw Bay Indian Community Tribal Police Station Renovation and Remodel*
VILLAGE OF BARAGA, MICHIGAN

Keweenaw County Emergency Operations Center Master Planning and Programming*
MOHAWK, MICHIGAN

Houghton County Courthouse Planning and Programming*
HOUGHTON, MICHIGAN

Ishpeming National Guard Armory*
ISHPEMING, MICHIGAN

North Loop Green, Mixed Use Office*
MINNEAPOLIS, MINNESOTA

Excelsior Offices, Corporate & Commercial*
HOPKINS, MINNESOTA

**Project completed prior to joining LEO A DALY*



Matthew Keenan NCIDQ

PUBLIC & INSTITUTIONAL PROJECT DIRECTOR

ROLE: HOLDING SPECIALIST/QC

Matthew brings 20 years of experience in government facility design and construction. Matthew's work history spans county and municipal facilities with experience in public safety, detention and headquarters facilities, as well as municipal office building.

LEO A DALY

EDUCATION
Bachelor of Science, Architecture, University of Minnesota

EXPERIENCE
20 years

REGISTRATIONS
National Council for Interior Design Qualification #417525

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

MN Department of Public Safety State Patrol HQ Predesign
ST PAUL, MINNESOTA

City of Bismarck Municipal Center, Public Safety Center, and Public Health
BISMARCK, NORTH DAKOTA

North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

Wake Technical Community College, Public Safety Simulation Complex
RALEIGH, NORTH CAROLINA

Hennepin County Medical Examiner Facility
MINNETONKA, MINNESOTA

City of Columbia Heights, New City Hall
COLUMBIA HEIGHTS, MINNESOTA

Elko New Market Police Station
ELKO NEW MARKET, MINNESOTA

Miami Beach Police Department Headquarters Renovation
MIAMI BEACH, FLORIDA

City of Omaha Fire Station Design Concept
OMAHA, NEBRASKA

Dakota County Law Enforcement,
HASTINGS, MINNESOTA

South Miami Police Department New HQ
SOUTH MIAMI, FLORIDA

Hennepin County Sheriff's Office Public Safety Services Division HQ
PLYMOUTH, MINNESOTA



Gina Shuck NCIDQ

INTERIOR DESIGNER

ROLE: INTERIOR DESIGNER

Gina has nine years of interior design experience in many market sectors including commercial, medical, federal, hospitality, corporate, and warehouse design. She has guided clients through all design phases, from programming, space planning, and design development to construction administration. Gina is skilled at communicating design ideas through 3D visualizations and is passionate about interpreting them into functional, buildable applications. She is open and honest with clients and values deliberate communication that helps achieve the project goals effectively and efficiently. Her recent work has been on facilities for first responders and mission-critical clients to which she brings a wellness-oriented perspective to creating spaces that are durable and support the human condition.

LEO A DALY

EDUCATION
Bachelor of Science, Interior Design
University of Minnesota

EXPERIENCE
9 years

REGISTRATIONS
National Council for Interior Design Qualification #417525

City of Bismarck Municipal Center, Public Safety Center, and Public Health
BISMARCK, NORTH DAKOTA

Minnesota Army National Guard, Arden Hills Readiness Center
ARDEN HILLS, MINNESOTA

City of Lake Elmo, City Hall Renovation/Expansion, New Fire Station
LAKE ELMO, MINNESOTA

City of Woodbury/City of Cottage Grove, HERO Public Safety Training Facility
COTTAGE GROVE, MINNESOTA

Hennepin County Medical Examiner Facility
MINNETONKA, MINNESOTA

North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

Hennepin County Sheriff's Office, Public Safety Services Headquarters
PLYMOUTH, MINNESOTA

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

City of Henderson Crime Lab
HENDERSON, NEVADA

Broward County Forensic Science Center
FORT LAUDERDALE, FLORIDA

Miami-Dade College, School of Justice Tactical Training Facility Renovation
MIAMI, FLORIDA



Mark Bradby PE

STUDIO LEAD, MECHANICAL ENGINEERING

ROLE: MECHANICAL ENGINEER

LEO A DALY

EDUCATION
Bachelor of Science, Engineering
Brunel University

EXPERIENCE
25 years

REGISTRATIONS
Registered Professional Engineer: MN# 44226

Mark is a seasoned mechanical engineer with 25 years of experience in the construction industry, specializing in high performance systems to drive project success. His expertise in project management enables him to effectively oversee and implement meaningful projects that enhance environmental sustainability, optimize project and life-cycle costs, and set benchmarks for high-performance buildings. Mark finds fulfillment in collaborating with teams from the conceptual phase through to construction, ensuring that each project exemplifies best-in-class standards. His dedication to creating impactful, real-world solutions underscores his commitment to advancing the field of sustainable construction.

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

City of Fridley, Civic Complex (New City Hall, Fire, Police Facilities)*
FRIDLEY, MINNESOTA

Minnesota Zoo Waterfront Restoration Project
APPLE VALLEY, MINNESOTA

Hennepin County, Multiple Recommissioning Projects*
HENNPIN COUNTY, MINNESOTA

Hennepin County Adult Correctional Facility, Admin Building Renovation*
PLYMOUTH, MINNESOTA

Pennington County Courthouse, Renovation,*
THIEF RIVER FALLS, MINNESOTA

Minnesota Dept. of Military Affairs, Army Combat Fitness Test Field House
NEW ULM, MINNESOTA

Henrico County, Fire House #19*
HENRICO, VIRGINIA

Wright County Courthouse*
BUFFALO, MINNESOTA

**Project completed prior to joining LEO A DALY*



Jeff Besel PE, CET, LEED AP

SENIOR ELECTRICAL ENGINEER / STUDIO LEAD - ELECTRICAL ENGINEERING

ROLE: ELECTRICAL ENGINEERING

LEO A DALY

EDUCATION
Bachelor of Architectural Engineering
Kansas State University

EXPERIENCE
25 years

REGISTRATIONS
Registered Professional Engineer: MN #44225

NCEES Records Program

NICET Fire Alarm Systems Level II

With 25 years of experience designing electrical systems for buildings, Jeff's experience includes designing power device layouts and motor connections, power distribution, electrical vehicle chargers (EVSE), photovoltaic (PV) systems, lighting and lighting controls, and low-voltage system layouts. He has extensive engineering experience on a wide variety of project types. Jeff is active in several professional organizations and has served as a technical committee member for the NFPA 99 HEA-FUN committee and served as a board member and president of Minnesota Automatic Fire Alarm Association (MNAFAA).

Hennepin County, Sheriff's Headquarters
PLYMOUTH, MINNESOTA

Hennepin County Medical Examiner Facility
MINNETONKA, MINNESOTA

City of Bismarck Municipal Center, Public Safety Center, and Public Health
BISMARCK, NORTH DAKOTA

City of Columbia Heights, City Hall
COLUMBIA HEIGHTS, MINNESOTA

Anoka Ramsey Community College Business and Nursing
COON RAPIDS, MINNESOTA

Anoka Ramsey Community College, Science Building Pre-Design
COON RAPIDS, MINNESOTA

North Metro Regional Public Safety Training Facility
MAPLE GROVE, MINNESOTA

Xcel Chestnut Service Center
MINNEAPOLIS, MINNESOTA

Goodhue County Justice Center Improvements*
RED WING, MINNESOTA



Thomas Kendrick PE

SENIOR ENGINEER, STRUCTURAL
ROLE: STRUCTURAL ENGINEER

Thomas is a skilled structural engineer with extensive project experience across healthcare, industrial, residential, public, and federal sectors. He is drawn to the challenge of taking unique architectural concepts and developing creative, efficient structural solutions that meet both aesthetic and functional requirements.

LEO A DALY

EDUCATION
Master of Science Civil Engineering, Michigan Technological University

EXPERIENCE
9 years

REGISTRATIONS
Registered Professional Engineer: MN# 57790

State of Minnesota Bureau of Criminal Apprehension; Mankato Forensic Sciences Center
MANKATO, MINNESOTA

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

Xcel Chestnut Service Center
MINNEAPOLIS, MINNESOTA

Air Reserve Station Vehicle Inspection Facility
MINNEAPOLIS, MINNESOTA

Suwon Air Base, Aircraft General Purpose Shop Repair
SUWON AIR BASE, REPUBLIC OF KOREA

University of Minnesota, Hormel Arctics Room
AUSTIN, MINNESOTA

Sam's Club New Conceptual Floor Plan
BENTONVILLE, ARKANSAS



Dan Olig, PE, SET

SENIOR ENGINEER, FIRE PROTECTION
ROLE: FIRE PROTECTION

Dan has 20 years of experience in the management, planning, and design of fire protection systems. He has a diverse knowledge base with unique understanding, training and leadership experience. With a strong background in both the contractor realm as well as engineer-led design, and his experience includes water-based and special hazard fire suppression systems for a multitude of occupancies; new and upgraded fire alarm systems; and determining building code and life safety requirements.

LEO A DALY

EDUCATION
Bachelor of Mechanical Engineering
Iowa State University

EXPERIENCE
20 years

REGISTRATIONS
Registered Professional Engineer: MN # 57942

NICET Water-Based Systems Layout Level IV

City of Columbia Heights, New City Hall
COLUMBIA HEIGHTS, MINNESOTA

Department of Veterans Affairs West LA Police Station
LOS ANGELES, CALIFORNIA

Bismarck Public Works, Building 2 Renovation and Addition
BISMARCK, NORTH DAKOTA

City of Omaha Joint Police & Fire HQ
OMAHA, NEBRASKA

Duluth Maintenance, Repair and Overhaul (MRO) Hangar Fire Alarm Replacement
DULUTH, MINNESOTA

Vance AFB
VANCE AFB, OKLAHOMA

Nebraska Army National Guard, Community Fire Safety Plans
MULTIPLE LOCATIONS, NEBRASKA

Anoka-Ramsey Community COllege School of Business & Nursing Renovation
COON RAPIDS, MINNESOTA

Winnebago Tribe of Nebraska Emergency Management / Fire Department Facility
WINNEBAGO, NEBRASKA

Minneapolis Federal Courthouse Remodeling
MINNEAPOLIS, MINNESOTA

Tulsa City/County Library and Parking Garage (5-story + parking)*
TULSA, OKLAHOMA

**Project completed prior to joining LEO A DALY*



Marcie Weslock, PE, LEED AP

PRESIDENT/PRINCIPAL CIVIL ENGINEER, ÉLAN DESIGN LAB

ROLE: CIVIL ENGINEERING

As President of Élan Design Lab, Marcie Weslock is responsible for every aspect of the firm's business plan, technical design standards, design direction, staffing, and mentor to the engineers on the team. She brings over 27 years of civil engineering experience working with a broad range of clients and projects including clients with numerous buildings with multiple stakeholders. Her qualifications as a civil engineer and interior designer combined with her project management skills gives Marcie a unique skill set that provides an eye for detail that connects the interior and exterior environments while promoting communication between a multi-faceted team.

EDUCATION

Bachelor of Science, Civil Engineering
Michigan Technological College

Associate of Applied Science, Interior Design
Art Institute International

EXPERIENCE

27 years

REGISTRATIONS

Registered Architect: MN #48181

Hennepin County Sheriff's Office Public Safety Services HQ
PLYMOUTH, MINNESOTA

City of Lakeville Public Safety Training Facility / FiRST Center
LAKEVILLE, MINNESOTA

Hennepin County Medical Examiners Facility
MINNETONKA, MINNESOTA

MN Army National Guard Readiness Center*
ARDEN HILLS, MINNESOTA

East Metro Public Safety Training Facility
MAPLEWOOD, MINNESOTA

State of Minnesota Bureau of Criminal Apprehension; Mankato Forensic Sciences Center
MANKATO, MINNESOTA

MN State Patrol Headquarters Building
EAGAN, MINNESOTA

USFW Sherburne NWR Visitor Center Expansion
ZIMMERMAN, MINNESOTA

MN Army National Guard (MNARNG) Readiness Center
NEW ULM, MINNESOTA

MNARNG Army Combat Fitness Test Fieldhouse
ARDEN HILLS, MINNESOTA



Jesse Symynkywicz ASLA, PLA

Principal Design Landscape Architect, DAMON FARBER

ROLE: LANDSCAPE ARCHITECTURE

Jesse creates exceptional, beautiful, sensitive, and inspiring landscapes. His expertise and passion helps every project be the best that it can be. Jesse provides unique and contextually sensitive design solutions while maintaining a focus on delivering quality, cost effective, and functional landscapes. Jesse is fluent through all phases of the design process, and works comfortably with clients and consultants to coordinate projects from concept through construction.

EDUCATION

Master of Urban Design Candidate
University Of Colorado At Denver

Bachelor Of Landscape Architecture
University Of Minnesota

EXPERIENCE

30+ years

REGISTRATIONS

Registered Landscape Architect: MN #26970

Hennepin County Sheriff's Office Public Safety Services HQ
PLYMOUTH, MINNESOTA

State of Minnesota Bureau of Criminal Apprehension; Mankato Forensic Sciences Center
MANKATO, MINNESOTA

City of Forest Lake City Center, New City Hall and Public Safety Facility
FOREST LAKE, MINNESOTA

Minnesota DHS, St. Peter Regional Treatment Center
ST. PETER, MINNESOTA

City of Cottage Grove and Woodbury, HERO Center
COTTAGE GROVE, MINNESOTA

Minnesota State Office Building
ST. PAUL, MINNESOTA

AHATS Readiness Center
ARDEN HILLS, MINNESOTA

Armed Forces Reserve Center
FARIBAULT, MINNESOTA

Minnesota National Guard Joint Forces Headquarters (JFHQ)
ARDEN HILLS, MINNESOTA

Brookview Elementary School
WOODBURY, MINNESOTA

Stillwater High School
WOODBURY, MINNESOTA



Talon DeWitz

SENIOR COST CONSULTANT - ROCKWISE STRATEGIES

ROLE: COST ESTIMATOR

Talon is an experienced senior cost consultant who has completed hundreds of projects from the estimating phase through job completion. In his history at Rockwise, Talon has worked with hands-on estimating and bidding processes as well as working closely with design firms to develop cost estimates, QA/QC, and scheduling in every market segment across the nation. He and the Rockwise team bring experience working in multiple relevant market segments including public safety, emergency communications, and local government clients.

EDUCATION

Bachelor of Science,
Construction Management
University of Minnesota

Bachelor of Business Administration
Minnesota State University, Mankato

EXPERIENCE

9 years

Minnesota State Patrol New HQ
TWIN CITIES, MINNESOTA

Hennepin County Sheriff's Office Public Safety Services HQ
PLYMOUTH, MINNESOTA

Martin County Public Safety Center
FAIRMONT, MINNESOTA

Hutchinson Police Department
HUTCHINSON, MINNESOTA

City of Wyoming Public Safety Building
WYOMING, MINNESOTA

City of Virginia Public Safety Building
VIRGINIA, MINNESOTA

North End Community Center
ST. PAUL, MINNESOTA

Jackson County Government Building and Law Enforcement Center
JACKSON, MINNESOTA

White Bear Lake Public Safety Building Addition and Renovation
WHITE BEAR LAKE, MINNESOTA



Brandon Frazier CTS, DSCE

DIRECTOR SECURITY TECHNOLOGIES

ROLE: SECURITY

Brandon specializes in security master planning and designing of security systems for law enforcement and public safety mission critical and secure facilities throughout Minnesota and the Upper Midwest.

EXPERIENCE

20 years

Hennepin County Medical Examiners Facility
MINNETONKA, MINNESOTA

Hennepin County Sheriff's Enforcement Services Division Headquarters Relocation
PLYMOUTH, MINNESOTA

Anoka County Jail Security System Upgrade
ANOKA, MINNESOTA



Nick Weber PMP, CTS-D

SENIOR TECHNOLOGY CONSULTANT

ROLE: IT, A/V

Nick has designed audiovisual, physical security, and structured cabling systems. Nick's training and certifications include Project Management Institute PMP (Project Management Professional) and InfoComm CTS (Certified Technology Specialist).

EXPERIENCE

19 years

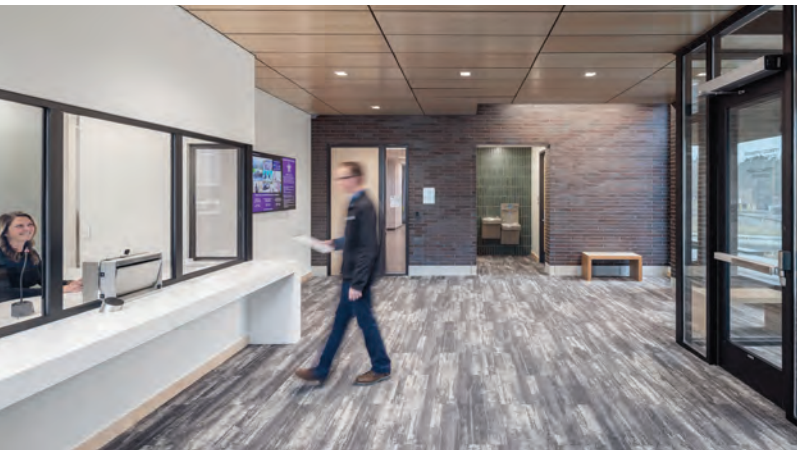
New Civic Campus
CHASSEN, MINNESOTA

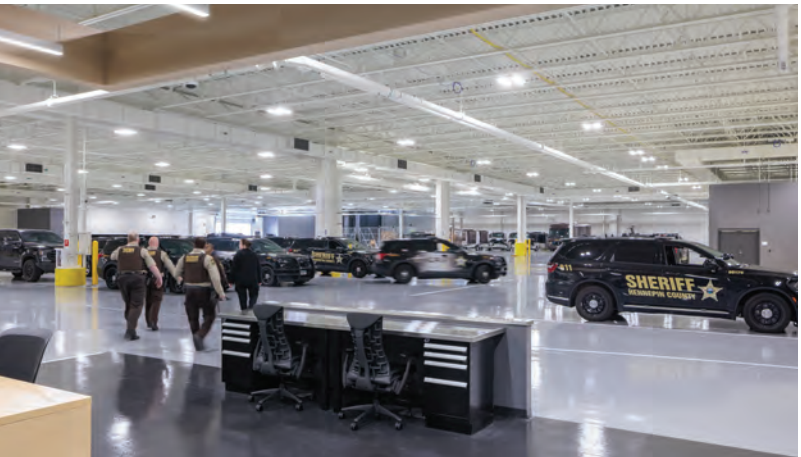
City of Chaska New Public Safety Building
CHASKA, MINNESOTA

Tribal Government Services Building
FLANDREAU SANTEE SIOUX TRIBE









Hennepin County Sheriff Public Safety Services HQ

PLYMOUTH, MINNESOTA

OWNER ▪ HENNEPIN COUNTY **SIZE** ▪ 100,000 SF **COST** ▪ EST: $38.4M / FINAL-$39.1M **COMPLETION** ▪ EST: 3/2025 / FINAL: 4/2025 **REFERENCE** ▪ JOHN RODE, SR. FACILITY PLANNER, HENNEPIN COUNTY, 612.596.7754, JOHN.RODE@HENNEPIN.US

The creation of a new Hennepin County Sheriff's Office Public Safety Services Division Headquarters represents a new patrol headquarters facility for the Sheriff's Office's entire patrol operations and fleet.

The complex is located in Plymouth on a secure campus that is presently home to the Emergency Communications facility and three Hennepin County corrections facilities. This new facility supports various department roles including leadership administration, patrol, investigations, and the crime lab. The new secure facility houses patrol locker rooms, evidence storage, a communications center, armory, SWAT team, and vehicle storage for approximately 120 vehicles — including infrastructure to support integration of an electric fleet.

As a mission-critical project supporting core departmental operations within a unified public safety campus, the site was carefully organized to optimize vehicle response, logistics, safety, and security. LEO A DALY simultaneously balanced these requirements with aspirational goals to provide an environmentally resilient and sustainable project that features the region's largest solar-power-supported secure electric vehicle squad garage and the harvesting of renewable energy on-site.

The project is expected to be net zero.

Team members associated with this project:

Daniel Yudchitz, Designer
Matthew Keenan, Project Manager
Jeff Besel, Electrical Engineer
Daniel Olig, QA/QC
Elan Design Lab, Civil
Damon Farber, Landscape Design
True North Consulting Group, IT/AV/Security
Rockwise Strategies-Cost Estimating (formerly Loeffler)

Forest Lake City Center Joint City Hall, Fire Station, & Police Station

FOREST LAKE, MINNESOTA

OWNER ▪ CITY OF FOREST LAKE **SIZE** ▪ 68,198 SF **COST** ▪ EST: $15.9M / FINAL $13.5M **COMPLETION** ▪ EST: 9/2014 / FINAL: 12/2014 **REFERENCE** ▪ RICHARD PETERSON, CHIEF OF POLICE/DIR OF PUBLIC SAFETY, CITY OF FOREST LAKE, 651.209.9725 RICK.PETERSON@CI.FOREST-LAKE.MN.US



The City of Forest Lake and the Forest Lake Economic Development Authority commissioned LEO A DALY to design a Planned Unit Development campus comprised of a new 65,000 SF municipal service center and future commercial parcels. The project redevelops an underutilized 14-acre brownfield site, anchoring the south stretches of the Highway 61 commercial corridor.

The Forest Lake City Hall and Public Safety facility houses city hall, a police station, and a fire station within a common building. The public safety facility is organized to accommodate full law enforcement operations over two floors including squad operations, investigations, detention, secured squad parking, K-9, and fitness and training spaces. The facility includes administrative offices for municipal staff, fire/dispatch/training spaces, public safety department and the emergency operations center.



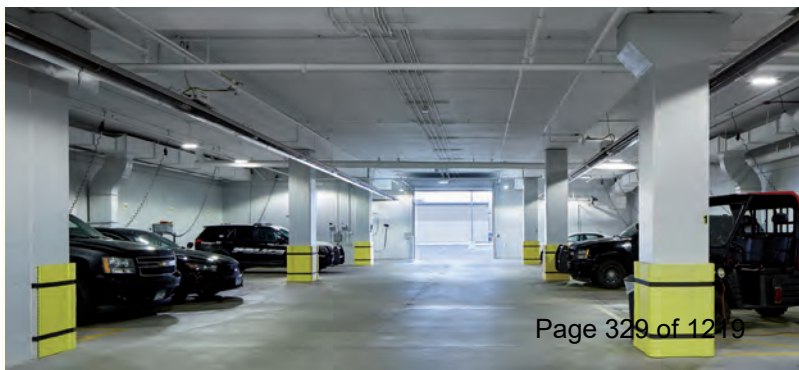
The police station contains a public lobby, squad car garage, detention cells and evidence handling. Evidence and lab spaces form a large portion of the behind-the-scenes components and provide secure perimeter and interlocked doors to contain movement and maintain chain of custody.



The evidence spaces include dedicated secure vehicle evidence bays, located with direct secured access from the forensic lab. The forensics lab is outfitted for processing latent prints, biology and toxicology, including dedicated refrigerated storage spaces for biologicals, long and short arms, drug lockers, and long-term evidence storage. Work counters for office functions are provided separately of lab spaces to maintain clean work environments and limit potentials for contamination of evidence.

Team members associated with this project:

Todd LaVold, Architect
Damon Farber, Landscape Design











Omaha Police Department West Precinct

ELKHORN, NEBRASKA

OWNER ▪ CITY OF OMAHA, NEBRASKA **SIZE** ▪ 36,000 SF **COST** ▪ EST: $10M / FINAL $8.2M **COMPLETION** ▪ EST:9/2019 / FINAL 9/2019 **REFERENCE** ▪ MICHAEL OESTMANN, CONTRACT ADMINISTRATION MANAGER, CITY OF OMAHA, 402.444.4575, MICHAEL. OESTMANN@CITYOFOMAHA.ORG

The Omaha Police Department needed to expand its presence in West Omaha as Omaha's population continues to grow westward. **The city sought a modern facility to house a growing police force, and one that promoted OPD's "community policing" philosophy.**

Our expertise and experience in public-safety design helped OPD leadership hone its vision for the facility during a series of pre-design workshops. We led architecture and engineering services for the 36,000-SF facility, which houses three police units, including emergency response, traffic investigations and patrol.

The building is positioned centrally on the site, facilitating the functionality of the building's internal layout. The Emergency Response Unit garage houses the fleet of the city's specialized response vehicles and was strategically located on site for ease of maneuverability of large vehicles. **The foreground of the building consists of public parking and a functional entry plaza that integrates protective barriers, benches, site walls and shade trees to form an outdoor "room" or extension of the public lobby. A gated secure perimeter surrounds the rear portion of the site and provides a secure outdoor space for police vehicle circulation and parking.** Inside, a north/south circulation spine provides a clear circulation path within the building, connecting the divisions and centrally located shared spaces.

DESIGNED FOR COMMUNITY POLICING

Amenities such as a community room, public workstations and Wi-Fi invite press members and neighborhood organizations to share space and engage with police, fostering transparency and partnership. Warm and inviting interior finishes adorn the precinct's public spaces, which are smartly aligned with entrances to provide staff with clear lines of site.

Team members associated with this project:
Daniel Yudchitz, Lead Designer
Gina Shuck, Interior Designer

Lake Elmo Joint City Hall & Public Safety Facility

LAKE ELMO, MINNESOTA

OWNER ▪ CITY OF LAKE ELMO **SIZE** ▪ 17,500 SF REMODEL, 37,500 SF TOTAL **COST** ▪ EST: $12.7M / FINAL:$13.6M **COMPLETION** ▪ EST:5/2023 FINAL: 5/2023 **REFERENCE** ▪ DUSTIN KALIS, FIRE CHIEF, CITY OF LAKE ELMO, DKALIS@LAKEELMO.ORG, 651.770.5006

The new Lake Elmo City Hall and Public Safety Facility combines city hall staff and functions, the entire Lake Elmo Fire Department, and a satellite office for the Washington County Sheriff's Department. **This co-location involved renovating and expanding the city-owned Brookfield office building to concentrate civic resources into a single structure at the historic core of the city** to help spur development and honor the roots of Lake Elmo.

This project consolidated Lake Elmo's two existing fire stations into a single, state-of-the-art station that meets the needs of the community and professional firefighters today and into the future. The building is designed to accommodate increasing call volumes, the transition to full time/career staffing model, meet training demands, and support the city's evolving role as all-hazard responders. The new facility includes staff dorm rooms, day room and kitchen area, fitness room, staff workspaces, and offices.

Lake Elmo City Hall, built in 1986, was 2,806 SF. City staff had long since outgrown this building and moved across the street into the Brookfield building, which required a major overhaul to increase its useful life. This updated facility provides:

- Improved service accessibility
- Community room available for public use
- New council chambers with updated technology
- Additional conference rooms
- Co-location of Washington County Sheriff staff
- Office space for growth of city staff
- Shared fitness room

Team members associated with this project:
Todd LaVold, Project Manager
Daniel Yudchitz, Director of Design
Matthew Keenan, Designer
Gina Shuck, Interior Designer

















Columbia Heights City Hall

COLUMBIA HEIGHTS, MINNESOTA

OWNER ▪ CITY OF COLUMBIA HEIGHTS **SIZE** ▪ 20,000 SF **COST** ▪ EST: $7.5 / FINAL:$6.5M **COMPLETION** ▪ EST:6/2024 / FINAL: 7/2023 **REFERENCE** ▪ KEVIN HANSEN, DIRECTOR OF PUBLIC WORKS, CITY OF COLUMBIA HEIGHTS, , 763.706.3705, KEVIN.HANSEN@CI.COLUMBIA-HEIGHTS.MN.US

The Columbia Heights City Hall is the first of its kind in Minnesota: a city hall constructed within a residential housing development. LEO A DALY designed the new 20,000 SF facility which sits at the prominent corner of Central Avenue.

Located on the ground level, the new city hall maintains a direct and approachable entrance to the highly traveled Central Avenue, making it more accessible to the citizens of Columbia Heights.

LEO A DALY designed the new city hall with large expanses of glass to provide as much natural lighting into the interior as possible. To address the security concern, a fritted film provided on the exterior glazing limits direct views into the work area by the public, but maintains a connection to the exterior.

This new city hall includes space for the city manager, administration, finance, community development and planning, information technology, and surveying departments.

The city hall features large staff meeting spaces, file rooms, work areas, and a break room. Additionally, a fireside community meeting room, and a council chambers with high-end AV systems separated from the greater space with a sliding glass wall that opens directly into the council room for varied uses and flexibility.

Team members associated with this project:

Daniel Yudchitz, Lead Designer
Matthew Keenan, Project Manager
Gina Shuck, Interior Designer
Jeff Besel, Electrical Engineer
Daniel Olig, Fire Protection





Elko New Market Police Department Expansion

ELKO NEW MARKET, MINNESOTA

OWNER ▪ CITY OF ELKO NEW MARKET **SIZE** ▪ 6,100 SF NEW, 11,600 SF SELECT REMODEL **COST** ▪ EST: $1.84 / FINAL: $1.9M **COMPLETION** ▪ EST: 9/2020 / FINAL: 11/2020 **REFERENCE** ▪ BRADY JUELL, POLICE CHIEF, CITY OF SAVAGE, 952.882.2600, POLICEADMIN@CITYOFSAVAGE.COM

After extensive review of use, efficiency, and cost, the city determined a new expansion and remodel to the existing city and fire hall were appropriate based on LEO A DALY's findings. wBy combining these operations into a single facility, the city would see benefit and returns on cost of operation. LEO A DALY ensured the construction documents included an understandable and appropriate phasing plan to alleviate confusion and/or added costs during construction. The phasing plan began with rerouting utilities and services, followed by the construction of the new building shell and interior spaces. Next, the existing fiber optic network was relocated to a new network/IT room, designed to serve as the future hub of the city's operations. Finally, targeted remodeling within the existing City Hall and Fire Hall enhanced and modernized shared departmental areas, improving collaboration and efficiency.

Team members associated with this project:
Todd LaVold, Project Manager; Matthew Keenan, Lead Designer; Daniel Olig, Fire Protection

North Metro Regional Training Center

MAPLE GROVE, MINNESOTA

OWNER ▪ CITY OF MAPLE GROVE **SIZE** ▪ 34,675 SF NEW CONSTRUCTION, 23,185 SF RENOVATION **COST** ▪ EST: $14.7M / FINAL: $14.8M **COMPLETION** ▪ EST: 5/2023 / FINAL:7/2023 **REFERENCE** ▪ ERIC WERNER, CHIEF OF POLICE, CITY OF MAPLE GROVE POLICE DEPARTMENT, 763.494.6100, EWERNER@MAPLEGROVEMN.GOV

LEO A DALY led an effort to complete the Minnesota predesign effort and associated activities required to prepare the project for support from the state. Upon recieving half of their funding request, combined with Hennepin County joining later in the process with $7 million of their own money, LEO A DALY designed additions and renovations that include **additional space for de-escalation and crisis intervention training, simulated ammunition space for a realistic scenario-based training environment, dedicated space for state-of-the-art tactical decision-making virtual reality, additiona firearms training lanes,** and office space to accommodate the nearly 20 regional public safety organizations and future customer organizations which utilize the NMR facility.

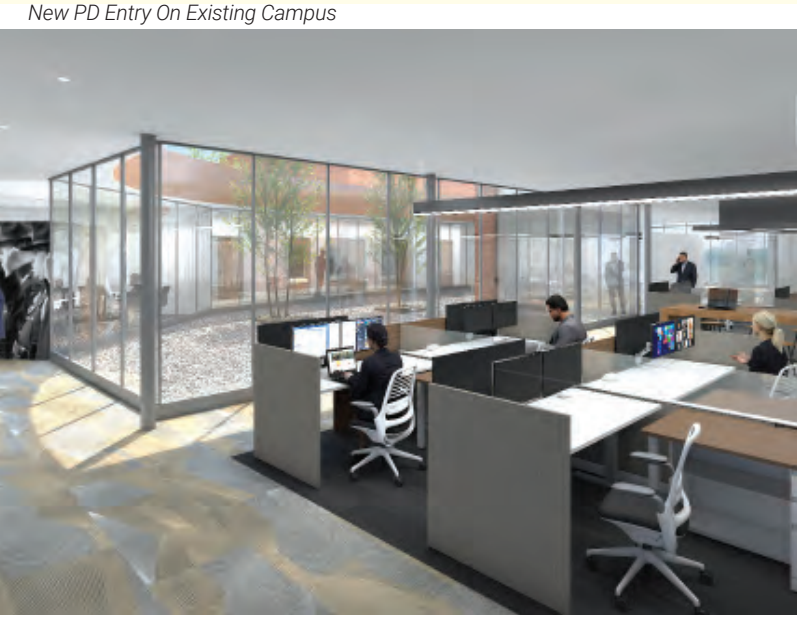
Team members associated with this project:
Todd LaVold, Project Manager; Daniel Yudchitz, Lead Designer; Matthew Keenan,QA/QC; Gina Shuck, Interior Designer; wDaniel Olig, Fire Protection







New PD Entry On Existing Campus



New Internal Courtyard Created Secure/All Access Daylight

Wake Technical Community College, Public Safety Simulation Center

WENDELL, NORTH CAROLINA

OWNER ▪ WAKE TECHNICAL COMMUNITY COLLEGE **SIZE** ▪ 85,000 SF **COST** ▪ EST: $40.29M / FINAL $40.29M **COMPLETION** ▪ EST: 12/2023 / FINAL 11/2023 **REFERENCE** ▪ JKATHY MONTERIO, DIR. OF DESIGN & CONSTRUCTION, WAKE TECHNICAL COMMUNITY COLLEGE, 919.866.5528, KGMONTERIO@WAKETECH.EDU

LEO A DALY designed the new 85,000 SF public safety simulation complex that will lead North Carolina, and likely the U.S., in effective 4D public safety simulation training. The new facility provides training for the College as well as state and local public safety agencies. The PSSC is designed with a full indoor simulation village for first responder real-life scenario and de-escalation training, and the highlight of the center -- a real streetway. **A fully immersive, 3D virtual reality lab provides for de-escalation,** force, mental illness and human judgment training scenarios. There is also a two-story corrections pod to facilitate training scenarios for public safety and detention personnel.

Team members associated with this project:
Todd LaVold, QA/QC SME; Daniel Yudchitz, Arch. Designer; Matthew Keenan, Architectural Advisor-Police

City of Coon Rapids Police Department Needs Assessment

COON RAPIDS, MINNESOTA

OWNER ▪ CITY OF COON RAPIDS **SIZE** ▪ N/A **COST** ▪ $16.4M **SCOPE** ▪ NEEDS ASSESSMENT, PLANNING **COMPLETION** ▪ N/A **REFERENCE** ▪ CHIEF STEINER, 763.767.6401, BSTEINER@COONRAPIDSMN.GOV

LEO A DALY partnered with the police department to assess their existing facility and develop a long-term plan that aligns with their growth and goals. Immediate needs include additional locker rooms for both genders, more private offices, fitness and wellness spaces, secure parking for department vehicles, and larger evidence processing areas. Additionally, the police department is using a portion of the public works facility for training, which is highly sought after for public works expansion.

The department's primary focus is to ensure any renovation or expansion is done correctly the first time, planning for growth and unknown future needs while being responsible with the city budget. Other priorities included allowing all occupied spaces to have access to daylight, easily accessible (mats rooms, VR space, and reality based training) for agency and joint/cross-agency training)

Team members associated with this project:
Todd LaVold, Project Manager; Daniel Yudchitz, Designer





PROJECT APPROACH

CHALLENGES SPECIFIC TO THIS PROJECT AND HOW LEO A DALY WILL ADDRESS THEM

Fast-Growing Community = Fast-Growing Police and City Staff. This Requires Planning for Both Short-Term and Long-Term Growth.

Community growth isn't just numbers; It's about people, quality environments, and the spaces needed to support them.

A decade ago, Rogers grew tremendously with the annexation of Hassan Township. Today, it remains one of the top growing cities in the state with projections showing two times the population 25 years from now. That growth is well within the lifespan of your new building. This will require short-term growth (5-10 years) AND long-term growth (20+ years) prior to the end of the useful life of this facility.

Designing your new police station and city hall to be "future proofed" isn't just about planning for future space, it is also about building in resiliency, flexibility, and durability, in a dignified manner so staff can be responsive well into the future.

People-Focused, Beyond Sworn Officer Counts

Thoughtful design must prioritize the people as well as space requirements. This means integrating access to daylight and connections to the outdoors in a secure manner *(refer to Coon Rapids PD project example on page 18)*, and accounting for acoustics to support confidential or sensitive conversations. It also means creating environments that support the full spectrum of an officer's needs. Even the most highly trained officers require moments of distance and separation from the gravity of the task at hand. They also need spaces to celebrate a case closed or share information informally or areas to bond together *(refer to Hennepin County Medical Examiner image on right)*. We take the need for these spaces seriously and plan spaces for interaction, collaboration, distancing, physical fitness, and mental stability. As we confirm the preliminary space needs program developed by Wold Architects, we will be asking your staff questions about:

- Pre-incident training to prepare and lesson law enforcement officers' susceptibility of developing mental health problems stemming from traumatic experiences.
- Exercise and connections to nature as a means improving employee well-being to better prepare officers for mental and physical situations.
- Post-incident training to cope and learn from an event and its effects on the public safety profession, both collectively and one-on-one in discrete sessions.
- Dorms or quiet rooms which allow flexibility for staff to accommodate long shifts, hectic schedules and mental down time if needed.

Flexibility and Growth That Evolves with Rogers Police Department

The way police departments serve their staff and the community is constantly changing.

- Providing dignified showers and locker rooms with flexibility for changing staff dynamics (continued growth of female officers, general diversity, and younger generations changing expectations) can ensure future staff are not short-changed.
- The use of tactical gear and equipment is growing. **Enough space today is not going to be enough space tomorrow. Agencies couldn't anticipate utilizing drones or body worn cameras 10 years ago.** Providing additional space for electronic forensics operations, real time intelligence centers *(refer to Miami Beach PD image below)*, crime scene unit equipment, or the unknown will make sure future staff are not short-changed.



Miami Beach Police Department-Real Time Intelligence Center



Hennepin County Medical Examiner Facility



Packaging Room, Pennington County Administration and Evidence Building

- Despite evolving laws and procedures, the need for secure property and evidence storage remains constant—and increasingly critical in today's highly litigious environment. Maintaining a clear and unbroken chain of custody is essential, and that starts with having adequate space for intake, packaging, logging, and long-term storage. Even in small to medium-sized departments that may not yet require dedicated evidence staff, conversations and thoughtful planning will help ensure future personnel have the resources and infrastructure they need to do the job right *(refer to Pennington County Administration and Evidence Building above).*
- As sworn officer staffing increases, so too does the demand for secure space to accommodate both patrol and command staff vehicles—critical assets to public safety operations. Additionally, sufficient parking for officers' personal vehicles must be factored in. On a constrained site like yours, this presents a significant challenge. While underground or lower-level parking can conserve surface area, it may limit flexibility as the department continues to grow. **We will work collaboratively with your team to explore a range of secure, indoor parking solutions—balancing short-term efficiency with long-term adaptability** *(refer to phasing diagram on page 23).*

Changing City Service Models, Changing Space Requirements

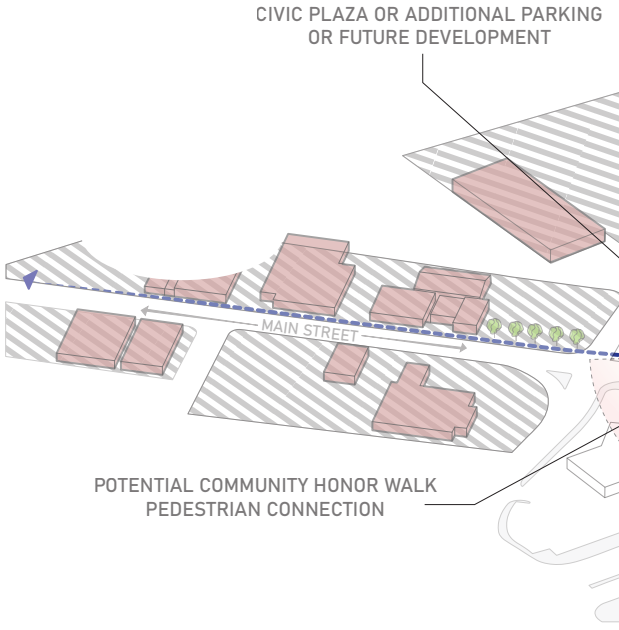
- Community expectations are evolving—some residents prefer the convenience of digital platforms to access city services, while others value in-person interactions. Despite these differences, a shared thread emerges: a growing interest in creative collaboration. Whether it's partnerships between local government and the private sector, engagement with residents, or coordination with non-profit organizations, these connections are vital. Together, we'll explore your current initiatives to strengthen these relationships and assess how they shape staffing needs, technology infrastructure, and the types of physical space required to support meaningful collaboration.
- As the city of Rogers continues to digitize, the need for large-format viewing, physical document storage, and plotting has significantly decreased. Beyond freeing up space for more purposeful use, this evolution enhances efficiency, improves access to information, and strengthens transparency—key drivers of civic engagement. By meeting with department heads and the Information Systems team, we'll gain insights into how digital tools are being used today and identify ways to better align physical space with the City's service delivery goals.

Layers of Security, Site/Building Security Clearly Defined

Police station design requires multiple levels of security to **ensure the safety of police officers, civilians, suspects and detainees, victims and witnesses, and the public.** This starts at the site level by mapping the following movements to ensure safety and security concerns:

PUBLIC MOVEMENTS

- Vehicular traffic visiting the city hall or the police station.
- People parking at the city hall parking lot for events located at the potential city hall plaza or walking to the revived historic downtown.
- People navigating between city hall and the police station.
- Civilian staff working at the city hall or police station.



POLICE MOVEMENTS

- Entering or leaving the site with their personal vehicle.
- Entering or leaving the site with their patrol vehicle with, or without a detainee.

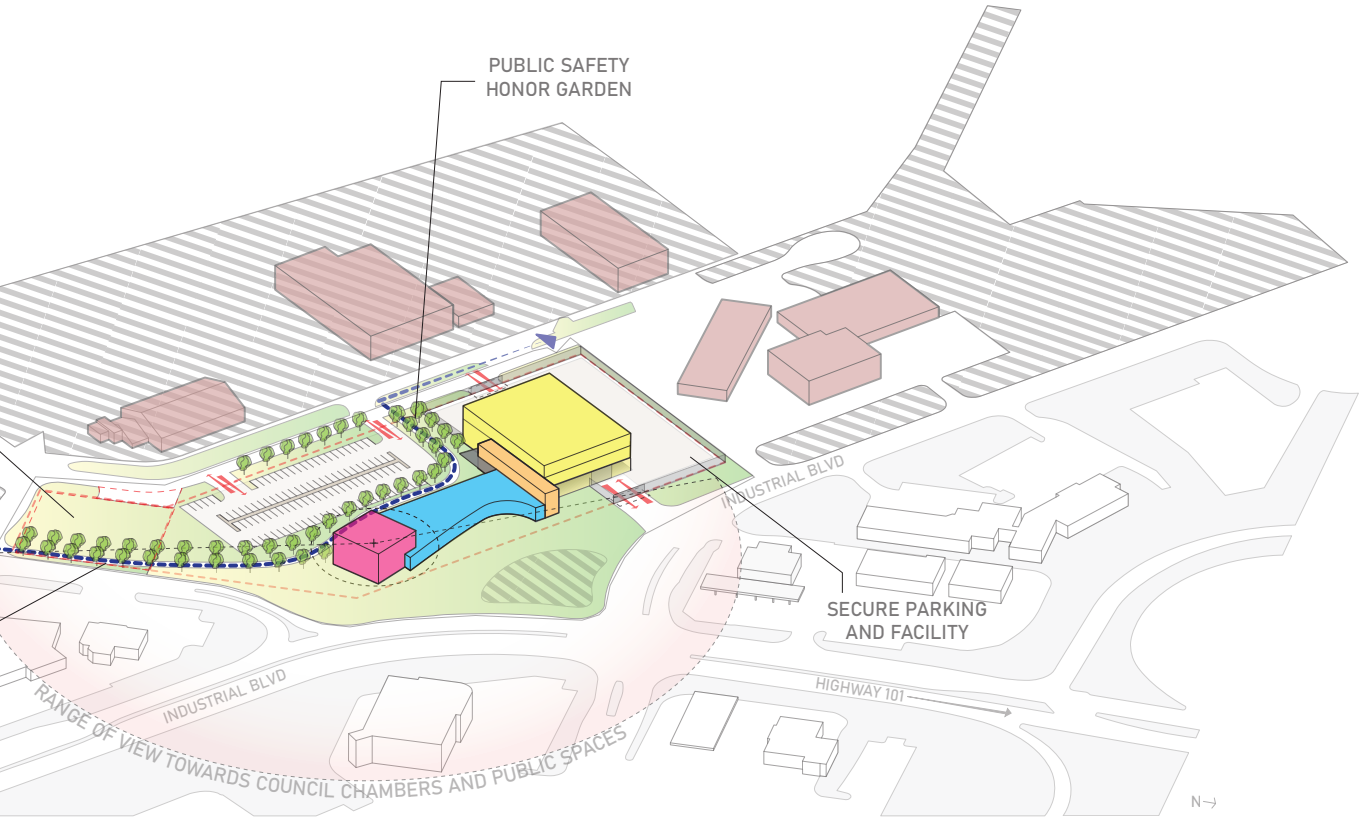
To ensure safe and efficient vehicular access to Industrial Blvd, Main Street, and John Deere Lane, we will collaborate closely with Planning and Engineering, Public Works, Community Development, and the Police Department to evaluate all potential access points and movement across the site. At the same time**, a pedestrian-first mindset must guide site planning if this facility is to truly support and stimulate the revitalization of Rogers' historic downtown** *(refer to Community Honor Walk idea below).* This includes designing walkable, pedestrian-friendly parking areas and thoughtful pathways that connect seamlessly to existing and future developments, reinforcing the building's role as both a civic anchor and a catalyst for community connection.

As the building design progresses, we will engage in detailed discussions around safety and security—addressing key areas such as facades and windows, lobbies, service counters, interview and conference rooms, holding areas, and office spaces. Early and throughout the design process, we will clearly define zones as **Public, Secure but Escorted, Secure, Detention Security, and Evidence Security.** At each point of transition between these zones, we'll evaluate potential threat levels, the desired sense of openness or formality, and the appropriate blend of passive and active security strategies.

Incorporating principles of **CPTED (**Crime Prevention Through Environmental Design), we'll use natural surveillance, territorial reinforcement, and access control to create safer environments.

Forward Thinking Workplace, Design that Confronts Stress Head-On

In parallel, **trauma-informed design** will guide decisions that minimize stress and anxiety, particularly in areas where victims, vulnerable individuals, or community members may engage with the facility. This includes attention to lighting, acoustics separation, and material choices that promote dignity and trust. Together, these frameworks support a facility that is not only secure, but also welcoming and responsive to the needs of all who enter.



LEO A DALY

Gateway Building with Public and Secure Requirements.

This project is a rare and powerful opportunity to establish a civic anchoring institution—one that not only fulfills the needs of the police and city departments, but also sets the tone and standard for future development in and around Rogers' historic downtown. Thoughtfully designed, this facility can become a landmark of public service, civic pride, and smart growth.

For the city hall, positioning the council chambers to anchor a prominent intersection offers residents a visible window into the inner workings of city government, establishing a strong civic presence and reinforcing the city's connection to its community without jeopardizing safety.

For the police department, windows can be problematic. Here, meaningful symbolism may play a vital role in furthering the service and mission of the Rogers Police Department. No longer housed in a re-purposed tile shop, the department will now occupy a space that visibly reflects its purpose and pride. The prominent display of the department's shield, along with the daily movement of patrol vehicles entering and exiting the facility, can establish a strong civic presence and reinforce its connection to the community.

A Phased Approach, Two Sides of a Fiscal Coin: Build more now, save later; But can the budget bear it?

The primary challenge of this project lies in its potential phased implementation, which introduces a distinct set of planning considerations. A potential phased approach necessitates a more strategic and adaptable Schematic Design process—one that balances multiple potential outcomes. While this adds a layer of complexity, it also presents a valuable opportunity to create a campus design that is both agile and responsive to evolving financial conditions (*The diagrams to the right indicate one way we will be thinking about a phased approach as well as future expansion capabilities).*

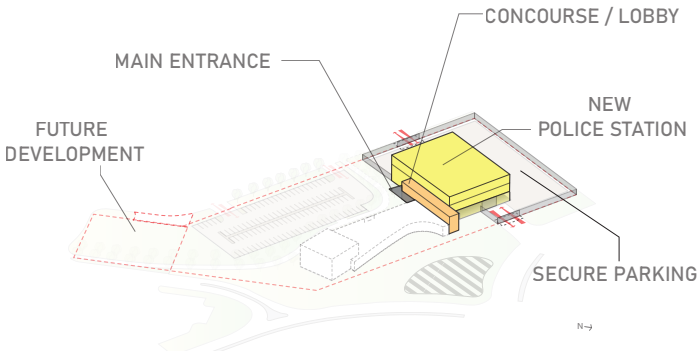
Prior to starting the project we will want to review your best and worst case cash flow scenarios for the construction and project estimates to understand what the implications of a phased approach may be.

The 2025-2029 Capital Improvement Plan indicates that in 2027 $20 million and $18 million is planned for the Police Station and City Hall respectively. Our schedule indicates a construction start date as early as the spring of 2026. This could potentially save about one year of construction escalation or $1.5 million calculated at 5% of $30.99 million. *(See separate Cost file for estimated construction cost calculation).* That represents approximately 3,000 sf or the size of a council chambers. Further, if the City Hall project is pushed out one year after the completion of the Police Station, the escalation cost factored into the City Hall could be as much as $850,000 or approximately the size of the programmed administrative space in City Hall. In other words, in waiting even one year after completing the Police Station to build City Hall in 2027 will mean the city will have paid for the equivalent of two council chambers and two administrative office spaces. The old adage says, "its cheaper to build today than tomorrow" is sadly true.

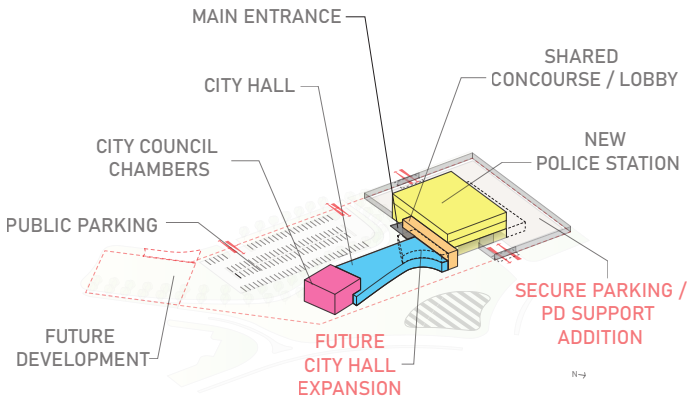
We will work early in the programming / conceptual / budgeting phase of the project to present options with and without a phased approach to understand the pros and cons of each. By the end of the first phase, we will have developed two comprehensive budget models—one reflecting a phased approach and the other assuming a single-phase implementation—providing the Building Task Force with clear, well-informed options as they prepare to enter the Schematic Design phase. Should a definitive path forward not emerge immediately, we will continue to refine the most viable phased strategy. This ensures we remain flexible while maintaining momentum, ultimately presenting a well-considered recommendation to Council once schematic design-level budget updates are available.

Storm Water Management, Seeking Long Term Solutions

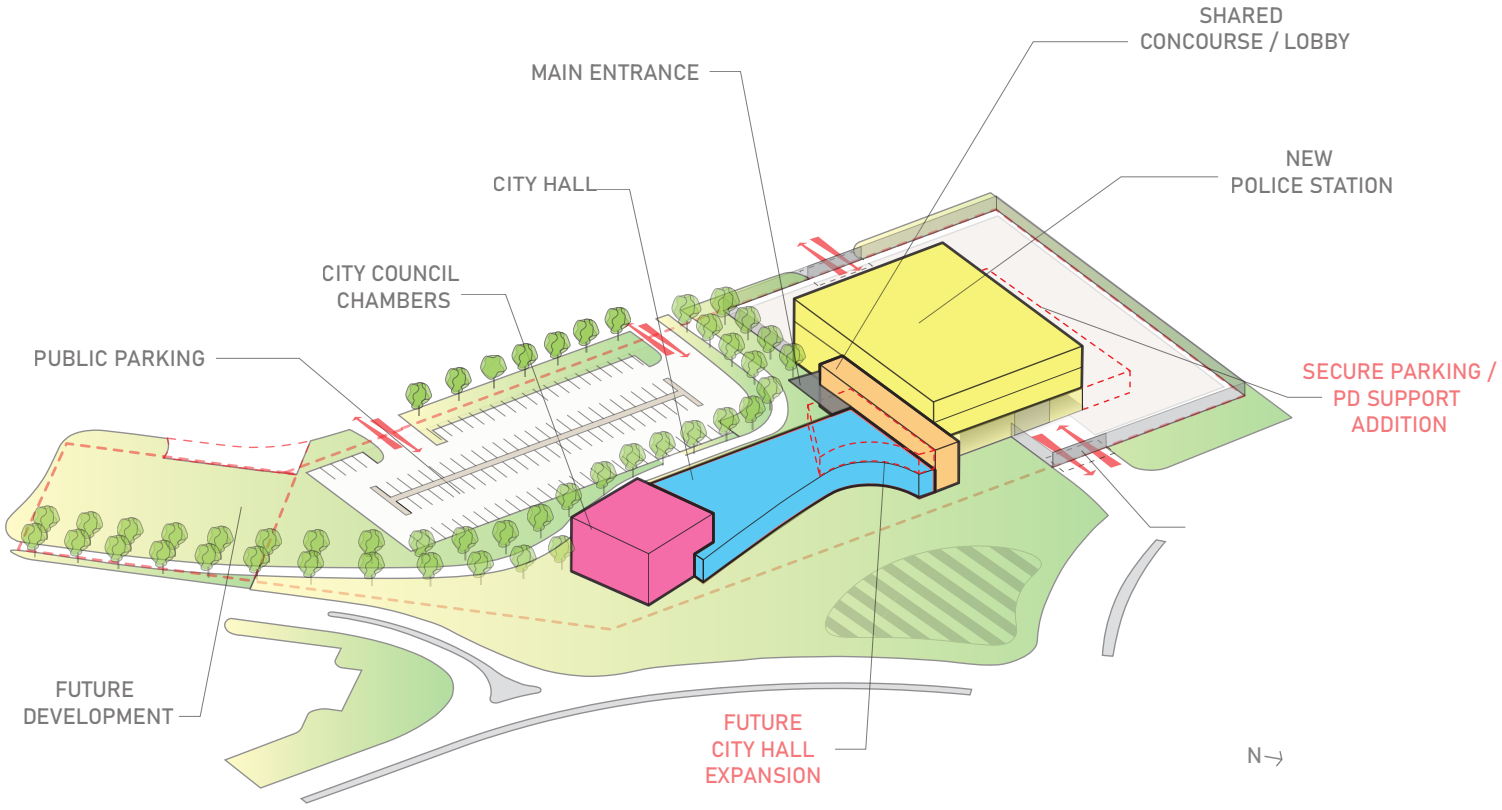
This project falls within the jurisdiction of the Elm Creek Watershed Management Commission, which requires a permit for land disturbances exceeding one acre. As part of compliance, volume abstraction (infiltration) is required for reconstructed impervious surfaces. If on-site soils are not conducive to infiltration (which may likely be the case based upon the general soil types in the area), the Commission provides a clear pathway for alternative solutions—allowing filtration practices to satisfy water quality requirements. Additionally, the use of off-site facilities is permitted, provided there is demonstrated capacity in the system. Planning for full build out on this relatively small site will require the design team to be creative to ensure regulatory requirements are met through the most effective and sustainable means possible.



PHASED APPROACH - POLICE STATION ONLY



FULL BUILD OUT APPROACH OF PHASE 2



FULL BUILD OUT APPROACH OF PHASE 2

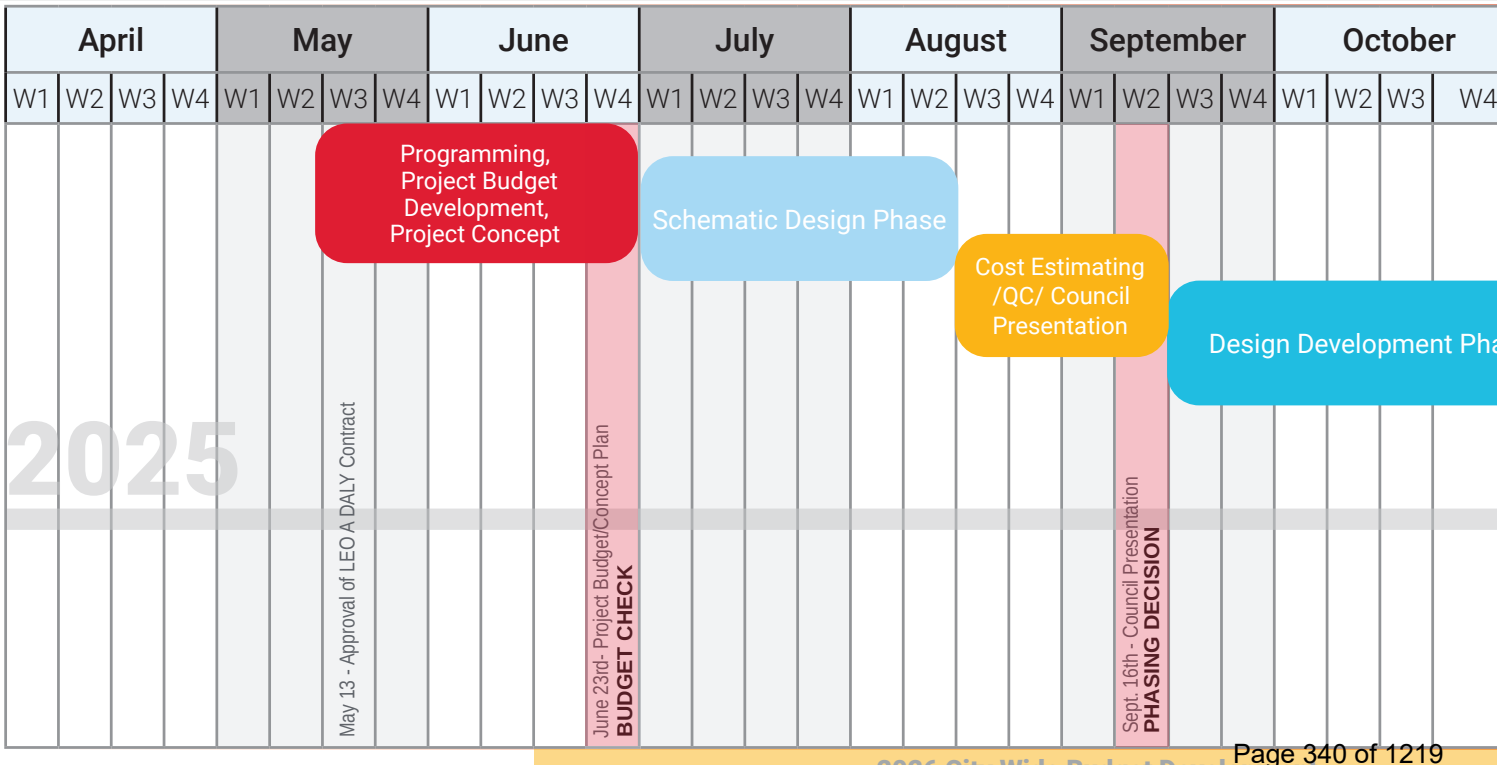
APPROACH-BUDGET

Our creativity, whether design and/or process, is focused on finding the best solutions for your City Hall and Police Department project. We are adept at value engineering and believe it to be part and parcel to the design process. Budgets are not just financial constraints; they are tools for refining priorities.

Our successful budgeting methodology has been centered on the following philosophies:

- On day one, we will establish a full project budget (soft costs and hard costs) consisting of over 70 lines of detail. This is a proven mechanism for cost control as all costs are estimated and allocated at the beginning of the project. This will define the anticipated project costs before design begins. Then the project goals can be reconciled within the the owner's project budget. As documentation is presented and tasks completed, work will be verified by our cost estimator, Talon DeWitz of Rockwise, and eventually your Construction Manager.
- During the project budget establishment, it is critical to establish realistic design, construction and owner contingencies, and know the criteria of use for each. This is more important than ever. Historically, there are always various market fluctuations and disruptions, however, with this project, tariff policy uncertainty looms. Early tariff contingencies must be considered and adjusted as new information becomes available.
- Tariff uncertainty will place even more importance upon developing estimating alternates to assist in budget maintenance at each phase. This is important as the team doesn't want to "hedge our bets" only to potentially see the tariff situation resolve itself which could mean leaving a lot of money "left on the table" with needs not met.
- Never leave a phase (especially schematic design) until the project is reconciled with the project budget.
- Cost estimates, as a design tool keep the design from being "bloated" or inefficient. Efficiently designed builds tend to also be less expensive to build.
- Relying on value engineering exercises at the end of phases, while necessary, can upend quality documentation by having to rework carefully developed designs and drawings. This is at the forefront of our decision-making throughout the process. We don't want to propose and develop the design knowing there is a good chance of it being over budget.

SCHEDULE







We firmly believe that 80% of a project's success occurs in the first 20% of the project. A strong plan is the road map to a project that mitigates surprises and stays on track.

Fiscal Responsibility Through Staff Partnership

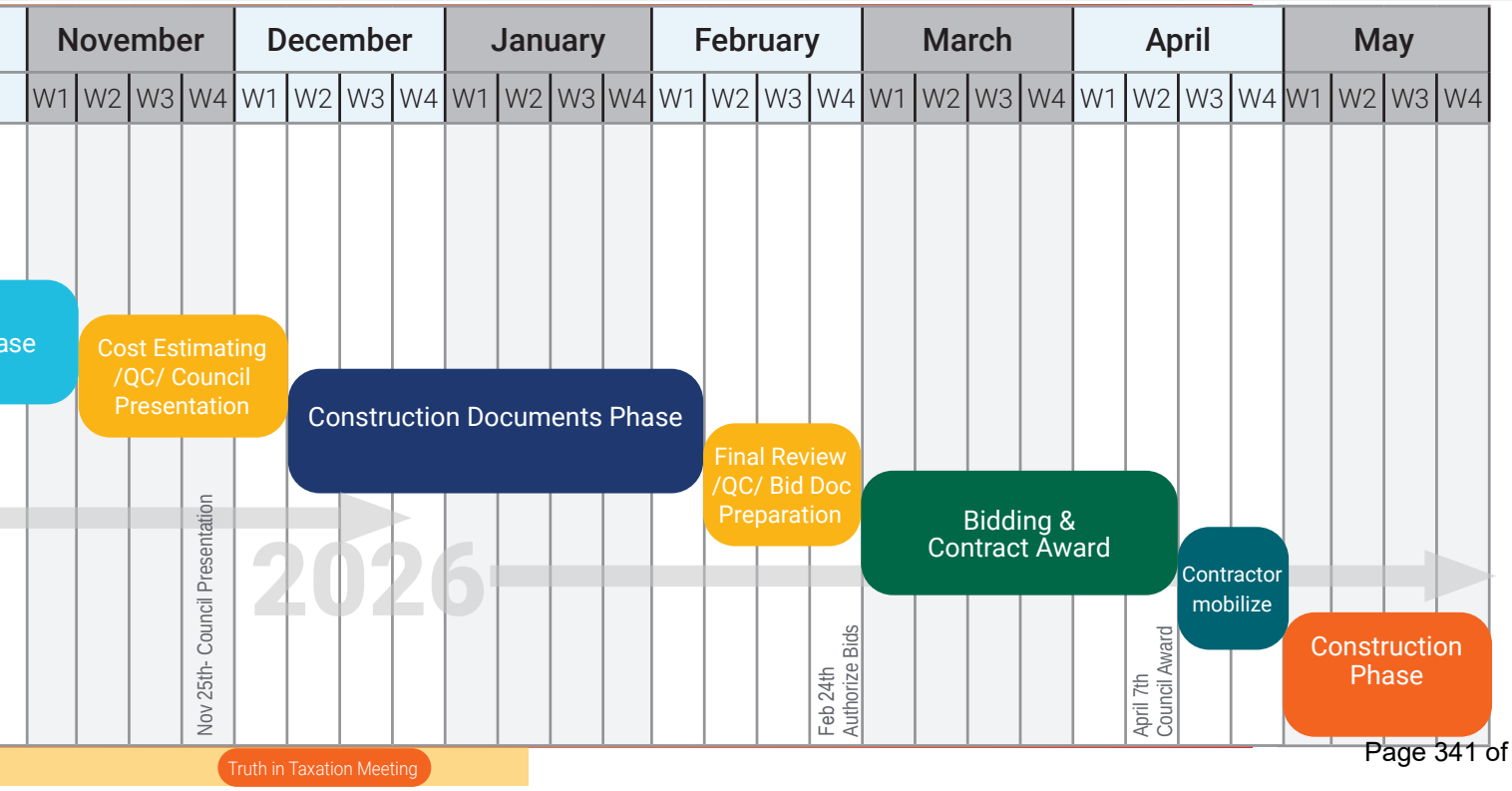
Our design process doesn't happen in a vacuum. Your building is being developed to serve your police officers and city staff. Building consensus through participating in the process creates ownership. This ownership includes understanding the fiscal consequences of every want and need. This makes goal setting at the beginning of the project valuable, because it can be used as a tool later in the process when wants and needs are weighed against the budget.

Our programming sessions with staff in each department focuses not just on finalizing your space requirements, it places a real emphasis trying to understand "the why" behind each conversation about the space needs ask of staff members. The goal of these conversations is to convert "the why" behind the conversation to a series of priorities and goals. This allows the best and highest priorities and ideas rise to the top, while lessor priorities may not fit into the budget. Having staff at the table, knowing not everything is possible while developing common goals gives ownership of the design process AND budget realities.

Quality Control is Cost Control

Our LEO A DALY public safety team believes in raising the design excellence bar for public safety facilities. Not only do we love serving those who serve others, we love doing it well. Our formal quality control implementation plans, insistence upon owner review periods, and consensus building end-of- phase budget reconciliation, all play critical roles in producing quality documents in a timely and steady manner that are on budget.

The schedule below is our approach to a reasonable design process which assumes construction of both the Police Station and City Hall, together. It also assumes no delays with council approval in June and/or September. A Police Station only project will not substantially affect the proposed schedule below.





LEO A DALY

Todd LaVold AIA
Project Manager / Market Sector Leader, P+I
D: 612.359.4656
TBLaVold@leoadaly.com

Wold

CITY OF ROGERS

Request for Proposal -
Architectural and Engineering Services for Site Design and Construction of Rogers City Hall and Police Department

April 25, 2025



WOLD ARCHITECTS & ENGINEERS

TOC

1 | COVER LETTER 04
2 | TEAM OVERVIEW 06
3 | PROJECT EXPERIENCE 11
4 | PROJECT APPROACH 18
5 | SCHEDULE 24

1

COVER LETTER

April 25, 2025

Dan Wills
City of Rogers Police Chief
21701 Industrial Boulevard
Rogers, MN 55374

RE: Request for Proposal - Architectural and Engineering Services for Site Design and Construction of Rogers City Hall and Police Department

Dear Doran,

Wold Architects and Engineers is pleased to respond to the Request for Proposal for Architectural and Engineering Design Services for the Rogers City Hall and Police Department. For over 57 years, Wold Architects and Engineers has worked with municipal governments to help them realize their facility visions. For the past 3 years, Wold has also had the pleasure of working directly with the City of Rogers to understand what your vision is for the City. We've brought our expertise in the planning and design of Public Safety Facilities – and continue to draw off of our extensive expertise in municipal facilities – our understanding of your City, your projects, and our expertise makes us the best fit to partner with the City of Rogers. Wold is committed to enter into the work promptly and is committed to completing the work in the time allotted to allow you to make well-funded facilities decisions moving forward. We know the work isn't done yet!

We match well with and exceed your qualifications:

- We have extensive experience planning and designing modern city hall and police facilities that meet the needs of today and allow municipalities the flexibility to grow and adapt in the future
- Our depth of experience and our specific team for this project has the exact qualifications needed to help determine the long-term needs across the entire breadth of facilities for Rogers, now and well into the future
- We know how to get ownership from elected officials to allow potential projects to move quickly from initial concepts to design to the eventual construction
- Our extensive experience locally and nationally in the operations of City Government and Police Departments makes us the best fit to develop solutions that will serve the community and your staff for years into the future
- Most importantly, we have built our firm around the ability to listen and respond to every client's specific needs – throughout the proposal you will see how we've tailored each of our facility solutions to every specific client's desired outcomes – there are no cookie cutter solutions, and we are excited to continue to listen to your vision and needs for a new City Hall and Police Department

We truly are excited about the opportunity to continue working with the City of Rogers. We look forward to extending the commitment to service and success on which we pride ourselves. Our creative and expert team is prepared to assist in the full range of opportunities this project presents, and we have a great start already! We respectfully submit this overview of our firm's qualifications and experience and would welcome an invitation to further describe our services, design approach, and our commitment in person.

Sincerely,

Jonathan Loose, *PE, LEED AP*
Principal-in-Charge
jloose@woldae.com
612 382 5870

team strengths

- 350+ in-house Architects, Interior Designers, Mechanical and Electrical Engineers
- Trusted and Valued Consultants to address unique requirements of this project

wold team

Jonathan Loose
Principal-in-Charge

Jordan Mediros
Project Lead

Jake Wollensak
Project Manager

John McNamara
Municipal Planner

Joel Dunning
Public Safety Planner

Reed Paitich
Mechanical Engineer

Bradley Johannsen
Electrical Engineer

consultant team

BKBM Engineers
Structural Engineer

Kimley-Horn
Civil Engineer, Landscape Architect

True North
Technology Consultant

Rockwise Strategies
Cost Estimating

Wold Architects and Engineers
332 Minnesota Street, Suite W 2000
St. Paul, MN 55101
woldae.com | 651 227 7773

PLANNERS
ARCHITECTS
ENGINEERS

2

TEAM OVERVIEW



PARTNER-IN-CHARGE

JONATHAN LOOSE, *PE, LEED AP*

minnesota license # | 53001

valparaiso university | BS, Mechanical Engineering

With his mechanical engineering background, Jonathan works closely with his clients to understand their needs and expectations. As a partner working with multiple municipal clients over his 22 years of experience, he has a firm understanding of the organizational and operational relationships that exist between different city departments. However, his true strength lies in his ability to listen to his clients, and respond with a team and unique solutions that will fit your exact goals and priorities. Ultimately, he will make sure that you have a solid plan for developing your facility solutions while looking long-term at the most effective approaches to using them to best serve your community.

city of burnsville | Police & City Hall Remodel
city of carver | New Carver City Hall
city of cottage grove | New Police Station & Fire Station
city of minnetonka | Public Safety Facility Addition & Remodel
city of new hope | New City Hall & Police Station
city of otsego | City Hall & Public Works Facility Space Needs Study, New Fire Station
city of rogers | New Fire Station, Police Addition & Renovation, City Hall/Police Predesign
city of sartell | New Public Safety Facility



PROJECT LEAD

JORDAN MEDEIROS

university of minnesota | Bachelors of Architecture

As Project Lead, Jordan will utilize her broad range of experience with public sector facilities to ensure needs are communicated and met between all project stakeholders. Her intuitive, solution-based design approach and collaboration-based workflow are strengths she brings to a team navigating the design process and especially working through construction.

city of burnsville | Police Addition & Renovation
city of hutchinson | New Police Department Facility
city of minnetonka | Public Safety Facility Expansion & Renovation
city of minneapolis | Police Facility Assessment, New Community Safety Facility
city of otsego | City Hall & Public Works Facility Space Needs Study, New Fire Station
city of rogers | New Fire Station, Police Addition & Renovation, City Hall/Police Predesign
city of rosemount | Police & Public Works Space Needs Study



PROJECT MANAGER

JAKE WOLLENSAK, *AIA*

minnesota license # | 54546

university of minnesota | BA, Architecture
university of minnesota | Master of Architecture

Jake will be responsible for translating and implementing the project goals. He will coordinate with the Design Team to ensure relevant details are being included throughout, and oversee the Construction Administration process. Jake has special expertise working with teams to accomplish technical, functional, and aesthetic objectives for new facilities.

city of brooklyn park | Police Addition & Remodeling, City Hall Renovation
city of cottage grove | City Hall Remodel, New Public Works Utility Facility
city of eagan | City Hall & Police Addition/Renovation
city of hutchinson | New Police Department Facility
city of isanti | Police Facility Renovation
city of minnetonka | Public Safety Facility Addition & Remodel
city of stillwater | Police/City Hall Remodeling
city of west st. paul | City Hall Renovation



MUNICIPAL PLANNER

JOHN MCNAMARA, *AIA, LEED AP*

minnesota license # | 24281

university of california | Bachelor of Architecture

As Municipal Planner, John has tremendous depth of experience in public sector facility planning. John has special expertise in working with clients to understand their needs for operational objectives while navigating the political environment for government facilities, ensuring expectations are met. John brings more than 31 years of experience designing public facilities with Wold, and he will provide added strength to the team early in the process to provide a different perspective on City Hall design and how to address some of the unique challenges Rogers faces.

city of alexandria | New Police Station
city of becker | City Hall/Police Addition & Renovation
city of brooklyn park | City Hall Addition & Renovation
city of cottage grove | New City Hall/Police Facility
city of farmington | New City Hall
city of minnetonka | Public Safety Facility Expansion & Renovation
city of richfield | New City Hall/Police/Fire Facility
city of virginia | New Public Safety Facility
city of south st. paul | City Hall Remodel
city of west st. paul | City Hall Remodel





PUBLIC SAFETY PLANNER

JOEL DUNNING, *AIA, LEED AP*

minnesota license # | 41467

ball state university | BS, Architecture
ball state university | BS, Environmental Design

In his role as Public Safety Planner, Joel will utilize his expertise to translate goals and objectives into highly functional and operational-based police and city hall facilities. He brings more than 29 years of government facility design experience to the table and will leverage that knowledge to bring the City of Rogers the most creative solutions to achieve your facility needs.

city of blaine | City Hall & Police Department Remodeling
city of corcoran | Police/City Hall FF&E, Police/City Hall Remodeling
city of cottage grove | New Public Safety/City Hall Facility
city of crystal | New Police & City Hall Remodeling
city of minneapolis | City Hall Office Improvements, Emergency Operations Training Facility, New South Community Safety Center
city of new hope | Police/City Hall Needs Assessment, New Police Station/City Hall
city of sartell | New Public Safety Facility
city of stillwater | Police/City Hall Remodeling

ELECTRICAL ENGINEER

BRADLEY JOHANNSEN, *PE, LEED AP*

minnesota license # | 47293

university of iowa | BS, Electrical Engineering

Bradley will lead our electrical team throughout the project. He ensures quality through all phases of planning and design, and guarantees uninterrupted service delivery for the life of the facility through efficient and reliable power systems. Bradley's experience in the public sector gives him a deep understanding of the high level expectations of sustainable and seamless electrical systems.

city of blaine | City Hall & Police Dept Furniture, City Hall Improvements
city of brooklyn park | Police & City Hall Master Plan, O&M Campus Improvements, Police Station Addition & Renovation
city of carver | Broadway City Hall Project
city of cottage grove | Police Additions & Renovations
city of corcoran | Police/City Hall FF&E, Police/City Hall Remodeling, Needs Assessment & Options Development
city of minneapolis | City Hall Office Improvements, Emergency Operations Training Facility
city of new hope | New Police/City Hall Facility, Police/City Hall Site Master Plan
city of st. paul | New Public Safety Training Facility



MECHANICAL ENGINEER

REED PAITICH, *PE*

minnesota license # | 50482

university of minnesota | BS, Mechanical Engineering

As the Mechanical Engineer, Reed's role is to bring a forward-thinking perspective on infrastructure needs through the planning process. He works collaboratively with each client to develop engineering solutions that balance the cost of the system with long-term maintenance and operations. Reed will work directly with the Owner to ensure all aspects of the project are reviewed and discussed.

city of crystal lake | AHU-PB & Boiler Replacement, West Cooling Plant, City Hall BAS Replacement
city of farmington | New City Hall Project
city of richfield | Ice Arena - Toilet-room Upgrades
city of st paul | Dunning Flood Storage & Concessions
village of buffalo grove | New Public Works Facility
village of long grove | Addition & Remodel
village of tower lakes | New Village Hall/Police
dakota county | Judicial Center Renovation, Communication Center
scott county | Government Center Renovations, Government Center Campus Addition, New Juvenile Detention Center

STRUCTURAL ENGINEER
BKBM ENGINEERS

BKBM has provided structural & civil engineering designs and consultation to Wold Architects & Engineers since 1967. This unique professional chemistry has provided a winning team for over four decades and nearly 1,000 projects. With an innovative approach to civil and structural engineering, BKBM Engineers strives to enhance the built environment by combining creativity, responsiveness, and collaboration. Utilizing their extensive local knowledge and advanced technological solutions, they aim to optimize project efficiency while fulfilling the ever-changing needs of their clients.

CIVIL ENGINEER & LANDSCAPE ARCHITECT
KIMLEY-HORN

Kimley-Horn is one of the nation's premier planning and design consulting firms. Whether your project is national or local, involving public infrastructure or private development, they look out for your best interest, reduce your risk, and deliver great value. Their engineers, planners, and environmental scientists combine the creativity to develop insightful solutions with the rigor to deliver practical results that consistently exceed your expectations.

TECHNOLOGY CONSULTANT
TRUE NORTH CONSULTING GROUP

True North Consulting Group (TNCG) was founded as Elert & Associates – an independent technology consulting firm – in 1984 and headquartered in Stillwater, MN. In 2018, True North Consulting Group and Elert & Associates merged and became one company – True North Consulting Group. TNCG carefully tailors each project team to meet the specific technology and professional consulting needs of our clients. This helps to ensure the highest level of accountability and quality control for work designed, specified, and administered through implementation.

COST ESTIMATING
ROCKWISE STRATEGIES

Rockwise's approach to cost consulting is based on an ongoing relationship with the project team, assisting owners, architects, and construction managers with all phases of project planning. They help owners define the parameters of the project, and then monitor each decision that may affect cost and provide conceptual budgeting for all aspects of the project – going so far as to estimate for pre-design services or feasibility studies. By using historical data, subcontractor input, and current market trends, cost consultants are able to provide more accurate estimates and advice, allowing clients to understand the cost implications of each variable and component of their project.

3

PROJECT EXPERIENCE

CLIENT-CENTERED EXPERIENCE

we know cities

Our goal at Wold is to provide an exceptionally high level of service to our clients, not only during projects but between projects. We see ourselves as always available to add value to our client's facility management and maintenance. In the following project profile pages, we highlight recent police and city hall facilities, each with design solutions thoughtfully tailored to the specific needs of the client. *These projects were delivered by the same dedicated team and include training and locker spaces as requested.*

MINNESOTA

city of alexandria
New Police Station
Police Facility Space Needs

city of annandale
New City Hall

city of becker
Police & City Hall Addition/Renovation

city of belle plaine
New Police Station
Public Works Renovation

city of blaine
Police Renovations
City Hall Improvements

city of brooklyn park
Police Station Addition/Renovation
City Hall Master Plan

city of burnsville
Police Space Needs
Police & City Hall Remodel

city of carver
New City Hall

city of coon rapids
Police Department Space Needs Assessment

city of corcoran
City Hall & Police Remodel

city of cottage grove
New Public Safety Facility
City Hall Remodel

city of crystal
Police Space Needs Study
New Police Station
City Hall Renovations

city of eagan
City Hall & Police Addition/Renovation

city of eden prairie
Police Space Needs Study

city of faribault
New Police Station Feasibility Study

city of farmington
New Police Station
City Hall Master Plan

city of hopkins
City Hall Master Planning
City Hall Renovation

city of hutchinson
New Police Facility
Police Master Plan

city of isanti
Police Facility Renovation

city of lakeville
Police Space Needs Study
New Police Station
City Hall Space Needs Study

city of little falls
Police Master Plan

city of lonsdale
New Police Facility
City Hall Master Plan

city of minneapolis
Police Facility Assessment
South Community Safety Center

city of minnetonka
Public Safety Facility Study
Police Addition & Remodel

city of nashwauk
City Wide Facility Space Needs

city of new prague
Police Renovation and Addition

city of new hope
New Police/City Hall Facility
Police/City Hall Master Plan

city of northfield
New Public Safety Facility Study

city of otsego
City Hall & Public Works Space Needs

city of prior lake
New City Hall/Police Station

city of richfield
New City Hall, Police & Fire

city of river falls
Police Addition/Remodel

city of rogers
Police Station Planning

city of rosemount
Police and Public Works Space Needs Study

city of st. paul
City Hall Annex Planning

city of sartell
Public Safety Facility

city of south st. paul
Facility Space Needs Assessment
Police Renovations

city of stillwater
Police/City Hall Remodeling

city of st. paul
Police Headquarters Renovation
Public Safety Training Center

city of west saint paul
City Hall Police Remodel

city of white bear lake
Public Safety Master Plan
New Public Safety Facility

city of woodbury
Public Safety Needs Study

city of wyoming
New Public Safety Facility

ILLINOIS

city of crystal lake
City Hall Space Study

city of dekalb
DeKalb City Hall

city of hazel park
City Hall Plaza

city of palos heights
City Hall Renovation

city of royal oak
City Hall Renovations

city of woodstock
Police Department Garage
City Hall Rendering

village of buffalo grove
Police HQ Jail Interlock
Police Break Room/Interview Room
Police Department Men's Shower Remodel

village of north aurora
New Police Facility

village of tower lakes
New Village Hall/Police

COLORADO

city of arvada
Police Department Briefing Renovation

city of wray
City Hall & Civic Center

WISCONSON

village of baldwin
Police Addition/Remodel

village of beloit
Police Space Needs Study

village of cross plains
Police Station

city of river falls
Police Department Addition/Renovation





CITY OF COTTAGE GROVE PUBLIC SAFETY FACILITY & CITY HALL

COTTAGE GROVE, MINNESOTA

Wold Architects and Engineers was hired by the City of Cottage Grove to revisit an earlier space needs assessment and design a new public safety facility and city hall.

The design of the public safety facility confirmed operations and considered future growth projections for civic departments. The resulting building is a transparent, adaptable, and comfortable place for visitors and staff alike. The new facility uses the spacious and pastoral site to its advantage; patios overlook Ravine Park and the natural topography allows for a tuck-under garage.

Wold Architects analyzed their existing Fire Station 2 to determine if it could continue to support changes to fire operations as the department transition to a full time department.

It was determined that the old station could no longer support the department and the design of a new station was approved.

total sf | 100,000 sf
completed | 2013 & 2018
initial budget | $16 M
final budget | $15 M
project type | New Facility

wold staff | Jonathan Loose, Jake Wollensak, Joel Dunning, John McNamara

reference

Jennifer Levitt, City Administrator
651 458 2890





CITY OF SARTELL PUBLIC SAFETY FACILITY

SARTELL, MINNESOTA

Wold Architects and Engineers was hired based on our knowledge and expertise in public safety facilities to assist a local firm, HMA Architects, in the design of a new joint Police and Fire station for the City of Sartell.

Wold was charged with the development of a realistic program. The facility needed to accommodate the needs of the existing departments and address projected growth of the future. There was a strong desire to create multi- functional spaces that could be used by both Police and Fire personnel. This includes the lobby, staff kitchen, and a large, multi-purpose room that can be split into two classrooms, used as a Police training room, or used as a community meeting room. Sleeping rooms were planned as a future addition in case the Fire Department shifts to a new service model.

total sf | 43,339 sf
completed | 2020
initial budget | $12.5 M
final budget | $10.8 M
project type | New Facility

wold staff | Joel Dunning, Bradley Johannsen

reference

Wayne Schreiner, Deputy Chief of Police
320 253 2171





CITY OF CRYSTAL POLICE & CITY HALL
CRYSTAL, MINNESOTA

Following a Needs Assessment Study performed by Wold Architects and Engineers in 2017, the City of Crystal determined the best strategy to replace their aging and inadequate police facility was to demolish the existing facility and build an expanded new police facility on the site adjacent to the existing City Hall.

The design solution creates an optimal facility to encourage interaction among the entire department. While Crystal's existing facility was spread out across two floors and tucked divisions into separate pockets throughout the mid-century modern building, the new facility places all occupied space on the main level. A lower level contains locker rooms, a training room, and a fitness room available for all city employees and indoor parking for the entire fleet. The administrative, patrol, investigations, and command staff are all adjacent in open, bright spaces that will encourage better camaraderie on the department and offer frequent changes to interact.

In addition to operational efficiency, the facility was designed to comply with the State of Minnesota's B3 Sustainability Guidelines for efficient buildings.

total sf | 47,800 sf
completed | 2022
initial budget | $16.4 M
final budget | $16.3 M
project type | New Facility

wold staff | Jonathan Loose, Joel Dunning, John McNamara, Bradley Johannsen

reference
Stephanie Revering, Chief of Police
763 531 1010





CITY OF NEW HOPE POLICE & CITY HALL
NEW HOPE, MINNESOTA

The City of New Hope commissioned an analysis of their existing buildings that determined space deficiencies at their existing police and city hall facilities. The analysis provided multiple options for renovating or building new at their existing civic center site that would best accommodate city government operations.

Moving forward with building new on their current pool site, the City of New Hope assembled a citizen's task force to incorporate community voices into a facility that functions as a beacon of pride for the residents. The city hall and police facility are the focal point of the civic center while respecting both the surrounding park and neighborhood and the existing buildings on site. The design stresses the need for safety and security resulting from an active shooter event at the existing city hall, and ensures that staff, officials, and the public alike feel secure while remaining an accessible resource to the City of New Hope.

total sf | 63,500 sf
completed | 2019
initial budget | $19.4 M
final budget | $19.3 M
project type | Study, New Facility

wold staff | Jonathan Loose, Joel Dunning, John McNamara, Bradley Johannsen, Reed Paitich

reference
John Elder, Mayor
763 341 1350



CITY OF CARVER CITY HALL REPLACEMENT
CARVER, MINNESOTA

The City of Carver hired Wold Architects and Engineers to replace their aging city hall.

The city hall for the City of Carver was in need of replacement and was beyond saving. A previous citizens' committee looked at various sites but ultimately recommended a replacement city hall be constructed in the historic downtown area.

Utilizing the citizens' committee's recommendation, the Carver City Hall design reflects the character of their downtown and maintains the storefront architecture of the rest of the historic district. An additional recommendation by this committee created a large scale meeting room with a commercial kitchen located on the main level with connections and views to the street and river.



total sf | 10,500 sf
completed | 2019
initial budget | $4.8 M
final budget | $5.3 M
project type | Replacement

wold staff | Jonathan Loose, Joel Dunning, Bradley Johannsen

reference
Brent Mareck, City Manager
952 448 8737



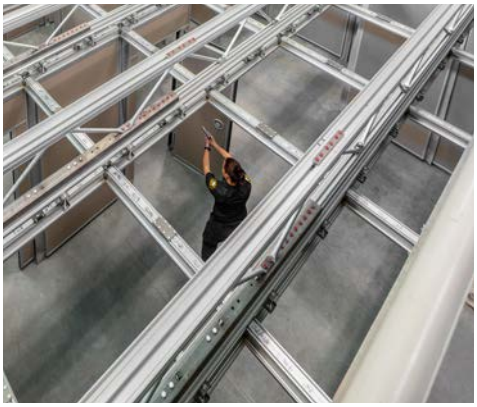
CITY OF SAINT PAUL PUBLIC SAFETY TRAINING CENTER
SAINT PAUL, MINNESOTA

With the immediacy surrounding police training, the Saint Paul Port Authority and the City of Saint Paul came together to provide a new Public Safety Training facility.

This facility aspires to create a positive identity for the police and connect the culture of the nearby Saint Paul Police headquarters with a state-of-the-art training facility. The training facility includes office space for training division staff, locker rooms for staff and cadets, two lecture classrooms, a reconfigurable scenario-training suite with movable walls, and a 12-lane firing range used for training and certification.

The training facility serves as the base for an on-going, in-service training for Saint Paul officers; with 17-week long police sessions and a professional development institute for continuing education seminars, the facility has the capacity for Saint Paul police as well as outside law enforcement agencies to train and take classes.

This facility was designed to comply with the State of Minnesota's B3 Sustainability Guidelines for efficient buildings.

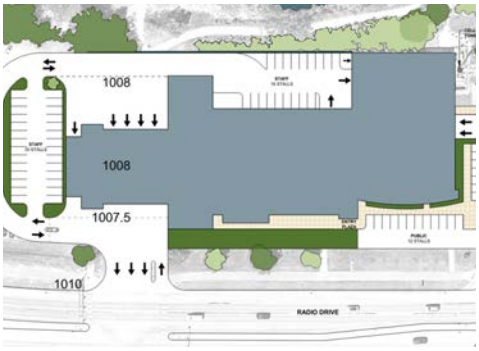


total sf | 40,000 sf
completed | 2017
initial budget | $12.9 M
final budget | $12.8 M
project type | New Facility

wold staff | Jake Wollensak, Joel Dunning, John McNamara, Bradley Johannsen

reference
Julie Maidment, Commander
651 266 5558





CITY OF WOODBURY PUBLIC SAFETY FACILITY
WOODBURY, MINNESOTA

After gaining approval from the State Legislature to pursue a Local Option Sales Tax to fund a potential Public Safety Facility Improvement project, the City of Woodbury hired Wold Architects and Engineers to plan and design a new public safety facility.

Wold's expertise in Public Safety Facilities allowed a rapid but thorough evaluation of the existing Woodbury Public Safety Facility, determination of projected future facility needs and development of several options of how to address those needs for consideration. All options focused on addressing the agreed upon objectives of maintaining a unified Public Safety facility to reinforce collaboration between Police and Fire, reuse of the well maintained and well functioning existing building components, and implementing solutions that reinforced best practices to keep officers and fire fighters safe in the line of duty. While the existing site was constrained, Wold's proposed solution segregates staff away from public but connects public parking and lobby spaces to the adjacent Woodbury City Hall. The quick resolution of Wold's study allowed the City Council to act in time to get the L.O.S.T. vote on the November 2024 election ballot. We are currently finishing the design for the facility and expect to be in construction in the spring of 2026.

total sf | 130,000 sf
completed | Est. Spring 2028
initial budget | $60 M
final budget | N/A
project type | New facility

wold staff | Joel Dunning, John McNamara
reference
Jason Posel, Public Safety Director
651 714 3600
Chris Hartzel, Engineer Director
651 714 3593





VILLAGE OF TOWER LAKES VILLAGE HALL & POLICE FACILITY
TOWER LAKES, ILLINOIS

Wold Architects and Engineers was hired by the Village of Tower Lakes to conduct a Municipal Building Feasibility Study.

The existing building is a two-story wood framed building is approximately 80 years old, and was originally constructed as a residence. Wold began the process by conducting an existing building evaluation which assessed the structure, exterior envelope, ADA accessibility, and mechanical and electrical systems.

At the same time, Wold facilitated meetings with Village administration and staff to determine the current and projected programmatic needs for Village Administration and Police operations. The current facility was determined to be too small to accommodate the functional requirements of modern municipal service and public safety operations. At the conclusion of the space needs analysis, Wold was retained to design a new combined Village Hall and Police Department facility. The facility will be sited in the location of the current structure. The new building is designed to reflect the "lake house" identity of the community. A new Board Room/ Community will provide a much needed gathering space. The new facility will also better support modern police operations.

total sf | 5,000 sf
completed | 2025
initial budget | $2.8 M
final budget | $2.3 M
project type | New Construction

wold staff | Reed Paitich
reference
Andy Hay, Village President
847 736 9640



CITY OF SOUTH MINNEAPOLIS COMMUNITY SAFETY CENTER
MINNEAPOLIS, MINNESOTA

The City of Minneapolis hired Wold Architects and Engineers to embark upon a study of their entire police operations in 2024. Following that, and the city re-imagining their approach to public safety and law enforcement, Wold was hired to begin designing a new South Minneapolis Community Safety Center.

While we are still early in design, this project is an example of Wold leveraging our expertise, while also listening intently to the goals and objectives of our client. While it will include the replacement of the 3rd Precinct police station, it will also have several other community services and resources available, including:

- 311 Service Center
- Culturally specific community navigators
- Domestic violence services
- Mental health services
- Youth services
- Advocacy and training about preventing and ending human trafficking
- Community meeting room

The intricate process of developing a program and design that respond to the myriad needs that Minneapolis has is a testament to our creativity and ability to pull in the breadth of experience we have not only in law enforcement, but community services through our dedication to public sector work.

wold staff | Jake Wollensak, Jordan Medieros, Joel Dunning





CITY OF MINNETONKA PUBLIC SAFETY FACILITY
MINNETONKA, MINNESOTA

Wold Architects and Engineers was hired by the City of Minnetonka to develop a new public safety facility that incorporated current best practices for fire and police operations.

After a comprehensive public safety study, Wold was retained to design and implement the solutions for the new police facility. The design addresses space deficiencies for the City of Minnetonka's growing police department. The planning group determined the need for a facility that is more welcoming to the public, accommodates future growth of the department, and provides adequate space for training and an EOC.

The police facility offers distinct zones of separation between various operational areas to ensure efficiency without compromising response times. Dedicated space for public engagement and education, including a lobby that houses historical artifacts, completes the design. This project has been a great collaboration to create a connected facility with shared resources for training and emergency services.

total sf | 41,000 sf
completed | 2021
initial budget | $30.5 M
final budget | $30 M
project type | New Facility

wold staff | Jonathan Loose, Jake Wollensak, John McNamara, Jordan Medieros, Bradley Johannsen

reference

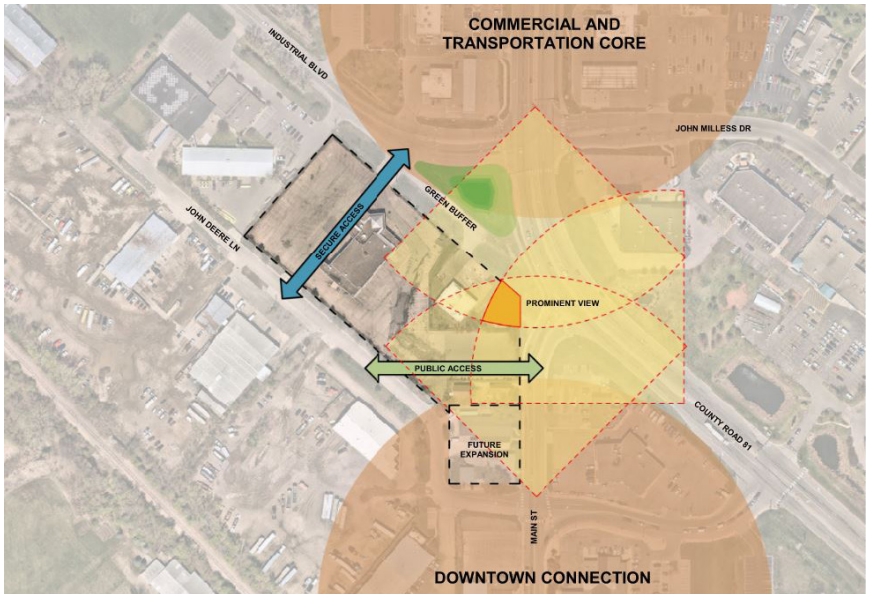
Kevin Maas, Facilities Manager
952 988 8412

4

PROJECT APPROACH

PROJECT UNDERSTANDING

UNDERSTANDING THE CITY OF ROGERS



understanding your project & city

Rogers is looking for a qualified planning and architectural design team to help plan for and ultimately implement work for their City Hall and Police Department. With existing facilities that no longer meet the needs of the City, the goal will be to have enough foresight in the planning process to provide implemented solutions that will keep pace with staff and operational changes, while adapting to the growing and changing demands for service from the community.

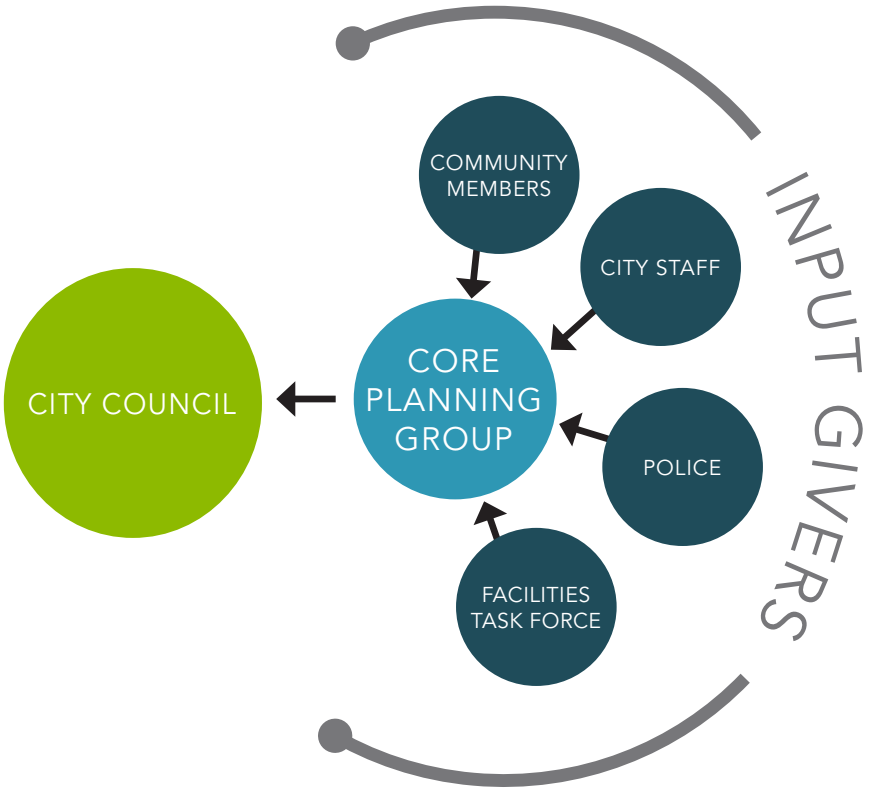
At Wold our mantra is that "a client is for life." Our hope is that what we have the opportunity to continue building a long-standing relationship where we support your endeavors well into the future. From the extensive planning already completed we can hit the ground running and jump start the process. However, while some efforts to understand the feasibility of your project have begun, we understand it's critical to re-engage in a process where we continue to listen to your objectives and develop solutions that respond to the whole breadth of needs that exist. Our robust process has some key components that help "future-proof " the outcomes and allows for immediate transition into design, but is also nimble enough to allow for additional investigation or new trends to be considered. Some of the challenges and opportunities that we've come to understand and things we've heard so far include:

- This project is a once in a generation opportunity to create the "Gateway to Rogers." While an initial feasibility solution has been generated by our team, we bring a whole new perspective with our planning and design team that will ensure an unbiased perspective as we continue to listen to the City's vision and develop solutions that are unique and inspiring to not only City leadership, but the entire community.
- Develop a solution that can allow for the potential of a phased implementation of City Hall and Police separately. We anticipate this will certainly affect the planning of the site configuration, and are eager to discuss the range of possibilities this challenge presents.
- We've reviewed the complete plan and your previous Downtown Master Plan. We understand the importance of the development of this site to provide amenities that will support your vision, including parking. As we continue to discuss the future opportunities, we have included Kimley-Horn as a national civil, landscape architect, and urban planning firm that will bring a new perspective on how this project will fit into the overall context of Rogers' downtown corridor.

We are excited to dig deeper into the issues and help achieve the best outcomes. As our previous planning & programming efforts coalesce, we will embark on a new design process that is structured to prioritize the City of Rogers, and realize your vision for City Hall and Police that will stand the test of time, and truly serve the community. We believe that each client and each project is unique, and while we want to be sure to learn from others, we'll never force a solution or apply a "cookie-cutter" design to your projects. Our robust processes will ensure your successful design that meets your budget expectations and incorporates your priorities as a city.

PARTICIPATORY DESIGN PROCESS

ESTABLISH A CORE PLANNING GROUP



The Wold team believes that successful facilities are those that include a great deal of participation that engages building users, staff, and the community. Wold has developed a "Participatory Planning Process" to make this planning and programming effort come to life.

Facility planning is an interactive process. Each participant's specific needs and objectives must be understood and every attempt must be made to meet those needs and objectives. Wold specializes in facilitating this ongoing site-based team process. We understand how to bring groups together and gain consensus.

core planning group

The Core Planning Group consists of key decision makers who would work to evaluate design options using criteria established by the group, prior to recommendation to the City Council for approval.

Among the issues that the Core Planning Group will decide when presented recommendations by the Wold team:

- Project objectives
- Needs list
- Functional options

guidelines for a successful participatory planning process

- Core Planning Group requests information from input givers; input givers' role is for input, not consensus decision
- The more efficient the Core Planning Group, the faster the project can develop
- We understand the importance of giving your departmental staff a voice in solutions while still maintaining the overall objectives and budget of the project.

our unified planning & design approach ensures input from all stakeholders

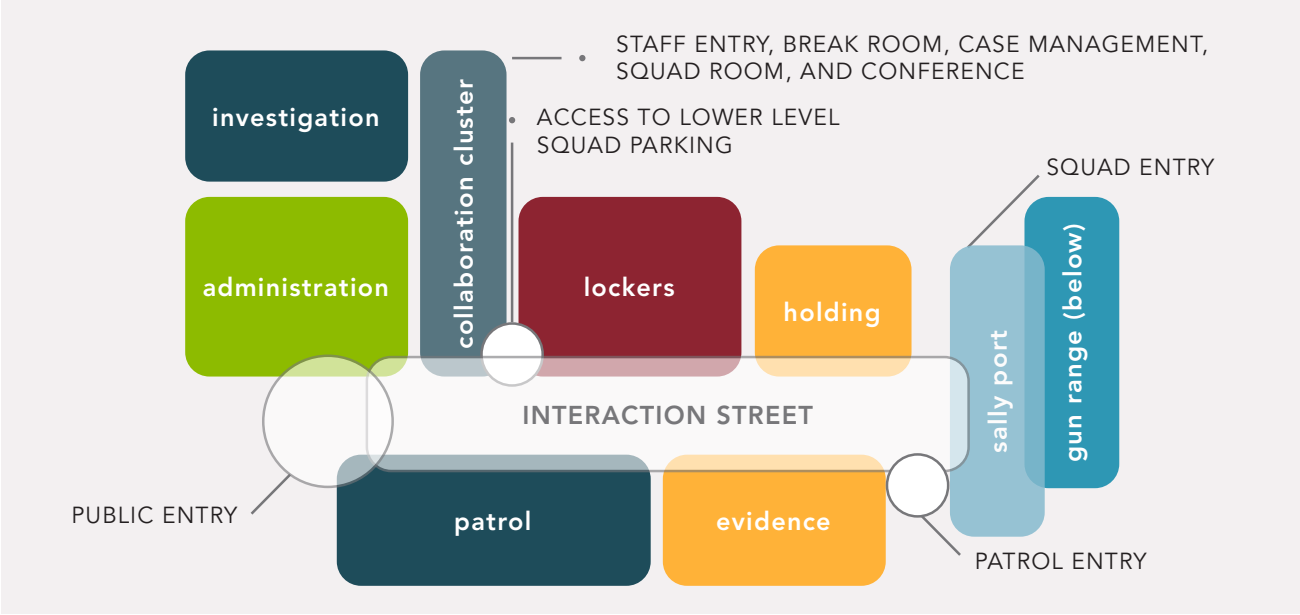
We meet with your stakeholders, on their schedules, to determine needs and desires for each individual space being planned, from room organization and orientation, down to the smallest details, like storage types, electrical outlet placement and door hardware. This input is clearly documented and distributed to all participants, then directly transmitted to the Core Planning Group's review.

DESIGN FACTORS

KEY CHALLENGES FOR POLICE FACILITIES

safety & security

One of the key discussion topics will be about transparency and access for the public to departments and their related functions. While having transparency is important, there are some easy solutions that will enhance the safety and security of your facility. These include installing panic buttons for staff at key locations, installing barriers at service counters, creating a second way out of all spaces that allow the staff to exit safely if needed, and adding more glazing to improve sight lines. Simple operational changes can also improve safety and security. These can include scenario planning, alerting systems, and putting together a committee to continually evaluate safety systems.



public access and orientation

- Provide clear orientation to a lobby for after hours public contact
- Victim privacy should be carefully considered

emergency services for flexible use and weather protection

- Construct storm-proof standards
- Consider positioning these conference-like spaces for potential community use

secure perimeter

- Secure administrative, investigative, patrol areas, holding and evidence
- Secure property, firearms
- Secure vehicle storage

functional interaction

- Facilitate mission and enhance staff safety and security
- Efficient adjacencies with privacy

durability for the test of time

- Materials that can withstand 24 hour use
- Flexibility in space definition
- Abuse resistance appropriate to each area of the facility/cleanable

vehicle parking

- Improve operational efficiency
- Increase staff comfort and safety
- Reduce fuel and maintenance costs
- Enhance police vehicle storage security
- Decrease response times

administrative services for public interactions and staff resources

- User-friendly reception area for public, yet secure with good sight lines for staff
- Provide conferencing off lobby for public interaction outside secure area, including community service room

investigators and patrol functions may be clustered for interaction

- Conferencing and interview positioned with recording capability
- Evidence processing and control with proximity to sally port
- Patrol workstations with privacy

interrogation: enhancing safety and security for staff and detainees

- Secure perimeter, non obtrusive, good neighbor concern
- Environment discourages acting out; providing security for the worst case
- Maximize backup staff support: good sight lines, visibility
- Appropriate spaces, materials
- Full video tape capability

DESIGN FACTORS

KEY CHALLENGES FOR CITY HALLS

Functional responses will start and end with listening to how the city currently operates and what would be the ideal way to operate. We understand the need to provide quality city services. Wold has a history of designing facilities to support state-of-the-art operational approaches where functionality is a high priority in achieving client goals. We will do this by:

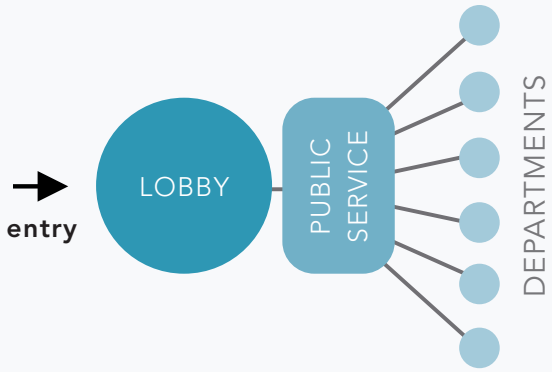
- Planning your city hall to fit into your operational needs, overall city functions, and mission. We listen to your goals and respond with design solutions.
- Challenging operational approaches to determine functional models for the City of Rogers at appropriate settings.
- Testing the design against operational models during a scenario development process so that no stone is left unturned, and the city receives a highly functional solution that meets your objectives.

we believe city hall design begins with a similar mission:

Supporting the city's customer service mission while enhancing staff interaction. With this as our focus, we can begin to design with function driving internal organization. City hall design typically follows one of two organizational models. One generates from a central focus, sometimes referred to as a central service counter design. The second follows a linear focus which is often referred to as a "Hub and Spoke" design. Clear customer orientation is critical in city hall design to avoid the "government runaround." The content below illustrates these two organizational models.

central

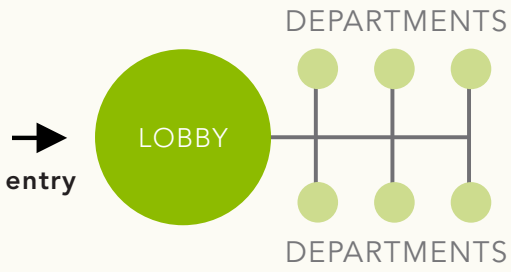
In the central service counter model, the public only has to find one counter to get services. The large open lobby provides circulation space for public functions such as the council chambers and provide overflow and gathering space for council meetings. Often flanking the service counter are smaller meeting rooms that are used for informal meetings with customers, contractors, or council members meeting with constituents.





linear

In the more linear "Hub & Spoke" design the "Hub" provides the entry focus and relationship to council chambers while the "Spokes" (corridors) provide the connection to large town departments. Critical to the linear design is clear orientation. Signage may play a role in effective orientation. Sub-lobbies connected to the "Spokes" (corridors) play a role in creating a node or focus for the department.





SCHEDULE & BUDGET MANAGEMENT

DETERMINING AND MAINTAINING YOUR SCHEDULE & BUDGET

schedule management

The Project Manager is responsible for managing the schedule. Wold will accomplish this by first working to establish a milestone schedule for the project. We will then develop a detailed Outcome Based Agenda for all meetings that we feel are needed to accomplish that milestone schedule.

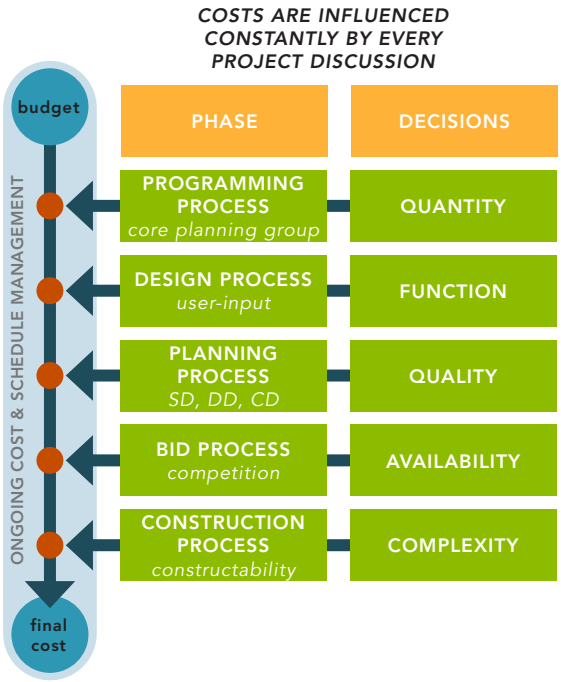
You'll find that we won't meet just because there is a regular meeting scheduled on the calendar. We meet to make decisions and move projects forward. We will not conclude each meeting until the tasks on the agenda are accomplished. As the project progresses, the Project Manager will monitor the performance and input of all participants to assure that information is available and distributed as required and that tasks are completed in a timely manner.

budget management

The Wold team approaches budget management as an ongoing task, from the start of planning and programming through the completion of the construction. We know that the planning for public facilities sets the framework for future costs. Eighty percent of the cost for a project is determined by the first 20% of the decisions. Therefore, we take the initial planning very seriously, because it is the key to future financial factors.

Specific cost and budget analyses ensure adherence to original budgets for the project. Construction and installation documents and management provides the direction for seamless process management moving toward occupancy.

Within our fixed fee, we include the services of an independent cost estimating consultant, Rockwise Strategies, to perform cost evaluations at key milestones of the project. This effort is completed in alignment with our own internal estimates, so collaboration on an agreed cost estimate can occur, and the City of Rogers can be confident the project is on budget and able to move forward.





wold does not charge our clients to resolve unexpected surprises

One of the benefits of our approach is the avoidance of cumbersome accounting for changes to the work. Therefore, there are no fees associated with change orders. It is especially important once construction begins for the Owner and Design Team to have a collaborative relationship. We believe our role in the partnership is extremely important to resolve construction claims.

Because of Wold's exclusive focus on public projects, we have learned the importance of identifying all risks and variables prior to bidding. Developing high quality, well-coordinated construction documents results in a history of minimal change orders on Wold projects. Typically, at project closeout, change orders to all construction contracts are less than 1%, with the majority of those changes being Owner requests for added value or additional scope.

5

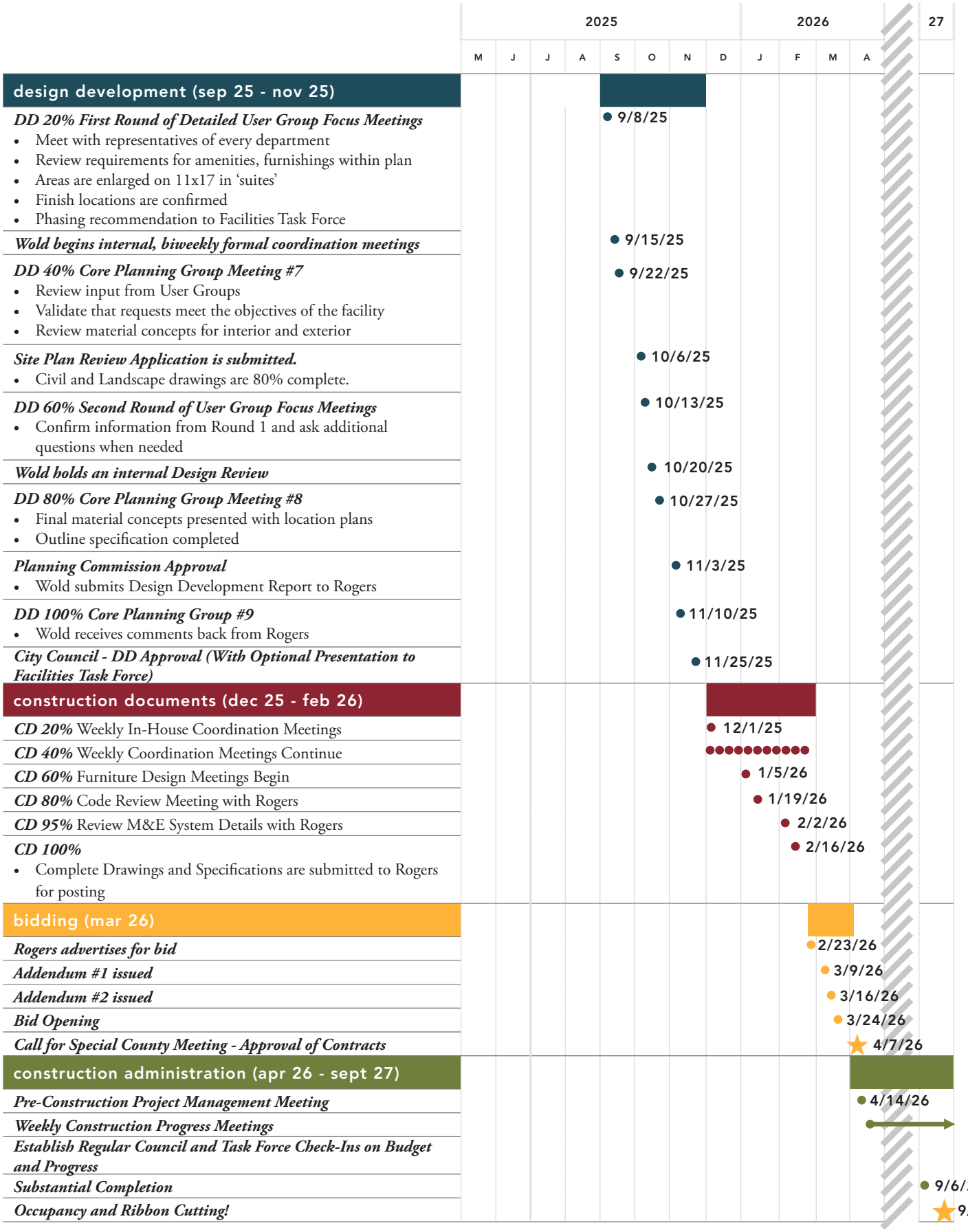
SCHEDULE

SCHEDULE

although the inspiration may come quickly, the proof takes time

Through our experience in the public sector, we have developed a firm understanding of the sequencing of the investigation and the required time for building occupant input and ownership, and believe that successful schedule planning and management is achieved only through whole-hearted partnering of the entire project team. Below is a work plan which identifies the critical path needed to achieve the targeted deadline. We are excited to continue to hear and refine designs to meet the City of Roger's exact needs. Moreover, should the City desire an alternative pace for the schedule our firm can easily shift and align with your needs.




2025
2026
27
M J J A S O N D J F M A
design development (sep 25 - nov 25)
DD 20% First Round of Detailed User Group Focus Meetings
• Meet with representatives of every department
• Review requirements for amenities, furnishings within plan
• Areas are enlarged on 11x17 in 'suites'
• Finish locations are confirmed
• Phasing recommendation to Facilities Task Force
9/8/25
Wold begins internal, biweekly formal coordination meetings
9/15/25
DD 40% Core Planning Group Meeting #7
• Review input from User Groups
• Validate that requests meet the objectives of the facility
• Review material concepts for interior and exterior
9/22/25
Site Plan Review Application is submitted.
• Civil and Landscape drawings are 80% complete.
10/6/25
DD 60% Second Round of User Group Focus Meetings
• Confirm information from Round 1 and ask additional questions when needed
10/13/25
Wold holds an internal Design Review
10/20/25
DD 80% Core Planning Group Meeting #8
• Final material concepts presented with location plans
• Outline specification completed
10/27/25
Planning Commission Approval
• Wold submits Design Development Report to Rogers
11/3/25
DD 100% Core Planning Group #9
• Wold receives comments back from Rogers
11/10/25
City Council - DD Approval (With Optional Presentation to Facilities Task Force)
11/25/25
construction documents (dec 25 - feb 26)
CD 20% Weekly In-House Coordination Meetings
12/1/25
CD 40% Weekly Coordination Meetings Continue
CD 60% Furniture Design Meetings Begin
1/5/26
CD 80% Code Review Meeting with Rogers
1/19/26
CD 95% Review M&E System Details with Rogers
2/2/26
CD 100%
• Complete Drawings and Specifications are submitted to Rogers for posting
2/16/26
bidding (mar 26)
Rogers advertises for bid
2/23/26
Addendum #1 issued
3/9/26
Addendum #2 issued
3/16/26
Bid Opening
3/24/26
Call for Special County Meeting - Approval of Contracts
4/7/26
construction administration (apr 26 - sept 27)
Pre-Construction Project Management Meeting
4/14/26
Weekly Construction Progress Meetings
Establish Regular Council and Task Force Check-Ins on Budget and Progress
Substantial Completion
9/6/27
Occupancy and Ribbon Cutting!
9/27/27



minnesota | colorado | illinois | tennessee

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 5.12

Subject: Approval of Special Event Permit Application Agreement with Rogers Lions Club for Rockin' Rogers Days
Prepared By:

Recommended Council Action
Motion to approve the Special Event Permit Application Agreement between the City and the Rogers Lions Club, with such minimally substantive changes as may be further necessary to be approved by the City Attorney and City Administrator.

Overview / Background / Analysis
In exchange for the Rogers Lions Club organizing and delivering the largest annual community festival in Rogers, the City has provided financial and in-kind service support for the event. Earlier in 2025, the City Council met to discuss increasing the maximum financial commitment to $25,000. As part of that discussion, Council directed that a formal agreement be drafted which would spell out the requirements and obligations of the Lions and the City, itemizing both the categories to be funded via the $25,000 commitment, as well as the in-kind services provided by the City with regard to staffing and equipment. That agreement is attached for Council review and approval.

Staff Recommendation
Staff recommends approval of the Special Event Permit Application Agreement between the City and the Rogers Lions Club, with such minimally substantive changes as may be further necessary to be approved by the City Attorney and City Administrator.

Financial Impact: $25,000 plus in-kind **Source Fund**:

Budgeted?

Supporting Documentation
A. Rockin Rogers Agreement and Certification

City of Rogers

Special Event Permit Application Agreement

This Agreement between the City of Rogers, a municipal corporation ("City"), and the Rogers Lions Club, a nonprofit corporation ("Lions") is made and entered as of _____, 2025.

IT IS HEREBY AGREED:

I. Agreement of Applicant (The Rogers Lions Club): The Lions agree to abide by all rules set forth below, together with all ordinances and other rules and regulations which may be imposed governing such activities. It is hereby agreed that Rockin' Rogers Days is a community event organized and hosted by the Lions, and that the City agrees to provide limited support and resources as outlined in this Agreement.

II. Regulations of Use: By signing and presentation of this Agreement, the Lions certify to the City that the following statements are true and correct, and the Lions will abide by the following:

A. Barricades: Barricades will be provided by the City. The City will be responsible for placement, maintenance, and removal of all barricades. No non-approved barricades are allowed. If City-owned barricades are lost or damaged during an event, the Lions will be charged for the replacement of the barricade.

B. Traffic: The total roadway portion of the right-of-way shall not be blocked. At least a ten (10) foot aisle shall be always kept open to permit passage of vehicles of residents of the block and emergency or other authorized or necessary vehicles to enter and exit. A temporary entrance and exit will be established for emergency vehicles to enter and exit.

C. Surface of Street: No materials of any type (such as powder, sawdust, etc.) shall be placed on the public right-of-way which will create hazards.

D. Clean Up: The City shall provide trash and recycling receptacles to prevent as much littering as possible. The City shall contract for their disposal. The Lions shall be responsible for the manual pickup or disposal of litter, trash and garbage following the event. Such clean up shall be completed within twenty-four (24) hours after the end of the event. If the City is required to perform manual clean up after the 24 hours, the Lions will be billed for all costs.

E. Hours: Streets may not be barricaded prior to times described within the permit and approved by the City.

F. Speakers: No loudspeaker system shall produce sounds audible outside the areas designated for the public gathering. All concerts will end no later than midnight each night. Carnival and food vendors will end all sales by 11:30 p.m., nightly.

G. Accessibility: The Lions are required to make reasonable accommodations for persons with disabilities at this event, for example, in the areas of parking, restroom facilities, curb ramps, and access to food and entertainment.

H. Security Services: The Lions will contract to provide private security services for the two nightly concerts on June 20, 2025, and June 21, 2025. The Rogers Police Department agrees provide police security at the Rockin' Rogers events. The number of officers and hours are as scheduled as follows, but may be subject to change:

i. Thursday June 19, 2025, 1900 to 2300 hours (2) Licensed Personnel Concert
ii. Friday June 20, 2025, 1900 to 0030 hours (3) Licensed Personnel Concert
iii. Saturday June 21, 2025, 1000 to 1400 hours (6) Licensed Personnel Parade
iv. Saturday June 21, 2024, 1900 to 0030 hours (3) Licensed Personnel Concert

I. Costs: The City has budgeted $25,000 in assistance for the Lions' Rockin' Rogers Days. Any further services outside of the described services and or times will be charged to the Lions at the appropriate City rate. This includes, but is not limited to, the items listed below:

City of Rogers, Minnesota Rockin' Rogers Days 2025 City Budgeted Expenses			
Date	**Vendor**	**Description**	**Amount**
06/19/2025	Rogers Police Department	Licensed Officers for Concert (2 Officers, 4 Hours, $170/Hour)	$1,360
06/20/2025	Rogers Police Department	Licensed Officers for Concert (3 Officers, 4 Hours, $170/Hour)	2,040
06/21/2025	Rogers Police Department	Licensed Officers for Parade (6 Officers, 4 Hours, $170/Hour)	4,080
06/21/2025	Rogers Police Department	Licensed Officers for Concert (3 Officers, 4 Hours, $170/Hour)	2,040
N/A	Miscellaneous - Police Department	Other Equipment and Supplies	850
N/A	MN Dept. of Labor and Industry	Transient Operation Permit	175
N/A	Wruck Sewer & Portable Rental	Porta Potties ADA Unit Wash Stations	3,250
N/A	Republic Services	Garbage	4,300
N/A	Ziegler, Inc.	Light Rental	3,500
N/A	Safety Signs LLC	Traffic Control Services	1,200
N/A	Miscellaneous – Public Works	Other Equipment and Supplies	1,000
N/A	Miscellaneous	Miscellaneous	1,205
Total			$25,000

J. In-Kind: The City agrees to provide in-kind staffing support for the Rockin' Rogers Day 2025 event through the Public Works and Fire Departments. These contributions are considered non-cash support and are provided to assist with event setup, operations, public safety, and logistics.

City of Rogers, Minnesota Rockin' Rogers Days 2025 In-Kind Contributions			
Date	**Vendor**	**Description**	**Amount**
06/17/2025	Public Works Department	Park Maintenance Staff and Equip. (6 staff, 8 hours, $150/hour)	$7,200
06/18/2025	Public Works Department	Park Maintenance Staff and Equip. (6 staff, 8 hours, $150/hour)	7,200
06/19/2025	Public Works Department	Park Maintenance Staff and Equip. (6 staff, 8 hours, $250/hour)	12,000
06/20/2025	Public Works Department	Park Maintenance Staff and Equip. (6 staff, 8 hours, $150/hour)	7,200
06/21/2025	Public Works Department	All Staff and Equip. (16 staff, 6 hours, $200/hour)	19,200
06/23/2025	Public Works Department	Park Maintenance Staff and Equip. (6 staff, 8 hours, $150/hour)	7,200
06/19/2025	Rogers Fire Department	Standby Crew and Touch-a-Truck (4 FF, 5 Hours, $20/Hour)	400
06/20/2025	Rogers Fire Department	Standby Crew ST. 2 & EMS Crew ST 1 (8 FF, 6 hours, $20/hour, 1 Chief Officer, 6 hours, $85/hour)	 960 510
06/21/2025	Rogers Fire Department	Parade Staffing Apparatus and Apparatus Cost (32 FF, 5 hours, $20/hour, 1 FT Chief Officer, 5 hours, $85/hour, 7 Apparatus, 5 hours, total $760/hour)	 3,200 425 3,800

06/21/2025	Rogers Fire Department	Standby Crew ST. 2 & EMS Crew ST 1 (8 FF, 6 hours, $20/hour 1 Chief Officer, 6 Hours, $85/hour)	 960 510
N/A	Rogers Fire Department	Event Planning 1 Chief Officer (20 hours, $85/hour)	1,700
N/A	Rogers Police Department	Event Planning 1 Police Captain (20 hours, $75/hour)	1,500
Total			$73,965

Indemnity: The Lions agree to indemnify and hold harmless the City, its officials, agents and employees, from any and all claims, demands, actions or cause of action of whatsoever nature or character arising out of or by reason of the conduct of the the Rockin' Rogers Day 2025 event and the associated public gathering, including costs, attorney's fees, expenses, incurred in connection with the defense or settlement of any claims for injuries or damage resulting from or connected with this event and public gathering. Nothing in this Agreement shall constitute a waiver or limitation on the City's statutory limits or immunities from liability under Minnesota Statutes, Chapter 466.

Insurance: The Lions must maintain commercial general liability insurance with coverage limits of not less than $1.5 Million Dollars, with coverages acceptable to the City to protect against claims and liability for injury or damage to persons or property for all activities undertaken pursuant to this Agreement, and the City must be named as an "additional insured" under such policy. The Lions must also have workers' compensation insurance coverage that meets the requirements of Minnesota law. The Lions must provide evidence to the City that acceptable insurance coverage is effective.

Amendments: No amendments may be made to this Agreement except in writing and executed in the same manner as this Agreement.

Independent Contractor: the Lions are not an employee of the City. The Lions will act under this Agreement as an independent contractor providing the event and associated services using independent judgment and discretion, and shall acquire no rights to tenure, workers compensation benefits, re-employment compensation benefits, medical and hospital benefits, sick and vacation leave, severance pay, pension benefits or other rights or benefits offered to employees of the City.

Audit: The Lions acknowledge Contractor agrees that the City or the State Auditor, including any duly authorized representatives of the City or State Auditor, shall have access to and the right to examine, audit, excerpt and transcribe any books, documents, papers, and records that involve relevant transactions relating to this Agreement at any time during normal business hours and as often as they may reasonably deem necessary.

Applicable Law: Minnesota law shall govern all interpretations of this Agreement, and the appropriate venue and jurisdiction for any litigation which may arise hereunder will be in and under those courts located within Hennepin County, Minnesota.

Signature of Applicant Date

The Minnesota Data Practices Act requires that you be advised of the following information:

As an applicant for a permit, some of the data you are being asked to provide could be private and/or confidential data about yourself which will be used to process your permit application and enable communications with you regarding any subsequently issued permit.

You may refuse to provide this information; however, should you refuse, the permit processing cannot be completed and will result in your application not being processed. The information that you provide may be conveyed to other City of Rogers departments for permit purposes only.

I HAVE READ AND UNDERSTAND THE ABOVE DATA PRACTICES ADVISORY

_____ _____

Signature Date

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 6.1

Subject: Public Hearing and Consideration of Resolution 2025-40 Authorizing the Assignment and Amendments to the MyPlas MIF Grant and Loan Agreements with GDB Circular, Inc.

Prepared By: Brett Angell, Community Development Director

Recommended Council Action

Motion to open the public hearing to accept public comment on the proposed grant and loan agreement amendments.

Motion to approve Resolution 2025-40 approving the Second Amendment to the Minnesota Investment Fund Grant Contract with MyPlas Recycling and amendments to the loan documents.

Overview / Background / Analysis

In 2022, the City of Rogers entered into a Minnesota Investment Fund ("MIF") Grant Agreement with the Department of Employment and Economic Development ("DEED") followed by loan documents with MyPlas related to a $1,000,000 MIF award that was granted to the city and MyPlas to facilitate the creation of a new plastics recycling facility within the community. The Minnesota Investment Fund is a state-run program which provides financial awards in the form of repayable and/or forgivable loans to businesses locating or expanding within Minnesota based upon their job creation and investment metrics. Through the program, the state enters into an agreement with the city for the award. The city then enters into agreements with the business. No city dollars are involved in this grant/loan.

In early 2024, MyPlas as an organization began to experience difficulties and ceased operations at the facility, leading to a default on the MIF loan with the city. Through the default process, MyPlas had entered a liquidation sale process which ended early as a potential buyer was identified to take over the business. GDB International acquired MyPlas in mid-2024 and has since been working diligently to get the plant operational. GDB is a national plastics recycling firm based in New Jersey who will be operating the facility in a similar manner to what MyPlas had planned to do. GDB has significant experience in the plastics recycling space with multiple facilities located across the nation (primarily on the East Coast).

Following GDB's acquisition of MyPlas, representatives of GDB, city staff, and DEED have worked towards coming to an agreement on a restructuring of the previous agreements pertaining to the outstanding and defaulted MIF award. GDB also came to an agreement with the two primary lenders of MyPlas on the restructuring of that debt.

After a few months of negotiations related the MIF agreements, all parties have come to an agreement on a proposed restructuring. The proposed restructured agreements include the following elements:

- Extension to the timelines for job creation goals through three (3) new compliance dates;
- Waiver of default interest that had accrued from the time of default to now;
- Restructuring of job goals to match the job and wage growth projections of GDB;
- Resetting of the loan term to five (5) years from the date of execution;
- A deferment period of one (1) year for repayments to allow for the business to become operational and begin cash flow.

Many of the elements of the previous agreements will remain consistent. The loan will still be a 0% interest loan. The total amount due remains the same as when MyPlas ceased operations of approximately $918,000, with $550,000 eligible to be forgiven if GDB meets their job and wage goals. No additional new funding is being granted as part of these amendments.

Per Minnesota Business Subsidy Law, a public hearing is required for the extension of time and amendments to the grant agreement and loan documents. This item and public hearing pertains to the assignment and amendments of the MyPlas MIF grant and loan agreements with GDB Circular, Inc. As noted above, this project involves no city dollars/contribution.

Staff Recommendation
Staff recommends approval of Resolution 2025-40 approving the Second Amendment to the Minnesota Investment Fund Grant Contract with MyPlas Recycling and amendments to the loan documents.

Financial Impact: Not applicable. **Source Fund**: Not applicable.

Budgeted? N/A

Supporting Documentation
A. Resolution 2025-40 GDB MIF/Loan Amendments
B. MIF Grant Amendment GDB Circular (MN) Inc.
C. GDB Loan Acknowledgement, Assignment, and Amendments

CITY OF ROGERS
HENNEPIN COUNTY
STATE OF MINNESOTA

RESOLUTION NO. 2025-40

RESOLUTION AUTHORIZING THE SECOND AMENDMENT TO THE MINNESOTA INVESTMENT FUND GRANT CONTRACT WITH MYPLAS RECYCLING (ASSIGNED TO GDB CIRCULAR) AND AMENDMENTS TO THE LOAN DOCUMENTS.

WHEREAS, on May 11, 2022, the City of Rogers ("City") and the Department of Employment and Economic Development ("DEED") entered into a Minnesota Investment Fund Grant Contract Agreement (CDAP-22-0002-H-FY22) for a $1,000,000 Minnesota Investment Fund award on behalf of MyPlas Recycling (MN), Inc. for a facility located at 19850 South Diamond Lake Road, Rogers, MN 55374, PID: 13-120-23-42-0005 (the "Development Property"); and

WHEREAS, on December 22, 2022, the City and DEED entered into the First Amendment to the Minnesota Investment Fund Contract Agreement for the change in verbiage of the Grantee's Duties; and

WHEREAS, on December 29, 2022, the City and MyPlas Recycling (Mn), Inc. ("MyPlas") entered into a Loan Agreement, Corporate Guaranty, Security Agreement, and Promissory Note (collectively, the "Existing MIF Loan Documents) corresponding to the Minnesota Investment Fund award; and

WHEREAS, MyPlas entered a state of default and financial distress and elected to sell the business and the Development Property to GDB Circular (MN), Inc. ("GDB") on September 10, 2024, with GDB assuming the rights and responsibilities of MyPlas, including without limitation, the assumption of the indebtedness under the Existing MIF Loan Documents; and

WHEREAS, the City, DEED, and GDB have a desire to amend the terms and conditions of the Minnesota Investment Fund Grant Contract Agreement and the Existing MIF Loan Documents to reflect new terms, compliance periods, deferment, and forgiveness criteria as set forth in that certain Amendment # 2 for Grant Contract Agreement # CDAP-22-0002-H-FY22 and that certain Acknowledgement, Assumption and Amendment to MIF Documents (collectively, the "Amendments"); and

WHEREAS, the Council has on this date conducted a duly noticed public hearing regarding extending the period for meeting certain wage and job goals pursuant to the Amendments in accordance with Minnesota Statutes, Section 116J.993 to 116J.995, as amended, (the "Business Subsidy Act") in particular, Section 116J.994, subd. 6, thereof; and

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Rogers, Minnesota (the "Council") as follows:

1. The City hereby approves the Amendments in substantially the form presented to the Council, together with any related documents necessary in connection therewith, including without limitation any documents or certifications referenced in or attached to the Amendments (collectively, the "Amendment Documents") and hereby authorizes the Mayor and City Clerk to execute the Amendment Documents on behalf of the City, and to carry out, on behalf of the City, the City's obligations thereunder when all conditions precedent thereto have been satisfied. In the event of absence or disability of the authorized officers, any of the documents authorized by this Resolution to be executed may be executed without further act or

authorization of the Council by any duly designated acting official, or by such other officer or officers of the Council as, in the opinion of legal counsel to the City, may act in their behalf.

2. The approval hereby given to the Amendment Documents includes approval of such additional details therein as may be necessary and appropriate and such modifications thereof, deletions therefrom and additions thereto as may be necessary and appropriate and approved by the Community Development Director, legal counsel to the City and by the officers authorized herein to execute said documents prior to their execution; and said officers are hereby authorized to approve said changes on behalf of the City. The execution of any instrument by the appropriate officers of the City herein authorized shall be conclusive evidence of the approval of such document in accordance with the terms hereof. This Resolution shall not constitute an offer and the Amendment Documents shall not be effective until the date of execution thereof as provided herein.

3. The City authorizes the business subsidy under Existing MIF Loan Documents as amended by the Amendments and authorizes extending the period for meeting certain wage and job goals pursuant to the Amendments in accordance with the Business Subsidy Act.

Approved this 27th day of May, 2025 by the City Council of the City of Rogers, Minnesota.

_____
Mayor

ATTEST:

_____
City Clerk

Amendment # 2 for Grant Contract Agreement # CDAP-22-0002-H-FY22

Grant Contract Agreement Start Date:	May 11, 2022		Total Grant Contract Agreement Amount:	$1,000,000
Original Grant Contract Agreement Expiration Date:	June 30, 2025		Original Grant Contract Agreement Amount:	$1,000,000
Current Grant Contract Agreement Expiration Date:	June 30, 2025		Previous Amendment(s) Total:	N/A
Requested Grant Contract Agreement Expiration Date:	June 30, 2028		This Amendment:	N/A

This amendment is by and between the State of Minnesota, through its Commissioner of Department of Employment and Economic Development ("State") and City of Rogers, 22350 South Diamond Lake Road, Rogers, Mn 55374 ("Grantee").

Recitals

1. The State has a grant contract agreement with the Grantee identified as CDAP -22-0002-H-FY22 Dated on May 11, 2022, to provide funding through the Minnesota Investment Fund (MIF) program for Myplas Recycling (Mn) Inc. The fund is to be used to purchase equipment as part of the expansion in Rogers, MN.

2. The State and the Grantee are willing to amend the Original Grant Contract Agreement as stated below.

- Change the name of the business as Myplas Recycling (Mn) Inc. which was bought by GDB Circular (MN) Inc.
- GDB Circular (MN) Inc. acquired Myplas Recycling (Mn) Inc. through an asset purchase agreement dated on September 10, 2024
- GDB Circular (MN) Inc. will continue to repay the loan portion of the award made to Myplas Recycling (Mn) Inc.'s with a current balance of $367,500.00 on a 5-year term at zero (0%) percent interest.
- DEED will allow GDB Circular MN Inc to defer the loan for the first 12 months after this amendment is fully executed
- Timeline for GDB Circular (MN) Inc. project is extended to allow it to meet its revised loan obligation, jobs creation and wage goals based on revised compliance and expiration dates as outlined in revision 3 below
- GDB Circular (MN) Inc. will create fifty-five (55) new jobs. Thirty (30) jobs will be created in compliance date one. Seventeen (17) jobs created in compliance date two and eight (8) jobs created in compliance date three. GDB Circular (MN) Inc will retain the 30 jobs from compliance one and create 17 new in compliance date two. It will retain 47 in compliance date two and create Eight (8) jobs in compliance date three with corresponding wages outlined in revision three below

Grant Contract Amendment

In this Amendment, changes to pre-existing Contract Language will use ~~strike through~~ for deletions and <u>underlining</u> for insertions.

REVISION 1. Clause 1.3 **"Compliance date"** is amended as follows:

Additional three Compliance dates added:

1.3 **Compliance date 1:** ~~March 31, 2025,~~ <u>March 31, 2026</u>,

Compliance date 2: <u>March 31, 2027</u>

Compliance date 3: March 31, 2028

1.4 **Expiration Date*:*** ~~June 30, 2025,~~ June 30, 2028

REVISION 2. "Defined Terms" is amended as follows:

"Application" means the Grantee's application to the state for a Minnesota Investment Fund award for the purpose of providing a loan to ~~Myplas Recycling (Mn) Inc~~., GDB Circular (MN) Inc ("BORROWER")

REVISION 3. Exhibit A Grantee Duties, Clause 2.2 Job Creation and Wages is amended as follows:

~~a) As of the project award date, the Borrower identified 0 full time equivalent (FTE) base jobs that must be maintained through the Compliance Date. If necessary, base job number will be amended following the Effective Date to account for The Borrower will create Ninety (90) permanent non-contract FTE jobs between the Effective Date and the Compliance Date. Each job created may be included in only one "wage bracket" as stated below:~~

~~(i) Twenty three (23) paying at least $15.55 per hour in cash wages, exclusive of Benefits. The Borrower is entitled to repayable loan proceeds in the amount of $19,565.22 per job created in this wage bracket not to exceed $450,000 in total;~~

~~(ii) Thirty four (34) paying at least $17.44 per hour in cash wages, exclusive of Benefits. The Borrower is entitled to forgivable loan proceeds in the amount of $6,380.51per job created in this wage bracket not to exceed $216,937.36 in total;~~

~~(iii) Three (3) paying at least $21.40 per hour in cash wages, exclusive of Benefits. The Borrower is entitled to forgivable loan proceeds in the amount of $8,932.71 per job created in this wage bracket not to exceed $26,798.14 in total;~~

~~(iv) Thirty (30) paying at least $30.52 per hour in cash wages, exclusive of Benefits. The Borrower is entitled to forgivable loan proceeds in the amount of $10,208.82 per job created in this wage bracket not to exceed $306,264.50 in total.~~

a) The Borrower will create Fifty Five (55) permanent non-contract FTE jobs between the Effective Date and the Compliance Dates. Each job created may be included in only one "compliance date" as stated below:

Compliance Date One (1)	Number of New FTE Positions	Minimum Cash Wage Per Hour	Number of Retained FTE Positions	Minimum Cash Wage Per Hour
Compliance Date One (1)	4	$ 50.00	-	-
Compliance Date One (1)	4	$ 36.00	-	-
Compliance Date One (1)	6	$ 34.00	-	-
Compliance Date One (1)	1	$ 32.00	-	-
Compliance Date One (1)	1	$ 22.50	-	-
Compliance Date One (1)	14	$ 21.00	-	-

Total:	**30**		**0**	

Compliance Date Two (2)	Number of New FTE Positions	Minimum Cash Wage Per Hour	Jobs Retained Compliance Date 1	Minimum Cash Wage Per Hour
Compliance Date Two (2)	1	$ 50.00	4	$ 50.00
Compliance Date Two (2)	2	$ 36.00	4	$ 36.00
Compliance Date Two (2)	2	$ 34.00	6	$ 34.00
Compliance Date Two (2)	1	$ 32.00	1	$ 32.00
Compliance Date Two (2)	1	$ 22.50	1	$ 22.50
Compliance Date Two (2)	10	$ 21.00	14	$ 21.00
Total:	**17**		**30**	

Compliance Date Three (3)	Number of New FTE Positions	Minimum Cash Wage Per Hour	Jobs Retained from Compliance Date 2	Minimum Cash Wage Per Hour
Compliance Date Three (3)	0	$ 50.00	5	$ 50.00
Compliance Date Three (3)	0	$ 36.00	6	$ 36.00
Compliance Date Three (3)	2	$ 34.00	8	$ 34.00
Compliance Date Three (3)	0	$ 32.00	2	$ 32.00
Compliance Date Three (3)	0	$ 22.50	2	$ 22.50
Compliance Date Three (3)	6	$ 21.00	24	$ 21.00
Total:	**8**		**47**	

Total Jobs **55**

REVISION 4.

1. STATE ENCUMBRANCE VERIFICATION
*Individual certifies that funds have been encumbered as required by Minn. Stat. §*16A.15

Signed:

Date:

SWIFT Contract/PO No(s):

2. GRANTEE
The Grantee certifies that the appropriate person(s) has executed the grant contract on behalf of the Grantee as required by applicable articles, bylaws, resolutions, or ordinances.

By:

Title: MAYOR

Date: 5/16/2025

By:

Title: CITY ADMINISTRATOR

Date: 5/16/2025

3. STATE OF MINNESOTA: DEPARTMENT OF EMPLOYMENT AND ECONOMIC DEVELOPMENT

By:
(WITH DELEGATED AUTHORITY)

Title:

Date:

Distribution:
Agency
Grantee
State's Authorized Representative

ACKNOWLEDGEMENT, ASSUMPTION AND AMENDMENT TO MIF DOCUMENTS

THIS ACKNOWLEDGEMENT, ASSUMPTION AND AMENDMENT TO MIF DOCUMENTS (the "Amendment") is made effective May __, 2025, (the "Effective Date") by and between the City of Rogers, Minnesota, a municipal corporation organized and existing under the laws of the State of Minnesota (the "Lender") and GDB Circular (MN), Inc., a Delaware limited liability company (the "GDB").

RECITALS

WHEREAS, on May 11, 2022, the Lender and the Department of Employment and Economic Development ("DEED") entered into a Minnesota Investment Fund Grant Contract Agreement (CDAP-22-0002-H-FY22) for a $1,000,000 Minnesota Investment Fund award on behalf of MyPlas Recycling (MN), Inc. ("MyPlas") for a facility located at 19850 South Diamond Lake Road, Rogers, MN 55374, PID: 13-120-23-42-0005 (the "Development Property"); and

WHEREAS, on December 22, 2022, the Lender and DEED entered into the First Amendment to the Minnesota Investment Fund Contract Agreement; and

WHEREAS, on December 29, 2022, the Lender and MyPlas entered into a Loan Agreement, Corporate Guaranty, Security Agreement, and Promissory Note (collectively, the "Existing MIF Loan Documents") corresponding to the Minnesota Investment Fund award; and

WHEREAS, MyPlas entered a state of default and financial distress and elected to sell the business to GDB, with GDB assuming the rights and responsibilities of MyPlas, including without limitation, the assumption of the indebtedness under the Existing MIF Loan Documents; and

WHEREAS, the Lender, DEED, and GDB desire to amend the terms and conditions of the Minnesota Investment Fund Grant Contract Agreement and the Existing MIF Loan Documents to reflect new terms, compliance periods, deferment, and forgiveness criteria as set forth herein; and

WHEREAS, except as otherwise defined herein, all capitalized terms in this Amendment shall have the meanings ascribed to them in the Existing MIF Loan Documents;

AGREEMENT

In consideration of the mutual covenants of the parties set out in this Amendment and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. GDB, effective as of the date of its acquisition of the Development Property on September 10, 2024, accepts the assignment of, and assumes and agrees to faithfully abide by, perform, and discharge each and every term, covenant, and condition of the Existing MIF Loan Documents applicable to the "Borrower", except as modified herein, (the "Assumed Obligations"), and to be fully bound by all of the foregoing.

2. GDB expressly represents, for the benefit of the Lender, that it is a limited liability company duly organized and in good standing under the laws of the State of Minnesota, is duly authorized to transact business within the State of Minnesota, is not in violation of any provisions of its organizational documents or the applicable laws of any state, has power to enter into this Amendment and the capability to perform the obligations of the Borrower under the Agreement and has duly authorized the execution, delivery and performance of this Amendment by proper action of its governing body. GDB further acknowledges and agrees, for the benefit of Lender, that it is fully bound by all of the terms and conditions of the Existing MIF Loan Documents as if it were the original "Borrower" thereunder and all references to the "Borrower" under the Existing MIF Loan Documents and this Amendment shall refer to and mean GDB.

3. GDB acknowledges that the Lender's rights and remedies against the "Borrower" under the Existing MIF Loan Documents are enforceable against GDB.

4. GDB acknowledges that it is assuming the full outstanding principal balance of remaining on the Loan in the amount of $917,500 and no further proceeds of the Loan shall be advanced. All references to "$1,000,000" in the Existing MIF Loan Documents are hereby modified to mean "$917,500".

Of this balance, the repayable portion of the Loan is $367,500 and the term "Repayable Loan" and "Repayable Portion" as used in the Existing MIF Loan Documents are hereby modified to mean such amount of the Loan. The forgivable portion of the Loan shall continue to be $550,000 and the term "Forgivable Loan" and "Forgivable Portion" as used in the Existing MIF Loan Documents shall continue mean such amount of the Loan. The Forgivable Portion of the Loan is eligible to be forgiven if the Borrower meets job and wage creation goals, as set forth in Section 6 hereof, by the applicable Compliance Date.

5. The definition of "Compliance Date" provided in **Section 1.1 of the Loan Agreement** shall be deleted in its entirety and replaced with the following:

> Compliance Date means (I) March 31, 2026 with respect to the jobs listed in Section 8.1(b)(2)(I) of the Loan Agreement as set forth in Section 6 of this Amendment; (II) March 31, 2027 with respect to the jobs listed in Section 8.1(b)(2)(II) of the Loan Agreement as set forth in Section 6 of this Amendment; and (III) March 31, 2028 with respect to the jobs listed in Section 8.1(b)(2)(III) of the Loan Agreement as set forth in Section 6 of this Amendment;

6. **Clause (d) of Section 7.1 of the Loan Agreement** shall be deleted in its entirety and replaced with the following:

> (d) Fifteen days after each Compliance Date.

7. **Clauses (2), (3) and (4) of Section 8.1(b) of the Loan Agreement** shall be deleted in their entirety and replaced with the following:

> (2) The Borrower shall have created at least 55 New Jobs at the Development Property with each job noted within "wage brackets" (exclusive of Benefits) and by the applicable Compliance Date as stated below:

	Compliance Date	Job Levels						
		Management	Team Leads	Operators	QA/QC/Safety	Administration	General	Total
		Base Rate: $50/hr	Base: $36/hr	Base: $34/hr	Base: $32/hr	Base: $22.50/hr	Base: $21/hr	
(I)	3/31/2026	4	4	6	1	1	14	30
(II)	3/31/2027	1	2	2	1	1	10	17
(III)	3/31/2028	0	0	2	0	0	6	8

(3) a. Up to $275,000 of the Forgivable Portion of the Loan shall be forgiven and deemed paid on March 31, 2026 if the 30 New Jobs listed in row (I) above are created at the applicable wage rates by such Compliance Date. If fewer than 30 New Jobs are created by March 31, 2026 at the applicable wage rates listed in row (I) above, the Forgivable Portion of the Loan shall be forgiven and deemed paid on March 31, 2026 by an amount equal to $275,000 multiplied by a fraction, the numerator of which is the number of New Jobs which were created at the wage level set forth above and the denominator of which is 30;

b. Up to $412,500 (including any amount forgiven under clause a., above) of the Forgivable Portion of the Loan shall be forgiven and deemed paid on March 31, 2027 if the 47 New Jobs listed in rows (I) and (II) above are created at the applicable wage rates by such Compliance Date. If fewer than 47 New Jobs are created by March 31, 2027 at the applicable wage rates listed in rows (I) and (II) above, the Forgivable Portion of the Loan shall be forgiven and deemed paid on March 31, 2027 by an amount equal to (A) $412,500 multiplied by a fraction, the numerator of which is the number of New Jobs which were created at the wage level set forth above and the denominator of which is 47, less (B) any amount deemed forgiven and prepaid under clause a., above;

c. Up to $550,000 (including any amount forgiven under clauses a. and b., above) of the Forgivable Portion of the Loan shall be forgiven and deemed paid on March 31, 2028 if the 55 New Jobs listed in rows (I), (II) and (III) above are created at the applicable wage rates by such Compliance Date. If fewer than 55 New Jobs are created by March 31, 2028 at the applicable wage rates listed in rows (I), (II) and (III) above, the Forgivable Portion of the Loan shall be forgiven and deemed paid on March 31, 2027 by an amount equal to (A) $550,000 multiplied by a fraction, the numerator of which is the number of New Jobs which were created at the wage level set forth above and the denominator of which is 55, less (B) any amount deemed forgiven and prepaid under clauses a. and b., above;

(4) New Jobs created on or after the Effective Date that meet the criteria outlined in 8.1(b)(2) will count toward the Borrower's job creation goal. Upon the final Compliance Date, all employees as defined in the projections shall be employees of the Borrower. Contract or temporary employees utilized through a staffing agency shall not be counted.

8. **Section 8.2(b) of the Loan Agreement** shall be deleted in its entirety and replaced with the following:

(b) The Borrower shall repay any portion of the Forgivable Loan which is not deemed forgiven and prepaid under Clauses a., b. and c., of Section 8.1(b)(3) of the Loan Agreement (the "Recapture Principal") plus interest set at the greater of three percent (3%) or the implicit price deflator defined in Minnesota Statutes, Section 275.70, Subdivision 2 ("Recapture Interest"). Recapture Interest on the Recapture Principal shall accrue from the date(s) funds are disbursed, in whole or in part, through the final Compliance Date, compounded annually. Recapture Principal plus Recapture Interest thereon shall be repaid not later than 30 days after the Lender notifies the Borrower of the amount to be repaid pursuant to this Section 8.2(b).

9. **Section 9.11 of the Loan Agreement** shall be deleted in its entirety and replaced with the following:

Section 9.11. **Workers Compensation Insurance**. The Borrower has obtained workers compensation insurance as required by Minn. Stat. § Section 176.181, subd. 2. The Borrower's workers compensation insurance information is as follows:

(a) Company Name: GDB Circular (MN), Inc.

(b) Policy Number: _____

(b) Local Agent: _____

10. All references to Myplas USA, Inc. or the "Guarantor" under the Existing MIF Loan Documents and this Amendment shall refer to and mean GDB International, Inc., whose address is: 1 Home News Row, New Brunswick, NJ 08901, and the definition of "Corporate Guaranty" provided in **Section 1.1 of the Loan Agreement** shall be deleted in its entirety and replaced with the following:

"**Corporate Guaranty**" means the Guaranty - Corporate executed May ___, 2025 from GDB International, Inc. (the "Guarantor") for the benefit of the Lender.

11. **Section 2 of the Promissory Note** shall be deleted in its entirety and replaced with the following:

2. Notwithstanding the provisions of Sections 8.1 and 8.2 of the Loan Agreement, $367,500 of the principal balance of this Promissory Note (the "Repayable Portion") must be repaid. The Repayable Portion shall accrue interest at the rate of zero percent (0.0%) per annum. Payments of principal and interest on the Repayable Portion by the Borrower shall commence on June 1, 2026, and continue on the first day of each and every month thereafter in the amount of $7,656.25 until paid in full. Such payments shall fully amortize the Loan over forty-eight (48) months; provided, however, the entire remaining unpaid balance of principal and interest shall be due and payable in full on May 1, 2030 in the amount of $367,500.

12. **Section 3 of the Promissory Note** shall be deleted in its entirety and replaced with the following:

> 3. The Borrower shall repay the principal balance of this Promissory Note in an amount equal to the portion of the Forgivable Loan which is not deemed forgiven and prepaid under Clauses a., b. and c., of Section 8.1(b)(3) of the Loan Agreement (the "Recapture Principal") plus interest set at the greater of three percent (3%) or the implicit price deflator defined in Minnesota Statutes, Section 275.70, Subdivision 2 ("Recapture Interest"). Recapture Interest on the Recapture Principal shall accrue from the date(s) funds are disbursed, in whole or in part, through the final Compliance Date, compounded annually. Recapture Principal plus Recapture Interest thereon shall be repaid not later than 30 days after the Lender notifies the Borrower of the amount to be repaid pursuant to Section 8.2(b) of the Loan Agreement.

13. Except as amended above, all other terms and conditions of the Existing MIF Loan Documents shall remain in full force and effect.

14. The amendments made to the Existing MIF Loan Documents, as amended by this Amendment, shall be effective as of the date hereof.

15. This Amendment shall be binding on and inure to the benefit of the parties hereto and their successors and assigns and shall further be for the benefit and reliance of the Lender.

16. This Amendment shall be governed by and construed in accordance with the laws of the State of Minnesota.

17. This Amendment may be executed in counterparts, which counterparts when considered together shall constitute a single, binding, valid and enforceable agreement.

IN WITNESS WHEREOF, this Amendment has been executed as of the day and year first above written.

CITY OF ROGERS, MINNESOTA

By: _____
Its: Mayor

By: _____
Its: Clerk

GDB Circular (MN), Inc., a Delaware limited liability company

By: _____

Its: _____

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 7.1

Subject: Approve the Hire of Jesse (Jess) Hertwig as a Paid-on-Call Firefighter
Prepared By: Patrick Farrens, Fire Chief

Recommended Council Action
Motion to approve the hiring of probationary paid-on-call firefighter Jess Hertwig.

Overview / Background / Analysis
The Rogers Fire Department is authorized to have 45 firefighters and is currently staffed with 39 paid-on-call firefighters. Jess has completed all necessary steps to be hired as a paid-on-call firefighter, including a criminal background check, medical exam, psychological exam, panel interview, and physical agility assessment. He has also completed his Firefighter 1 and 2, Hazmat Operations, FAO, EMT, and other firefighting courses. Jess has no courses required to start with the RFD, and can begin going to calls immediately. Jess will complete our mentorship program in the coming months. Jess has about 5 years of FF experience, which he brings with him.

Staff Recommendation
Staff recommends Council approve the hiring of probationary paid-on-call firefighter Jess Hertwig.

Financial Impact: **Source Fund**:

Budgeted? Yes

Supporting Documentation
None

STAFF REPORT **Meeting Date**: May 27, 2025

ROGERS CITY COUNCIL **Agenda Item**: 7.2

Subject: Consider Applications by Rachel Development for Preliminary Plat and Planned Unit Development for Cowley Lake Preserve (169-lot Subdivision).

- Consider Ordinance 2025-03, Rezoning to PUD
- Consider Resolution 2025-32, Authorizing Summary Publication of Ordinance
- Consider Resolution 2025-30, Approval of Preliminary Plat and Master Development Plan for Cowley Lake Preserve

Prepared By:

Recommended Council Action

Motion to Approve Ordinance 2025-03, Approving a Rezoning from R2 to PUD for Cowley Lake Preserve.

Motion to Approve Resolution 2025-32, Authorizing Summary Publication of Ord. 2025-03.

Motion to Approve Resolution 2025-30, Approval of the Preliminary Plat and Master Development Plan for the Cowley Lake Preserve Subdivision.

Overview / Background / Analysis

Rachel Development has applied for Preliminary Plat and Planned Unit Development for a residential subdivision consisting of 169 lots. The development proposes a range of detached single-family home styles. The development is within the shoreland overlay district and proposes the Alternative Development Standards framework as outlined in the Shoreland ordinance. The Applicant also requests a Planned Unit Development Rezoning deviating from the Standard R2 Zoning Performance standards.

Concept Plan

The developer previously went through concept plan review and multiple meetings over a year ago preceding the recent Shoreland updates which were codified in early 2025. The Concept Plan initially showed 182 units with fewer lots meeting 10-ft setbacks. The feedback provided by the city included: reduction in units, increased setbacks and more consideration of the shoreline with regard to buffering and open space. The developer has since reworked the plan to increase setbacks for the majority of the lots to 10 ft side setbacks. A block of the development does differ more greatly from the standard R2 requirements with 42 ft wide lots with 6 ft side yard setbacks for a smaller single-family home product. The developer has increased the shoreland buffer area compared to the concept plan above what is required in Code.

Rachel Development submitted their application on February 24, 2025. Preliminary Plats follow a 120-day timeline per state statute and the PUD is tied to the preliminary plat plans. The applications have a mandatory deadline of June 24, 2025.

The Council tabled this item at the 4/22/2025 meeting. This report provides additional information in the transportation section of this report regarding the included traffic memo and other build-out scenarios.

Primary Issues to Consider

1. Land Use & Zoning
2. Development Plan
3. Conservation Easement

Analysis of Primary Issues

1. **Land Use & Zoning**

The development consists of two existing parcels (Scherber Trust 2112023240005 and Casco Ventures LLC 2112023130004) and a portion of a third parcel (Weber LP2112023110003). The subject area falls within the Low Density Residential (LDR) land use designation. The LDR designation permits **2-5 units per acre** and allows for single-family development.

Comprehensive Plan Goals
The Comprehensive Plan also includes goals beyond just simply meeting land use density thresholds. The Cowley Lake Preserve development is consistent with the Rogers 2040 Comprehensive Plan and advances City goals in the following ways:

Housing Diversity & Livability

- Provides three distinct lot types and housing sizes to serve a range of household sizes, income levels, and life stages, including first-time buyers, families, and seniors. [Chapter 5 – Housing, p. 66; Chapter 11 – Implementation, p. 175]
- Supports lifecycle housing and reinvestment through design flexibility and coordinated infrastructure that aligns with the City's housing strategy. [Chapter 10 – Resiliency, p. 165]

Natural Resource Protection & Stewardship

- Preserves approximately 19 acres of wetlands, buffers, and conservation easements in accordance with the updated Shoreland Ordinance and impaired water body protections. [Chapter 8 – Water Resources, p. 105–109]

- Integrates stormwater BMPs and open space as functional and aesthetic design elements. [Chapter 10 – Resiliency, p. 164–165]

Transportation & Infrastructure Connectivity

- Extends Edgewater Parkway towards Territorial Road, supporting long-range transportation connectivity and circulation goals. [Chapter 9 – Transportation, p. 136–137]
- Prepares a logical and phased expansion of utilities and roads, maximizing efficiency of municipal infrastructure investments. [Chapter 11 – Implementation, p. 179–180]
- Plans for internal pedestrian routes and trail linkages to connect residents to adjacent neighborhoods and open spaces. [Chapter 11 – Implementation, p. 181]

Sustainable and Efficient Growth

- Employs compact, clustered lot design to balance density with environmental preservation and reduce land consumption while achieving density targets. [Chapter 10 – Resiliency, p. 164; Chapter 3 – Vision, p. 31]
- Promotes smart growth principles in a greenfield context by aligning development with existing and planned infrastructure corridors. [Chapter 11 – Implementation, p. 180]

Existing Zoning

The subject area currently falls within the R2 district which permits, by right (meaning without additional land use approvals), 10,000 square foot lots (65 ft wide minimum), 10 ft side setbacks, 25 ft front and corner setbacks and 20 ft rear setbacks. Additionally, the area falls within the Shoreland Overlay district, which applies additional development restrictions related to shoreland protection. Traditional R2 development can *generally* reach around, or slightly above 2 units an acre based upon lot requirements in the code. Anything above the minimum density of 2 units/acre – depending on the existing conditions – would generally require Planned Unit Development approvals. A PUD provides a new zoning district specific to a development plan. The unique physical characteristics of the parcels involved in this development make it unlikely that the site area would be able to meet the minimum density requirements of the R2 district (parcel shape and environmental constraints) without the use of a PUD. The Developer proposes a Planned Unit Development to deviate from the R2 standards which allows for the development to reach the required density range.

Proposed Zoning

The developer is requesting a Planned Unit Development (PUD) to deviate from the R2 zoning requirements for their development area. PUDs can be requested and reviewed

by the City. PUDs are typically an exchange where the developer proposes different performance standards and the city reviews the particulars of the development and how it would be in the public interest (or what the benefits are) to approve deviations. The benefits can be development-specific, are usually related to comprehensive plan goals, and can include offsite improvements. The theory behind PUDs is that the design/development outcomes proposed by the developer outweigh the benefits of keeping to the by-right zoning district standards. PUDs effectively rezone a property to allow different standards. Because PUDs rezone the property, this is a legislative or policy decision for the council with high discretion. PUDs have previously been approved for other residential developments within the community, including Skye Meadows, Grass Lake Preserve, and Laurel Creek.

The applicant is requesting PUD approval to deviate from R-2 standards in accordance with Section 125-29 of the Rogers Zoning Code. The PUD request could be justified for the following reasons:

- Better Design Outcome – The PUD enables clustering of lots and preservation of key natural resources that could not be achieved under strict R-2 compliance.
- Consistency with Comprehensive Plan – The project achieves the Low Density Residential net density range (2.32 units/acre) and reflects goals for housing variety, natural resource stewardship, and infrastructure efficiency.
- Public Benefit – The PUD facilitates key infrastructure extensions and improvements (Edgewater Parkway and trunk utilities) and includes wetland preservation, stormwater basins, public trail connectivity, and sediment load reduction for Cowley Lake.
- No Detriment to Surrounding Properties – The development provides appropriate transitions to adjacent uses, maintains tree buffers, and supports regional planning objectives without creating adverse impacts.

PUD Deviations
The proposed PUD includes three lot standards for four different single-family product types: a 70 ft wide lot (8,750 sq ft minimum) with 10 ft side setbacks; a 60 ft wide lot (7,500 sq ft minimum) with 10 ft side setbacks for a standard single-family home and a villa style home; and a 42 ft wide lot (5,460 sq ft minimum) with 6 ft side setbacks. All other setbacks are proposed to meet the minimum required (25 ft front/corner, 20 ft rear).

- 59 lots are proposed to be 70 ft-wide lots with standard single-family homes.
- 74 lots are proposed to be 60 ft-wide lots
    1. 48 lots are proposed to be 60 ft-wide lots with standard single-family homes.
    2. 26 lots are proposed to be 60 ft-wide lots with villa-style homes.
- 36 lots are proposed to be 42 ft-wide lots with carriage-style homes.

All lots are proposed to deviate from the R2 minimum lot size (59 exceed the lot width minimum but are shy of the 10,000 sq ft lot size only by reason of depth). However, 133 lots would meet the required R2 setbacks. The 74 proposed 60-ft-wide lots are under the 65 ft R2 minimum.

PUD Benefits
The narrative includes additional information regarding the proposed products and their identified benefits.
Developer Identified Benefits:

- Preservation of wetland and natural drainage features
- Ensuring a smooth transition to adjacent [planned] higher density properties – [The Land use plan shows higher density land uses to the south east of the subject property]
- Offer a variety of home types to serve diverse household sizes and price points

City Analysis of benefits
The development does preserve natural drainage features and wetlands. However, existing wetland regulations already accomplish much of the wetland protection. That being said, there are a number of benefits that could be argued that the developer is providing through this development.

- The shoreland ordinance Alternative Development Standards requires a 75 ft shoreline buffer to be dedicated to the city. The developer is proposing on average double that buffer which increases shoreland protection (ranges from 122 ft to 536 ft). This is identified as a benefit.
- **The shoreland ordinance would require 22.8 acres of open space for the development. The developer proposes 32.86 acres.** This exceeds the Alternative Development standards and is identified as a benefit.
- A trail and boardwalk within the buffer area, and pedestrian connections through the site are proposed for the development that would be usable by the public.
- The developer proposes the extension of trunk utilities to Willandale Rd through the development, which is a public benefit.
- The developer proposes turn lane improvements within Territorial Road which is a public benefit.
- Cowley Lake is currently classified as an impaired waterbody by the DNR. An impaired water body is one which does not meet established water quality standards. The subject site is currently agricultural and therefore has no formal sediment controls to protect Cowley Lake from sediment runoff. The Cowley Lake Preserve stormwater management and lake buffer areas now provide significant sediment controls. The stormwater management modeling suggests a reduction in total suspended solids in excess of 6,000lbs. The reduction in suspended solids and chemicals such as phosphorus aid in the potential improvement of water quality standards for the lake.

Shoreland Overlay
When within the shoreland overlay district, properties may be developed in two ways: traditional shoreland development, or Alternative Development Standards (ADS). Traditional shoreland development requires much larger minimum lot sizes – 20,000 to 40,000 square feet depending on the DNR-designated type of lake – and allows new riparian lot creation (meaning lots which touch the shoreland). Traditional shoreland development would not permit a development to reach the minimum density required by the Comprehensive Plan for LDR.

The Alternative Development Standards (as proposed in this application) would permit the lots created to match the underlying zoning in exchange for dedication of shoreland buffer land, decreased impervious surface, open space, and more stringent stormwater management requirements. The Alternative Shoreland Development Standards do permit Planned Unit Development which alter the underlying zoning provided the deviations requested only impact the performance standards of the zoning district and not the requirements of the shoreland overlay (e.g. open space requirements must be met, impervious surface limitations, shoreland setbacks, etc). All of the shoreland protections measures required by the Alternative Development Standards are being met as proposed by the developer: the site is under 25% impervious surface, open spaces have been provided, the shoreland buffer zone provided exceeds the minimum, the shoreline setbacks are met, and the stormwater management plan meets the increased standards required by the ADS.

The plans are consistent with the comprehensive plan, and shoreland ordinance. Planned Unit Developments are processes identified in ordinance which require Council authorization and approval. Assuming a PUD is approved, the plan would be consistent with land use and zoning requirements.

2. **Development Plan**

Transportation
The development plan includes the extension of Edgewater Parkway within the project boundary (two-lane divided by a median), and the extension of 133rd Ave to the west and South to Willandale. Three additional offshoots of proposed road ways end in cul-de-sacs. The plan also includes turn lane improvements on Territorial Road (left turn lane for east-bound traffic on Territorial and right turn lane for west-bound traffic). No turn lanes are proposed from Willandale Road. The Transportation Study did not identify additional roadway improvements. Hennepin County review has been completed.

It should be noted that Street F proposed 50 ft right of way as a public street. The City standard is 60 ft. This is a deviation from code and included in the deviations. The roadway as constructed would match what is required for public streets but the overall right-of-way would be less than standard.

A traffic study was completed for the proposed Cowley Lake Preserve development, which includes 169 new single-family homes in Rogers. The study evaluated both current traffic patterns and how they might change once the development and nearby properties are fully built out (2030 scenario using Land Use Densities). It found that all nearby intersections, including Territorial Road and Willandale Road, currently operate at good levels of service (LOS B or better) and are expected to continue functioning efficiently through 2030, even with the added traffic from new homes.

The development is projected to generate about 1,636 vehicle trips per day, including 120 during the morning peak hour and 163 during the evening peak hour. Despite this increase, the overall impact on area traffic operations is expected to be minimal. The only recommended improvement is the addition of a westbound right-turn lane at the intersection of Territorial Road and Willandale Road to enhance safety and flow. No other turn lanes or roadway expansions are warranted at this time. The plan also includes sidewalks and future roadway connections to improve local circulation and pedestrian access.

At the previous meeting there was considerable discussion related to traffic impacts of this PUD development vs a more standard development. The following is an overview of likely traffic counts based on different lot counts:

1. Trip Generation Recap for 169 Lots (Original Study):

- AM Peak Hour: 120 trips
- PM Peak Hour: 163 trips
- Daily Trips: 1,636 trips

2. 120-Lot Scenario Estimates & Reductions

- AM Peak Hour: 85 trips → ↓ 35 trips → 29.2% reduction
- PM Peak Hour: 115 trips → ↓ 48 trips → 29.4% reduction
- Daily Trips: 1,162 trips → ↓ 474 trips → 29.0% reduction

It should be noted that the net density of a 120-lot development would not meet the minimum density of 2 units/ac. The density would be 1.65 units/ac. This scenario would still require some other land use application that granted deviations (PUD or Variance).

3. 145-Lot Scenario Estimates & Reductions

- AM Peak Hour: 103 trips → ↓ 17 trips → 14.2% reduction
- PM Peak Hour: 139 trips → ↓ 24 trips → 14.7% reduction
- Daily Trips: 1,404 trips → ↓ 232 trips → 14.2% reduction

While may be possible to achieve exactly 145 lots, it is likely there would still need to be

some additional land use approvals (e.g. PUD) due to the shape of the site, the irregular nature of Cowley Lake, and the limited ROW and utility crossing over the conservation easement.

Regardless of the above three scenarios, the level of service for intersections would still operate at an A-/B+.

The traffic study indicates that the planned connection of Edgewater Parkway through the Cowley Lake Preserve development—and its potential future extension south to 129th Avenue—would provide important benefits to the surrounding transportation network. While specific traffic shifts from the southern extension were not modeled, the study suggests that improved connectivity would offer residents more direct travel routes, reduce reliance on Oakwood Drive as a cut-through street, and help distribute traffic more evenly across the local system. This enhanced network flexibility is expected to reduce traffic volumes on Oakwood Drive and improve overall circulation without requiring major infrastructure upgrades. The timeline of when Edgewater could fully extend depends on when the Weber family is a willing seller of the remainder of their property.

Hennepin County has reviewed the application and will require a westbound right turn lane.

Utilities
The Plan includes the construction of water, sewer, and stormwater facilities consistent with the Comprehensive Plan goals. Sewer and water are planned to go through a conservation easement through an established easement identified as a street and utility corridor within the easement. All public infrastructure proposed is planned within right of way and drainage and utility easements. The utility plans are under review by the Engineer and will require approval prior to final plat application and ultimately construction. The stormwater plans indicate that pre-construction and post-construction stormwater runoff rates and filtration are the same or improved as compared to the existing conditions. Additionally, the Elm Creek Watershed Management Commission reviews the development plans to ensure compliance with watershed rules.

Park and Trails
Trails are planned or accounted for through the construction or creation of Trail easement. A park search area is not in the subject property and lies generally to the south the east of the development area nearer to 129th Avenue. Park dedication is expected through fees in lieu of land dedication.

The Development adequately plans for utility and infrastructure delivery consistent with the needs for the development and meeting the goals of the Comprehensive Plan.

3. **Conservation Easement**

A conservation easement exists within the Casco Ventures Property. The plan identifies the extension of road and utilities through a corridor which is allowed for by the easement. However, some construction activities and stormwater infrastructure are shown outside of identified areas. The Developer and City are working with Hennepin County (owners of the Easement) on reviewing impacts and determining if these improvements meet the terms of the easement or if modifications to the easement are warranted. Continued coordination is required of the developer. If the County is not willing to amend terms, some revisions to the stormwater plan will be required. A condition of approval related to this item is included in the proposed motions.

4. **Miscellaneous**

Homeowners Association (HOA)
The villas and carriage homes will be under an HOA. HOA documentation will be required to be submitted with future final plats.

Eagle Nest
An eagle nest is within the site boundary but not within the construction area. Meaning no direct impacts are expected. However, disturbance from construction will need review by the US Fish and Wildlife. The Developer is in contact and coordination with the Wildlife Service and is in the process of gaining any required permits prior to construction activity. The permits include review if the nest, buffer requirements, review of mating season timing, and monitoring of the nest.

Planning Commission Review and Hearing
The Planning Commission reviewed the applications and held a public hearing on April 7th, 2025. Ultimately, the items were recommended for approval with staff conditions with a 5-2 vote.

The Commission, in recommending approval, identified the following:

- The development goes beyond code requirements for shoreland and wetland protection that wouldn't otherwise be possible through standard zoning.
- The development may not be able to meet minimum density requirements without a PUD (some 1.6 units/acre due to constraints with conservation easement, parcel shape, and shoreland).
- The multiple product types available may not be possible with standard zoning and the PUD proposes multiple products that have lower entry points than would otherwise be possible.
- The extension of utilities through this area is important for long-range plans.
- A few items came up regarding the development from the residents attending the hearing as well.

Concerns communicated by residents:

- Concerns with eagles nest and wildlife impact (pre construction vs post construction).
- Concerns about traffic (existing Territorial traffic is bad and increased development will impact territorial and adjacent streets).
- Desire for additional park land.
- Off-site drainage concerns.
- Impacts to schools.
- Xcel electrical capacity concerns.
- Drain Tiles through the property should be maintained.
- Taxes are too high
- There is generally too much development.

The Commission did also forward to the council recommendations (none related to the items' motion) to continue to review concerns about stormwater in adjacent neighborhoods, review traffic safety concerns on adjacent roadways, and to possibly explore acquiring additional park land nearby.

Staff have been in contact with Xcel Energy related to concerns voiced regarding the electrical grid which they are currently planning for upgrades in the coming years. Staff also continue to discuss population trends with the school district to ensure they have the resources needed to adequately plan for their facility needs, as the school district would be the entity to decide if and when an additional school would be needed.

Staff Recommendation
Planning Commission recommended approval of the PUD and Preliminary Plat applications. The following motions are recommended:

Motion to Approve Ordinance 2025-03, Approving a Rezoning from R2 to PUD for Cowley Lake Preserve.
Motion to Approve Resolution 2025-32, Authorizing Summary Publication of Ord. 2025-03.
Motion to Approve Resolution 2025-30, Approval of the Preliminary Plat and Master Development Plan for the Cowley Lake Preserve Subdivision.

The following are recommended conditions by staff and the commission and are found in the resolution.

1. The Applicant shall revise the preliminary plans (the development, civil plans, and preliminary plat) to the satisfaction of the Public Works Department, City Engineer, and City Planner.
2. The Applicant shall receive approval for the Stormwater Management Plan from Elm Creek Watershed Management Commission, and shall address and conform to all requirements of the Elm Creek Watershed Management

Commission, including but not limited to the requisite wetland approvals and delineations, and other conditions as established.

3. The Applicant shall continue to work with Hennepin County's Natural Resources Department regarding impacts to the Conservation Easement and ensuring the development meets the terms of the Conservation Easement. Revisions to the plan may be required to satisfy the requirements of Hennepin County.
4. The Applicant shall be responsible for constructing turn lane improvements at Territorial Road at their cost. The Applicant shall meet the requirements of the Hennepin County Transportation Department and improvements shall be permitted prior to construction.
5. The Applicant shall construct the proposed trail and boardwalk improvements within the shoreland buffer and conservation easement, and construct the public improvements as shown on the plans.
6. The Shoreland Buffer shall be dedicated to the City when the public improvements are accepted by the City.
7. The Applicant shall be responsible for constructing trunk utilities through the development to Willandale Road and shall continue to review options to extend water main to the east for potential watermain looping.
8. The Applicant shall ensure the public benefits outlined in the resolution are provided.
9. A Lot Split shall be processed prior to Final Plat approval for the approximate north 20 acres of PID 21-120-23-11-0003.
10. A vacation request shall be processed prior to the plat including the existing half right of way of Hawkins Drive within the subject property.
11. The Development shall conform to the PUD rezoning, Ord. No. 2025-03, as approved by Council on April 22, 2025.
12. The Applicant shall continue to work with the City to resolve issues related to Drain Tiles, and adequately maintain Drain Tile drainage through the site to the satisfaction of the City Engineer so as to not adversely impact drainage conditions of properties downstream of the development.
13. The Applicant shall submit current title work for the Preliminary Plat and shall conform to any requirements resulting from City staff and the City Attorney's review of the title work and plat opinion.
14. The Applicant shall form a Homeowner's Association to manage and maintain shared amenities and common areas, in a form satisfactory to both City staff and the City Attorney. Said Homeowner's Association and Protective Covenants must be provided prior to the first phase Final Plan and shall be recorded with Hennepin County.
15. The applicant shall enter into a Stormwater Maintenance Agreement for the development that shall identify the terms and conditions of the Development.
16. The applicant shall enter into and execute a Subdivision Development Agreement with the City governing each phase of development in conjunction with final plat approval, of which said Subdivision Development Agreement shall outline the terms and conditions and financial obligations of the Applicant for each phase of development.
17. The Applicant shall pay to the City all applicable fees and expenses incurred by

the City as related to the development.

18. Except as otherwise expressly authorized by City resolution or ordinance, all aspects of the development shall comply with all applicable state laws, city codes, ordinances, and regulations.

Financial Impact: NA **Source Fund**: NA

Budgeted?

Supporting Documentation

A. Ordinance 2025-03 Rezoning Cowley Lake Preserve to PUD
B. Resolution 2025-32 Authorizing Summary Publication of Ordinance 2025-03
C. Resolution No. 2025-30_Preliminary Plat_Cowley Lake Preserve
D. Rachel Development - Cowley Lake Preserve Preliminary Plat-PUD Narrative_FINAL
E. Existing Conditions Survey
F. Cowley Lake Preserve - Preliminary Plan Set 04-15-2025
G. Cowley - Stormwater Mgmt Plan 04-15-2025
H. Cowley Lake Preserve - Preliminary Plat - Outlot ownership plan
I. Draft_ScherberPropertyDevelopment_TrafficStudy
J. Henn. Co. Rev - Plat 4029 - Rogers - Cowley Lake Preserve (CSAH 159)

ORDINANCE NO. 2025 - 03

AN ORDINANCE AMENDING THE ZONING MAP OF THE CITY OF ROGERS; REZONING THE SUBJECT PROPERTIES FROM SINGLE-FAMILY RESIDENTIAL (R2) TO PLANNED UNIT DEVELOPMENT (PUD) FOR THE COWLEY LAKE PRESERVE DEVELOPMENT

The City Council hereby ordains as follows:

Section 1. Zoning Map Amendment

The official zoning map of the City of Rogers is hereby amended as follows:

The Subject Properties legally described in Exhibit A are hereby rezoned from Single Family Residential (R2) to Planned Unit Development (PUD).

Section 2. Permitted Uses

Pursuant to the Planned Unit Development (PUD) zoning of the Subject Properties legally described in Exhibit A, the permitted uses shall be as follows:

Permitted Uses

Single-Family Detached Residential Dwellings

Section 3. PUD District Standards

Pursuant to the Planned Unit Development (PUD) zoning of the Subject Properties legally described in Exhibit A, the following standards shall be applicable (shown in Exhibit B):

70’ Single Family Residential

Lot Standards					
Housing Type: Single-Family Residential					
Lots: Blocks 1-4 & 13					
	Setbacks (Min)				
	Front Yard	Rear Yard	Side Yard	Corner Yard	Height (Max)
70’ Minimum	25 ft	20 ft	10 ft	25 ft	35 ft
Lot Area	Minimum of 8,750 square feet				
Impervious Surface	50% maximum				

60’ Single Family Residential

Lot Dimensions
Housing Type: Single-Family Residential
Lots: Blocks 5, 6, 8, & 12 & Lots 21, 23, Block 9

	Lot			
	Front Yard	Rear Yard	Side Yard	Corner Yard
60’ Minimum	25 ft	20 ft	10 ft	25 ft
Lot Area	Minimum of 7,500 square feet			
Impervious Surface	50% maximum			

Lot Dimensions				
Housing Type: Single-Family Residential (Villa Lots)				
Lots: Blocks 7 & 11				
	Lot			
	Front Yard	Rear Yard	Side Yard	Corner Yard
60’ Minimum	25 ft	20 ft	10 ft	25 ft
Lot Area	Minimum of 7,500 square feet			
Impervious Surface	50% maximum			

42’ Single-Family Residential

Lot Standards					
Housing Type: Single-Family Residential (Carriage Lots)					
Lots: Block 10, & Lots 1-20, Block 9					
	Setbacks (Min)				
	Front Yard	Rear Yard	Side Yard	Corner Yard	Height (Max)
65’ Minimum	25 ft	20 ft	6 ft	20 ft	35 ft
Lot Area	Minimum of 5,460 square feet				
Impervious Surface	50% maximum				

All lots within the Cowley Lake Preserve development area shall remain subject to the Shoreland Overlay District requirements per Section 125-100, Shoreland Management as may be amended from time to time. The development has adequately shown the development is meeting the Residential Alternative Development Standards and shall be labeled as such on the zoning map.

Section 4. Effective

The City Clerk is directed to revise the official zoning map consistent with this ordinance. This ordinance shall have full force effect upon its passage and publication as required by law.

Passed by the City Council of the City of Rogers, Hennepin County, Minnesota, this 27th day of May, 2025.

Shannon Klick, Mayor

ATTEST:

Stacie Brown, City Clerk

EXHIBIT A

COWLEY LAKE PRESERVE
LEGAL DESCRIPTIONS

Existing Legal Descriptions

Scherber Parcel (PID 21-120-23-24-0005)

Legal Description:

Beginning at a point on the East line of Government Three (3) distant 525 feet North 0 degrees 14 minutes 28 seconds West from the Southeast corner thereof; thence South 89 degrees 44 minutes 7 seconds West parallel with the South line thereof distant 553.53 feet; thence South 0 degrees 21 minutes East to center line of county road; thence Northwesterly along said center line to the West line thereof; thence Northerly to the Northwest corner thereof; thence along the Northerly line thereof to the Northeast corner thereof; thence Southerly to the point of beginning.
Also that part of the West 30 rods of Government Lot 2 lying North of the South 53 rods thereof, except roads, in Section Twenty-one (21), Township One Hundred Twenty (120), Range Twenty-three (23), Hennepin County, State of Minnesota.

Casco Parcel (PID 21-120-23-13-0004)

Legal Description:

That part of Government Lot 2 in Section 21, Township 120, Range 23, described as commencing at the Southwest corner thereof, thence South 89 degrees 48 minutes 24 seconds East, assumed bearing along the South line of Government Lot 2, a distance of 438.00 feet to the point of beginning; thence North 00 degrees 13 minutes 06 seconds East parallel to the West line of Government Lot 2, a distance of 874.50 feet; thence South 89 degrees 48 minutes 24 seconds East a distance of 57.00 feet; thence North 0 degrees 13 minutes 06 seconds East a distance of 891.00 feet, more or less, to the shore of Cowley Lake; thence Northeasterly along said shoreline a distance of 1043.00 feet, more or less, to the East line of Government Lot 2; thence South 00 degrees 20 minutes 20 seconds West along said East line to a point which is 1604.32 feet North of the Southeast corner of Government Lot 2; thence North 89 degrees 39 minutes 40 seconds West a distance of 154.63 feet; thence South 22 degrees 32 minutes 57 seconds West a distance of 930.19 feet; thence South 00 degrees 13 minutes 06 seconds West distance 744.43 feet to the South line of Government Lot 2; thence North 89 degrees 48 minutes 24 seconds West along said South line a distance of 387.00 feet to the point of beginning, Hennepin County, Minnesota.

Weber Parcel (PID 21-120-23-11-0003)

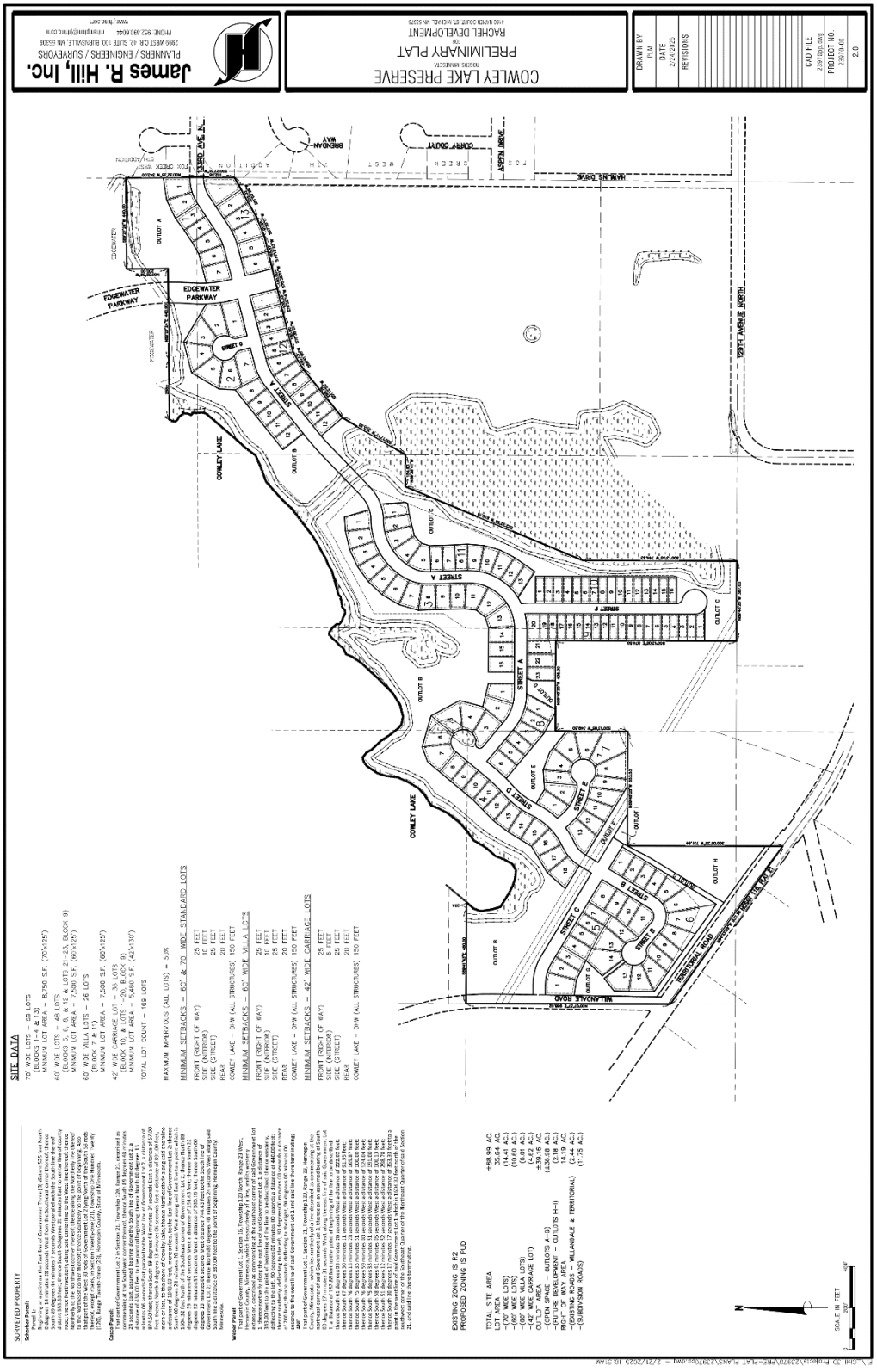
Legal Description:

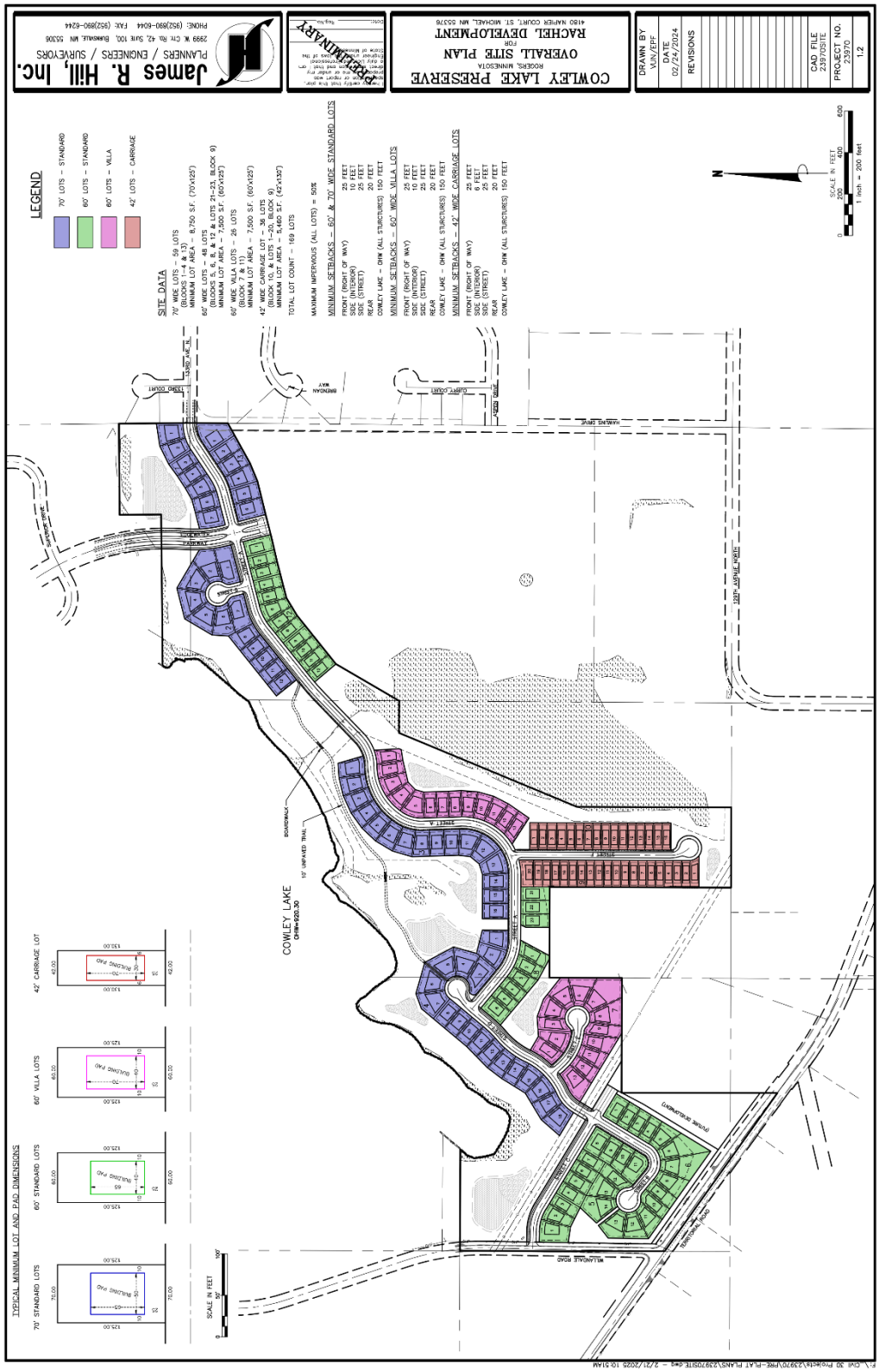
That part of Government Lot 1, Section 16, Township 120 North, Range 23 West, Hennepin County, Minnesota, which lies southerly of a line, and its westerly extension, described as commencing at the

southeast corner of said Government Lot 1; thence northerly along the east line of said Government Lot 1, a distance of 343.00 feet to the point of beginning of the line to be described; thence westerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 440.00 feet; thence southerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 200 feet; thence westerly deflecting to the right, 90 degrees 00 minutes 00 seconds to the west line of said Government Lot 1 and said line there terminating;
AND
That part of Government Lot 1, Section 21, Township 120, Range 23, Hennepin County, Minnesota, which lies northerly of a line described as commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South 00 degrees 27 minutes 31 seconds West, along the east line of said Government Lot 1, a distance of 182.88 feet to the point of beginning of the line to be described; thence South 61 degrees 03 minutes 26 seconds West a distance of 222.02 feet; thence South 67 degrees 30 minutes 11 seconds West a distance of 91.95 feet; thence South 76 degrees 13 minutes 23 seconds West a distance of 165.87 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 100.00 feet; thence South 76 degrees 59 minutes 00 seconds West a distance of 124.04 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 191.00 feet; thence South 58 degrees 41 minutes 05 seconds West a distance of 100.13 feet; thence South 51 degrees 12 minutes 52 seconds West a distance of 298.78 feet; thence South 30 degrees 17 minutes 17 seconds West a distance of 353.33 feet to a point in the west line of said Government Lot 1 which is 1604.32 feet north of the southwest corner thereof, and said line there terminating.

EXHIBIT B

COWLEY LAKE PRESERVE
MASTER DEVELOPMENT PLAN


James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2500 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.0604 PHILHILL@JRHILL.COM
WWW.JRHILL.COM
COWLEY LAKE PRESERVE
MASTER
PRELIMINARY PLAT
RACHEL DEVELOPMENT
6100 MEADOW COURT ST. MICHAEL, MN 55376
DRAWN BY ITLM
DATE 2/24/2025
REVISIONS
CAD FILE 239100p.dwg
PROJECT NO. 239.19.HR
2.0
SURVEYED PROPERTY
Schreiber Parcel:
Parcel A
That part of a point on the East Row of Government Three (3) distant 535 feet North of the Southeast corner thereof; thence North 89 degrees 14 minutes 28 seconds West parallel with the South line of said Government Three (3) a distance of 1320.00 feet; thence South 0 degrees 21 minutes East to and the point of beginning; thence South 0 degrees 21 minutes East a distance of 655.53 feet; thence South 0 degrees 21 minutes East to central line of vacated Cowley Lake Road; thence Southwesterly along said central line to the West line of said Government Three (3); thence North along said West line to the Northwest corner thereof; thence along the North line to the point of beginning, Hennepin County, Minnesota. Together with that part of the West 30 rods of Government Lot 1 lying North of the South 33 rods thereof, Section 13, Township 120, Range 23, Hennepin County, Minnesota. Subject to the rights of the public in the Cowley Lake Road over the West 33 feet thereof.
Cocca Parcel:
That part of Government Lot 2 in Section 13, Township 120, Range 23, described as beginning at the point of intersection of the North line of said Government Lot 2 with the East line of the West 24 rods of said Government Lot 2; thence South 0 degrees 24 minutes East, assumed bearing along the East line of Government Lot 2, a distance of 1320.00 feet to the South line of said Government Lot 2; thence South 89 degrees 14 minutes 06 seconds East parallel to the North line of Government Lot 2, a distance of 1320.12 feet to the East line of said Government Lot 2; thence North 0 degrees 24 minutes East along said East line, 1320.00 feet to the Northeast corner of said Government Lot 2; thence North 89 degrees 13 minutes 54 seconds West along said North line, 1320.12 feet to the point of beginning, Hennepin County, Minnesota. Subject to the rights of the public in the Cowley Lake Road over the West 33 feet thereof.
Weber Parcel:
That part of Government Lot 1, Section 13, Township 120, Range 23, Hennepin County, Minnesota, which lies north of a line described as commencing at the southeast corner of said Government Lot 1; thence on an assumed bearing of North 0 degrees 21 minutes 23 seconds West, along the east line of said Government Lot 1, 1320.00 feet to the point of beginning of the line to be described; thence westerly, 343.30 feet to the point of beginning of the line to be described; thence westerly, 343.30 feet; thence South 0 degrees 21 minutes 23 seconds East, a distance of 20 feet; thence southerly, deflecting to the left, 80 degrees 10 minutes 00 seconds, a distance of 80.00 feet; thence southeasterly, deflecting to the right, 80 degrees 10 minutes 00 seconds, a distance of 20 feet; thence South 0 degrees 21 minutes 23 seconds East, a distance of 80.00 feet; thence southeasterly, deflecting to the left, 80 degrees 10 minutes 00 seconds, a distance of 20 feet; thence South 0 degrees 21 minutes 23 seconds East


COWLEY LAKE PRESERVE
OVERALL SITE PLAN
RACHEL DEVELOPMENT
4180 VAPIER COURT, ST. MICHAEL, MN 55376
James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
LEGEND
70' LOTS - STANDARD
60' LOTS - STANDARD
60' LOTS - VILLA
42' LOTS - CARRIAGE
SITE DATA
MINIMUM SETBACKS — 60' & 70' WIDE STANDARD LOTS
MINIMUM SETBACKS — 60' WIDE VILLA LOTS
MINIMUM SETBACKS — 42' WIDE CARRIAGE LOTS
TYPICAL MINIMUM LOT AND PAD DIMENSIONS
COWLEY LAKE
OHW=920.30
SCALE IN FEET
1 inch = 200 feet

RESOLUTION 2025-32

A RESOLUTION AUTHORIZING SUMMARY PUBLICATION OF ORDINANCE NO. 2025-03

WHEREAS, the City Council of the City of Rogers adopted Ordinance No. 2025-03 titled "AN ORDINANCE AMENDING THE ZONING MAP OF THE CITY OF ROGERS; REZONING THE SUBJECT PROPERTIES FROM SINGLE-FAMILY RESIDENTIAL (R2) TO PLANNED UNIT DEVELOPMENT (PUD) FOR THE COWLEY LAKE PRESERVE DEVELOPMENT", and

WHEREAS, in the case of lengthy ordinances or those containing charts or maps, Minnesota state law allows the City Council to approve, by a four-fifths vote, the publication of an Ordinance by title and summary only; and

WHEREAS, the expense to publish the complete text of Ordinance No. 2025-03 is not justified; and

WHEREAS, the following summary clearly informs the public of the intent and effect of the ordinance.

NOW THEREFORE, IT IS HEREBY RESOLVED, by the City Council of the City of Rogers, Hennepin County, Minnesota, that the following summary is hereby approved for official publication:

Summary of Ordinance 2025-03

AN ORDINANCE OF THE CITY OF ROGERS, MINNESOTA, REZONING PROPERTY FROM R2 TO PUD

On the 122nd day of April, 2025, the Rogers City Council passed Ordinance No. 2025-03, An Ordinance of the City of Rogers, Minnesota Amending the Zoning Map for the City of Rogers; Rezoning the Subject Properties from Single-Family Residential (R2) to Planned Unit Development (PUD) for the Cowley Lake Preserve Development. The ordinance clarifies approves deviations from the R2 district for Cowley Lake Preserve and establishes single-family lot performance standards specific to the 169-lot single-family subdivision proposed by Rachel Development.

The full text of the Ordinance and figures may be reviewed at City Hall, located at 22350 South Diamond Lake Road, Rogers, MN 55374. The ordinance can also be viewed online at our website http://rogersmn.gov.

Moved by Councilmember , seconded by Councilmember ;

The following voted in favor of said resolution:

The following voted against the same:

The following abstained:

Whereupon said resolution was declared duly passed and adopted, and was signed by the Mayor, and attested by the City Clerk dated this 22nd day of April, 2025.

ATTEST:

_____
Shannon Klick, Mayor

_____
Stacie Brown, City Clerk

RESOLUTION NO. 2025 - 30

A RESOLUTION GRANTING APPROVAL OF THE PRELIMINARY PLAT AND MASTER DEVELOPMENT PLAN FOR THE COWLEY LAKE PRESERVE SUBDIVISION

WHEREAS, Rachel Development ("Applicant"), has submitted application to the City of Rogers ("City"), requesting Preliminary Plat ("Plat") approval and Planned Unit Development for Cowley Lake Preserve ("Development"); and,

WHEREAS, the Development is a 169-lot residential development, located on three (3) properties (PIDs: 21-120-23-24-0005, 21-120-23-13-0004, and approximately 20 acres of 21-120-23-11-0003) ("Subject Property) north and east of Territorial Road and east of Willandale Road legally described in Exhibit A; and,

WHEREAS, the Rogers 2040 Comprehensive Plan ("2040 Plan") guides the Subject Property as Low Density Residential with a required residential density of 2.0 to 5.0 units per net acre; and,

WHEREAS, the Development proposes a residential density of 2.3 units per net acre; and,

WHEREAS, the Development proposes a Planned Unit Development ("PUD") to deviate from its current zoning of R2, single-family residential; and,

WHEREAS, PUDs are regulated by Section 125-29, Planned Unit Developments; and,

WHEREAS, pursuant to Minnesota Statute §462.357 the Planning Commission ("Commission") held a Public Hearing ("Hearing") on April 7, 2025 to consider and receive public comment regarding the proposed Plat and PUD; and,

WHEREAS, notice of the Hearing was posted, published in the City's official newspaper, and mailed to any and all owners of affected properties, as required by State Statute; and,

WHEREAS, verbal and written comments were received and considered by the Commission regarding traffic, stormwater, parks, lot sizes and development density; and recommended approval of the Plat and Development's PUD request with conditions outlined by staff and directed staff to forward the recommendation to Council; and,

WHEREAS, the Council reviewed the Plat and Development at its April 22, 2025 meeting; and,

WHEREAS, on April 22, 2020, the City Council also considered Ordinance No. 2025-03, Rezoning the Subject Property from Single Family Residential (R2) to Planned Unit Development (PUD) establishing the master development plan (attached as Exhibit B) and PUD district standards for the Development, thereby making the Plat consistent with the Comprehensive Plan and Zoning and make the following findings related to the Plat and Development:

i. The PUD enables clustering of lots and preservation of key natural resources (wetlands and natural drainage features) that could not be achieved under strict R-2 compliance. The Development also includes wetland buffers, shoreland buffers, and shoreland open which exceed code requirements.

ii. The project achieves the Low-Density Residential net density range (2.32 units/acre) and reflects goals for housing variety, natural resource stewardship, and infrastructure efficiency.
iii. The PUD facilitates key infrastructure extensions/improvements (Territorial Road intersection improvements, Edgewater Parkway and trunk utilities extensions) and includes wetland preservation, stormwater basins, and public trail connectivity.
iv. The development provides appropriate transitions to adjacent uses, maintains tree buffers, and supports regional planning objectives without creating adverse impacts; and,

WHEREAS, the City Council concludes that the Cowley Lake Preserve Preliminary Plat and Planned Unit Development are consistent with the goals and policies of the Rogers 2040 Comprehensive Plan and meet the intent and criteria of Section 125-29 of the Zoning Code, the Subdivision Code, and Shoreland Management Ordinance of the City, and the development area shall be labeled as ADS on the zoning map per Section 125-100, Shoreland Management (per Ord 2024-10).

NOW THEREFORE, BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF ROGERS, MINNESOTA, that the Preliminary Plat and Master Development Plan for Cowley Lake Preserve is hereby approved with the following conditions:

1. The Applicant shall revise the preliminary plans (the development, civil plans, and preliminary plat) to the satisfaction of the Public Works Department, City Engineer, and City Planner.
2. The Applicant shall receive approval for the Stormwater Management Plan from Elm Creek Watershed Management Commission, and shall address and conform to all requirements of the Elm Creek Watershed Management Commission, including but not limited to the requisite wetland approvals and delineations, and other conditions as established.
3. The Applicant shall continue to work with Hennepin County's Natural Resources Department regarding impacts to the Conservation Easement and ensuring the development meets the terms of the Conservation Easement. Revisions to the plan may be required to satisfy the requirements of Hennepin County.
4. The Applicant shall be responsible for constructing turn lane improvements at Territorial Road at their cost. The Applicant shall meet the requirements of the Hennepin County Transportation Department and improvements shall be permitted prior to construction.
5. The Applicant shall construct the proposed trail and boardwalk improvements within the shoreland buffer and conservation easement, and construct the public improvements as shown on the plans.
6. The Shoreland Buffer shall be dedicated to the City when the public improvements are accepted by the City.
7. The Applicant shall be responsible for constructing trunk utilities through the development to Willandale Road and shall continue to review options to extend water main to the east for potential watermain looping.
8. The Applicant shall ensure the public benefits outlined in the resolution are provided.
9. A Lot Split shall be processed prior to Final Plat approval for the approximate north 20 acres of PID 21-120-23-11-0003.
10. A vacation request shall be processed prior to the plat including the existing half right of way of Hawkins Drive within the subject property.
11. The Development shall conform to the PUD rezoning, Ord. No. 2025-03, as approved by Council on April 22, 2025.

12. The Applicant shall continue to work with the City to resolve issues related to Drain Tiles, and adequately maintain Drain Tile drainage through the site to the satisfaction of the City Engineer so as to not adversely impact drainage conditions of properties downstream of the development.
13. The Applicant shall submit current title work for the Preliminary Plat and shall conform to any requirements resulting from City staff and the City Attorney's review of the title work and plat opinion.
14. The Applicant shall form a Homeowner's Association to manage and maintain shared amenities and common areas, in a form satisfactory to both City staff and the City Attorney. Said Homeowner's Association and Protective Covenants must be provided prior to the first phase Final Plan and shall be recorded with Hennepin County.
15. The applicant shall enter into a Stormwater Maintenance Agreement for the development that shall identify the terms and conditions of the Development.
16. The applicant shall enter into and execute a Subdivision Development Agreement with the City governing each phase of development in conjunction with final plat approval, of which said Subdivision Development Agreement shall outline the terms and conditions and financial obligations of the Applicant for each phase of development.
17. The Applicant shall pay to the City all applicable fees and expenses incurred by the City as related to the development.
18. Except as otherwise expressly authorized by City resolution or ordinance, all aspects of the development shall comply with all applicable state laws, city codes, ordinances, and regulations.

BE IT FURTHER RESOLVED, the City Council authorizes City staff and City consultants to take any appropriate action necessary and convenient in order to accomplish the intent of this Resolution, and to prepare any appropriate documents to facilitate the directives of the City Council as set forth in this Resolution.

Moved by Councilmember , seconded by Councilmember

The following voted in favor of said resolution:

The following voted against the same:

The following abstained:

Whereupon said resolution was declared duly passed and adopted, and was signed by the Mayor, and attested by the Clerk dated this 27th day of May, 2025.

_____
Shannon Klick, Mayor

ATTEST:

_____
Stacie Brown, City Clerk

EXHIBIT A

COWLEY LAKE PRESERVE
LEGAL DESCRIPTIONS

Existing Legal Descriptions

Scherber Parcel (PID 21-120-23-24-0005)

Legal Description:

Beginning at a point on the East line of Government Three (3) distant 525 feet North 0 degrees 14 minutes 28 seconds West from the Southeast corner thereof; thence South 89 degrees 44 minutes 7 seconds West parallel with the South line thereof distant 553.53 feet; thence South 0 degrees 21 minutes East to center line of county road; thence Northwesterly along said center line to the West line thereof; thence Northerly to the Northwest corner thereof; thence along the Northerly line thereof to the Northeast corner thereof; thence Southerly to the point of beginning. Also that part of the West 30 rods of Government Lot 2 lying North of the South 53 rods thereof, except roads, in Section Twenty-one (21), Township One Hundred Twenty (120), Range Twenty-three (23), Hennepin County, State of Minnesota.

Casco Parcel (PID 21-120-23-13-0004)

Legal Description:

That part of Government Lot 2 in Section 21, Township 120, Range 23, described as commencing at the Southwest corner thereof, thence South 89 degrees 48 minutes 24 seconds East, assumed bearing along the South line of Government Lot 2, a distance of 438.00 feet to the point of beginning; thence North 00 degrees 13 minutes 06 seconds East parallel to the West line of Government Lot 2, a distance of 874.50 feet; thence South 89 degrees 48 minutes 24 seconds East a distance of 57.00 feet; thence North 0 degrees 13 minutes 06 seconds East a distance of 891.00 feet, more or less, to the shore of Cowley Lake; thence Northeasterly along said shoreline a distance of 1043.00 feet, more or less, to the East line of Government Lot 2; thence South 00 degrees 20 minutes 20 seconds West along said East line to a point which is 1604.32 feet North of the Southeast corner of Government Lot 2; thence North 89 degrees 39 minutes 40 seconds West a distance of 154.63 feet; thence South 22 degrees 32 minutes 57 seconds West a distance of 930.19 feet; thence South 00 degrees 13 minutes 06 seconds West distance 744.43 feet to the South line of Government Lot 2; thence North 89 degrees 48 minutes 24 seconds West along said South line a distance of 387.00 feet to the point of beginning, Hennepin County, Minnesota.

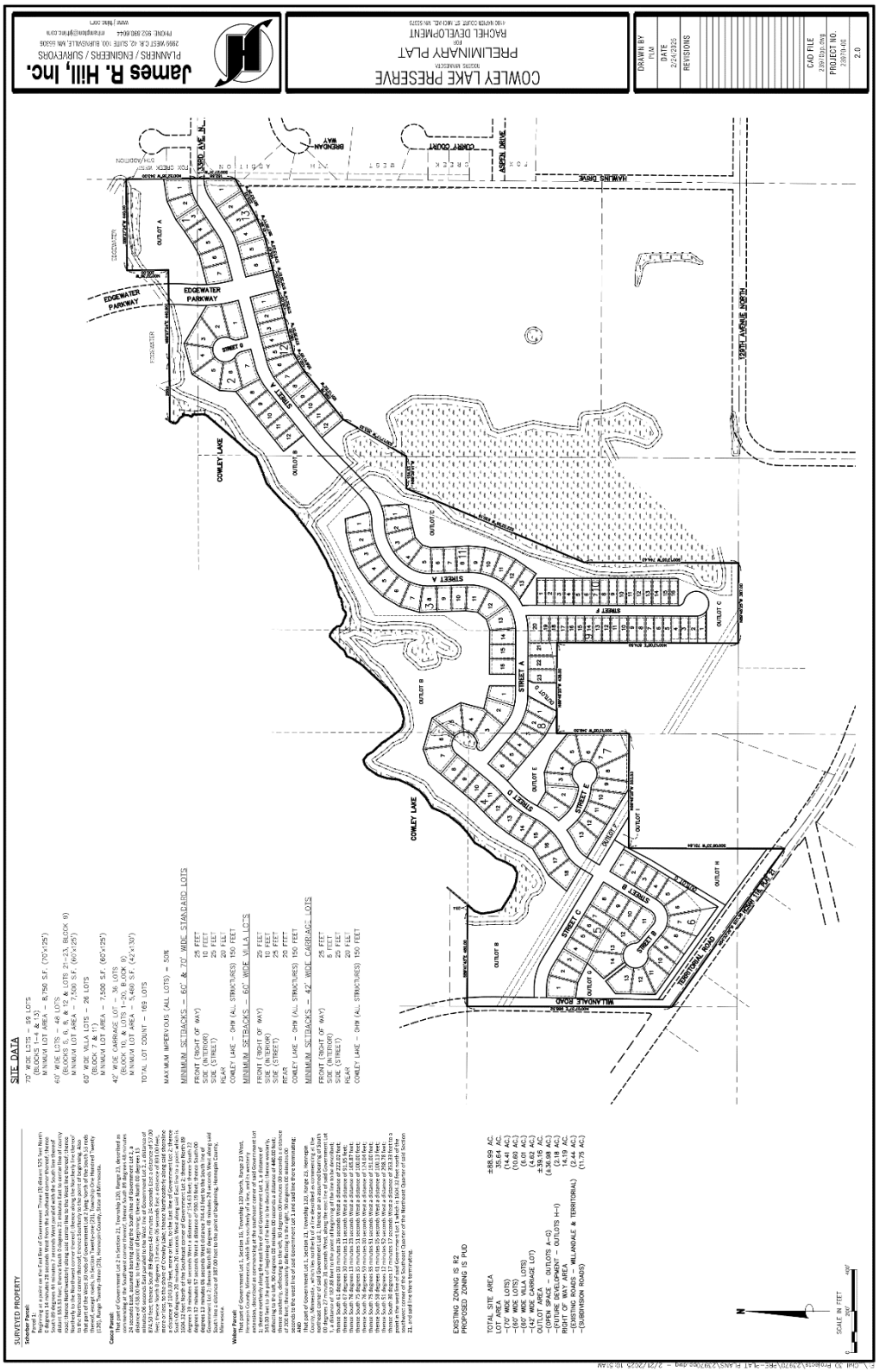
Weber Parcel (PID 21-120-23-11-0003)

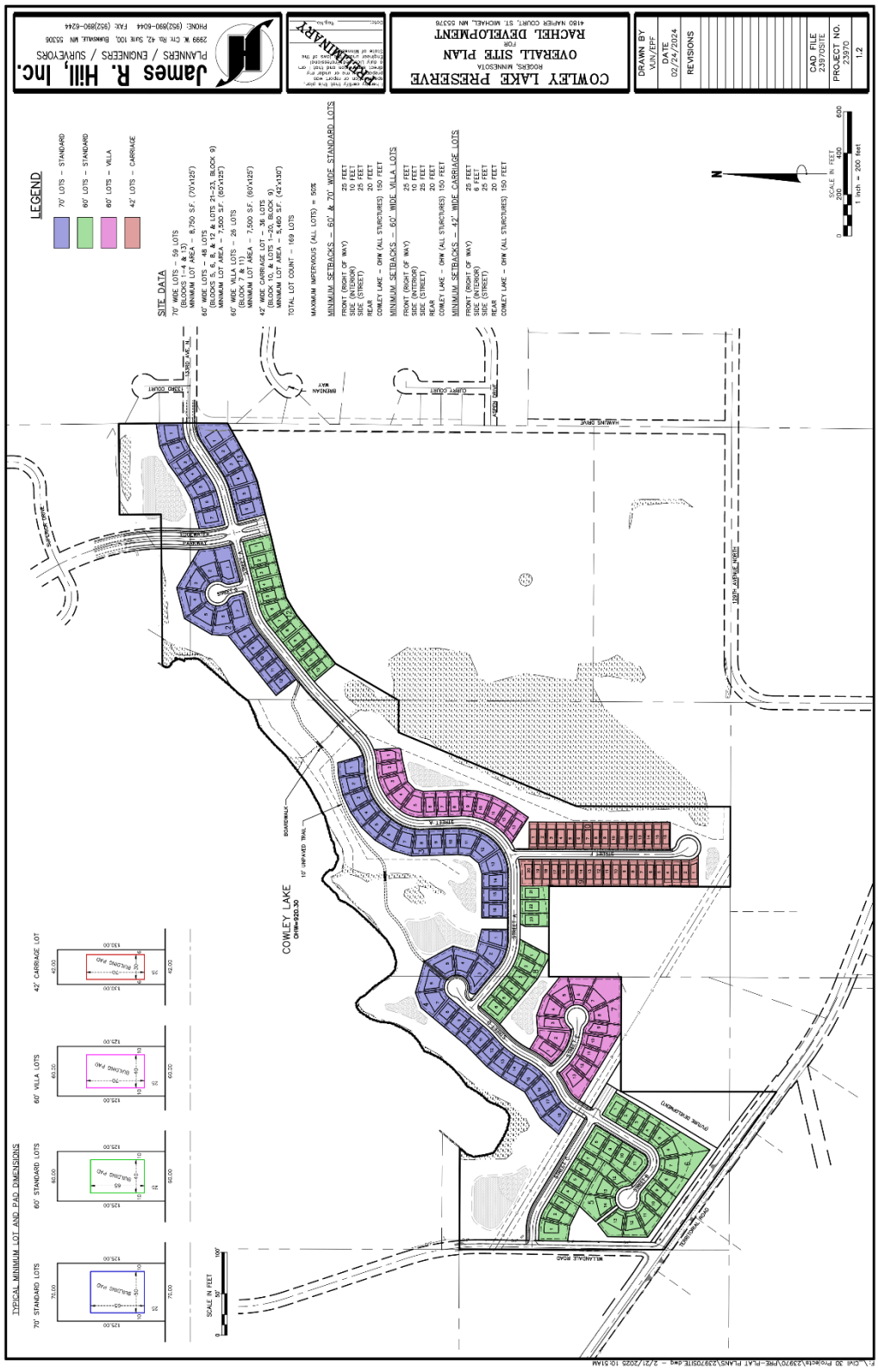
Legal Description:

That part of Government Lot 1, Section 16, Township 120 North, Range 23 West, Hennepin County, Minnesota, which lies southerly of a line, and its westerly extension, described as commencing at the southeast corner of said Government Lot 1; thence northerly along the east line of said Government Lot 1, a distance of 343.00 feet to the point of beginning of the line to be described; thence westerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 440.00 feet; thence southerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 200 feet; thence westerly deflecting to the right, 90 degrees 00 minutes 00 seconds to the west line of said Government Lot 1 and said line there terminating;
AND
That part of Government Lot 1, Section 21, Township 120, Range 23, Hennepin County, Minnesota, which lies northerly of a line described as commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South 00 degrees 27 minutes 31 seconds West, along the east line of said Government Lot 1, a distance of 182.88 feet to the point of beginning of the line to be described; thence South 61 degrees 03 minutes 26 seconds West a distance of 222.02 feet; thence South 67 degrees 30 minutes 11 seconds West a distance of 91.95 feet; thence South 76 degrees 13 minutes 23 seconds West a distance of 165.87 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 100.00 feet; thence South 76 degrees 59 minutes 00 seconds West a distance of 124.04 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 191.00 feet; thence South 58 degrees 41 minutes 05 seconds West a distance of 100.13 feet; thence South 51 degrees 12 minutes 52 seconds West a distance of 298.78 feet; thence South 30 degrees 17 minutes 17 seconds West a distance of 353.33 feet to a point in the west line of said Government Lot 1 which is 1604.32 feet north of the southwest corner thereof, and said line there terminating.

EXHIBIT B

COWLEY LAKE PRESERVE
MASTER DEVELOPMENT PLAN




COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
RACHEL DEVELOPMENT
OVERALL SITE PLAN
4160 VANDER COURT, ST. MICHAEL, MN 55376
PRELIMINARY
James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. City Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244
DRAWN BY
DATE
02/24/2024
REVISIONS
CAD FILE
PROJECT NO.
23970
1-2
LEGEND
70' LOTS - STANDARD
60' LOTS - STANDARD
60' LOTS - VILLA
42' LOTS - CARRIAGE
SITE DATA
MINIMUM SETBACKS - 60' & 70' WIDE STANDARD LOTS
MINIMUM SETBACKS - 60' WIDE VILLA LOTS
MINIMUM SETBACKS - 42' WIDE CARRIAGE LOTS
TYPICAL MINIMUM LOT AND PAD DIMENSIONS
COWLEY LAKE
OHW=920.30
SCALE IN FEET
1 inch = 200 feet

Rachel Development is pleased to submit the enclosed preliminary plat and Planned Unit Development (PUD) application for Cowley Lake Preserve for the City of Rogers' consideration. Additionally, we are requesting a simple subdivision of Hennepin County PID 2112023110003 to separate the project portion owned by Keith and Jody Weber ahead of the final platting process, which will occur in the coming months.

Project Overview

The subject property is located in the northeast quadrant of Willandale and Territorial Roads, extending northeasterly to the current termination of Edgewater Parkway, along the southern shore of Cowley Lake within the City of Rogers. The site encompasses approximately 87 acres, including 19 acres of delineated wetlands, wetland buffers, and conservation easements. A gas pipeline easement crosses the site from Willandale Road, running southeasterly.

The property comprises three ownership parcels:

- **Parcel 1 - PID 2112023240005:** 42 acres (owned by Marlene Scherber)
- **Parcel 2 - PID 2112023130004:** 26 acres (owned by Casco Ventures)
- **Parcel 3 - PID 2112023110003:** 19 acres- to be split (owned by Keith and Jody Weber)

Hennepin County GIS aerial maps of these parcels are included with this submission.

Background & Planning Process

The development of this property has been under discussion for several years. In March and April 2023, City staff and Rachel Development reviewed a concept development plan with the Planning Commission and City Council, featuring a range of lot sizes and single-family housing styles. The plan received positive feedback and formed the foundation for this preliminary plat/PUD application.

A key consideration in our planning process was the City's Shoreland Ordinance, which required updates to better align with the DNR's model shoreland code and the City's Comprehensive Guide Plan. As the Planning Commission and Council well know, City staff worked tirelessly with the DNR to produce an updated shoreland ordinance. The revised ordinance was approved in January 2025, and Cowley Lake Preserve complies fully with these new regulations.

Zoning & Land Use Compliance

The subject property is designated for low-density residential use in the City's 2040 Comprehensive Guide Plan, with a residential density requirement of 2 to 6 dwelling units per net acre. The property, currently used for agricultural purposes, is zoned R-2, which mandates:

- **Minimum lot width:** 65 feet

- **Minimum lot size:** 10,000 sq. ft.
- **Setbacks:** 25 ft (front), 20 ft (rear), 10 ft (side)

During the concept review discussions with Planning Commission and City Council we discussed many of the unique characteristics of the subject property that create challenges and limitations for developing the site under strict R-2 zoning standards. Strict adherence to R-2 zoning does not allow the project to meet the City's minimum density of 2 units per net acre. Through PUD flexibilities, we have designed a better-planned neighborhood that aligns with the City's goals while preserving site characteristics.

PUD Flexibilities & Benefits

Our PUD request includes provisions to:

- **Preserve wetlands and natural drainage features**
- **Ensure a smooth transition** to adjacent higher-density properties
- **Offer a variety of home types** to serve diverse household sizes and price points

A table containing our requested PUD flexibility is included with this narrative and in our project submittal. Our proposed development will also effectively serve the City's goals for obtaining a public water and sewer trunk connection from the existing termination of Edgewater Parkway through our project and connecting with Territorial Road.

Development Plan

Cowley Lake Preserve consists of 169 single-family residential lots, achieving a density of 2.32 dwelling units per net acre, consistent with low-density residential guidance. The neighborhood offers three distinct lot sizes to serve a variety of market segments:

1. **Standard Single-Family Lots (59 lots, 70' wide, 10' side yard setbacks)**
    - Larger rambler and two-story style home
    - Home sizes: 2,500+ sq. ft.
    - Price range: Upper $600Ks+
    - Product Line: M/I Homes "Prestige Series"
    - Due to impervious surface and open space requirements under the new shoreland ordinance, lot sizes are slightly below the 10,000 square foot size minimum in the R-2 district.

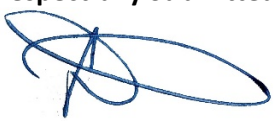
- Rachel has a project in the southeastern area of Delano called Legacy Woods that includes this home product.

2. **Medium Single-Family Lots (74 lots, 60' wide, 10' side yard setbacks, Avg. 7,500 SF)**
    - Villa homes as well as rambler and two-story style homes
    - Home sizes: 1,700–2,600 sq. ft.
    - Price range: Upper $400Ks – Mid $700Ks
    - Product Line: M/I Homes “Smart Series” & Hans Hagen Patio & Villa Homes
    - Currently being sold in numerous areas throughout the Twin Cities metro area
3. **Small Single-Family Lots (36 lots, 42' wide, 5' side yard setbacks)**
    - One and two-level homes
    - Home sizes: 1,600–2,200 sq. ft.
    - Price range: Upper $300Ks – Low $500Ks
    - Product Line: M/I Homes “Carriage Series”
    - Empty nesters as well as smaller families and single homeowners
    - These homes are well-received in neighborhoods throughout the Twin Cities.

Conclusion

We are excited to present Cowley Lake Preserve for the City Council’s review. This thoughtfully designed neighborhood balances preservation, transition, and diversity while ensuring key infrastructure connections for future development. We appreciate the City’s consideration and look forward to working together to bring this project to fruition.

Respectfully Submitted,

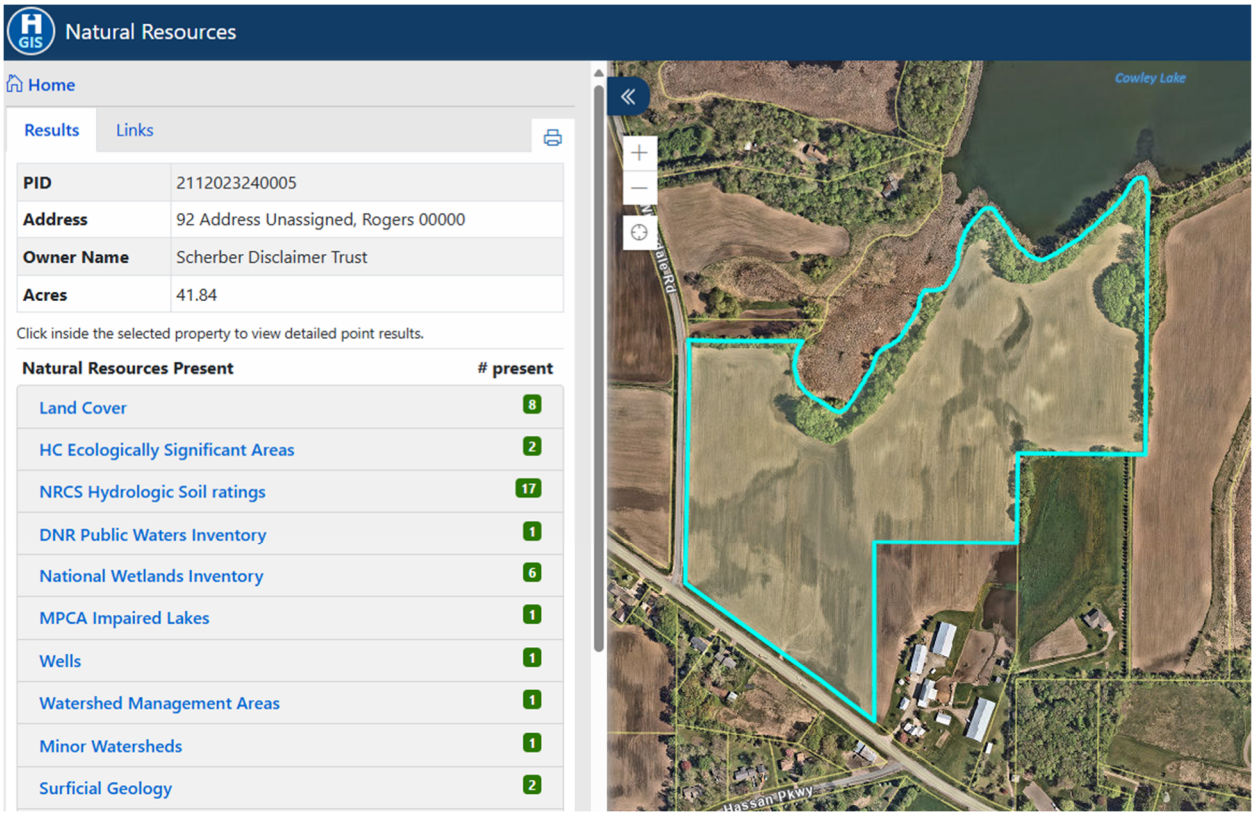


_____

Rachel Development, Inc.
David Stradtman
Vice President of Development

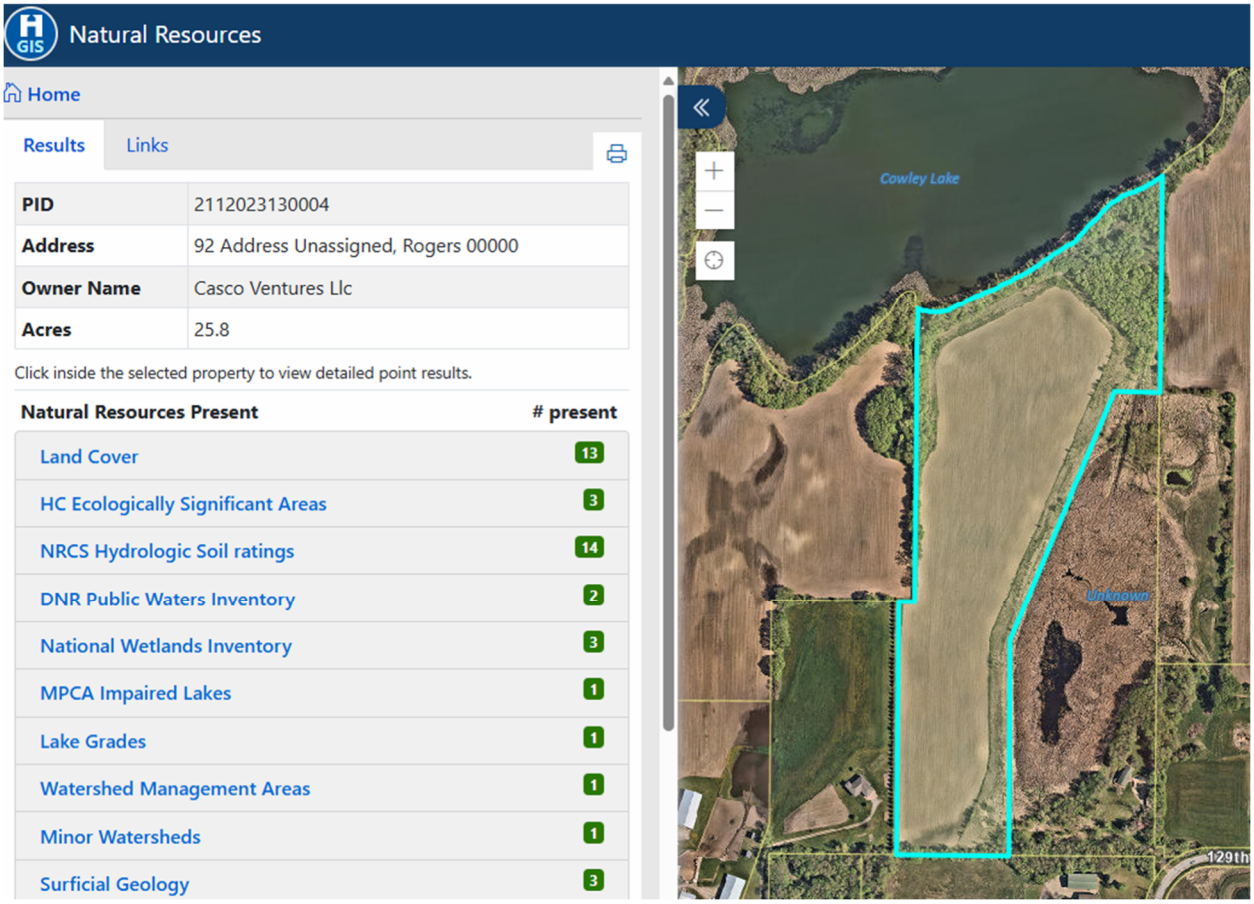
Parcel 1:

PID 2112023240005: 42 acres (owned by Marlene Scherber)



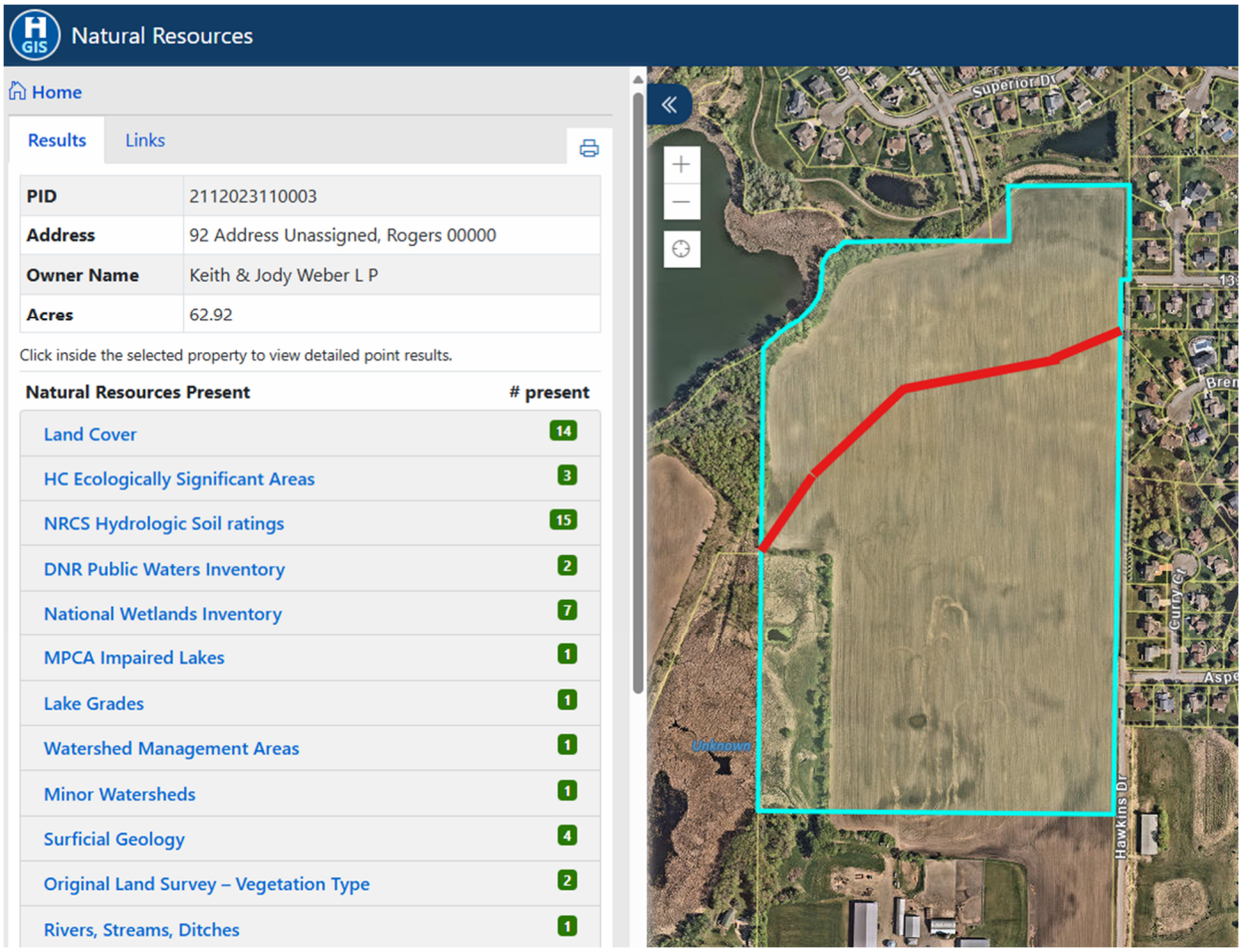
Parcel 2:

PID 2112023130004: 26 acres (owned by Casco Ventures)



Parcel 3:

PID 2112023110003: 19 acres- to be split (owned by Keith and Jody Weber)



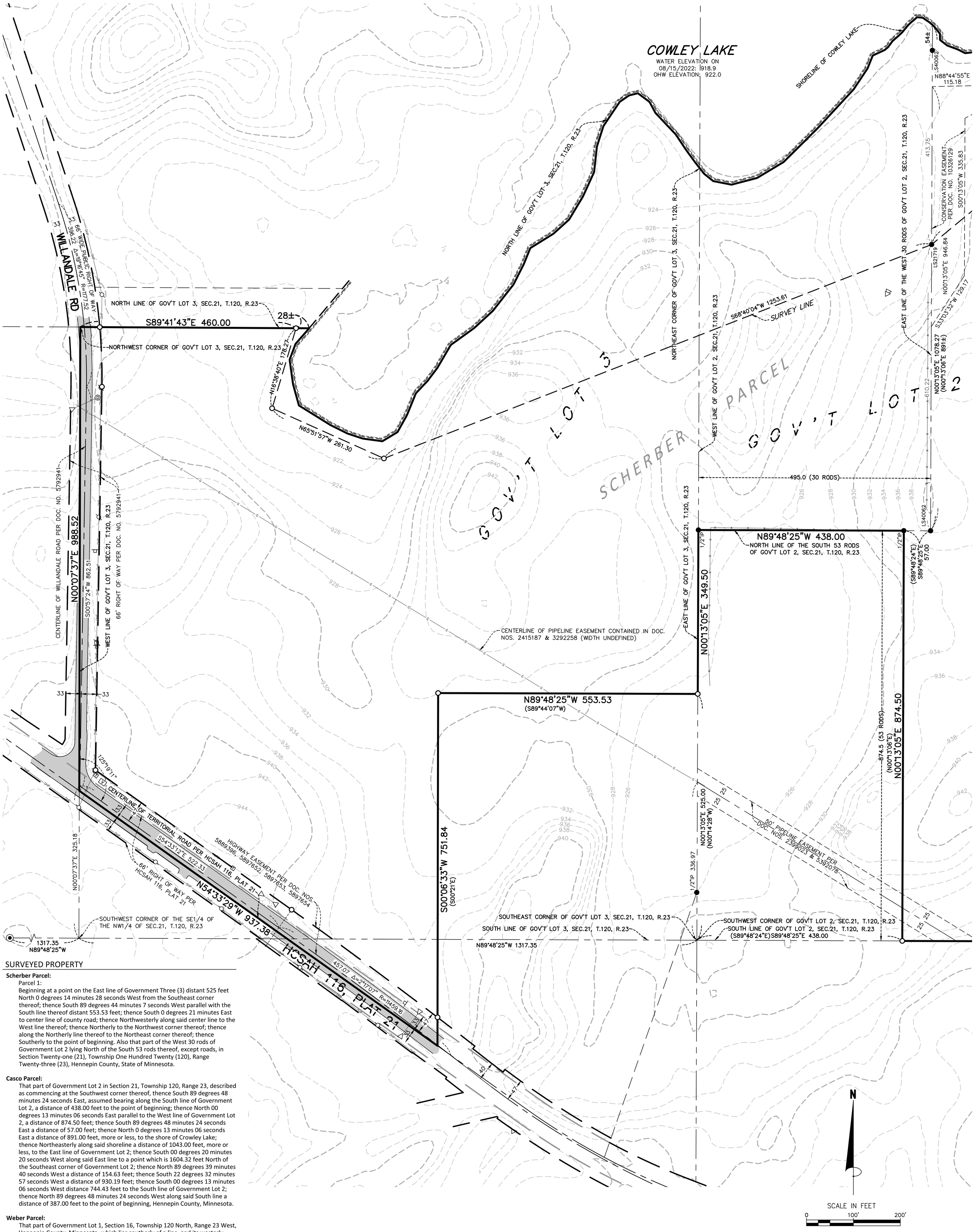
Proposed PUD Standards:

COWLEY LAKE PRESERVE

PROPOSED PUD STANDARDS

(SHORELAND ALTERNATIVE DEVELOPMENT STANDARDS, WITHIN 1000' OVERLAY AREA, ARE APPLIED)

	ROGERS R2 ZONING	70-FT WIDE LOTS 59 LOTS	60-FOOT WIDE LOTS 48 LOTS	60-FOOT WIDE LOTS 26 LOTS	42-FOOT WIDE LOTS 36 LOTS
MIN LOT WIDTH	65 FT	70 FT	60 FT	60 FT	42 FT
MIN LOT AREA	10,000 SF	8,750 SF	7,500 SF	7,500 SF	5,460 SF
FRONT SB	25 FT	25 FT	25 FT	25 FT	25 FT
SIDE YARD SB - INT	10 FT	10 FT	10 FT	10 FT	6 FT
SIDE YARD SB - COR	25 FT	25 FT	25 FT	25 FT	25 FT
REAR YARD SB	20 FT	20 FT	20 FT	20 FT	20 FT
SB TO COUNTY ROW	50 FT	50 FT	50 FT	50 FT	50 FT
MAX HARD COVER	75%	50%	50%	50%	50%
DENSITY	2.0 TO 6.0 UNITS PER ACRE	AVE DENSITY = 2.32 UNITS PER ACRE			
MAX BUILDING HT	35 FT	35 FT	35 FT	35 FT	35 FT



SURVEYED PROPERTY

Scherber Parcel:

Parcel 1:
Beginning at a point on the East line of Government Three (3) distant 525 feet North 0 degrees 14 minutes 28 seconds West from the Southeast corner thereof; thence South 89 degrees 44 minutes 7 seconds West parallel with the South line thereof distant 553.53 feet; thence South 0 degrees 21 minutes East to center line of county road; thence Northwesterly along said center line to the West line thereof; thence Northerly to the Northwest corner thereof; thence along the Northerly line thereof to the Northeast corner thereof; thence Southerly to the point of beginning. Also that part of the West 30 rods of Government Lot 2 lying North of the South 53 rods thereof, except roads, in Section Twenty-one (21), Township One Hundred Twenty (120), Range Twenty-three (23), Hennepin County, State of Minnesota.

Casco Parcel:

That part of Government Lot 2 in Section 21, Township 120, Range 23, described as commencing at the Southwest corner thereof, thence South 89 degrees 48 minutes 24 seconds East, assumed bearing along the South line of Government Lot 2, a distance of 438.00 feet to the point of beginning; thence North 00 degrees 13 minutes 06 seconds East parallel to the West line of Government Lot 2, a distance of 874.50 feet; thence South 89 degrees 48 minutes 24 seconds East a distance of 57.00 feet; thence North 0 degrees 13 minutes 06 seconds East a distance of 891.00 feet, more or less, to the shore of Crowley Lake; thence Northeasterly along said shoreline a distance of 1043.00 feet, more or less, to the East line of Government Lot 2; thence South 00 degrees 20 minutes 20 seconds West along said East line to a point which is 1604.32 feet North of the Southeast corner of Government Lot 2; thence North 89 degrees 39 minutes 40 seconds West a distance of 154.63 feet; thence South 22 degrees 32 minutes 57 seconds West a distance of 930.19 feet; thence South 00 degrees 13 minutes 06 seconds West distance 744.43 feet to the South line of Government Lot 2; thence North 89 degrees 48 minutes 24 seconds West along said South line a distance of 387.00 feet to the point of beginning, Hennepin County, Minnesota.

Weber Parcel:

That part of Government Lot 1, Section 16, Township 120 North, Range 23 West, Hennepin County, Minnesota, which lies southerly of a line, and its westerly extension, described as commencing at the southeast comer of said Government Lot 1; thence northerly along the east line of said Government Lot 1, a distance of 343.00 feet to the point of beginning of the line to be described; thence westerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 440.00 feet; thence southerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 200 feet; thence westerly deflecting to the right, 90 degrees 00 minutes 00 seconds to the west line of said Government Lot 1 and said line there terminating;
AND
That part of Government Lot 1, Section 21, Township 120, Range 23, Hennepin County, Minnesota , which lies northerly of a line described as commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South 00 degrees 27 minutes 31 seconds West, along the east line of said Government Lot 1, a distance of 182.88 feet to the point of beginning of the line to be described; thence South 61 degrees 03 minutes 26 seconds West a distance of 222.02 feet; thence South 67 degrees 30 minutes 11 seconds West a distance of 91.95 feet; thence South 76 degrees 13 minutes 23 seconds West a distance of 165.87 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 100.00 feet; thence South 76 degrees 59 minutes 00 seconds West a distance of 124.04 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 191.00 feet; thence South 58 degrees 41 minutes 05 seconds West a distance of 100.13 feet; thence South 51 degrees 12 minutes 52 seconds West a distance of 298.78 feet; thence South 30 degrees 17 minutes 17 seconds West a distance of 353.33 feet to a point in the west line of said Government Lot 1 which is 1604.32 feet north of the southwest corner thereof, and said line there terminating.

LEGEND

- FOUND CIM
- FOUND IRON PIPE
- SET IRON PIPE
- SIGN
- TRANSFORMER
- POWER POLE
- TELEPHONE BOX
- VAULT
- CATCH BASIN
- FLARED END SECTION
- GATE VALVE
- HYDRANT
- STORM MANHOLE
- OHU — OVERHEAD UTILITY
- G — UNDERGROUND GAS
- ST — UNDERGROUND STORM
- UFO — UNDERGROUND FIBER OPTIC
- X — FENCE
- BITUMINOUS SURFACE
- GRAVEL SURFACE

VICINITY MAP & SHEET INDEX

NOT TO SCALE

SURVEY NOTES

1. The bearing system is based on the Hennepin County Coordinate System.
2. This survey is based upon Title Commitment Nos. 54769, Revision 2 (Scherber), 56284 (Casco), and 56535 (Weber), all prepared by CHB Title, LLC as agent for Old Republic National Title Insurance Company.
3. Subject property's addresses are unassigned. Its property identification numbers are 21.120.23.24.0005 (Scherber), 21.120.23.13.0004 (Casco), and 21.120.23.11.0003 (Weber).
4. Vertical relief shown hereon was obtained from the Minnesota Department of Natural Resources mapping application, MnTOPO.
5. Field work was completed 08/15/2022.
6. The gross area of the subject property is ±89 acres or ±3,876,300 sq.ft.
7. Benchmark: Top nut of hydrant at end of 133rd Ave N: 930.85 (NAVD88)

SURVEYOR'S CERTIFICATE

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota. That this survey does not purport to show all improvements, easements or encroachments, to the property except as shown thereon.

Signed this 16th day of August, 2022

Marcus F. Hampton MN Lic. No. 47481

DRAWN BY	CAD FILE	REVISIONS
MFH	23970s.dwg	A. 01/23/25: Weber Parcel Boundary
DATE	PROJECT NO.	
08/16/2022	23970-00	
SHEET 1 OF 3	FILE NO.	
	1-22-053	

SCHERBER PROPERTY

ROGERS, MINNESOTA

BOUNDARY SURVEY

FOR

RACHEL DEVELOPMENT

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

F:_Civil 3D Projects\23970\23970s.dwg – 1/23/2025 11:08AM

LEGEND

- FOUND CIM
- FOUND IRON PIPE
- SET IRON PIPE
- SIGN
- TRANSFORMER
- POWER POLE
- TELEPHONE BOX
- VAULT
- CATCH BASIN
- FLARED END SECTION
- GATE VALVE
- HYDRANT
- STORM MANHOLE
- OHU — OVERHEAD UTILITY
- G — UNDERGROUND GAS
- ST — UNDERGROUND STORM
- UFO — UNDERGROUND FIBER OPTIC
- FENCE
- BITUMINOUS SURFACE
- GRAVEL SURFACE

N

SCALE IN FEET
0 100' 200'

COWLEY LAKE
WATER ELEVATION ON
08/15/2022: 918.9
OHW ELEVATION: 922.0

SHORELINE OF COWLEY LAKE

54±

S40062

N88°44'55"E
115.18

CONSERVATION EASEMENT
PER DOC. NO. 10306709

N64°05'09"E 333.21

S61°55'10"W 490.38

N55°06'06"E 211.70

N44°00'55"E 175.92

N64°44'04"E 144.31

152±

1/2"IP

SURVEY LINE

WEST LINE OF GOV'T LOT 1, SEC.21, T.120, R.23

CONSERVATION EASEMENT
PER DOC. NO. 10326129

APPROXIMATE LOCATION
OF 60' WIDE "BAND FOR
ROAD AND EASEMENT
PER DOC. NO. 1032619

N45°41'27"W 261.70

734±

581.73

S50°19'08"W 1093.92

S30°17'17"W 353.33

LS7439 LS7439
154.63
N89°39'41"W
(N89°39'40"W)

NORTH LINE OF GOV'T LOT 3, SEC.21, T.120, R.23

NORTHEAST CORNER OF GOV'T LOT 3, SEC.21, T.120, R.23

S68°40'04"W 1253.61'

SURVEY LINE

WEST LINE OF GOV'T LOT 2, SEC.21, T.120, R.23

EAST LINE OF THE WEST 30 RODS OF GOV'T LOT 2, SEC.21, T.120, R.23

413.75

CONSERVATION EASEMENT
PER DOC. NO. 10326129

S00°13'05"W 335.83

LS21719

N00°13'05"E 946.84

S33°03'32"W 129.17

N00°13'05"E 1078.27
(N00°13'06"E 891±)

610.22

SCHERBER PARCEL

GOV'T LOT 3

GOV'T LOT 2

CASCO PARCEL

495.0 (30 RODS)

LS40062

N89°48'25"W 438.00
NORTH LINE OF THE SOUTH 53 RODS
OF GOV'T LOT 2, SEC.21, T.120, R.23

1/2"IP

(S89°48'24"E)
S89°48'25"E
57.00

EAST LINE OF GOV'T LOT 3, SEC.21, T.120, R.23

N00°13'05"E 349.50

CENTERLINE OF PIPELINE EASEMENT CONTAINED IN DOC.
NOS. 2415187 & 3292258 (WIDTH UNDEFINED)

N89°48'25"W 553.53
(S89°44'07"W)

874.5 (53 RODS)
(N00°13'06"E)
N00°13'05"E 874.50

S00°13'05"W 744.43
(S00°13'06"W)

LS7439

N00°13'05"E 449.60

CONSERVATION EASEMENT
PER DOC. NO. 10326129

N21°38'44"E 237.88

N00°13'05"E
54.26

N89°48'25"W 156.82

LS7439

N22°32'56"E 1130.94

S22°32'56"W 930.19
(S22°32'57"W)

EAST LINE OF GOV'T LOT 2, SEC.21, T.120, R.23

939.32

1604.32

LS40062

SOUTHWEST CORNER OF GOV'T LOT 1, SEC.21, T.120, R.23

N00°13'05"E 525.00
(N00°14'28"W)

25 25

50' PIPELINE EASEMENT PER
DOC. NOS. 2399025 & 5392078

1/2"IP 336.97

SOUTHEAST CORNER OF GOV'T LOT 3, SEC.21, T.120, R.23

SOUTH LINE OF GOV'T LOT 3, SEC.21, T.120, R.23

N89°48'25"W 1317.35

SOUTHWEST CORNER OF GOV'T LOT 2, SEC.21, T.120, R.23

SOUTH LINE OF GOV'T LOT 2, SEC.21, T.120, R.23
(S89°48'24"E)S89°48'25"E 438.00

387.00
N89°48'25"W

SOUTHEAST CORNER OF GOV'T LOT 2, SEC.21, T.120, R.23

504.68

33 33 33

INGRESS & EGRESS EASEMENT
PER DOC. NO. 8727188

75 75

129TH AVE N

33 33

SURVEYED PROPERTY

Scherber Parcel:

Parcel 1:
Beginning at a point on the East line of Government Three (3) distant 525 feet North 0 degrees 14 minutes 28 seconds West from the Southeast corner thereof; thence South 89 degrees 44 minutes 7 seconds West parallel with the South line thereof distant 553.53 feet; thence South 0 degrees 21 minutes East to center line of county road; thence Northwesterly along said center line to the West line thereof; thence Northerly to the Northwest corner thereof; thence along the Northerly line thereof to the Northeast corner thereof; thence Southerly to the point of beginning. Also that part of the West 30 rods of Government Lot 2 lying North of the South 53 rods thereof, except roads, in Section Twenty-one (21), Township One Hundred Twenty (120), Range Twenty-three (23), Hennepin County, State of Minnesota.

Casco Parcel:

That part of Government Lot 2 in Section 21, Township 120, Range 23, described as commencing at the Southwest corner thereof, thence South 89 degrees 48 minutes 24 seconds East, assumed bearing along the South line of Government Lot 2, a distance of 438.00 feet to the point of beginning; thence North 00 degrees 13 minutes 06 seconds East parallel to the West line of Government Lot 2, a distance of 874.50 feet; thence South 89 degrees 48 minutes 24 seconds East a distance of 57.00 feet; thence North 0 degrees 13 minutes 06 seconds East a distance of 891.00 feet, more or less, to the shore of Crowley Lake; thence Northeasterly along said shoreline a distance of 1043.00 feet, more or less, to the East line of Government Lot 2; thence South 00 degrees 20 minutes 20 seconds West along said East line to a point which is 1604.32 feet North of the Southeast corner of Government Lot 2; thence North 89 degrees 39 minutes 40 seconds West a distance of 154.63 feet; thence South 22 degrees 32 minutes 57 seconds West a distance of 930.19 feet; thence South 00 degrees 13 minutes 06 seconds West distance 744.43 feet to the South line of Government Lot 2; thence North 89 degrees 48 minutes 24 seconds West along said South line a distance of 387.00 feet to the point of beginning, Hennepin County, Minnesota.

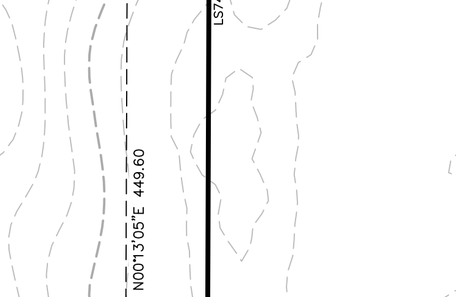
SURVEYED PROPERTY CONTINUED

Weber Parcel:

That part of Government Lot 1, Section 16, Township 120 North, Range 23 West, Hennepin County, Minnesota, which lies southerly of a line, and its westerly extension, described as commencing at the southeast comer of said Government Lot 1; thence northerly along the east line of said Government Lot 1, a distance of 343.00 feet to the point of beginning of the line to be described; thence westerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 440.00 feet; thence southerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 200 feet; thence westerly deflecting to the right, 90 degrees 00 minutes 00 seconds to the west line of said Government Lot 1 and said line there terminating;
AND
That part of Government Lot 1, Section 21, Township 120, Range 23, Hennepin County, Minnesota , which lies northerly of a line described as commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South 00 degrees 27 minutes 31 seconds West, along the east line of said Government Lot 1, a distance of 182.88 feet to the point of beginning of the line to be described; thence South 61 degrees 03 minutes 26 seconds West a distance of 222.02 feet; thence South 67 degrees 30 minutes 11 seconds West a distance of 91.95 feet; thence South 76 degrees 13 minutes 23 seconds West a distance of 165.87 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 100.00 feet; thence South 76 degrees 59 minutes 00 seconds West a distance of 124.04 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 191.00 feet; thence South 58 degrees 41 minutes 05 seconds West a distance of 100.13 feet; thence South 51 degrees 12 minutes 52 seconds West a distance of 298.78 feet; thence South 30 degrees 17 minutes 17 seconds West a distance of 353.33 feet to a point in the west line of said Government Lot 1 which is 1604.32 feet north of the southwest corner thereof, and said line there terminating.

VICINITY MAP

NOT TO SCALE



SURVEY NOTES

1. The bearing system is based on the Hennepin County Coordinate System.
2. This survey is based upon Title Commitment Nos. 54769, Revision 2 (Scherber), 56284 (Casco), and 56535 (Weber), all prepared by CHB Title, LLC as agent for Old Republic National Title Insurance Company.
3. Subject property's addresses are unassigned. Its property identification numbers are 21.120.23.24.0005 (Scherber), 21.120.23.13.0004 (Casco), and 21.120.23.11.0003 (Weber).
4. Vertical relief shown hereon was obtained from the Minnesota Department of Natural Resources mapping application, MnTOPO.
5. Field work was completed 08/15/2022.
6. The gross area of the subject property is ±89 acres or ±3,876,300 sq.ft.
7. Benchmark: Top nut of hydrant at end of 133rd Ave N: 930.85 (NAVD88)

DRAWN BY	CAD FILE	REVISIONS
MFH	23970s.dwg	A. 01/23/25: Weber Parcel Boundary
DATE	PROJECT NO.	
08/16/2022	23970-00	
SHEET 2 OF 3	FILE NO.	
	1-22-053	

SCHERBER PROPERTY

ROGERS, MINNESOTA

BOUNDARY SURVEY

FOR

RACHEL DEVELOPMENT

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

F:_Civil 3D Projects\23970\23970s.dwg – 1/23/2025 11:08AM

LEGEND

- FOUND CIM
- FOUND IRON PIPE
- SET IRON PIPE
- SIGN
- TRANSFORMER
- POWER POLE
- TELEPHONE BOX
- VAULT
- CATCH BASIN
- FLARED END SECTION
- GATE VALVE
- HYDRANT
- STORM MANHOLE
- OHU — OVERHEAD UTILITY
- G — UNDERGROUND GAS
- ST — UNDERGROUND STORM
- UFO — UNDERGROUND FIBER OPTIC
- FENCE
- BITUMINOUS SURFACE
- GRAVEL SURFACE

N

SCALE IN FEET
0 100' 200'

EDGEWATER

EDGEWATER PKWY
100' WIDE PUBLIC RIGHT OF WAY
50 50

S89°27'24"W 440.00
1/2"IP 1/2"IP
90° 90°
N00°32'36"W 200.00
288±
N89°27'24"E 440.90
90° 90°

EAST LINE OF GOV'T LOT 1, SEC.16, T.120, R.23
N00°32'36"W 343.00

FOX CREEK WEST 5TH ADDITION
133RD CT
30 30

GOV'T LOT 1, SEC. 15

SOUTHEAST CORNER OF GOV'T LOT 1, SEC.16, T.120, R.23
930.85 BM TNH
NORTH LINE OF GOV'T LOT 1, SEC.21, T.120, R.23
NORTHEAST CORNER OF GOV'T LOT 1, SEC.21, T.120, R.23
133RD AVE N
33 33

182.88
S00°27'31"W

WEST LINE OF GOV'T LOT 1, SEC.16, T.120, R.23
COWLEY LAKE
WATER ELEVATION ON 08/15/2022: 918.9
OHW ELEVATION: 922.0
SHORELINE OF COWLEY LAKE

S39°00'00"W 723.86
SURVEY LINE

WEBER PARCEL

GOV'T LOT 1, SEC. 21

HAWKINS DRIVE RIGHT OF WAY PER DOC. NO. 5792941

222.02 S61°03'26"W
91.95 S67°30'11"W
165.87 S76°13'23"W
100.00 S75°35'51"W
124.04 S76°59'00"W
191.00 S75°35'51"W
100.13 S58°41'05"W
S51°12'52"W 298.78
S30°17'17"W 353.33

N64°44'04"E 144.31
152±
N44°00'55"E 175.92
N55°06'06"E 211.70
1/2"IP
WEST LINE OF GOV'T LOT 1, SEC.21, T.120, R.23
CONSERVATION EASEMENT PER DOC. NO. 10326129
734±
N45°41'27"W 261.70
APPROXIMATE LOCATION OF 60' WIDE "BAND FOR ROAD AND EASEMENT" PER DOC. NO. 1032619
581.73

LS7439 LS7439
154.63
N89°39'41"W
(N89°39'40"W)

N22°32'56"E 1130.94
S22°32'56"W 930.19
(S22°32'57"W)

EAST LINE OF GOV'T LOT 2, SEC.21, T.120, R.23
939.32
1604.32
LS40062

SOUTH LINE OF GOV'T LOT 1, SEC.21, T.120, R.23
LS40062

HAWKINS DRIVE RIGHT OF WAY PER FOX CREEK WEST 7TH ADDITION
EAST LINE OF GOV'T LOT 1, SEC.21, T.120, R.23
33' WIDE PUBLIC RIGHT OF WAY
HAWKINS DRIVE (UNIMPROVED)

BRENDAN WAY
30

FOX CREEK WEST 7TH ADDITION
CURRY COURT
30 30
ASPEN DRIVE
30 30
33 33
33

SURVEYED PROPERTY

Scherber Parcel:

Parcel 1:
Beginning at a point on the East line of Government Three (3) distant 525 feet North 0 degrees 14 minutes 28 seconds West from the Southeast corner thereof; thence South 89 degrees 44 minutes 7 seconds West parallel with the South line thereof distant 553.53 feet; thence South 0 degrees 21 minutes East to center line of county road; thence Northwesterly along said center line to the West line thereof; thence Northerly to the Northwest corner thereof; thence along the Northerly line thereof to the Northeast corner thereof; thence Southerly to the point of beginning. Also that part of the West 30 rods of Government Lot 2 lying North of the South 53 rods thereof, except roads, in Section Twenty-one (21), Township One Hundred Twenty (120), Range Twenty-three (23), Hennepin County, State of Minnesota.

Casco Parcel:

That part of Government Lot 2 in Section 21, Township 120, Range 23, described as commencing at the Southwest corner thereof, thence South 89 degrees 48 minutes 24 seconds East, assumed bearing along the South line of Government Lot 2, a distance of 438.00 feet to the point of beginning; thence North 00 degrees 13 minutes 06 seconds East parallel to the West line of Government Lot 2, a distance of 874.50 feet; thence South 89 degrees 48 minutes 24 seconds East a distance of 57.00 feet; thence North 0 degrees 13 minutes 06 seconds East a distance of 891.00 feet, more or less, to the shore of Crowley Lake; thence Northeasterly along said shoreline a distance of 1043.00 feet, more or less, to the East line of Government Lot 2; thence South 00 degrees 20 minutes 20 seconds West along said East line to a point which is 1604.32 feet North of the Southeast corner of Government Lot 2; thence North 89 degrees 39 minutes 40 seconds West a distance of 154.63 feet; thence South 22 degrees 32 minutes 57 seconds West a distance of 930.19 feet; thence South 00 degrees 13 minutes 06 seconds West distance 744.43 feet to the South line of Government Lot 2; thence North 89 degrees 48 minutes 24 seconds West along said South line a distance of 387.00 feet to the point of beginning, Hennepin County, Minnesota.

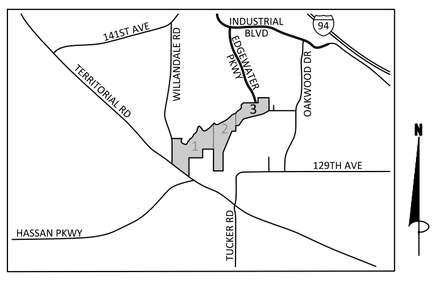
SURVEYED PROPERTY CONTINUED

Weber Parcel:

That part of Government Lot 1, Section 16, Township 120 North, Range 23 West, Hennepin County, Minnesota, which lies southerly of a line, and its westerly extension, described as commencing at the southeast comer of said Government Lot 1; thence northerly along the east line of said Government Lot 1, a distance of 343.00 feet to the point of beginning of the line to be described; thence westerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 440.00 feet; thence southerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 200 feet; thence westerly deflecting to the right, 90 degrees 00 minutes 00 seconds to the west line of said Government Lot 1 and said line there terminating;
AND
That part of Government Lot 1, Section 21, Township 120, Range 23, Hennepin County, Minnesota , which lies northerly of a line described as commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South 00 degrees 27 minutes 31 seconds West, along the east line of said Government Lot 1, a distance of 182.88 feet to the point of beginning of the line to be described; thence South 61 degrees 03 minutes 26 seconds West a distance of 222.02 feet; thence South 67 degrees 30 minutes 11 seconds West a distance of 91.95 feet; thence South 76 degrees 13 minutes 23 seconds West a distance of 165.87 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 100.00 feet; thence South 76 degrees 59 minutes 00 seconds West a distance of 124.04 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 191.00 feet; thence South 58 degrees 41 minutes 05 seconds West a distance of 100.13 feet; thence South 51 degrees 12 minutes 52 seconds West a distance of 298.78 feet; thence South 30 degrees 17 minutes 17 seconds West a distance of 353.33 feet to a point in the west line of said Government Lot 1 which is 1604.32 feet north of the southwest corner thereof, and said line there terminating.

VICINITY MAP

NOT TO SCALE



SURVEY NOTES

1. The bearing system is based on the Hennepin County Coordinate System.
2. This survey is based upon Title Commitment Nos. 54769, Revision 2 (Scherber), 56284 (Casco), and 56535 (Weber), all prepared by CHB Title, LLC as agent for Old Republic National Title Insurance Company.
3. Subject property's addresses are unassigned. Its property identification numbers are 21.120.23.24.0005 (Scherber), 21.120.23.13.0004 (Casco), and 21.120.23.11.0003 (Weber).
4. Vertical relief shown hereon was obtained from the Minnesota Department of Natural Resources mapping application, MnTOPO.
5. Field work was completed 08/15/2022.
6. The gross area of the subject property is ±89 acres or ±3,876,300 sq.ft.
7. Benchmark: Top nut of hydrant at end of 133rd Ave N: 930.85 (NAVD88)

DRAWN BY	CAD FILE	REVISIONS
MFH	23970s.dwg	A. 01/23/25: Weber Parcel Boundary
DATE	PROJECT NO.	
08/16/2022	23970-00	
SHEET 3 OF 3	FILE NO.	
	1-22-053	

SCHERBER PROPERTY

ROGERS, MINNESOTA

BOUNDARY SURVEY

FOR

RACHEL DEVELOPMENT

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

F:_Civil 3D Projects\23970\23970s.dwg – 1/23/2025 11:08AM

BENCHMARKS

#1 TOP NUT HYDRANT EAST PROPERTY LINE, NORTH SIDE OF 133RD AVE N ELEV=930.85

COWLEY LAKE PRESERVE

ROGERS, MINNESOTA

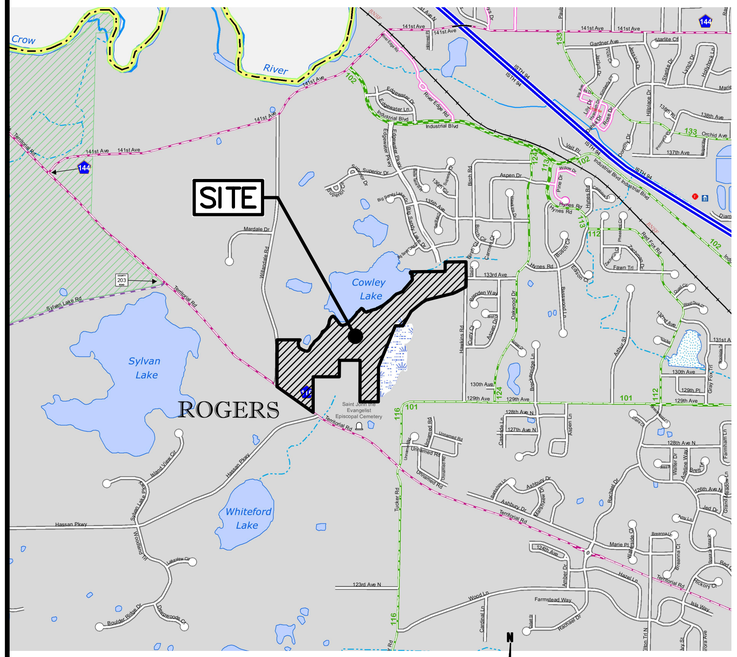
PRELIMINARY PLAT EXHIBITS

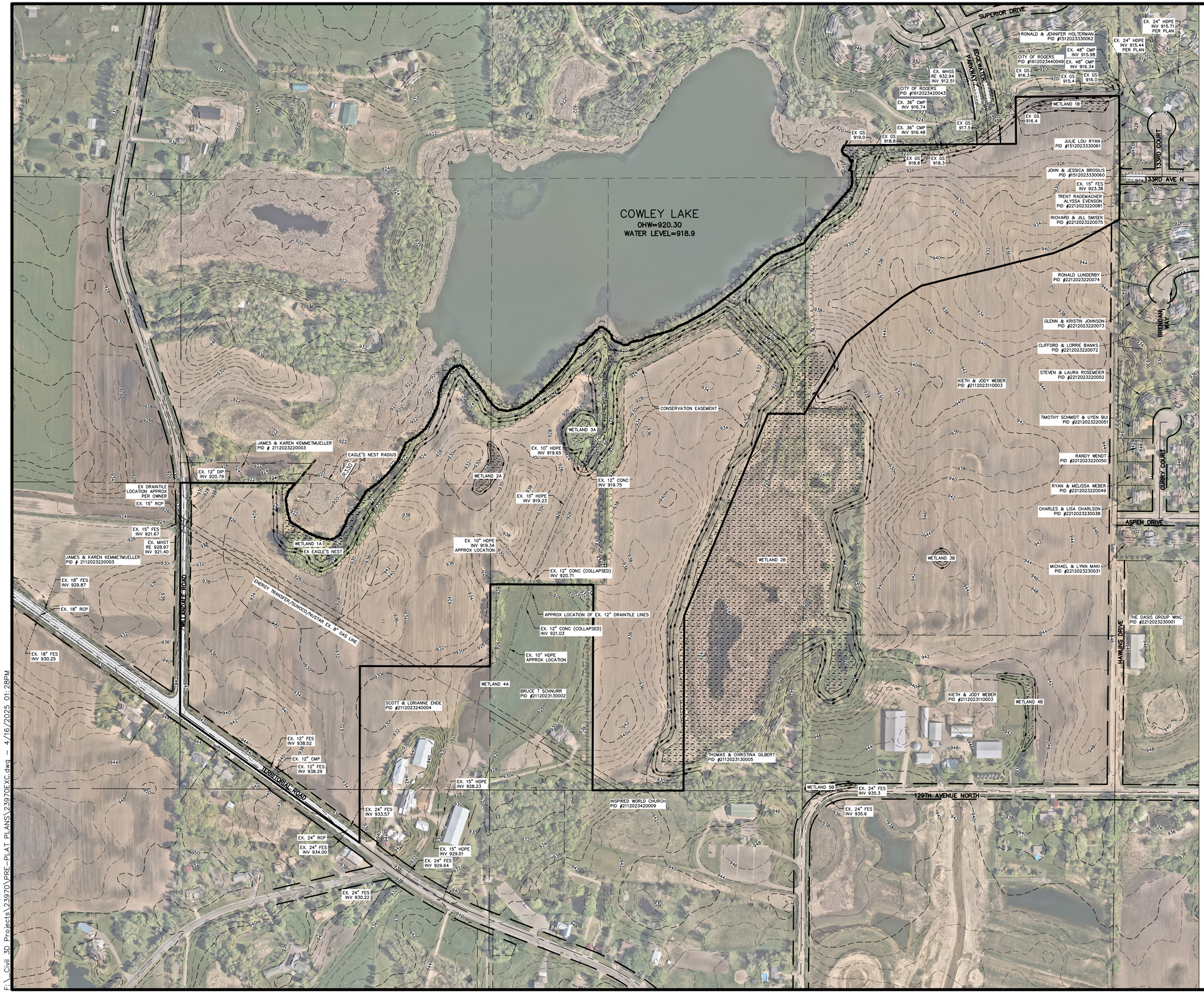
FOR

RACHEL DEVELOPMENT

4180 NAPIER COURT, ST. MICHAEL, MN 55376

PHONE: (763) 424-1525


SITE
ROGERS
Cowley Lake
Sylvan Lake
Whiteford Lake
Crow River
Hassan Pkwy
129th Ave N
133rd Ave N
141st Ave
Sylvan Rd
Bridge St
Main St
Industrial Blvd
Hemlock Ln
Aspen Dr
Oxford St
Oxford Ct
Mandan Rd
Wildwood Rd
Meadow Rd
Oakwood Dr
Oakwood Ct
Lake Wood Dr
Diamond Dr
Kiowa Rd
Kiowa Trl
Fawn Trl
Fawn Ct
Elm Creek Rd
Elm Creek Blvd
Elm Creek Ln
Elm Creek Ct
Hayden Lake Rd
Hayden Lake Dr
Hayden Lake Ct
Hayden Lake Trl
Hayden Lake Cir
Hayden Lake Pl
Hayden Lake Ln
Hayden Lake Way



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND

NOTE

1. DRAINTILE LOCATIONS ARE APPROXIMATE AND SHOWN PER FIELD LOCATES AND/OR OWNER TESTIMONY.

Know what's **below.** **Call** before you dig.

SCALE IN FEET
0 200 400 600
1 inch = 200 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

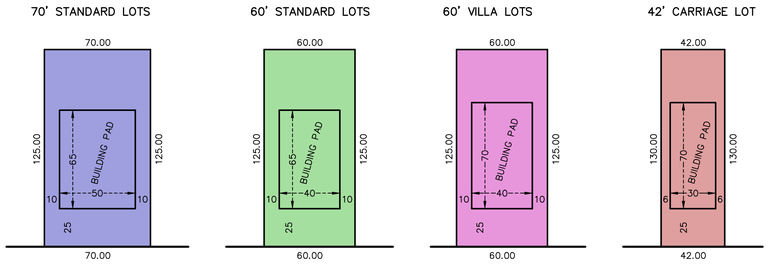
Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
EXISTING CONDITIONS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

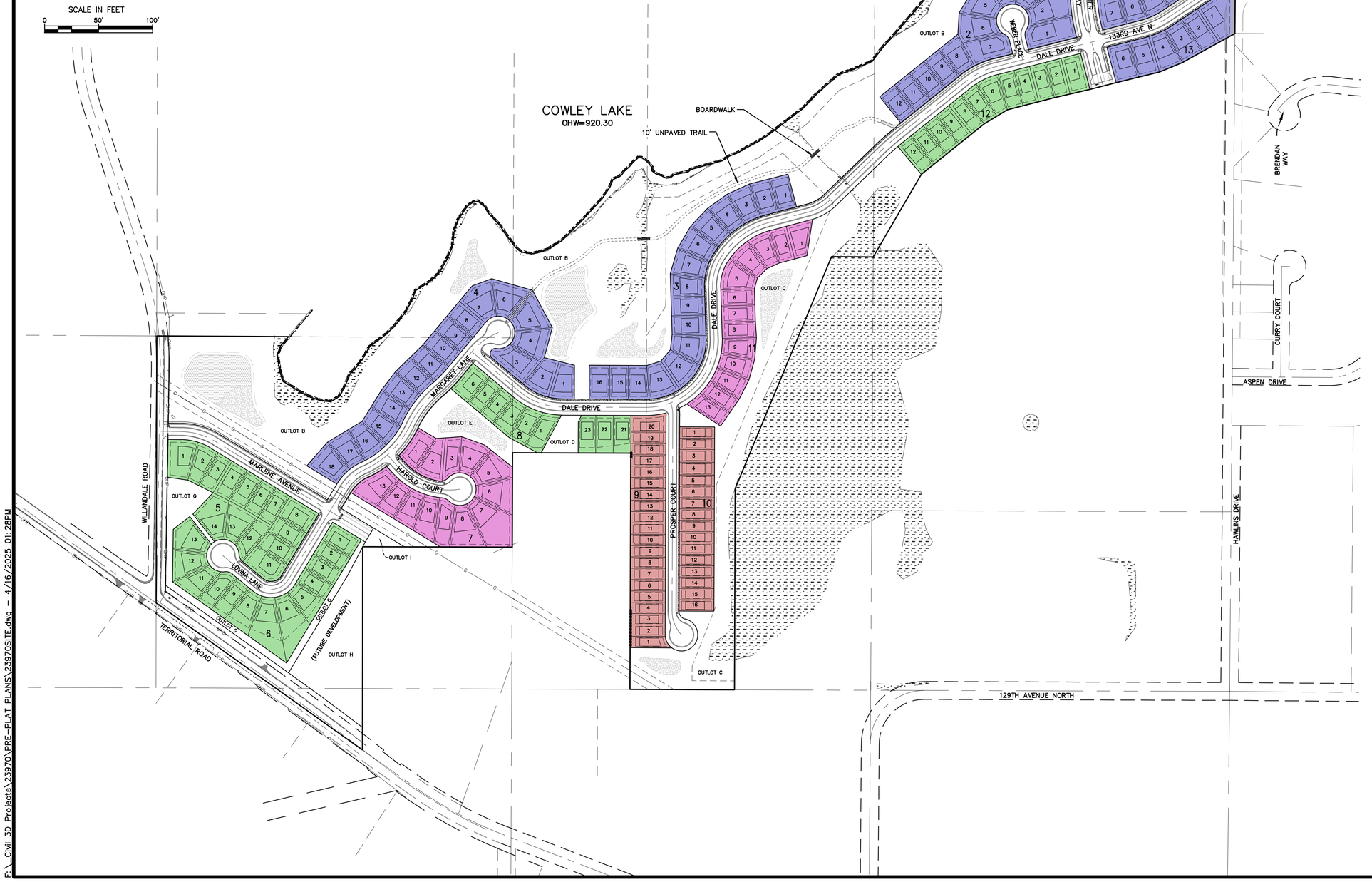
DRAWN BY	VUN
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970EXC
PROJECT NO.	23970
	1.1

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970EXC.dwg - 4/16/2025 01:28PM

TYPICAL MINIMUM LOT AND PAD DIMENSIONS



SCALE IN FEET
0 50' 100'



LEGEND

- 70' LOTS – STANDARD
- 60' LOTS – STANDARD
- 60' LOTS – VILLA
- 42' LOTS – CARRIAGE

SITE DATA

70' WIDE LOTS – 59 LOTS
(BLOCKS 1–4 & 13)
MINIMUM LOT AREA – 8,750 S.F. (70'x125')

60' WIDE LOTS – 48 LOTS
(BLOCKS 5, 6, 8, & 12 & LOTS 21–23, BLOCK 9)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

60' WIDE VILLA LOTS – 26 LOTS
(BLOCK 7 & 11)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

42' WIDE CARRIAGE LOT – 36 LOTS
(BLOCK 10, & LOTS 1–20, BLOCK 9)
MINIMUM LOT AREA – 5,460 S.F. (42'x130')

TOTAL LOT COUNT – 169 LOTS

MAXIMUM IMPERVIOUS (ALL LOTS) = 50%

MINIMUM SETBACKS – 60' & 70' WIDE STANDARD LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STURCTURES)	150 FEET

MINIMUM SETBACKS – 60' WIDE VILLA LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STURCTURES)	150 FEET

MINIMUM SETBACKS – 42' WIDE CARRIAGE LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	6 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STURCTURES)	150 FEET

N

SCALE IN FEET
0 200 400 600
1 inch = 200 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Date: Reg.No.

PRELIMINARY

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
OVERALL SITE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF

DATE
02/24/2025

REVISIONS

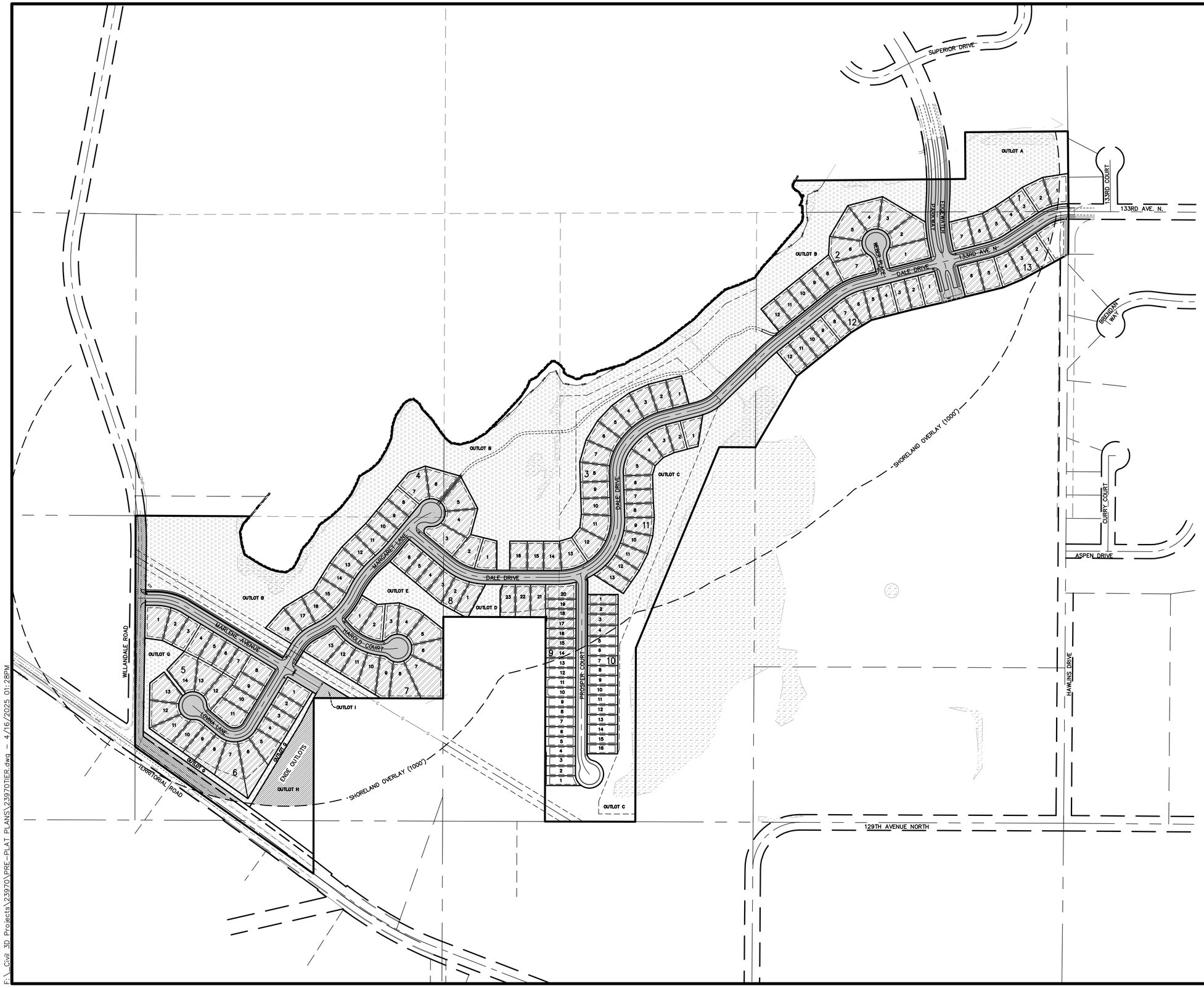
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970SITE

PROJECT NO.
23970

1.2

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970SITE.dwg – 4/16/2025 01:28PM



LEGEND

- DELINEATED WETLAND
- RIGHT-OF-WAY (TERRITORIAL/WILLANDALE)
- ENDE OUTLOTS
- OPEN SPACE
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT AREA

PROJECT AREA SUMMARY

COMPUTE NET PROJECT AREA	
GROSS AREA (AREA WITHIN 1000 FT OF OHW AND HAVING AN ELEVATION ABOVE OT OHW.)	79.19 AC
SUBTRACT EXISTING ROW (WILLANDALE & TERRITORIAL)	-1.44 AC
SUBTRACT PROPOSED ROW	-11.04 AC
SUBTRACT OUTLOTS TO BE DEEDED TO ENDE	-1.51 AC
NET PROJECT AREA	65.20 AC

COMPUTE PROJECT IMPERVIOUS	
PROPOSED LOT AREA	32.01 AC
PROPOSED IMPERVIOUS (50% OF LOT AREA = 32.01 X 0.5)	16.01 AC
% IMPERVIOUS (IMPERVIOUS AREA / NET PROJECT AREA = 16.01/65.20)	24.6 %
MAXIMUM IMPERVIOUS ALLOWABLE	25.0 %

COMPUTE OPEN SPACE	
PROPOSED OPEN SPACE (NET PROJECT AREA - LOT AREA)	33.17 AC
% OPEN SPACE (OPEN SPACE AREA / NET PROJECT AREA = 33.17/65.20)	50.9 %
MINIMUM OPEN SPACE REQUIRED	35.0 %

N

SCALE IN FEET
0 200 400 600
1 inch = 200 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, report or specification was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
SHORELAND OVERLAY EXHIBIT
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF

DATE
02/24/2025

REVISIONS

03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970TIER

PROJECT NO.
23970

1.3

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970TIER.dwg - 4/16/2025 01:28PM

SURVEYED PROPERTY

Scherber Parcel:

Parcel 1:
Beginning at a point on the East line of Government Three (3) distant 525 feet North 0 degrees 14 minutes 28 seconds West from the Southeast corner thereof; thence South 89 degrees 44 minutes 7 seconds West parallel with the South line thereof distant 553.53 feet; thence South 0 degrees 21 minutes East to center line of county road; thence Northwesterly along said center line to the West line thereof; thence Northerly to the Northwest corner thereof; thence along the Northerly line thereof to the Northeast corner thereof; thence Southerly to the point of beginning. Also that part of the West 30 rods of Government Lot 2 lying North of the South 53 rods thereof, except roads, in Section Twenty-one (21), Township One Hundred Twenty (120), Range Twenty-three (23), Hennepin County, State of Minnesota.

Casco Parcel:

That part of Government Lot 2 in Section 21, Township 120, Range 23, described as commencing at the Southwest corner thereof, thence South 89 degrees 48 minutes 24 seconds East, assumed bearing along the South line of Government Lot 2, a distance of 438.00 feet to the point of beginning; thence North 00 degrees 13 minutes 06 seconds East parallel to the West line of Government Lot 2, a distance of 874.50 feet; thence South 89 degrees 48 minutes 24 seconds East a distance of 57.00 feet; thence North 0 degrees 13 minutes 06 seconds East a distance of 891.00 feet, more or less, to the shore of Crowley Lake; thence Northeasterly along said shoreline a distance of 1043.00 feet, more or less, to the East line of Government Lot 2; thence South 00 degrees 20 minutes 20 seconds West along said East line to a point which is 1604.32 feet North of the Southeast corner of Government Lot 2; thence North 89 degrees 39 minutes 40 seconds West a distance of 154.63 feet; thence South 22 degrees 32 minutes 57 seconds West a distance of 930.19 feet; thence South 00 degrees 13 minutes 06 seconds West distance 744.43 feet to the South line of Government Lot 2; thence North 89 degrees 48 minutes 24 seconds West along said South line a distance of 387.00 feet to the point of beginning, Hennepin County, Minnesota.

Weber Parcel:

That part of Government Lot 1, Section 16, Township 120 North, Range 23 West, Hennepin County, Minnesota, which lies southerly of a line, and its westerly extension, described as commencing at the southeast comer of said Government Lot 1; thence northerly along the east line of said Government Lot 1, a distance of 343.00 feet to the point of beginning of the line to be described; thence westerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 440.00 feet; thence southerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 200 feet; thence westerly deflecting to the right, 90 degrees 00 minutes 00 seconds to the west line of said Government Lot 1 and said line there terminating; AND
That part of Government Lot 1, Section 21, Township 120, Range 23, Hennepin County, Minnesota , which lies northerly of a line described as commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South 00 degrees 27 minutes 31 seconds West, along the east line of said Government Lot 1, a distance of 182.88 feet to the point of beginning of the line to be described; thence South 61 degrees 03 minutes 26 seconds West a distance of 222.02 feet; thence South 67 degrees 30 minutes 11 seconds West a distance of 91.95 feet; thence South 76 degrees 13 minutes 23 seconds West a distance of 165.87 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 100.00 feet; thence South 76 degrees 59 minutes 00 seconds West a distance of 124.04 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 191.00 feet; thence South 58 degrees 41 minutes 05 seconds West a distance of 100.13 feet; thence South 51 degrees 12 minutes 52 seconds West a distance of 298.78 feet; thence South 30 degrees 17 minutes 17 seconds West a distance of 353.33 feet to a point in the west line of said Government Lot 1 which is 1604.32 feet north of the southwest corner of the Southeast Quarter of the Northeast Quarter of said Section 21, and said line there terminating.

EXISTING ZONING IS R2
PROPOSED ZONING IS PUD

TOTAL SITE AREA	±88.99 AC.
LOT AREA	35.59 AC.
–(70' WIDE LOTS)	(14.37 AC.)
–(60' WIDE LOTS)	(10.60 AC.)
–(60' WIDE VILLA LOTS)	(6.00 AC.)
–(42' WIDE CARRIAGE LOT)	(4.62 AC.)
OUTLOT AREA	±39.22 AC.
–(OPEN SPACE – OUTLOTS A–G)	(±37.04 AC.)
–(FUTURE DEVELOPMENT – OUTLOTS H–I)	(2.18 AC.)
RIGHT OF WAY AREA	14.18 AC.
–(EXISTING ROADS – WILLANDALE & TERRITORIAL)	(2.44 AC.)
–(SUBDIVISION ROADS)	(11.74 AC.)

SITE DATA

70' WIDE LOTS – 59 LOTS
(BLOCKS 1–4 & 13)
MINIMUM LOT AREA – 8,750 S.F. (70'x125')

60' WIDE LOTS – 48 LOTS
(BLOCKS 5, 6, 8, & 12 & LOTS 21–23, BLOCK 9)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

60' WIDE VILLA LOTS – 26 LOTS
(BLOCK 7 & 11)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

42' WIDE CARRIAGE LOT – 36 LOTS
(BLOCK 10, & LOTS 1–20, BLOCK 9)
MINIMUM LOT AREA – 5,460 S.F. (42'x130')

TOTAL LOT COUNT – 169 LOTS

MAXIMUM IMPERVIOUS (ALL LOTS) = 50%

MINIMUM SETBACKS – 60' & 70' WIDE STANDARD LOTS

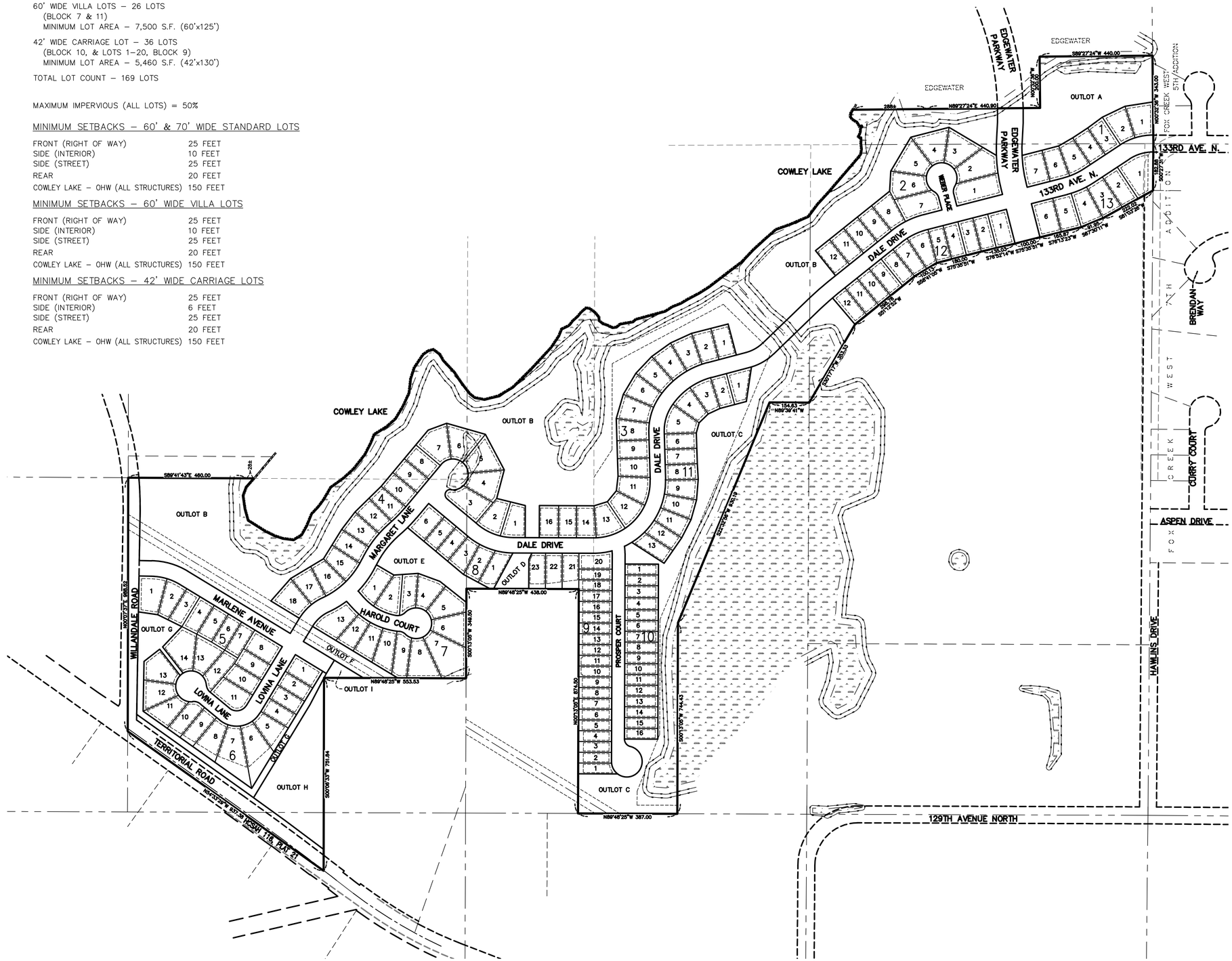
FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET

MINIMUM SETBACKS – 60' WIDE VILLA LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET

MINIMUM SETBACKS – 42' WIDE CARRIAGE LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	6 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET



N

SCALE IN FEET
0 200' 400'

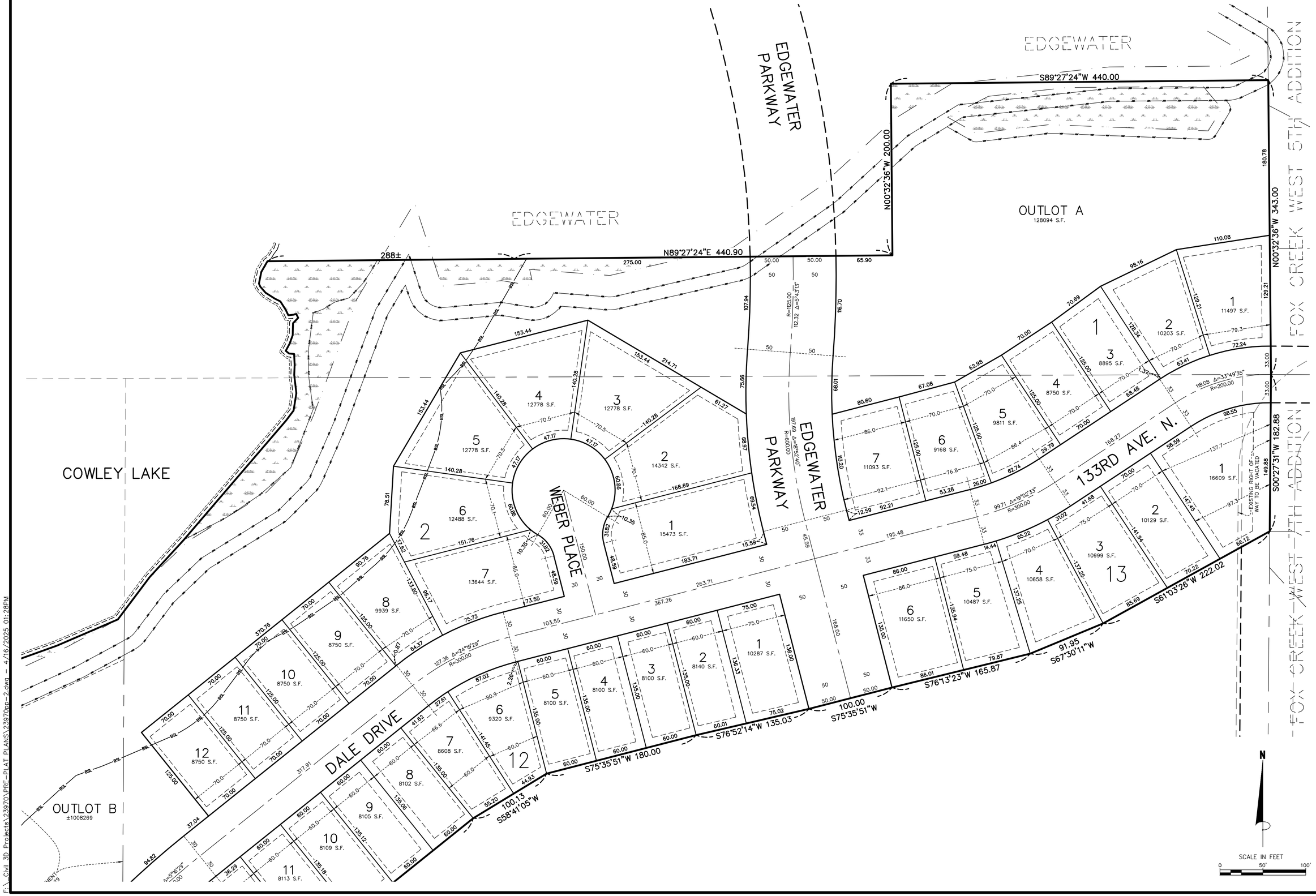
James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY PLAT
FOR
RACHEL DEVELOPMENT
4180 NAPPER COURT, ST. MICHAEL, MN 55376

DRAWN BY
PLM
DATE
2/24/2025
REVISIONS
A 04/04/25: STREET NAMES

CAD FILE
23970pp.dwg
PROJECT NO.
23970-00
2.0

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp.dwg – 4/16/2025 01:28PM



James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY PLAT
FOR
RACHEL DEVELOPMENT
4180 INNPER COURT, ST. MICHAEL, MN 55376

DRAWN BY	PLM
DATE	2/24/2025
REVISIONS	A 04/04/25: STREET NAMES
CAD FILE	23970pp-2.dwg
PROJECT NO.	23970-00
	2.1

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp-2.dwg — 4/16/2025 01:28PM

COWLEY LAKE

OUTLOT B
±1008269

OUTLOT C
343025 S.F.

DALE DRIVE

CONSERVATION EASEMENT PER DOC. NO. 10326709

CONSERVATION EASEMENT PER DOC. NO. 10326819

APPROXIMATE LOCATION OF 60' WIDE "BAND FOR ROAD AND EASEMENT" PER DOC. NO. 10326819

1	8768 S.F.	
2	9155 S.F.	
3	9757 S.F.	
4	9757 S.F.	
5	9791 S.F.	
6	10041 S.F.	
7	10245 S.F.	
8	9604 S.F.	
9	9009 S.F.	
10	10443 S.F.	
11	7500 S.F.	
1	9256 S.F.	
2	7674 S.F.	
3	8853 S.F.	
4	8750 S.F.	
5	8750 S.F.	
6	8750 S.F.	
7	8750 S.F.	
8	9939 S.F.	
9	8750 S.F.	
10	8750 S.F.	
11	8750 S.F.	
12	8750 S.F.	
1	8102 S.F.	
2	8195 S.F.	
3	8113 S.F.	
4	8109 S.F.	
5	8105 S.F.	
6	8608 S.F.	
7	9320 S.F.	
8	12488 S.F.	
12	13644 S.F.	

N89°39'41"W 154.63

S30°17'17"W 353.33

S51°12'52"W 298.78

S58°41'05"W 100.13

SCALE IN FEET
0 50' 100'

N

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA

PRELIMINARY PLAT
FOR
RACHEL DEVELOPMENT
4160 NAPPER COURT, ST. MICHAEL, MN 55376

DRAWN BY
PLM

DATE
2/24/2025

REVISIONS
A 04/04/25: STREET NAMES

CAD FILE
23970pp-2.dwg

PROJECT NO.
23970-00

2.2

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp-2.dwg - 4/16/2025 01:28PM

COWLEY LAKE

OUTLOT B
±1008269

OUTLOT C
343025 S.F.

OUTLOT D
14079 S.F.

OUTLOT E
43412 S.F.

DALE DRIVE
311.46

MARGARET LANE

PROSPER COURT

N89°39'41"W 154.63

S22°32'56"W 930.19

N89°48'25"W 438.00

SCALE IN FEET
0 50' 100'

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com www.jrhinc.com

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY PLAT
FOR
RACHEL DEVELOPMENT
4180 WAPPEN COURT, ST. MICHAEL, MN 55376

DRAWN BY
PLM

DATE
2/24/2025

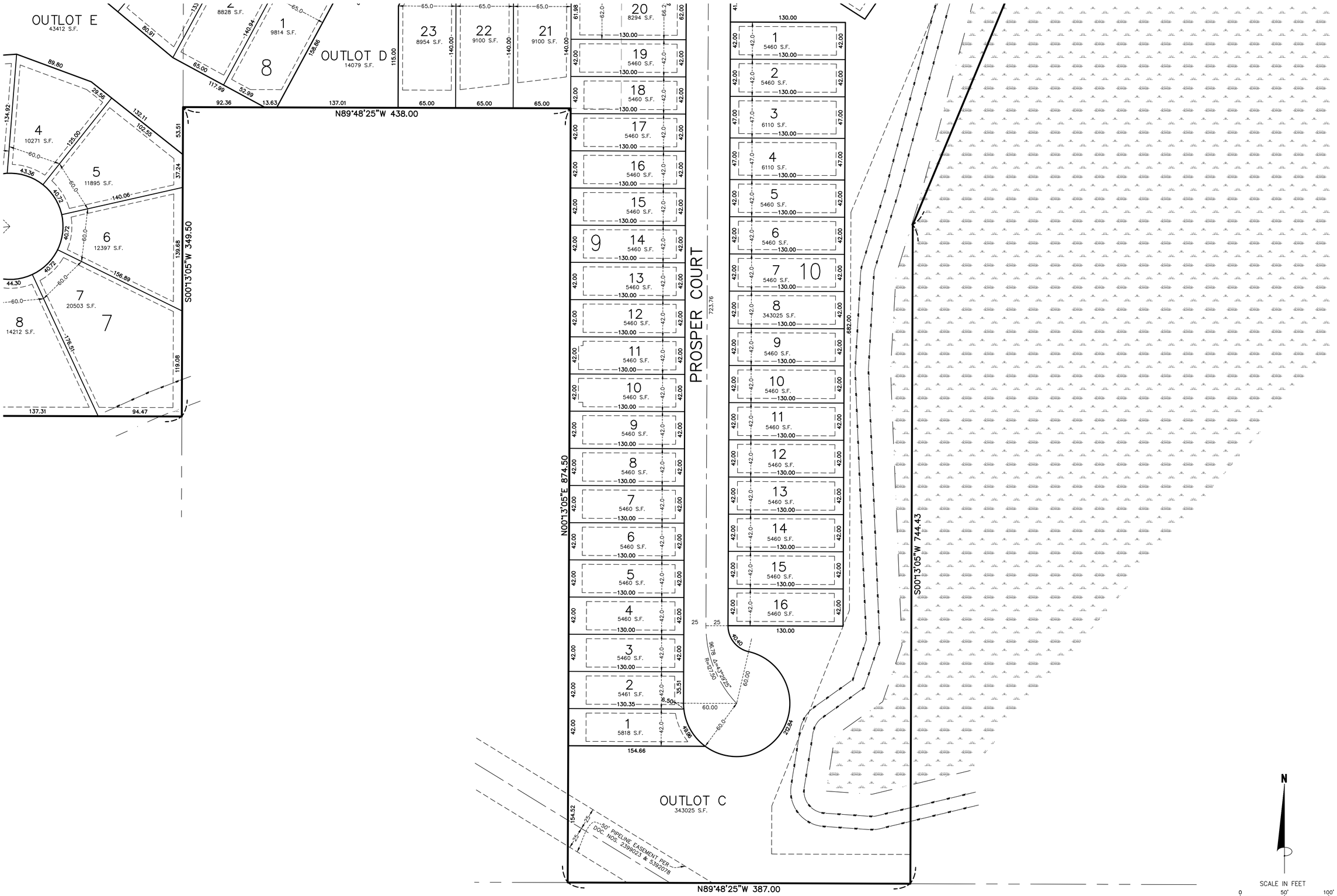
REVISIONS
A 04/04/25: STREET NAMES

CAD FILE
23970pp-2.dwg

PROJECT NO.
23970-00

2.3

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp-2.dwg - 4/16/2025 01:28PM



James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
FOR
PRELIMINARY PLAT
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	PLM
DATE	2/24/2025
REVISIONS	A 04/04/25: STREET NAMES
CAD FILE	23970pp-2.dwg
PROJECT NO.	23970-00
	2.4

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp-2.dwg - 4/16/2025 01:28PM

COWLEY LAKE

S89°41'43"E 460.00
418.44

28±

OUTLOT B
±1008269

WILLANDALE ROAD
N00°07'37"E 988.52
625.85
WILLANDALE ROAD

MARLENE AVENUE

MARGARET LANE

HAROLD COURT

LOVINA LANE

PROPOSED GASLINE CONFINEMENT EASEMENT BY OTHERS

OUTLOT E
43412 S.F.

OUTLOT F
22977

OUTLOT G
53602 S.F.

OUTLOT H
89641 S.F.

OUTLOT I
5336 S.F.

N89°48'25"W 553.53

S00°13'05"W 349.50

SCALE IN FEET
0 50' 100'

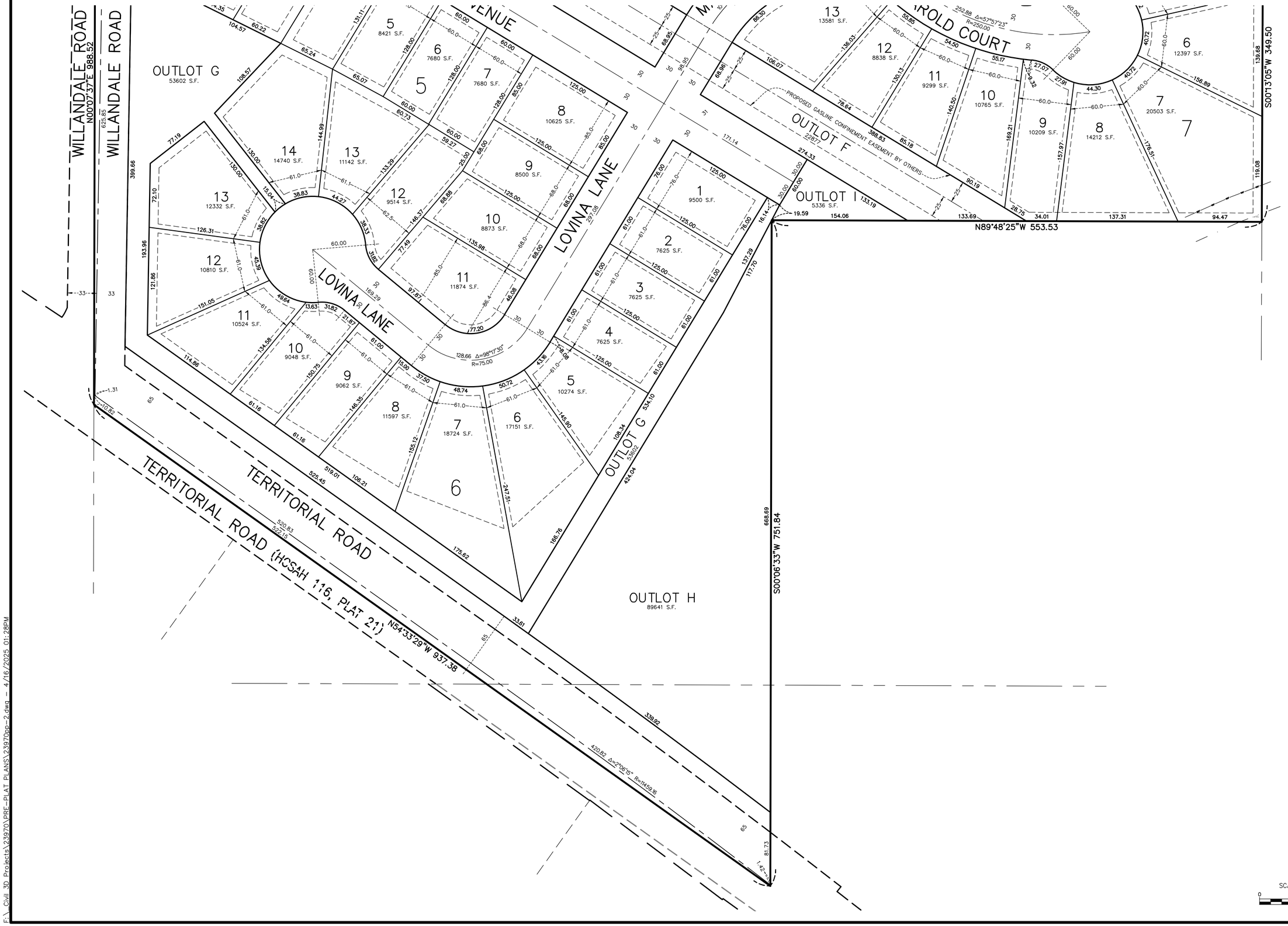
N

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY PLAT
FOR
RACHEL DEVELOPMENT
4160 NAPIER COURT, ST. MICHAEL, MN 55376

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

DRAWN BY	PLM
DATE	2/24/2025
REVISIONS	A. 04/04/25: STREET NAMES
CAD FILE	23970pp-2.dwg
PROJECT NO.	23970-00
	2.5

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp-2.dwg - 4/16/2025 01:28PM



James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY PLAT
FOR
RACHEL DEVELOPMENT
4160 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	PLM
DATE	2/24/2025
REVISIONS	A. 04/04/25: STREET NAMES
CAD FILE	23970pp-2.dwg
PROJECT NO.	23970-00
	2.6

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp-2.dwg - 4/16/2025 01:28PM

LEGEND

- EXISTING WATERMAIN
- EXISTING RAW WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING SANITARY FORCEMAIN
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING ELECTRIC OUTLET POST
- EXISTING GUY WIRE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (WATER)
- EXISTING SIGN
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING WETLAND BUFFER

- SB-1 EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND

- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW

- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED INFILTRATION BASIN
- PROPOSED SILT FENCE
- PROPOSED SILT FENCE POST CONSTRUCTION
- PROPOSED WIMCO OR EQUAL POST STORM SEWER CONSTRUCTION
- PROPOSED YARD CB INLET PROTECTION POST STORM SEWER CONSTRUCTION
- PROPOSED DITCH CHECK – POST GRADING/UTILITY CONSTRUCTION
- PROPOSED TEMPORARY ROCK CONSTRUCTION ENTRANCE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED BWSR SEED MIX 33-261
- PROPOSED BWSR SEED MIX 32-231

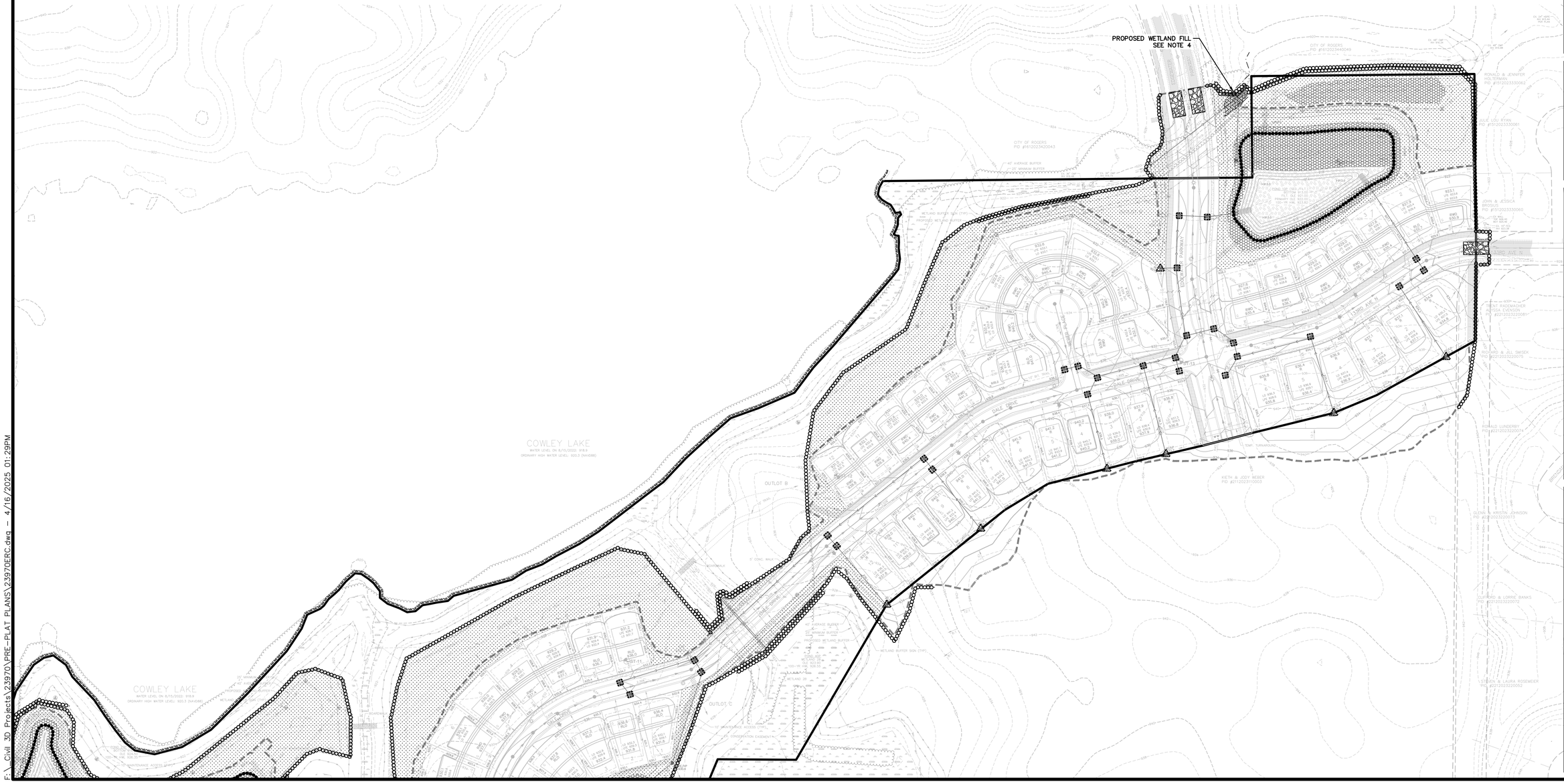
NOTES

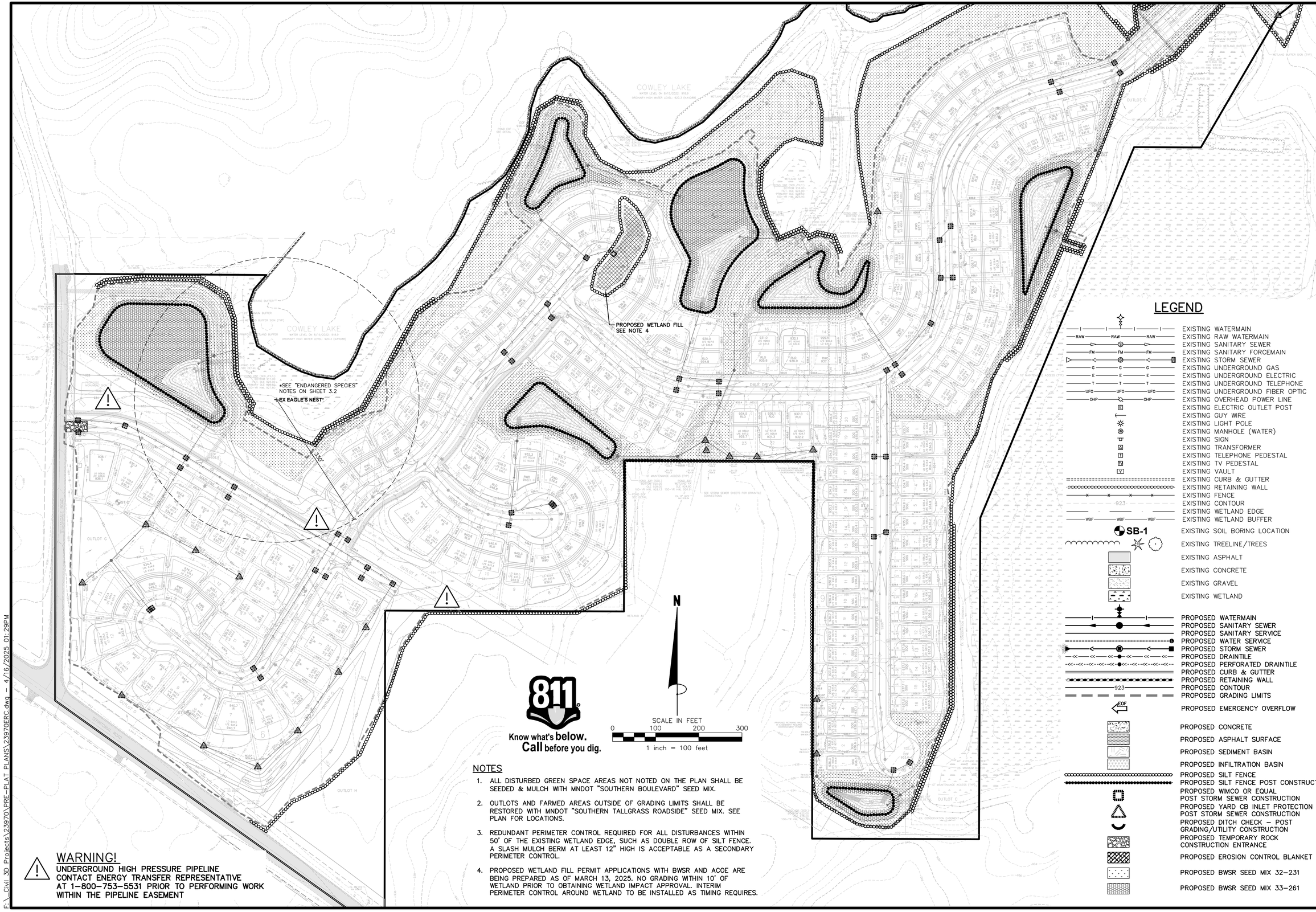
1. ALL DISTURBED GREEN SPACE AREAS NOT NOTED ON THE PLAN SHALL BE SEEDED & MULCH WITH MNDOT "SOUTHERN BOULEVARD" SEED MIX.
2. OUTLOTS AND FARMED AREAS OUTSIDE OF GRADING LIMITS SHALL BE RESTORED WITH MNDOT "SOUTHERN TALLGRASS ROADSIDE" SEED MIX. SEE PLAN FOR LOCATIONS.
3. REDUNDANT PERIMETER CONTROL REQUIRED FOR ALL DISTURBANCES WITHIN 50' OF THE EXISTING WETLAND EDGE, SUCH AS DOUBLE ROW OF SILT FENCE. A SLASH MULCH BERM AT LEAST 12" HIGH IS ACCEPTABLE AS A SECONDARY PERIMETER CONTROL.
4. PROPOSED WETLAND FILL PERMIT APPLICATIONS WITH BWSR AND ACOE ARE BEING PREPARED AS OF MARCH 13, 2025. NO GRADING WITHIN 10' OF WETLAND PRIOR TO OBTAINING WETLAND IMPACT APPROVAL. INTERIM PERIMETER CONTROL AROUND WETLAND TO BE INSTALLED AS TIMING REQUIRES.

811 Know what's below. Call before you dig.

N

SCALE IN FEET
0 100 200 300
1 inch = 100 feet


PROPOSED WETLAND FILL
SEE NOTE 4
COWLEY LAKE
WATER LEVEL ON 8/15/2022: 918.9'
ORDINARY HIGH WATER LEVEL: 920.3 (NAVD88)
OUTLOT B
OUTLOT C
GALE DRIVE
LARSO AVENUE
CITY OF ROGERS
PID #160200340049
PID #160200340060
PID #160200330060
PID #160200330050
PID #160200320043
PID #171202332060
PID #171202332075
PID #171202332074
PID #171202332082
PID #171202311003
PID #171202332053
PID #171202332052
PID #171202332051
PID #171202332050
PID #171202332040
PID #171202332030
PID #171202332020
PID #171202332010
PID #171202331010
PID #171202331020
PID #171202331030
PID #171202331040
PID #171202331050
PID #171202331060
PID #171202331070
PID #171202331080
PID #171202331090
PID #171202331100
PID #171202331110
PID #171202331120
PID #171202331130
PID #171202331140
PID #171202331150
PID #171202331160
PID #171202331170
PID #171202331180
PID #171202331190
PID #171202331200
PID #171202331210
PID #171202331220
PID #171202331230
PID #171202331240
PID #171202331250
PID #171202331260
PID #171202331270
PID #171202331280
PID #171202331290
PID #171202331300
PID #171202331310
PID #171202331320
PID #171202331330
PID #171202331340
PID #171202331350
PID #171202331360
PID #171202331370
PID #171202331380
PID #171202331390
PID #171202331400
PID #171202331410
PID #171202331420
PID #171202331430
PID #171202331440
PID #171202331450
PID #171202331460
PID #171202331470
PID #171202331480
PID #171202331490
PID #171202331500
PID #171202331510
PID #171202331520
PID #171202331530
PID #171202331540
PID #171202331550
PID #171202331560
PID #171202331570
PID #171202331580
PID #171202331590
PID #171202331600
PID #171202331610
PID #171202331620
PID #171202331630
PID #171202331640
PID #171202331650
PID #171202331660
PID #171202331670
PID #171202331680
PID #171202331690
PID #171202331700
PID #171202331710
PID #171202331720
PID #171202331730
PID #171202331740
PID #171202331750
PID #171202331760
PID #171202331770
PID #171202331780
PID #171202331790
PID #171202331800
PID #171202331810
PID #171202331820
PID #171202331830
PID #171202331840
PID #171202331850
PID #171202331860
PID #171202331870
PID #171202331880
PID #171202331890
PID #171202331900
PID #171202331910
PID #171202331920
PID #171202331930
PID #171202331940
PID #171202331950
PID #171202331960
PID #171202331970
PID #171202331980
PID #171202331990
PID #171202332000
PID #171202332010
PID #171202332020
PID #171202332030
PID #171202332040
PID #171202332050
PID #171202332060
PID #171202332070
PID #171202332080
PID #171202332090
PID #171202332100
PID #171202332110
PID #171202332120
PID #171202332130
PID #171202332140
PID #171202332150
PID #171202332160
PID #171202332170
PID #171202332180
PID #171202332190
PID #171202332200
PID #171202332210
PID #171202332220
PID #171202332230
PID #171202332240
PID #171202332250
PID #171202332260
PID #171202332270
PID #171202332280
PID #171202332290
PID #171202332300
PID #171202332310
PID #171202332320
PID #171202332330
PID #171202332340
PID #171202332350
PID #171202332360
PID #171202332370
PID #171202332380
PID #171202332390
PID #171202332400
PID #171202332410
PID #171202332420
PID #171202332430
PID #171202332440
PID #171202332450
PID #171202332460
PID #171202332470
PID #171202332480
PID #171202332490
PID #171202332500
PID #171202332510
PID #171202332520
PID #171202332530
PID #171202332540
PID #171202332550
PID #171202332560
PID #171202332570
PID #171202332580
PID #171202332590
PID #171202332600
PID #171202332610
PID #171202332620
PID #171202332630
PID #171202332640
PID #171202332650
PID #171202332660
PID #171202332670
PID #171202332680
PID #171202332690
PID #171202332700
PID #171202332710
PID #171202332720
PID #171202332730
PID #171202332740
PID #171202332750
PID #171202332760
PID #171202332770
PID #171202332780
PID #171202332790
PID #171202332800
PID #171202332810
PID #171202332820
PID #171202332830
PID #171202332840
PID #171202332850
PID #171202332860
PID #171202332870
PID #171202332880
PID #171202332890
PID #171202332900
PID #171202332910
PID #171202332920
PID #171202332930
PID #171202332940
PID #171202332950
PID #171202332960
PID #171202332970
PID #171202332980
PID #171202332990
PID #171202333000
PID #171202333010
PID #171202333020
PID #171202333030
PID #171202333040
PID #171202333050
PID #171202333060
PID #171202333070
PID #171202333080
PID #171202333090
PID #171202333100
PID #171202333110
PID #171202333120
PID #171202333130
PID #171202333140
PID #171202333150
PID #171202333160
PID #171202333170
PID #171202333180
PID #171202333190
PID #171202333200
PID #171202333210
PID #171202333220
PID #171202333230
PID #171202333240
PID #171202333250
PID #171202333260
PID #171202333270
PID #171202333280
PID #171202333290
PID #171202333300
PID #171202333310
PID #171202333320
PID #171202333330
PID #171202333340
PID #171202333350
PID #171202333360
PID #171202333370
PID #171202333380
PID #171202333390
PID #171202333400
PID #171202333410
PID #171202333420
PID #171202333430
PID #171202333440
PID #171202333450
PID #171202333460
PID #171202333470
PID #171202333480
PID #171202333490
PID #171202333500
PID #171202333510
PID #171202333520
PID #171202333530
PID #171202333540
PID #171202333550
PID #171202333560
PID #171202333570
PID #171202333580
PID #171202333590
PID #171202333600
PID #171202333610
PID #171202333620
PID #171202333630
PID #171202333640
PID #171202333650
PID #171202333660
PID #171202333670
PID #171202333680
PID #171202333690
PID #171202333700
PID #171202333710
PID #171202333720
PID #171202333730
PID #171202333740
PID #171202333750
PID #171202333760
PID #171202333770
PID #171202333780
PID #171202333790
PID #171202333800
PID #171202333810
PID #171202333820
PID #171202333830
PID #171202333840
PID #171202333850
PID #171202333860
PID #171202333870
PID #171202333880
PID #171202333890
PID #171202333900
PID #171202333910
PID #171202333920
PID #171202333930
PID #171202333940
PID #171202333950
PID #171202333960
PID #171202333970
PID #171202333980
PID #171202333990
PID #171202334000
PID #171202334010
PID #171202334020
PID #171202334030
PID #171202334040
PID #171202334050
PID #171202334060
PID #171202334070
PID #171202334080
PID #171202334090
PID #171202334100
PID #171202334110
PID #171202334120
PID #171202334130
PID #171202334140
PID #171202334150
PID #171202334160
PID #171202334170
PID #171202334180
PID #171202334190
PID #171202334200
PID #171202334210
PID #171202334220
PID #171202334230
PID #171202334240
PID #171202334250
PID #171202334260
PID #171202334270
PID #171202334280
PID #171202334290
PID #171202334300
PID #171202334310
PID #171202334320
PID #171202334330
PID #171202334340
PID #171202334350
PID #171202334360
PID #171202334370
PID #171202334380
PID #171202334390
PID #171202334400
PID #171202334410
PID #171202334420
PID #171202334430
PID #171202334440
PID #171202334450
PID #171202334460
PID #171202334470
PID #171202334480
PID #171202334490
PID #171202334500
PID #171202334510
PID #171202334520
PID #171202334530
PID #171202334540
PID #171202334550
PID #171202334560
PID #171202334570
PID #171202334580
PID #171202334590
PID #171202334600
PID #171202334610
PID #171202334620
PID #171202334630
PID #171202334640
PID #171202334650
PID #171202334660
PID #171202334670
PID #171202334680
PID #171202334690
PID #171202334700
PID #171202334710
PID #171202334720
PID #171202334730
PID #171202334740
PID #171202334750
PID #171202334760
PID #171202334770
PID #171202334780
PID #171202334790
PID #171202334800
PID #171202334810
PID #171202334820
PID #171202334830
PID #171202334840
PID #171202334850
PID #171202334860
PID #171202334870
PID #171202334880
PID #171202334890
PID #171202334900
PID #171202334910
PID #171202334920
PID #171202334930
PID #171202334940
PID #171202334950
PID #171202334960
PID #171202334970
PID #171202334980
PID #171202334990
PID #171202335000
PID #171202335010
PID #171202335020
PID #171202335030
PID #171202335040
PID #171202335050
PID #171202335060
PID #171202335070
PID #171202335080
PID #171202335090
PID #171202335100
PID #171202335110
PID #171202335120
PID #171202335130
PID #171202335140
PID #171202335150
PID #171202335160
PID #171202335170
PID #171202335180
PID #171202335190
PID #171202335200
PID #171202335210
PID #171202335220
PID #171202335230
PID #171202335240
PID #171202335250
PID #171202335260
PID #171202335270
PID #171202335280
PID #171202335290
PID #171202335300
PID #171202335310
PID #171202335320
PID #171202335330
PID #171202335340
PID #171202335350
PID #171202335360
PID #171202335370
PID #171202335380
PID #171202335390
PID #171202335400
PID #171202335410
PID #171202335420
PID #171202335430
PID #171202335440
PID #171202335450
PID #171202335460
PID #171202335470
PID #171202335480
PID #171202335490
PID #171202335500
PID #171202335510
PID #171202335520
PID #171202335530
PID #171202335540
PID #171202335550
PID #171202335560
PID #171202335570
PID #171202335580
PID #171202335590
PID #171202335600
PID #171202335610
PID #171202335620
PID #171202335630
PID #171202335640
PID #171202335650
PID #171202335660
PID #171202335670
PID #171202335680
PID #171202335690
PID #171202335700
PID #171202335710
PID #171202335720
PID #171202335730
PID #171202335740
PID #171202335750
PID #171202335760
PID #171202335770
PID #171202335780
PID #171202335790
PID #171202335800
PID #171202335810
PID #171202335820
PID #171202335830
PID #171202335840
PID #171202335850
PID #171202335860
PID #171202335870
PID #171202335880
PID #171202335890
PID #171202335900
PID #171202335910
PID #171202335920
PID #171202335930
PID #171202335940
PID #171202335950
PID #171202335960
PID #171202335970
PID #171202335980
PID #171202335990
PID #171202336000
PID #171202336010
PID #171202336020
PID #171202336030
PID #171202336040
PID #171202336050
PID #171202336060
PID #171202336070
PID #171202336080
PID #171202336090
PID #171202336100
PID #171202336110
PID #171202336120
PID #171202336130
PID #171202336140
PID #171202336150
PID #171202336160
PID #171202336170
PID #171202336180
PID #171202336190
PID #171202336200
PID #171202336210
PID #171202336220
PID #171202336230
PID #171202336240
PID #171202336250
PID #171202336260
PID #171202336270
PID #171202336280
PID #171202336290
PID #171202336300
PID #171202336310
PID #171202336320
PID #171202336330
PID #171202336340
PID #171202336350
PID #171202336360
PID #171202336370
PID #171202336380
PID #171202336390
PID #171202336400
PID #171202336410
PID #171202336420
PID #171202336430
PID #171202336440
PID #171202336450
PID #171202336460
PID #171202336470
PID #171202336480
PID #171202336490
PID #171202336500
PID #171202336510
PID #171202336520
PID #171202336530
PID #171202336540
PID #171202336550
PID #171202336560
PID #171202336570
PID #171202336580
PID #171202336590
PID #171202336600
PID #171202336610
PID #171202336620
PID #171202336630
PID #171202336640
PID #171202336650
PID #171202336660
PID #171202336670
PID #171202336680
PID #171202336690
PID #171202336700
PID #171202336710
PID #171202336720
PID #171202336730
PID #171202336740
PID #171202336750
PID #171202336760
PID #171202336770
PID #171202336780
PID #171202336790
PID #171202336800
PID #171202336810
PID #171202336820
PID #171202336830
PID #171202336840
PID #171202336850
PID #171202336860
PID #171202336870
PID #171202336880
PID #171202336890
PID #171202336900
PID #171202336910
PID #171202336920
PID #171202336930
PID #171202336940
PID #171202336950
PID #171202336960
PID #171202336970
PID #171202336980
PID #171202336990
PID #171202337000
PID #171202337010
PID #171202337020
PID #171202337030
PID #171202337040
PID #171202337050
PID #171202337060
PID #171202337070
PID #171202337080
PID #171202337090
PID #171202337100
PID #171202337110
PID #171202337120
PID #171202337130
PID #171202337140
PID #171202337150
PID #171202337160
PID #171202337170
PID #171202337180
PID #171202337190
PID #171202337200
PID #171202337210
PID #171202337220
PID #171202337230
PID #171202337240
PID #171202337250
PID #171202337260
PID #171202337270
PID #171202337280
PID #171202337290
PID #171202337300
PID #171202337310
PID #171202337320
PID #171202337330
PID #171202337340
PID #171202337350
PID #171202337360
PID #171202337370
PID #171202337380
PID #171202337390
PID #171202337400
PID #171202337410
PID #171202337420
PID #171202337430
PID #171202337440
PID #171202337450
PID #171202337460
PID #171202337470
PID #171202337480
PID #171202337490
PID #171202337500
PID #171202337510
PID #171202337520
PID #171202337530
PID #171202337540
PID #171202337550
PID #171202337560
PID #171202337570
PID #171202337580
PID #171202337590
PID #171202337600
PID #171202337610
PID #171202337620
PID #171202337630
PID #171202337640
PID #171202337650
PID #171202337660
PID #171202337670
PID #171202337680
PID #171202337690
PID #171202337700
PID #171202337710
PID #171202337720
PID #171202337730
PID #171202337740
PID #171202337750
PID #171202337760
PID #171202337770
PID #171202337780
PID #171202337790
PID #171202337800
PID #171202337810
PID #171202337820
PID #171202337830
PID #171202337840
PID #171202337850
PID #171202337860
PID #171202337870
PID #171202337880
PID #171202337890
PID #171202337900
PID #171202337910
PID #171202337920
PID #171202337930
PID #171202337940
PID #171202337950
PID #171202337960
PID #171202337970
PID #171202337980
PID #171202337990
PID #171202338000
PID #171202338010
PID #171202338020
PID #171202338030
PID #171202338040
PID #171202338050
PID #171202338060
PID #171202338070
PID #171202338080
PID #171202338090
PID #171202338100
PID #171202338110
PID #171202338120
PID #171202338130
PID #171202338140
PID #171202338150
PID #171202338160
PID #171202338170
PID #171202338180
PID #171202338190
PID #171202338200
PID #171202338210
PID #171202338220
PID #171202338230
PID #171202338240
PID #171202338250
PID #171202338260
PID #171202338270
PID #171202338280
PID #171202338290
PID #171202338300
PID #171202338310
PID #171202338320
PID #171202338330
PID #171202338340
PID #171202338350
PID #171202338360
PID #171202338370
PID #171202338380
PID #171202338390
PID #171202338400
PID #171202338410
PID #171202338420
PID #171202338430
PID #171202338440
PID #171202338450
PID #171202338460
PID #171202338470
PID #171202338480
PID #171202338490
PID #171202338500
PID #171202338510
PID #171202338520
PID #171202338530
PID #171202338540
PID #171202338550
PID #171202338560
PID #171202338570
PID #171202338580
PID #171202338590
PID #171202338600
PID #171202338610
PID #171202338620
PID #171202338630
PID #171202338640
PID #171202338650
PID #171202338660
PID #171202338670
PID #171202338680
PID #171202338690
PID #171202338700
PID #171202338710
PID #171202338720
PID #171202338730
PID #171202338740
PID #171202338750
PID #171202338760
PID #171202338770
PID #171202338780
PID #171202338790
PID #171202338800
PID #171202338810
PID #171202338820
PID #171202338830
PID #171202338840
PID #171202338850
PID #171202338860
PID #171202338870
PID #171202338880
PID #171202338890
PID #171202338900
PID #171202338910
PID #171202338920
PID #171202338930
PID #171202338940
PID #171202338950
PID #171202338960
PID #171202338970
PID #171202338980
PID #171202338990
PID #171202339000
PID #171202339010
PID #171202339020
PID #171202339030
PID #171202339040
PID #171202339050
PID #171202339060
PID #171202339070
PID #171202339080
PID #171202339090
PID #171202339100
PID #171202339110
PID #171202339120
PID #171202339130
PID #171202339140
PID #171202339150
PID #171202339160
PID #171202339170
PID #171202339180
PID #171202339190
PID #171202339200
PID #171202339210
PID #171202339220
PID #171202339230
PID #171202339240
PID #171202339250
PID #171202339260
PID #171202339270
PID #171202339280
PID #171202339290
PID #171202339300
PID #171202339310
PID #171202339320
PID #171202339330
PID #171202339340
PID #171202339350
PID #171202339360
PID #171202339370
PID #171202339380
PID #171202339390
PID #171202339400
PID #171202339410
PID #171202339420
PID #171202339430
PID #171202339440
PID #171202339450
PID #171202339460
PID #171202339470
PID #171202339480
PID #171202339490
PID #171202339500
PID #171202339510
PID #171202339520
PID #171202339530
PID #171202339540
PID #171202339550
PID #171202339560
PID #171202339570
PID #171202339580
PID #171202339590
PID #171202339600
PID #171202339610
PID #171202339620
PID #171202339630
PID #171202339640
PID #171202339650
PID #171202339660
PID #171202339670
PID #171202339680
PID #171202339690
PID #171202339700
PID #171202339710
PID #171202339720
PID #171202339730
PID #171202339740
PID #171202339750
PID #171202339760
PID #171202339770
PID #171202339780
PID #171202339790
PID #171202339800
PID #171202339810
PID #171202339820
PID #171202339830
PID #171202339840
PID #171202339850
PID #171202339860
PID #171202339870
PID #171202339880
PID #171202339890
PID #171202339900
PID #171202339910
PID #171202339920
PID #171202339930
PID #171202339940
PID #171202339950
PID #171202339960
PID #171202339970
PID #171202339980
PID #171202339990
PID #171202340000
PID #171202340010
PID #171202340020
PID #171202340030
PID #171202340040
PID #171202340050
PID #171202340060
PID #171202340070
PID #171202340080
PID #171202340090
PID #171202340100
PID #171202340110
PID #171202340120
PID #171202340130
PID #171202340140
PID #171202340150
PID #171202340160
PID #171202340170
PID #171202340180
PID #171202340190
PID #171202340200
PID #171202340210
PID #171202340220
PID #171202340230
PID #171202340240
PID #171202340250
PID #171202340260
PID #171202340270
PID #171202340280
PID #171202340290
PID #171202340300
PID #171202340310
PID #171202340320
PID #171202340330
PID #171202340340
PID #171202340350
PID #171202340360
PID #171202340370
PID #171202340380
PID #171202340390
PID #171202340400
PID #171202340410
PID #171202340420
PID #171202340430
PID #171202340440
PID #171202340450
PID #171202340460
PID #171202340470
PID #171202340480
PID #171202340490
PID #171202340500
PID #171202340510
PID #171202340520
PID #171202340530
PID #171202340540
PID #171202340550
PID #171202340560
PID #171202340570
PID #171202340580
PID #171202340590
PID #171202340600
PID #171202340610
PID #171202340620
PID #171202340630
PID #171202340640
PID #171202340650
PID #171202340660
PID #171202340670
PID #171202340680
PID #171202340690
PID #171202340700
PID #171202340710
PID #171202340720
PID #171202340730
PID #171202340740
PID #171202340750
PID #171202340760
PID #171202340770
PID #171202340780
PID #171202340790
PID #171202340800
PID #171202340810
PID #171202340820
PID #171202340830
PID #171202340840
PID #171202340850
PID #171202340860
PID #171202340870
PID #171202340880
PID #171202340890
PID #171202340900
PID #171202340910
PID #171202340920
PID #171202340930
PID #171202340940
PID #171202340950
PID #171202340960
PID #171202340970
PID #171202340980
PID #171202340990
PID #171202341000
PID #171202341010
PID #171202341020
PID #171202341030
PID #171202341040
PID #171202341050
PID #171202341060
PID #171202341070
PID #171202341080
PID #171202341090
PID #171202341100
PID #171202341110
PID #171202341120
PID #171202341130
PID #171202341140
PID #171202341150
PID #171202341160
PID #171202341170
PID #171202341180
PID #171202341190
PID #171202341200
PID #171202341210
PID #171202341220
PID #171202341230
PID #171202341240
PID #171202341250
PID #171202341260
PID #171202341270
PID #171202341280
PID #171202341290
PID #171202341300
PID #171202341310
PID #171202341320
PID #171202341330
PID #171202341340
PID #171202341350
PID #171202341360
PID #171202341370
PID #171202341380
PID #171202341390
PID #171202341400
PID #171202341410
PID #171202341420
PID #171202341430
PID #171202341440
PID #171202341450
PID #171202341460
PID #171202341470
PID #171202341480
PID #171202341490
PID #171202341500
PID #171202341510
PID #171202341520
PID #171202341530
PID #171202341540
PID #171202341550
PID #171202341560
PID #171202341570
PID #171202341580
PID #171202341590
PID #171202341600
PID #171202341610
PID #171202341620
PID #171202341630
PID #171202341640
PID #171202341650
PID #171202341660
PID #171202341670
PID #171202341680
PID #171202341690
PID #171202341700
PID #171202341710
PID #171202341720
PID #171202341730
PID #171202341740
PID #171202341750
PID #171202341760
PID #171202341770
PID #171202341780
PID #171202341790
PID #171202341800
PID #171202341810
PID #171202341820
PID #171202341830
PID #171202341840
PID #171202341850
PID #171202341860
PID #171202341870
PID #171202341880
PID #171202341890
PID #171202341900
PID #171202341910
PID #171202341920
PID #171202341930
PID #171202341940
PID #171202341950
PID #171202341960
PID #171202341970
PID #171202341980
PID #171202341990
PID #171202342000
PID #171202342010
PID #171202342020
PID #171202342030
PID #171202342040
PID #171202342050
PID #171202342060
PID #171202342070
PID #171202342080
PID #171202342090
PID #171202342100
PID #171202342110
PID #171202342120
PID #171202342130
PID #171202342140
PID #171202342150
PID #171202342160
PID #171202342170
PID #171202342180
PID #171202342190
PID #171202342200
PID #171202342210
PID #171202342220
PID #171202342230
PID #171202342240
PID #171202342250
PID #171202342260
PID #171202342270
PID #171202342280
PID #171202342290
PID #171202342300
PID #171202342310
PID #171202342320
PID #171202342330
PID #171202342340
PID #171202342350
PID #171202342360
PID #171202342370
PID #171202342380
PID #171202342390
PID #171202342400
PID #171202342410
PID #171202342420
PID #171202342430
PID #171202342440
PID #171202342450
PID #171202342460
PID #171202342470
PID #171202342480
PID #171202342490
PID #171202342500
PID #171202342510
PID #171202342520
PID #171202342530
PID #171202342540
PID #171202342550
PID #171202342560
PID #171202342570
PID #171202342580
PID #171202342590
PID #171202342600
PID #171202342610
PID #171202342620
PID #171202342630
PID #171202342640
PID #171202342650
PID #171202342660
PID #171202342670
PID #171202342680
PID #171202342690
PID #171202342700
PID #171202342710
PID #171202342720
PID #171202342730
PID #171202342740
PID #171202342750
PID #171202342760
PID #171202342770
PID #171202342780
PID #171202342790
PID #171202342800
PID #171202342810
PID #171202342820
PID #171202342830
PID #171202342840
PID #171202342850
PID #171202342860
PID #171202342870
PID #171202342880
PID #171202342890
PID #171202342900
PID #171202342910
PID #171202342920
PID #171202342930
PID #171202342940
PID #171202342950
PID #171202342960
PID #171202342970
PID #171202342980
PID #171202342990
PID #171202343000
PID #171202343010
PID #171202343020
PID #171202343030
PID #171202343040
PID #171202343050
PID #171202343060
PID #171202343070
PID #171202343080
PID #171202343090
PID #171202343100
PID #171202343110
PID #171202343120
PID #171202343130
PID #171202343140
PID #171202343150
PID #171202343160
PID #171202343170
PID #171202343180
PID #171202343190
PID #171202343200
PID #171202343210
PID #171202343220
PID #171202343230
PID #171202343240
PID #171202343250
PID #171202343260
PID #171202343270
PID #171202343280
PID #171202343290
PID #171202343300
PID #171202343310
PID #171202343320
PID #171202343330
PID #171202343340
PID #171202343350
PID #171202343360
PID #171202343370
PID #171202343380
PID #171202343390
PID #171202343400
PID #171202343410
PID #171202343420
PID #171202343430
PID #171202343440
PID #171202343450
PID #171202343460
PID #171202343470
PID #171202343480
PID #171202343490
PID #171202343500
PID #171202343510
PID #171202343520
PID #171202343530
PID #171202343540
PID #171202343550
PID #171202343560
PID #171202343570
PID #171202343580
PID #171202343590
PID #171202343600
PID #171202343610
PID #171202343620
PID #171202343630
PID #171202343640
PID #171202343650
PID #171202343660
PID #171202343670
PID #171202343680
PID #171202343690
PID #171202343700
PID #171202343710
PID #171202343720
PID #171202343730
PID #171202343740
PID #171202343750
PID #171202343760
PID #171202343770
PID #171202343780
PID #171202343790
PID #171202343800
PID #171202343810
PID #171202343820
PID #171202343830
PID #171202343840
PID #171202343850
PID #171202343860
PID #171202343870
PID #171202343880
PID #171202343890
PID #171202343900
PID #171202343910
PID #171202343920
PID #171202343930
PID #171202343940
PID #171202343950
PID #171202343960
PID #171202343970
PID #171202343980
PID #171202343990
PID #171202344000
PID #171202344010
PID #171202344020
PID #171202344030
PID #171202344040
PID #171202344050
PID #171202344060
PID #171202344070
PID #171202344080
PID #171202344090
PID #171202344100
PID #171202344110
PID #171202344120
PID #171202344130
PID #171202344140
PID #171202344150
PID #171202344160
PID #171202344170
PID #171202344180
PID #171202344190
PID #171202344200
PID #171202344210
PID #171202344220
PID #171202344230
PID #171202344240
PID #171202344250
PID #171202344260
PID #171202344270
PID #171202344280
PID #171202344290
PID #171202344300
PID #171202344310
PID #171202344320
PID #171202344330
PID #171202344340
PID #171202344350
PID #171202344360
PID #171202344370
PID #171202344380
PID #171202344390
PID #171202344400
PID #171202344410
PID #171202344420
PID #171202344430
PID #171202344440
PID #171202344450
PID #171202344460
PID #171202344470
PID #171202344480
PID #171202344490
PID #171202344500
PID #171202344510
PID #171202344520
PID #171202344530
PID #171202344540
PID #171202344550
PID #171202344560
PID #171202344570
PID #171202344580
PID #171202344590
PID #171202344600
PID #171202344610
PID #171202344620
PID #171202344630
PID #171202344640
PID #171202344650
PID #171202344660
PID #171202344670
PID #171202344680
PID #171202344690
PID #171202344700
PID #171202344710
PID #171202344720
PID #171202344730
PID #171202344740
PID #171202344750
PID #171202344760
PID #171202344770
PID #171202344780
PID #171202344790
PID #171202344800
PID #171202344810
PID #171202344820
PID #171202344830
PID #171202344840
PID #171202344850
PID #171202344860
PID #171202344870
PID #171202344880
PID #171202344890
PID #171202344900
PID #171202344910
PID #171202344920
PID #171202344930
PID #171202344940
PID #171202344950
PID #171202344960
PID #171202344970
PID #171202344980
PID #171202344990
PID #171202345000
PID #171202345010
PID #171202345020
PID #171202345030
PID #171202345040
PID #171202345050
PID #171202345060
PID #171202345070
PID #171202345080
PID #171202345090
PID #171202345100
PID #171202345110
PID #171202345120
PID #171202345130
PID #171202345140
PID #171202345150
PID #171202345160
PID #171202345170
PID #171202345180
PID #171202345190
PID #171202345200
PID #171202345210
PID #171202345220
PID #171202345230
PID #171202345240
PID #171202345250
PID #171202345260
PID #171202345270
PID #171202345280
PID #171202345290
PID #171202345300
PID #171202345310
PID #171202345320
PID #171202345330
PID #171202345340
PID #171202345350
PID #171202345360
PID #171202345370
PID #171202345380
PID #171202345390
PID #171202345400
PID #171202345410
PID #171202345420
PID #171202345430
PID #171202345440
PID #171202345450
PID #171202345460
PID #171202345470
PID #171202345480
PID #171202345490
PID #171202345500
PID #171202345510
PID #171202345520
PID #171202345530
PID #171202345540
PID #171202345550
PID #171202345560
PID #171202345570
PID #171202345580
PID #171202345590
PID #171202345600
PID #171202345610
PID #171202345620
PID #171202345630
PID #171202345640
PID #171202345650
PID #171202345660
PID #171202345670
PID #171202345680
PID #171202345690
PID #171202345700
PID #171202345710
PID #171202345720
PID #171202345730
PID #171202345740
PID #171202345750
PID #171202345760
PID #171202345770
PID #171202345780
PID #171202345790
PID #171202345800
PID #171202345810
PID #171202345820
PID #171202345830
PID #171202345840
PID #171202345850
PID #171202345860
PID #171202345870
PID #171202345880
PID #171202345890
PID #171202345900
PID #171202345910
PID #171202345920
PID #171202345930
PID #171202345940
PID #171202345950
PID #171202345960
PID #171202345970
PID #171202345980
PID #171202345990
PID #171202346000
PID #171202346010
PID #171202346020
PID #171202346030
PID #171202346040
PID #171202346050
PID #171202346060
PID #171202346070
PID #171202346080
PID #171202346090
PID #171202346100
PID #171202346110
PID #171202346120
PID #171202346130
PID #171202346140
PID #171202346150
PID #171202346160
PID #171202346170
PID #171202346180
PID #171202346190
PID #171202346200
PID #171202346210
PID #171202346220
PID #171202346230
PID #171202346240
PID #171202346250
PID #171202346260
PID #171202346270
PID #171202346280
PID #171202346290
PID #171202346300
PID #171202346310
PID #171202346320
PID #171202346330
PID #171202346340
PID #171202346350
PID #171202346360
PID #171202346370
PID #171202346380
PID #171202346390
PID #171202346400
PID #171202346410
PID #171202346420
PID #171202346430
PID #171202346440
PID #171202346450
PID #171202346460
PID #171202346470
PID #171202346480
PID #171202346490
PID #171202346500
PID #171202346510
PID #171202346520
PID #171202346530
PID #171202346540
PID #171202346550
PID #171202346560
PID #171202346570
PID #171202346580
PID #171202346590
PID #171202346600
PID #171202346610
PID #171202346620
PID #171202346630
PID #171202346640
PID #171202346650
PID #171202346660
PID #171202346670
PID #171202346680
PID #171202346690
PID #171202346700
PID #171202346710
PID #171202346720
PID #171202346730
PID #171202346740
PID #171202346750
PID #171202346760
PID #171202346770
PID #171202346780
PID #171202346790
PID #171202346800
PID #171202346810
PID #171202346820
PID #171202346830
PID #171202346840
PID #171202346850
PID #171202346860
PID #171202346870
PID #171202346880
PID #171202346890
PID #171202346900
PID #171202346910
PID #171202346920
PID #171202346930
PID #171202346940
PID #171202346950
PID #171202346960
PID #171202346970
PID #171202346980
PID #171202346990
PID #171202347000
PID #171202347010
PID #171202347020
PID #171202347030
PID #171202347040
PID #171202347050
PID #171202347060
PID #171202347070
PID #171202347080
PID #171202347090
PID #171202347100
PID #171202347110
PID #171202347120
PID #171202347130
PID #171202347140
PID #171202347150
PID #171202347160
PID #171202347170
PID #171202347180
PID #171202347190
PID #171202347200
PID #171202347210
PID #171202347220
PID #171202347230
PID #171202347240
PID #171202347250
PID #171202347260
PID #171202347270
PID #171202347280
PID #171202347290
PID #171202347300
PID #171202347310
PID #171202347320
PID #171202347330
PID #171202347340
PID #171202347350
PID #171202347360
PID #171202347370
PID #171202347380
PID #171202347390
PID #171202347400
PID #171202347410
PID #171202347420
PID #171202347430
PID #171202347440
PID #171202347450
PID #171202347460
PID #171202347470
PID #171202347480
PID #171202347490
PID #171202347500
PID #171202347510
PID #171202347520
PID #171202347530
PID #171202347540
PID #171202347550
PID #171202347560
PID #171202347570
PID #171202347580
PID #171202347590
PID #171202347600
PID #171202347610
PID #171202347620
PID #171202347630
PID #171202347640
PID #171202347650
PID #171202347660
PID #171202347670
PID #171202347680
PID #171202347690
PID #171202347700
PID #171202347710
PID #171202347720
PID #171202347730
PID #171202347740
PID #171202347750
PID #171202347760
PID #171202347770
PID #171202347780
PID #171202347790
PID #171202347800
PID #171202347810
PID #171202347820
PID #171202347830
PID #171202347840
PID #171202347850
PID #171202347860
PID #171202347870
PID #171202347880
PID #171202347890
PID #171202347900
PID #171202347910
PID #171202347920
PID #171202347930
PID #171202347940
PID #171202347950
PID #171202347960
PID #171202347970
PID #171202347980
PID #171202347990
PID #171202348000
PID #171202348010
PID #171202348020
PID #171202348030
PID #171202348040
PID #171202348050
PID #171202348060
PID #171202348070
PID #171202348080
PID #171202348090
PID #171202348100
PID #171202348110
PID #171202348120
PID #171202348130
PID #171202348140
PID #171202348150
PID #171202348160
PID #171202348170
PID #171202348180
PID #171202348190
PID #171202348200
PID #171202348210
PID #171202348220
PID #171202348230
PID #171202348240
PID #171202348250
PID #171202348260
PID #171202348270
PID #171202348280
PID #171202348290
PID #171202348300
PID #171202348310
PID #171202348320
PID #171202348330
PID #171202348340
PID #171202348350
PID #171202348360
PID #171202348370
PID #171202348380
PID #171202348390
PID #171202348400
PID #171202348410
PID #171202348420
PID #171202348430
PID #171202348440
PID #171202348450
PID #171202348460
PID #171202348470
PID #171202348480
PID #171202348490
PID #171202348500
PID #171202348510
PID #171202348520
PID #171202348530
PID #171202348540
PID #171202348550
PID #171202348560



811 Know what's **below.** **Call** before you dig.

NOTES

1. ALL DISTURBED GREEN SPACE AREAS NOT NOTED ON THE PLAN SHALL BE SEEDED & MULCH WITH MNDOT "SOUTHERN BOULEVARD" SEED MIX.
2. OUTLOTS AND FARMED AREAS OUTSIDE OF GRADING LIMITS SHALL BE RESTORED WITH MNDOT "SOUTHERN TALLGRASS ROADSIDE" SEED MIX. SEE PLAN FOR LOCATIONS.
3. REDUNDANT PERIMETER CONTROL REQUIRED FOR ALL DISTURBANCES WITHIN 50' OF THE EXISTING WETLAND EDGE, SUCH AS DOUBLE ROW OF SILT FENCE. A SLASH MULCH BERM AT LEAST 12" HIGH IS ACCEPTABLE AS A SECONDARY PERIMETER CONTROL.
4. PROPOSED WETLAND FILL PERMIT APPLICATIONS WITH BWSR AND ACOE ARE BEING PREPARED AS OF MARCH 13, 2025. NO GRADING WITHIN 10' OF WETLAND PRIOR TO OBTAINING WETLAND IMPACT APPROVAL. INTERIM PERIMETER CONTROL AROUND WETLAND TO BE INSTALLED AS TIMING REQUIRES.

WARNING!
UNDERGROUND HIGH PRESSURE PIPELINE
CONTACT ENERGY TRANSFER REPRESENTATIVE AT 1-800-753-5531 PRIOR TO PERFORMING WORK WITHIN THE PIPELINE EASEMENT

LEGEND

- EXISTING WATERMAIN
- EXISTING RAW WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING SANITARY FORCEMAIN
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING ELECTRIC OUTLET POST
- EXISTING GUY WIRE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (WATER)
- EXISTING SIGN
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING WETLAND BUFFER
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED INFILTRATION BASIN
- PROPOSED SILT FENCE
- PROPOSED SILT FENCE POST CONSTRUCTION
- PROPOSED WIMCO OR EQUAL POST STORM SEWER CONSTRUCTION
- PROPOSED YARD CB INLET PROTECTION POST STORM SEWER CONSTRUCTION
- PROPOSED DITCH CHECK – POST GRADING/UTILITY CONSTRUCTION
- PROPOSED TEMPORARY ROCK CONSTRUCTION ENTRANCE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED BWSR SEED MIX 32-231
- PROPOSED BWSR SEED MIX 33-261

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date:_____ Reg.No._____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
EROSION & SEDIMENT CONTROL PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/JSO

DATE
02/24/2025

REVISIONS

03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970ERC

PROJECT NO.
23970

3.1

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970ERC.dwg - 4/16/2025 01:29PM

COWLEY LAKE PRESERVE - ROGERS, MN
These plans shall be considered part of the project Storm Water Pollution Prevention Plan (SWPPP.) A copy of the SWPPP shall remain on site throughout active construction.

PROJECT SUMMARY
COWLEY LAKE PRESERVE is a single-family residential development project. The project includes construction of building pads, streets, utilities and stormwater management basins.

TYPE OF PROJECT: Platting and development of 169 Single-family Residential Lots

TYPE OF WORK: Clearing and grubbing, demolition of existing houses, mass grading, utility and street construction and installation of phone, communication, gas and electric utilities.

TOTAL SITE AREA: 88.32 AC

TOTAL DISTURBED AREA: 67.17 AC

EXISTING IMPERVIOUS AREA: 1.04 AC

PROPOSED (DESIGN) IMPERVIOUS AREA: 22.32 AC

IMPAIRED WATERS:
Cowley Lake has an EPA-approved impairment for: Nutrients.

Crow River has an EPA-approved impairment for: Benthic macroinvertebrates bioassessments; Fecal coliform; Fish bioassessments; Mercury in fish tissue; Nutrients; Turbidity.

These impairment(s) are considered to be construction related parameters and require the additional best management practices (BMPs) found in items 23.9 and 23.10 of the permit if the project has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired water.

23.9:
Permittees must immediately initiate stabilization of exposed soil areas, as described in item 8.4, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the site temporarily or permanently ceases.

23.10:
Permittees must provide a temporary sediment basin as described in Section 14 for common drainage locations that serve an area with five (5) or more acres disturbed at one time.

A mandatory Stormwater Pollution Prevention Plan (SWPPP) review is required by the MPCA if the project will disturb over 50 acres and has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired water. Owners must submit the application for coverage and the SWPPP at least 30-days before the construction start date. The SWPPP can be attached electronically when using the online application.

ENVIRONMENTAL REVIEW
No environmental reviews were performed for the site, nor were any required by the City of Rogers or for other agency approvals.

ENDANGERED SPECIES
Endangered species summary:
Bald Eagles: A single nest has been identified on-site. Clearing, external construction, and landscaping within 330 feet and up to 660 feet of the nest may be restricted. Construction activity allowed between August 15th and January 15th, or outside of breeding season. Removal of the nest and/or existing vegetation adjacent to the nest is not anticipated.

In the event any other endangered species are identified on-site, construction shall cease and the U.S. Fish and Wildlife Service shall be contacted to coordinate all necessary protection and mitigation measures.

CONSTRUCTION PHASING
Mass grading will be in multiple phases. Mass grading is anticipated to take 12 months, which will include the construction of the stormwater basins. The stie will generally be graded from east to west. Utility installation will immediately follow grading. Upon completion of utilities, street construction will take place. Final construction work prior to home construction includes installation of phone, cable, gas and electric utilities, as well as retaining wall construction.

MPCA STORMWATER PERMIT - RESPONSIBILITY
Rachel Development is the Owner for the development. The owner will apply for the Stormwater Permit and shall remain responsible for implementation of the SWPPP until final stabilization and filing of the N.O.T. or Subdivision Registration Form.

OWNER:
Rachel Development - David Stradtman - 763-424-1525

PERMITTEE:
Rachel Development - Steve Wolbeck - 763-248-0342

OPERATOR(S):
Rachel Contracting - Ron Fricke - 763-274-9599

ENGINEER:
Rick Osberg, PE, Proj. Mgr - James R. Hill, Inc. - 952-890-6044

LGU CONTACT:
Doran Cote - City of Rogers - 763-428-8580

MPCA COMPLIANCE:
Josh Norman - 651-757-2389

The Contractor shall follow the implementation sequence as described on these plans. Amendments shall be made as site conditions change. Amendments shall be reviewed by the engineer.

IMPLEMENTATION OF THE SWPPP
The GENERAL CONTRACTOR (GC) or their subcontractor is responsible for implementation of the SWPPP. Contractor has or will provide trained personnel responsible for inspection of erosion and sediment control BMPs. Either the Contractor or their subcontractor will provide trained personnel responsible for installing and maintaining erosion and sediment control BMPs.

Long term operation and maintenance of the permanent stormwater management system will the responsibility of City of Rogers.

DOCUMENTATION OF TRAINED INDIVIDUALS
Prior to start of construction, GC and/or their subcontractors shall ensure they have proper documentation for all individuals involved in implementing the SWPPP, as well as all involved individuals as described in section 21 of the General Stormwater Permit.

SWPPP Design: Rick Osberg, PE, training by University of Minnesota "Design of Construction SWPPP", expires 5/31/2026. Instructor: Online.

SWPPP Contact for Contractor: Steve Wolbeck, training by University of Minnesota "Construction Site Management", expires 5/31/2027.

Alternate SWPPP Contact for Contractor: Jeremy Rose, training by University of Minnesota "Construction Site Management", expires 5/31/2026.

REQUIREMENTS FOR NOTICE OF TERMINATION (NOT)
Before the submitting the NOT, the permittee must meet the following requirements:

1. All construction activity associated with the project must be completed.
2. All pervious surfaces must be stabilized with permanent vegetative cover having a growth density of 70% of the expected full growth density (unless a specific area of the site specifies no vegetation.)
3. The stormwater treatment system (basins, pipes, structures, ditches, swales, etc.) is cleaned, removing all accumulation of sediment and debris.
4. All synthetic erosion and sediment prevention BMPs have removed.

RECORD RETENTION
During construction, the Contractor must retain a copy of the SWPPP and any amendments thereto on site at all times (or on the portion of the site for which the Contractor has control.) The SWPPP may be kept in a designated repository, in the construction field office or in an on-site vehicle during normal working hours. Copies of all maintenance records, inspection reports shall also be retained on site with the SWPPP.

Upon completion of all construction and submittal of the NOT, the Owner shall retain the SWPPP documents for no less than three years, including the final SWPPP, other stormwater related permits, inspection and maintenance records, SWMP operational and maintenance agreements, and any other documents or binding agreements that relate to the operation and maintenance of the SWMP.

GC and/or their subcontractors shall ensure they have proper documentation for all individuals involved.

POTENTIONAL FOR EROSION AND DISCHARGE OF SEDIMENT
There is moderate potential for erosion to occur. Certain portions of the site have grades exceeding 5% and shall be closely managed to prevent erosion. Temporary sediment traps or basins shall be considered in the final SWPPP implementation. Redundant protection is required along all wetlands. Contractor shall be required to appropriately manage individual erosion-prone areas, using BMP's suitable for the particular application.

GENERAL CONSTRUCTION SEQUENCING
1. Install perimeter control. Install inlet protection on existing structures.
2. Perform any clearing, as needed.
3. Perform demolition and debris removal.
4. Place topsoil perimeter berms and stabilize with seed and mulch.
5. Grade stormwater basins. Perform mass grading. As sheet drainage patterns develop, place silt fence or filter dikes as necessary to dissipate sediment transfer.
6. Construct utilities and pavements.
7. Construct buildings and structures.
8. Install phone, cable, gas and electric utilities.
9. Stabilize basins and swales with final stabilization. Stabilize landscape areas with final permanent vegetation, landscaping or turf. Stabilize future development areas with temp seed and mulch until final site development stage.

GUIDANCE FOR TIMING OF BMP INSTALLATION
Prior to Start of Construction
1. Install all new perimeter control BMPs as specified on plans prior to start of construction. Ensure that all existing perimeter control BMPs are functional.
2. Install or establish stabilized construction entrance.
3. Install protection devices on existing ponds, outlets, storm sewer inlets, etc. prior to start of construction.
4. Install sediment control practices on down gradient site perimeters.

During Construction
1. Identify topsoil stockpile locations and stabilize with temporary seed and mulch.
2. Areas in which construction becomes inactive must have stabilization commence immediately and be completed no later than 7 days after construction activity in that area has either temporarily or permanently ceased.
3. Provide temporary or permanent energy dissipation at all pipe outlets within 24 hours of connection to a Surface Water.
4. Minimize active construction areas. Where possible, establish final grade and stabilize with permanent vegetation, particularly around stormwater basins, filter strips, berms, etc.
5. During grading construction, utilize street "hold down" areas for sediment trapping. Direct overland construction runoff towards stormwater basins to the fullest extent practicable.

6. After construction is completed and grades are certified in a particular area of the site, review that the area is ready for permanent vegetation or other permanent cover.
7. Identify locations where topsoil stockpiles will be placed for builders. Stabilize with temporary seed and mulch and install perimeter control around stockpile circumference. Stockpiles shall be located outside of natural buffers or surface waters, included stormwater conveyances, unless there is a bypass in place.

During Inactivity or After Construction
1. Areas in which construction becomes inactive must have stabilization commence immediately and be completed no later than **7 days** after construction activity in that area has either temporarily or permanently ceased.
2. Final stabilization cover types are shown on **Sheet 3.0** of the plan set. Final cover consists of vegetation, paved or gravel surfaces, sod, landscaping and buildings.
3. At the point where vegetated cover has achieved 70% of expected full growth density, vegetated areas can be considered fully stabilized. Removal of synthetic sediment control BMPs can be initiated.
4. Basins that have received sediment deposits shall be re excavated to plan grade, removing accumulated sediment. Verify final grade and basin capacities.
5. Inlet protection devices can be removed from structures as the attributing drainage area becomes fully stabilized.
6. Maintain street and drive sweeping activities until construction activities are fully completed.

EROSION CONTROL BMPs
The construction plans anticipate the use of, but are not limited to, the following Erosion Control BMPs:
1. Stabilized Construction Entrance
2. Temporary straw mulch as needed.
3. Seed and mulch
4. Erosion Control Blanket
5. Turf Reinforcement Mat (TRM)
6. Rip rap
7. Minimize active or disturbed work areas

SEDIMENT CONTROL BMPs
The construction plans anticipate the use of, but are not limited to, the following Sediment Control BMPs
1. Sediment traps constructed in street subcut or other strategic locations.
2. Rock filter dikes in street subcut.
3. Utilize permanent stormwater basins as Temporary Sediment Basins.
4. Silt fence at project perimeter or toe of slopes.
5. Inlet protection on existing catch basins.
6. Inlet protection on existing culverts.
7. Inlet protection after utility construction.
8. Rock checks or bio roll checks.
9. Linear control along back of new curb and gutter or concrete (bio-roll or silt fence).
10. Post construction silt fence along normal wetted perimeters of basins and filter strips.
11. Routine street sweeping adjacent to construction entrance.

Refer to plans for designated locations of BMPs, details and implementation notes.
All BMP's selected and implemented shall be appropriate for the time of year, the current site conditions and for the estimated duration of use.

Enhancing sedimentation with the use chemicals and chemical treatment systems is NOT anticipated for this project.

BASIN AND TRAP DEWATERING BMPs
Should the need arise for basin or trap dewatering, Contractor shall utilize a floating skimmer pump intake, such that the water is drawn from the surface of the basin. Pumped effluent shall be discharged, to the extent feasible, over well-vegetated upland areas. Effluent shall not be discharged into Surface Waters in a visually turbid state. Turbid effluent shall be filtered with mechanical devices, chemical filtering, or a combination thereof, until it is no longer visually turbid.

POLLUTION CONTROL BMPs
BMP's and good housekeeping should be implemented to prevent spills, pollutants or chemicals from entering the drainage system.

1. Fueling: A fixed fueling station is not anticipated. Contractor will be required to implement BMPs for onsite re-fueling of equipment.
2. Concrete Washout: Refer to MPCA's recommendation for concrete washouts. The developer has the ability to adjust location or to provide alternative washout containment.
3. There is not an anticipated need for storing chemicals, paints, solvents or other potentially toxic or hazardous materials on site. If at some point there is a need to store them on site, they must be stored in a receptacle or container capable of retaining spills. The container must be fenced and locked from unauthorized access.
4. Portable toilets shall be positioned and secured to prevent tipping over.

SEED & MULCH SPECIFICATIONS
Seed placed for permanent cover or final stabilization requires 6" minimum topsoil cover. Exception: Infiltration basins - see basin details for soil type). Multiple site visits will be required to accommodate permanent or temporary stabilization as required during the phases of construction. Refer to MnDOT Seeding Manual, Latest Edition or MnBWSR for more details.

1) Boulevards and Urban Roadsides:
A. Seed: Southern Boulevard (SB) at a rate of 160 lb/acre
B. Fertilizer: Type 1 20-10-20 NPK at a rate of 200 lb/acre
C. Mulch: MNDOT Type 1 at a rate of 2 tons/acre
2) Commercial/Residential Yards:
A. Seed: Residential Turfgrass (RT) at a rate of 200 lb/acre
B. Fertilizer: Type 1 20-10-20 NPK at a rate of 200 lb/acre
C. Mulch: MNDOT Type 1 at a rate of 2 tons/acre
3) Stormwater Basins/Wet Soils
A. Seed: Wet Ditch (WD) at a rate of 35 lb/acre
B. Fertilizer: Type 3 slow release 22-5-10 NPK at a rate of 200 lb/acre
C. Mulch: MNDOT Type 3 at a rate of 2 tons/acre
4) Tallgrass Native/Moderately Wet Soils/Wetland Buffers
A. Seed: Southern Tallgrass Roadside (STR) at a rate of 26 lb/acre
B. Fertilizer: Type 3 slow release 22-5-10 NPK at a rate of 350 lb/acre
C. Mulch: MNDOT Type 3 at a rate of 2 tons/acre
5) Shortgrass Native/Dryer Soils
A. Seed: Southern Shortgrass Roadside (SSR) at a rate of 26 lb/acre
B. Fertilizer: Type 3 slow release 22-5-10 NPK at a rate of 350 lb/acre
C. Mulch: MNDOT Type 3 at a rate of 2 tons/acre

INSPECTION AND MAINTENANCE OF BMPs
Routine Inspection
1. Rock Entrances - Inspect weekly. If rock becomes filled with sediment and tracked material to the extent the purpose ceases to function, remove the contaminated rock and replace with new rock.
2. Stabile Concrete Entrance - Inspect weekly. Remove dirt and debris and sweep regularly to control dust.
3. Silt fence - Inspect weekly, particularly for damaged sections, breaches, down-gradient areas, flow concentration points, scour areas and sections adjacent to sensitive areas. Where capacity is filled to more than 50% of depth, sediment shall be removed to restore capture capacity.
4. Sediment traps and basins - Inspect weekly. Where capacity is filled to more than 50% of depth, sediment shall be removed to restore capture capacity within 72 hours of discovery.
5. Inlet Protection - Inspect weekly or more frequently as needed after multiple rainfalls less than 0.5". Verify intake capacity is not compromised. Where capacity is filled to more than 50% of depth, sediment shall be removed to restore capture capacity.
6. Slope - inspect steep slopes for rills and gullies, often forming after placement of topsoil, seed and erosion control blanket. As a guide, repair and re stabilize eroded areas where rills exceed 6" in depth.
7. Inspect other site-specific BMP's on a weekly basis minimum.

Rain Event Inspection - Mandatory, within 24 hours after a rain event 0.5" or greater. Complete all items associated with Routine Inspection. Furthermore, inspect site for breaches, failures, scours and gullying. Take corrective actions as necessary to restore functionality to the BMP's. If a given situation is discovered to be prone to repetitive failure, advise the Engineer and Contractor for SWPPP and BMP amendments.

ADDITIONAL SWPPP NOTES
1. All Erosion and Sediment Control facilities shall be maintained by the Contractor during the construction operations. Any temporary facilities which are to be removed as called for on these plans and specifications shall be removed by the Contractor at the time directed by the engineer. The Contractor shall then restore the subsequently disturbed areas in accordance with these plans and specifications.
2. Wherever practical and feasible, the Contractor shall protect and preserve existing natural trees, grass and other vegetative cover in effort to provide natural buffering and filtering of runoff.
3. Contractor shall be adaptable in adjusting construction schedules in anticipation of weather forecasts of precipitation, in order to minimize risk of erosion and sediment transport.
4. It is the responsibility of the Contractor to keep public streets, travel ways, parking lots and trails utilized for ingress to and egress from the construction site free of dirt, sediment and debris, resulting from construction activity. Cost for this shall be considered incidental to the contract.
5. Adequate control of dust shall be maintained by the Contractor. Cost for dust control shall be considered incidental to the contract.
6. Perimeter controls shall not be removed until final stabilization of areas draining toward the control devices.
7. When temperatures do not exceed 40° F, areas that require seed and mulch stabilization shall be dormant seeded. Application rate shall be two times the normal rate. No dormant seeding shall be done on ice or snow greater than 2" in depth.
8. Any areas that were seeded that do not achieve 70% coverage shall be reseeded at the Contractor's expense, where coverage limitation is caused by lack of seed germination and growth.

STORMWATER BASIN MAINTENANCE
All stormwater basins within the project will be owned and maintained by the City. Suggested practices are as follows:

1. For the first three years after construction, basins should be inspected for obvious signs of erosion, such as gullies, rills or sediment plumes. Identify the cause and take corrective measures such that grades are restored and surfaces re-established with appropriate vegetation.

2. During the first year after final stabilization, mow the slopes of stormwater basins, approximately 30-day intervals, 6"-8" high. Over-seed any areas not fully established.
3. Inspect for sediment accumulation at the pipe outlets into the pond at the completion of sod installation of last lot in plat. Remove sediment. Re-inspect every 3-5 years.
4. Inspect inlets and outlets for blockage or debris buildup annually. Remove debris as necessary to allow for inlets and outlets to function as designed.
5. Verify basin design capacity after 15 to 20 years of service.

TURF AND VEGETATION MAINTENANCE

Boulevard Mixes and Salt-tolerant Sod (SB)
Planting Season:
Seed: April 1 - June 1 and July 20 - Sept 20; Sod: April 15 - June 10

Year 1:
1. Watch for germination in 1-2 weeks.
2. Initial seedling density should be at least 1 per square inch.
3. Water if rainfall is less than 1" per week, continue until established.
4. Mow when grass reaches 5" to 6" high, cut back to 3" to 4" height.
5. Re-seed any bare patches - plants do no spread quickly like bluegrass does.

Long Term Maintenance:
1. Mow 4-8 times per year, if turfgrass appearance is desired
2. Spot spray weeds only if necessary.
3. Re-seed any bare patches - plants do no spread quickly like bluegrass does.

Shortgrass Native (SSR), Tall Grass Native (STR) and Stormwater (WD)
Planting Season:
Seed: April 1 - June 1 and July 20 - Sept 20 (Some mixes can be planted April 15 - October 20)

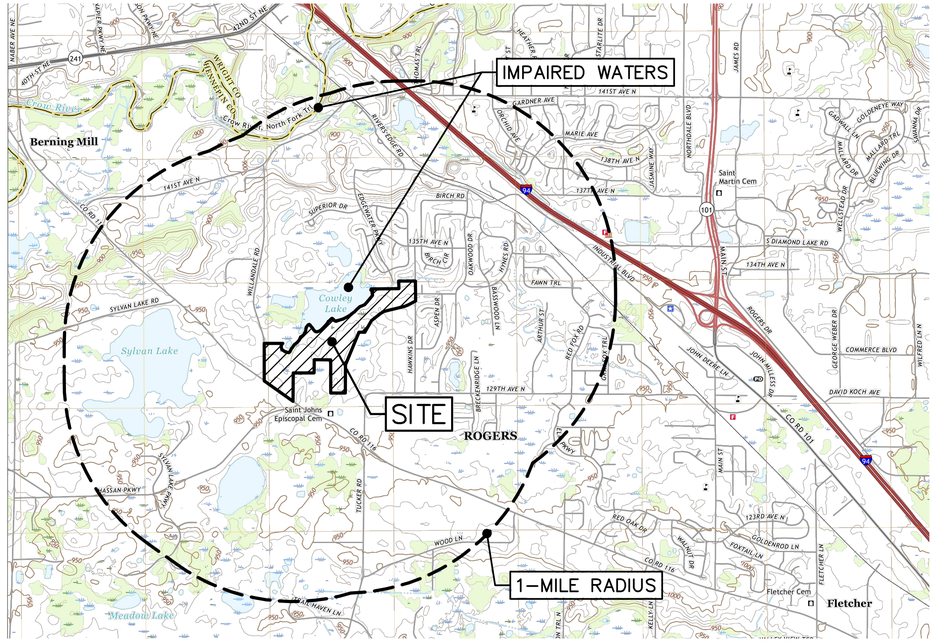
Year 1:
1. Watch for indicator species to emerge in 3-5 weeks.
2. Perennial seedling density should be 4-6 plants per square foot.
3. Water if conditions get very dry after germination.
4. Mow 2 to 3 times, when 18" high or before weeds flower. Cut to 6" to 10" height.

Year 2:
1. Look for at least 1 perennial plant per square foot.
2. Planted vegetation should cover 50% of soil surface by mid-summer.
3. Mow 1 to 2 times, before weeds flower. Cut to 8" to 12" height.
4. Spot spray perennial noxious weeds and birdsfoot trefoil.

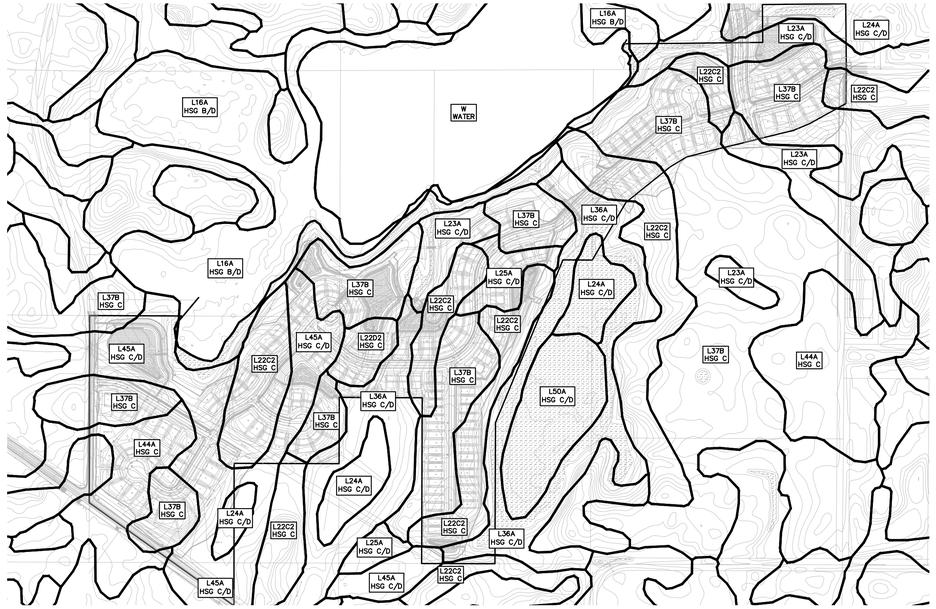
Long Term Maintenance:
1. Mow or burn every 3-5 years. Spot spray weeds and brush, as needed.

ESTIMATED EROSION AND SEDIMENT CONTROL QUANTITIES

CONSTRUCTION ROCK ENTRANCE	EA	4
STANDARD DUTY SILT FENCE	LF	17,100
STANDARD DUTY SILT FENCE - POST CONSTRUCTION	LF	5,800
BWSR SEED MIX 33-261 STORMWATER - 1.5X	AC	8.0
BWSR SEED MIX 32-231 MESIC TO DRY BUFFER SOUTH (OUTLOTS) - 1.5X	AC	19.0
MNDOT SEED MIX - SOUTHERN BOULEVARD (GENERAL MIX) - 1.5X	AC	50.0
REAR YARD INLET PROTECTION	EA	25
WIMCO OR APPROVED EQUAL INLET PROTECTION	EA	73



USGS MAP
1" = 2000'



USDA SOIL MAP
1" = 400'

GENERAL PERMIT NOTE
VISIT THE MPCA WEB SITE FOR THE LATEST INFORMATION ON THE CONSTRUCTION STORMWATER PERMIT:
https://www.pca.state.mn.us/business-with-us/construction-stormwater

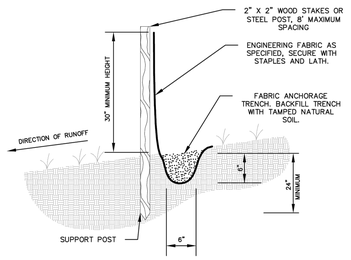
James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
PRELIMINARY
Date: ____ Reg.No. ____

COWLEY LAKE PRESERVE
EROSION & SEDIMENT CONTROL DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

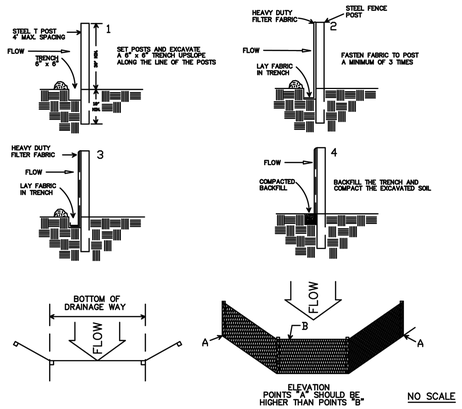
DRAWN BY
JSO
DATE
02/24/2025
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS
CAD FILE
23970ERD
PROJECT NO.
23970
3.2

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970ERD.dwg - 4/16/2025 01:29PM



DOUBLE SILT FENCE TO BE REQUIRED NEAR WETLANDS

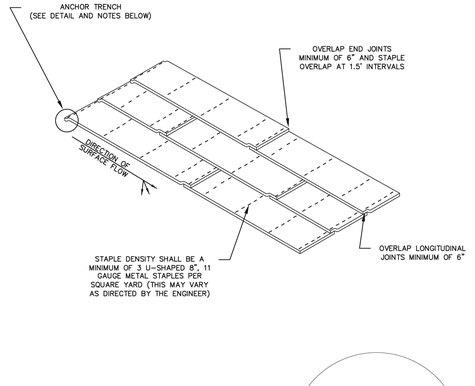
		Standard Details	
CITY OF ROGERS	STANDARD SILT FENCE	Date: SEPTEMBER, 2020 Revised:	EROS–1



Maintenance

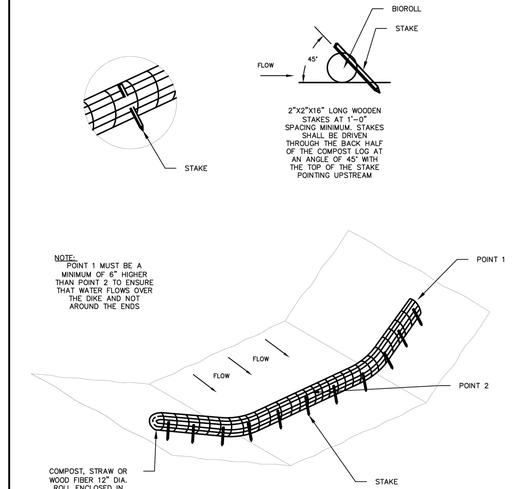
1. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USEABLE LIFE AND THE BARRIER STILL BE NECESSARY. THE FABRIC SHALL BE REPLACED PROMPTLY.
3. WETLANDS ARE TO BE PROTECTED BY TWO ROWS OF H.D. SILT FENCE. DOUBLE H.D. SILT FENCE IS REQUIRED AROUND WATER BODIES, STEEP SLOPES AND HIGHLY ERODIBLE SOILS.
3. SEDIMENT DEPOSITS MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY 1/3 HEIGHT OF THE BARRIER, OR AS DIRECTED BY THE ENGINEER.
4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED, SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
6. ALL MATERIAL & INSTALLATION MUST CONFORM TO THE REQUIREMENTS OF THE CURRENT EDITION OF THE MNDOT CONSTRUCTION SPECIFICATIONS TABLE 3886-1.

		Standard Details	
CITY OF ROGERS	SILT FENCE ALONG WETLAND	Date: SEPTEMBER, 2020 Revised:	EROS–4

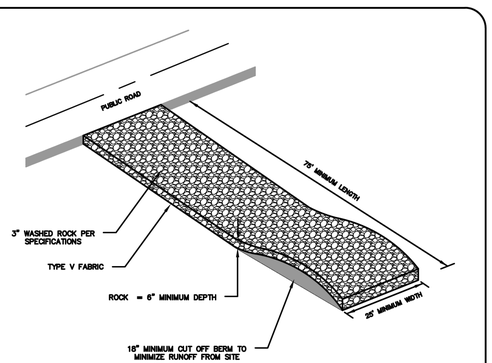


ANCHOR TRENCH
1. DIG 6" X 6" TRENCH
2. LAY BLANKET IN TRENCH
3. STAPLE AT 1.5' INTERVALS
4. BACKFILL WITH NATURAL SOIL AND COMPACT
5. BLANKET LENGTH SHALL NOT EXCEED 100' WITHOUT AN ANCHOR TRENCH

		Standard Details	
CITY OF ROGERS	EROSION CONTROL BLANKET INSTALLATION	Date: SEPTEMBER, 2020 Revised:	EROS–5



		Standard Details	
CITY OF ROGERS	BIOLOG DITCH CHECK	Date: SEPTEMBER, 2020 Revised:	EROS–8



NOTE:
TYPE V FILTER FABRIC SHALL BE PLACED UNDER ROCK TO STOP MUD MIGRATION THROUGH MATERIAL.

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OF FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.

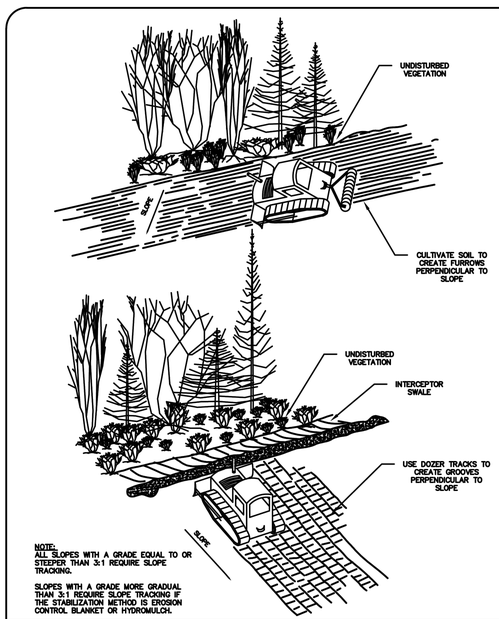
WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM

IN AREAS WITH CONCRETE WALK THERE SHALL BE 6" OF SAND PLACED OVERTOP THE SIDEWALK PRIOR TO PLACEMENT OF THE 3" WASHED ROCK.

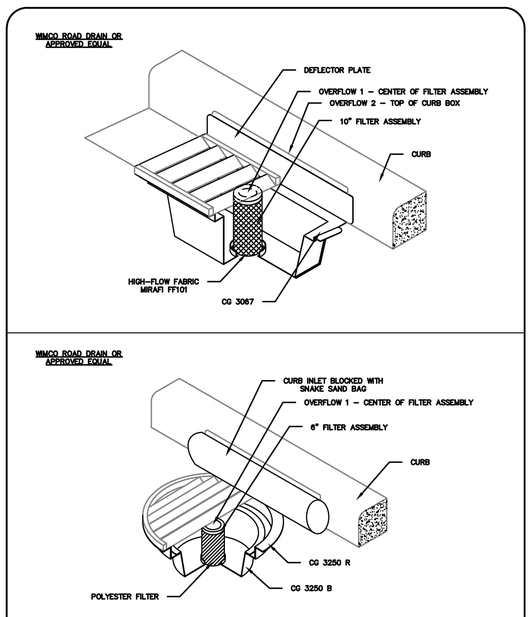
		Standard Details	
CITY OF ROGERS	CONSTRUCTION ROCK ENTRANCE	Date: SEPTEMBER, 2020 Revised:	EROS–10



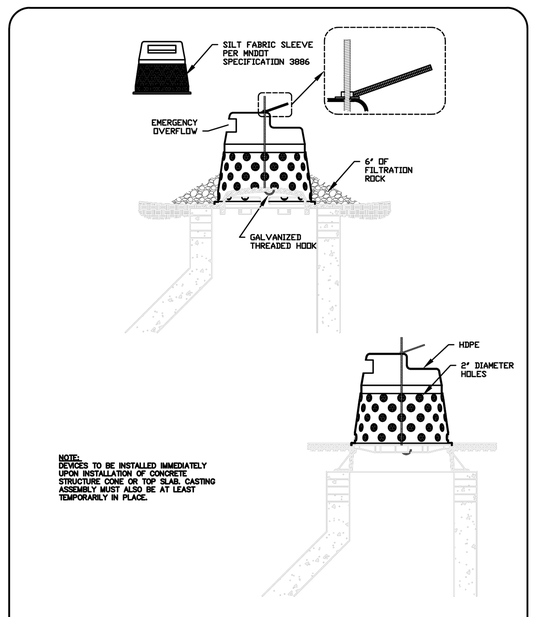
NOTE:
ALL SLOPES WITH A GRADE EQUAL TO OR STEEPER THAN 3:1 REQUIRE SLOPE TRACKING.

SLOPES WITH A GRADE MORE GRADUAL THAN 3:1 REQUIRE SLOPE TRACKING IF THE STABILIZATION METHOD IS EROSION CONTROL BLANKET OR HYDROMULCH.

		Standard Details	
CITY OF ROGERS	SLOPE TRACKING	Date: SEPTEMBER, 2020 Revised:	EROS–12



		Standard Details	
CITY OF ROGERS	CURB INLET PROTECTION	Date: SEPTEMBER, 2020 Revised:	EROS–15



NOTE:
DEVICES TO BE INSTALLED IMMEDIATELY UPON INSTALLATION OF CONCRETE STRUCTURE CONE OR TOP SLAB. CASTING ASSEMBLY MUST ALSO BE AT LEAST TEMPORARILY IN PLACE.

		Standard Details	
CITY OF ROGERS	INFRASAFE – SEDIMENT CONTROL BARRIER	Date: SEPTEMBER, 2020 Revised:	EROS–16

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
EROSION & SEDIMENT CONTROL DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2025

REVISIONS

03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970ERD

PROJECT NO.
23970

3.3

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970ERD.dwg - 4/16/2025 01:29PM

NPDES REQUIREMENTS

1.1 Permit Coverage. [Minn. R. 7090]
1.2 This permit is required for construction activity that results in land disturbance of equal to or greater than one (1) acre or if a project is part of a common plan of development or sale that ultimately will disturb greater than one (1) acre, and authorizes, subject to the terms and conditions of this permit, the discharge of stormwater associated with construction activity. [Minn. R. 7090]
1.3 Construction activity covered by this permit cannot commence until coverage under this permit is effective as described in item 3.3 through 3.4 or, if applicable, until the Minnesota Pollution Control Agency (MPCA) has issued an individual National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) construction stormwater permit for the project. [Minn. R. 7090]
1.4 This permit covers all areas of the State of Minnesota except land wholly within the boundaries of a federally recognized Indian Reservation owned by a tribe or a tribal member or land held in trust by the federal government for a tribe or tribal member.[Minn. R. 7090]
1.5 Coverage under this permit is not required when all stormwater from construction activity is routed directly to and treated by a "treatment works," as defined in Minn. Stat. Section 115.01, subd. 21, operated under an individual NPDES/SDS permit with a Total Suspended Solids (TSS) effluent limit. [Minn. R. 7090]
1.6 This permit covers ongoing projects covered under any previous construction stormwater permit that are not complete on the issuance date of this permit. Permittees must either remain in compliance with the previous permit and terminate coverage within 18 months of the issuance date of this permit or comply with this permit, including updating the Stormwater Pollution Prevention Plan (SWPPP), within the 18-month period. Permittees of previously permitted projects are not required to incorporate any additional requirements regarding the permanent stormwater treatment system included in this reissued permit. [Minn. R. 7090]
1.7 Coverage for projects that extend beyond the expiration date of this permit remains effective for a grace period of 18 months. If Permittees cannot complete projects during the grace period, the MPCA will extend coverage under the next permit and permittees must comply with the requirements of the new permit including updating the SWPPP. Permittees are not required to follow changes to the permanent stormwater treatment section of the next permit. [Minn. R. 7090]
2.1 Prohibitions and Limitations of Coverage. [Minn. R. 7090]
2.2 The owner must develop a complete and accurate SWPPP that complies with item 5.2 prior to submitting the application for coverage and starting construction activity. Failure to prepare a SWPPP prior to submitting the application may result in permit revocation. [Minn. R. 7090]
2.3 This permit prohibits discharges of any material other than stormwater treated in compliance with this permit and discharges from dewatering or basin draining activities in accordance with Section 10. Prohibited discharges include, but are not limited to, wastewater from washout of concrete, stucco, paint, form release oils, curing compounds and other construction materials, fuels, lubricants, oils, or other pollutants used in vehicle and equipment operation and maintenance, soaps or solvents used in vehicle and equipment washing and maintenance, and other hazardous substances or wastes. [Minn. R. 7090]
2.4 This permit does not authorize stormwater discharges related to the placement of fill into waters of the state requiring local, state or federal authorizations (such as U.S. Army Corps of Engineers Section 404 permits, Minnesota Department of Natural Resources (DNR) Public Waters Work permits or local governmental unit (LGU) Wetland Conservation Act replacement plans or determinations). [Minn. R. 7090]
2.5 This permit does not authorize stormwater discharges associated with industrial activity except for construction activity. Permittees must obtain coverage for discharges associated with industrial activity under a separate NPDES/SDS permit once day-to-day operational activities commence even if construction is ongoing. [Minn. R. 7090]
2.6 This permit does not authorize discharges from non-point source agricultural and silvicultural activities excluded from NPDES permit requirements under 40 CFR pt. 122.3(e). [Minn. R. 7090]
2.7 This permit does not authorize stormwater discharges to Prohibited, Restricted, Special or Impaired waters unless permittees follow the additional stormwater requirements in Section 23. [Minn. R. 7090]
2.8 This permit does not replace or satisfy any environmental review requirements including those under the Minnesota Environmental Policy Act or the National Environmental Policy Act. The owner must verify completion of any environmental review required by law, including any required Environmental Assessment Work Sheets or Environmental Impact Statements, Federal or Minnesota review, or other required review prior to applying for coverage under this permit. If any part of your common plan of development or sale requires environmental review, coverage under this permit cannot be obtained until such environmental review is complete. [Minn. R. 7090]
2.9 This permit does not replace or satisfy any review requirements for discharges adversely impacting State or Federally designated endangered or threatened species or a designated critical habitat. The owner must comply with the National Historic Preservation Act and conduct all required review and coordination related to historic preservation, including significant anthropological sites and any burial sites, with the Minnesota Historic Preservation Officer. [Minn. R. 7090]
2.10 This permit does not authorize discharges to wetlands unless permittees comply with the requirements in Section 22. Coverage under this permit cannot be issued until the requirements for wetland permits, decisions, other determinations, or the mitigative sequence required in section 22 have been finalized and documented. [Minn. R. 7050.0186]
3.1 Application and Coverage Effective Date. [Minn. R. 7090]
3.2 The owner and operator must complete and submit accurate on-line application with the appropriate fee to the MPCA for each project that disturbs one (1) or more acres of land or for a common plan of development or sale that will ultimately disturb one (1) or more acres. [Minn. R. 7090]
3.3 For projects or common plans of development or sale that disturb less than 50 acres or do not discharge stormwater within 1 mile (aerial radius measurement) of a special or impaired water, permittees do not need to submit the SWPPP with the application. Permit coverage for these projects is effective upon application and completing the payment process. [Minn. R. 7090]
3.4 For certain projects or common plans of development or sale disturbing 50 acres or more, the complete SWPPP must be included with the application and submitted at least 30 days before the start of construction activity. This applies if there is a discharge point on the project within one mile (aerial radius measurement) of the receiving water, and flows to a special water listed in item 23.3 through 23.6 or an impaired water as described in item 23.7. Permit coverage for these projects is effective upon submitting the application and complete SWPPP, completing the payment process and receiving a determination from the MPCA that the review of the SWPPP is complete. The determination may take longer than 30 days if the SWPPP is incomplete. If the MPCA fails to contact the permittee(s) within 30 days of application receipt, coverage is effective 30 days after completing the payment process. [Minn. R. 7090]
3.5 The application requires listing all persons meeting the definition of owner and operator as permittees. The owner is responsible for compliance with all terms and conditions of this permit. The operator is responsible for compliance with Sections 3, 4, 5.2, 7.4 and applicable requirements for construction activity in Sections 8, 9, 10, 11 and 12. [Minn. R. 7090]
3.6 Permittees will receive coverage notification in a manner determined by the MPCA. [Minn. R. 7090]
3.7 For construction projects where the owner or operator changes (e.g., an original developer sells portions of the property to various homebuilders or sells the entire site to a new owner), the current owner and the new owner or operator must submit a complete permit termination or transfer form provided by the MPCA. The current owner and the new owner or operator must submit the form prior to the new owner or operator commencing construction activity or no later than 30 days after taking ownership of the property. [Minn. R. 7090]
3.8 For construction projects where the owner or operator changes, the current owner must provide a SWPPP to the new owner and operator that specifically addresses the remaining construction activity. The new owner or operator can implement the original SWPPP, modify the SWPPP, or develop a new SWPPP. Permittees must ensure their activities do not render another party's erosion prevention and sediment control BMPs ineffective. [Minn. R. 7090]
4.1 Termination of Coverage. [Minn. R. 7090]
4.2 Permittees must submit a NOT within 30 days after all termination conditions listed in Section 13 are complete.[Minn. R. 7090]
4.3 Permittees must submit a NOT within 30 days after selling or otherwise legally transferring the entire site, including permit responsibility for roads (e.g., street sweeping) and stormwater infrastructure final clean out, or transferring portions of a site to another party. The permittees' coverage under this permit terminates at midnight on the submission date of the NOT.[Minn. R. 7090]
4.4 Permittees may terminate permit coverage prior to completion of all construction activity if they meet all of the following conditions:
a. construction activity has ceased for at least 90 days; and
b. at least 90 percent (by area) of all originally proposed construction activity has been completed and permanent cover has been established on those areas; and
c. on areas where construction activity is not complete, permanent cover has been established; and
d. the site complies with item 13.3 through 13.7.
After permit coverage is terminated under this item, any subsequent development on the remaining portions of the site will require permit coverage if the subsequent development itself or as part of the remaining common plan of development or sale will result in land disturbing activities of one (1) or more acres in size. [Minn. R. 7090]
4.5 Permittees may submit the notice of termination NOT as approval after submitting information documenting the owner cancelled the project. [Minn. R. 7090]
5.1 Stormwater Pollution Prevention Plan (SWPPP) Content. [Minn. R. 7090]
5.1 The owner must develop and implement a SWPPP. The SWPPP must include items 5.3 through 5.26. [Minn. R. 7090]
5.3 The SWPPP must incorporate specific Best Management Practices (BMP) used to comply with the requirements of this permit. [Minn. R. 7090]
5.4 The SWPPP must include a narrative describing the timing for installation of all erosion prevention and sediment control BMPs and a description of the permanent stormwater treatment system. [Minn. R. 7090]
5.5 The SWPPP must include the location and type of all temporary and permanent erosion prevention and sediment control BMPs along with procedures used to establish additional temporary BMPs as necessary for the site conditions during construction. Standard details and/or specifications for BMPs must be included in the final plans and specifications for the project. [Minn. R. 7090]
5.6 The SWPPP must include the calculations and other information used for the design of temporary sediment basins and any of the permanent stormwater treatment systems required in Section 15. [Minn. R. 7090]
5.7 The SWPPP must include estimated quantities anticipated at the start of the project for the life of the project for all erosion prevention and sediment control BMPs (e.g., linear feet of silt fence or square feet of erosion control blanket). [Minn. R. 7090]
5.8 The SWPPP must include the number of acres of impervious surface for both pre- and post-construction. [Minn. R. 7090]
5.9 The SWPPP must include a site map with existing and final grades, including drainage area boundaries, directions of flow and all discharge points where stormwater is leaving the site or entering a surface water. The site map must indicate the areas of steep slopes. The site map must also include impervious surfaces, soil types and locations of potential pollutant-generating activities as identified in Section 12. [Minn. R. 7090]
5.10 The SWPPP must include a map of all surface waters, existing wetlands, and stormwater ponds or basins that can be identified on maps such as United States Geological Survey 7.5-minute quadrangle maps, the National Wetland Inventory map or other publicly available maps and within one mile (aerial radius measurement) from the project boundaries that will receive stormwater from the construction site, during or after construction. The SWPPP must identify if the surface waters are special or impaired waters. [Minn. R. 7090]
5.11 The SWPPP must include a site map showing construction activity areas that are adjacent to and drain to Public Waters for which the DNR has promulgated "work in water restrictions" during specified fish spawning time frames. [Minn. R. 7090]
5.12 Permittees must identify locations of 50' buffer zones as required in item 9.17 and 100' permanent buffer zones as required in item 23.11, on plan sheets in the SWPPP. [Minn. R. 7090]
5.13 If permittees determine compliance with the following requirements is infeasible, they must document the determination in the SWPPP:
a. temporary sediment basins as described in Section 14; and
b. for linear projects, if the permanent stormwater treatment system cannot be constructed within the right-of-way, a reasonable attempt must be made to obtain additional right-of-way (item 15.9); and
c. buffer zones as described in item 9.17 and item 23.11. [Minn. R. 7090]
5.14 If permittees determine that a temporary sediment basin is infeasible as described in item 14.10, the SWPPP must describe the alternative BMPs used. [Minn. R. 7090]
5.15 If permittees cannot meet the full volume reduction requirement on-site, (e.g., the site has infiltration prohibitions, see item 16.14 through item 16.21) the permittee must document the reasons in the SWPPP. [Minn. R. 7090]
5.16 The SWPPP must include any stormwater mitigation measures proposed to be part of the final project in any environmental review document, endangered species review, archeological or other required local, state or federal review conducted for the project. For purposes of this permit, mitigation measures mean actions necessary to avoid, minimize, or mitigate for impacts related to erosion prevention, sediment control, the permanent stormwater treatment system, pollution prevention management measures and discharges associated with the project's construction activity. [Minn. R. 7090]
5.17 The SWPPP must describe the methods used for permanent cover of all exposed soil areas. [Minn. R. 7090]
5.18 Permittees must identify the locations of areas where construction will be phased to minimize the duration of exposed soil areas in the SWPPP. [Minn. R. 7090]
5.19 For projects with a discharge point on the project within one (1) mile (aerial radius measurement) of and which flows to an impaired water, permittees must identify the impaired water(s), and any Total Annual Environmental Protection Agency (USEPA)-approved Total Maximum Daily Load (TMDL) for the pollutant(s) or stressor(s) described in item 23.7. Permittees' identification must include those TMDLs approved at any time prior to permit application submittal and are still in effect. [Minn. R. 7090]
5.20 Permittees must document in the SWPPP, all trained individuals identified in item 21.2. Documentation must include:
a. names of personnel required to be trained; and
b. dates of training and name of instructor(s) and entity providing training; and
c. content of training course.
If permittees do not know the names of the individuals at the time of application, the permittees must ensure they document training before construction activity commences. [Minn. R. 7090]
5.21 The SWPPP must identify a person knowledgeable and experienced in the application of erosion prevention and sediment control BMPs who will coordinate with all contractors, subcontractors, and operators on-site to oversee the implementation of the SWPPP. [Minn. R. 7090]
5.22 The SWPPP must describe any specific chemicals and chemical treatment systems used for enhancing the sedimentation process and how it achieves compliance with item 9.19. [Minn. R. 7090]
5.23 The SWPPP must identify the person(s), organizations, or entities responsible for long-term operation and maintenance of permanent stormwater treatment systems. [Minn. R. 7090]
5.24 The SWPPP must describe methods to minimize soil compaction and preserve topsoil. Minimizing soil compaction is not required where the function of a specific area dictates compaction. [Minn. R. 7090]
5.25 The SWPPP must include any site assessments for groundwater or soil contamination required in item 16.15.[Minn. R. 7090]
5.26 The SWPPP must account for the following factors in designing temporary erosion prevention and sediment control BMPs:
a. the expected amount, frequency, intensity, and duration of precipitation; and
b. the nature of stormwater runoff and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features; and
c. the stormwater volume, velocity, and peak flowrates to minimize discharge of pollutants in stormwater and to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points; and
d. the range of soil particle sizes expected to be present. [Minn. R. 7090]
6.1 SWPPP Amendment. [Minn. R. 7090]
6.2 One of the individuals described in item 21.2.a or item 21.2.b or another qualified individual must complete all SWPPP changes. Changes involving the use of a less stringent BMP must include a justification describing how the replacement BMP is effective for the site characteristics. [Minn. R. 7090]
6.3 Permittees must amend the SWPPP within 7 days to include additional or modified BMPs whenever there is a change in design, construction, operation, maintenance, weather or seasonal conditions having a significant effect on the discharge of pollutants to surface waters or groundwater. [Minn. R. 7090]
6.4 Permittees must amend the SWPPP within 7 days to include additional or modified BMPs whenever inspections or investigations by the site owner or operator, USEPA or MPCA officials indicate the SWPPP is not effective in eliminating or significantly minimizing the discharge of pollutants to surface waters or groundwater or the discharges are causing water quality standard exceedances (e.g., nuisance conditions as defined in Minn. R. 7050.0210, subp. 2) or the SWPPP is not consistent with the objectives of a USEPA approved TMDL. [Minn. R. 7050.0210]
7.1 BMP Selection and Stormwater Management. [Minn. R. 7090]
7.2 Permittees must select, install, and maintain the BMPs identified in the SWPPP and in this permit in an appropriate and functional manner and in accordance with relevant manufacturer specifications and accepted engineering practices to minimize the discharge of pollutants in stormwater from construction activities. Examples of stormwater management practices for this section include but are not limited to wet sedimentation basins, temporary depressions to hold stormwater, stormwater routing, dikes, berms, pumping, and stormwater treatment BMPs. Permittees must phase and incorporate stormwater management principles as the construction progresses. Unless infeasible, temporary or permanent wet sedimentation basins (where required, see section 14 and 15) should be constructed as a first step in the process and stormwater routed to these. [Minn. R. 7090]
7.3 Permittees must not disturb more land (i.e., phasing) than can be effectively inspected and maintained in accordance with Section 11. [Minn. R. 7090]
7.4 If permittees intend on using some type of erosion control netting on the site as part of the soil stabilization techniques, permittees are encouraged to use products that have been shown to minimize impacts on wildlife. The U.S. Fish & Wildlife Service recommends using types of netting practices that are considered "wildlife friendly," including those that use natural fiber or 100 percent biodegradable materials and that use a loose weave with a non-welded, movable jointed netting. Products that do not use wildlife friendly include square plastic netting that are plastic netting (e.g., photodegradable, UV-degradable, oxo-degradable), netting made from polypropylene, nylon, polyethylene, or polyester. Other recommendations include removing the netting product when it is no longer needed. More information may be found at: https://www.fws.gov/initiative/protecting-wildlife/make-change-wildlife-friendly-erosion-control-products. There also may be State, Tribal, or local requirements about using wildlife friendly erosion control products. See Minnesota Department of Transportation requirements at: https://www.mndot.gov/environment/erosion/rolled-erosion-prevention-products.html. [Minn. R. 7050]
8.1 Erosion Prevention Practices. [Minn. R. 7090]
8.2 Before work begins, permittees must delineate the location of areas not to be disturbed. [Minn. R. 7090]
8.3 Permittees must minimize the need for disturbance of portions of the project with steep slopes. When steep slopes must be disturbed, permittees must use techniques such as phasing and stabilization practices designed for steep slopes (e.g., slope draining and terracing). [Minn. R. 7090]
8.4 Permittees must stabilize all exposed soil areas, including stockpiles. Stabilization must be initiated immediately to limit soil erosion when construction activity has permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days (7 days for sites discharging to special or impaired waters, see section 24). Stabilization must be completed no later than 14 calendar days after the construction activity has ceased. Stabilization is not required on constructed base components of roads, parking lots and similar surfaces. Stabilization is not required on temporary stockpiles without significant silt, clay or organic components (e.g., clean aggregate stockpiles, demolition concrete stockpiles, sand stockpiles) but permittees must provide sediment controls at the base of the stockpile. [Minn. R. 7090]
8.5 For Public Waters that the Minnesota DNR has promulgated "work in water restrictions" during specified fish spawning time frames, permittees must complete stabilization of all exposed soil areas within 200 feet of the water's edge, and that drain to these waters, within 24 hours during the restriction period. [Minn. R. 7090]
8.6 Permittees must stabilize the normal wetted perimeter of the last 200 linear feet of temporary or permanent drainage ditches or swales that discharge to surface waters or stormwater conveyance systems to a functional vegetative buffer or property edge. Permittees must complete stabilization of remaining portions of temporary or permanent ditches or swales within 14 calendar days (7 days for sites discharging to special or impaired waters, see section 24) after connecting to a surface water or property edge and construction in that portion of the ditch temporarily or permanently ceases. [Minn. R. 7090]
8.7 Temporary or permanent ditches or swales being used as a sediment containment system during construction (with properly designed rock-ditch checks, bio rolls, silt dikes, etc.) do not need to be stabilized. Permittees must stabilize these areas within 24 hours after their use as a sediment containment system ceases. [Minn. R. 7090]
8.8 Permittees must not use mulch, hydromulch, tackifier, polyacrylamide or similar erosion prevention practices within any portion of the normal wetted perimeter of a temporary or permanent drainage ditch or swale section with a continuous slope of greater than 2 percent. Examples of acceptable erosion prevention practices include blankets, poly, riprap, etc. [Minn. R. 7090]
8.9 Permittees must provide temporary or permanent energy dissipation at all pipe outlets within 24 hours after connection to a surface water or permanent stormwater treatment system. [Minn. R. 7090]
9.1 Sediment Control Practices. [Minn. R. 7090]
9.2 Permittees must establish sediment control BMPs on all downgradient perimeters of the site and downgradient areas of the site that drain to any surface water, including curb and gutter systems. Permittees must locate sediment control practices upgradient of any buffer zones. Permittees must install sediment control practices before any upgradient land-disturbing activities begin and must keep the sediment control practices in place until they establish permanent cover. [Minn. R. 7090]
9.3 If downgradient sediment controls are overloaded, based on frequent failure or excessive maintenance requirements, permittees must install additional upgradient sediment control practices or redundant BMPs to minimize the overloading and amend the SWPPP to identify these additional practices as required in item 6.3. [Minn. R. 7090]
9.4 Temporary or permanent drainage ditches and sediment basins designed as part of a sediment containment system (e.g., ditches with rock-check dams) require sediment control practices only as appropriate for site conditions. [Minn. R. 7090]
9.5 A floating silt curtain placed in the water is not a sediment control BMP to satisfy Item 9.2 except when working on a shoreline or below the waterline. Immediately after the construction activity (e.g., installation of rip rap along the shoreline) in that area is complete, permittees must install an upland perimeter control practice if exposed soils still drain to a surface water. [Minn. R. 7090]
9.6 Permittees must re-install all sediment control practices adjusted or removed to accommodate short-term activities such as clearing or grubbing, or passage of vehicles, immediately after the short-term activity is completed. Permittees must re-install sediment control practices before the next precipitation event even if the short-term activity is not complete. [Minn. R. 7090]
9.7 Permittees must protect all storm drain inlets using appropriate BMPs during construction until they establish permanent cover on all areas with potential for discharging to the inlet. [Minn. R. 7090]
9.8 Permittees may remove inlet protection for a particular inlet if a specific safety concern (e.g. street flooding/freezing) is identified by the permittees or the jurisdictional authority (e.g., city/county/township/Minnesota Department of Transportation engineer). Permittees must document the need for removal in the SWPPP. [Minn. R. 7090]
9.9 Permittees must provide silt fence or other effective sediment controls at the base of stockpiles on the downgradient perimeter prior to the initiation of stockpiling. Sediment controls must be managed in accordance with section 9.6. [Minn. R. 7090]
9.10 Permittees must locate stockpiles outside of natural buffers or surface waters, including stormwater conveyances such as curb and gutter systems unless there is a bypass in place for the stormwater. [Minn. R. 7090]
9.11 Permittees must install a vehicle tracking BMP to minimize the track out of sediment from the construction site or onto paved roads within the site. [Minn. R. 7090]
9.12 Permittees must use street sweeping in addition to vehicle tracking BMPs if vehicle tracking BMPs alone are not adequate to prevent sediment tracking onto the street. [Minn. R. 7090]
9.13 Permittees must install temporary sediment basins as required in Section 14. [Minn. R. 7090]
9.14 In any areas of the site where final vegetative stabilization will occur, permittees must restrict vehicle and equipment use to minimize soil compaction. [Minn. R. 7090]
9.15 Permittees must preserve topsoil on the site, unless infeasible. [Minn. R. 7090]
9.16 Permittees must direct discharges from BMPs to vegetated areas unless infeasible. [Minn. R. 7090]
9.17 Permittees must preserve a 50-foot natural buffer or, if a buffer is infeasible on the site, provide redundant (double) perimeter sediment controls when a surface water is located within 50 feet of the project's earth disturbances and stormwater flows to the surface water. Permittees must install perimeter sediment controls at least 5 feet apart unless limited by lack of available space. Natural buffers are not required adjacent to road ditches, judicial ditches, county ditches, stormwater conveyance channels, storm drain inlets, and sediment basins. If preserving the buffer is infeasible, permittees must document the reasons in the SWPPP. Sheet piling and other impermeable barriers installed in a manner that retains all stormwater are considered redundant perimeter control. [Minn. R. 7090]
9.18 Any sediment control made of soil must be temporarily or permanently stabilized within 24 hours. [Minn. R. 7090]
9.19 Permittees must use polymers, flocculants, or other sedimentation treatment chemicals in accordance with accepted engineering practices, dosing specifications and sediment removal design specifications provided by the manufacturer or supplier. The permittees must use conventional erosion and sediment controls prior to chemical addition and must direct treated stormwater to a sediment control system for filtration or settlement of the floc prior to discharge. [Minn. R. 7090]
10.1 Dewatering and Basin Draining. [Minn. R. 7090]
10.2 Permittees must not cause nuisance conditions (see Minn. R. 7050.0210, subp. 2) in surface waters from dewatering and basin draining (e.g., pumped discharges, trench/ditch cuts for drainage) discharges. Permittees must discharge turbid or sediment-laden waters related to dewatering or basin draining to a sediment control (e.g. sediment trap or basin, filter bag) designed to prevent discharges with visual turbidity. To the extent possible, use well-vegetated (e.g., grassy or wooded), upland areas of the site to infiltrate dewatering water before discharge. Permittees are prohibited from using receiving waters as part of the treatment area. Permittees must visually check and photograph the discharge at the beginning and at least once every 24 hours of operation to ensure adequate treatment has been obtained and nuisance conditions will not result from the discharge. [Minn. R. 7050.0210]
10.3 If nuisance conditions result from the discharge, Permittees must cease dewatering immediately and corrective actions must occur before dewatering is resumed. Nuisance conditions includes, but is not limited to, a sediment plume in the discharge or the discharge appears cloudy, or opaque, or has a visible contrast, or has a visible oil film, or has aquatic habitat degradation that can be identified by an observer. [Minn. R. 7050.0210]
10.4 If permittees must discharge water containing oil or grease, they must use an oil-water separator or suitable filtration device (e.g., cartridge filters, absorbents pads) prior to discharge. [Minn. R. 7090]
10.5 Permittees must discharge all water from dewatering or basin-draining activities in a manner that does not cause erosion or scour in the immediate vicinity of discharge points or inundation of wetlands in the immediate vicinity of discharge points that causes significant adverse impact to the wetland. [Minn. R. 7090]
10.6 If permittees pump sediment-laden water, they must haul the backwash water away for disposal, return the backwash water to the beginning of the treatment process, or incorporate the backwash water into the site in a manner that does not cause erosion. [Minn. R. 7090]
11.1 Inspections and Maintenance. [Minn. R. 7090]
11.2 Permittees must ensure a trained person, as identified in item 21.2.b, will inspect the entire construction site at least once every seven (7) days during active construction and within 24 hours after a rainfall event greater than 1/2 inch in 24 hours. [Minn. R. 7090]
11.3 Permittees must inspect and maintain all permanent stormwater treatment BMPs. [Minn. R. 7090]
11.4 Permittees must inspect all erosion prevention and sediment control BMPs and Pollution Prevention Management Measures to ensure integrity and effectiveness. Permittees must repair, replace or supplement all nonfunctional BMPs with functional BMPs by the end of the next business day after discovery unless another time frame is specified in item 11.5 or 11.6. Permittees may take additional time if field conditions prevent access to the area. [Minn. R. 7090]
11.5 During each inspection, permittees must inspect areas adjacent to the project, surface waters, including drainage ditches and conveyance systems but not curb and gutter systems, for evidence of erosion and sediment deposition. Permittees must remove all deltas and sediment deposited in areas adjacent to the project, surface waters, including drainage ways, catch basins, and other drainage systems and restabilize the areas where sediment removal results in exposed soil. Permittees must complete removal and stabilization within seven (7) calendar days of discovery unless precluded by legal, regulatory, or physical access constraints. Permittees must use all reasonable efforts to obtain access. If precluded, removal and stabilization must take place within seven (7) days of obtaining access. Permittees are responsible for contacting all local, regional, state and federal authorities and receiving any applicable permits, prior to conducting any work in surface waters. [Minn. R. 7090]
11.6 Permittees must inspect construction site vehicle exit locations, streets and curb and gutter systems within and adjacent to the project for sedimentation from erosion or tracked sediment from vehicles. Permittees must remove sediment from all paved surfaces within one (1) calendar day of discovery or, if applicable, within a shorter time to avoid a safety hazard to users of public streets. [Minn. R. 7090]
11.7 Permittees must repair, replace or supplement all perimeter control devices when they become nonfunctional or the sediment reaches 1/2 of the height of the device. [Minn. R. 7090]
11.8 Permittees must drain temporary and permanent sedimentation basins and remove the sediment when the depth of sediment collected in the basin reaches 1/2 the storage volume within 72 hours of discovery. [Minn. R. 7090]
11.9 Permittee's must inspect and photograph dewatering discharges at the beginning and at least once every 24 hours during operation. Dewatering discharges that only last for minutes, as opposed to hours, and do not reach a surface water, do not require photographs or documentation. [Minn. R. 7090]
11.10 Permittees must ensure that at least one individual present on the site (or available to the project site in three (3) calendar days) is trained in the job duties described in item 21.2.b. [Minn. R. 7090]
11.11 Permittees may adjust the inspection schedule described in item 11.2 as follows:
a. inspections of areas with permanent cover can be reduced to once per month, even if construction activity continues on other portions of the site; or
b. where sites have permanent cover on all exposed soil and no construction activity is occurring anywhere on the site, inspections can be reduced to once per month and, after 12 months, may be suspended completely until construction activity resumes. Before each monthly inspection is conducted, determine if conditions warrant; or
c. where construction activity has been suspended due to frozen ground conditions, inspections may be suspended. Inspections must resume within 24 hours of runoff occurring, or upon resuming construction, whichever comes first.
d. for projects where a pollinator habitat or native prairie type vegetated cover is being established, inspections may be reduced to once per month after the vegetation has emerged and has reached 70% temporary uniform cover. If after 24 months no significant erosion problems are observed, inspections may be suspended completely until the termination requirements in section 13 have been met. [Minn. R. 7090]
11.12 Permittees must perform inspection and maintenance activities within 24 hours of being conducted and these records must be retained with the SWPPP. These records must include:
a. date and time of inspections; and
b. name of persons conducting inspections; and
c. findings of inspections, including the specific location where corrective actions are needed; and
d. corrective actions taken (including dates, times, and party completing maintenance activities); and
e. date of all rainfall events greater than 1/2 inches in 24 hours, and the amount of rainfall for each event. Permittees must obtain rainfall amounts by either a properly maintained rain gauge installed on-site, a weather station that is within one (1) mile of your location, or a weather reporting system that provides site specific rainfall data from radar summaries; and
f. if permittees observe a discharge during the inspection, they must record and should photograph and describe the location of the discharge (i.e., color, odor, settled or suspended solids, oil sheen, and other obvious indicators of pollutants); and
g. any amendments to the SWPPP proposed as a result of the inspection must be documented as required in Section 6 within seven (7) calendar days; and
h. all photographs of dewatering activities and documentation of nuisance conditions resulting from dewatering activities as described in section 10. [Minn. R. 7090]
12.1 Pollution Prevention Management Measures. [Minn. R. 7090]
12.2 Permittees must place construction materials and landscape materials under cover (e.g., plastic sheeting or temporary days) or protect them by similarly effective means designed to minimize contact with stormwater. Permittees are not required to cover or protect products which are either not a source of contamination to stormwater or are designed to be exposed to stormwater. [Minn. R. 7090]
12.3 Permittees must place pesticides, fertilizers and treatment chemicals under cover (e.g., plastic sheeting or temporary roofs) or protect them by similarly effective means designed to minimize contact with stormwater. [Minn. R. 7090]
12.4 Permittees must store hazardous materials and toxic waste, (including oil, diesel fuel, gasoline, hydraulic fluids, paint solvents, petroleum-based products, scrap metal, batteries, additives, curing compounds, and acids) in sealed containers to prevent spills, leaks or other discharge. Storage and disposal of hazardous waste materials must be in compliance with Minn. R. ch. 7045 including secondary containment as applicable. [Minn. R. 7090]
12.5 Permittees must properly store, collect and dispose solid waste in compliance with Minn. R. ch. 7035. [Minn. R. 7035]
12.6 Permittees must position portable toilets so they are secure and will not tip or be knocked over. Permittees must properly dispose sanitary waste in accordance with Minn. R. ch. 7041. [Minn. R. 7041]
12.7 Permittees must take reasonable steps to prevent the discharge of spilled or leaked chemicals, including fuel, from any area where chemicals or fuel will be loaded or unloaded including the use of drip pans or absorbents unless infeasible. Permittees must ensure adequate supplies are available at all times to clean up discharged materials and that an appropriate disposal method is available for recovered spilled materials. Permittees must report and clean up spills immediately as required by Minn. Stat. 115.061, using dry clean up measures where possible. [Minn. Stat. 115.061]
12.8 Permittees must train employees and subcontractors on spill prevention and proper disposal procedures. Permittees must instruct employees on applicable pollution control procedures and equipment to a defined area of the site. Permittees must contain runoff from the washing area in a sediment basin or other similarly effective controls and must dispose waste from the washing activity properly. Permittees must properly use and store soaps, detergents, or solvents. [Minn. R. 7090]
12.9 Permittees must provide effective containment for all liquid and solid wastes generated by washout operations (e.g., concrete, stucco, paint, form release oils, curing compounds and other construction materials) related to the construction activity. Permittees must prevent liquid and solid washout wastes from contacting the ground and must design the containment so it does not result in runoff from the washout operations or areas. Permittees must properly dispose liquid and solid wastes in compliance with MPCA rules. Permittees must install a sign indicating the location of the washout facility. [Minn. R. 7035, Minn. R. 7090]
13.1 Permit Termination Conditions. [Minn. R. 7090]
13.2 Permittees must complete all construction activity and must install permanent cover over all areas prior to submitting the NOT. Vegetative cover must consist of a uniform perennial vegetation with a density of 70 percent of its expected final growth Vegetation is not required where the function of a specific area dictates no vegetation, such as impervious surfaces or the base of a sand filter. [Minn. R. 7090]
13.3 Permittees must clean the permanent stormwater treatment system of any accumulated sediment and must ensure the system meets all applicable requirements in Section 15 through 19 and is operating as designed. [Minn. R. 7090]
13.4 Permittees must remove all sediment from conveyance systems prior to submitting the NOT. [Minn. R. 7090]
13.5 Permittees must remove all temporary synthetic erosion prevention and sediment control BMPs prior to submitting the NOT. Permittees may leave BMPs designed to decompose on-site in place. [Minn. R. 7090]
13.6 For residential construction only, permittees must temporarily stabilize an individual lots if the lot is sold to the homeowner, structures are finished, and permanent cover has been established. For lots that are sold to the homeowner where permanent cover has not been established, coverage terminates if temporary erosion prevention and downgradient perimeter control is properly installed and the permittee distributes the MPCA's "Homeowner Fact Sheet" to the homeowner. [Minn. R. 7090]
13.7 For construction projects on agricultural land (e.g., pipelines across cropland), permittees must return the disturbed land to its preconstruction agricultural use prior to submitting the NOT. [Minn. R. 7090]
13.8 When submitting the NOT, Permittees must include either ground or aerial photographs showing the requirements of 13.2 have been met. Permittees must take photographs of every distinct part of the site, however in cases where design conditions are portrayed must be substantially similar to those areas that are not photographed. Photographs must be clear and in focus and must include the date the photo was taken. [Minn. R. 7090]
14.1 Temporary Sediment Basins. [Minn. R. 7090]
14.2 Where ten (10) or more acres of disturbed soil (5 acres for sites discharging to special or impaired waters, see section 24) drain to a common location, permittees must provide a temporary sediment basin to provide treatment of the runoff before it leaves the construction site or enters surface waters. Permittees may convert a temporary sediment basin to a permanent basin after construction is complete. The temporary basin is no longer required when permanent cover has reduced the total suspended soil to less than ten (10) acres draining to a common location. [Minn. R. 7090]
14.3 The temporary basin must provide live storage for a calculated volume of runoff from a two (2)-year, 24-hour storm from each acre drained to the basin or 1,800 cubic feet of live storage per acre drained, whichever is greater. [Minn. R. 7090]
14.4 Where permittees have not calculated the two (2)-year, 24-hour storm runoff amount, the temporary basin must provide 3,600 cubic feet of live storage per acre of the basins' drainage area. [Minn. R. 7090]
14.5 Permittees must design basin outlets to prevent short-circuiting and the discharge of floating debris. [Minn. R. 7090]
14.6 Permittees must design the outlet structure to withdraw water from the surface to minimize the discharge of pollutants. Permittees may temporarily suspend the use of a surface withdrawal system during frozen conditions. The basin must include a stabilized emergency overflow to prevent failure of pond integrity. [Minn. R. 7090]
14.7 Permittees must provide energy dissipation for the basin outlet within 24 hours after connection to a surface water. [Minn. R. 7090]
14.8 Permittees must locate temporary basins outside of surface waters and any buffer zone required in item 23.11.[Minn. R. 7090]
14.9 Permittees must construct the temporary basins prior to disturbing 10 or more acres of soil draining to a common location. [Minn. R. 7090]
14.10 Where a temporary sediment basin meeting the requirements of item 14.3 through 14.9 is infeasible, permittees must install effective sediment controls such as smaller sediment basins and/or sediment traps, silt fences, vegetative buffer strips or any appropriate combination of measures as dictated by individual site conditions. In determining whether installing a sediment basin is infeasible, permittees must consider public safety and may consider factors such as site soils, slope, and available area on-site. Permittees must document this determination of infeasibility in the SWPPP.[Minn. R. 7090]
15.1 Permanent Stormwater Treatment System. [Minn. R. 7090]
15.2 Permittees must design and implement the project so all stormwater discharged from the project during and after construction activities does not cause a violation of state water quality standards, including nuisance conditions, erosion in receiving channels or on downslope properties, or a significant adverse impact to wetlands caused by inundation or decrease of flow. [Minn. R. 7090]
15.3 Permittees must design and construct a permanent stormwater treatment system to treat the water quality volume if the project's ultimate development replaces vegetation and/or other pervious surfaces creating a net increase of one (1) or more acres of cumulative impervious surface. [Minn. R. 7090]
15.4 Permittees must calculate the water quality volume as one (1) inch times the net increase of impervious surfaces created by the project. [Minn. R. 7090]
15.5 Permittees must first consider volume reduction practices on-site (e.g., infiltration or other) when designing the permanent stormwater treatment system. If this permit prohibits infiltration as described in item 16.14 through item 16.21, permittees may consider a wet sedimentation basin, filtration basin or regional pond. This permit does not consider wet sedimentation basins and filtration systems to be volume reduction practices. [Minn. R. 7090]
15.6 For projects on-site where the full volume reduction requirement cannot be met on-site, (e.g., the site has infiltration prohibitions), permittees must document the reasons in the SWPPP. [Minn. R. 7090]
15.7 Permittees must discharge the water quality volume to a permanent stormwater treatment system prior to discharge to a surface water. For purposes of this item, surface waters do not include man-made drainage systems that convey stormwater to a permanent stormwater treatment system. [Minn. R.

NOTES

1. SUBCATCHMENT 30S: REAR ROOF DRAINAGE FROM LOTS 11–23, BLOCK 9 WILL BE COLLECTED BY STORM SEWER. LOTS 5–7, BLOCK 7 AND LOTS 1–2, BLOCK 8 REAR ROOFS, FOR AN ESTIMATED TOTAL OF 9,550 SF (0.22 AC) IMPERVIOUS, ARE PROPOSED TO RUNOFF DIRECTLY TO ADJACENT LAND.

LEGEND

1P — POND AREA

1R — REACH

1S — DRAINAGE AREA (TOTAL DRAINAGE AREA / IMPERVIOUS AREA)

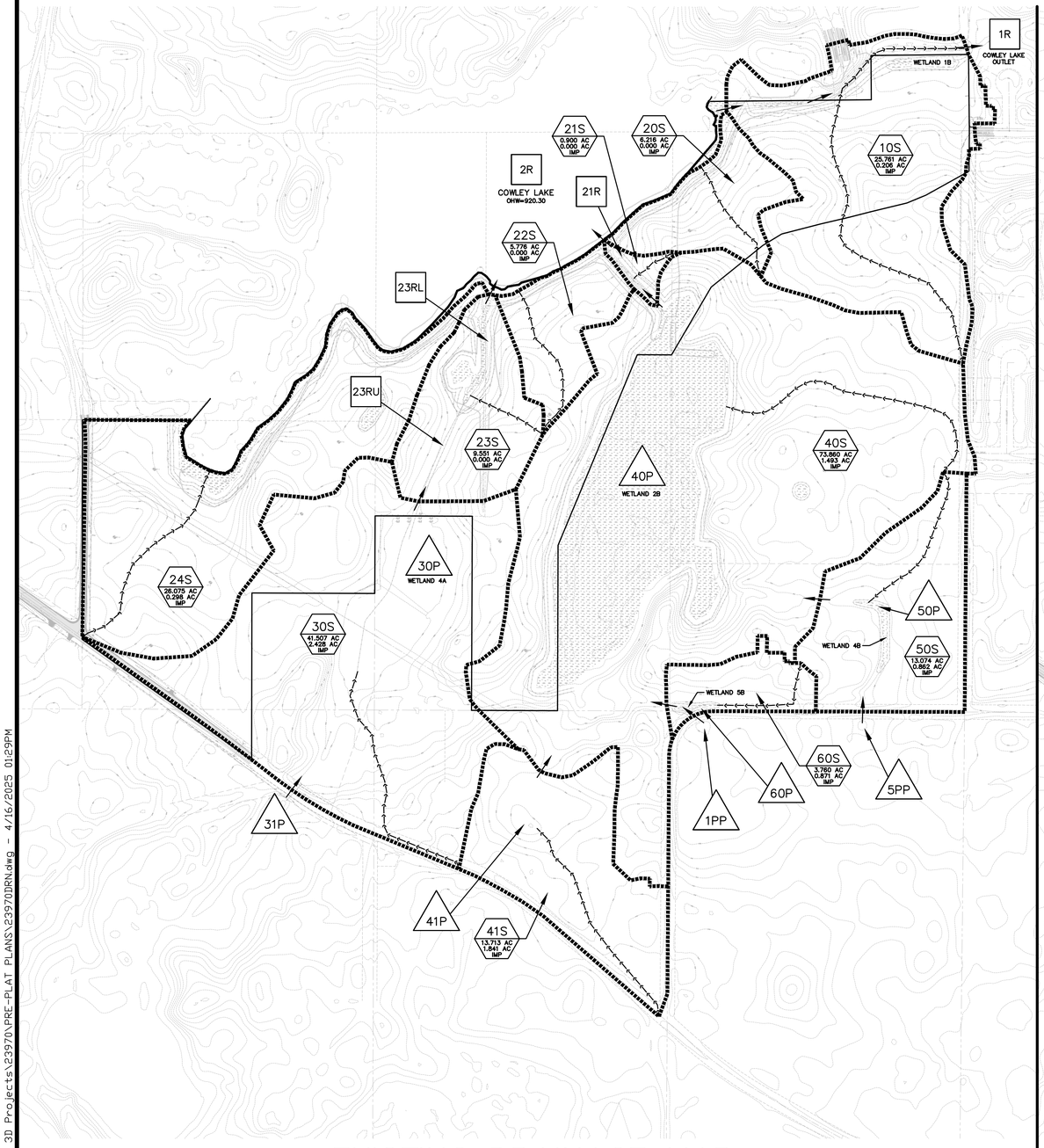
FLOW DIRECTION

ToC PATH

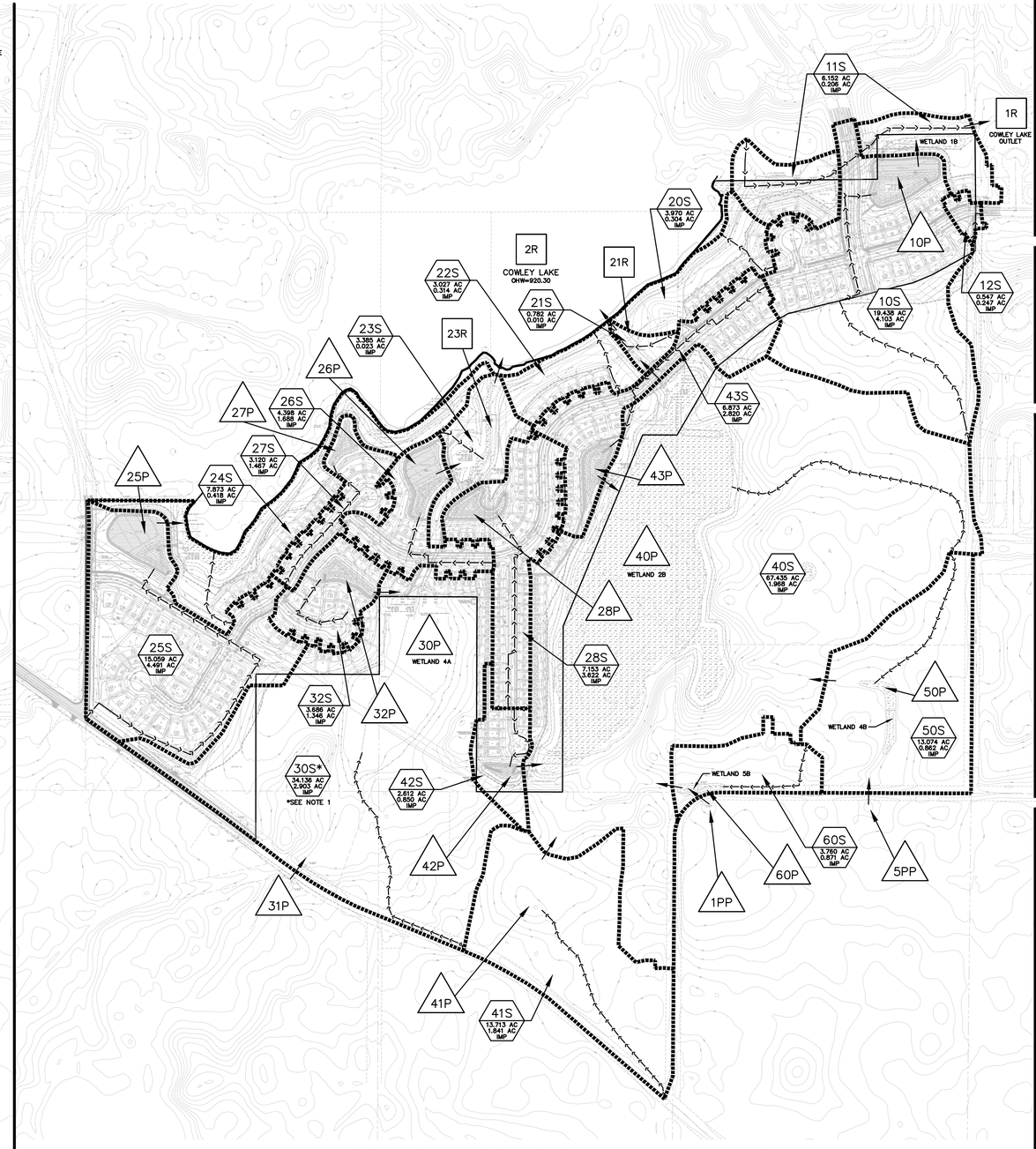
DRAINAGE BOUNDARY

SCALE IN FEET
0 300 600 900
1 inch = 300 feet

N



EXISTING DRAINAGE MAP



PROPOSED DRAINAGE MAP

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Date: _____ Reg.No. _____

PRELIMINARY

COWLEY LAKE PRESERVE

ROGERS, MINNESOTA

DRAINAGE MAPS

FOR

RACHEL DEVELOPMENT

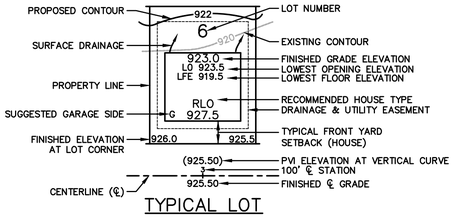
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970DRN
PROJECT NO.	23970
	3.5

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970DRN.dwg - 4/16/2025 01:29PM

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR (923)
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION (SB-1)
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR (923)
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW (EOF)
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- WETLAND BUFFER SIGN



TYPICAL LOT

WARNING!
UNDERGROUND HIGH PRESSURE PIPELINE
CONTACT ENERGY TRANSFER REPRESENTATIVE
AT 1-800-753-5531 PRIOR TO PERFORMING WORK
WITHIN THE PIPELINE EASEMENT

811 Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 200 400 600
1 inch = 200 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	VUN/JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970G
PROJECT NO.	23970
	4.0

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970G.dwg - 4/16/2025 01:29PM

CITY OF ROGERS
PID #1612023440049

CITY OF ROGERS
PID #1612023420043

RONALD & JENNIFER HOLTERMAN
PID #1512023330062

JULIE LOU RYAN
PID #1512023330061

JOHN & JESSICA BROSIUS
PID #1512023330060

TRENT RADEMACHER ALYSSA EVENSON
PID #2212023220081

RICHARD & JILL SMISEK
PID #2212023220075

RONALD LUNDERBY
PID #2212023220074

GLENN & KRISTIN JOHNSON
PID #2212023220073

KIETH & JODY WEBER
PID #2112023110003

EDGEWATER PARKWAY

WEBER PLACE

DALE DRIVE

133RD AVE N

OUTLOT A

OUTLOT B

POND EOF
SEE DETAIL
EOF
924.0

POND 10P (SED./FILT.)
BOTTOM 913.00
FILT. OLE 921.00
PRIMARY OLE 922.00
100-YR HWL 923.82

WETLAND 1B

10' MAINTENANCE ACCESS (TYP)

10' MINIMUM BUFFER

40' AVERAGE BUFFER

25' MINIMUM BUFFER

WETLAND BUFFER SIGN (TYP)

PROPOSED WETLAND BUFFER

10' BIT. TRAIL

FUTURE TRAIL. WIDTH OF TRAIL EASEMENT TO BE DETERMINED AT TIME OF FINAL PLAT. MIN. 20' WIDTH.

TEMP. TURNAROUND

EX. 36" CMP INV 916.48

EX. 36" CMP INV 916.74

EX. 48" CMP INV 916.34

EX. 48" CMP INV 915.98

EX. WALL TOP 926.40 BOT 925.46

EX. 15" FES INV 923.38

ST-14

ST-13

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- WETLAND BUFFER SIGN

TYPICAL LOT

- PROPOSED CONTOUR
- SURFACE DRAINAGE
- PROPERTY LINE
- SUGGESTED GARAGE SIDE
- FINISHED ELEVATION AT LOT CORNER
- CENTERLINE (℄)
- LOT NUMBER
- EXISTING CONTOUR
- FINISHED GRADE ELEVATION
- LOWEST OPENING ELEVATION
- LOWEST FLOOR ELEVATION
- RECOMMENDED HOUSE TYPE
- DRAINAGE & UTILITY EASEMENT
- TYPICAL FRONT YARD SETBACK (HOUSE)
- PVI ELEVATION AT VERTICAL CURVE
- 100' ℄ STATION
- FINISHED ℄ GRADE

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/JSO

DATE
02/24/2025

REVISIONS

03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970G

PROJECT NO.
23970

4.1

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970G.dwg - 4/16/2025 01:29PM

COWLEY LAKE
WATER LEVEL ON 8/15/2022: 918.9
ORDINARY HIGH WATER LEVEL: 920.3 (NAVD88)

OUTLOT B
OUTLOT C
10' BIT. TRAIL
10' TRAIL
EX. CONSERVATION EASEMENT
5' CONC. WALK
BOARDWALK
DALE DRIVE
10' MAINTENANCE ACCESS (TYP)
40' AVERAGE BUFFER
25' MINIMUM BUFFER
PROPOSED WETLAND BUFFER
WETLAND BUFFER SIGN (TYP)
WETLAND 2B
POND 40P
WETLAND 2B
OLE 923.90
100-YR HWL 926.55
POND 43P (SED.)
BOTTOM 918.50
OLE 926.50
100-YR HWL 929.07
28P (SED.)
TOM 914.00
OLE 922.00
+WL 924.00
POND EOF
SEE DETAIL
THOMAS & CHRISTINA GILBERT
PID #2112023130005
ANCE
(TYP)

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- WETLAND BUFFER SIGN

PROPOSED CONTOUR — LOT NUMBER
SURFACE DRAINAGE — EXISTING CONTOUR
FINISHED GRADE ELEVATION
LOWEST OPENING ELEVATION
LOWEST FLOOR ELEVATION
PROPERTY LINE
RECOMMENDED HOUSE TYPE
SUGGESTED GARAGE SIDE — DRAINAGE & UTILITY EASEMENT
FINISHED ELEVATION AT LOT CORNER — TYPICAL FRONT YARD SETBACK (HOUSE)
PVI ELEVATION AT VERTICAL CURVE
100' ℄ STATION
CENTERLINE (℄) — FINISHED ℄ GRADE

TYPICAL LOT

Know what's below. Call before you dig.

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Date: _____ Reg.No. _____

PRELIMINARY

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/JSO

DATE
02/24/2025

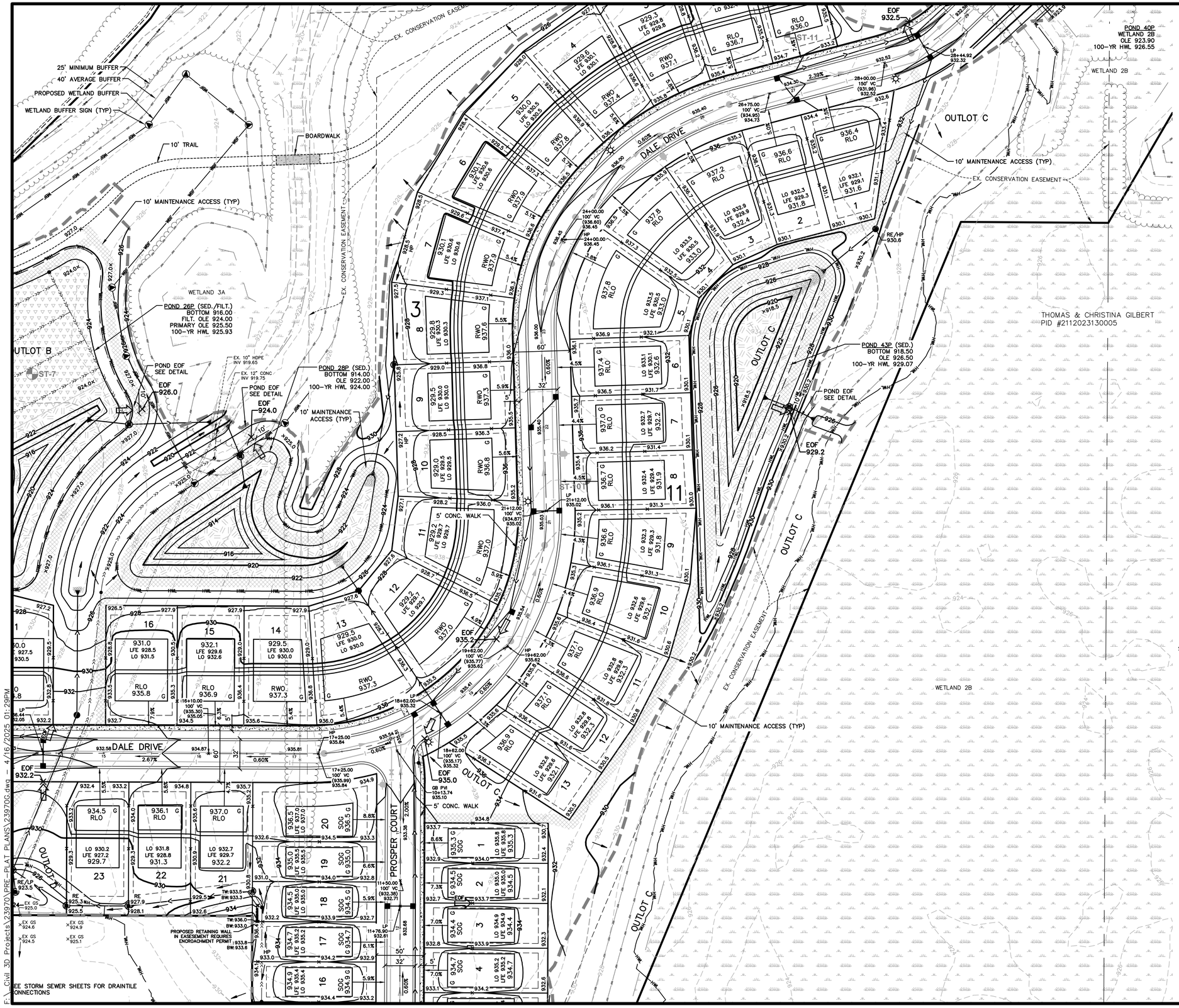
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970G

PROJECT NO.
23970

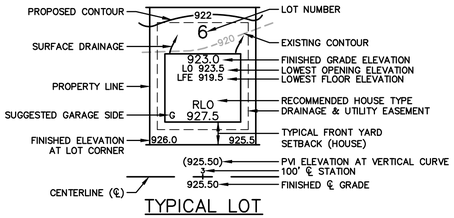
4.2

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970G.dwg — 4/16/2025 01:29PM



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- WETLAND BUFFER SIGN



TYPICAL LOT

Know what's **below.** **Call** before you dig.

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/JSO

DATE
02/24/2025

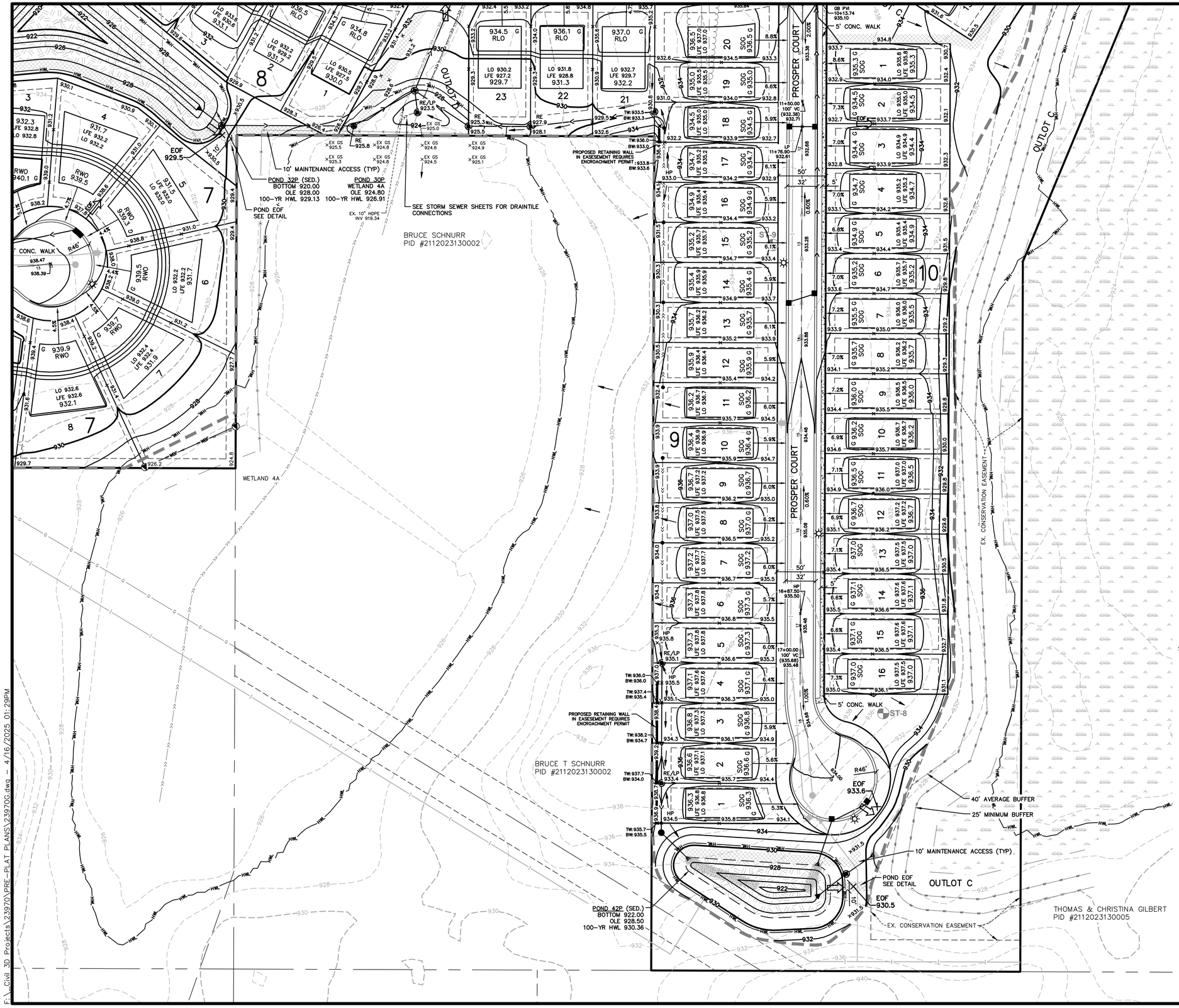
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970G

PROJECT NO.
23970

4.3

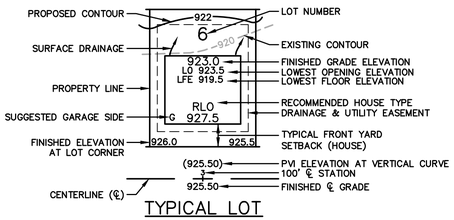
F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970G.dwg - 4/16/2025 01:29PM



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- WETLAND BUFFER SIGN

TYPICAL LOT



Know what's below. Call before you dig.

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

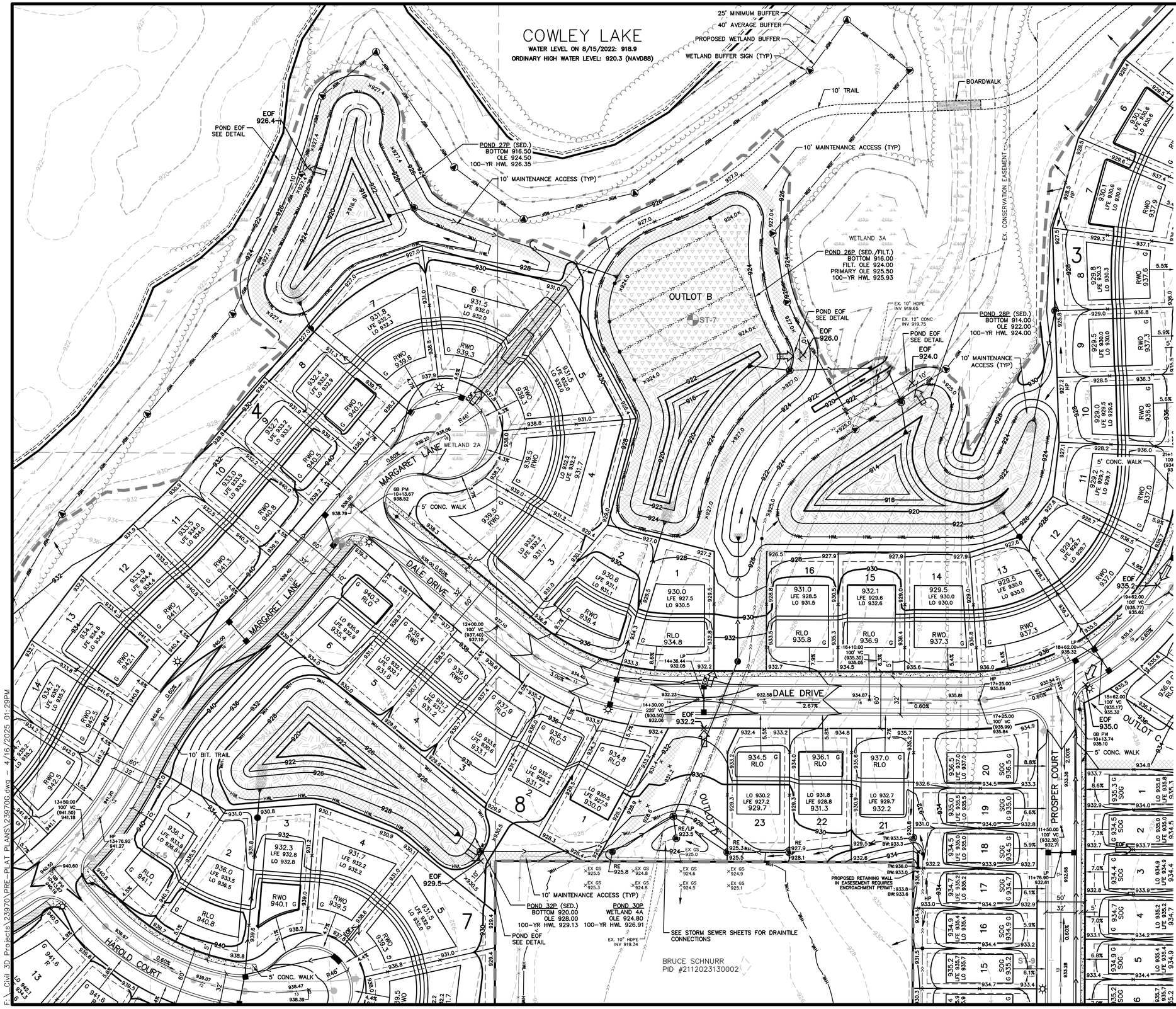
PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

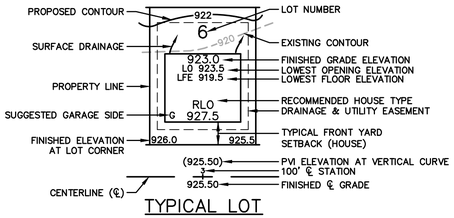
DRAWN BY	VUN/JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970G
PROJECT NO.	23970
	4.4

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970G.dwg - 4/16/2025 01:29PM



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- WETLAND BUFFER SIGN



TYPICAL LOT

Know what's **below.** **Call** before you dig.

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Date: _____ Reg.No. _____

PRELIMINARY

COWLEY LAKE PRESERVE

ROGERS, MINNESOTA

PRELIMINARY GRADING & DRAINAGE PLAN

FOR

RACHEL DEVELOPMENT

4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY VUN/JSO
DATE 02/24/2025
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS
CAD FILE 23970G
PROJECT NO. 23970
4.5

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970C.dwg - 4/16/2025 01:29PM

JAMES & KAREN KEMMETMUELLER
PID # 2112023220003

EX. 12" CMP
INV 920.79

10' MAINTENANCE ACCESS (TYP)

EX. UNDERGROUND STORM SEWER/DRAINTILE TO BE FIELD LOCATED

EX. MHST
RE 928.97
INV 921.40

EX. 15" RCP

EX. 15" FES
INV 921.67

OUTLOT B

PROPOSED MONUMENT SIGN

R330'

EAGLE'S NEST RADIUS

40' AVERAGE BUFFER

25' MINIMUM BUFFER

WETLAND BUFFER SIGN (TYP)

PROPOSED WETLAND BUFFER

COWLEY LAKE
WATER LEVEL ON 8/15/2022: 918.9
ORDINARY HIGH WATER LEVEL: 920.3 (NAVD88)

EOF
928.0

POND EOF
SEE DETAIL

POND 2SP (SED./FILT.)
BOTTOM 917.00
FILT. OLE 925.00
PRIMARY OLE 926.50
100-YR HWL 927.80

WETLAND 1A

EX EAGLE'S NEST*
*SEE "ENDANGERED SPECIES" NOTES ON SHEET 3.2

MARGARET LANE

10' BIT. TRAIL

HAROLD COURT

5' CONC. WALK

OUTLOT F

OUTLOT I

OUTLOT G

MARLENE AVENUE

LOVINA LANE

8' CONC. WALK

WILLANDALE ROAD

EX 8" GAS MAIN

SCOTT & LORIANNE ENDE
PID #2112023240004

JAMES & KAREN KEMMETMUELLER
PID # 2112023220003

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970G.dwg - 4/16/2025 01:30PM

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- WETLAND BUFFER SIGN

PROPOSED CONTOUR — 922 — LOT NUMBER
SURFACE DRAINAGE — EXISTING CONTOUR
PROPERTY LINE — FINISHED GRADE ELEVATION
LO 923.5 — LOWEST OPENING ELEVATION
LFE 919.5 — LOWEST FLOOR ELEVATION
SUGGESTED GARAGE SIDE — RECOMMENDED HOUSE TYPE
DRAINAGE & UTILITY EASEMENT
FINISHED ELEVATION AT LOT CORNER — TYPICAL FRONT YARD SETBACK (HOUSE)
(925.50) — PVI ELEVATION AT VERTICAL CURVE
100' ℄ STATION
925.50 — FINISHED ℄ GRADE
CENTERLINE (℄)

TYPICAL LOT

WARNING!

UNDERGROUND HIGH PRESSURE PIPELINE
CONTACT ENERGY TRANSFER REPRESENTATIVE
AT 1-800-753-5531 PRIOR TO PERFORMING WORK
WITHIN THE PIPELINE EASEMENT

Know what's below.
Call before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/JSO

DATE
02/24/2025

REVISIONS

03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970G

PROJECT NO.
23970

4.6

JAMES & KAREN KEMMETMUELLER
PID # 2112023220003

WILLANDALE ROAD

MARLENE AVENUE

MARGARET LANE

HAROLD COURT

LOVINA LANE

TERRITORIAL ROAD

OUTLOT G

OUTLOT F

OUTLOT I

OUTLOT H

SCOTT & LORIANNE ENDE
PID #2112023240004

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING CURB & GUTTER
- EXISTING FENCE
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- WETLAND BUFFER SIGN

PROPOSED CONTOUR — 922 — LOT NUMBER
SURFACE DRAINAGE — 6 — EXISTING CONTOUR
923.0 — FINISHED GRADE ELEVATION
LO 923.5 — LOWEST OPENING ELEVATION
PROPERTY LINE — LFE 919.5 — LOWEST FLOOR ELEVATION
RLO — RECOMMENDED HOUSE TYPE
SUGGESTED GARAGE SIDE — G 927.5 — DRAINAGE & UTILITY EASEMENT
FINISHED ELEVATION AT LOT CORNER — 926.0 — 925.5 — TYPICAL FRONT YARD SETBACK (HOUSE)
(925.50) — PVI ELEVATION AT VERTICAL CURVE
100' ℄ STATION
925.50 — FINISHED ℄ GRADE
CENTERLINE (℄)

TYPICAL LOT

WARNING!
UNDERGROUND HIGH PRESSURE PIPELINE
CONTACT ENERGY TRANSFER REPRESENTATIVE
AT 1-800-753-5531 PRIOR TO PERFORMING WORK
WITHIN THE PIPELINE EASEMENT

Know what's **below.**
Call before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Date: _____ Reg.No. _____

PRELIMINARY

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/JSO

DATE
02/24/2025

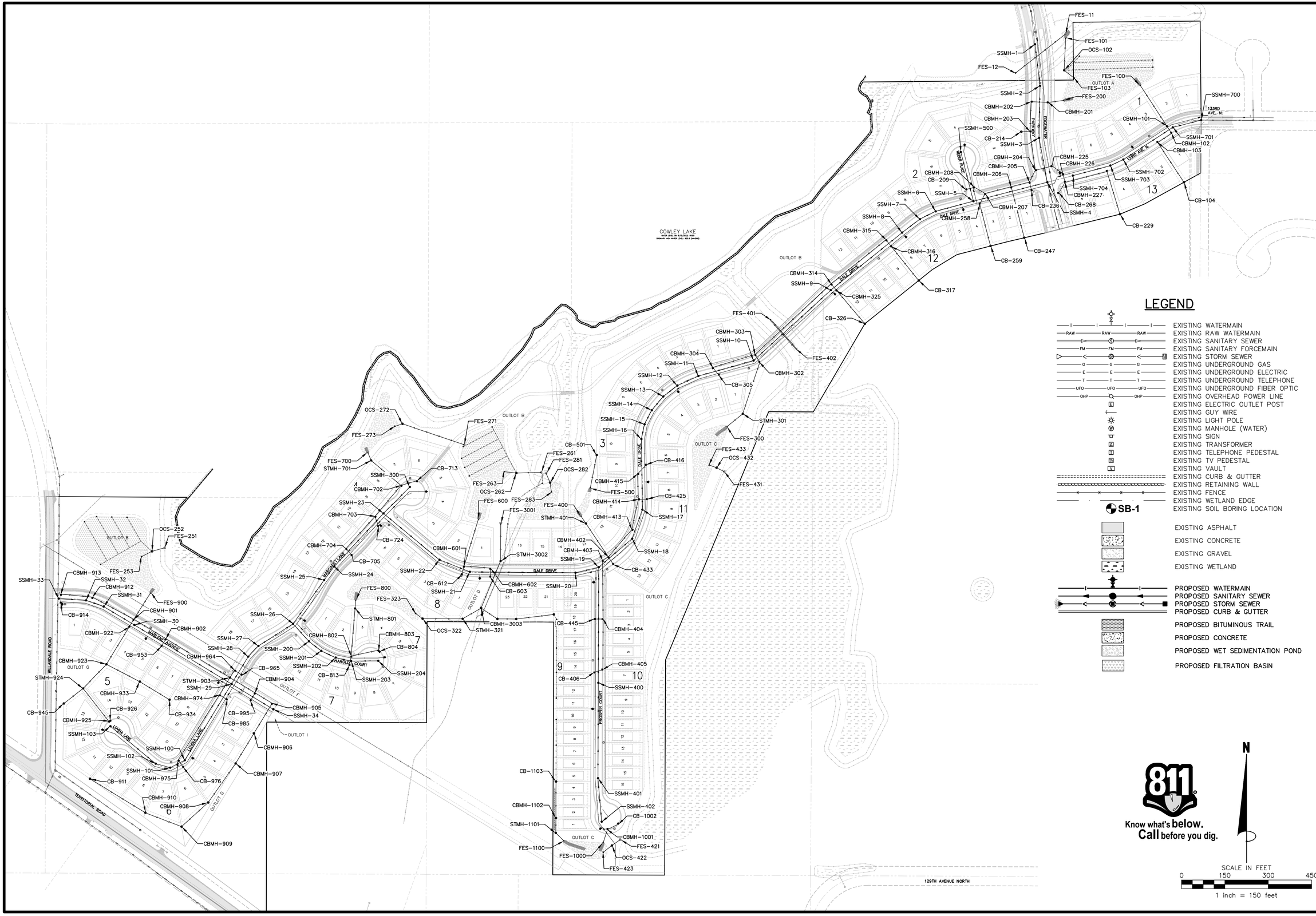
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970G

PROJECT NO.
23970

4.7

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970G.dwg - 4/16/2025 01:30PM



LEGEND

- EXISTING WATERMAIN
- EXISTING RAW WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING SANITARY FORCEMAIN
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING ELECTRIC OUTLET POST
- EXISTING GUY WIRE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (WATER)
- EXISTING SIGN
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- EXISTING WETLAND EDGE
- SB-1 EXISTING SOIL BORING LOCATION
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED CURB & GUTTER
- PROPOSED BITUMINOUS TRAIL
- PROPOSED CONCRETE
- PROPOSED WET SEDIMENTATION POND
- PROPOSED FILTRATION BASIN

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 150 300 450
1 inch = 150 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: Reg.No.

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
OVERALL UTILITY PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO

DATE
02/24/2025

REVISIONS

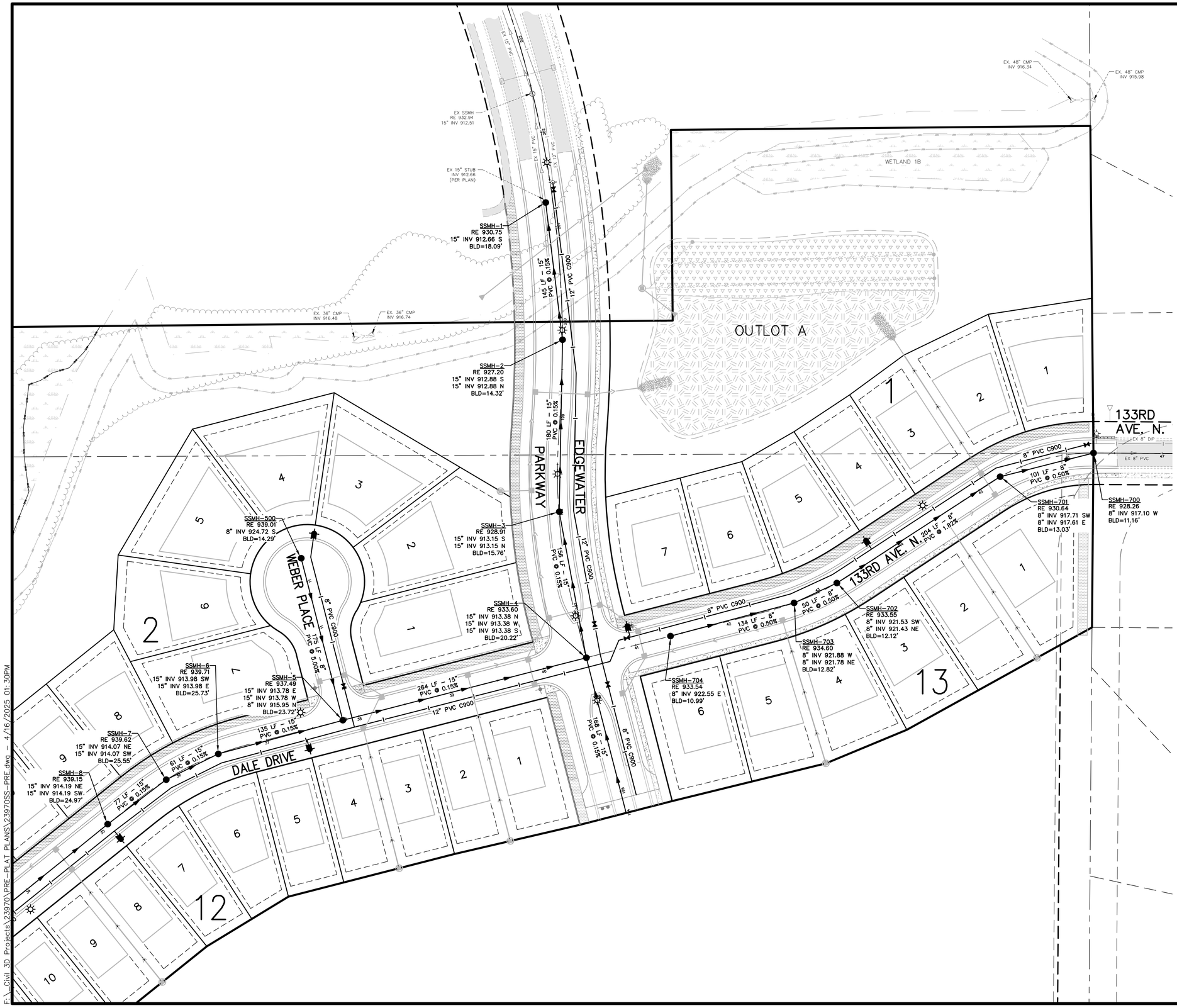
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970SS-PRE

PROJECT NO.
23970

5.0

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970SS-PRE.dwg - 4/16/2025 01:30PM



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: Reg.No.

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY SANITARY SEWER & WATERMAIN PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	VUN/EPF/JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970SS-PRE
PROJECT NO.	23970
	5.1

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970SS-PRE.dwg - 4/16/2025 01:30PM

COWLEY LAKE
WATER LEVEL ON 8/15/2022: 918.9
ORDINARY HIGH WATER LEVEL: 920.3 (NAVD88)

OUTLOT B

OUTLOT C

WETLAND 2B

DALE DRIVE

SSMH-7
RE 939.62
15" INV 914.07 NE
15" INV 914.07 SW
BLD=25.55'

SSMH-8
RE 939.15
15" INV 914.19 NE
15" INV 914.19 SW
BLD=24.97'

SSMH-9
RE 934.50
15" INV 914.67 SW
15" INV 914.67 NE
BLD=19.83'

SSMH-10
RE 932.34
15" INV 915.21 NE
15" INV 915.21 W
BLD=17.13'

SSMH-11
RE 935.21
15" INV 915.51 SW
15" INV 915.51 E
BLD=19.70'

SSMH-12
RE 935.69
15" INV 915.63 SW
15" INV 915.63 NE
BLD=20.06'

SSMH-13
RE 936.06
15" INV 915.72 SW
15" INV 915.72 NE
BLD=20.34'

SSMH-14
RE 936.40
15" INV 915.81 NE
15" INV 915.81 SW
BLD=20.59'

SSMH-15
RE 936.40
15" INV 915.89 NE
15" INV 915.89 S
BLD=20.51'

SSMH-16
RE 936.12
15" INV 915.97 N
15" INV 915.97 S
BLD=20.15'

317 LF - 15" PVC @ 0.15%
12" PVC C900
61 LF - 15" PVC @ 0.15%
77 LF - 15" PVC @ 0.15%
361 LF - 15" PVC @ 0.15%
198 LF - 15" PVC @ 0.15%
80 LF - 15" PVC @ 0.15%
62 LF - 15" PVC @ 0.15%
62 LF - 15" PVC @ 0.15%
35 LF - 15" PVC @ 0.15%
52 LF - 15" PVC @ 0.15%

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN

Know what's below. Call before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: Reg.No.

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY SANITARY SEWER & WATERMAIN PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO

DATE
02/24/2025

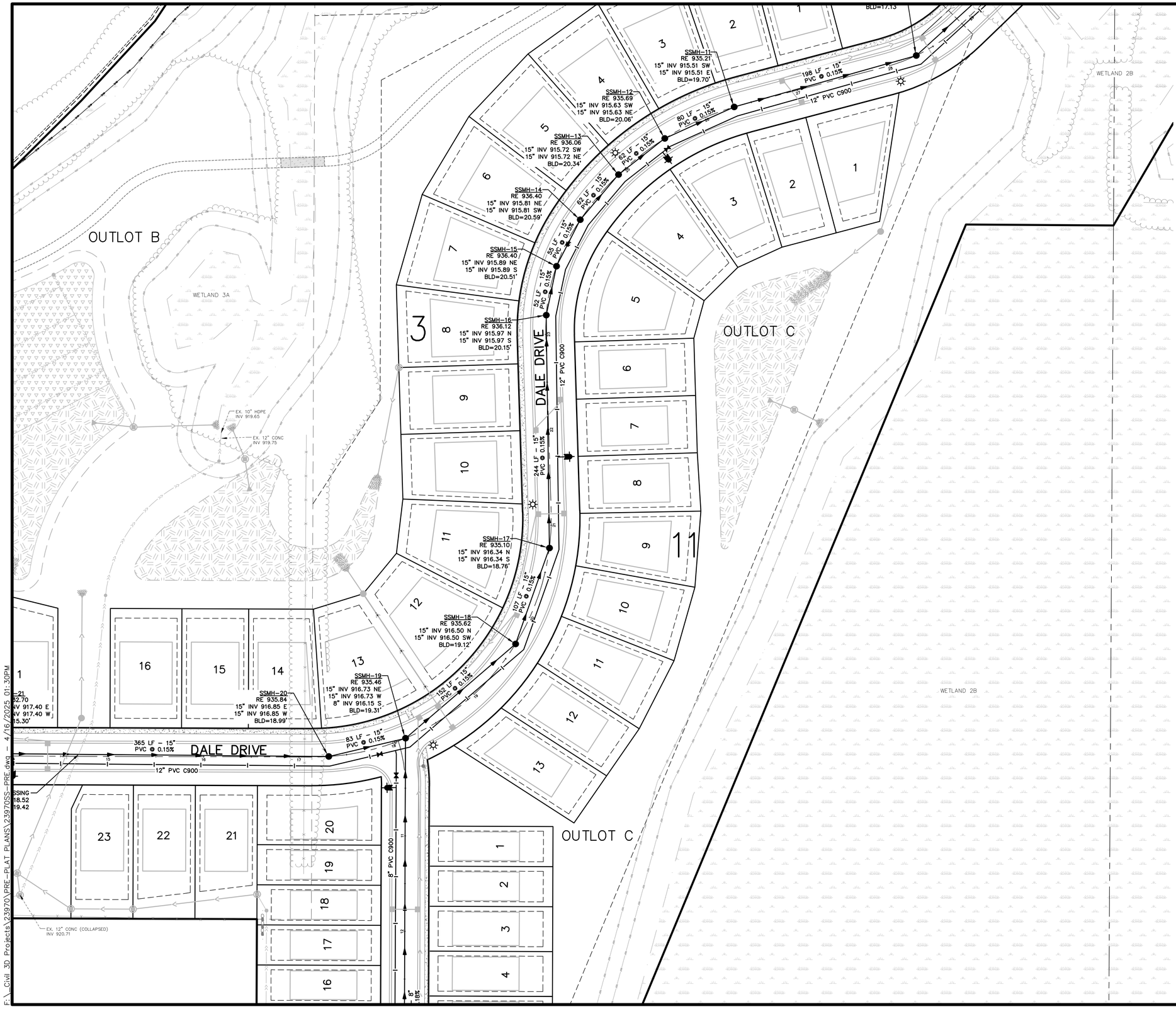
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970SS-PRE

PROJECT NO.
23970

5.2

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970SS-PRE.dwg 4/16/2025 01:30PM



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date:_____ Reg.No._____

COWLEY LAKE PRESERVE

ROGERS, MINNESOTA

PRELIMINARY SANITARY SEWER & WATERMAIN PLAN

FOR

RACHEL DEVELOPMENT

4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	VUN/EPF/JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 WPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970SS-PRE
PROJECT NO.	23970
	5.3

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970SS-PRE.dwg - 4/16/2025 01:30PM

PROPOSED CROSSING
TOP OF 15" SAN PVC=918.52
DRAINTILE 12" INV=919.42

EX. 10" HDPE
INV 919.34

EX. 12" CONC (COLLAPSED)
INV 920.71

OUTLOT D

OUTLOT C

17+25.00
935.84

8" PVC C900

400 LF – 8"
PVC @ 1.18%

PROSPER COURT

330 LF – 8"
PVC @ 0.50%

151 LF – 8"
PVC @ 0.50%

8" PVC C900

8" PVC C900

SSMH–204
RE 937.87
8" INV 926.87 W
BLD=11.00'

SSMH–400
RE 933.87
8" INV 920.89 N
8" INV 920.99 S
BLD=12.98'

SSMH–401
RE 935.37
8" INV 922.64 N
8" INV 922.74 S
BLD=12.73'

SSMH–402
RE 933.80
8" INV 923.50 N
BLD=10.30'

WETLAND 4A

FUTURE WATERMAIN (FINAL SIZE AND LOCATION TBD)

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN

Know what's below. Call before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY SANITARY SEWER & WATERMAIN PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO

DATE
02/24/2025

REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970SS–PRE

PROJECT NO.
23970

5.4

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970SS-PRE.dwg – 4/16/2025 01:30PM

OUTLOT B

WETLAND 3A

WETLAND 2A

EX. 10" HDPE INV 919.65

EX. 12" CONC INV 919.75

SSMH-300
RE 937.76
8" INV 926.55 SW
BLD=11.20'

129 LF - 8" PVC @ 5.00%

8" PVC C900

SSMH-23
RE 938.79
15" INV 917.95 SE
15" INV 917.95 SW
8" INV 920.11 NE
BLD=20.85'

250 LF - 15" PVC @ 0.15%

12" PVC C900

252 LF - 15" PVC @ 0.15%

SSMH-22
RE 935.85
15" INV 917.57 E
15" INV 917.57 NW
BLD=18.28'

SSMH-21
RE 932.70
15" INV 917.40 E
15" INV 917.40 W
BLD=15.30'

113 LF - 15" PVC @ 0.15%

SSMH-20
RE 935.84
15" INV 916.85 E
15" INV 916.85 W
BLD=18.99'

SSMH-19
RE 935.46
15" INV 916.73 NE
15" INV 916.73 W
8" INV 916.15 S
BLD=19.31'

152 LF - 15" PVC @ 0.15%

SSMH-18
RE 935.62
15" INV 916.50 N
15" INV 916.50 SW
BLD=19.12'

MARGARET LANE

SSMH-24
RE 940.30
15" INV 918.33 NE
15" INV 918.33 SW
BLD=21.97'

59 LF - 15" PVC @ 0.15%

SSMH-25
RE 940.65
15" INV 918.42 NE
15" INV 918.42 SW
BLD=22.23'

365 LF - 15" PVC @ 0.15%

DALE DRIVE

12" PVC C900

83 LF - 15" PVC @ 0.15%

PROPOSED CROSSING
TOP OF 15" SAN PVC=918.52
DRAINTILE 12" INV=919.42

OUTLOT D

EX. 10" HDPE INV 919.34

EX. 12" CONC (COLLAPSED) INV 920.71

SSMH-26
RE 940.60
15" INV 918.70 SW
8" INV 920.86 SE
15" INV 918.70 NE
BLD=21.90'

186 LF - 15" PVC @ 0.15%

12" PVC C900

82 LF - 8" PVC @ 5.00%

55 LF - 8" PVC @ 0.50%

8" PVC C900

SSMH-200
RE 939.78
8" INV 924.95 NW
8" INV 925.05 SE
BLD=14.83'

54 LF - 8" PVC @ 0.95%

55 LF - 8" PVC @ 0.50%

94 LF - 8" PVC @ 0.50%

SSMH-201
RE 939.45
8" INV 925.66 SE
8" INV 925.56 NW
BLD=13.89'

SSMH-202
RE 939.12
8" INV 926.02 E
8" INV 925.93 NW
BLD=13.19'

HAROLD COURT

SSMH-203
RE 938.79
8" INV 926.30 W
8" INV 926.40 E
BLD=12.49'

SSMH-204
RE 937.87
8" INV 926.87 W
BLD=11.00'

OUTLOT F

EX. 8" GAS MAIN

8" PVC C900

400 LF - 8" PVC @ 1.18%

SSMH-400
RE 933.87
8" INV 920.89 N
8" INV 920.99 S
BLD=12.98'

COURT

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

PRELIMINARY

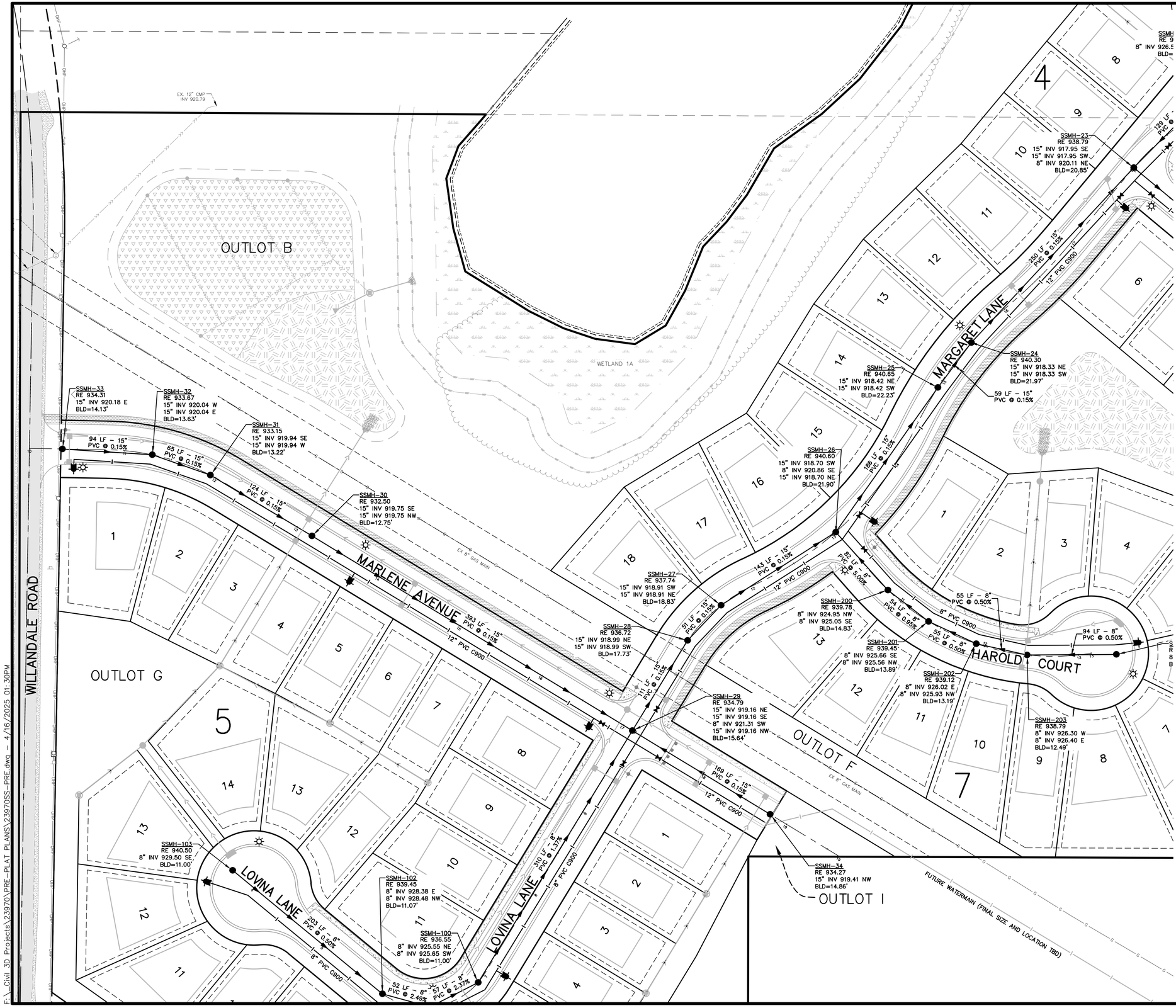
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY SANITARY SEWER & WATERMAIN PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	VUN/EPF/JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970SS-PRE
PROJECT NO.	23970
	5.5

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970SS-PRE.dwg - 4/16/2025 01:30PM



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN

Know what's below. Call before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE

PRELIMINARY SANITARY SEWER & WATERMAIN PLAN

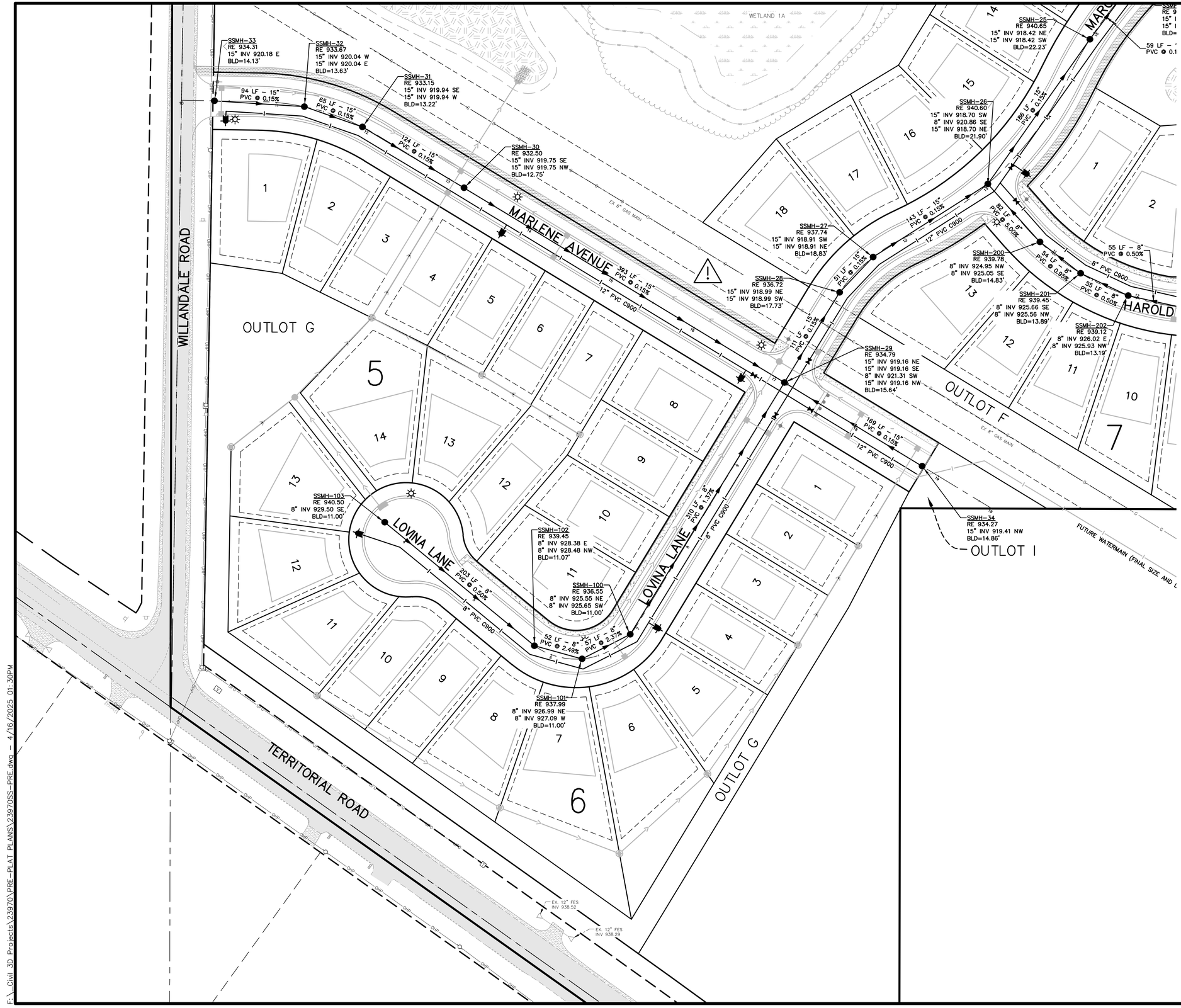
FOR

RACHEL DEVELOPMENT

4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	VUN/EPF/JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970SS-PRE
PROJECT NO.	23970
	5.6

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970SS-PRE.dwg - 4/16/2025 01:30PM



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN

WARNING!
UNDERGROUND HIGH PRESSURE PIPELINE
CONTACT ENERGY TRANSFER REPRESENTATIVE
AT 1-800-753-5531 PRIOR TO PERFORMING WORK
WITHIN THE PIPELINE EASEMENT

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Date: Reg.No.
PRELIMINARY

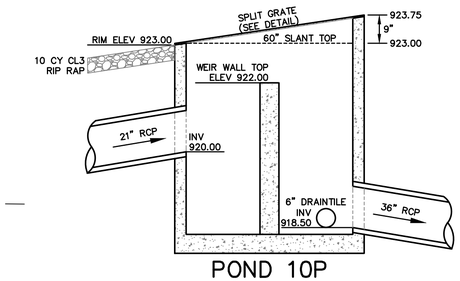
COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY SANITARY SEWER & WATERMAIN PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO
DATE
02/24/2025
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS
CAD FILE
23970SS-PRE
PROJECT NO.
23970
5.7

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970SS-PRE.dwg - 4/16/2025 01:30PM

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN



POND 10P
OUTLET STRUCTURE 102 (OCS-102)
NOT TO SCALE

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY STORM SEWER PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO
DATE
02/24/2025
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS
CAD FILE
23970ST-PRE
PROJECT NO.
23970
5.8

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970ST-PRE.dwg - 4/16/2025 01:30PM

COWLEY LAKE
WATER LEVEL ON 8/15/2022: 918.9
ORDINARY HIGH WATER LEVEL: 920.3 (NAVD88)

OUTLOT B

DALE DRIVE

CBMH-315
RE 938.16
15" INV 932.99 SE
15" INV 932.99 SW
BLD=5.17'

CBMH-316
RE 938.16
15" INV 933.15 NW
15" INV 933.15 SE
BLD=5.01'

244 LF – 15" RCP @ 1.23%

32 LF – 15" RCP @ 0.50%

149 LF – 15" RCP @ 0.50%

CB-317
RE 936.90
15" INV 933.90 NW
BLD=3.00'

CBMH-314
RE 934.08
15" INV 929.99 SE
21" INV 929.59 SW
15" INV 929.99 NE
BLD=4.49'

32 LF – 15" RCP @ 0.50%

CBMH-325
RE 934.08
15" INV 930.15 SE
15" INV 930.15 NW
BLD=3.93'

149 LF – 15" RCP @ 0.83%

CB-326
RE 934.53
15" INV 931.53 NW
BLD=3.00'

FES-401
36" INV 923.50 SE

138 LF – 5'Wx3'H BOX CULVERT @ 0.29%

359 LF – 21" RCP @ 0.58%

CBMH-303
RE 931.68
21" INV 927.83 NE
15" INV 928.23 W
24" INV 927.63 SE
BLD=4.05'

CBMH-304
RE 933.89
15" INV 929.45 SE
15" INV 929.45 E
BLD=4.44'

153 LF – 15" RCP @ 0.80%

35 LF – 15" RCP @ 0.50%

FES-402
36" INV 923.90 NW

POND 40P
WETLAND 2B
OLE 923.90
100-YR HWL 926.55

WETLAND 2B

CBMH-302
RE 931.68
24" INV 927.47 NW
27" INV 927.27 S
4' SUMP INV 923.27
BLD=8.41'

CB-305
RE 933.63
15" INV 929.63 NW
BLD=4.00'

187 LF – 27" RCP @ 0.30%

STMH-301
RE 930.60
27" INV 926.71 N
27" INV 926.71 SW
BLD=3.89'

71 LF – 27" RCP @ 0.30%

FES-300
27" INV 926.50 NE

OUTLOT C

29 LF – 18" RCP @ -3.51%

FES-433
18" INV 924.00 E

POND 43P (SED.)
BOTTOM 918.50
OLE 926.50
100-YR HWL 929.07

29 LF – 18" RCP @ 1.70%

OCS-432
RE 928.50
18" INV 926.50 SE
18" INV 925.00 W
BLD=3.50'

FES-431
18" INV 926.00 NW

CB-416
RE 934.95
15" INV 930.95 SW
BLD=4.00'

45 LF – 15" RCP @ 0.50%

CBMH-415
RE 934.76
15" INV 930.73 NE
15" INV 930.73 S
BLD=4.03'

88 LF – 15" RCP @ 0.58%

CB-425
RE 934.38
15" INV 930.38 W
BLD=4.00'

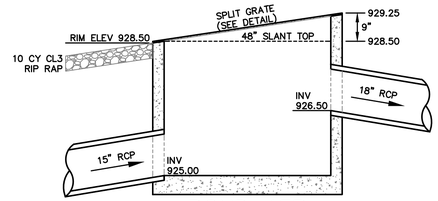
CBMH-414
RE 934.38
15" INV 930.22 E

22.78 S

0 N

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN



POND 43P
OUTLET STRUCTURE 432 (OCS-432)
NOT TO SCALE

Know what's below. Call before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Date: _____ Reg.No. _____
PRELIMINARY

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY STORM SEWER PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO

DATE
02/24/2025

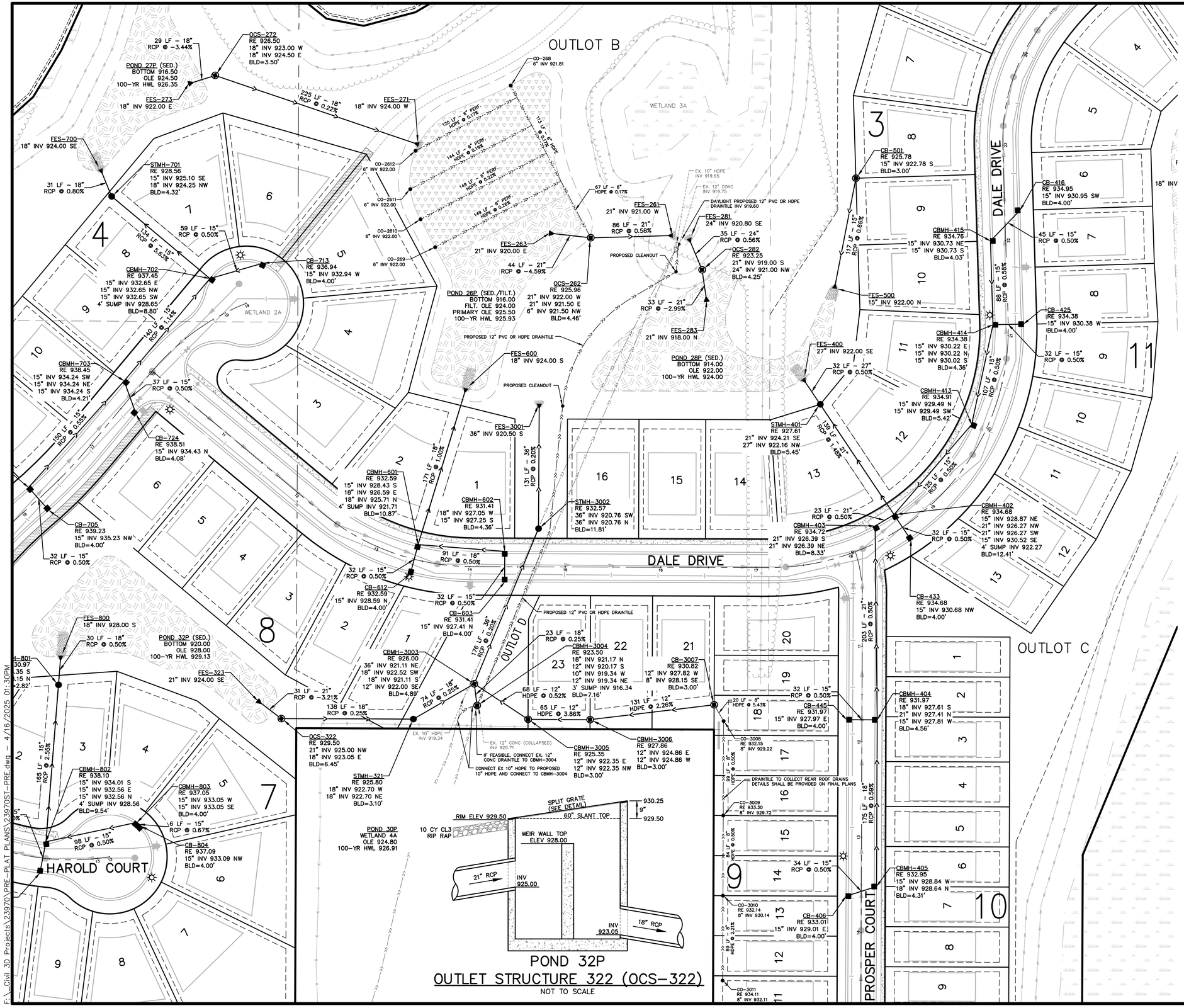
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970ST-PRE

PROJECT NO.
23970

5.9

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970ST-PRE.dwg - 4/16/2025 01:30PM



James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

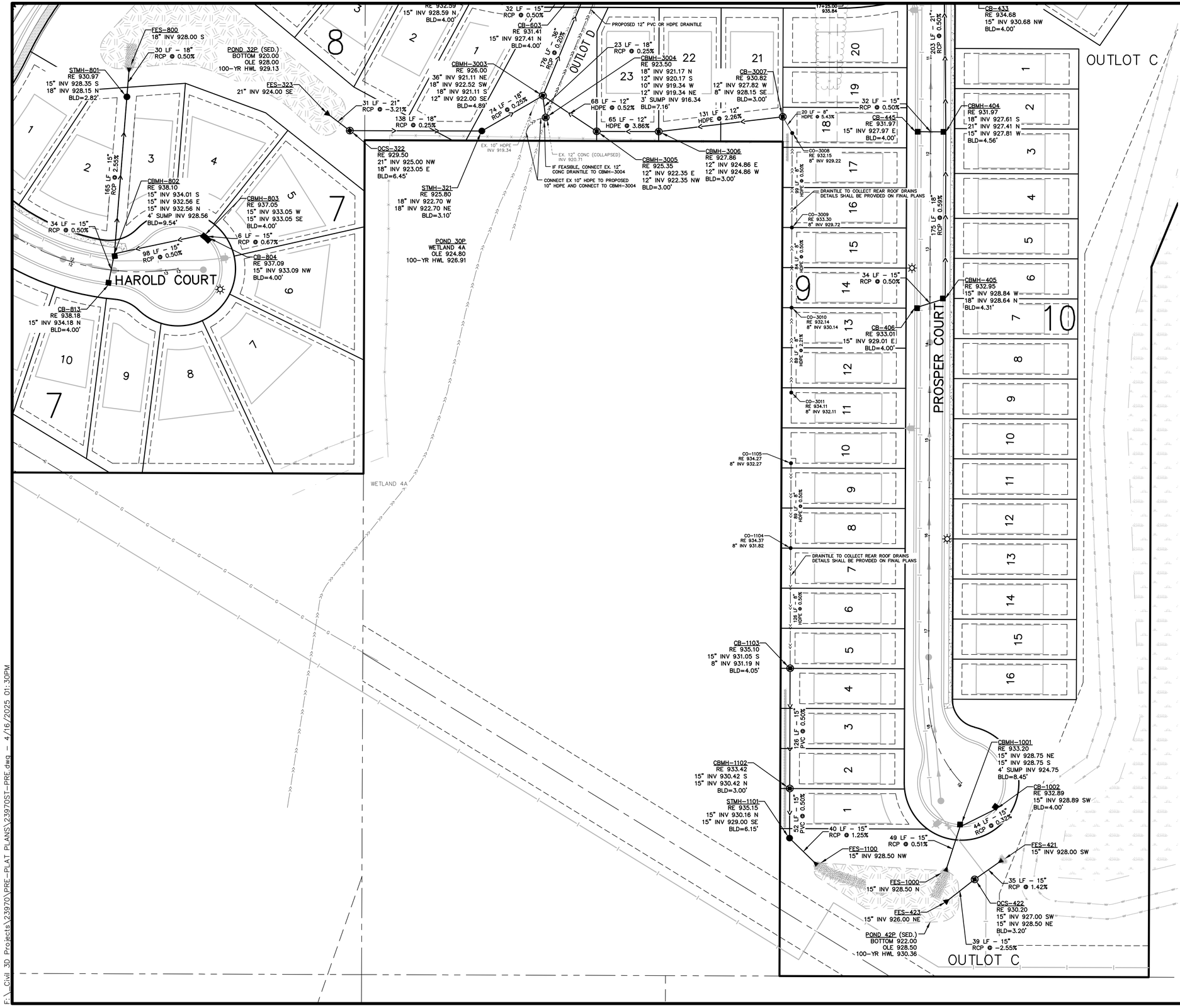
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: Reg.No.

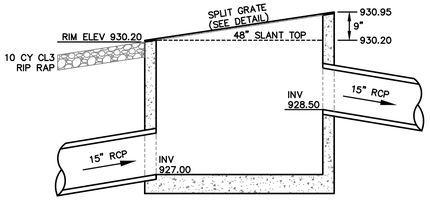
COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY STORM SEWER PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO
DATE
02/24/2025
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS
CAD FILE
23970ST-PRE
PROJECT NO.
23970
5.10



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN



POND 42P
OUTLET STRUCTURE 422 (OCS-422)
NOT TO SCALE

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

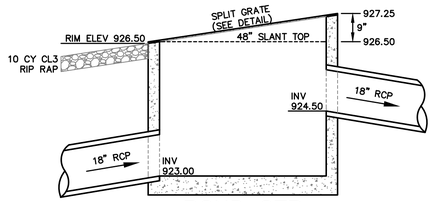
PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY STORM SEWER PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	VUN/EPF/JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970ST-PRE
PROJECT NO.	23970
	5.11

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970ST-PRE.dwg - 4/16/2025 01:30PM



POND 27P

OUTLET STRUCTURE 272 (OCS-272)

NOT TO SCALE

COWLEY LAKE

WATER LEVEL ON 8/15/2022: 918.9

ORDINARY HIGH WATER LEVEL: 920.3 (NAVD88)

OUTLOT B

WETLAND 3A

WETLAND 2A

MARGARET LANE

DALE DRIVE

HAROLD COURT

OUTLOT D

29 LF – 18" RCP @ -3.44%

OCS-272
RE 926.50
18" INV 923.00 W
18" INV 924.50 E
BLD=3.50'

POND 27P (SED.)
BOTTOM 916.50
OLE 924.50
100-YR HWL 926.35

FES-273
18" INV 922.00 E

225 LF – 18" RCP @ 0.22%

FES-271
18" INV 924.00 W

FES-700
18" INV 924.00 SE

31 LF – 18" RCP @ 0.80%

STMH-701
RE 928.56
15" INV 925.10 SE
18" INV 924.25 NW
BLD=4.32'

59 LF – 15" RCP @ 0.50%

134 LF – 15" RCP @ 5.83%

CBMH-702
RE 937.45
15" INV 932.65 E
15" INV 932.65 NW
15" INV 932.65 SW
4' SUMP INV 928.65
BLD=8.80'

CB-713
RE 936.94
15" INV 932.94 W
BLD=4.00'

140 LF – 15" RCP @ 1.14%

CBMH-703
RE 938.45
15" INV 934.24 SW
15" INV 934.24 NE
15" INV 934.24 S
BLD=4.21'

37 LF – 15" RCP @ 0.50%

150 LF – 15" RCP @ 0.55%

CB-724
RE 938.51
15" INV 934.43 N
BLD=4.08'

CBMH-704
RE 939.23
15" INV 935.07 SE
15" INV 935.07 NE
BLD=4.16'

CB-705
RE 939.23
15" INV 935.23 NW
BLD=4.00'

32 LF – 15" RCP @ 0.50%

CO-268
6" INV 921.81

CO-2612
6" INV 922.00

CO-2611
6" INV 922.00

CO-2610
6" INV 922.00

CO-269
6" INV 922.00

120 LF – 6" PERF HDPE @ 0.17%

113 LF – 6" HDPE @ 0.17%

144 LF – 6" PERF HDPE @ 0.10%

140 LF – 6" PERF HDPE @ 0.22%

149 LF – 6" PERF HDPE @ 0.06%

67 LF – 6" HDPE @ 0.17%

EX. 10" HDPE
INV 919.65

EX. 12" CONC
INV 919.75

FES-261
21" INV 921.00 W

DAYLIGHT PROPOSED 12" PVC OR HDPE DRAINTILE INV 919.60

FES-281
24" INV 920.80 SE

86 LF – 21" RCP @ 0.58%

35 LF – 24" RCP @ 0.56%

OCS-282
RE 923.25
21" INV 919.00 S
24" INV 921.00 NW
BLD=4.25'

FES-263
21" INV 920.00 E

44 LF – 21" RCP @ -4.59%

PROPOSED CLEANOUT

OCS-262
RE 925.96
21" INV 922.00 W
21" INV 921.50 E
6" INV 921.50 NW
BLD=4.46'

POND 26P (SED./FILT.)
BOTTOM 916.00
FILT. OLE 924.00
PRIMARY OLE 925.50
100-YR HWL 925.93

33 LF – 21" RCP @ -2.99%

FES-283
21" INV 918.00 N

PROPOSED 12" PVC OR HDPE DRAINTILE

POND 28P (SED.)
BOTTOM 914.00
OLE 922.00
100-YR HWL 924.00

FES-600
18" INV 924.00 S

PROPOSED CLEANOUT

FES-3001
36" INV 920.50 S

STMH-401
RE 927.61
21" INV 924.21 SE
27" INV 922.16 NW
BLD=5.45'

CBMH-601
RE 932.59
15" INV 928.43 S
18" INV 926.59 E
18" INV 925.71 N
4' SUMP INV 921.71
BLD=10.87'

171 LF – 18" RCP @ 1.05%

131 LF – 36" RCP @ 0.20%

CBMH-602
RE 931.41
18" INV 927.05 W
15" INV 927.25 S
BLD=4.36'

STMH-3002
RE 932.57
36" INV 920.76 SW
36" INV 920.76 N
BLD=11.81'

91 LF – 18" RCP @ 0.50%

32 LF – 15" RCP @ 0.50%

CB-612
RE 932.59
15" INV 928.59 N
BLD=4.00'

32 LF – 15" RCP @ 0.50%

CB-603
RE 931.41
15" INV 927.41 N
BLD=4.00'

FES-800
18" INV 928.00 S

30 LF – 18" RCP @ 0.50%

POND 32P (SED.)
BOTTOM 920.00
OLE 928.00
100-YR HWL 929.13

STMH-801
RE 930.97
15" INV 928.35 S
18" INV 928.15 N
BLD=2.82'

FES-323
21" INV 924.00 SE

31 LF – 21" RCP @ -3.21%

138 LF – 18" RCP @ 0.25%

PROPOSED 12" PVC OR HDPE DRAINTILE

23 LF – 18" RCP @ 0.25%

CBMH-3003
RE 926.00
36" INV 921.11 NE
18" INV 922.52 SW
18" INV 921.11 S
12" INV 922.00 SE
BLD=4.89'

74 LF – 18" RCP @ 0.25%

176 LF – 36" RCP @ 0.20%

CBMH-3004
RE 923.50
18" INV 921.17 N
12" INV 920.17 S
10" INV 919.34 W
12" INV 919.34 NE
3' SUMP INV 916.34
BLD=7.16'

68 LF – 12" HDPE @ 0.52%

65 LF – 12" HDPE @ 3.86%

131 LF – 12" HDPE @ 2.26%

CB-3007
RE 930.82
12" INV 927.82 W
8" INV 928.15 SE
BLD=3.00'

20 LF – 8" HDPE @ 5.43%

CO-3008
RE 932.15
8" INV 929.22

99 LF – 8" HDPE @ 0.50%

DRAINTILE TO COLLEC
DETAILS SHALL BE PR

CO-3009
RE 933.30
8" INV 929.72

84 LF – 8" HDPE @ 0.50%

CO-3010
RE 932.14
8" INV 930.14

OCS-322
RE 929.50
21" INV 925.00 NW
18" INV 923.05 E
BLD=6.45'

EX. 10" HDPE
INV 919.34

EX. 12" CONC (COLLAPSED)
INV 920.71

IF FEASIBLE, CONNECT EX. 12" CONC DRAINTILE TO CBMH-3004

CONNECT EX 10" HDPE TO PROPOSED 10" HDPE AND CONNECT TO CBMH-3004

CBMH-3005
RE 925.35
12" INV 922.35 E
12" INV 922.35 NW
BLD=3.00'

CBMH-3006
RE 927.86
12" INV 924.86 E
12" INV 924.86 W
BLD=3.00'

STMH-321
RE 925.80
18" INV 922.70 W
18" INV 922.70 NE
BLD=3.10'

POND 30P
WETLAND 4A
OLE 924.80
100-YR HWL 926.91

CBMH-802
RE 938.10
15" INV 934.01 S
15" INV 932.56 E
15" INV 932.56 N
4' SUMP INV 928.56
BLD=9.54'

165 LF – 15" RCP @ 2.55%

CBMH-803
RE 937.05
15" INV 933.05 W
15" INV 933.05 SE
BLD=4.00'

6 LF – 15" RCP @ 0.67%

CB-804
RE 937.09
15" INV 933.09 NW
BLD=4.00'

34 LF – 15" RCP @ 0.50%

98 LF – 15" RCP @ 0.50%

32 LF – 15" RCP @ 0.50%

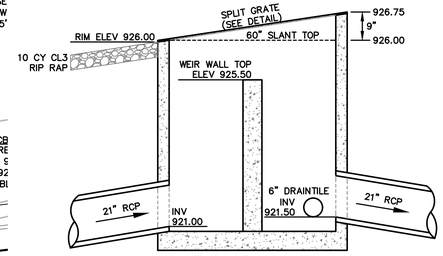
CB-965
RE 934.78
15" INV 930.78 NW
BLD=4.00'

CBMH-904
RE 933.20
18" INV 928.64 SE
18" INV 928.64 NW

CB-813
RE 938.18
15" INV 934.18 N
BLD=4.00'

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN



POND 26P

OUTLET STRUCTURE 262 (OCS-262)

NOT TO SCALE

Know what's below. Call before you dig.

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY STORM SEWER PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	VUN/EPF/JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970ST-PRE
PROJECT NO.	23970
	5.12

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970ST-PRE.dwg - 4/16/2025 01:30PM

COWLEY LAKE
WATER LEVEL ON 8/15/2022: 918.9
ORDINARY HIGH WATER LEVEL: 920.3 (NAVD88)

OUTLOT B

EX. 12" CMP
INV 920.79

CO-2511
6" INV 923.00

CO-2510
6" INV 923.00

CO-259
6" INV 923.00

CO-2512
6" INV 923.00

EX. MHST
RE 928.97
INV 921.40

EX. 15" RCP

EX. 15" FES
INV 921.67

46 LF – 21"
RCP @ 1.10%

FES-251
21" INV 922.00 W

FES-253
18" INV 921.00 NE

42 LF – 18"
RCP @ -2.40%

OCS-252
RE 927.40
18" INV 922.00 SW
21" INV 922.50 E
6" INV 922.50 NW
BLD=5.40'

CO-258
6" INV 922.83

POND 25P (SED./FILT.)
BOTTOM 917.00
FILT. OLE 925.00
PRIMARY OLE 926.50
100-YR HWL 927.80

WETLAND 1A

CBMH-913
RE 933.72
15" INV 929.56 S
15" INV 929.56 E
BLD=4.16'

CBMH-912
RE 932.88
15" INV 928.88 W
15" INV 928.88 SE
BLD=4.00'

110 LF – 15"
RCP @ 0.62%

32 LF – 15"
RCP @ 0.50%

FES-900
36" INV 925.00 SW

CBMH-901
RE 931.85
30" INV 925.72 SE
36" INV 925.32 NE
24" INV 926.12 SW
15" INV 927.85 NW
4' SUMP INV 921.32
BLD=10.53'

CBMH-902
RE 932.50
27" INV 926.42 SE
30" INV 926.22 NW
15" INV 928.34 SW
BLD=6.28'

CB-914
RE 933.72
15" INV 929.72 N
BLD=4.00'

32 LF – 24"
RCP @ 0.40%

CBMH-922
RE 931.85
24" INV 926.25 NE
24" INV 926.25 SW
BLD=5.60'

130 LF – 30"
RCP @ 0.38%

CBMH-964
RE 934.76
15" INV 930.62 SE
15" INV 930.62 SW
BLD=4.14'

29 LF – 15"
RCP @ 0.75%

STMH-903
RE 934.64
15" INV 930.40 NE
27" INV 927.33 NW
15" INV 928.13 SW
18" INV 927.93 SE
BLD=7.31'

32 LF – 15"
RCP @ -3.78%

CB-953
RE 932.50
15" INV 927.13 NE
BLD=5.37'

CBMH-923
RE 930.84
15" INV 927.19 SW
15" INV 927.19 SE
24" INV 926.59 NE
BLD=4.25'

OUTLOT G

STMH-924
RE 934.49
15" INV 930.94 SE
15" INV 930.94 NE
15" INV 930.94 SW
BLD=3.55'

116 LF – 15"
HDPE @ 3.23%

130 LF – 15"
HDPE @ 0.50%

CBMH-933
RE 930.84
15" INV 927.84 NW
15" INV 927.84 SE
BLD=3.00'

130 LF – 15"
HDPE @ 2.00%

85 LF – 15"
HDPE @ 0.50%

CB-945
RE 934.36
15" INV 931.36 NE
BLD=3.00'

144 LF – 15"
RCP @ 3.47%

CB-926
RE 939.96
15" INV 935.96 SW
BLD=4.00'

6 LF – 15"
RCP @ 0.67%

CBMH-925
RE 939.92
15" INV 935.92 NW
15" INV 935.92 NE
BLD=4.00'

LOVINA LANE

CB-934
RE 933.24
15" INV 930.24 NW
BLD=3.00'

CBMH-974
RE 933.89
15" INV 929.73 SW
15" INV 929.73 NE
15" INV 929.73 SE
BLD=4.16'

71 LF – 15"
RCP @ 2.25%

102 LF – 15"
RCP @ 0.10%

32 LF – 15"
RCP @ 0.50%

CB-985
RE 933.89
15" INV 929.89 NW
BLD=4.00'

68 LF – 18"
RCP @ 0.40%

CBMH-905
RE 933.55
18" INV 928.92 SW
18" INV 928.92 NW
BLD=4.63'

CB-995
RE 933.20
15" INV 929.20 NE
BLD=4.00'

122 LF – 18"
RCP @ 0.30%

OUTLOT I

CBMH-906
RE 932.49
15" INV 929.49 SW
18" INV 929.29 NE
BLD=3.20'

167 LF – 15"
RCP @ 0.90%

CBMH-975
RE 936.30

MARLENE AVENUE

WILLANDALE ROAD

EX. 8" GAS MAIN

CBMH-904
RE 933.20
18" INV 928.64 SE
18" INV 928.64 NW
15" INV 929.04 SW
BLD=4.56'

32 LF – 15"
RCP @ 0.50%

CB-965
RE 934.78
15" INV 930.78 NW
BLD=4.00'

259 LF – 27"
RCP @ 0.35%

CBMH-964
RE 934.76
15" INV 930.62 SE
15" INV 930.62 SW
BLD=4.14'

CBMH-704
RE 939.23
15" INV 935.07 SE
15" INV 935.07 NE
BLD=4.16'

MARGARET LANE

STMH-801
RE 930.97
15" INV 928.35 S
18" INV 928.15 N
BLD=2.82'

165 LF – 15"
RCP @ 2.55%

34 LF – 15"
RCP @ 0.50%

CB-813
RE 938.18
15" INV 934.18 N
BLD=4.00'

OUTLOT F

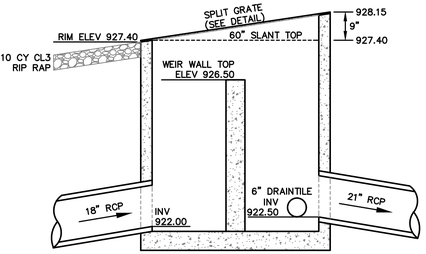
31 LF
RCP

32
RC

15" INV
15" INV
15" INV

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN



POND 25P
OUTLET STRUCTURE 252 (OCS-252)
NOT TO SCALE

WARNING!
UNDERGROUND HIGH PRESSURE PIPELINE
CONTACT ENERGY TRANSFER REPRESENTATIVE
AT 1-800-753-5531 PRIOR TO PERFORMING WORK
WITHIN THE PIPELINE EASEMENT

Know what's **below.**
Call before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY STORM SEWER PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO

DATE
02/24/2025

REVISIONS

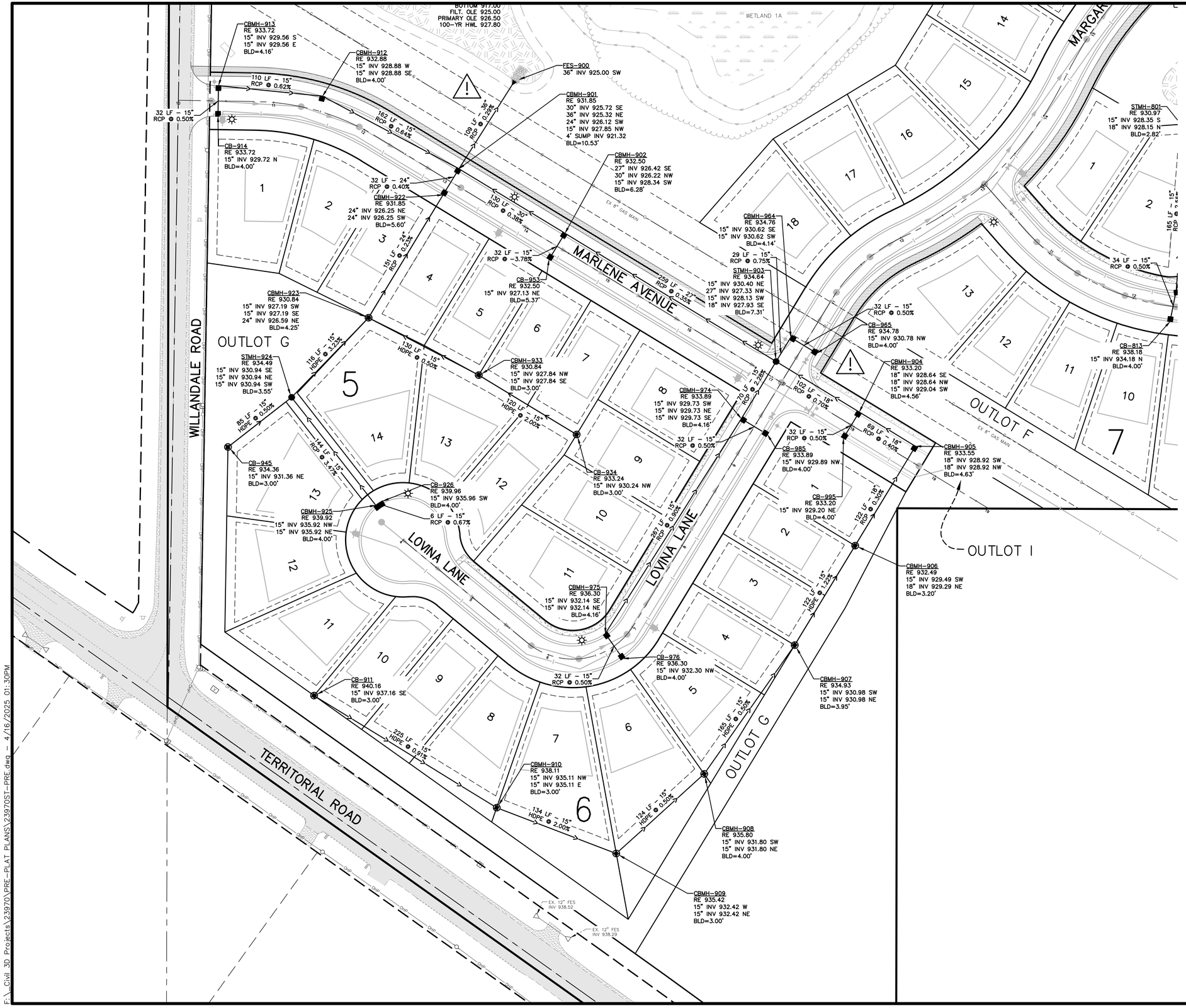
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970ST-PRE

PROJECT NO.
23970

5.13

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970ST-PRE.dwg - 4/16/2025 01:30PM



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND GAS
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS VALVE
- EXISTING GUY WIRE
- EXISTING HANDHOLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (ELECTRIC)
- EXISTING MANHOLE (WATER)
- EXISTING SEMAPHORE
- EXISTING SIGN
- EXISTING TELEPHONE PEDESTAL
- EXISTING TRANSFORMER
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- SB-1 EXISTING SOIL BORING LOCATION
- TP-1 EXISTING TEST PIT LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN

WARNING!
UNDERGROUND HIGH PRESSURE PIPELINE
CONTACT ENERGY TRANSFER REPRESENTATIVE
AT 1-800-753-5531 PRIOR TO PERFORMING WORK
WITHIN THE PIPELINE EASEMENT

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 50 100 150
1 inch = 50 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Date: Reg.No.

PRELIMINARY

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY STORM SEWER PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF/JSO

DATE
02/24/2025

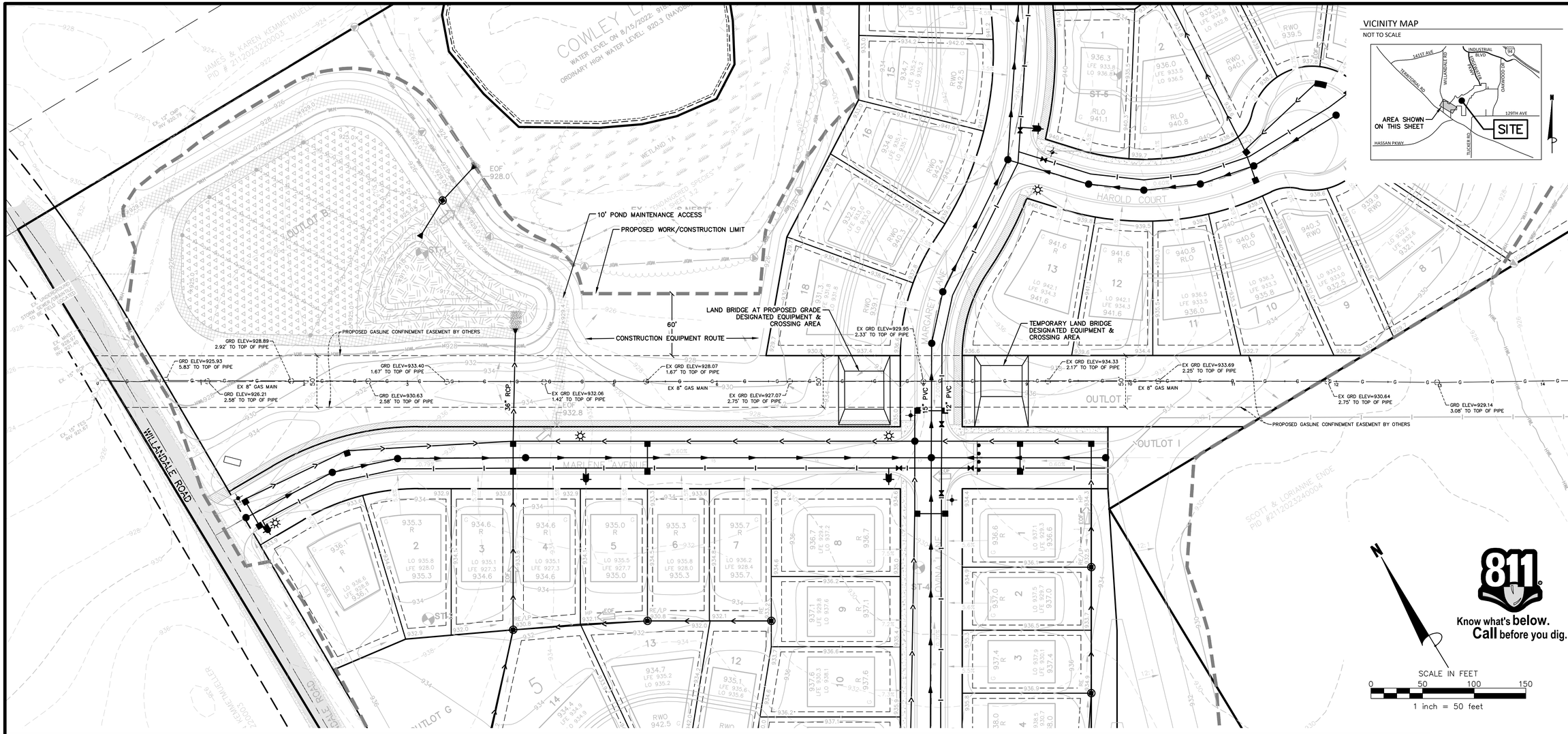
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

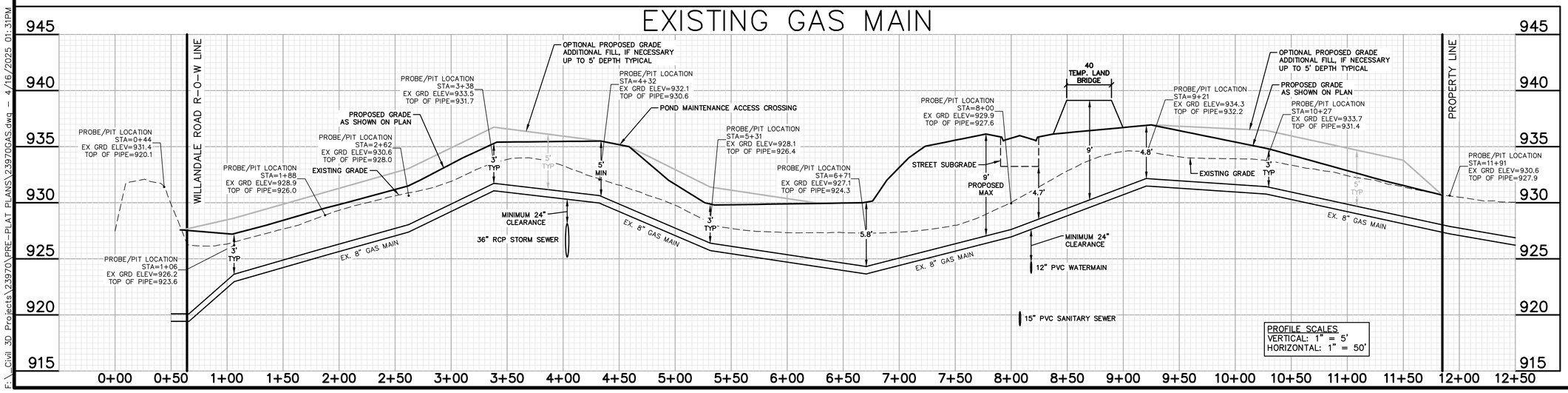
CAD FILE
23970ST-PRE

PROJECT NO.
23970

5.14

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970ST-PRE.dwg - 4/16/2025 01:30PM





James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Date: _____ Reg.No. _____

PRELIMINARY

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
EXISTING GAS MAIN EXHIBIT
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2025

REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

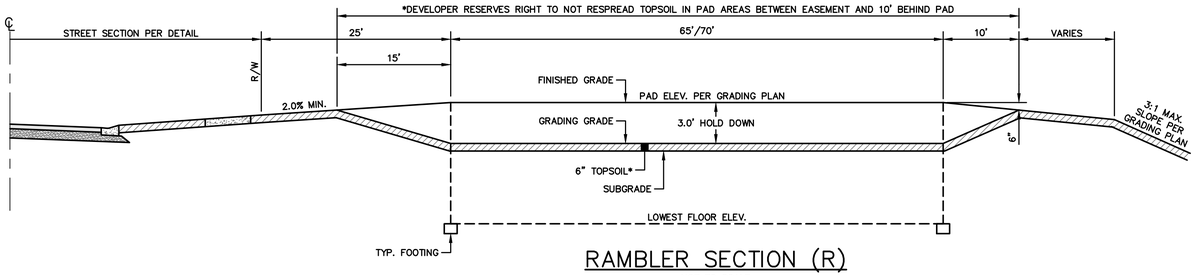
CAD FILE
23970GAS

PROJECT NO.
23970

5.15

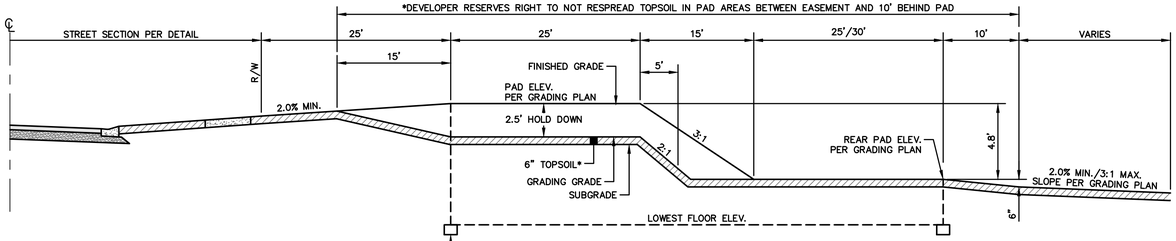
F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970GAS.dwg - 4/16/2025 01:31PM

65' DEPTH STANDARD/70' DEPTH VILLA LOT HOLD DOWNS



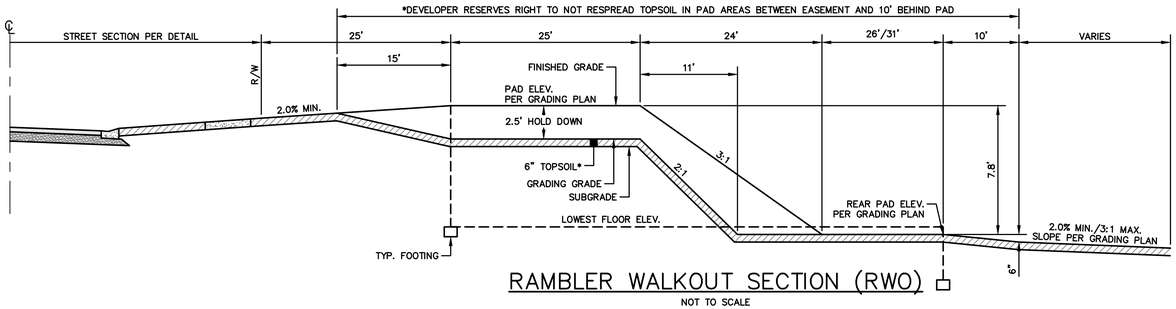
RAMBLER SECTION (R)

NOT TO SCALE



RAMBLER LOOKOUT SECTION (RLO)

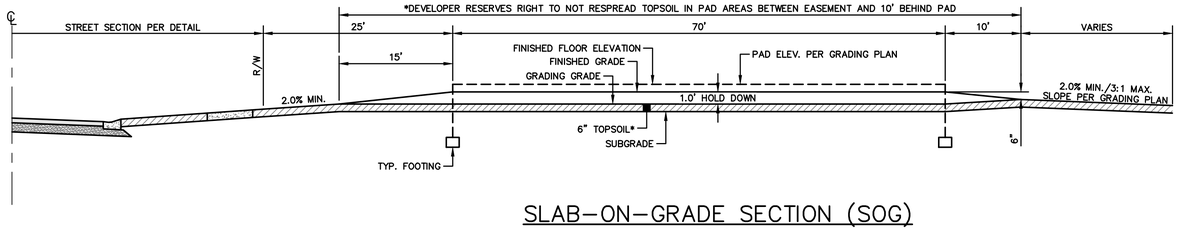
NOT TO SCALE



RAMBLER WALKOUT SECTION (RWO)

NOT TO SCALE

CARRIAGE LOTS



SLAB-ON-GRADE SECTION (SOG)

NOT TO SCALE

RECOMMENDED HOUSE TYPES

SOG	SLAB ON GRADE LOT – ELEVATION IS THE SAME AT THE FRONT AND REAR OF THE HOUSE. LOT CAN ACCOMODATE A SLAB ON GRADE HOME. LOWEST FLOOR ELEVATION/OPENING IS 0.5' ABOVE FINISHED GROUND ELEVATION SHOWN.
R	STANDARD LOT – FINISHED GROUND ELEVATION IS THE SAME AT THE FRONT AND REAR OF HOUSE. LOT CAN ACCOMMODATE RAMBLER, SPLIT ENTRY OR TWO STORY HOME. BASEMENT FLOOR ELEVATION IS 7.3' LOWER THAN FINISHED GROUND ELEVATION SHOWN AT FRONT OF HOUSE.
RLO	LOOKOUT LOT – FINISHED GROUND ELEVATION FOR LOOKOUT IS 4.8' LOWER THAN FINISHED GROUND ELEVATION SHOWN AT FRONT OF HOUSE. WINDOW OPENINGS ARE 0.5' ABOVE FINISHED GROUND ELEVATION SHOWN AT LOOKOUT.
RWO	WALKOUT LOT – FINISHED GROUND ELEVATION FOR WALKOUT IS 7.8' LOWER THAN FINISHED GROUND ELEVATION SHOWN AT FRONT OF HOUSE. BASEMENT FLOOR ELEVATION/OPENING IS 0.5' ABOVE FINISHED GROUND ELEVATION SHOWN AT WALKOUT.

NOTE: FOR ALL RECOMMENDED HOUSE TYPES, GARAGE FLOOR ELEVATION IS 0.3' ABOVE FINISHED GROUND ELEVATION SHOWN AT FRONT OF HOUSE. TOP OF BLOCK ELEVATION IS 0.7' ABOVE FINISHED GROUND ELEVATION SHOWN AT FRONT OF HOUSE.

STANDARD GRADING NOTES:

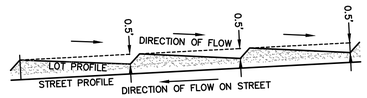
1. SPECIFICATIONS WHICH APPLY ARE THE MOST RECENT EDITIONS OF THE MUNICIPALITY IN WHICH THE WORK IS LOCATED AND THE MINNESOTA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR HIGHWAY CONSTRUCTION UNLESS MODIFIED HEREIN ON THESE CONTRACT DOCUMENTS.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UTILIZE THE "GOPHER STATE ONE CALL" EXCAVATION NOTICE SYSTEM AS REQUIRED UNDER MINNESOTA STATUTE CHAPTER 216D. CALL 811 OR SUBMIT A TICKET AT gopherstateonecall.org AT LEAST 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION.
3. GRADING CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF ALL UNDERGROUND UTILITIES WITH THE RESPECTIVE UTILITY COMPANIES PRIOR TO CONSTRUCTION.
4. ALL CONSTRUCTION AS CALLED FOR ON THESE CONTRACT DOCUMENTS SHALL BE PERFORMED IN ACCORDANCE WITH ALL OSHA REQUIREMENTS.
5. ALL LOT AND EASEMENT DIMENSIONS ARE SUBJECT TO FINAL PLAT.
6. IT IS THE RESPONSIBILITY OF THE GRADING CONTRACTOR TO DISPOSE OFF-SITE ALL TREES, STUMPS, BRUSH, OR OTHER DEBRIS THAT EXISTS WITHIN THE CONSTRUCTION AREAS. TREES TO REMAIN SHALL BE DESIGNATED BY THE ENGINEER.
7. THE GRADING CONTRACTOR SHALL SCHEDULE THE SOILS ENGINEER SO THAT CERTIFICATION OF ALL CONTROLLED FILLS CAN BE FURNISHED TO THE OWNER DURING AND UPON COMPLETION OF THE PROJECT.

MINIMUM DENSITY REQUIREMENTS NOTES 8-10 (REFER TO GEOTECHNICAL REPORT FOR DENSITY RECOMMENDATIONS)

8. DENSITY TESTS SHALL BE TAKEN TO EVALUATE THE COMPACTION WITHIN THE STREETS, TRAVEL WAYS OR PARKING LOTS, WITHIN THE UPPER 3 FEET OF STREET, TRAVEL WAYS OR PARKING LOT SUBGRADE, THE CONTRACTOR SHALL INSURE THAT ALL SOILS BE NOT MORE THAN ONE PERCENTAGE POINT OVER THE SOIL'S STANDARD PROCTOR OPTIMUM MOISTURE CONTENT, AND THAT COMPACTION TO A MINIMUM OF 100% OF STANDARD PROCTOR DENSITY BE PROVIDED. IN AREAS BELOW THE UPPER THREE FEET OF SUBGRADE OF THE STREETS, TRAVEL WAYS OR PARKING LOTS, THE CONTRACTOR SHALL INSURE THAT ALL SOILS BE NOT MORE THAN THREE PERCENTAGE POINTS OVER THE SOIL'S STANDARD PROCTOR OPTIMUM MOISTURE CONTENT, AND THAT COMPACTION TO A MINIMUM OF 95% OF STANDARD PROCTOR DENSITY BE PROVIDED. THE GRADING TOLERANCE FOR THESE AREAS SHALL BE WITHIN 0.1'±.
9. LOT GRADING AND/OR THE PREPARATION OF BUILDING PADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS. THE GRADING TOLERANCE SHALL BE 0.30'±. ALL EARTHWORK OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE HUD-FHA DATA SHEET 79G "LAND DEVELOPMENT WITH CONTROLLED EARTHWORK", PROVIDING FOR A MINIMUM OF 95% STANDARD DENSITY, OR AS OTHERWISE SPECIFIED BY THE GEOTECHNICAL ENGINEER.
10. IN AREAS WHERE RETAINING WALLS ARE PROPOSED ON CONTROLLED FILL AREAS, A MINIMUM 95% STANDARD DENSITY NEEDS TO BE ATTAINED WHERE FILL THICKNESS EXCEEDS 10' BELOW WALL FOUNDATION ELEVATIONS, A HIGHER MINIMUM OF 98% SHALL BE ATTAINED
11. BUILDING PADS SHOWN ON EACH LOT ARE TYPICAL ONLY. THE DEPTH OF THE PAD FROM FRONT TO BACK SHALL BE GRADED THROUGHOUT THE FULL WIDTH OF THE LOT OR AS NECESSARY TO ALLOW FOR CONSTRUCTION OF A BUILDING AT THE MINIMUM SIDE YARD SETBACKS. (REFER TO THE PLANS FOR SPECIFIC SETBACK DISTANCES.) IF UNSUITABLE SOIL CONDITIONS ARE ENCOUNTERED WITHIN A PROPOSED BUILDING PAD THAT CANNOT BE CORRECTED OR REMOVED, IT IS THE RESPSONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER OF THE CONDITIONS AND TO LOCATE THE LIMITS OF THE UNSUITABLE AREAS.
12. THE SITE GRADING TOLERANCE FOR THE SITE SHOULD BE ±0.1' FOR STREETS AND ±0.30' FOR LANDSCAPED/OPEN AREAS.
13. TOPSOIL SHALL BE RE-SPREAD AT A MINIMUM DEPTH OF 6" ON ALL DISTURBED AREAS TO BE VEGETATED.

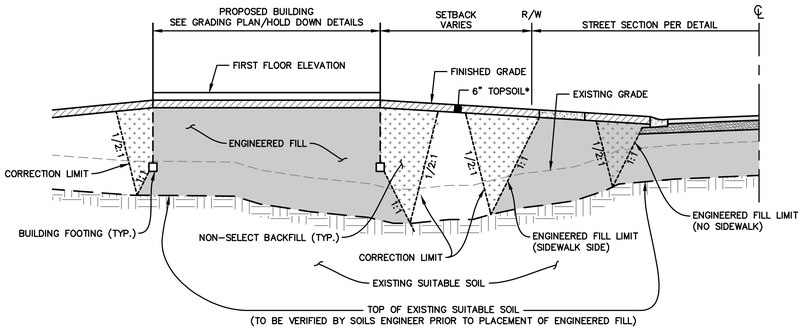
SPECIFIC GRADING NOTES:

1. THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS ON THE PLANS WERE PROVIDED BY MNTOPO LIDAR, AND SUPPLEMENTED WITH FIELD ELEVATIONS AND OBTAINED BY JAMES R. HILL FROM 6/7/2022 TO 12/17/2024. THE DEGREE OF ACCURACY OF THE EXISTING CONTOURS SHOWN ON THE PLAN IS EQUAL TO ± ONE HALF THE CONTOUR INTERVAL.



LOT BENCHING DETAIL

NOT TO SCALE



SUBGRADE CORRECTION DETAIL

NOT TO SCALE

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
CONSTRUCTION DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2025

REVISIONS

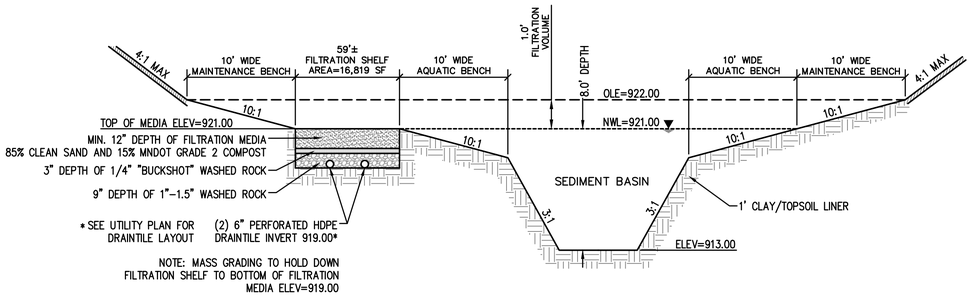
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970D

PROJECT NO.
23970

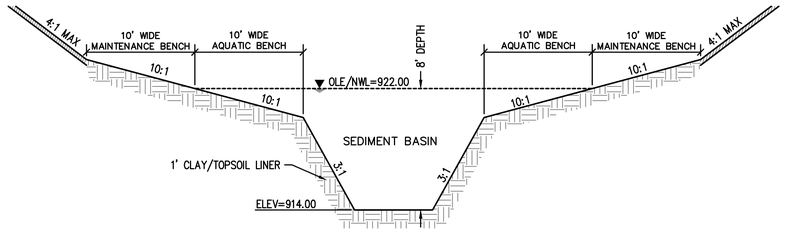
6.0

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970D.dwg - 4/16/2025 01:31PM



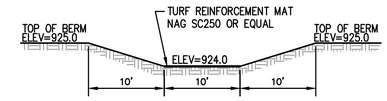
POND 10P W/ FILTRATION SHELF CROSS SECTION

NOT TO SCALE

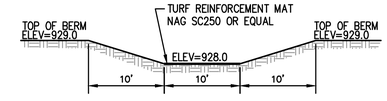


POND 28P CROSS SECTION

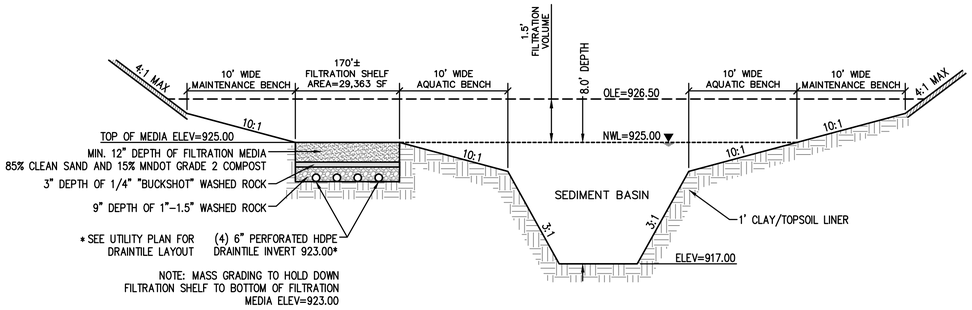
NOT TO SCALE



POND 10P STABILIZED EMERGENCY OVERFLOW

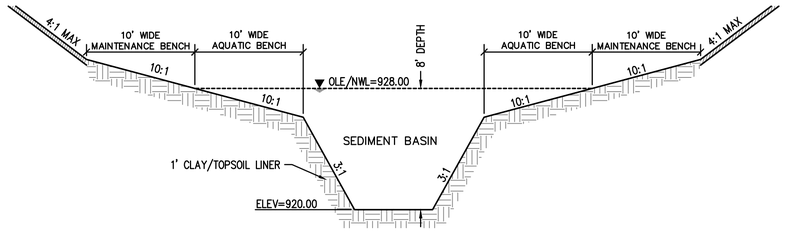


POND 25P STABILIZED EMERGENCY OVERFLOW



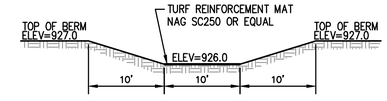
POND 25P W/ FILTRATION SHELF CROSS SECTION

NOT TO SCALE

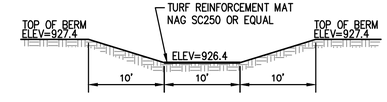


POND 32P CROSS SECTION

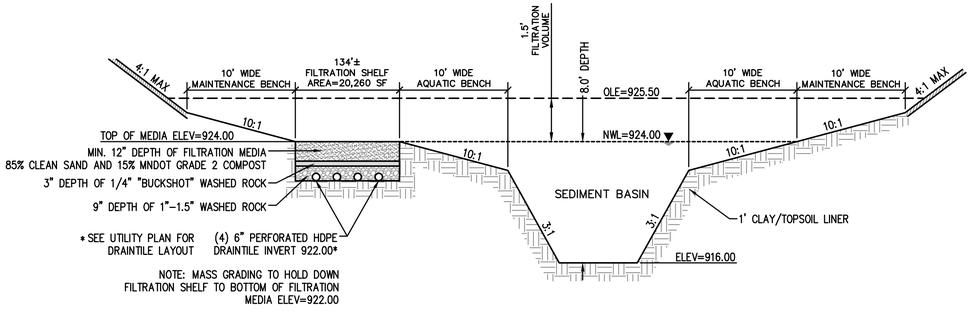
NOT TO SCALE



POND 26P STABILIZED EMERGENCY OVERFLOW

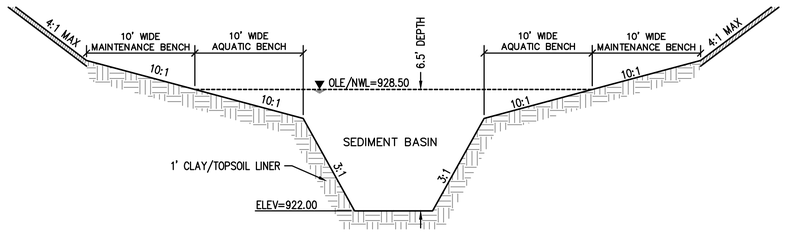


POND 27P STABILIZED EMERGENCY OVERFLOW



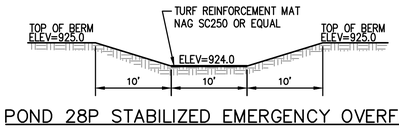
POND 26P W/ FILTRATION SHELF CROSS SECTION

NOT TO SCALE

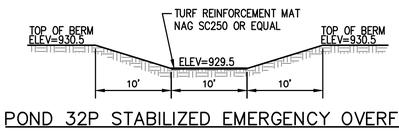


POND 42P CROSS SECTION

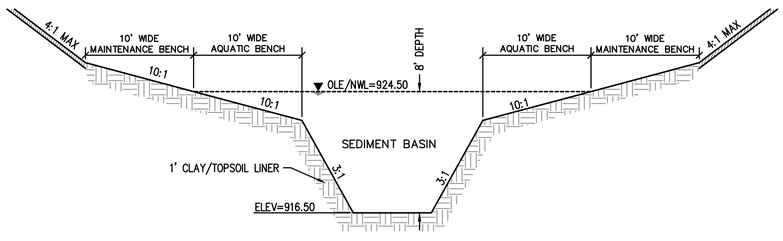
NOT TO SCALE



POND 28P STABILIZED EMERGENCY OVERFLOW

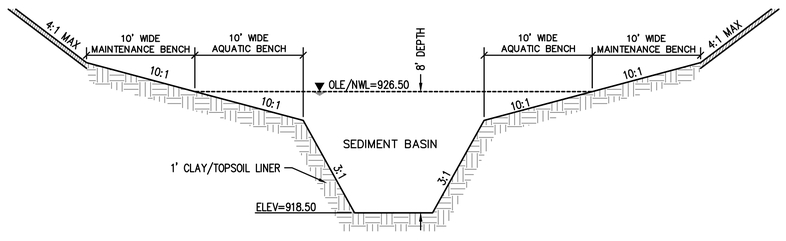


POND 32P STABILIZED EMERGENCY OVERFLOW



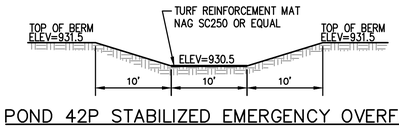
POND 27P CROSS SECTION

NOT TO SCALE

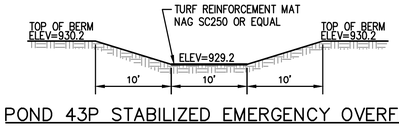


POND 43P CROSS SECTION

NOT TO SCALE



POND 42P STABILIZED EMERGENCY OVERFLOW



POND 43P STABILIZED EMERGENCY OVERFLOW

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date:_____ Reg.No._____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
CONSTRUCTION DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2025

REVISIONS

03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970D

PROJECT NO.
23970

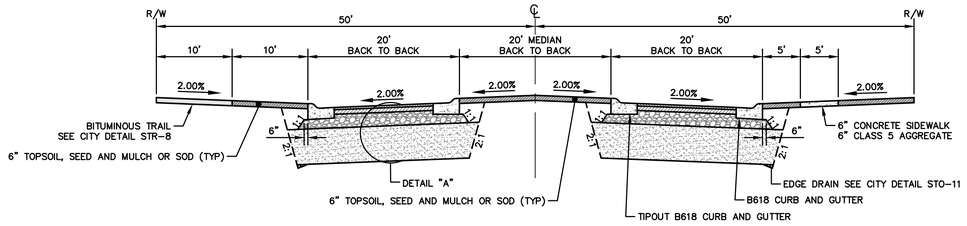
6.1

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970D.dwg - 4/16/2025 01:31PM

100' R-O-W EDGEWATER PARKWAY STREET SECTION

NOT TO SCALE

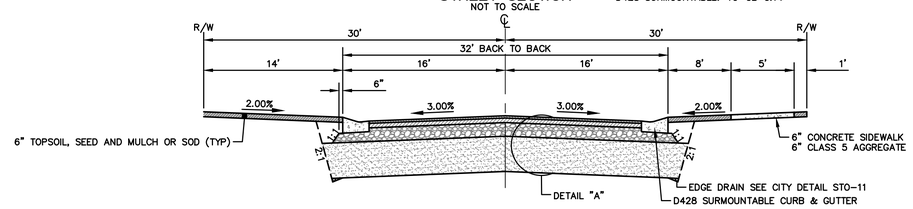
TYPICAL EQUATION
OUTER B618 CURB: TC=CL-0.64'
MEDIAN TIPOUT B618 CURB: TC=CL-0.20'



60' R-O-W RESIDENTIAL STREET SECTION

NOT TO SCALE

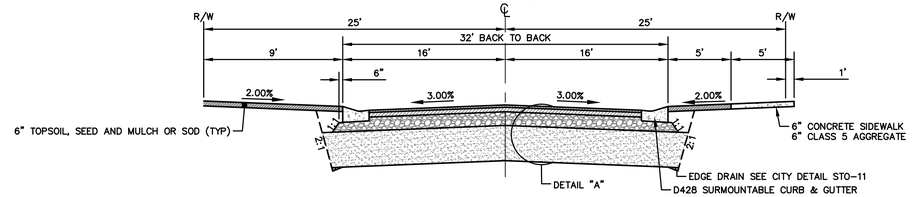
TYPICAL EQUATION
D428 SURMOUNTABLE: TC=CL-0.14'

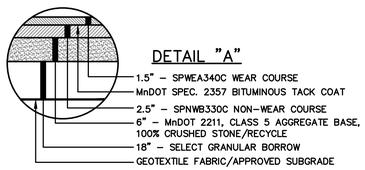


50' R-O-W RESIDENTIAL STREET SECTION

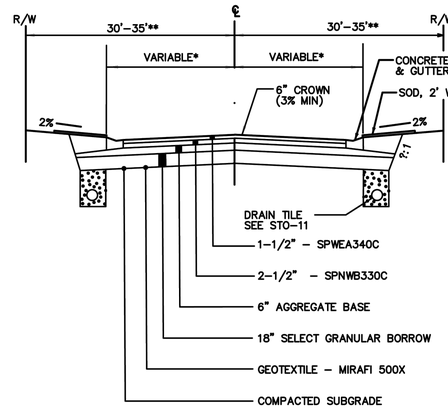
NOT TO SCALE

TYPICAL EQUATION
D428 SURMOUNTABLE: TC=CL-0.14'





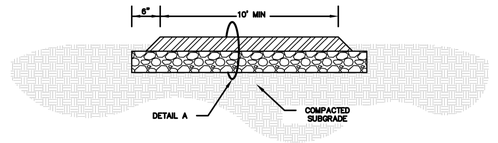
NOTE: ALL ORGANIC OR OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM BENEATH THE ROADWAY.

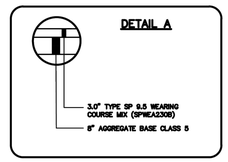


* 16' FOR RESIDENTIAL URBAN
19.5' FOR LOW VOLUME MINOR COLLECTOR
21' FOR HIGH VOLUME MINOR COLLECTOR
** 30' FOR RESIDENTIAL URBAN
35' FOR MINOR COLLECTORS
*** SURMOUNTABLE FOR RESIDENTIAL URBAN
B618 OR SURMOUNTABLE FOR MINOR COLLECTORS

BITUMINOUS STREET WITH CONCRETE CURB AND GUTTER

CITY OF ROGERS	TYPICAL SECTION FOR COLLECTOR & RESIDENTIAL STREETS –URBAN SECTION	Standard Details Date: SEPTEMBER, 2019 Revised	STR-7A





NOTES:

PLACE ALL ASPHALT IN ONE LIFT TO PROVIDE A MINIMUM OF 3.0" COMPACTED DEPTH.

PROVIDE A MINIMUM BASE OF 8" COMPACTED AGGREGATE. IMPORT ADDITIONAL MATERIALS IF MILLING FAILS TO PRODUCE ADEQUATE BASE MATERIAL.

TAMP ALL TRAIL EDGES AT A 45° BEVEL.

CONTRACTOR IS RESPONSIBLE FOR ROUGH GRADING EDGES OF TRAIL CORRIDOR WITH ON-SITE MATERIAL. HOLD GRADES 3" LOWER THAN FINISHED TRAIL SURFACE TO ALLOW FOR ADDITIONAL TOPSOIL PLACEMENT AND SEED.

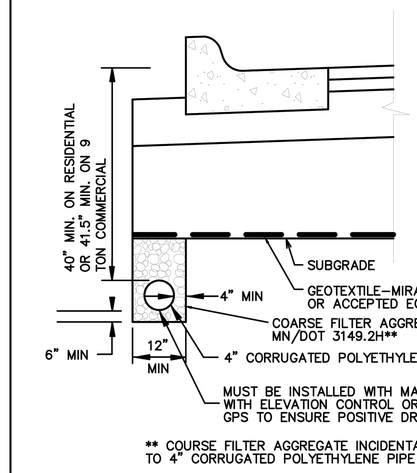
SLOPE OF BITUMINOUS TRAIL SHALL BE A MINIMUM OF 1% TO A MAXIMUM OF 2% TO THE DOWNHILL EDGE.

SIDEWALKS OR TRAIL CROSSING COMMERCIAL OR INDUSTRIAL DRIVEWAYS SHALL BE CONSTRUCTED TO DRIVEWAY REQUIREMENTS.

SUBGRADE MUST BE APPROVED BY THE ENGINEER.

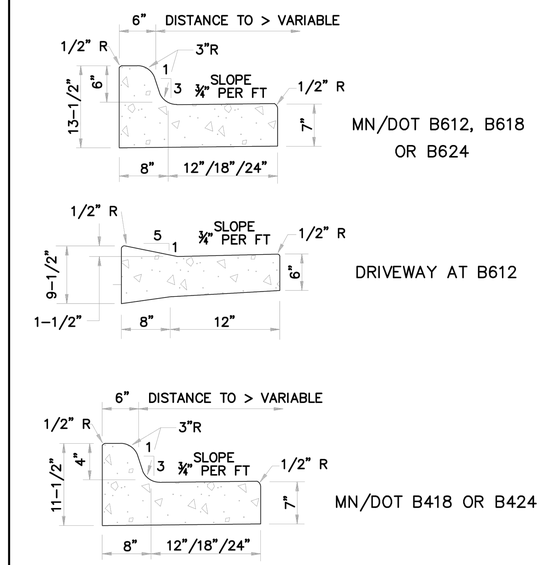
SUBCUT WHERE UNSUITABLE MATERIALS EXIST AS DIRECTED BY THE ENGINEER IN THE FIELD. SUBCUT AREAS SHALL BE BACKFILLED WITH SUITABLE MATERIAL AS DETERMINED BY THE ENGINEER.

CITY OF ROGERS	BITUMINOUS TRAIL TYPICAL SECTION	Standard Details Date: SEPTEMBER, 2020 Revised	STR-8

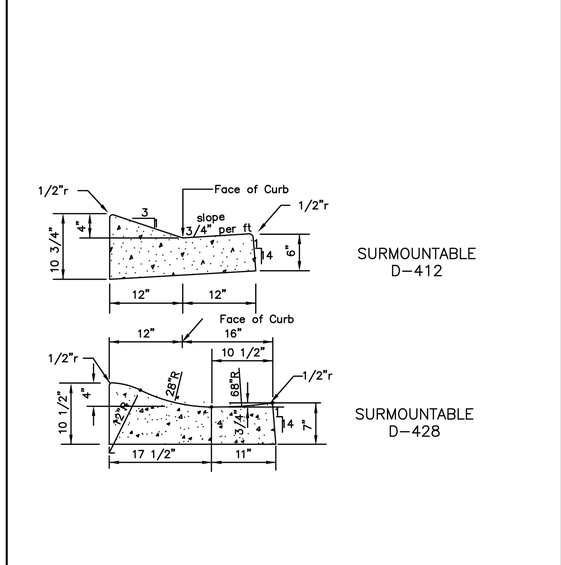


** COURSE FILTER AGGREGATE INCIDENTAL TO 4" CORRUGATED POLYETHYLENE PIPE

CITY OF ROGERS	POLYETHYLENE PERFORATED PIPE	Standard Details Date: SEPTEMBER, 2020 Revised	STO-11



CITY OF ROGERS	CURB SECTIONS	Standard Details Date: SEPTEMBER, 2020 Revised	CON-1



CITY OF ROGERS	CURB RADIUS	Standard Details Date: SEPTEMBER, 2020 Revised	CON-1A

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
CONSTRUCTION DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2025

REVISIONS

03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970D

PROJECT NO.
23970

6.2

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970D.dwg - 4/16/2025 01:31PM

GENERAL UTILITY CONSTRUCTION NOTES:

1. SPECIFICATIONS: THE WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF ROGERS GENERAL SPECIFICATIONS AND STANDARD DETAIL PLATES FOR STREET AND UTILITY CONSTRUCTION.

2. EXISTING FACILITIES: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ALL EXISTING UTILITIES BEFORE STARTING CONSTRUCTION. THIS INCLUDES, BUT IS NOT LIMITED TO SANITARY AND STORM SEWER, WATERMAIN, NATURAL GAS, ELECTRIC, TELEPHONE AND CABLE TELEVISION SERVICES.

   THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICT BETWEEN THE EXISTING UTILITIES AND THE PROPOSED CONSTRUCTION. THE ENGINEER IN COOPERATION WITH THE UTILITY COMPANIES, SHALL DETERMINE THE NECESSITY FOR ANY RELOCATION OF THESE FACILITIES.

   THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES AND FACILITIES SO THAT THEY WILL CONTINUE TO FUNCTION IN THEIR PROPER MANNER BOTH DURING CONSTRUCTION AND IN THE FUTURE. ANY SUPPORTING STRUCTURE THAT MAY BE REQUIRED BECAUSE OF THE CONTRACTOR'S OPERATION SHALL BE PROVIDED BY THE CONTRACTOR.

   THE CONTRACTOR SHALL BRING TO THE ATTENTION OF THE ENGINEER ANY CONDITIONS SUCH AS SAND IN MANHOLES OR VALVE BOXES EXISTING PRIOR TO THE CONTRACTOR'S EXCAVATION. ONCE EXCAVATION HAS COMMENCED, IT WILL BE ASSUMED THAT ALL DAMAGE TO UNDERGROUND UTILITIES HAS BEEN CAUSED BY THE CONTRACTOR'S OPERATIONS AND IT WILL BE HIS RESPONSIBILITY TO MAKE THE NECESSARY REPAIRS.

3. CONTRACTOR RESPONSIBILITIES:
   THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR RECEIVING WATER FROM PUBLIC OR PRIVATE SOURCES AND SECURE NECESSARY PERMITS AND PAY REGULAR CHARGES. ALL CITY WATER SHALL BE METERED. DISPOSAL OF ANY WASTEWATER OR ANY TEST WATER INTO THE CITY SANITARY SEWER SYSTEM IS SUBJECT TO CITY CHARGE. CONTRACTORS ARE NOT TO OPERATE GATE VALVES OR HYDRANTS ON CITY WATER SUPPLY.

   THE CITY ENGINEER AND THE ENGINEER SHALL BE NOTIFIED 48 HOURS PRIOR TO COMMENCING WORK. CONTRACTORS SHALL BE SUBJECT TO SHUT DOWN IF PROPER NOTIFICATION IS NOT GIVEN TO THE ENGINEER.

   CITY STREETS THAT ARE UTILIZED FOR INGRESS TO OR EGRESS FROM THE CONSTRUCTION SITE SHALL BE KEPT FREE OF DIRT AND OTHER DEBRIS RESULTING FROM SAID CONSTRUCTION. COST FOR THIS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

   THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN ADEQUATE STORM DRAINAGE PROTECTION OF THE SITE IN ORDER TO PREVENT EROSION AND SILTING OF ON-SITE AND OFF-SITE AREAS. THIS SHALL BE ACCOMPLISHED BY PLACEMENT OF HAY BALES OR FILTER FABRIC FENCE AROUND THE DRAINAGE INLETS AND OUTLETS AND BY CONSTRUCTION OF DITCHES, BERMS, DEBRIS BASINS, FILTER FABRIC FENCING AND BY ANY OTHER ON-SITE PROTECTION AS DETERMINED BY THE ENGINEER. UNLESS SPECIFICALLY CALLED OUT AS A BID ITEM ON THE BID FORM, ANY TEMPORARY DITCHING, CULVERTS, HAY BALES, AND FILTER FABRIC FENCE NECESSARY TO ACCOMPLISH THIS SHALL BE AT THE CONTRACTOR'S EXPENSE.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AND LEAVE UNDISTURBED THOSE MARKERS OR MONUMENTS SET FOR THE SUBDIVISION OF LAND.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UTILIZE THE "GOPHER STATE ONE CALL" EXCAVATION NOTICE SYSTEM AS REQUIRED UNDER MINNESOTA STATUTE CHAPTER 216D. CALL 811 OR SUBMIT A TICKET AT gopherstateonecall.org AT LEAST 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION.

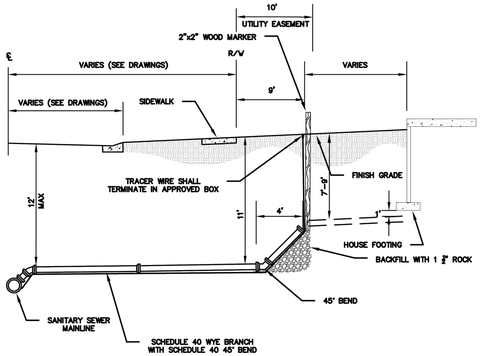
2. COMPACTION: DENSITY TESTS SHALL BE TAKEN ON ALL TRENCHES WITHIN THE STREET CROSS SECTION AND THE PAD AREAS TO EVALUATE THE COMPACTION ACHIEVED DURING UTILITY CONSTRUCTION. WITHIN THE UPPER 3 FEET OF STREET SUBGRADE THE CONTRACTOR SHALL INSURE THAT ALL SOILS BE NOT MORE THAN ONE PERCENTAGE POINT OVER THE SOIL'S STANDARD PROCTOR OPTIMUM MOISTURE CONTENT, AND THAT COMPACTION TO A MINIMUM OF 100% OF STANDARD PROCTOR DENSITY (AASHTO T-99) BE PROVIDED. WITHIN UTILITY TRENCHES IN OPEN SPACE AREAS (PAD AREAS) AND AREAS BELOW THE UPPER 3 FEET OF STREET SUBGRADE, THE CONTRACTOR SHALL INSURE THAT ALL SOILS BE NOT MORE THAN THREE PERCENTAGE POINTS OVER THE SOIL'S STANDARD PROCTOR OPTIMUM MOISTURE CONTENT, AND THAT COMPACTION TO A MINIMUM OF 95% OF STANDARD PROCTOR DENSITY BE PROVIDED. THE SURFACE OF ALL UTILITY TRENCHES SHALL BE FINISHED GRADED TO THE ELEVATIONS AS STAKED BY THE ENGINEER TO WITHIN A TOLERANCE OF ±0.3' IN OPEN SPACE AREAS AND ± 0.1' WITHIN STREET RIGHT OF WAYS. THE DENSITY WILL BE TESTED BY AN APPROVED TESTING LABORATORY. AN APPROVED TESTING METHOD WHICH UTILIZES A NUCLEAR DENSITY METER MAY BE USED FOR THE DENSITY TESTS. THE LOCATION OF THE TESTS WILL BE AT THE DIRECTION OF THE ENGINEER.

   THE OWNER SHALL BEAR ALL COSTS OF THE TESTING. FAILURE TO MEET THE COMPACTION REQUIREMENTS OUTLINED IN THIS SECTION SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE. ALL COSTS FOR ANY RE-TESTING ASSOCIATED WITH ANY CORRECTIVE WORK SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

3. ALL PVC WATERMAIN TO BE INSTALLED WITH 8.5' MINIMUM COVER. ALL DIP WATERMAIN TO BE INSTALLED WITH 7.5' MINIMUM COVER.

4. ALL 8" WATERMAIN TO BE CONSTRUCTED OF CLASS C900 PVC W/ TRACER WIRE.

5. SANITARY SEWER PIPE TYPE & CLASS AS FOLLOWS:
   a. 0' – 18' DEEP = PVC SDR 35
   b. 18' – 28' DEEP = PVC SDR 26
   c. 28' – 32' DEEP = PVC SDR 18, AWWA C900
   d. 32' + DEEP = POLYBOND LINED DIP, ASTM A746



NOTES:

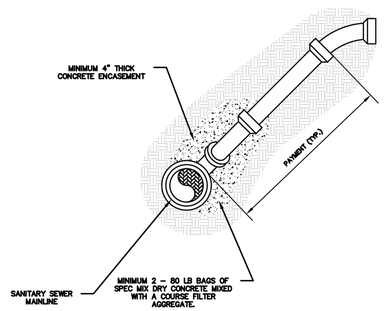
SEWER SERVICE, PVC SCHEDULE 40 4" OR 6" AS SPECIFIED

2% MINIMUM SLOPE OR 12% MAXIMUM SLOPE, ½" PER FOOT

ALL PIPE SHALL BE BEDDED IN GRANULAR BORROW 3149 B.1 OR COURSE FILTER AGGREGATE 3149H

END OF SERVICE SHALL BE 7' TO 8' DEEP AT END OF SERVICE. THE END SHALL BE A FACTORY JOINT WITH PLUG, USING A FACTORY MANUFACTURED ADAPTOR WHERE NECESSARY

CITY OF ROGERS	SANITARY SEWER SERVICE	Standard Details	SAN-1
		Date: SEPTEMBER, 2020	
		Revised:	



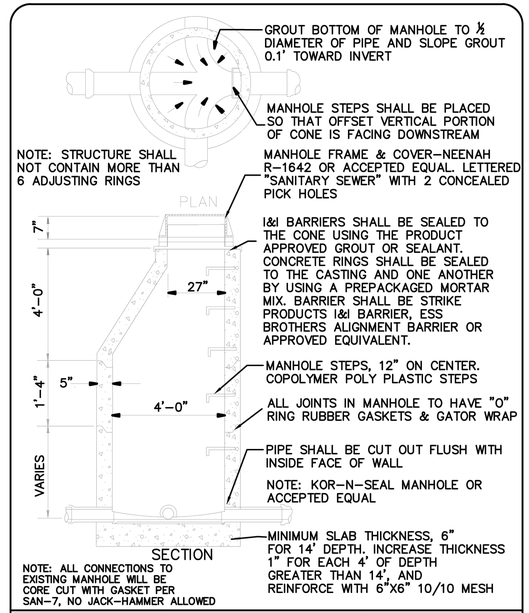
NOTES:

SERVICE CONNECTION TO BE AT 2:00 OR 10:00 WITH APPROVED FACTORY INSTALLED SCHEDULE 40 WYE.

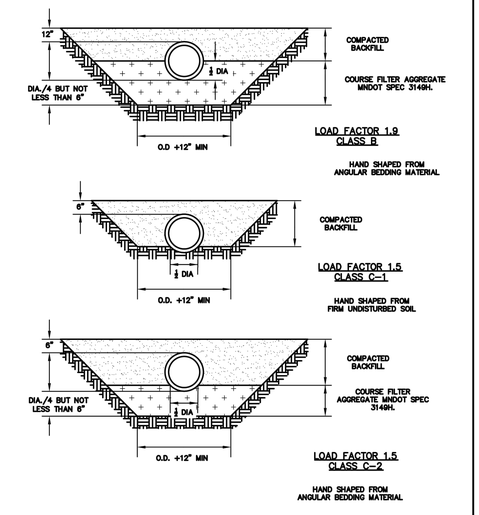
4" OR 6" SANITARY SEWER SERVICE RISER SUPPORT ON TRENCH SLOPE 1:1 MAX

SCHEDULE 40 PVC SERVICES

CITY OF ROGERS	SANITARY SEWER SERVICE RISER	Standard Details	SAN-2
		Date: SEPTEMBER, 2020	
		Revised:	



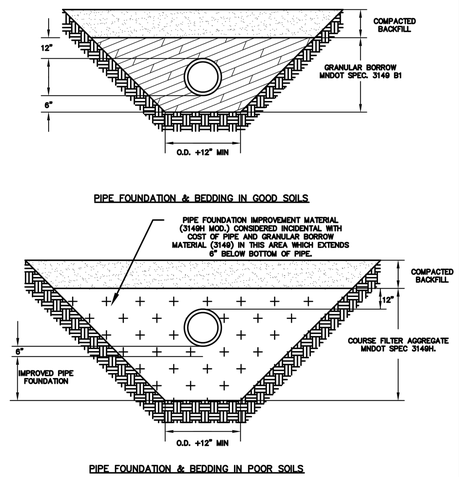
CITY OF ROGERS	STANDARD SANITARY MANHOLE	Standard Details	SAN-4
		Date: SEPTEMBER, 2020	
		Revised:	



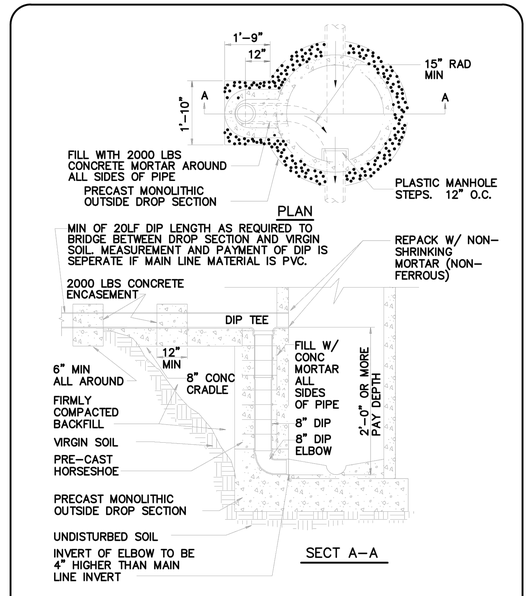
NOTES:

"DIA" DENOTES OUTSIDE DIAMETER OF PIPE

CITY OF ROGERS	PIPE BEDDING METHODS FOR RCP OR DIP	Standard Details	SAN-11
		Date: SEPTEMBER, 2020	
		Revised:	



CITY OF ROGERS	PIPE BEDDING METHODS FOR PVC	Standard Details	SAN-12
		Date: SEPTEMBER, 2020	
		Revised:	



CITY OF ROGERS	SANITARY MANHOLE OUTSIDE DROP SECTION	Standard Details	SAN-13
		Date: SEPTEMBER, 2020	
		Revised:	

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
CONSTRUCTION DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2025

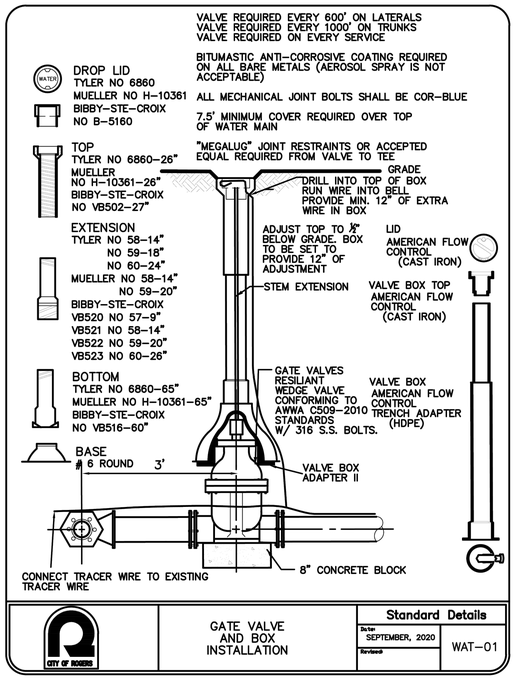
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970D

PROJECT NO.
23970

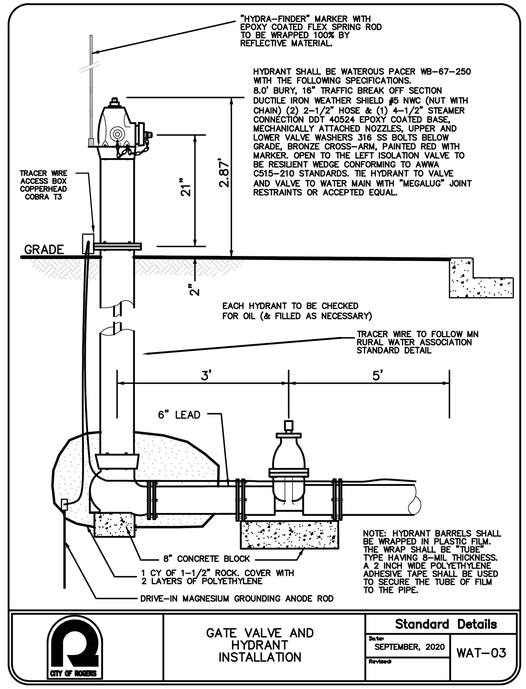
6.3

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970D.dwg - 4/16/2025 01:31PM



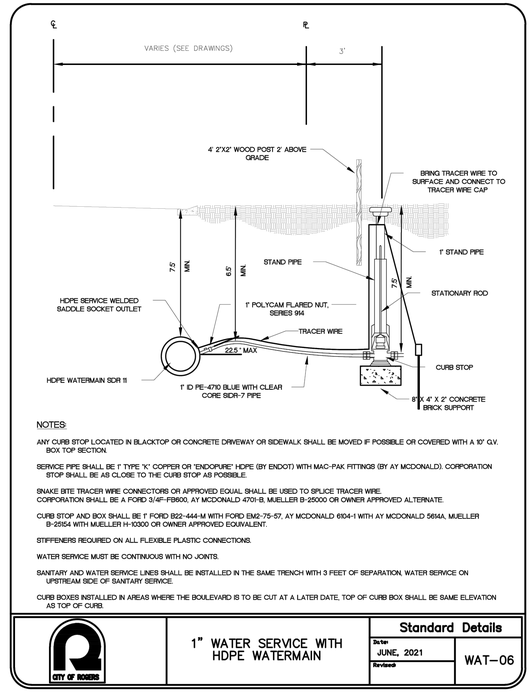
GATE VALVE AND BOX INSTALLATION

Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-01



GATE VALVE AND HYDRANT INSTALLATION

Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-03



NOTES:

ANY CURB STOP LOCATED IN BLACKTOP OR CONCRETE DRIVEWAY OR SIDEWALK SHALL BE MOVED IF POSSIBLE OR COVERED WITH A 10" G.V. BOX TOP SECTION.

SERVICE PIPE SHALL BE 1" TYPE "K" COPPER OR "ENDOPURE" HDPE (BY ENDOT) WITH MAC-PAK FITTINGS (BY AY MCDONALD). CORPORATION STOP SHALL BE AS CLOSE TO THE CURB STOP AS POSSIBLE.

SNAKE BITE TRACER WIRE CONNECTORS OR APPROVED EQUAL SHALL BE USED TO SPLICE TRACER WIRE. CORPORATION SHALL BE A FORD 3/4F-FB600, AY MCDONALD 4701-B, MUELLER B-25000 OR OWNER APPROVED ALTERNATE.

CURB STOP AND BOX SHALL BE 1" FORD B22-444-M WITH FORD EM2-75-57, AY MCDONALD 6104-1 WITH AY MCDONALD 569A, MUELLER B-20254 WITH MUELLER H-10300 OR OWNER APPROVED EQUIVALENT.

STIFFENERS REQUIRED ON ALL FLEXIBLE PLASTIC CONNECTIONS.

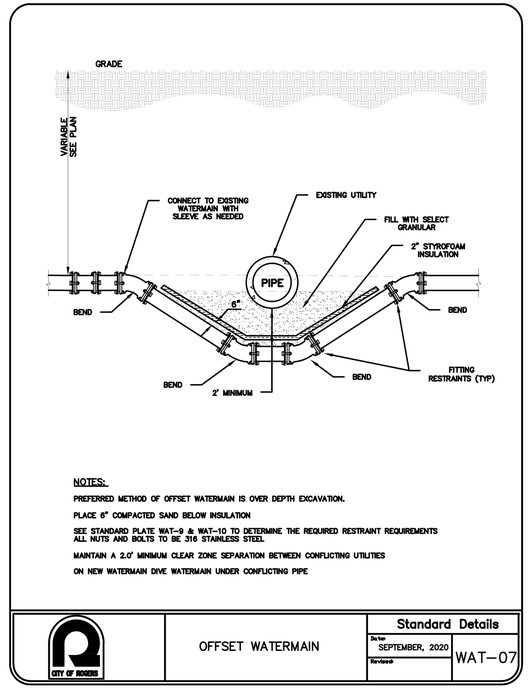
WATER SERVICE MUST BE CONTINUOUS WITH NO JOINTS.

SANITARY AND WATER SERVICE LINES SHALL BE INSTALLED IN THE SAME TRENCH WITH 3 FEET OF SEPARATION. WATER SERVICE ON UPSTREAM SIDE OF SANITARY SERVICE.

CURB BOXES INSTALLED IN AREAS WHERE THE BOULEVARD IS TO BE CUT AT A LATER DATE, TOP OF CURB BOX SHALL BE SAME ELEVATION AS TOP OF CURB.

1" WATER SERVICE WITH HDPE WATERMAIN

Standard Details — Date: JUNE, 2021 — Revised: — WAT-06



NOTES:

PREFERRED METHOD OF OFFSET WATERMAIN IS OVER DEPTH EXCAVATION.

PLACE 6" COMPACTED SAND BELOW INSULATION

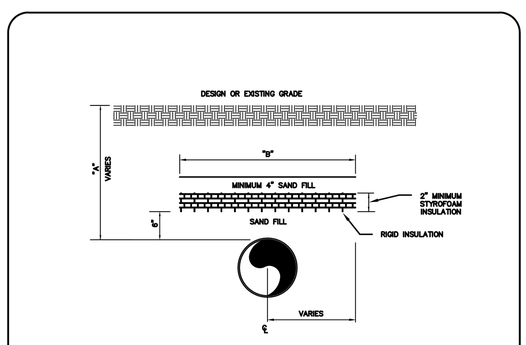
SEE STANDARD PLATE WAT-9 & WAT-10 TO DETERMINE THE REQUIRED RESTRAINT REQUIREMENTS
ALL NUTS AND BOLTS TO BE 316 STAINLESS STEEL.

MAINTAIN A 2.0' MINIMUM CLEAR ZONE SEPARATION BETWEEN CONFLICTING UTILITIES

ON NEW WATERMAIN DIVE WATERMAIN UNDER CONFLICTING PIPE

OFFSET WATERMAIN

Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-07



NOTES:

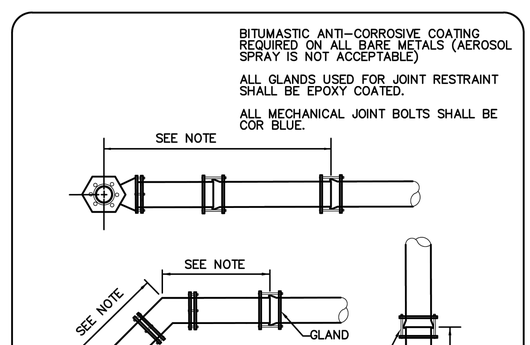
PIPE SHALL BE CENTERED UNDER INSULATION UNLESS OTHERWISE SPECIFIED

COVER OVER PIPE - "A"	WIDTH OF INSULATION BOARD - "B"
4'-0"	12'
4'-6"	13'
5'-0"	14'

2" OF INSULATION = 2' OF COVER

INSULATION DETAIL

Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-08



WATERMAIN TYING DETAIL

Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-09

TRACER WIRE

TRACER WIRE SHALL BE COPPERHEAD #12 AWG CCS COMPLYING WITH ASTM-D-1248, 30 VOLT RATING.(GREEN) FOR SEWER SERVICES AND FORCEMAIN AND (BLUE) FOR WATER MAIN
- #1230HS HIGH STRENGTH FOR OPEN CUT
- #1245EHS EXTRA HIGH STRENGTH FOR HORIZONTAL DIRECTIONAL DRILLING AND JACK/BORING.
- SPLICING 2 WIRES, DRYCONN KING 6 BLUE
- SPLICING 3 OR MORE, DRYCONN DIRECT BURY LUG YELLOW
- WIRE SPLICING WILL BE ALLOWED WHEN APPROVED ONLY

ALL NEW TRACER WIRE INSTALLATIONS SHALL BE LOCATED USING TYPICAL LOW FREQUENCY (512 HZ) LINE TRACING EQUIPMENT, WITNESSED BY THE CONTRACTOR, ENGINEER AND FACILITY OWNER AS APPLICABLE, PRIOR TO ACCEPTANCE OF OWNERSHIP.

POLYVINYL CHLORIDE PIPE (PVC) - C900

PVC WATER DISTRIBUTION PIPE AND JOINTS SHALL CONFORM TO:
AWWA C-900 (DR)
ASTM D3139

NOTE: TRACER WIRE ACCESSES SHALL NOT EXCEED 500-FT

DUCTILE IRON PIPE

DIP WATER DISTRIBUTION PIPE SHALL BE PRESSURE CLASS 350 AWWA C150/151.

PLASTIC FILM WRAP FOR DIP

WATER DISTRIBUTION PIPE, RISER PIPE, AND HYDRANT BARRELS SHALL BE WRAPPED IN PLASTIC FILM. THE WRAP SHALL BE "TUBE" TYPE HAVING 8-MIL THICKNESS. A 2 INCH WIDE POLYETHYLENE ADHESIVE TAPE SHALL BE USED TO SECURE THE TUBE OF FILM TO THE PIPE.

DUCTILE IRON FITTINGS

WATER MAIN FITTINGS SHALL CONFORM TO ANSI A21.53, A21.11 & A21.4. FITTINGS SHALL BE COATED WITH 6 - 8 MM MINIMUM THICKNESS FUSION BONDED EPOXY CONFORMING TO ANSI/AWWA C550 AND C116/A21.16.

THRUST RESTRAINT

ALL WATER MAIN, VALVES, SERVICES, FITTINGS, STUBS, EXTENSIONS, BLIND FLANGES, AND PLUGS USED FOR RETAINING WATER PRESSURE MUST BE TIED WITH "MEGALUG" JOINT RESTRAINTS OR ACCEPTED EQUAL, BASED UPON A 150 PSI TEST PRESSURE AND 7.5' COVER, THE FOLLOWING SHOWS THE MINIMUM LENGTH OF PIPE EACH WAY OF A FITTING TO BE RESTRAINED. JOINT RESTRAINTS TO BE EPOXY COATED AS REQUIRED ON WATER MAIN FITTINGS.

PIPE DIAMETER	DEAD END OR 90^BEND	TEE BRANCH 45^BEND	TEE BRANCH 22-1/2^BEND
4" (SERVICE)	22 LF	5 LF	2 LF
6"	23 LF	7 LF	3 LF
8"	30 LF	10 LF	5 LF
10"	38 LF	12 LF	5 LF
12"	50 LF	16 LF	5 LF

ALL TEES WITH A VALVE IMMEDIATELY AFTER A TEE BRANCH SHOULD BE TREATED AS A 90 DEGREE BEND.

WHERE RESTRAINED JOINTS ARE REQUIRED AND THE PIPE IS IN A CASING NEAR THE FITTING TO BE RESTRAINED, THE LENGTH OF PIPE IN THE CASING SHALL NOT BE INCLUDED IN THE LENGTH OF PIPE NECESSARY TO DEVELOP SUFFICIENT SOIL FRICTION TO OVERCOME THRUST.

ALL BARE METALS SHALL HAVE TWO COATS OF BITUMASTIC OR ACCEPTED EQUAL. (AEROSOL SPRAY IS NOT ACCEPTABLE) ALL MECHANICAL JOINT BOLTS SHALL BE COR-BLUE.
ALL JOINT TIE RODS AND NUTS SHALL BE 316 STAINLESS STEEL.

WATER MAIN DETAILS AND TIE SCHEDULE TABLE

Standard Details — Date: SEPTEMBER, 2020 — Revised: — WAT-10

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
CONSTRUCTION DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2025

REVISIONS

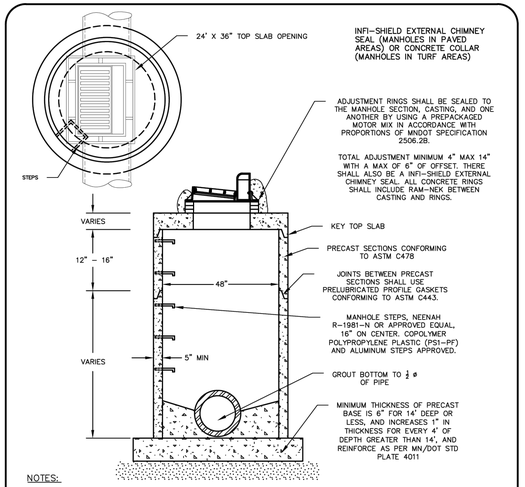
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970D

PROJECT NO.
23970

6.4

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970D.dwg - 4/16/2025 01:31PM



NOTES:

FRAME AND GRATE FOR BULKHEAD STYLE CURB SHALL BE A NEENAH R-3067-V OR NEENAH R-3067-VB

FRAME AND GRATE FOR SURMOUNTABLE STYLE CURB OR DRIVEWAYS SHALL BE A NEENAH R-3501-TR OR R-3501-TL LOW POINTS 3501-TB

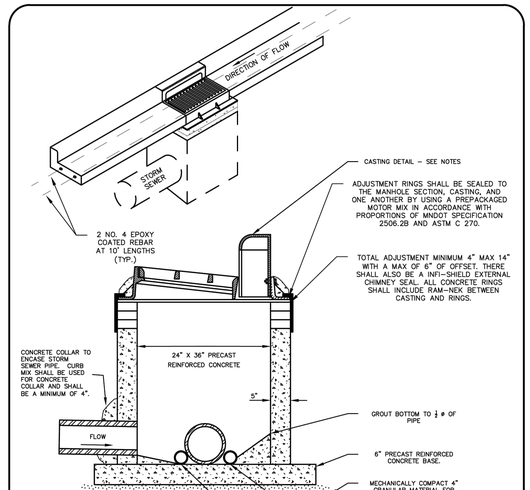
FRAME AND GRATE FOR OFF ROAD LOCATION (DITCH GRATE, STOOL TYPE) R-4342

ALL MANHOLES WITH FRAME AND LID IN A PAVED AREA SHALL USE A NEENAH R-1642 WITH SOLID B LID WITH 2 CONCEALED PICK HOLES OR APPROVED EQUAL. LID SHALL BE LETTERED "STORM SEWER" WITH 2" RAISED LETTERS

DOG HOUSES SHALL BE GROUTED ON BOTH THE OUTSIDE AND INSIDE OF THE STRUCTURE

DRAINTILE OPENING MUST BE CORE-DRILLED OR PRECAST AND GROUTED INSIDE AND OUTSIDE OF THE STRUCTURE.

CITY OF ROGERS	STORM SEWER MANHOLE	Standard Details	STO-1
		Date: SEPTEMBER, 2020	
		Revised:	



NOTES:

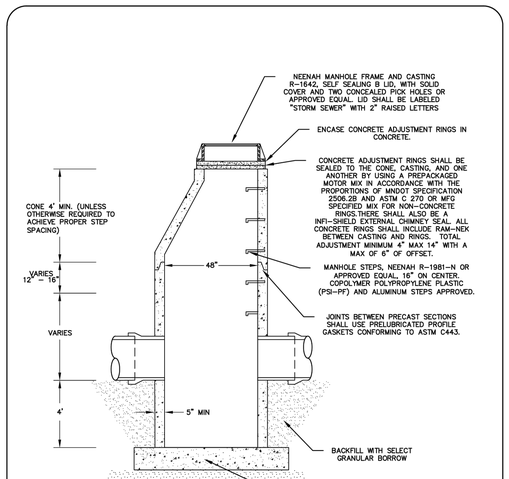
FRAME AND GRATE FOR BULKHEAD STYLE CURB SHALL BE A NEENAH R-3067-V OR NEENAH R-3067-VB

FRAME AND GRATE FOR SURMOUNTABLE STYLE CURB OR DRIVEWAYS SHALL BE A NEENAH R-3501-TR OR R-3501-TL. LOW POINTS SHALL BE R-3501-TB

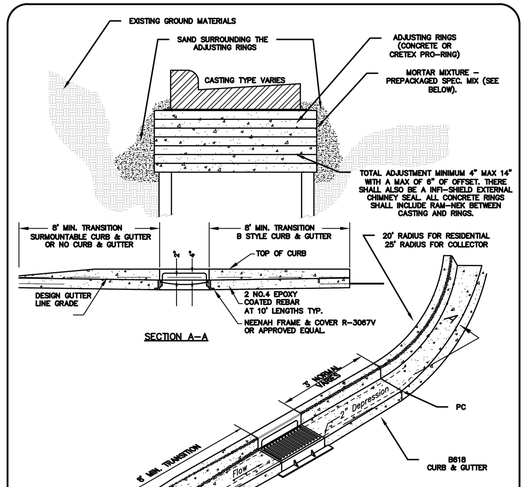
FRAME AND GRATE FOR OFF ROAD LOCATION (DITCH GRATE, STOOL TYPE) R-4342

DOG HOUSES AND RINGS SHALL BE GROUTED ON BOTH THE OUTSIDE AND INSIDE OF THE STRUCTURE

CITY OF ROGERS	STORM SEWER JUNCTION MANHOLE	Standard Details	STO-2
		Date: JUNE, 2021	
		Revised:	



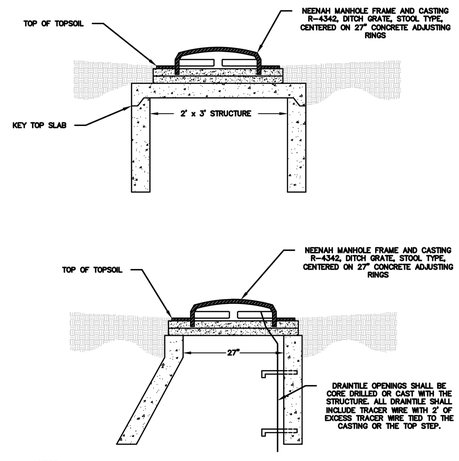
CITY OF ROGERS	STANDARD MANHOLE WITH SUMP	Standard Details	STO-3
		Date: SEPTEMBER, 2020	
		Revised:	



NOTES:

THE CONCRETE ADJUSTMENT RINGS SHALL BE SEALED TO THE CONE, CASTING AND ONE ANOTHER BY USING A PREPACKAGED MORTAR MIX IN ACCORDANCE WITH PROPORTIONS OF MNDOT SPECIFICATION 2506.2B AND ASTM C 270. THIS WILL ALSO BE USED FOR ALL "MUD WORK" INSIDE OF CONCRETE STRUCTURES

CITY OF ROGERS	CB ADJUSTMENT AND CB PLACEMENT IN CONCRETE CURB AND GUTTER	Standard Details	STO-5
		Date: SEPTEMBER, 2020	
		Revised:	



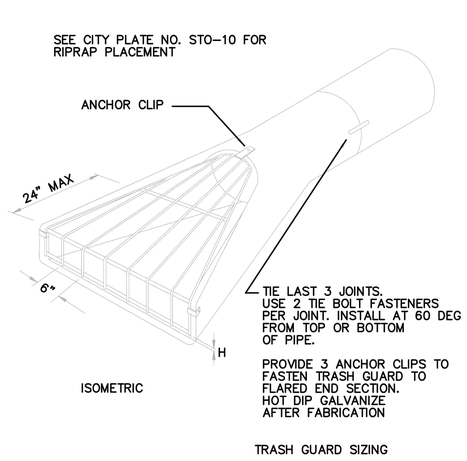
NOTES:

THE CONCRETE ADJUSTING RINGS SHALL BE SEALED TO THE CONE AND ONE ANOTHER BY USING MORTAR MIX IN ACCORDANCE WITH THE PROPORTIONS OF MNDOT SPECIFICATION 2506.2B AND ASTM C 270.THERE SHALL ALSO BE A INFI-SHIELD EXTERNAL CHIMNEY SEAL

THIS WILL ALSO BE USED FOR ALL "MUD WORK" INSIDE OF CONCRETE STRUCTURES

THE CASTING SHALL NOT BE SEALED TO THE ADJUSTMENT RINGS TO FACILITATE IN THE REMOVAL OF THE CASTING IF NECESSARY.

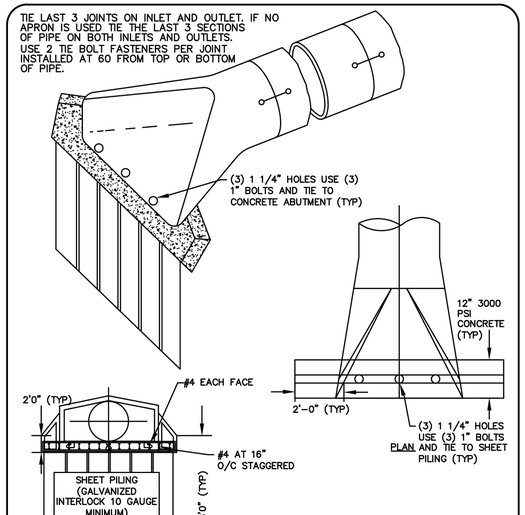
CITY OF ROGERS	CATCH BASIN FOR R-4342 CASTING	Standard Details	STO-6
		Date: SEPTEMBER, 2020	
		Revised:	



TRASH GUARD SIZING

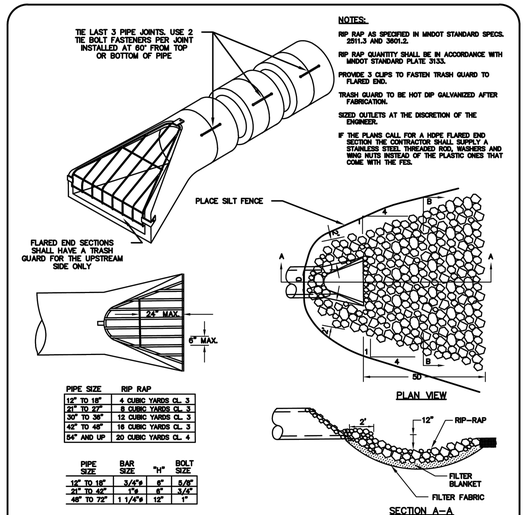
PIPE SIZE	BARS	"H"	BOLTS
12"-18"	3/4" DIA	4"	5/8"
21"-42"	1" DIA	6"	3/4"
48"-72"	1-1/4" DIA	12"	1"

CITY OF ROGERS	FLARED END SECTION AND TRASH GUARD	Standard Details	STO-7
		Date: SEPTEMBER, 2020	
		Revised:	



NOTE:
THIS DRAWING IS TYPICAL FOR ALL FLARED END SECTIONS 30 INCHES IN DIAMETER OR LARGER.

CITY OF ROGERS	OUTLET SHEET PILING	Standard Details	STO-9
		Date: SEPTEMBER, 2020	
		Revised:	



NOTES:

RIP RAP AS SPECIFIED IN MNDOT STANDARD SPECS. 2511.3 AND 3601.2.

RIP RAP QUANTITY SHALL BE IN ACCORDANCE WITH MNDOT STANDARD PLATE 3133.

PROVIDE 3 CLIPS TO FASTEN TRASH GUARD TO FLARED END.

TRASH GUARD TO BE HOT DIP GALVANIZED AFTER FABRICATION.

SIZED OUTLETS AT THE DISCRETION OF THE ENGINEER.

IF THE PLANS CALL FOR A HDPE FLARED END SECTION THE CONTRACTOR SHALL SUPPLY A STAINLESS STEEL THREADED ROD, WASHERS AND WING NUTS INSTEAD OF THE PLASTIC ONES THAT COME WITH THE PES.

PIPE SIZE	RIP RAP
12" TO 18"	4 CUBIC YARDS CL. 3
21" TO 27"	8 CUBIC YARDS CL. 3
30" TO 36"	12 CUBIC YARDS CL. 3
42" TO 48"	16 CUBIC YARDS CL. 3
54" AND UP	20 CUBIC YARDS CL. 4

PIPE SIZE	BAR SIZE	"H"	BOLT SIZE
12" TO 18"	3/4"ø	6"	5/8"
21" TO 42"	1"ø	6"	3/4"
48" TO 72"	1 1/4"ø	12"	1"

CITY OF ROGERS	RIPRAP AT OUTLETS	Standard Details	STO-10
		Date: SEPTEMBER, 2020	
		Revised:	

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: Reg.No.

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
CONSTRUCTION DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2025

REVISIONS

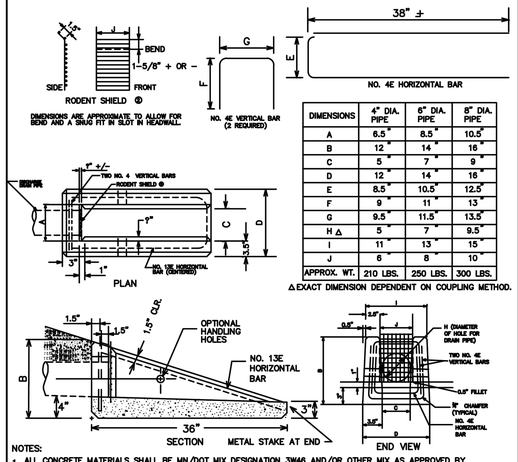
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970D

PROJECT NO.
23970

6.5

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970D.dwg - 4/16/2025 01:31PM



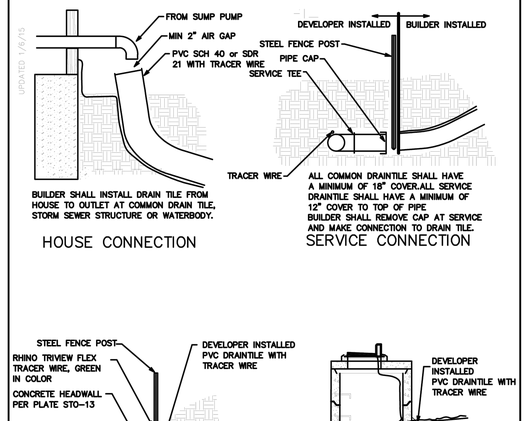
DIMENSIONS	4" DIA. PIPE	6" DIA. PIPE	8" DIA. PIPE
A	6.5"	8.5"	10.5"
B	12"	14"	16"
C	5"	7"	9"
D	12"	14"	16"
E	8.5"	10.5"	12.5"
F	9"	11"	13"
G	9.5"	11.5"	13.5"
H △	5"	7"	9.5"
I	11"	13"	15"
J	6"	8"	10"
APPROX. WT.	210 LBS.	250 LBS.	300 LBS.

△ EXACT DIMENSION DEPENDENT ON COUPLING METHOD.

NOTES:

1. ALL CONCRETE MATERIALS SHALL BE MN/DOT MIX DESIGNATION 3W46 AND/OR OTHER MIX AS APPROVED BY THE STATE MATERIALS ENGINEER. HEADWALLS SHALL NOT BE SHIPPED UNTIL CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5000 PSI. THE EPOXY BARS SHALL BE SECURELY RETAINED SO THEY ARE NOT DISPLACED DURING CONCRETE PLACEMENT. TIE WIRE SHALL BE EPOXY COATED. WELDING WILL NOT BE PERMITTED. THE FABRICATOR SHALL PROVIDE A QUALITY CONTROL PROGRAM APPROVED BY THE MATERIALS ENGINEER.
2. THE RODENT SHIELD SHALL BE FABRICATED FROM CARBON STEEL FLATTENED EXPANDED METAL, STYLE 4" NO 4F. IT SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION. ACTUAL SCREEN DIMENSIONS SHALL BE SUCH AS WILL SNUGLY FIT THE PROVIDED SLOT (TAPERED IF NECESSARY), WITH THE SCREEN LIP FITTING FLUSH WITH THE CASTING TOP AND THE BOTTOM FITTING TIGHT TO THE FLOW LINE.
3. THE MANUFACTURER'S NAME AND DATE OF PRODUCTION (MONTH AND YEAR) SHALL BE CLEARLY CAST (NOT INK STAMPED) INTO EITHER THE BOTTOM OF EACH HEADWALL OR NEAR THE BOTTOM OF THE LARGE END. IF A MANUFACTURER HAS MORE THAN ONE PLANT, THEY SHALL BE APPROPRIATELY CODED.

		Standard Details	
CITY OF ROGERS	PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS	Date: SEPTEMBER, 2020 Revised:	STO–13



		Standard Details	
CITY OF ROGERS	SUMP PUMP DISCHARGE REQUIREMENTS	Date: SEPTEMBER, 2020 Revised:	STO–14

CITY OF ROGERS MINIMUM DRAIN TILE REQUIREMENTS

(REQUIREMENTS FOR ALL NEW HOMES AS OF JANUARY, 2016)

- PIPE SIZE – 4" PVC
- TYPE OF PIPE – SCH 40 OR ASTM 1785, OR SDR 21
- DEPTH OF PIPE – 12" TO TOP OF PIPE FROM FINISH GRADE
- TRACER WIRE – MINIMUM GAUGE #12 COPPERHEAD COPPER CLAD STEEL TRACER WIRE, GREEN IN COLOR.

NOTE: ALL STORM SEWER PIPE CROSSINGS THAT PENETRATE THE TYPICAL SECTION SHALL INCLUDE DRAINTILE THAT RUNS PARALLEL TO THE CROSSING. THIS DRAINTILE SHALL TIE INTO BOTH DRAINAGE STRUCTURES AND BE PLACED AT THE BOTTOM OF THE PIPE TRENCH.

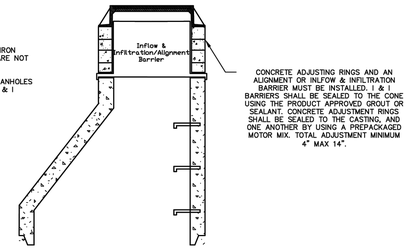
NOTE: CORRECT FITTINGS MUST BE USED WITH ALL PIPE, NO TAPING OR SPLICING WILL BE ACCEPTED. A TRACER WIRE SHALL BE INSTALLED ALONG WITH THE PIPE, THIS WIRE MUST BE COPPERHEAD #12 AWG CCS #1230HS COMPLYING WITH ASTM–D–1248, 30 VOLT RATING BE EXPOSED A MINIMUM LENGTH OF 12 INCHES AT THE HOUSE AND SHALL DEAD END AT THE CONNECTION OR TILE DISCHARGE. NO WIRE SHALL BE ACCEPTED EXCEPT AS SPECIFIED ABOVE.

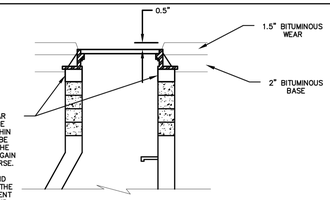
NOTE: THE TRENCH MUST BE LEFT OPEN AT ALL CONNECTIONS FOR INSPECTION PURPOSES. IF A TILE LINE IS TO DEAD END INTO A POND OR WET LAND A FENCE POST SHALL CLEARLY MARK ITS END. ALL INSPECTIONS SHALL REQUIRE A 24 HOUR NOTICE. ALL TRENCHES MUST BE BACK FILLED WITHIN 24 HOURS. IT IS RECOMMENDED THAT A REPRESENTATIVE OF THE BUILDER BE PRESENT AT ALL INSPECTIONS.

		Standard Details	
CITY OF ROGERS	SUMP PUMP DISCHARGE REQUIREMENTS	Date: SEPTEMBER, 2020 Revised:	STO–14A

Notes

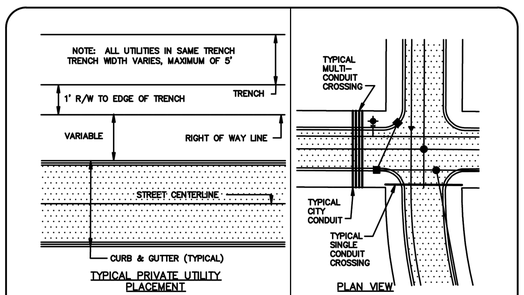
Barrier shall be Strike Products I&I Barrier, Ess Brothers Alignment Barrier or approved equivalent.



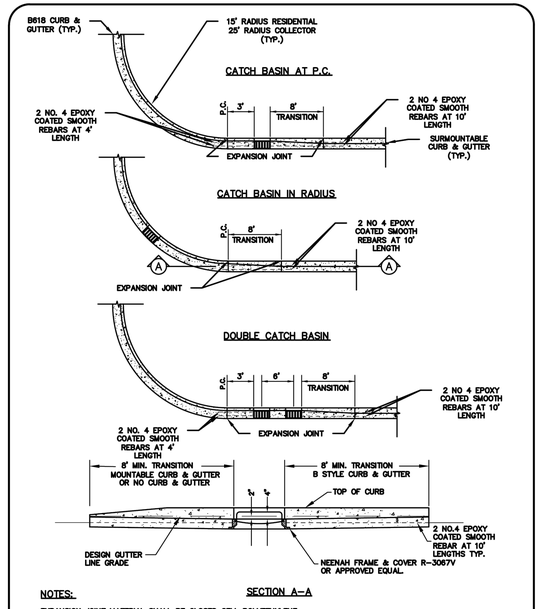


BITUMINOUS WEAR COURSE ADJUSTMENT DETAIL

		Standard Details	
CITY OF ROGERS	MANHOLE CASTING ADJUSTMENT DETAIL	Date: SEPTEMBER, 2020 Revised:	STR–10



		Standard Details	
CITY OF ROGERS	PRIVATE UTILITY CONDUIT CROSSING	Date: SEPTEMBER, 2020 Revised:	STR–11



NOTES:

EXPANSION JOINT MATERIAL SHALL BE CLOSED CELL POLYETHYLENE

		Standard Details	
CITY OF ROGERS	CURB RADIUS	Date: SEPTEMBER, 2020 Revised:	CON–2

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890–6044 FAX: (952)890–6244

PRELIMINARY

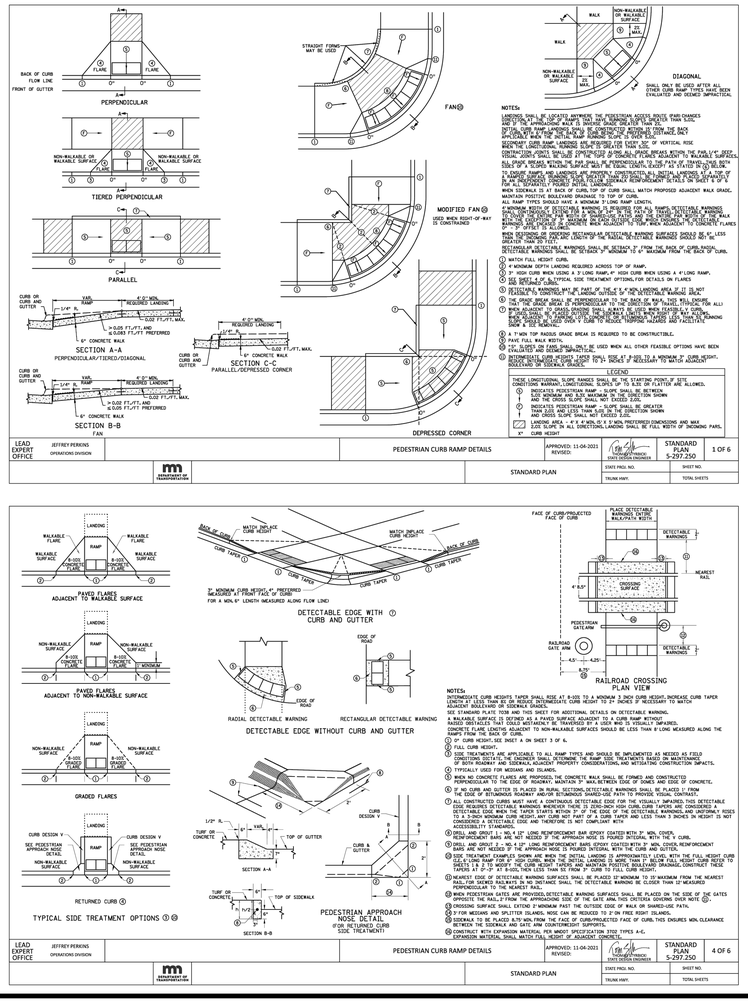
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

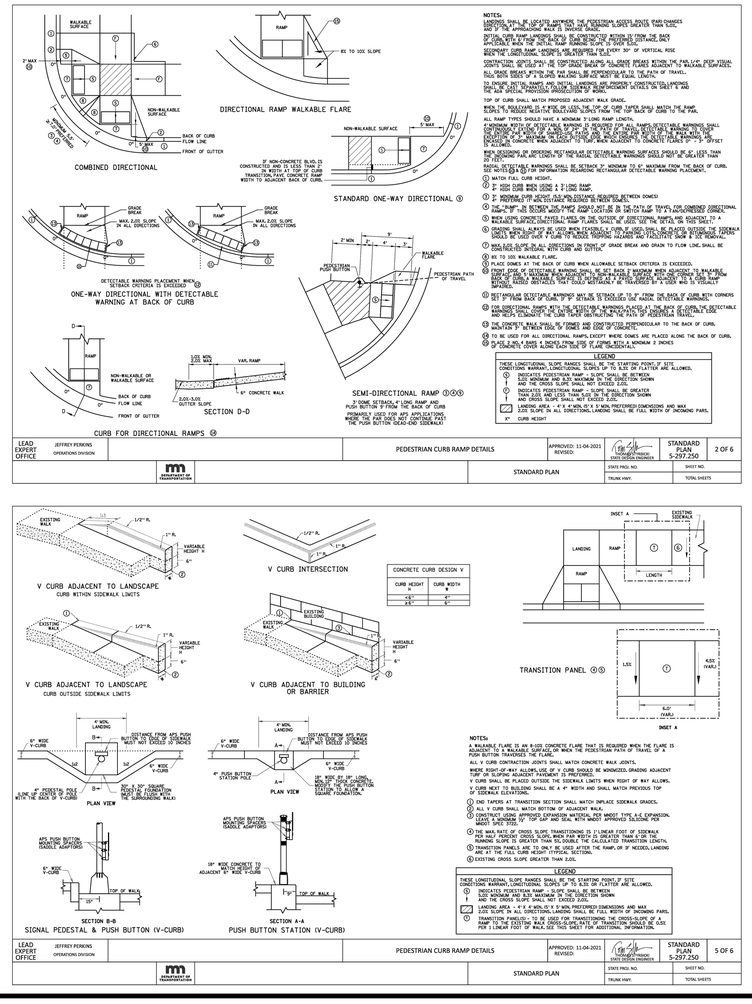
Date: Reg.No.

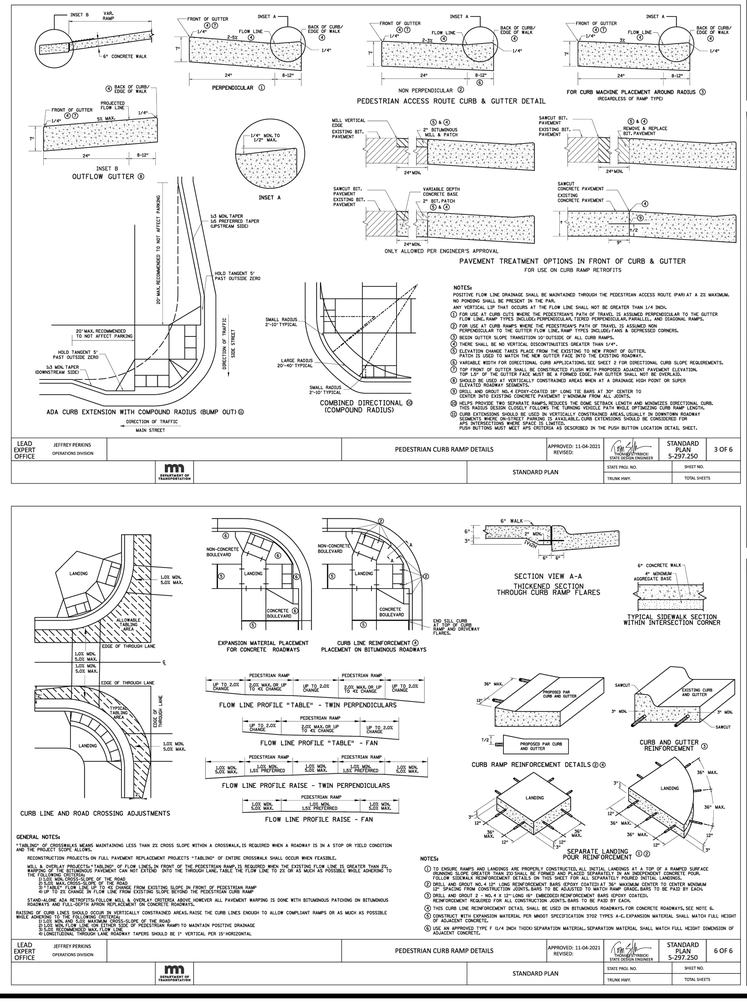
COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
CONSTRUCTION DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970D
PROJECT NO.	23970
	6.6

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970D.dwg - 4/16/2025 01:31PM







James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
CONSTRUCTION DETAILS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376
ROGERS, MINNESOTA

DRAWN BY
JSO

DATE
02/24/2025

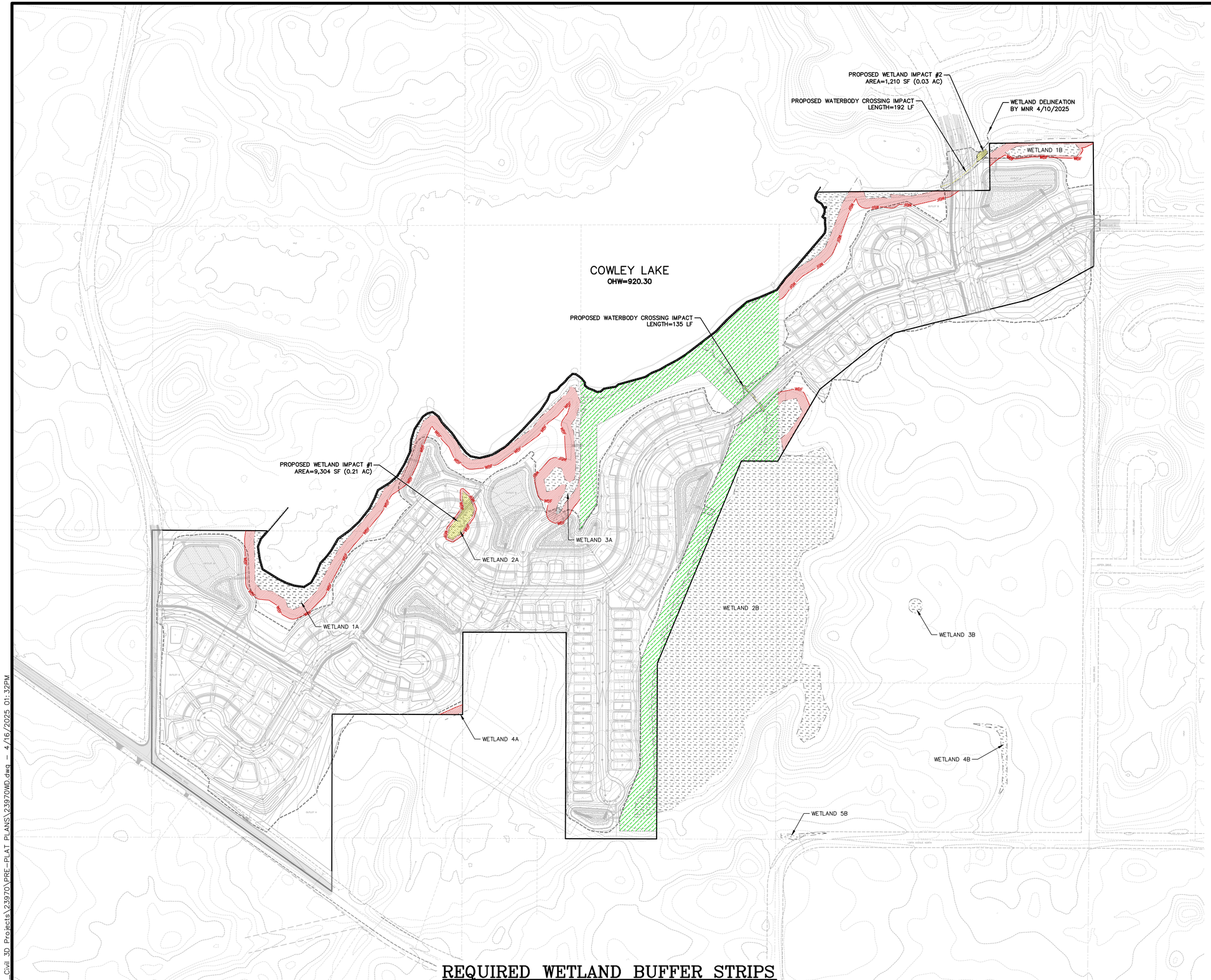
REVISIONS
03/19/2025 MPCA REVIEW SUBMITTAL
04/04/2025 PARTIAL CITY COMMENTS
04/15/2025 WATERSHED COMMENTS

CAD FILE
23970D

PROJECT NO.
23970

6.7

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970D.dwg - 4/16/2025 01:31PM



REQUIRED WETLAND BUFFER STRIPS

LEGEND

- EXISTING WETLAND
- EXISTING CONSERVATION EASEMENT
- PROPOSED WETLAND FILL
- REQUIRED WETLAND BUFFER
- PROPOSED WETLAND BUFFER

WETLAND SUMMARY

TOTAL PROPOSED WETLAND IMPACT AREA	10,514 SF (0.24 AC)
TOTAL PROPOSED WATERBODY CROSSING IMPACT	327 LF
REQUIRED BUFFER AREA	194,755 SF (4.47 AC)
PROPOSED BUFFER AREA	254,103 SF (5.83 AC)

NOTES

1. REQUIRED WETLAND BUFFER STRIPS PER CITY OF ROGERS IS 40 FEET AVERAGE WIDTH, 25 FEET MINIMUM FOR HIGH QUALITY WETLAND AND 10 FEET MINIMUM FOR ALL OTHER WETLANDS.
2. WETLANDS 1A, 3A AND 2B ARE CONSIDERED HIGH QUALITY.
3. WETLANDS 1A THRU 4A DELINEATED BY MIDWEST NATURAL RESOURCES, INC., REPORT DATED 6/27/2022.
4. WETLANDS 1B THRU 5B DELINEATED BY ANDERSON ENGINEERING OF MINNESOTA, REPORT DATED 11/10/2021.
5. BUFFER STRIPS WITHIN THE EXISTING CONSERVATION EASEMENT AREA EXCLUDED FROM THE CALCULATIONS.
6. REQUIRED BUFFER AREA EXCLUDES WETLAND 2A.

Know what's **below.**
Call before you dig.

N

SCALE IN FEET
0 200 400 600
1 inch = 200 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

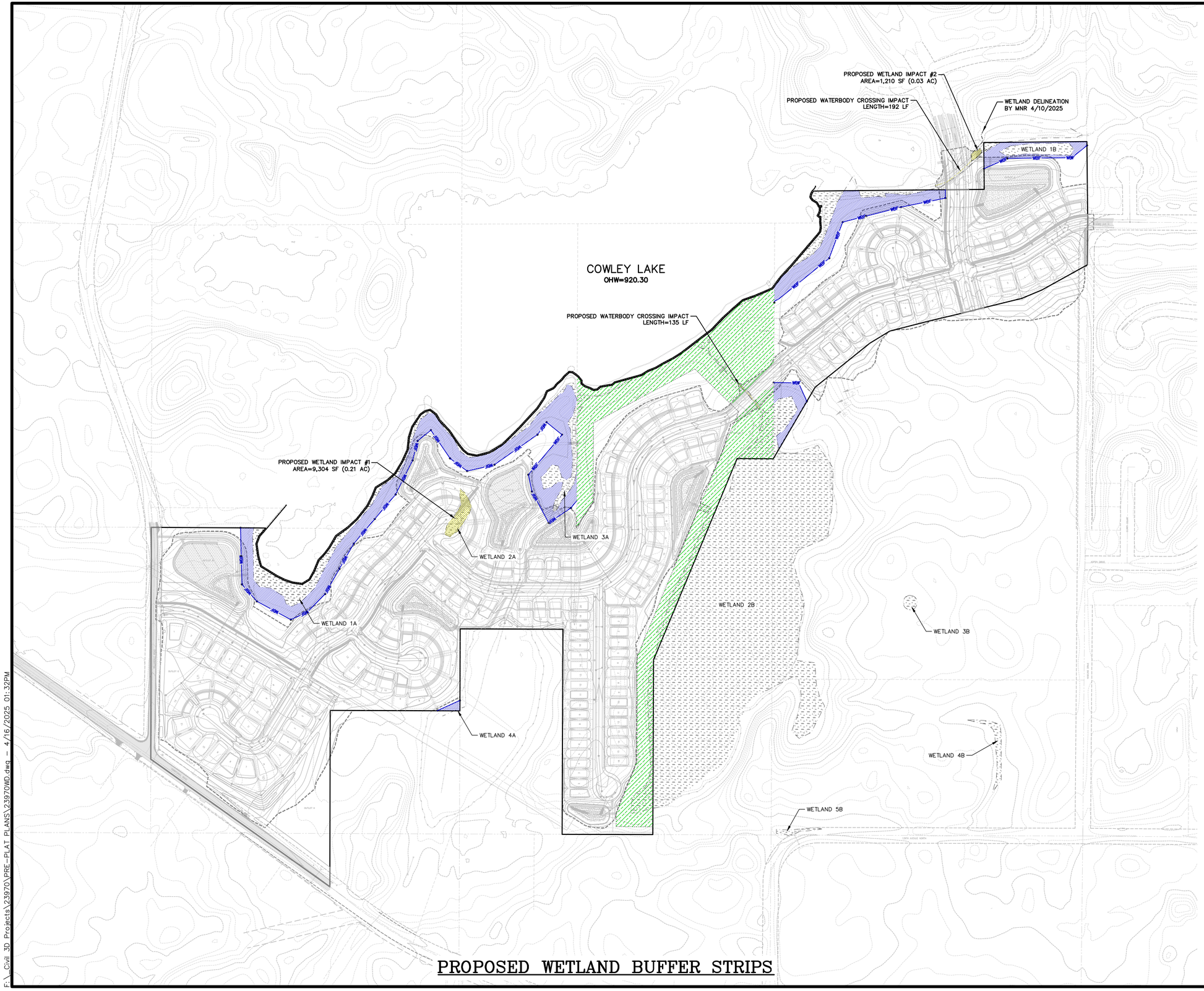
PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
WETLAND IMPACTS AND BUFFERS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970WD
PROJECT NO.	23970
	7.0

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970WD.dwg - 4/16/2025 01:32PM



LEGEND

- EXISTING WETLAND
- EXISTING CONSERVATION EASEMENT
- PROPOSED WETLAND FILL
- REQUIRED WETLAND BUFFER
- PROPOSED WETLAND BUFFER

WETLAND SUMMARY

TOTAL PROPOSED WETLAND IMPACT AREA	10,514 SF (0.24 AC)
TOTAL PROPOSED WATERBODY CROSSING IMPACT	327 LF
REQUIRED BUFFER AREA	194,755 SF (4.47 AC)
PROPOSED BUFFER AREA	254,103 SF (5.83 AC)

NOTES

1. REQUIRED WETLAND BUFFER STRIPS PER CITY OF ROGERS IS 40 FEET AVERAGE WIDTH, 25 FEET MINIMUM FOR HIGH QUALITY WETLAND AND 10 FEET MINIMUM FOR ALL OTHER WETLANDS.
2. WETLANDS 1A, 3A AND 2B ARE CONSIDERED HIGH QUALITY.
3. WETLANDS 1A THRU 4A DELINEATED BY MIDWEST NATURAL RESOURCES, INC., REPORT DATED 6/27/2022.
4. WETLANDS 1B THRU 5B DELINEATED BY ANDERSON ENGINEERING OF MINNESOTA, REPORT DATED 11/10/2021.
5. BUFFER STRIPS WITHIN THE EXISTING CONSERVATION EASEMENT AREA EXCLUDED FROM THE CALCULATIONS.
6. REQUIRED BUFFER AREA EXCLUDES WETLAND 2A.

Know what's **below.** **Call** before you dig.

N

SCALE IN FEET
0 200 400 600
1 inch = 200 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date:_____ Reg.No._____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
WETLAND IMPACTS AND BUFFERS
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970WD
PROJECT NO.	23970
	7.1

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970WD.dwg - 4/16/2025 01:32PM

COWLEY LAKE PRESERVE

ROGERS, MN

STORMWATER MANGEMENT PLAN NARRATIVE AND SUMMARY

February 20, 2025
Revised April 16, 2025

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the state of Minnesota.

Signature: _____

Rick L. Osberg, PE
License No. 22709

Developer/Owner:

Rachel Development
4180 Napier Court NE
St. Michael, MN 55376

JAMES R. HILL, INC.
PLANNERS ENGINEERS SURVEYORS
Serving our Clients since 1976

2999 WEST COUNTY ROAD 42, SUITE 100
BURNSVILLE, MINNESOTA 55306
PH. (952) 890-6044 FAX (952) 890-6244

TABLE OF CONTENTS

I. Project Introduction
- A. Overview, land characteristics, special information
- B. Terrain and Soil Type
- C. Existing Drainage
- D. Receiving waters
- E. Impaired and special waters

II. Proposed Conditions and Design Development
- A. Description of proposed grading and terrain changes
- B. Description of collection system, basins, treatment methods

III. Modeling and Design Results
- A. Rate Control
- B. Volume Control (abstraction)
- C. Water Quality

IV. Conclusion

Attachments
1. Drainage Maps
2. Special Waters Search
3. HydroCAD Reports – Peak Elevations and flows
4. Cowley Lake Preserve – Design Impervious Surface Summary Worksheet
5. P8 Model Input and Results
6. Geotechnical Report
7. NRCS Soils Report
8. Storm Sewer Drainage Map
9. Storm Sewer Design Calculations

I. Project Introduction

A. Overview, land characteristics, special information

Cowley Lake Preserve is a proposed single-family shoreland PUD development. The project is located generally along the south shore of Cowley Lake, situated between the intersection of Territorial Road - Willandale Road (westerly limits) and the westerly terminus of 133rd Avenue North (easterly limits). The preliminary plat consists of three parcels, generally referred to as the Scherber parcel (west), the Casco parcel (central) and the Weber parcel (east). The three parcels comprise 89.0 acres.



FIGURE 1 – Site Proximity Map and Adjacent Landowners

All three parcels are used for agriculture and are tilled annually for growing crops. A gas main, operated by NuStar/Sunoco, diagonally bisects the Scherber property, running from east to west. The present and past land use is represented in Figures 2 and 3. Refer also to the Existing Conditions sheets of the Cowley Lake Preserve preliminary plat plans.



FIGURE 1 – 2024 Aerial image of site and vicinity – Hennepin County GIS



FIGURE 2 - 1957 Aerial image of site and vicinity – Hennepin County GIS

B. Existing Terrain and Soil Type

The existing terrain is gently rolling, generally ranging in elevation of 944 to 920. There are several mild depressions and drainage courses within the site. A wetland delineation was conducted and several wetlands were identified. Runoff from all portions of the site eventually discharge into Cowley Lake.

The on-site soils fall into classifications that are Hydrologic C and D type soils. The geotechnical investigation also indicates the presence of lean clay throughout the site. The on-site soils are prone to having low permeability and thus do not promote the practice of infiltration.

C. Existing Drainage

The drainage area for Cowley Lake is depicted in Figure 4. The site lies within the Elm Creek Watershed District boundary. Cowley Lake receives runoff from directly around itself and is also fed by a channel outlet from Whiteford Lake and a wetland complex located south of Territorial Road. The wetlands drain to a channel, leading to a 24-inch diameter culvert beneath Territorial Road, which discharges onto the Ende Property. A second 24-inch diameter culvert drains another tributary area, again beneath Territorial Road and toward the Ende property.

Additional runoff flows from south of 129th Avenue N./Tucker Road, into the large wetland on the Gilbert property, through a channel and to Cowley Lake.

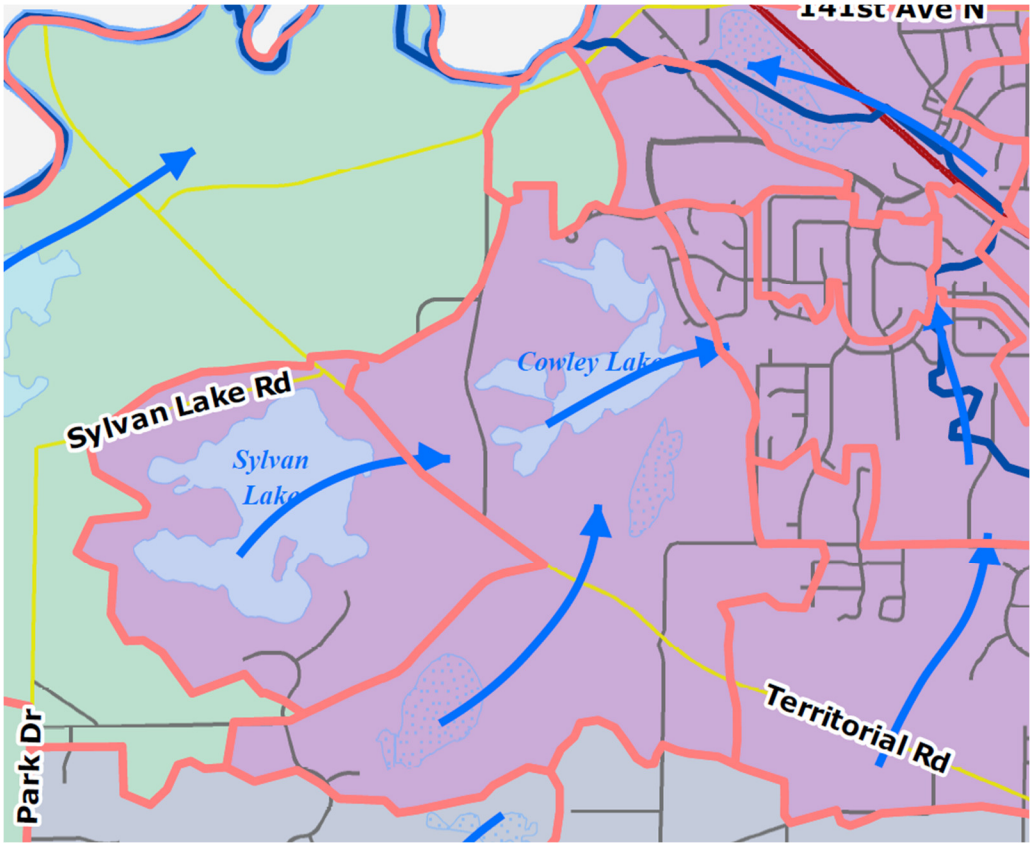


Figure 4 - Cowley Lake Drainage Boundary – from Figure 8.1, Rogers Comprehensive Plan

The low-lying area of the Ende and Schnurr properties receive the runoff from South of Territorial Road, as previously described. This area apparently is drained via a private draintile.

The privately installed draintile line was discovered within the project boundary, which crosses the easterly portion of the Scherber parcel, originating from the south on the Schnurr property and terminating in a drainage channel leading to Cowley Lake. From discussion with the adjacent landowners, it was learned that two tiles exist. At some point, the original tile line became compromised or damaged. A second line was installed, generally parallel to the original line. Based upon interviews with the land owners, it is believed the tile lines originate on the Ende property, continue through the wetland on the Schnurr property and continue across the Scherber property.

The outfalls of the draintile lines were located and surveyed. Another location further south was potholed and an invert was obtained. From the information gathered, it appears the draintile has an inverse grade, as the elevation at the pothole location was found to be approximately 0.4 feet lower than the elevation at the outfall. Despite the inverse grade, the tile line reportedly provides drawdown of the runoff that remains impounded on the Schnurr and Ende properties to a level deemed adequate.

The 1957 aerial photo in Figure 2 indicates a diagonal feature following the path of the draintile lines, suggesting some type of drainage feature existed at that time, whether buried or as a surface ditch. Figure 5 contains two photos portraying the current condition of the draintile outfall.



Figure 5 - Outfall of twin draintile lines – November 14, 2024

D. Receiving waters

The Cowley Lake outlet channel varies in elevation from 918.2 to 919.3. An existing 36-inch culvert located in the channel west of Edgewater Parkway was found partially submerged, having an invert of 917.5. At the location of the old Hawkins Drive, there is another 48-inch.

After leaving the project boundary, Cowley Lake discharges easterly through a series of channels, ponds and pipes, eventually discharging into the Crow River. See Figure 6.

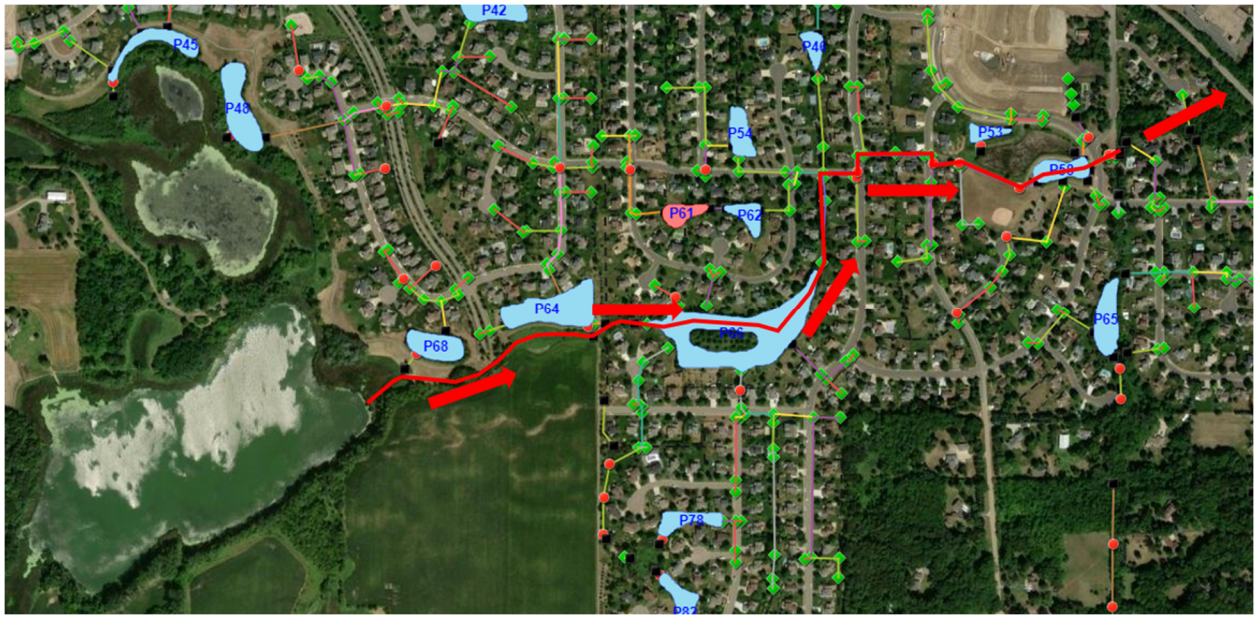


Figure 6 – Cowley Lake Outlet

E. Impaired and Special Waters

A search was conducted using the MPCA Construction Stormwater Special Waters Search tool. Three special waters were identified: Crow River, Cowley Lake and Sylvan Lake. However, no runoff from the project drains to Sylvan Lake. Specific construction and SWPPP requirements are listed in Attachment 2.

II. Proposed Conditions and Design Development

A. Description of proposed grading and terrain changes

The site will likely be mass-graded in two phases. Work will commence on the east side of the project, coinciding with the first addition final platting. The balance of the site will be graded in the second phase.
Final street grades are not anticipated to exceed four percent. Permanent slopes have a maximum slope of 4H:1V with slope distances rarely exceeding 50 feet. Proposed tree removal has been minimized. Proposed drainage patterns will remain consistent with existing drainage patterns.

B. Description of collection system, basins, treatment methods

Eight stormwater management basins are proposed. Three of the basins will incorporate filtration. Runoff received from offsite will generally be routed through the project, bypassing newly constructed ponds or filtration cells.

The two existing draintile lines extending from Schnurr property will be intercepted at a junction manhole, within Outlot D. From the junction manhole, a new draintile will be constructed on a new alignment, and will discharge at the same location and elevation as the existing tiles outlet. All existing draintile north of the junction will be removed. The junction manhole will not have any other incoming storm pipe connections other than the existing draintile.

Additionally, a secondary outlet will be connected to the junction manhole, but at a higher elevation, which will allow for runoff from larger storm events to enter the new storm sewer routed through Outlot D.

Storm sewer and draintile lines will be constructed within the rear yards of the lots in block 9, abutting the Schnurr property. Draintiles are to be connected to roof downspouts and sump pumps but will not collect surface runoff. The rear yard storm sewers will collect surface runoff, sump pumps and downspouts, reducing the fugitive flow into the Schnurr property.

The site design achieves the goal of maintaining pass-through drainage routes for runoff that flows into the site from offsite, together with the independent conveyance of the draintile flows.

III. Modeling and Design Results

A. Rate Control

The peak runoff rates for proposed conditions must not be greater than the existing peak rates for the site, per the meet City of Rogers requirements for the 2-yr, 10-yr and 100-yr rainfall events.

The peak flows are being analyzed at two points: Reach 1R is a discharge point at the northeast corner of the site at the Cowley Lake Outlet and Reach 2R is the central drainage channel, into which the draintile discharges. Reach 2R also receives the runoff from the more-than 300 acres south of Territorial Road.

In order to simulate an approximate flow of what may pass through the 24-inch culvert under Territorial Road, an approximate model of the offsite drainage area was included in the HydroCAD model. Given the capacity constraint of the 24-inch culvert, the flow from offsite is attenuated in the model to produce reasonable anticipated peak flows for the modeled storm events.

The HydroCAD modeling results demonstrate these criteria has been met and is summarized in the following table:

Storm Event	1R Ex. (cfs)	1R Prop. (cfs)	2R Ex. (cfs)	2R Prop (cfs)	FUGITIVE (cfs)
2-Year	39.59	11.02	111.83	62.32	1.51
10-Year	68.61	20.37	198.51	102.35	2.54
100-Year	128.35	65.25	387.66	184.21	4.71

The fugitive runoff shown in the above table represents a small drainage area that drains to the existing 133rd Avenue N. storm sewer system from the proposed condition and is considered negligible.

B. Volume Control (abstraction)

Unless impractical or unfeasible, new developments shall capture and retain on site 1.1 inches of runoff from net new impervious surfaces. Infiltration on this site is infeasible due to the presence of Hydrologic C & D soils. Therefore, the alternative of infiltration has been incorporated into the design. Furthermore, because the Residential Alternative Development Standards are being applied to the site design under the Shoreland Ordinance, the required abstraction volume must be increased by 55% (multiplied by 1.82). The COWLEY LAKE PRESERVE – DESIGN IMPERVIOUS SURFACE SUMMARY demonstrates the calculations, which are supported by the HydroCAD outputs. The Volume Control requirement has been met and is summarized below:

Computed Required Abstraction Volume	2.046 ac-ft
Required Volume multiplied by 1.82	*3.724 ac-ft*
Abstraction Volume Provided	4.328 ac-ft

C. Water Quality

New developments shall have no increase in TSS and TP. The P8 pollutant model was utilized to predict pre- and post-development TSS and TP. The modeling results indicate the proposed stormwater management system meets the requirement of no net increase. A summary of the overall computation is as follows:

	TSS	TP
Existing Condition	13,468 lb/yr	63.2 lb/yr
Proposed Condition	7,360 lb/yr	55.9 lb/yr

IV. Conclusion

The combined effect of the flow routing design and the construction of the eight stormwater management basins demonstrate the stormwater rate, volume and quality requirements of the City of Rogers are satisfied.

NOTES

1. SUBCATCHMENT 30S: REAR ROOF DRAINAGE FROM LOTS 11–23, BLOCK 9 WILL BE COLLECTED BY STORM SEWER. LOTS 5–7, BLOCK 7 AND LOTS 1–2, BLOCK 8 REAR ROOFS, FOR AN ESTIMATED TOTAL OF 9,550 SF (0.22 AC) IMPERVIOUS, ARE PROPOSED TO RUNOFF DIRECTLY TO ADJACENT LAND.

LEGEND

1P — POND AREA

1R — REACH

1S — DRAINAGE AREA (TOTAL DRAINAGE AREA / IMPERVIOUS AREA)

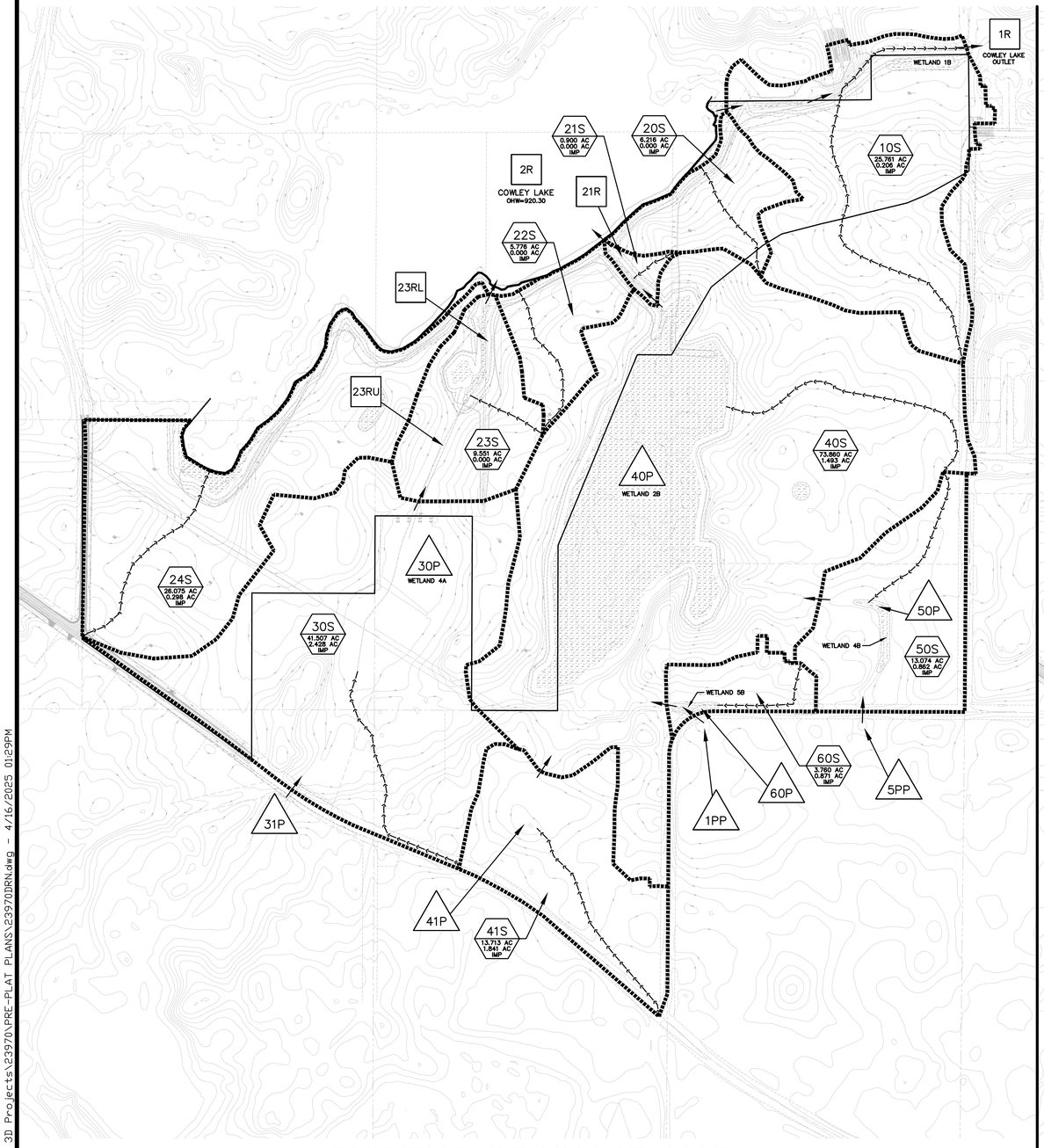
FLOW DIRECTION

ToC PATH

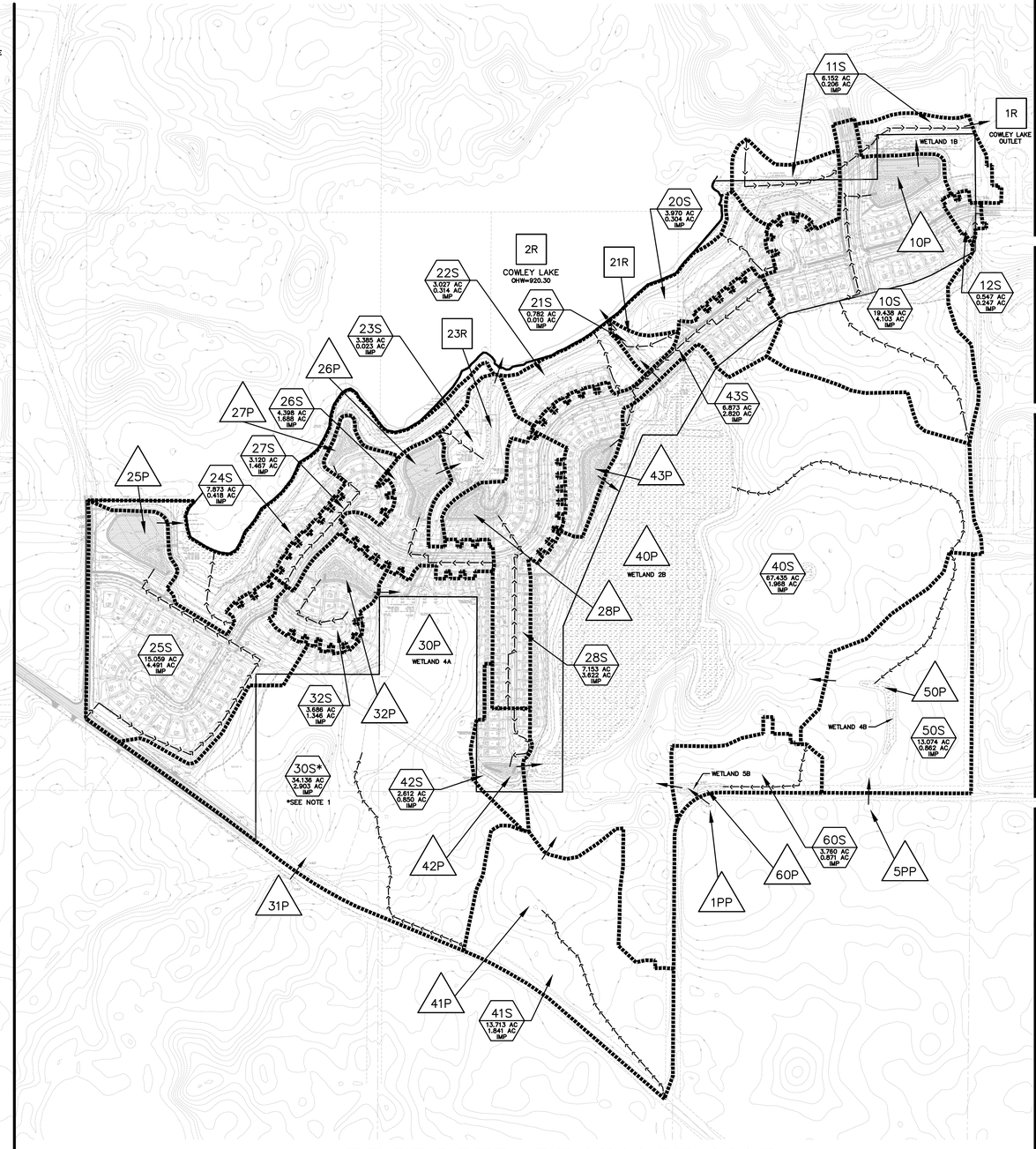
DRAINAGE BOUNDARY

SCALE IN FEET
0 300 600 900
1 inch = 300 feet

N



EXISTING DRAINAGE MAP



PROPOSED DRAINAGE MAP

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Date: _____ Reg.No. _____

PRELIMINARY

COWLEY LAKE PRESERVE

ROGERS, MINNESOTA

DRAINAGE MAPS

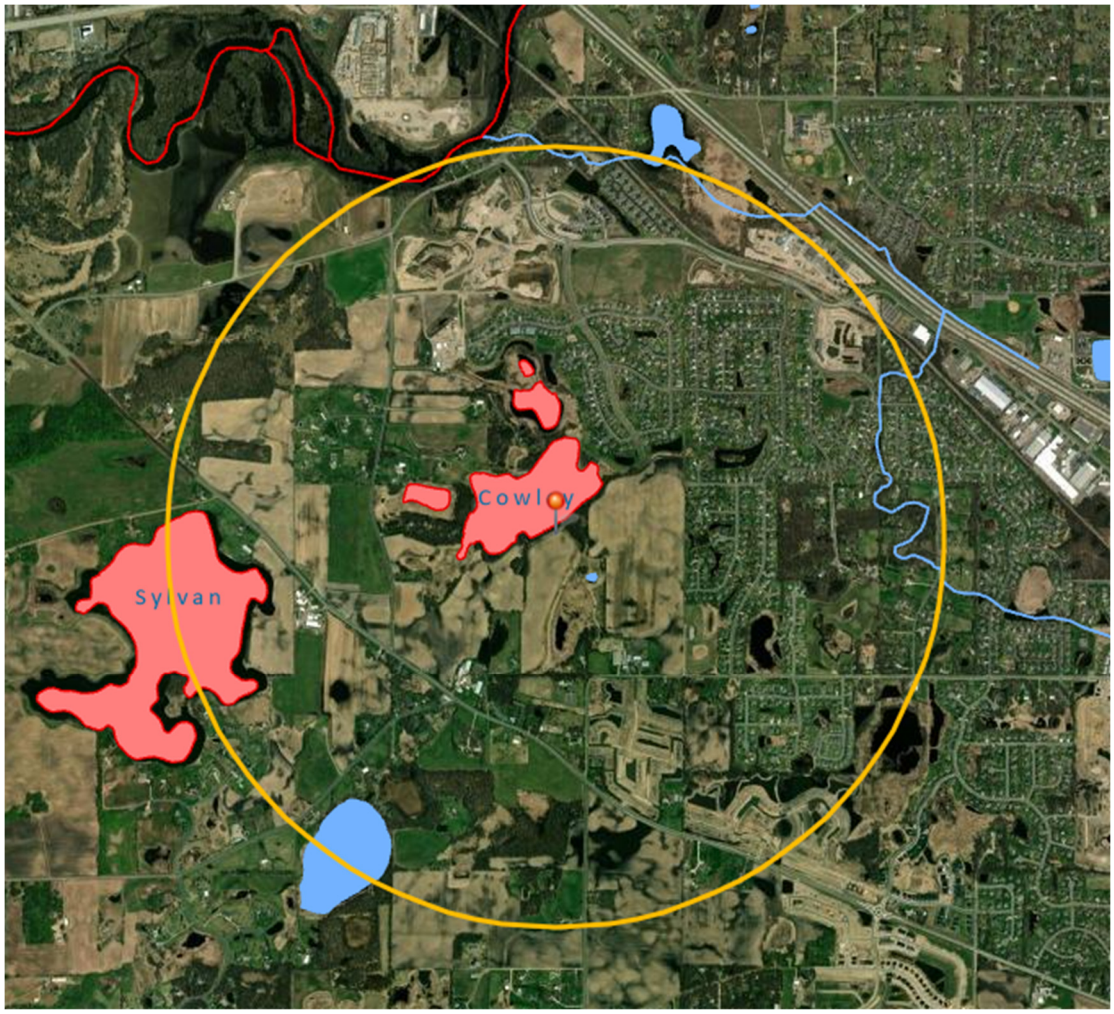
FOR

RACHEL DEVELOPMENT

4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	JSO
DATE	02/24/2025
REVISIONS	
03/19/2025 MPCA REVIEW SUBMITTAL	
04/04/2025 PARTIAL CITY COMMENTS	
04/15/2025 WATERSHED COMMENTS	
CAD FILE	23970DRN
PROJECT NO.	23970
	3.5

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970DRN.dwg - 4/16/2025 01:29PM



Crow River

This river segment has an EPA-approved impairment for: Benthic macroinvertebrates bioassessments; Fecal coliform; Fish bioassessments; Mercury in fish tissue; Nutrients; Turbidity.

These impairment(s) are considered to be construction related parameters and require the additional best management practices (BMPs) found in items 23.9 and 23.10 of the permit if the project has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired stream.

23.9:

Permittees must immediately initiate stabilization of exposed soil areas, as described in item 8.4, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the site temporarily or permanently ceases.

23.10:

Permittees must provide a temporary sediment basin as described in Section 14 for common drainage locations that serve an area with five (5) or more acres disturbed at one time.

Also, a mandatory Stormwater Pollution Prevention Plan (SWPPP) review is required by the MPCA if the project will disturb over 50 acres and has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired water. Owners must submit the application for coverage and the Storm Water Pollution Prevention Plan at least 30-days before the construction start date. The SWPPP can be attached electronically when using the online application.

Cowley Lake

This lake has an EPA-approved impairment for: Nutrients.

These impairment(s) are considered to be construction related parameters and require the additional best management practices (BMPs) found in items 23.9 and 23.10 of the permit if the project has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired water.

23.9:

Permittees must immediately initiate stabilization of exposed soil areas, as described in item 8.4, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the site temporarily or permanently ceases.

23.10:

Permittees must provide a temporary sediment basin as described in Section 14 for common drainage locations that serve an area with five (5) or more acres disturbed at one time.

Also, a mandatory Stormwater Pollution Prevention Plan (SWPPP) review is required by the MPCA if the project will disturb over 50 acres and has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired water. Owners must submit the application for coverage and the SWPPP at least 30-days before the construction start date. The SWPPP can be attached electronically when using the online application.

Sylvan Lake

This lake has an EPA-approved impairment for: Nutrients.

These impairment(s) are considered to be construction related parameters and require the additional best management practices (BMPs) found in items 23.9 and 23.10 of the permit if the project has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired water.

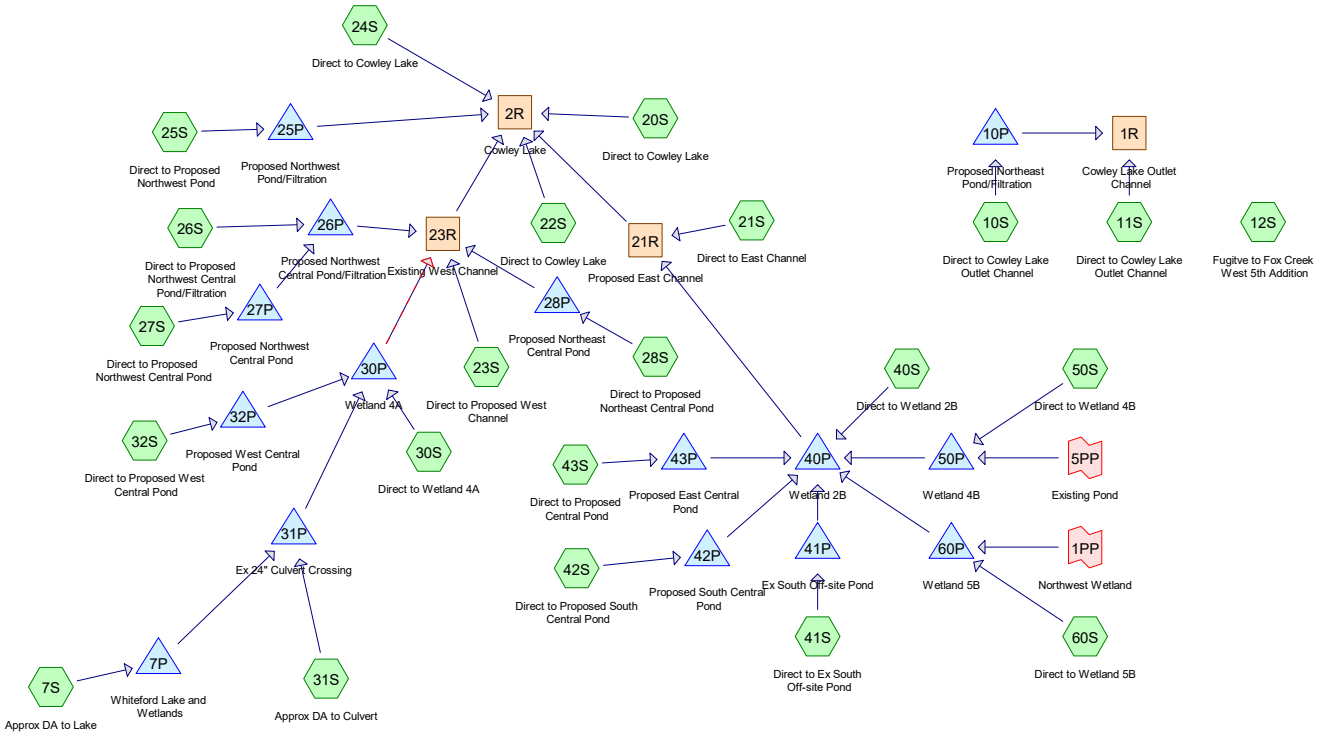
23.9:

Permittees must immediately initiate stabilization of exposed soil areas, as described in item 8.4, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the site temporarily or permanently ceases.

23.10:

Permittees must provide a temporary sediment basin as described in Section 14 for common drainage locations that serve an area with five (5) or more acres disturbed at one time.

Also, a mandatory Stormwater Pollution Prevention Plan (SWPPP) review is required by the MPCA if the project will disturb over 50 acres and has a discharge point on the project within 1 mile (aerial radius measurement) of, and flows to the impaired water. Owners must submit the application for coverage and the SWPPP at least 30-days before the construction start date. The SWPPP can be attached electronically when using the online application.



Subcat Reach Pond Link

Routing Diagram for COWLEY LAKE PRESERVE - PROPOSED Rev 1
Prepared by James R. Hill, Inc., Printed 4/16/2025
HydroCAD® 10.00-25 s/n 00744 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
20.000	77	2 acre lots, 12% imp, HSG C (31S)
71.456	80	>75% Grass cover, Good, HSG D (10S, 11S, 12S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 30S, 32S, 40S, 41S, 42S, 43S, 50S, 60S)
2.902	96	Gravel surface, HSG D (25S, 30S, 40S, 41S, 50S, 60S)
22.912	78	Meadow, non-grazed, HSG D (10S, 11S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 32S, 40S, 41S, 42S, 43S)
2.775	89	Pasture/grassland/range, Poor, HSG D (30S, 40S, 50S)
4.074	98	Paved parking, HSG D (10S, 12S, 25S, 26S, 27S, 28S, 32S, 42S, 43S)
6.670	98	Paved roads w/curbs & sewers, HSG D (10S, 12S, 25S, 26S, 27S, 28S, 32S, 42S, 43S)
2.509	98	Roofs, HSG D (10S, 12S, 25S, 26S, 27S, 28S, 32S, 42S, 43S)
51.253	89	Row crops, straight row, Good, HSG D (10S, 25S, 30S, 40S, 43S, 50S)
6.931	98	Unconnected pavement, HSG D (10S, 11S, 12S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 30S, 32S, 40S, 41S, 42S, 43S, 50S, 60S)
10.168	98	Unconnected roofs, HSG D (10S, 11S, 12S, 20S, 22S, 24S, 25S, 26S, 27S, 28S, 30S, 32S, 40S, 41S, 42S, 43S, 50S, 60S)
23.478	98	Water Surface, 0% imp, HSG D (10S, 11S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 32S, 40S, 41S, 42S, 43S, 50S, 60S)
15.065	77	Woods, Good, HSG D (11S, 20S, 21S, 22S, 23S, 24S, 28S, 30S, 40S, 42S, 60S)
300.000	72	Woods/grass comb., Good, HSG C (7S)
540.193	**78**	**TOTAL AREA**

Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth=0.73"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min CN=72/0 Runoff=185.67 cfs 18.153 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=19.438 ac 21.11% Impervious Runoff Depth=1.77"
Flow Length=1,602' Tc=23.6 min CN=86/98 Runoff=34.17 cfs 2.871 af

Subcatchment 11S: Direct to Cowley Lake Runoff Area=6.152 ac 3.35% Impervious Runoff Depth=1.38"
Flow Length=1,308' Tc=15.2 min CN=83/98 Runoff=10.71 cfs 0.706 af

Subcatchment 12S: Fugitve to Fox Creek Runoff Area=0.547 ac 45.16% Impervious Runoff Depth=1.82"
Flow Length=165' Tc=8.1 min CN=80/98 Runoff=1.51 cfs 0.083 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=3.970 ac 7.66% Impervious Runoff Depth=1.21"
Flow Length=310' Tc=10.9 min CN=79/98 Runoff=6.85 cfs 0.399 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.782 ac 1.28% Impervious Runoff Depth=1.11"
Flow Length=392' Tc=17.3 min CN=79/98 Runoff=1.02 cfs 0.072 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=3.027 ac 10.37% Impervious Runoff Depth=1.25"
Flow Length=309' Tc=17.0 min CN=79/98 Runoff=4.39 cfs 0.315 af

Subcatchment 23S: Direct to Proposed Runoff Area=3.385 ac 0.68% Impervious Runoff Depth=1.22"
Flow Length=243' Tc=13.3 min CN=81/98 Runoff=5.55 cfs 0.343 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=7.873 ac 5.31% Impervious Runoff Depth=1.28"
Flow Length=407' Tc=11.1 min CN=81/98 Runoff=14.54 cfs 0.841 af

Subcatchment 25S: Direct to Proposed Runoff Area=15.059 ac 29.82% Impervious Runoff Depth=1.63"
Flow Length=1,817' Tc=17.1 min CN=81/98 Runoff=27.99 cfs 2.047 af

Subcatchment 26S: Direct to Proposed Runoff Area=4.398 ac 38.38% Impervious Runoff Depth=1.75"
Flow Length=621' Tc=8.6 min CN=81/98 Runoff=11.60 cfs 0.642 af

Subcatchment 27S: Direct to Proposed Runoff Area=3.120 ac 47.02% Impervious Runoff Depth=1.94"
Flow Length=621' Tc=8.6 min CN=83/98 Runoff=9.07 cfs 0.505 af

Subcatchment 28S: Direct to Proposed Runoff Area=7.153 ac 50.64% Impervious Runoff Depth=1.96"
Flow Length=1,013' Tc=14.4 min CN=82/98 Runoff=17.02 cfs 1.167 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=34.136 ac 8.50% Impervious Runoff Depth=1.39"
Flow Length=1,249' Tc=23.4 min CN=82/98 Runoff=47.41 cfs 3.941 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth=1.04"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min CN=74/98 Runoff=14.22 cfs 1.729 af

Subcatchment 32S: Direct to Proposed Runoff Area=3.686 ac 36.52% Impervious Runoff Depth=1.81"
Flow Length=440' Slope=0.0200 '/' Tc=7.1 min CN=83/98 Runoff=10.74 cfs 0.555 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=67.435 ac 2.92% Impervious Runoff Depth=1.72"
Flow Length=1,354' Tc=23.6 min CN=88/98 Runoff=118.16 cfs 9.674 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=1.35"
Flow Length=1,032' Tc=10.2 min CN=80/98 Runoff=26.82 cfs 1.537 af

Subcatchment 42S: Direct to Proposed Runoff Area=2.612 ac 32.54% Impervious Runoff Depth=1.63"
Flow Length=422' Tc=10.2 min CN=80/98 Runoff=5.99 cfs 0.354 af

Subcatchment 43S: Direct to Proposed Runoff Area=6.873 ac 41.00% Impervious Runoff Depth=1.83"
Flow Length=1,173' Tc=14.8 min CN=82/98 Runoff=15.17 cfs 1.046 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth=1.68"
Flow Length=734' Tc=26.4 min CN=87/98 Runoff=20.94 cfs 1.835 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=1.58"
Flow Length=531' Tc=5.6 min CN=82/98 Runoff=10.21 cfs 0.496 af

Reach 1R: Cowley Lake Outlet Channel Inflow=11.02 cfs 3.577 af
Outflow=11.02 cfs 3.577 af

Reach 2R: Cowley Lake Inflow=62.32 cfs 28.667 af
Outflow=62.32 cfs 28.667 af

Reach 21R: Proposed East Channel Avg. Flow Depth=0.75' Max Vel=4.82 fps Inflow=19.13 cfs 16.186 af
n=0.022 L=264.0' S=0.0125 '/' Capacity=149.23 cfs Outflow=19.13 cfs 16.186 af

Reach 23R: Existing West Channel Avg. Flow Depth=1.00' Max Vel=3.23 fps Inflow=32.28 cfs 8.880 af
n=0.022 L=251.0' S=0.0037 '/' Capacity=321.50 cfs Outflow=32.22 cfs 8.880 af

Pond 7P: Whiteford Lake and Wetlands Peak Elev=930.30' Storage=18.153 af Inflow=185.67 cfs 18.153 af
Outflow=0.00 cfs 0.000 af

Pond 10P: Proposed Northeast Peak Elev=922.35' Storage=4.697 af Inflow=34.17 cfs 2.871 af
Outflow=4.30 cfs 2.871 af

Pond 25P: Proposed Northwest Peak Elev=926.22' Storage=2.622 af Inflow=27.99 cfs 2.047 af
Outflow=0.54 cfs 2.047 af

Pond 26P: Proposed Northwest Central Peak Elev=924.81' Storage=1.573 af Inflow=12.53 cfs 1.145 af
Outflow=0.37 cfs 1.145 af

Pond 27P: Proposed Northwest Central Peak Elev=925.29' Storage=0.996 af Inflow=9.07 cfs 0.505 af
Outflow=1.70 cfs 0.502 af

Pond 28P: Proposed Northeast Central Peak Elev=922.71' Storage=1.359 af Inflow=17.02 cfs 1.167 af
Outflow=9.47 cfs 1.167 af

Pond 30P: Wetland 4A Peak Elev=925.77' Storage=1.671 af Inflow=61.25 cfs 6.225 af
Primary=16.70 cfs 4.022 af Secondary=3.04 cfs 2.203 af Outflow=19.74 cfs 6.225 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=932.25' Storage=0.018 af Inflow=14.22 cfs 1.729 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=13.72 cfs 1.729 af

Pond 32P: Proposed West Central Pond Peak Elev=928.42' Storage=1.393 af Inflow=10.74 cfs 0.555 af
Outflow=4.39 cfs 0.555 af

Pond 40P: Wetland 2B Peak Elev=925.13' Storage=6.361 af Inflow=129.76 cfs 16.114 af
60.0" x 36.0" Box Culvert n=0.013 L=138.0' S=0.0029 '/' Outflow=19.04 cfs 16.114 af

Pond 41P: Ex South Off-site Pond Peak Elev=939.36' Storage=1.537 af Inflow=26.82 cfs 1.537 af
Outflow=0.00 cfs 0.000 af

Pond 42P: Proposed South Central Pond Peak Elev=929.23' Storage=0.445 af Inflow=5.99 cfs 0.354 af
Outflow=2.17 cfs 0.354 af

Pond 43P: Proposed East Central Pond Peak Elev=927.51' Storage=1.806 af Inflow=15.17 cfs 1.046 af
Outflow=4.30 cfs 1.044 af

Pond 50P: Wetland 4B Peak Elev=940.27' Storage=94,258 cf Inflow=21.86 cfs 2.164 af
Outflow=0.00 cfs 0.000 af

Pond 60P: Wetland 5B Peak Elev=938.67' Storage=11,075 cf Inflow=12.04 cfs 5.255 af
Outflow=7.32 cfs 5.041 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=5.22 cfs 4.759 af
Primary=5.22 cfs 4.759 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=1.61 cfs 0.329 af
Area= 26.390 ac 15.63% Imperv. Primary=1.61 cfs 0.329 af

Total Runoff Area = 540.193 ac Runoff Volume = 49.313 af Average Runoff Depth = 1.10"
93.94% Pervious = 507.441 ac 6.06% Impervious = 32.752 ac

Summary for Subcatchment 7S: Approx DA to Lake

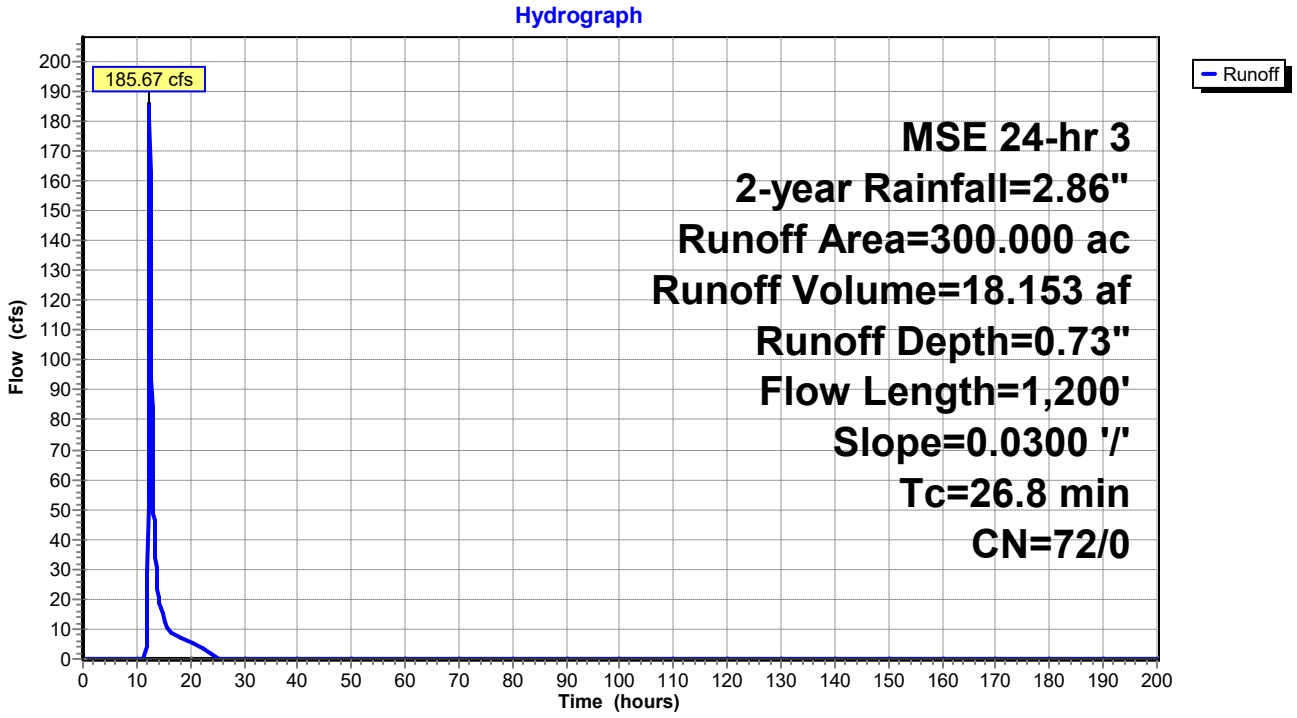
Runoff = 185.67 cfs @ 12.43 hrs, Volume= 18.153 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
300.000	72	Woods/grass comb., Good, HSG C
300.000	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

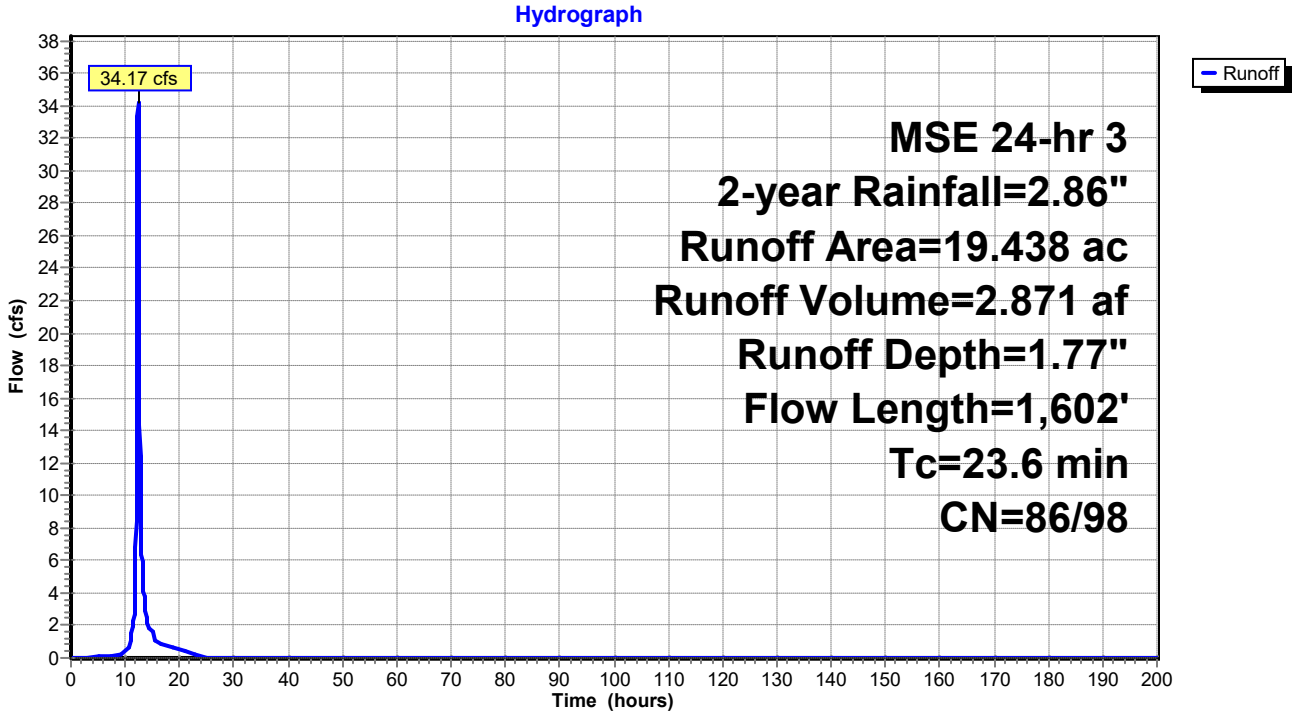
Runoff = 34.17 cfs @ 12.34 hrs, Volume= 2.871 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.399	98	Unconnected pavement, HSG D
1.088	98	Unconnected roofs, HSG D
1.617	98	Paved roads w/curbs & sewers, HSG D
0.606	98	Paved parking, HSG D
0.393	98	Roofs, HSG D
0.699	98	Water Surface, 0% imp, HSG D
8.527	89	Row crops, straight row, Good, HSG D
4.972	80	>75% Grass cover, Good, HSG D
1.137	78	Meadow, non-grazed, HSG D
19.438	88	Weighted Average
15.335	86	78.89% Pervious Area
4.103	98	21.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
14.6	842	0.0114	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.7	660		3.00		**Direct Entry, Pipe flow @ 3 fps**
23.6	1,602	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 11S: Direct to Cowley Lake Outlet Channel

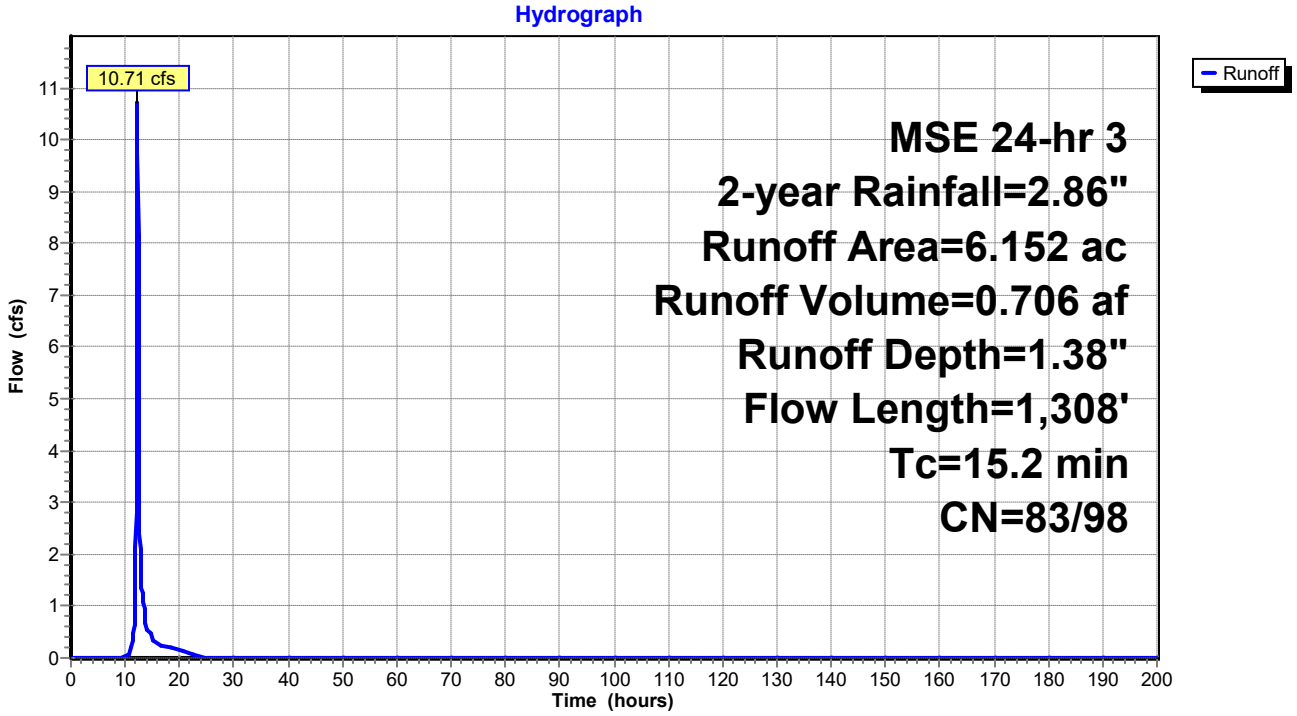
Runoff = 10.71 cfs @ 12.24 hrs, Volume= 0.706 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.024	98	Unconnected pavement, HSG D
0.182	98	Unconnected roofs, HSG D
1.316	98	Water Surface, 0% imp, HSG D
1.199	80	>75% Grass cover, Good, HSG D
2.901	78	Meadow, non-grazed, HSG D
0.530	77	Woods, Good, HSG D
6.152	83	Weighted Average
5.946	83	96.65% Pervious Area
0.206	98	3.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.8	114	0.0263	2.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	1,094	0.0024	3.27	46.64	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=1.50' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
15.2	1,308	Total			

Subcatchment 11S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 12S: Fugitve to Fox Creek West 5th Addition

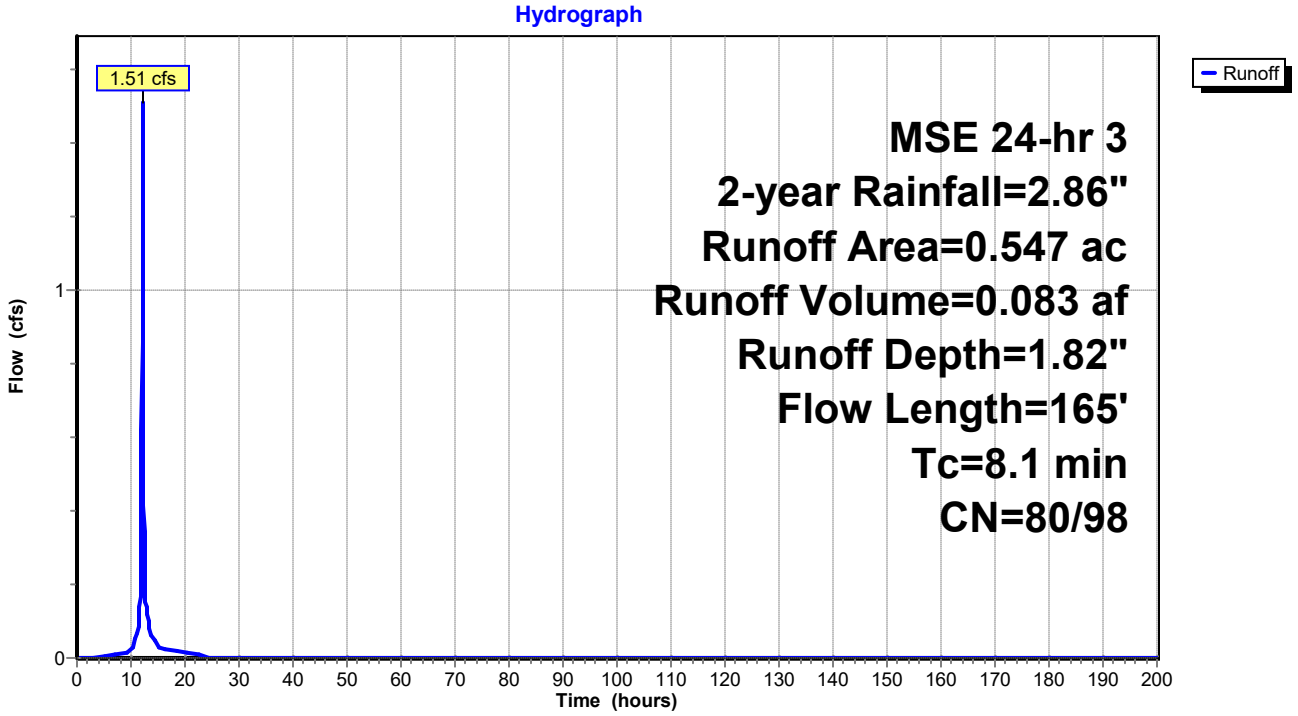
Runoff = 1.51 cfs @ 12.15 hrs, Volume= 0.083 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.015	98	Unconnected pavement, HSG D
0.043	98	Unconnected roofs, HSG D
0.104	98	Paved roads w/curbs & sewers, HSG D
0.051	98	Paved parking, HSG D
0.034	98	Roofs, HSG D
0.300	80	>75% Grass cover, Good, HSG D
0.547	88	Weighted Average
0.300	80	54.84% Pervious Area
0.247	98	45.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0440	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.3	40	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	25	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	165	Total			

Subcatchment 12S: Fugitve to Fox Creek West 5th Addition



Summary for Subcatchment 20S: Direct to Cowley Lake

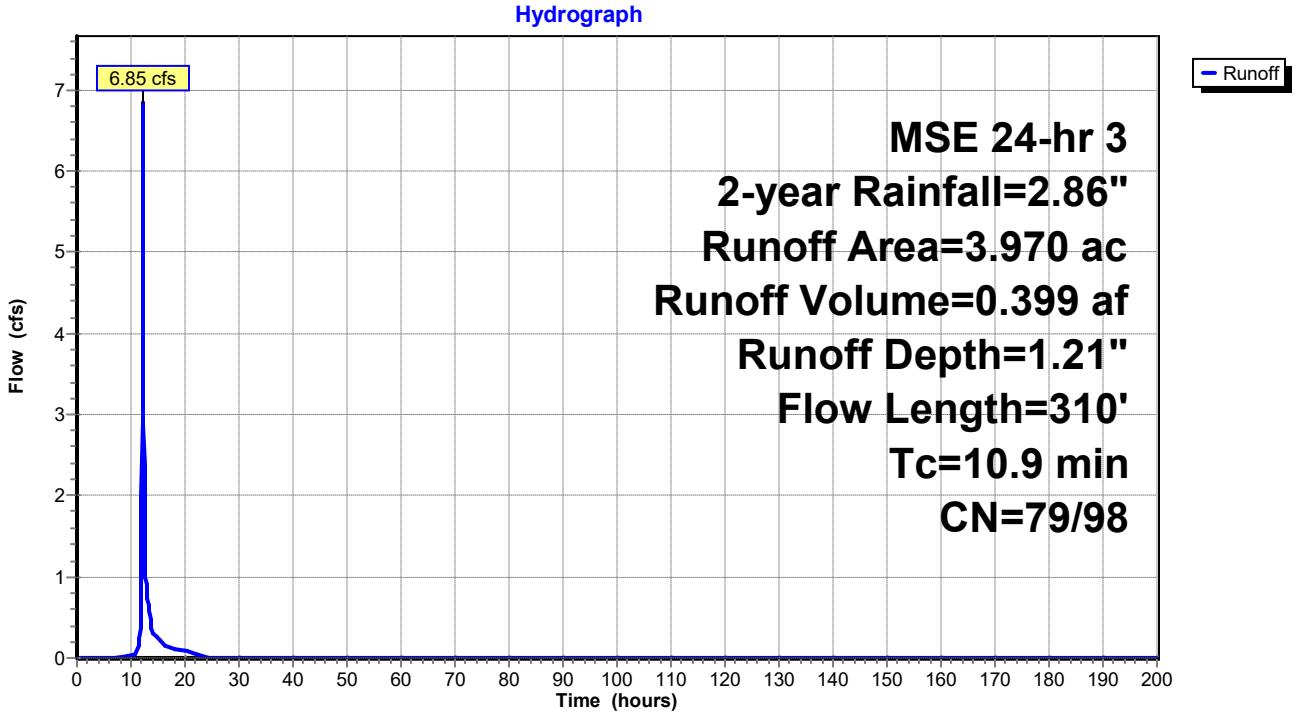
Runoff = 6.85 cfs @ 12.19 hrs, Volume= 0.399 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.046	98	Unconnected pavement, HSG D
0.258	98	Unconnected roofs, HSG D
0.122	98	Water Surface, 0% imp, HSG D
0.949	80	>75% Grass cover, Good, HSG D
1.018	78	Meadow, non-grazed, HSG D
1.577	77	Woods, Good, HSG D
3.970	80	Weighted Average
3.666	79	92.34% Pervious Area
0.304	98	7.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0270	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	72	0.0347	2.79		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.3	138	0.0667	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	310	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

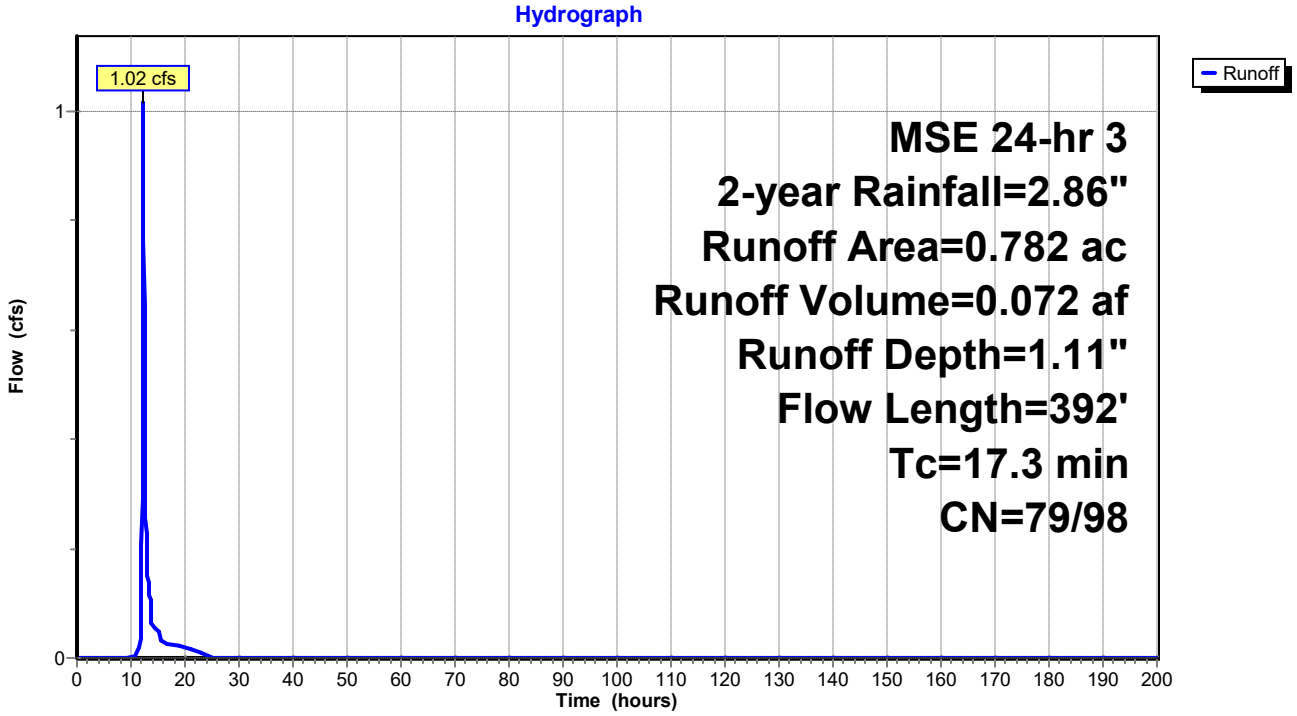
Runoff = 1.02 cfs @ 12.27 hrs, Volume= 0.072 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.010	98	Unconnected pavement, HSG D
0.054	98	Water Surface, 0% imp, HSG D
0.016	80	>75% Grass cover, Good, HSG D
0.162	78	Meadow, non-grazed, HSG D
0.540	77	Woods, Good, HSG D
0.782	79	Weighted Average
0.772	79	98.72% Pervious Area
0.010	98	1.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.8	100	0.0590	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.3	146	0.0452	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	146	0.0164	10.55	221.46	**Channel Flow,** Area= 21.0 sf Perim= 15.6' r= 1.35' n= 0.022 Earth, clean & straight
17.3	392	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

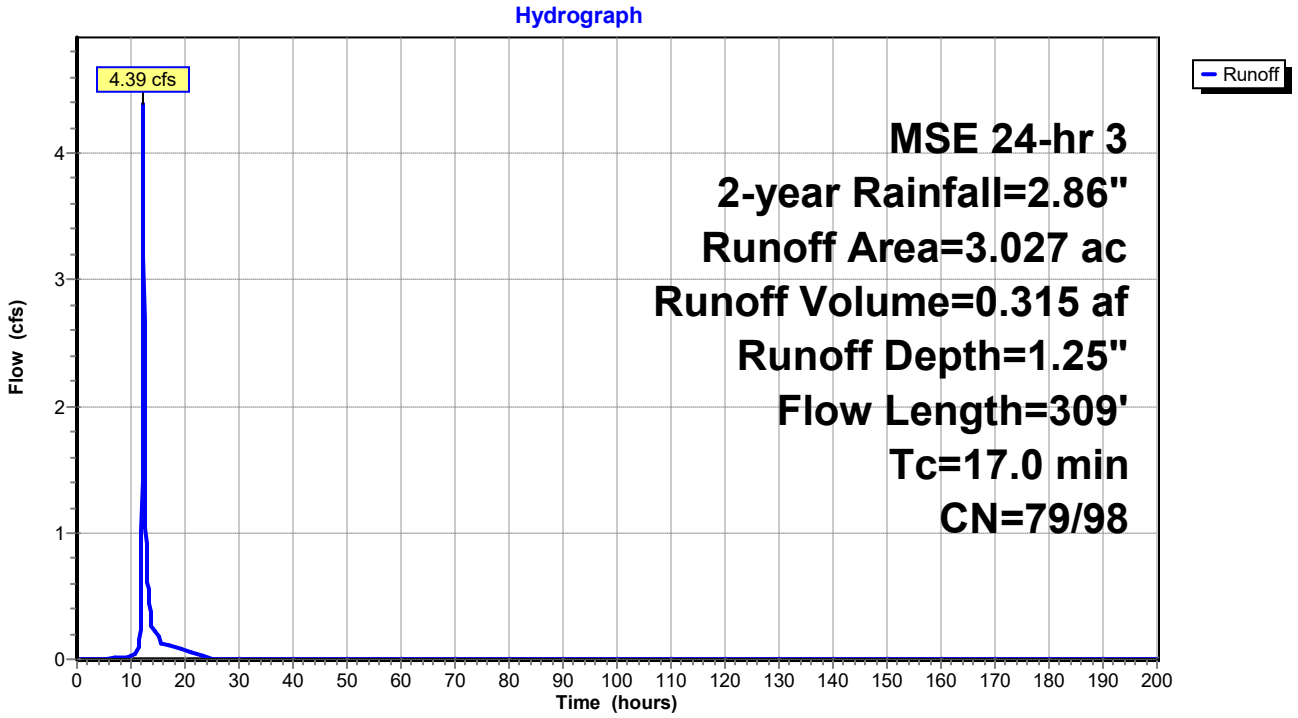
Runoff = 4.39 cfs @ 12.27 hrs, Volume= 0.315 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.125	98	Unconnected pavement, HSG D
0.189	98	Unconnected roofs, HSG D
0.031	98	Water Surface, 0% imp, HSG D
0.779	80	>75% Grass cover, Good, HSG D
1.348	78	Meadow, non-grazed, HSG D
0.555	77	Woods, Good, HSG D
3.027	81	Weighted Average
2.713	79	89.63% Pervious Area
0.314	98	10.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0220	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
2.4	209	0.0445	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.0	309	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Proposed West Channel

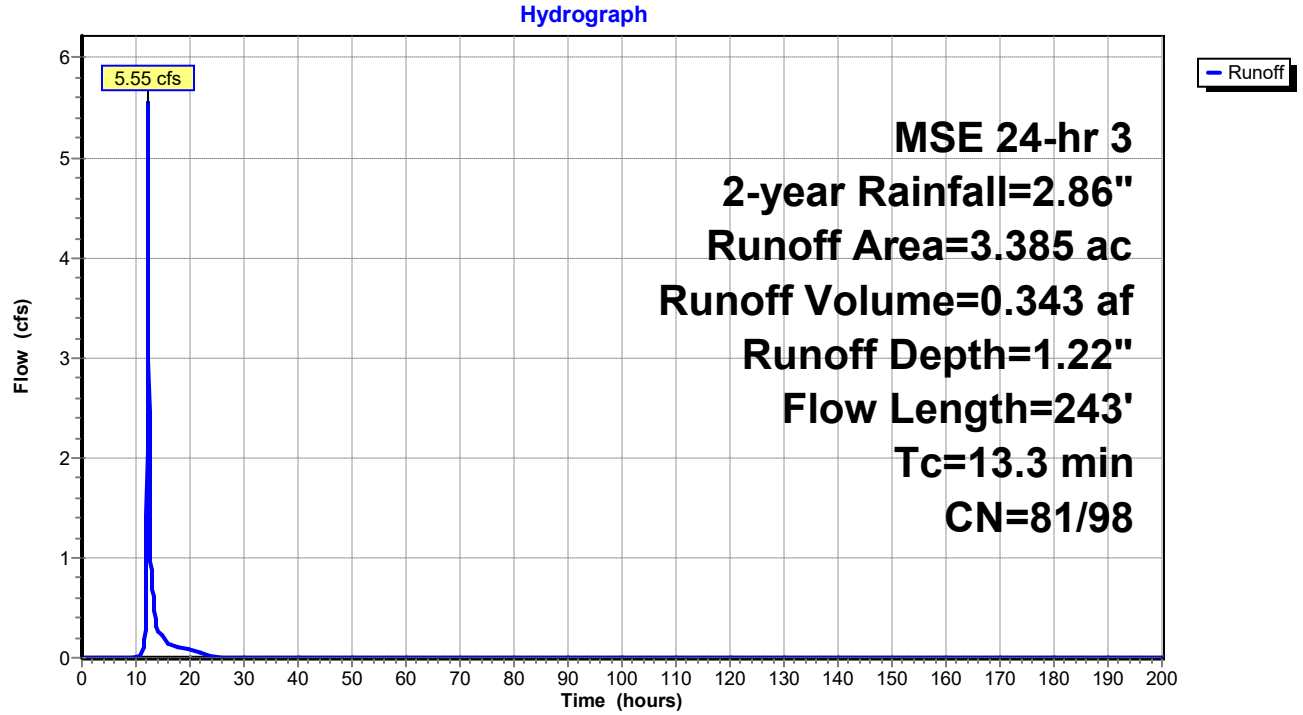
Runoff = 5.55 cfs @ 12.22 hrs, Volume= 0.343 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.023	98	Unconnected pavement, HSG D
0.467	98	Water Surface, 0% imp, HSG D
0.253	80	>75% Grass cover, Good, HSG D
1.225	78	Meadow, non-grazed, HSG D
1.417	77	Woods, Good, HSG D
3.385	81	Weighted Average
3.362	81	99.32% Pervious Area
0.023	98	0.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0520	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
3.0	143	0.0259	0.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	243	Total			

Subcatchment 23S: Direct to Proposed West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

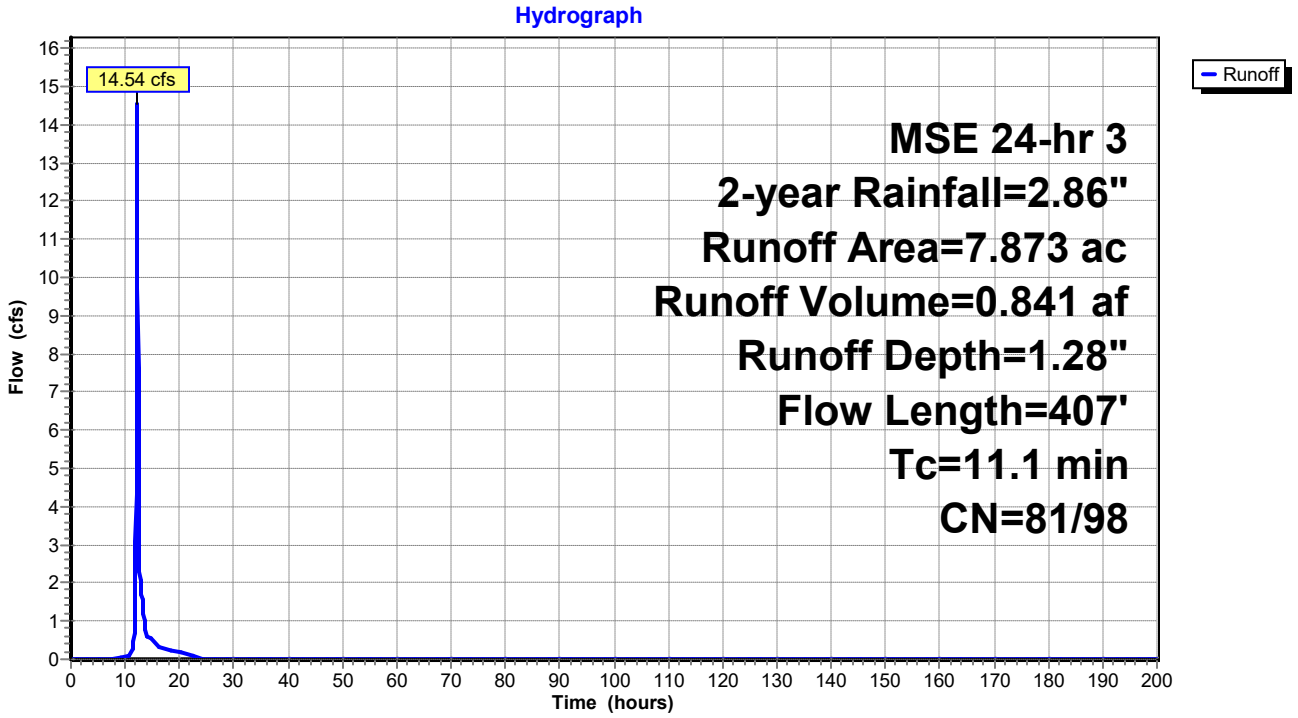
Runoff = 14.54 cfs @ 12.20 hrs, Volume= 0.841 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.039	98	Unconnected pavement, HSG D
0.379	98	Unconnected roofs, HSG D
0.980	98	Water Surface, 0% imp, HSG D
1.643	80	>75% Grass cover, Good, HSG D
2.538	78	Meadow, non-grazed, HSG D
2.294	77	Woods, Good, HSG D
7.873	82	Weighted Average
7.455	81	94.69% Pervious Area
0.418	98	5.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0600	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
4.4	307	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	407	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 25S: Direct to Proposed Northwest Pond

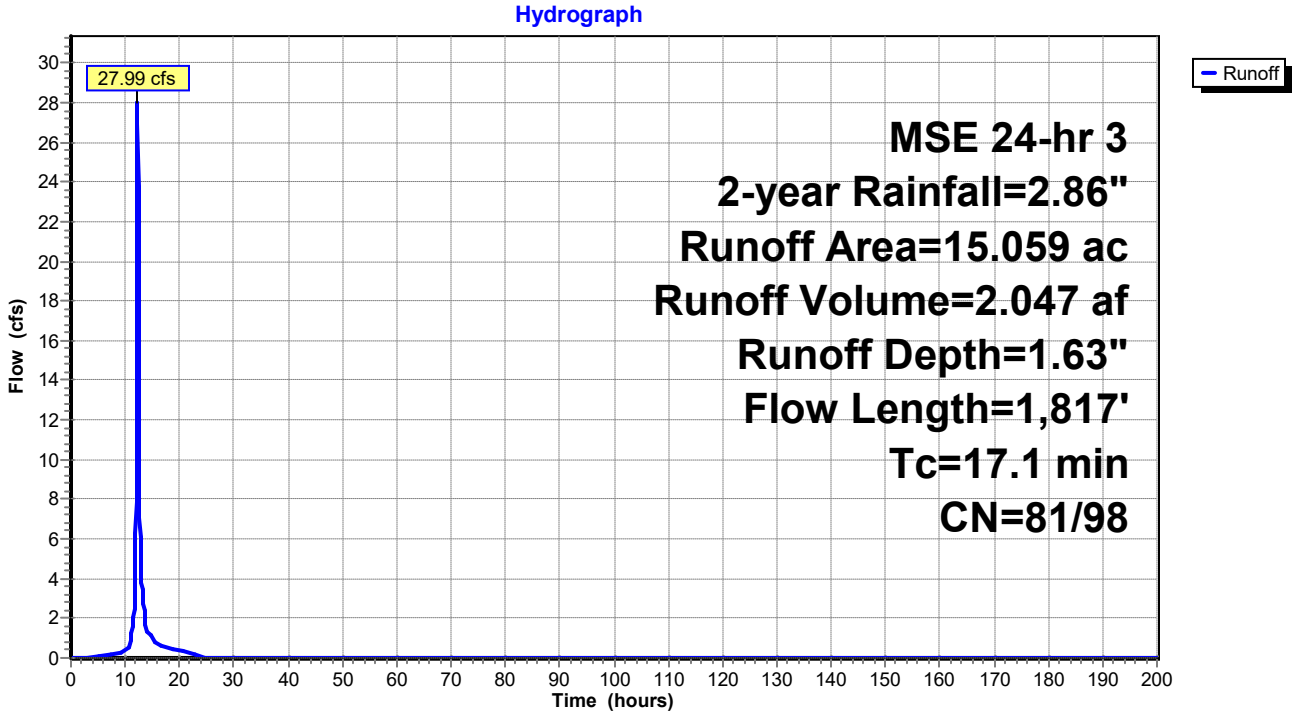
Runoff = 27.99 cfs @ 12.26 hrs, Volume= 2.047 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.652	98	Unconnected pavement, HSG D
1.214	98	Unconnected roofs, HSG D
1.443	98	Paved roads w/curbs & sewers, HSG D
0.758	98	Paved parking, HSG D
0.424	98	Roofs, HSG D
0.322	98	Water Surface, 0% imp, HSG D
0.084	96	Gravel surface, HSG D
0.179	89	Row crops, straight row, Good, HSG D
8.582	80	>75% Grass cover, Good, HSG D
1.401	78	Meadow, non-grazed, HSG D
15.059	86	Weighted Average
10.568	81	70.18% Pervious Area
4.491	98	29.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	90	0.0378	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	57	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.3	1,670		3.00		**Direct Entry, Pipe flow @ 3 fps**
17.1	1,817	Total			

Subcatchment 25S: Direct to Proposed Northwest Pond



Summary for Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration

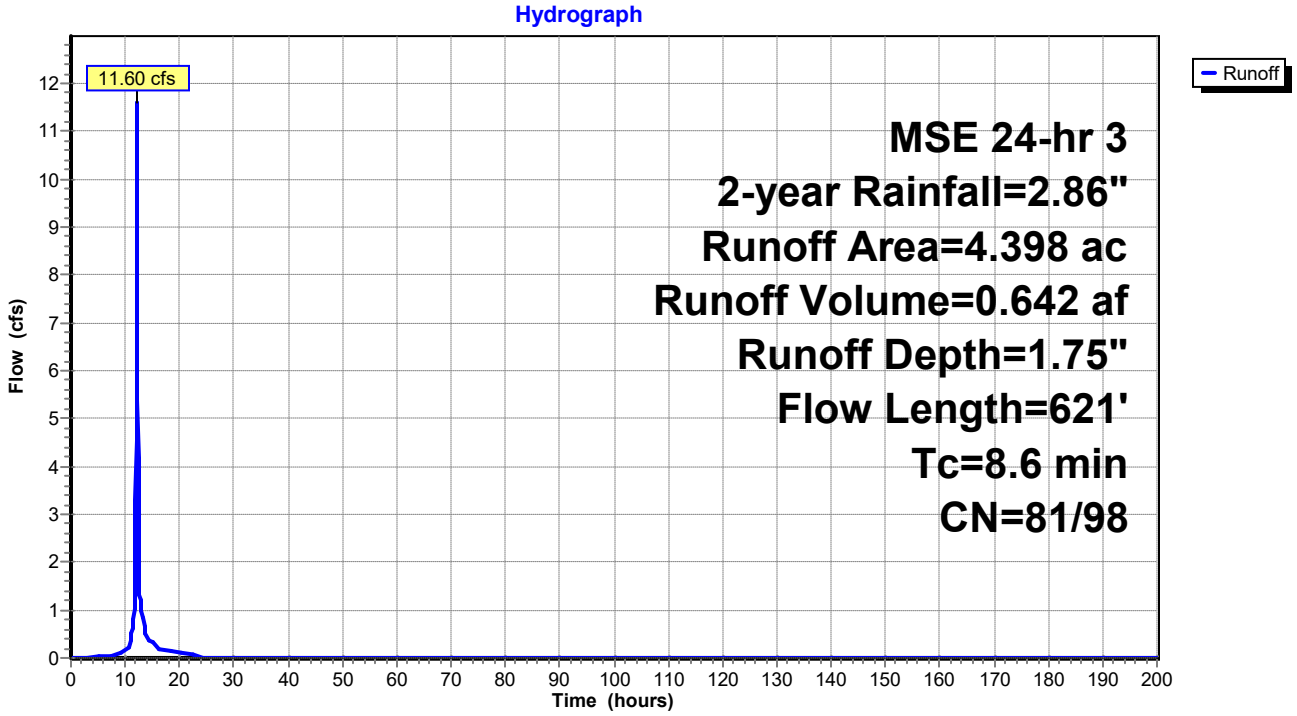
Runoff = 11.60 cfs @ 12.16 hrs, Volume= 0.642 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.170	98	Unconnected pavement, HSG D
0.393	98	Unconnected roofs, HSG D
0.551	98	Paved roads w/curbs & sewers, HSG D
0.354	98	Paved parking, HSG D
0.220	98	Roofs, HSG D
0.318	98	Water Surface, 0% imp, HSG D
1.487	80	>75% Grass cover, Good, HSG D
0.905	78	Meadow, non-grazed, HSG D
4.398	88	Weighted Average
2.710	81	61.62% Pervious Area
1.688	98	38.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration



Summary for Subcatchment 27S: Direct to Proposed Northwest Central Pond

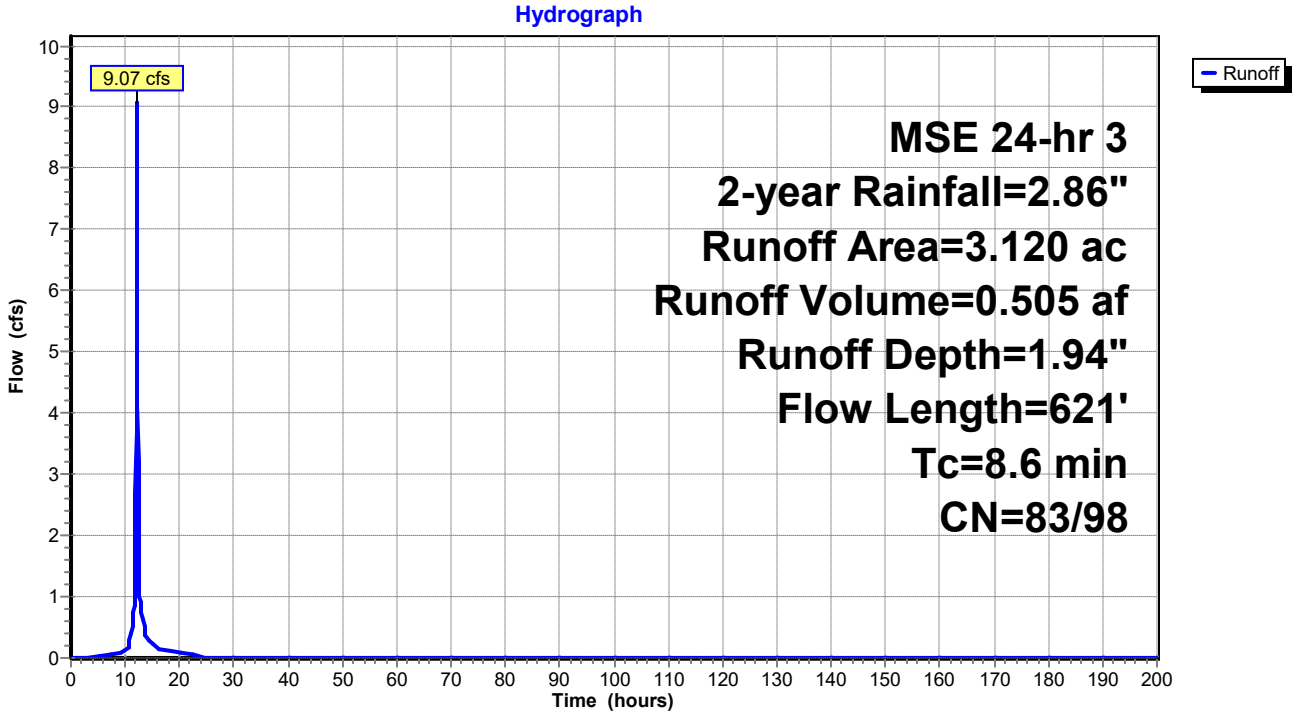
Runoff = 9.07 cfs @ 12.16 hrs, Volume= 0.505 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.134	98	Unconnected pavement, HSG D
0.275	98	Unconnected roofs, HSG D
0.506	98	Paved roads w/curbs & sewers, HSG D
0.328	98	Paved parking, HSG D
0.224	98	Roofs, HSG D
0.278	98	Water Surface, 0% imp, HSG D
0.979	80	>75% Grass cover, Good, HSG D
0.396	78	Meadow, non-grazed, HSG D
3.120	90	Weighted Average
1.653	83	52.98% Pervious Area
1.467	98	47.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 27S: Direct to Proposed Northwest Central Pond



Summary for Subcatchment 28S: Direct to Proposed Northeast Central Pond

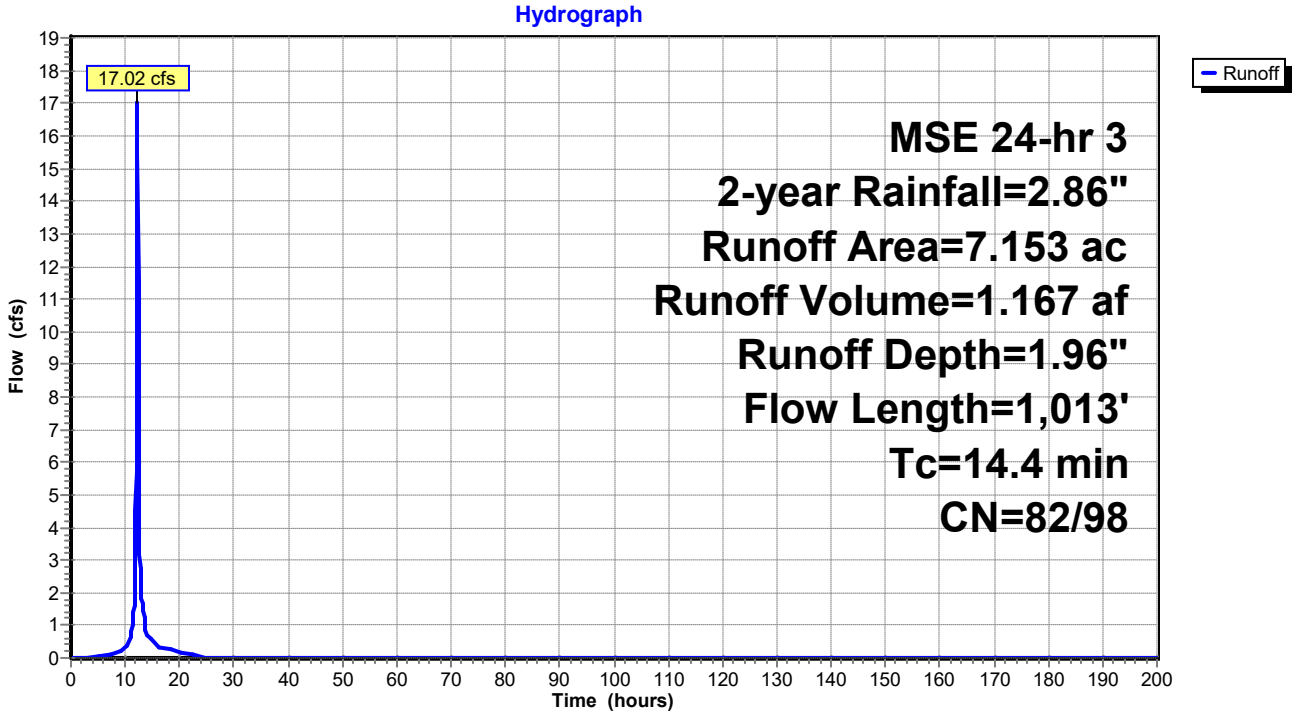
Runoff = 17.02 cfs @ 12.22 hrs, Volume= 1.167 af, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.152	98	Unconnected pavement, HSG D
0.932	98	Unconnected roofs, HSG D
0.930	98	Paved roads w/curbs & sewers, HSG D
1.004	98	Paved parking, HSG D
0.604	98	Roofs, HSG D
0.380	98	Water Surface, 0% imp, HSG D
2.416	80	>75% Grass cover, Good, HSG D
0.684	78	Meadow, non-grazed, HSG D
0.051	77	Woods, Good, HSG D
7.153	90	Weighted Average
3.531	82	49.36% Pervious Area
3.622	98	50.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	71	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.6	242	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	700		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.4	1,013	Total			

Subcatchment 28S: Direct to Proposed Northeast Central Pond



Summary for Subcatchment 30S: Direct to Wetland 4A

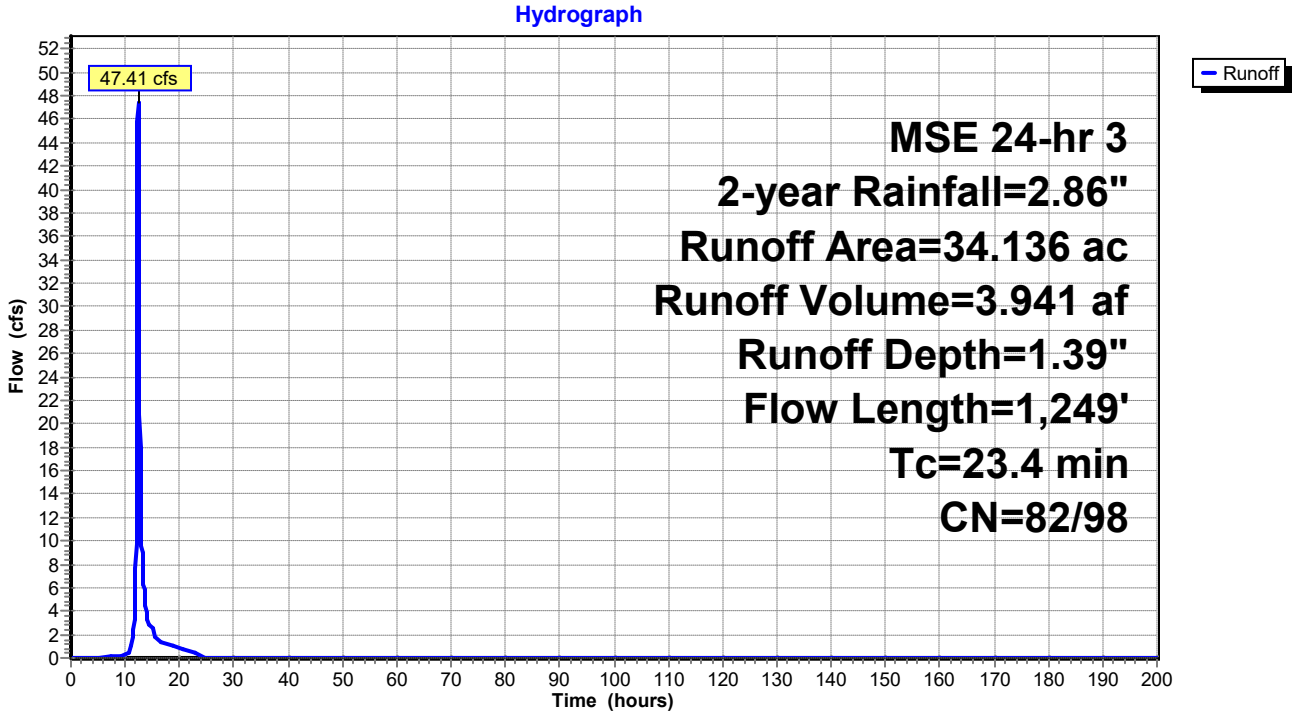
Runoff = 47.41 cfs @ 12.35 hrs, Volume= 3.941 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
1.401	98	Unconnected pavement, HSG D
1.502	98	Unconnected roofs, HSG D
0.939	96	Gravel surface, HSG D
6.512	89	Row crops, straight row, Good, HSG D
1.609	89	Pasture/grassland/range, Poor, HSG D
18.400	80	>75% Grass cover, Good, HSG D
3.773	77	Woods, Good, HSG D
34.136	84	Weighted Average
31.233	82	91.50% Pervious Area
2.903	98	8.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

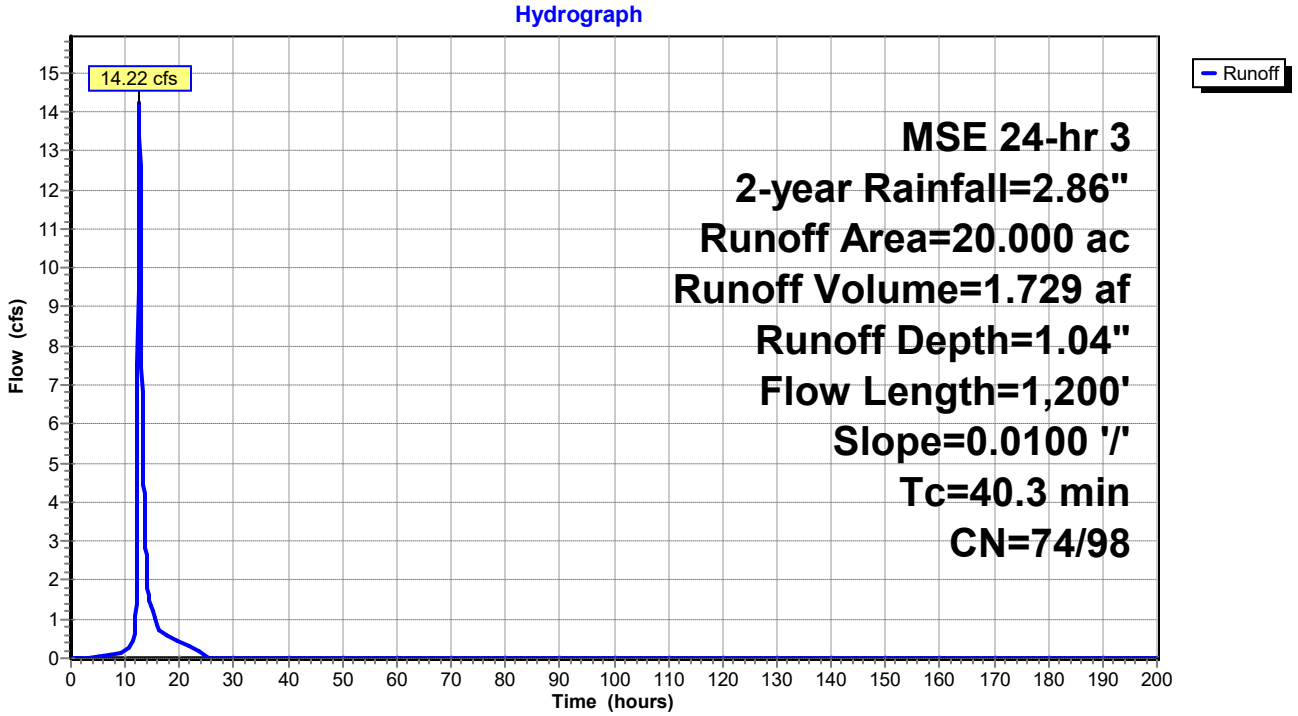
Runoff = 14.22 cfs @ 12.59 hrs, Volume= 1.729 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
20.000	77	2 acre lots, 12% imp, HSG C
17.600	74	88.00% Pervious Area
2.400	98	12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 32S: Direct to Proposed West Central Pond

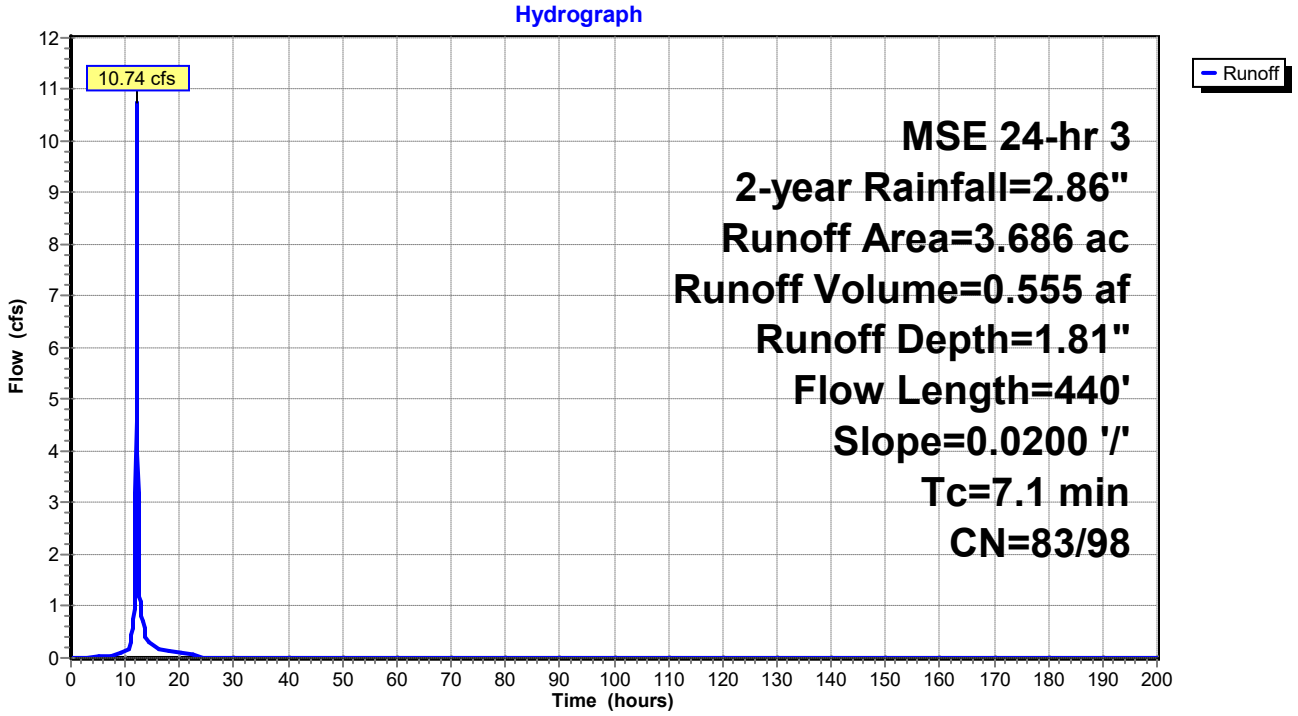
Runoff = 10.74 cfs @ 12.14 hrs, Volume= 0.555 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.039	98	Unconnected pavement, HSG D
0.438	98	Unconnected roofs, HSG D
0.377	98	Paved roads w/curbs & sewers, HSG D
0.298	98	Paved parking, HSG D
0.194	98	Roofs, HSG D
0.395	98	Water Surface, 0% imp, HSG D
1.443	80	>75% Grass cover, Good, HSG D
0.502	78	Meadow, non-grazed, HSG D
3.686	88	Weighted Average
2.340	83	63.48% Pervious Area
1.346	98	36.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.2	401		3.00		**Direct Entry,**
7.1	440	Total			

Subcatchment 32S: Direct to Proposed West Central Pond



Summary for Subcatchment 40S: Direct to Wetland 2B

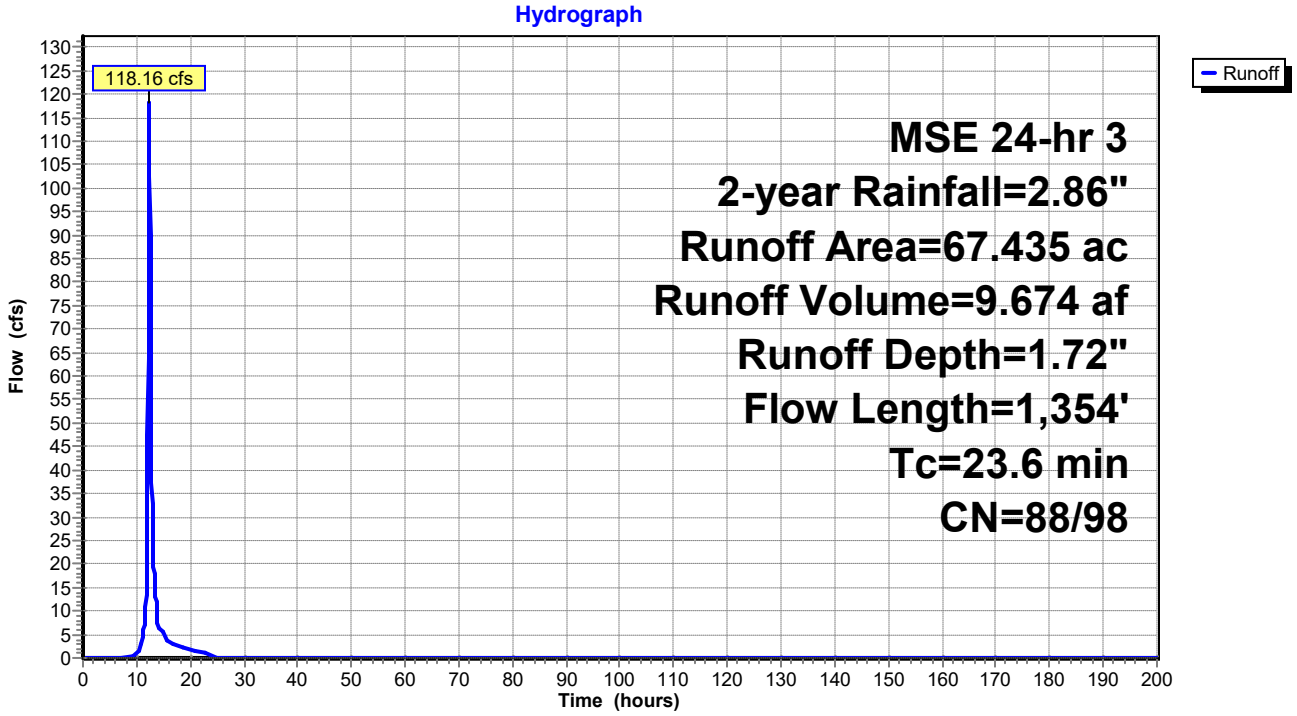
Runoff = 118.16 cfs @ 12.34 hrs, Volume= 9.674 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.965	98	Unconnected pavement, HSG D
1.003	98	Unconnected roofs, HSG D
17.214	98	Water Surface, 0% imp, HSG D
1.249	96	Gravel surface, HSG D
27.306	89	Row crops, straight row, Good, HSG D
0.208	89	Pasture/grassland/range, Poor, HSG D
9.713	80	>75% Grass cover, Good, HSG D
6.057	78	Meadow, non-grazed, HSG D
3.720	77	Woods, Good, HSG D
67.435	89	Weighted Average
65.467	88	97.08% Pervious Area
1.968	98	2.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

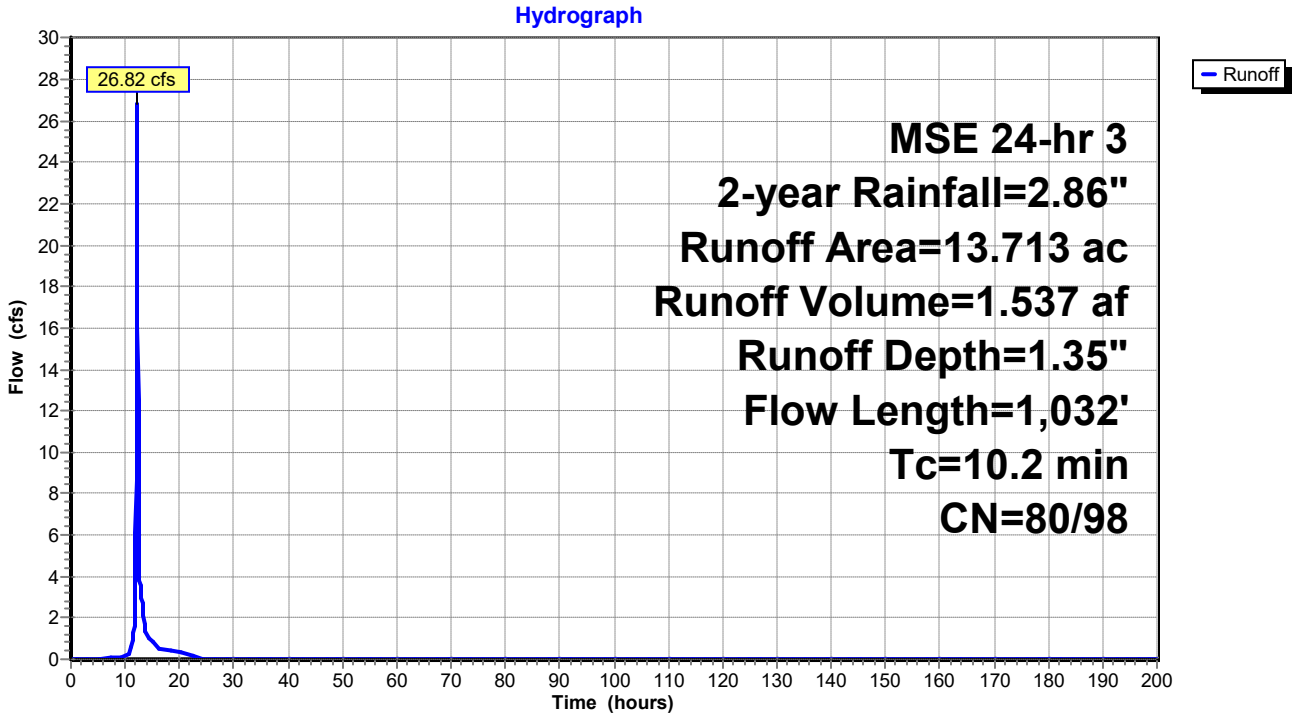
Runoff = 26.82 cfs @ 12.18 hrs, Volume= 1.537 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
1.568	98	Unconnected pavement, HSG D
0.273	98	Unconnected roofs, HSG D
0.107	98	Water Surface, 0% imp, HSG D
0.066	96	Gravel surface, HSG D
10.431	80	>75% Grass cover, Good, HSG D
1.268	78	Meadow, non-grazed, HSG D
13.713	82	Weighted Average
11.872	80	86.57% Pervious Area
1.841	98	13.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 42S: Direct to Proposed South Central Pond

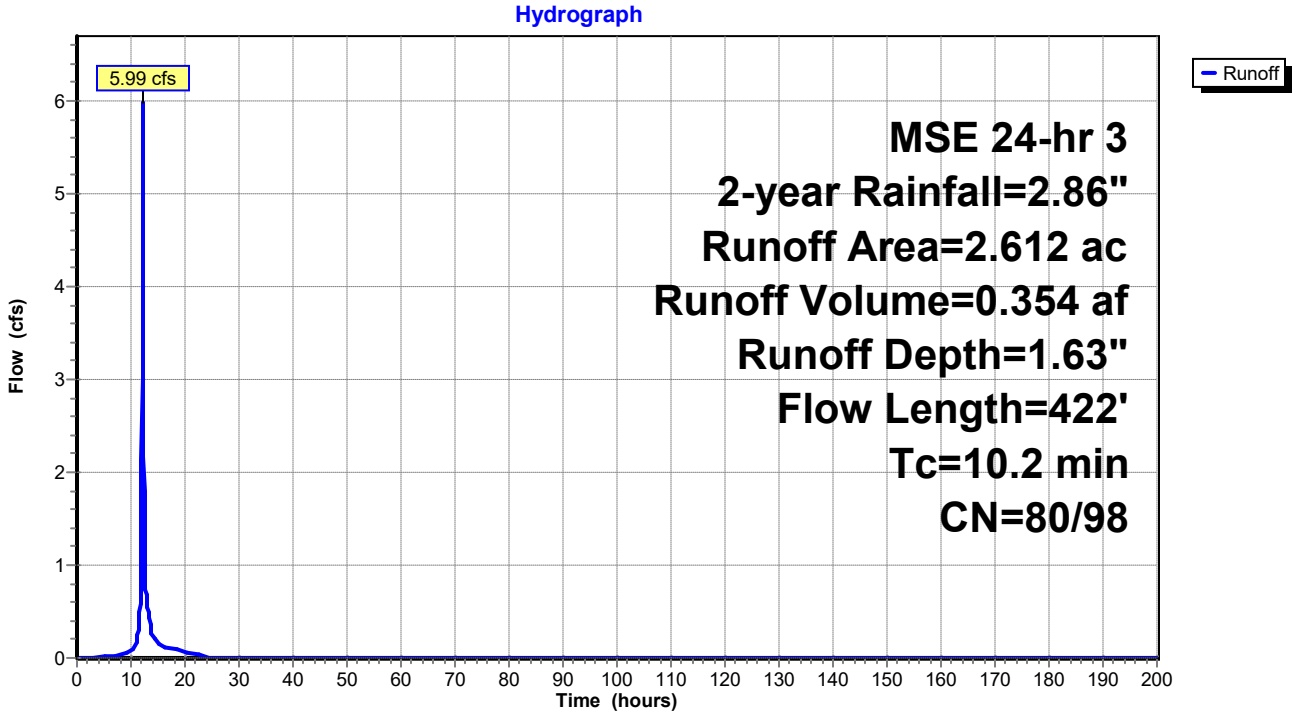
Runoff = 5.99 cfs @ 12.18 hrs, Volume= 0.354 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.013	98	Unconnected pavement, HSG D
0.362	98	Unconnected roofs, HSG D
0.246	98	Paved roads w/curbs & sewers, HSG D
0.145	98	Paved parking, HSG D
0.084	98	Roofs, HSG D
0.154	98	Water Surface, 0% imp, HSG D
0.600	80	>75% Grass cover, Good, HSG D
0.811	78	Meadow, non-grazed, HSG D
0.197	77	Woods, Good, HSG D
2.612	86	Weighted Average
1.762	80	67.46% Pervious Area
0.850	98	32.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.7	235	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	117		3.00		**Direct Entry, Pipe flow @ 3 fps**
10.2	422	Total			

Subcatchment 42S: Direct to Proposed South Central Pond



Summary for Subcatchment 43S: Direct to Proposed Central Pond

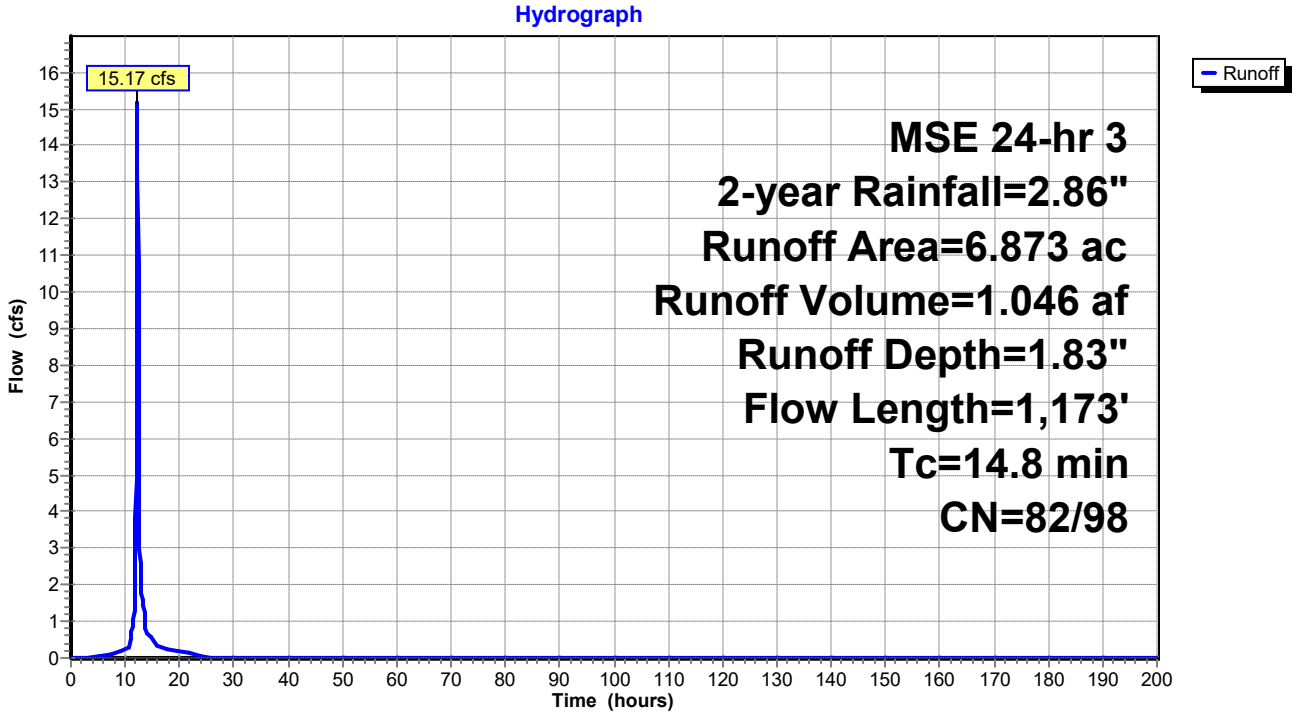
Runoff = 15.17 cfs @ 12.23 hrs, Volume= 1.046 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.205	98	Unconnected pavement, HSG D
0.855	98	Unconnected roofs, HSG D
0.896	98	Paved roads w/curbs & sewers, HSG D
0.530	98	Paved parking, HSG D
0.332	98	Roofs, HSG D
0.402	98	Water Surface, 0% imp, HSG D
0.383	89	Row crops, straight row, Good, HSG D
2.711	80	>75% Grass cover, Good, HSG D
0.559	78	Meadow, non-grazed, HSG D
6.873	89	Weighted Average
4.055	82	59.00% Pervious Area
2.818	98	41.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.5	286	0.0088	1.90		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	817		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.8	1,173	Total			

Subcatchment 43S: Direct to Proposed Central Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

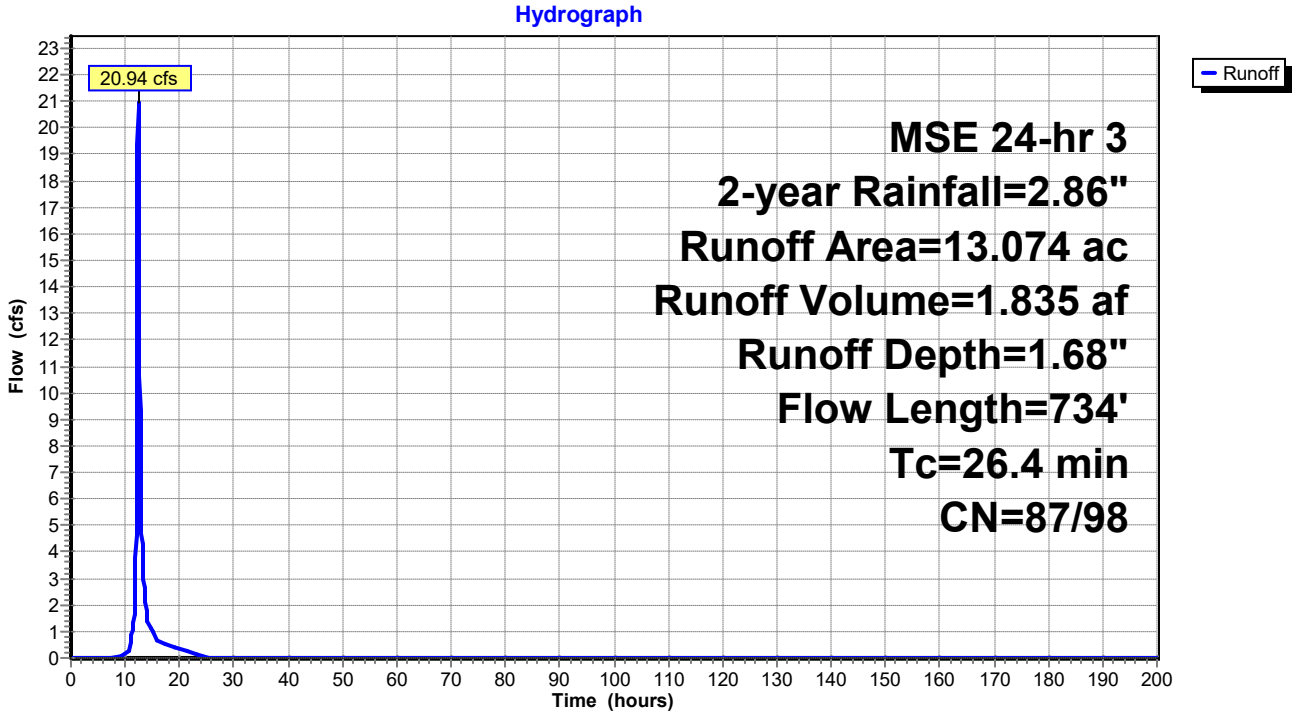
Runoff = 20.94 cfs @ 12.38 hrs, Volume= 1.835 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.523	98	Unconnected pavement, HSG D
0.339	98	Unconnected roofs, HSG D
0.175	98	Water Surface, 0% imp, HSG D
0.233	96	Gravel surface, HSG D
8.346	89	Row crops, straight row, Good, HSG D
0.958	89	Pasture/grassland/range, Poor, HSG D
2.500	80	>75% Grass cover, Good, HSG D
13.074	88	Weighted Average
12.212	87	93.41% Pervious Area
0.862	98	6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

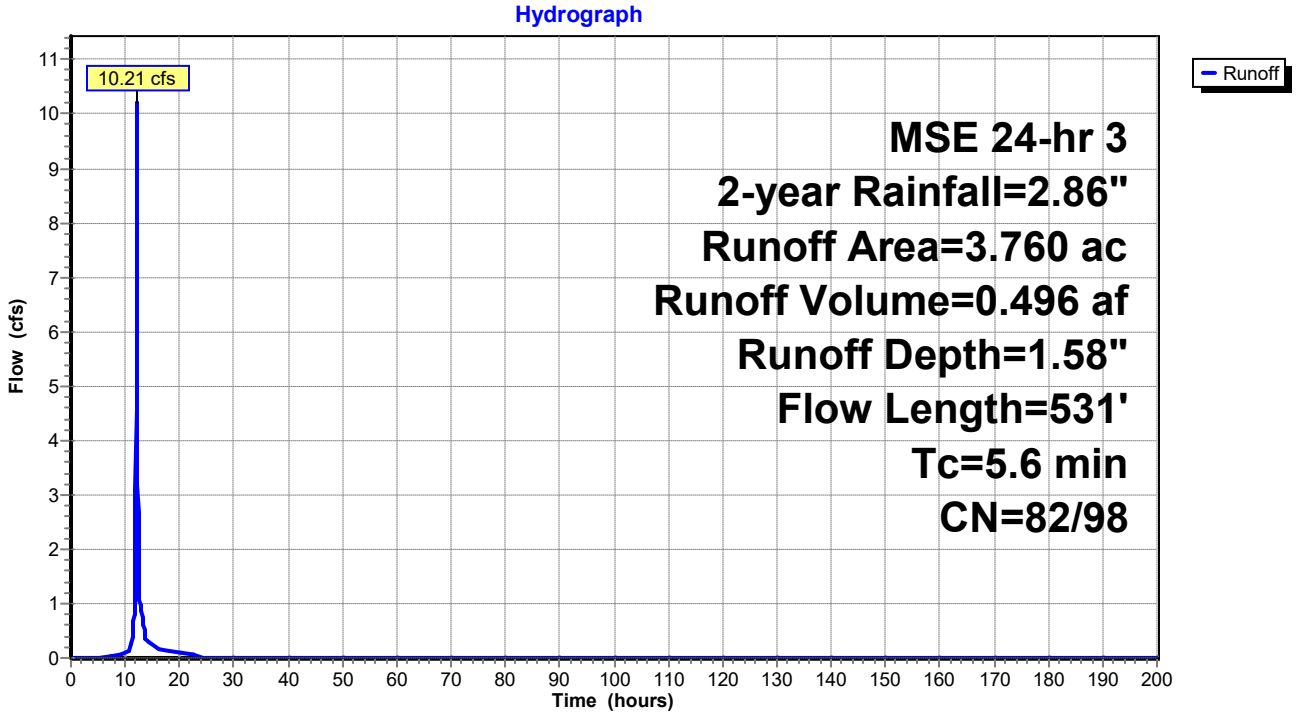
Runoff = 10.21 cfs @ 12.13 hrs, Volume= 0.496 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.428	98	Unconnected pavement, HSG D
0.443	98	Unconnected roofs, HSG D
0.064	98	Water Surface, 0% imp, HSG D
0.331	96	Gravel surface, HSG D
2.083	80	>75% Grass cover, Good, HSG D
0.411	77	Woods, Good, HSG D
3.760	86	Weighted Average
2.889	82	76.84% Pervious Area
0.871	98	23.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



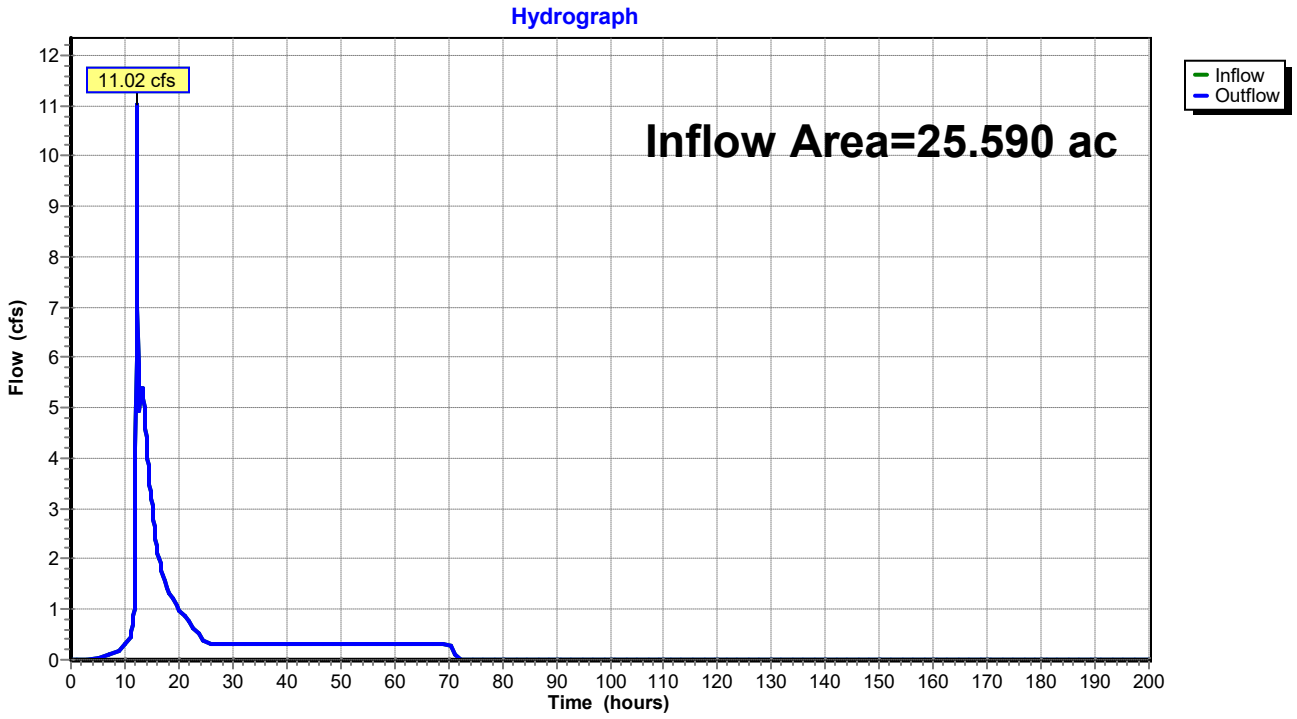
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.590 ac, 16.84% Impervious, Inflow Depth = 1.68" for 2-year event
Inflow = 11.02 cfs @ 12.24 hrs, Volume= 3.577 af
Outflow = 11.02 cfs @ 12.24 hrs, Volume= 3.577 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



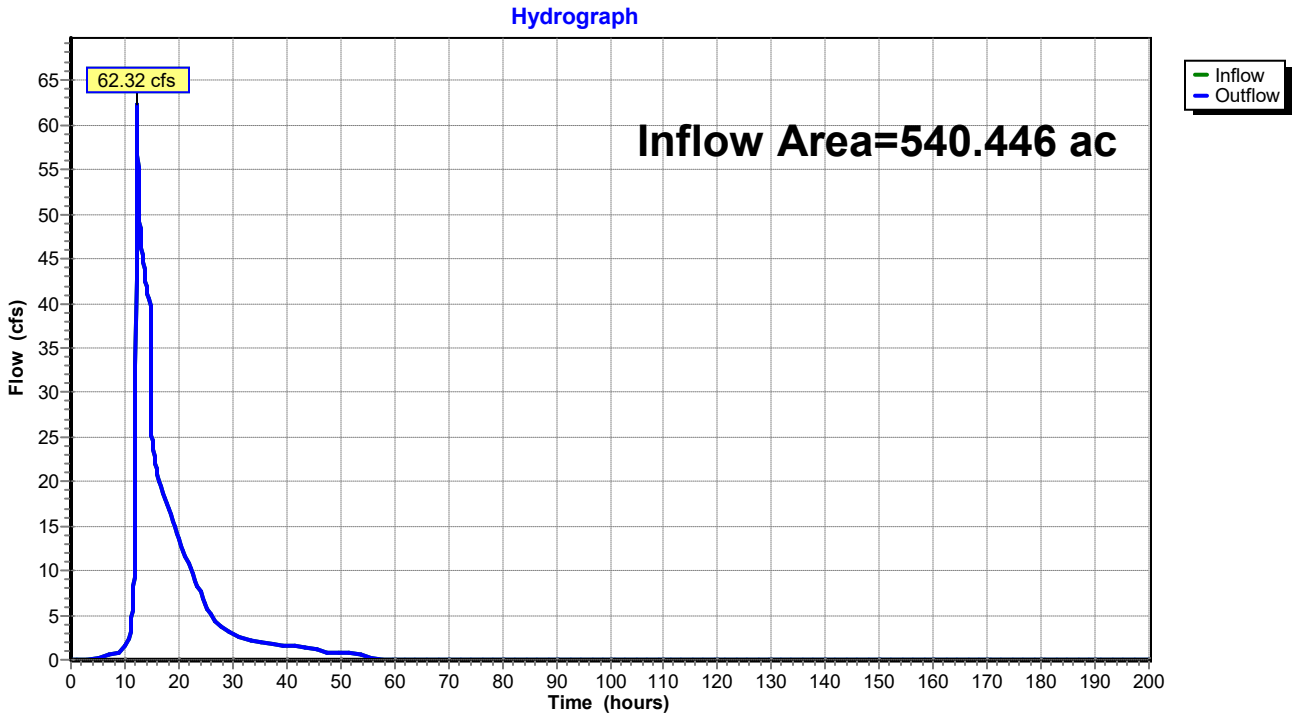
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.446 ac, 5.98% Impervious, Inflow Depth = 0.64" for 2-year event
Inflow = 62.32 cfs @ 12.24 hrs, Volume= 28.667 af
Outflow = 62.32 cfs @ 12.24 hrs, Volume= 28.667 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



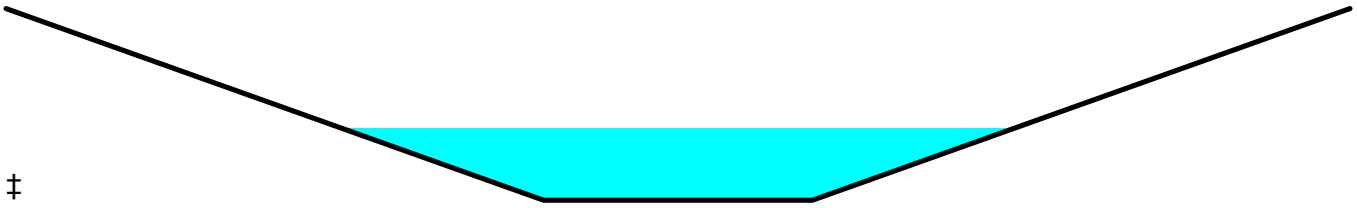
Summary for Reach 21R: Proposed East Channel

Inflow Area = 134.639 ac, 9.91% Impervious, Inflow Depth > 1.44" for 2-year event
Inflow = 19.13 cfs @ 13.63 hrs, Volume= 16.186 af
Outflow = 19.13 cfs @ 13.64 hrs, Volume= 16.186 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.82 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 4.4 min

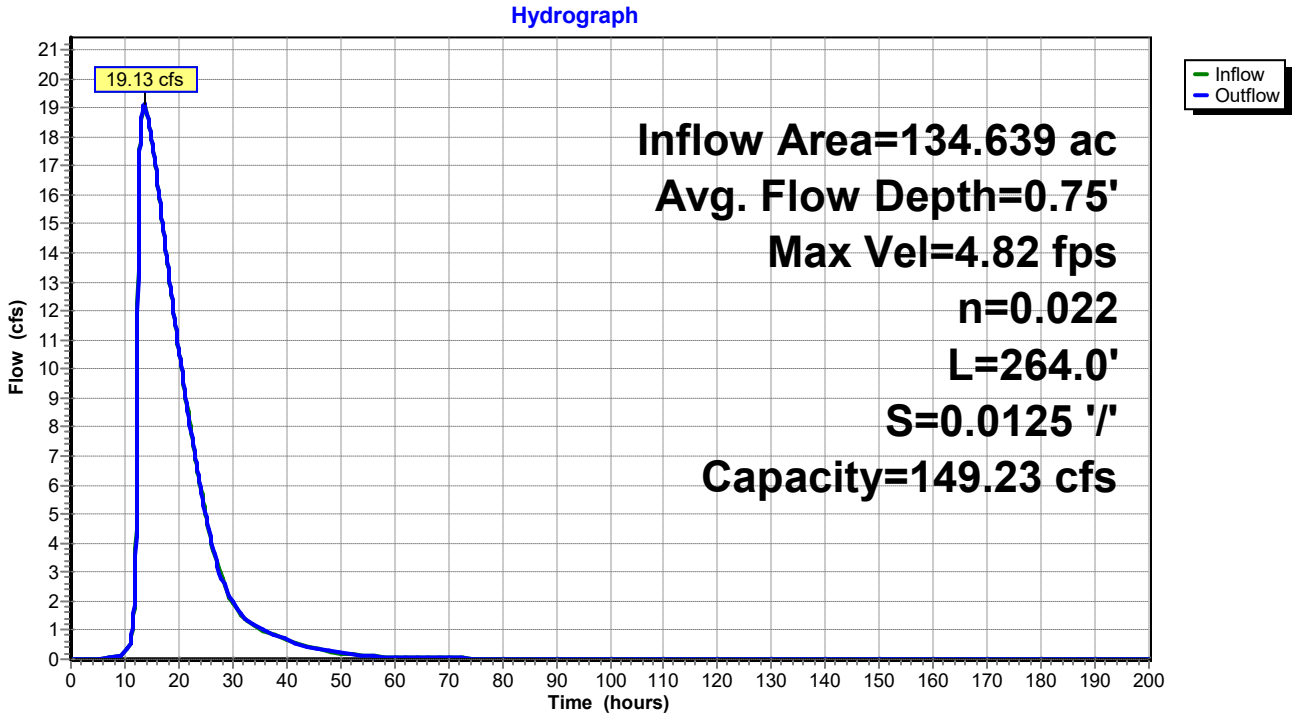
Peak Storage= 1,047 cf @ 13.64 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 149.23 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 264.0' Slope= 0.0125 '/'
Inlet Invert= 923.50', Outlet Invert= 920.20'



‡

Reach 21R: Proposed East Channel



Summary for Reach 23R: Existing West Channel

Inflow Area = 375.878 ac, 3.58% Impervious, Inflow Depth = 0.28" for 2-year event
Inflow = 32.28 cfs @ 12.32 hrs, Volume= 8.880 af
Outflow = 32.22 cfs @ 12.34 hrs, Volume= 8.880 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 7.8 min

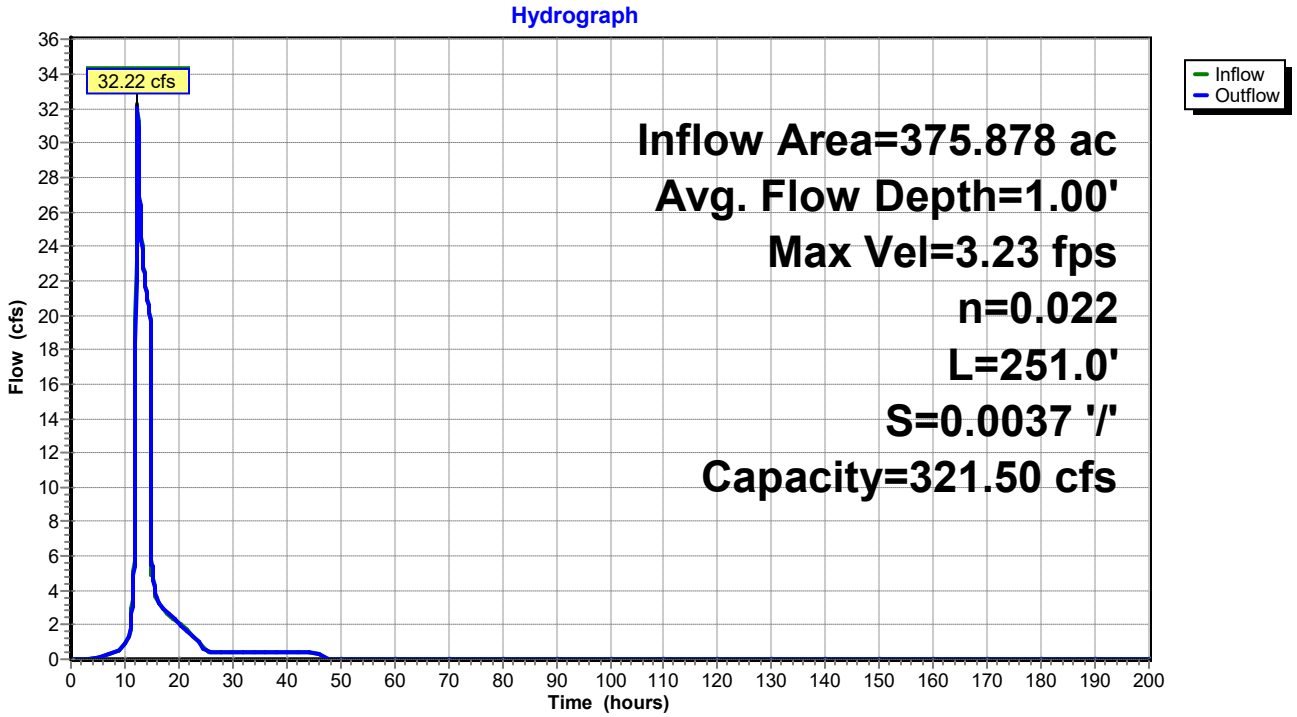
Peak Storage= 2,505 cf @ 12.34 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 321.50 cfs

6.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 4.0 '/' Top Width= 30.00'
Length= 251.0' Slope= 0.0037 '/'
Inlet Invert= 920.50', Outlet Invert= 919.58'



‡

Reach 23R: Existing West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth = 0.73" for 2-year event
Inflow = 185.67 cfs @ 12.43 hrs, Volume= 18.153 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 930.30' @ 25.55 hrs Surf.Area= 60.901 ac Storage= 18.153 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

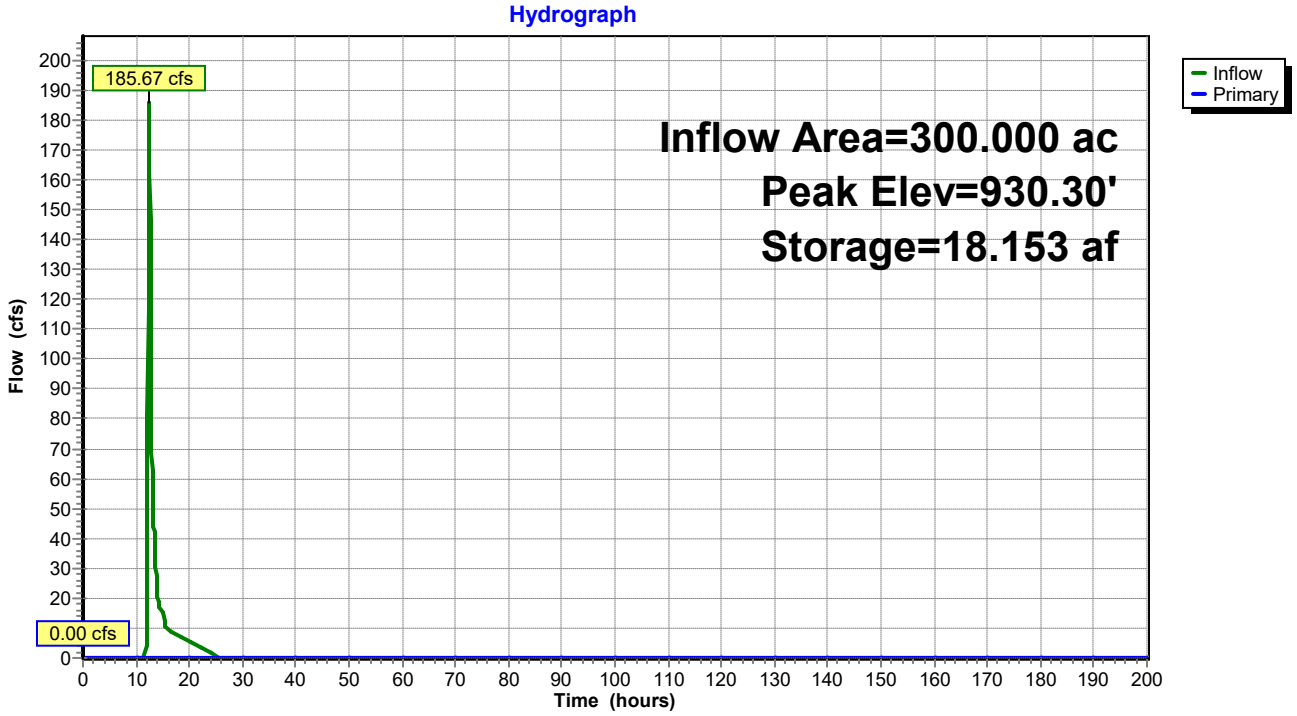
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=930.00' TW=930.22' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 10P: Proposed Northeast Pond/Filtration

[58] Hint: Peaked 0.35' above defined flood level

Inflow Area = 19.438 ac, 21.11% Impervious, Inflow Depth = 1.77" for 2-year event
Inflow = 34.17 cfs @ 12.34 hrs, Volume= 2.871 af
Outflow = 4.30 cfs @ 13.39 hrs, Volume= 2.871 af, Atten= 87%, Lag= 62.9 min
Primary = 4.30 cfs @ 13.39 hrs, Volume= 2.871 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 921.00' Surf.Area= 0.662 ac Storage= 2.955 af
Peak Elev= 922.35' @ 13.39 hrs Surf.Area= 1.411 ac Storage= 4.697 af (1.742 af above start)
Flood Elev= 922.00' Surf.Area= 1.255 ac Storage= 4.104 af (1.149 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 941.7 min (1,745.9 - 804.3)

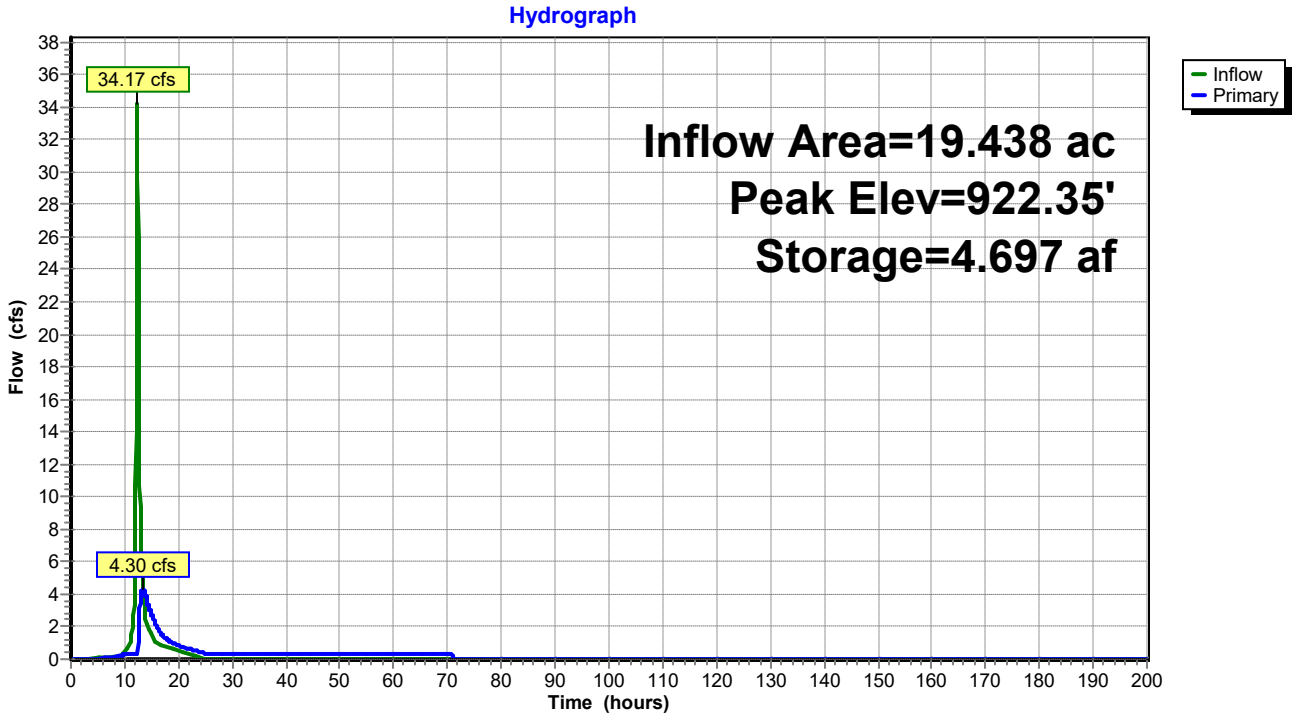
Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	9.359 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
913.00	0.209	0.000	0.000
914.00	0.242	0.226	0.226
916.00	0.314	0.556	0.781
918.00	0.396	0.710	1.491
920.00	0.491	0.887	2.378
921.00	0.662	0.576	2.955
921.01	1.049	0.009	2.964
922.00	1.255	1.140	4.104
924.00	2.149	3.404	7.508
925.00	1.553	1.851	9.359

Device	Routing	Invert	Outlet Devices
#1	Primary	918.50'	**36.0" Round Culvert** L= 113.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.50' / 918.00' S= 0.0044 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	922.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	923.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	920.00'	**21.0" Round Culvert** L= 45.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 920.00' S= -0.0444 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	921.00'	**0.31 cfs Exfiltration when above 921.00'** Phase-In= 0.01'

Primary OutFlow Max=4.30 cfs @ 13.39 hrs HW=922.35' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.30 cfs of 45.69 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Weir Controls 3.99 cfs @ 1.93 fps)
  │ └─**4=Culvert** (Passes 3.99 cfs of 6.84 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Exfiltration** (Exfiltration Controls 0.31 cfs)

Pond 10P: Proposed Northeast Pond/Filtration



Summary for Pond 25P: Proposed Northwest Pond/Filtration

Inflow Area = 15.059 ac, 29.82% Impervious, Inflow Depth = 1.63" for 2-year event
Inflow = 27.99 cfs @ 12.26 hrs, Volume= 2.047 af
Outflow = 0.54 cfs @ 10.90 hrs, Volume= 2.047 af, Atten= 98%, Lag= 0.0 min
Primary = 0.54 cfs @ 10.90 hrs, Volume= 2.047 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 925.00' Surf.Area= 0.322 ac Storage= 1.156 af
Peak Elev= 926.22' @ 17.82 hrs Surf.Area= 1.328 ac Storage= 2.622 af (1.466 af above start)
Flood Elev= 926.50' Surf.Area= 1.369 ac Storage= 3.002 af (1.846 af above start)

Plug-Flow detention time= 1,970.1 min calculated for 0.890 af (44% of inflow)
Center-of-Mass det. time= 1,092.8 min (1,889.2 - 796.4)

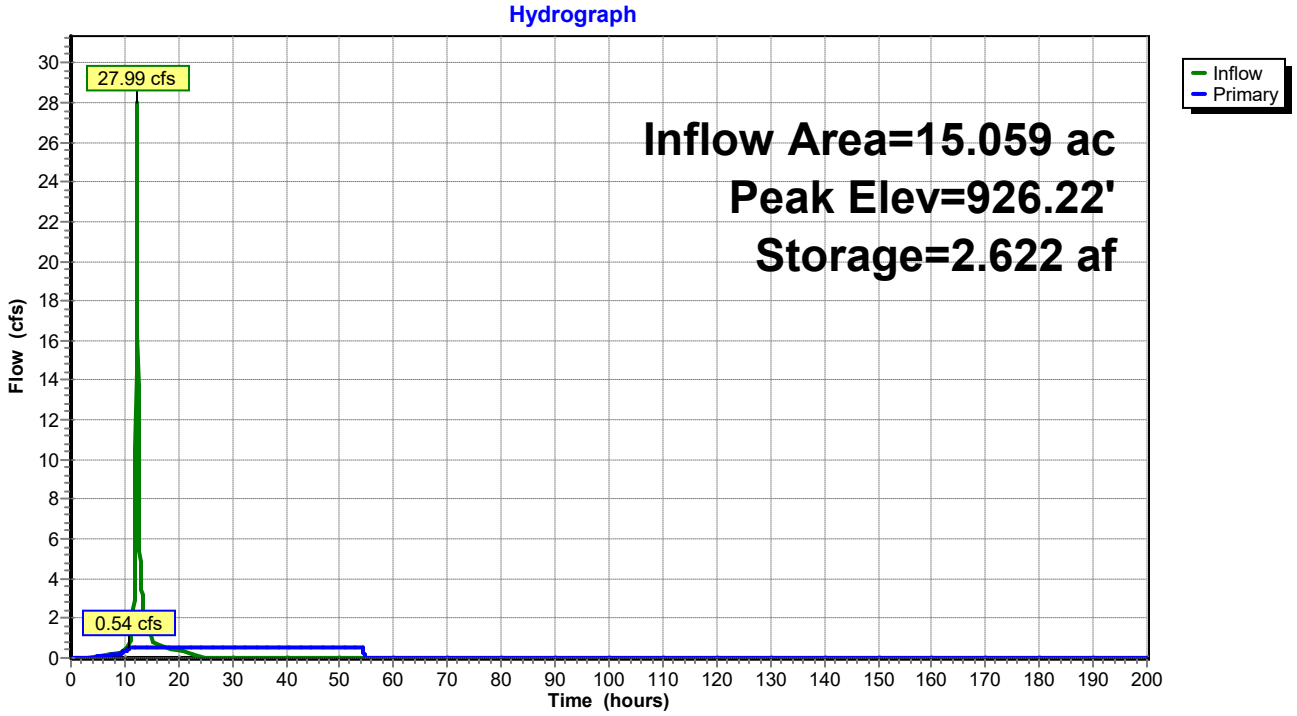
Volume	Invert	Avail.Storage	Storage Description
#1	917.00'	5.216 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
917.00	0.052	0.000	0.000
918.00	0.069	0.061	0.061
920.00	0.110	0.179	0.239
922.00	0.160	0.270	0.509
924.00	0.217	0.377	0.887
925.00	0.322	0.269	1.156
925.01	1.071	0.007	1.163
926.00	1.297	1.172	2.335
928.00	1.584	2.881	5.216

Device	Routing	Invert	Outlet Devices
#1	Primary	922.50'	**21.0" Round Culvert** L= 46.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.50' / 922.00' S= 0.0109 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	926.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	927.40'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	922.00'	**18.0" Round Culvert** L= 42.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 921.00' S= 0.0238 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#5	Device 1	925.00'	**0.54 cfs Exfiltration when above 925.00'** Phase-In= 0.01'

Primary OutFlow Max=0.54 cfs @ 10.90 hrs HW=925.01' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.54 cfs of 14.66 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  │ └─**4=Culvert** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Exfiltration** (Exfiltration Controls 0.54 cfs)

Pond 25P: Proposed Northwest Pond/Filtration



Summary for Pond 26P: Proposed Northwest Central Pond/Filtration

Inflow Area = 7.518 ac, 41.97% Impervious, Inflow Depth = 1.83" for 2-year event
Inflow = 12.53 cfs @ 12.16 hrs, Volume= 1.145 af
Outflow = 0.37 cfs @ 11.15 hrs, Volume= 1.145 af, Atten= 97%, Lag= 0.0 min
Primary = 0.37 cfs @ 11.15 hrs, Volume= 1.145 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.00' Surf.Area= 0.318 ac Storage= 0.894 af
Peak Elev= 924.81' @ 17.71 hrs Surf.Area= 0.899 ac Storage= 1.573 af (0.679 af above start)
Flood Elev= 925.50' Surf.Area= 0.997 ac Storage= 2.227 af (1.333 af above start)

Plug-Flow detention time= 2,015.1 min calculated for 0.251 af (22% of inflow)
Center-of-Mass det. time= 762.3 min (1,716.4 - 954.1)

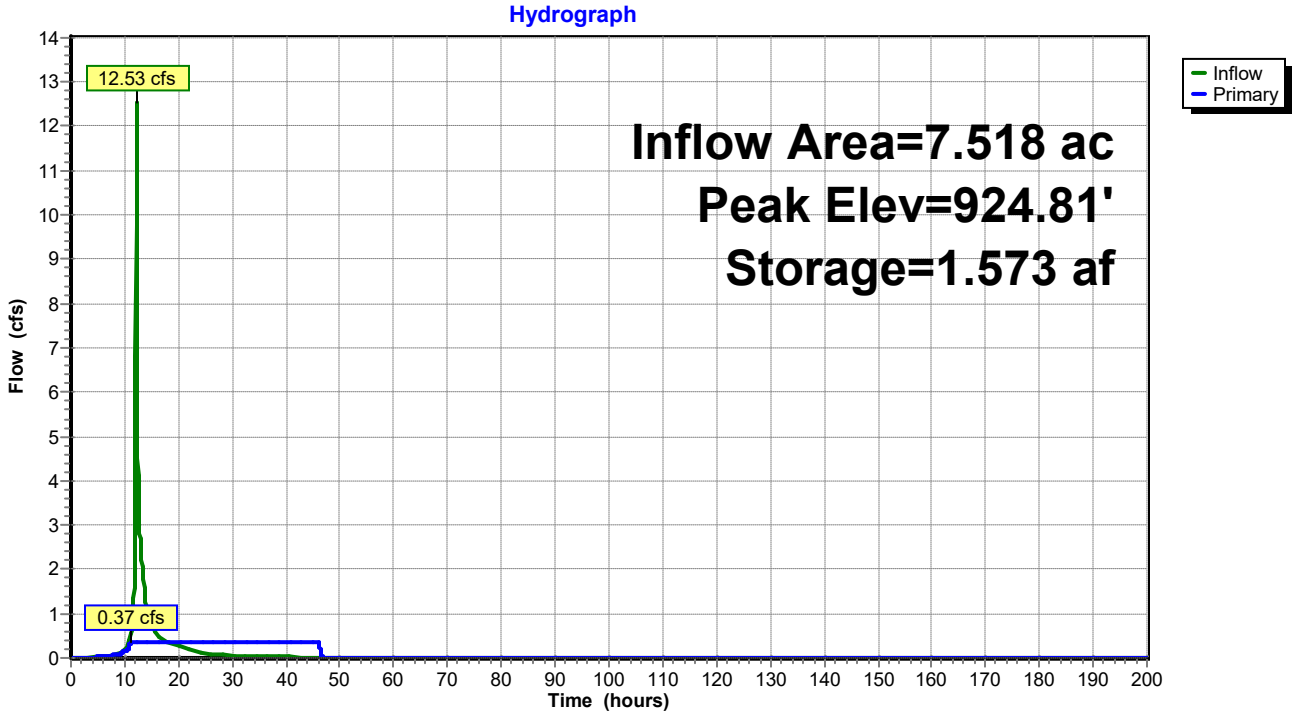
Volume	Invert	Avail.Storage	Storage Description
#1	916.00'	3.855 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.00	0.009	0.000	0.000
918.00	0.045	0.054	0.054
920.00	0.099	0.144	0.198
922.00	0.162	0.261	0.459
923.00	0.195	0.179	0.637
924.00	0.318	0.256	0.894
924.01	0.784	0.006	0.900
926.00	1.069	1.844	2.743
927.00	1.155	1.112	3.855

Device	Routing	Invert	Outlet Devices
#1	Primary	921.50'	**21.0" Round Culvert** L= 86.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.50' / 921.00' S= 0.0058 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	925.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	926.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	921.00'	**21.0" Round Culvert** L= 44.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 921.00' S= -0.0227 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	924.00'	**0.37 cfs Exfiltration when above 924.00'** Phase-In= 0.01'

Primary OutFlow Max=0.37 cfs @ 11.15 hrs HW=924.01' TW=920.74' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.37 cfs of 13.00 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
    - **4=Culvert** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Exfiltration** (Exfiltration Controls 0.37 cfs)

Pond 26P: Proposed Northwest Central Pond/Filtration



Summary for Pond 27P: Proposed Northwest Central Pond

Inflow Area = 3.120 ac, 47.02% Impervious, Inflow Depth = 1.94" for 2-year event
Inflow = 9.07 cfs @ 12.16 hrs, Volume= 0.505 af
Outflow = 1.70 cfs @ 12.52 hrs, Volume= 0.502 af, Atten= 81%, Lag= 22.0 min
Primary = 1.70 cfs @ 12.52 hrs, Volume= 0.502 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.50' Surf.Area= 0.278 ac Storage= 0.732 af
Peak Elev= 925.29' @ 12.52 hrs Surf.Area= 0.391 ac Storage= 0.996 af (0.265 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 396.3 min (1,173.3 - 777.1)

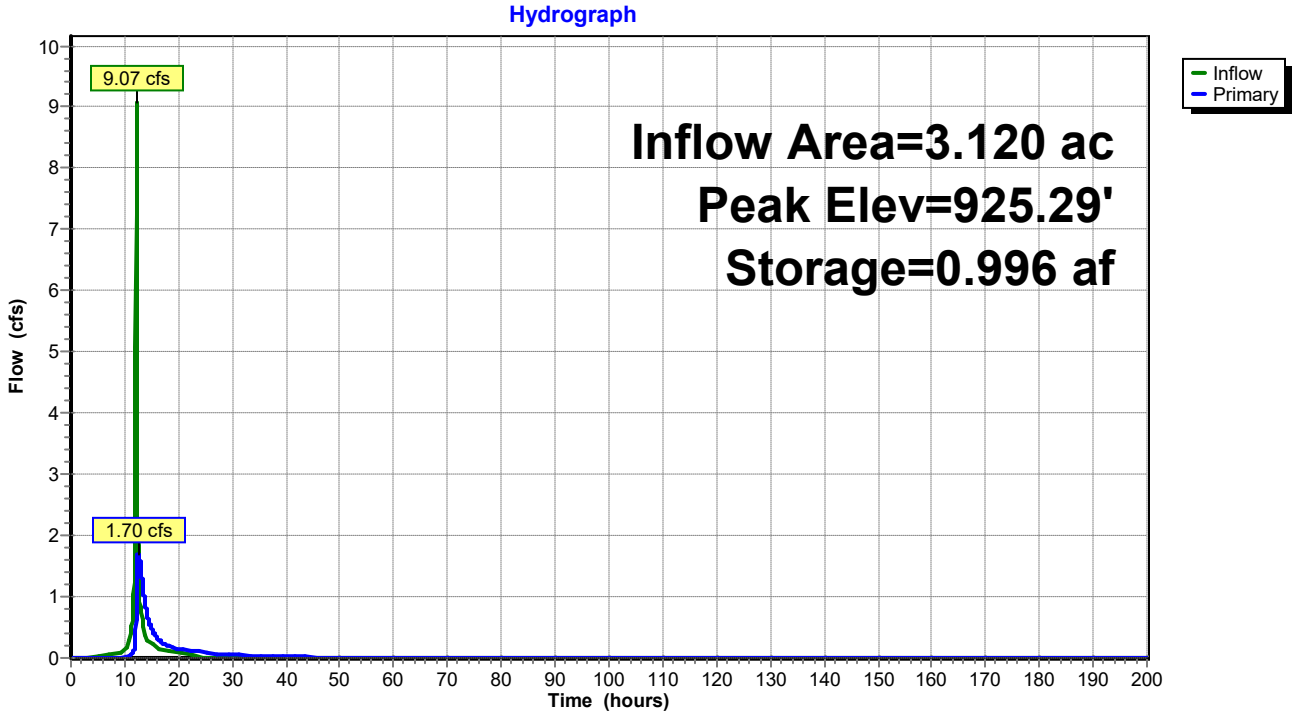
Volume	Invert	Avail.Storage	Storage Description
#1	916.50'	1.797 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.50	0.015	0.000	0.000
917.00	0.019	0.008	0.008
918.00	0.031	0.025	0.033
920.00	0.063	0.094	0.128
922.00	0.114	0.177	0.304
923.50	0.162	0.207	0.512
924.50	0.278	0.220	0.732
925.50	0.420	0.349	1.081
926.00	0.459	0.220	1.300
927.00	0.535	0.497	1.797

Device	Routing	Invert	Outlet Devices
#1	Primary	924.50'	**18.0" Round Culvert** L= 225.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.50' / 924.00' S= 0.0022 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	926.50'	**48.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 923.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=1.70 cfs @ 12.52 hrs HW=925.29' TW=924.47' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.70 cfs @ 2.61 fps)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**3=Culvert** (Passes 1.70 cfs of 7.57 cfs potential flow)

Pond 27P: Proposed Northwest Central Pond



Summary for Pond 28P: Proposed Northeast Central Pond

Inflow Area = 7.153 ac, 50.64% Impervious, Inflow Depth = 1.96" for 2-year event
Inflow = 17.02 cfs @ 12.22 hrs, Volume= 1.167 af
Outflow = 9.47 cfs @ 12.40 hrs, Volume= 1.167 af, Atten= 44%, Lag= 10.6 min
Primary = 9.47 cfs @ 12.40 hrs, Volume= 1.167 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 922.00' Surf.Area= 0.380 ac Storage= 1.043 af
Peak Elev= 922.71' @ 12.40 hrs Surf.Area= 0.511 ac Storage= 1.359 af (0.316 af above start)

Plug-Flow detention time= 681.3 min calculated for 0.124 af (11% of inflow)
Center-of-Mass det. time= 41.5 min (822.2 - 780.7)

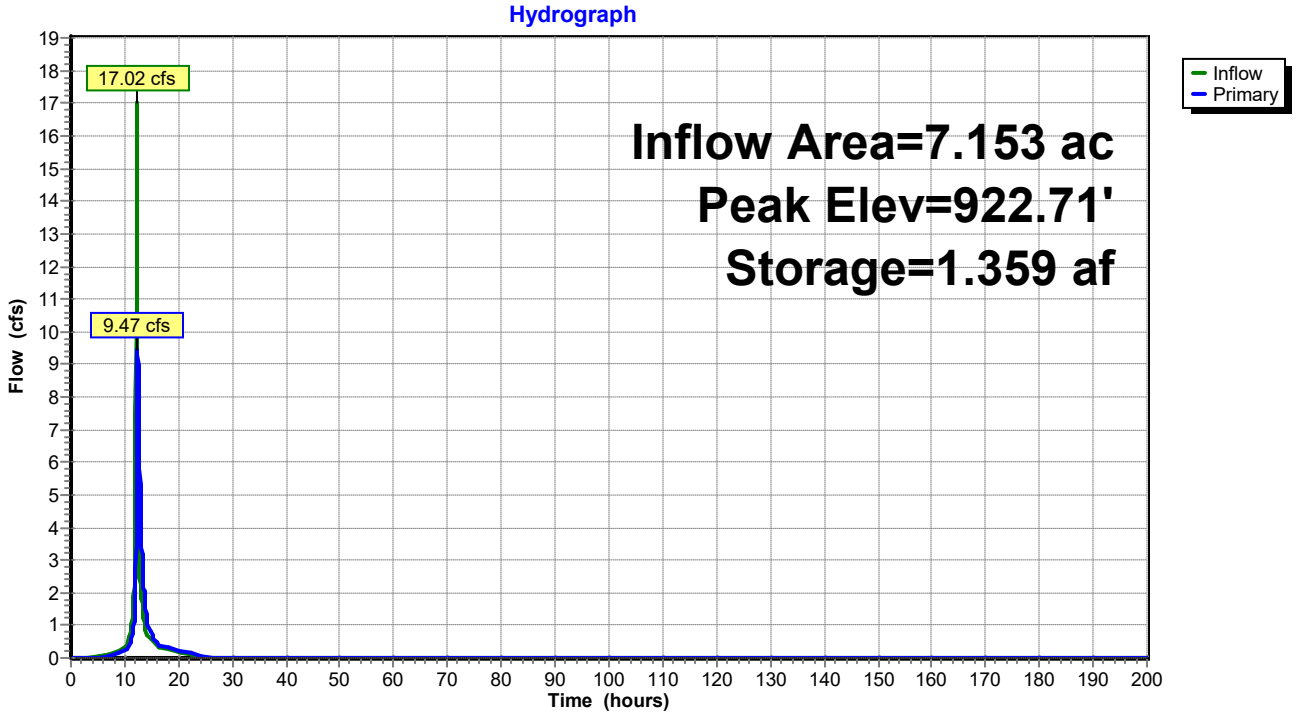
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	2.802 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.00	0.034	0.000	0.000
916.00	0.065	0.099	0.099
918.00	0.109	0.174	0.273
920.00	0.172	0.281	0.554
921.00	0.213	0.192	0.746
922.00	0.380	0.297	1.043
923.00	0.565	0.472	1.515
924.00	0.642	0.603	2.119
925.00	0.724	0.683	2.802

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**24.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.80' S= 0.0057 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	923.25'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	922.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 3	919.00'	**21.0" Round Culvert** L= 33.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 919.00' S= -0.0303 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=9.47 cfs @ 12.40 hrs HW=922.71' TW=921.49' (Dynamic Tailwater)
- **1=Culvert** (Passes 9.47 cfs of 9.89 cfs potential flow)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Sharp-Crested Rectangular Weir** (Weir Controls 9.47 cfs @ 2.75 fps)
    - **4=Culvert** (Passes 9.47 cfs of 9.75 cfs potential flow)

Pond 28P: Proposed Northeast Central Pond



Summary for Pond 30P: Wetland 4A

[44] Hint: Outlet device #5 is below defined storage

Inflow Area = 357.822 ac, 1.86% Impervious, Inflow Depth = 0.21" for 2-year event
Inflow = 61.25 cfs @ 12.37 hrs, Volume= 6.225 af
Outflow = 19.74 cfs @ 13.05 hrs, Volume= 6.225 af, Atten= 68%, Lag= 40.5 min
Primary = 16.70 cfs @ 13.02 hrs, Volume= 4.022 af
Secondary = 3.04 cfs @ 13.22 hrs, Volume= 2.203 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 925.77' @ 13.02 hrs Surf.Area= 4.135 ac Storage= 1.671 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 26.9 min (854.4 - 827.5)

Volume	Invert	Avail.Storage	Storage Description
#1	923.50'	15.942 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

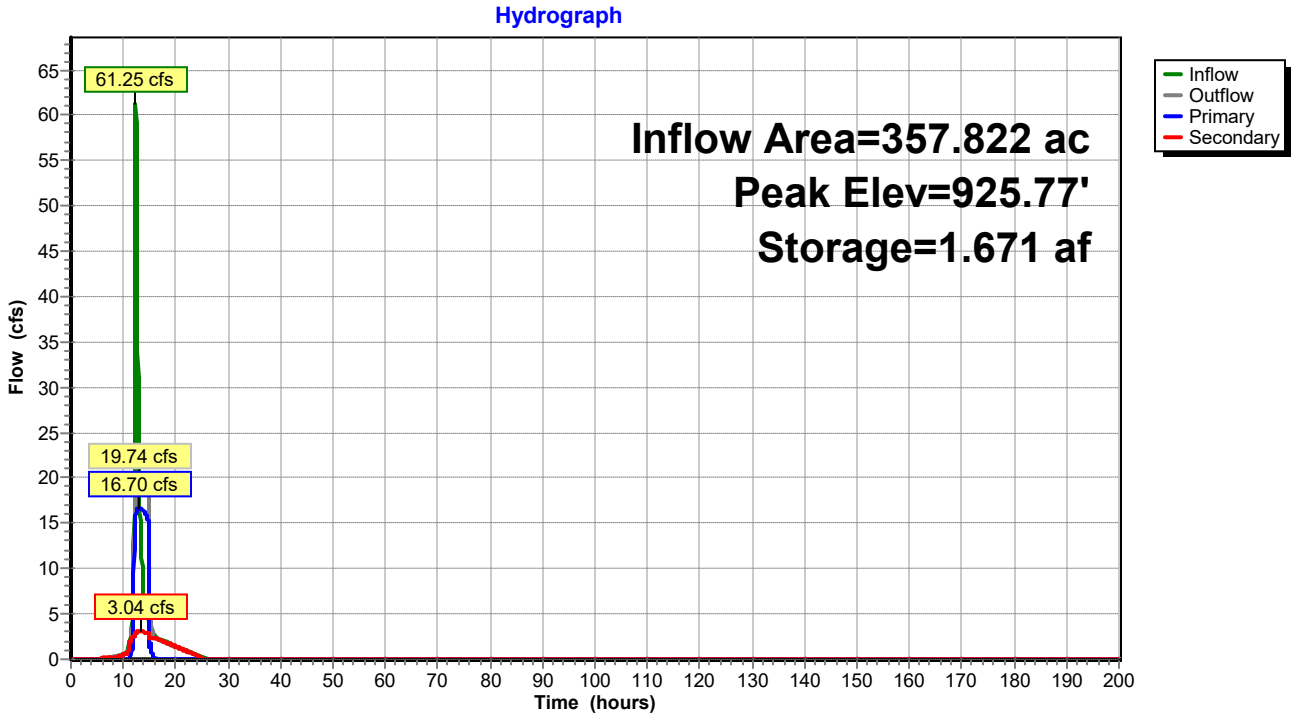
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.50	0.011	0.000	0.000
924.00	0.027	0.009	0.009
925.00	0.058	0.042	0.052
926.00	5.338	2.698	2.750
927.00	6.566	5.952	8.702
928.00	7.914	7.240	15.942

Device	Routing	Invert	Outlet Devices
#1	Primary	921.11'	**36.0" Round 36" RCP** L= 307.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.11' / 920.50' S= 0.0020 '/' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 7.07 sf
#2	Device 1	926.00'	**60.0" Horiz. CBMH-3003** C= 0.600 Limited to weir flow at low heads
#3	Device 1	921.17'	**18.0" Round 18" RCP** L= 23.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 921.17' / 921.11' S= 0.0026 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#4	Device 3	923.50'	**48.0" Horiz. CBMH-3004** C= 0.600 Limited to weir flow at low heads
#5	Secondary	919.60'	**12.0" Round 12" Draintile** L= 553.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.34' / 919.60' S= -0.0005 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=16.70 cfs @ 13.02 hrs HW=925.77' TW=921.38' (Dynamic Tailwater)
└─**1=36" RCP** (Passes 16.70 cfs of 44.28 cfs potential flow)
  └─**2=CBMH-3003** (Controls 0.00 cfs)
  └─**3=18" RCP** (Inlet Controls 16.70 cfs @ 9.45 fps)
    └─**4=CBMH-3004** (Passes 16.70 cfs of 91.20 cfs potential flow)

Secondary OutFlow Max=3.05 cfs @ 13.22 hrs HW=925.76' TW=921.36' (Dynamic Tailwater)
└─**5=12" Draintile** (Outlet Controls 3.05 cfs @ 3.88 fps)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[80] Warning: Exceeded Pond 7P by 2.14' @ 12.65 hrs (149.57 cfs 7.851 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth = 0.06" for 2-year event
Inflow = 14.22 cfs @ 12.59 hrs, Volume= 1.729 af
Outflow = 13.72 cfs @ 12.67 hrs, Volume= 1.729 af, Atten= 4%, Lag= 4.9 min
Primary = 13.72 cfs @ 12.67 hrs, Volume= 1.729 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 932.25' @ 12.67 hrs Surf.Area= 0.101 ac Storage= 0.018 af

Plug-Flow detention time= 0.3 min calculated for 1.729 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (841.7 - 841.4)

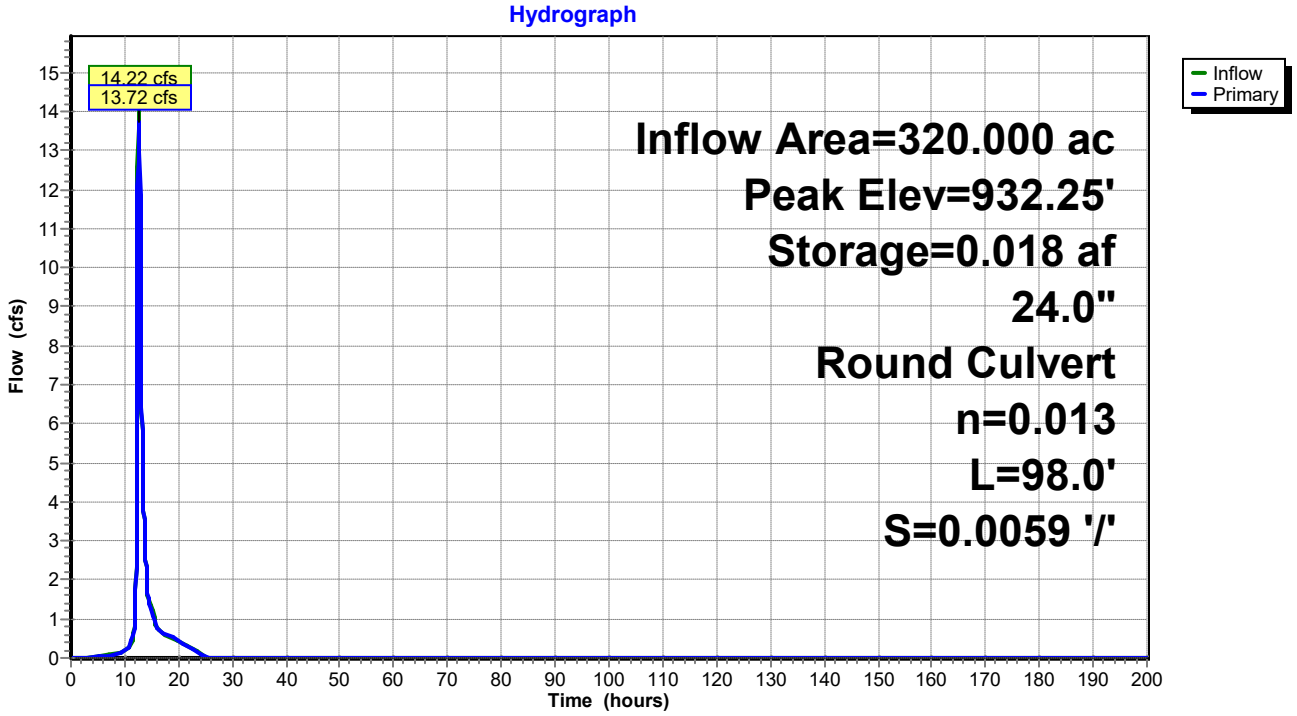
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=13.70 cfs @ 12.67 hrs HW=932.25' TW=925.71' (Dynamic Tailwater)
1=Culvert (Barrel Controls 13.70 cfs @ 5.35 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 32P: Proposed West Central Pond

Inflow Area = 3.686 ac, 36.52% Impervious, Inflow Depth = 1.81" for 2-year event
Inflow = 10.74 cfs @ 12.14 hrs, Volume= 0.555 af
Outflow = 4.39 cfs @ 12.29 hrs, Volume= 0.555 af, Atten= 59%, Lag= 8.8 min
Primary = 4.39 cfs @ 12.29 hrs, Volume= 0.555 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.00' Surf.Area= 0.395 ac Storage= 1.213 af
Peak Elev= 928.42' @ 12.29 hrs Surf.Area= 0.462 ac Storage= 1.393 af (0.180 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 54.0 min (835.7 - 781.7)

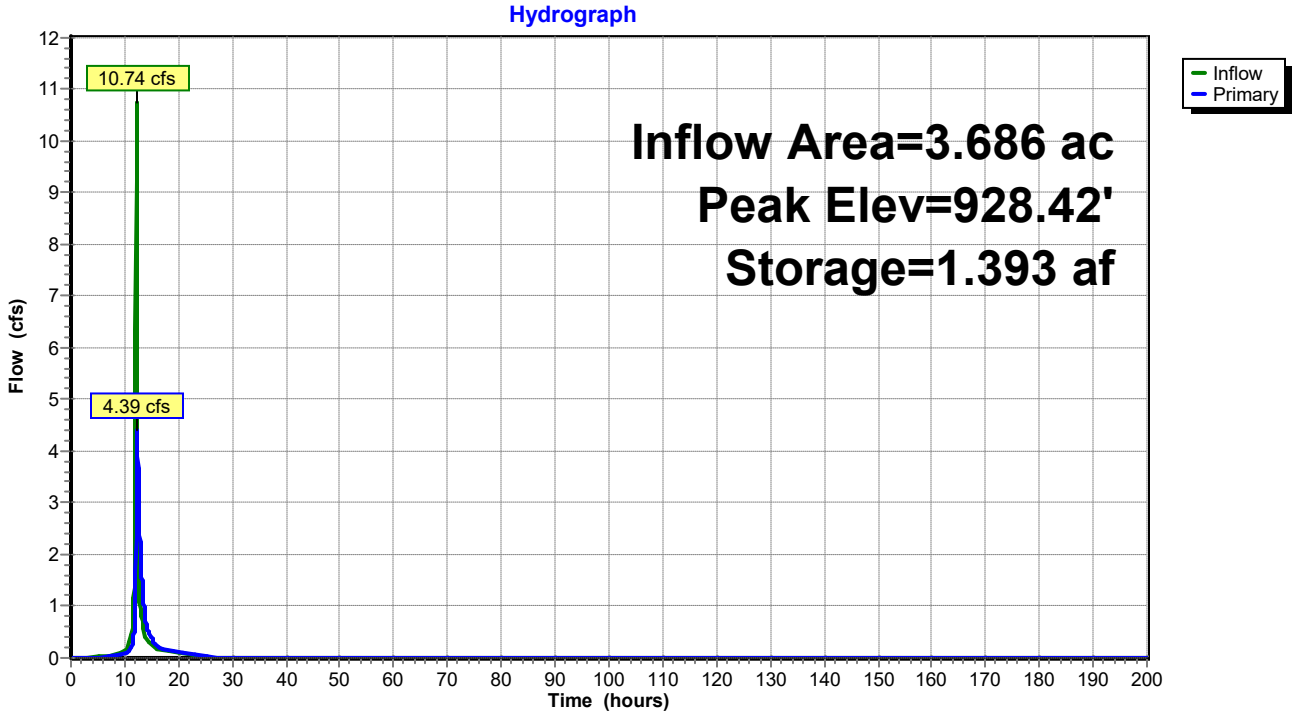
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	2.284 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.034	0.000	0.000
922.00	0.073	0.107	0.107
924.00	0.134	0.207	0.314
926.00	0.211	0.345	0.659
927.00	0.251	0.231	0.890
928.00	0.395	0.323	1.213
929.00	0.554	0.475	1.687
930.00	0.638	0.596	2.284

Device	Routing	Invert	Outlet Devices
#1	Primary	923.05'	**18.0" Round Culvert** L= 212.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.05' / 922.52' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	929.50'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	925.00'	**21.0" Round Culvert** L= 20.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0500 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=4.38 cfs @ 12.29 hrs HW=928.42' TW=925.33' (Dynamic Tailwater)
- **1=Culvert** (Passes 4.38 cfs of 10.75 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Weir Controls 4.38 cfs @ 2.12 fps)
    - **4=Culvert** (Passes 4.38 cfs of 7.51 cfs potential flow)
  - **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 32P: Proposed West Central Pond



Summary for Pond 40P: Wetland 2B

Inflow Area = 133.857 ac, 9.96% Impervious, Inflow Depth = 1.44" for 2-year event
Inflow = 129.76 cfs @ 12.34 hrs, Volume= 16.114 af
Outflow = 19.04 cfs @ 13.67 hrs, Volume= 16.114 af, Atten= 85%, Lag= 79.7 min
Primary = 19.04 cfs @ 13.67 hrs, Volume= 16.114 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 925.13' @ 13.67 hrs Surf.Area= 8.976 ac Storage= 6.361 af

Plug-Flow detention time= 222.8 min calculated for 16.110 af (100% of inflow)
Center-of-Mass det. time= 222.7 min (1,226.8 - 1,004.1)

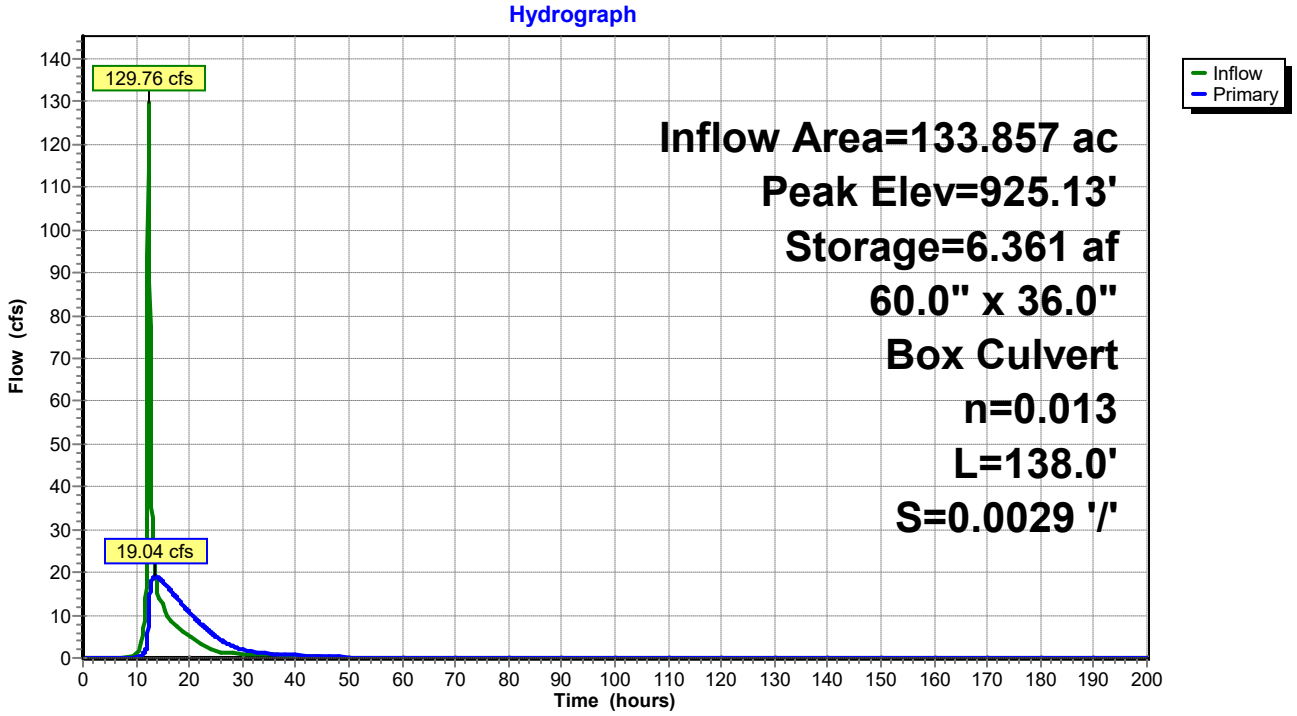
Volume	Invert	Avail.Storage	Storage Description
#1	923.90'	52.747 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.90	0.000	0.000	0.000
924.00	2.123	0.106	0.106
926.00	14.283	16.406	16.512
928.00	21.952	36.235	52.747

Device	Routing	Invert	Outlet Devices
#1	Primary	923.90'	**60.0" W x 36.0" H Box Culvert** L= 138.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.90' / 923.50' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 15.00 sf

Primary OutFlow Max=19.04 cfs @ 13.67 hrs HW=925.13' TW=924.25' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 19.04 cfs @ 4.14 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 1.35" for 2-year event
Inflow = 26.82 cfs @ 12.18 hrs, Volume= 1.537 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 939.36' @ 24.60 hrs Surf.Area= 1.420 ac Storage= 1.537 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

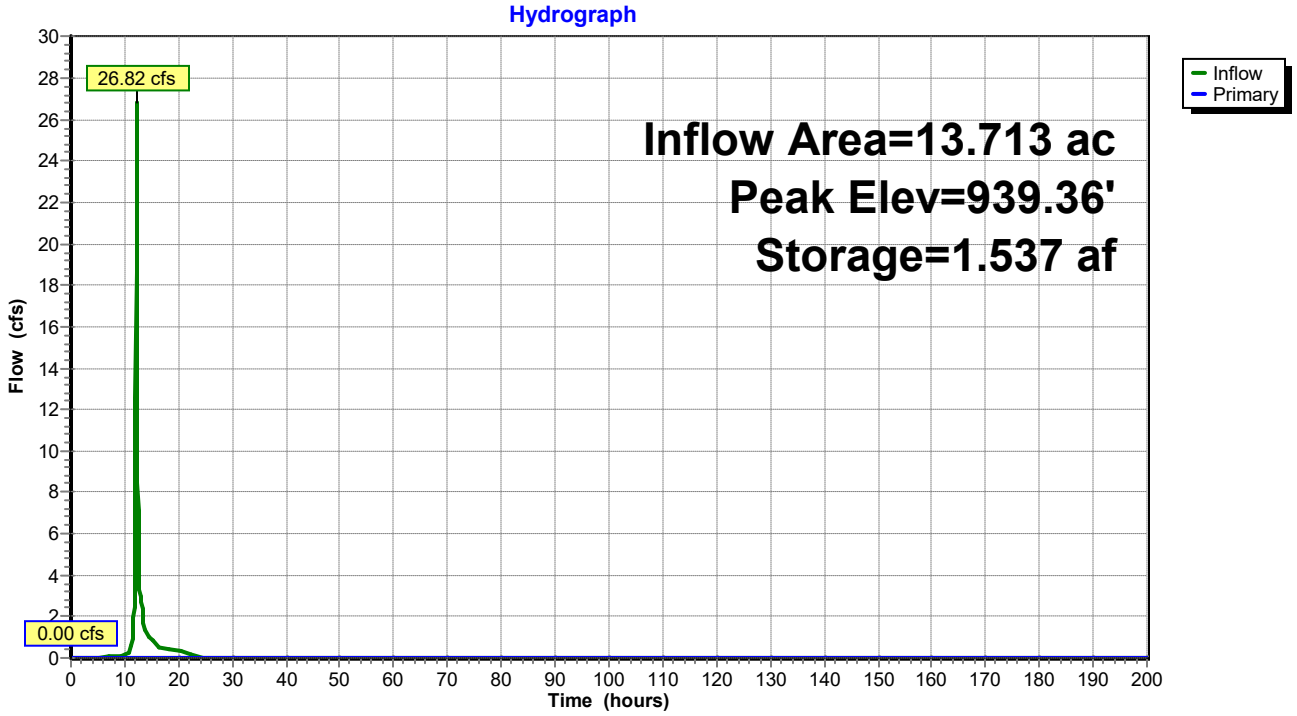
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=936.00' TW=923.90' (Dynamic Tailwater)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 41P: Ex South Off-site Pond



Summary for Pond 42P: Proposed South Central Pond

Inflow Area = 2.612 ac, 32.54% Impervious, Inflow Depth = 1.63" for 2-year event
Inflow = 5.99 cfs @ 12.18 hrs, Volume= 0.354 af
Outflow = 2.17 cfs @ 12.41 hrs, Volume= 0.354 af, Atten= 64%, Lag= 13.6 min
Primary = 2.17 cfs @ 12.41 hrs, Volume= 0.354 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.50' Surf.Area= 0.154 ac Storage= 0.309 af
Peak Elev= 929.23' @ 12.41 hrs Surf.Area= 0.220 ac Storage= 0.445 af (0.136 af above start)

Plug-Flow detention time= 935.9 min calculated for 0.045 af (13% of inflow)
Center-of-Mass det. time= 115.7 min (904.1 - 788.4)

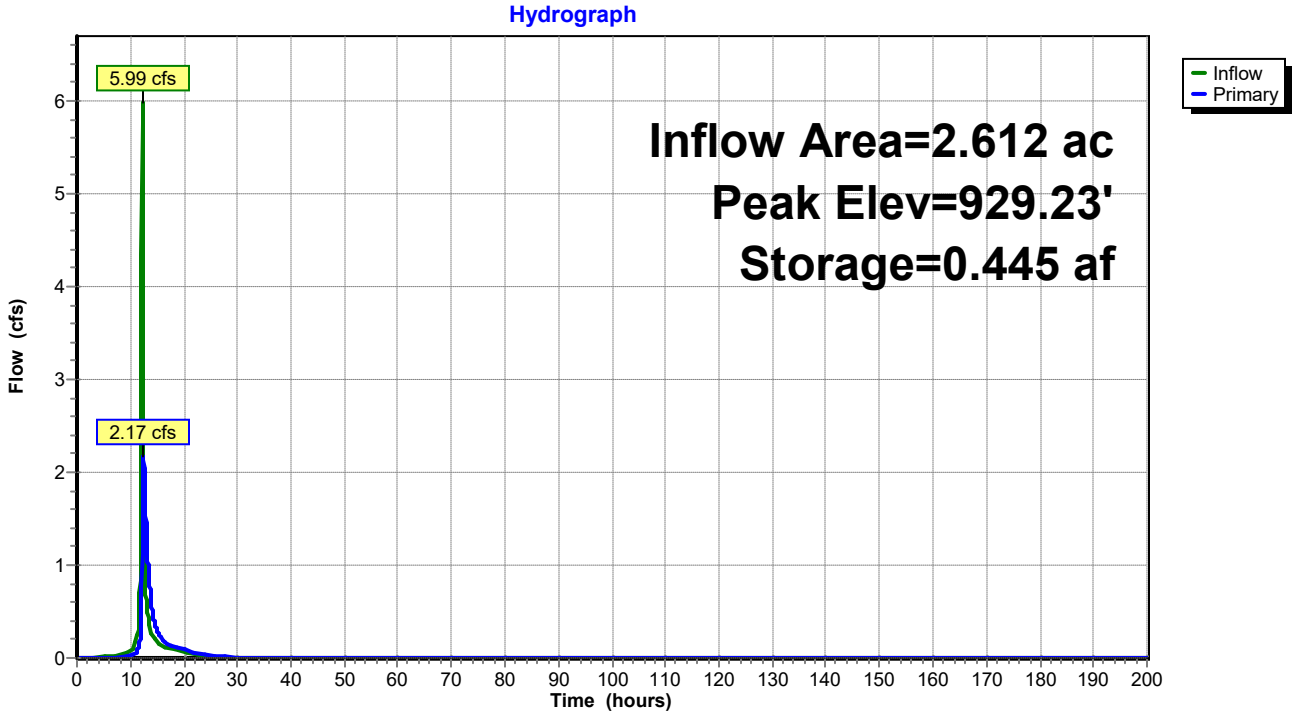
Volume	Invert	Avail.Storage	Storage Description
#1	922.00'	1.122 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
922.00	0.004	0.000	0.000
924.00	0.022	0.026	0.026
926.00	0.050	0.072	0.098
927.50	0.078	0.096	0.194
928.00	0.114	0.048	0.242
928.50	0.154	0.067	0.309
929.50	0.244	0.199	0.508
930.00	0.274	0.130	0.637
931.50	0.372	0.484	1.122

Device	Routing	Invert	Outlet Devices
#1	Primary	928.50'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 928.50' / 928.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	930.20'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	927.00'	**15.0" Round Culvert** L= 39.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.00' / 927.00' S= -0.0256 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

Primary OutFlow Max=2.16 cfs @ 12.41 hrs HW=929.23' TW=924.77' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 2.16 cfs @ 2.91 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Culvert** (Passes 2.16 cfs of 5.05 cfs potential flow)

Pond 42P: Proposed South Central Pond



Summary for Pond 43P: Proposed East Central Pond

Inflow Area = 6.873 ac, 41.00% Impervious, Inflow Depth = 1.83" for 2-year event
Inflow = 15.17 cfs @ 12.23 hrs, Volume= 1.046 af
Outflow = 4.30 cfs @ 12.59 hrs, Volume= 1.044 af, Atten= 72%, Lag= 21.7 min
Primary = 4.30 cfs @ 12.59 hrs, Volume= 1.044 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 926.50' Surf.Area= 0.401 ac Storage= 1.319 af
Peak Elev= 927.51' @ 12.59 hrs Surf.Area= 0.567 ac Storage= 1.806 af (0.486 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 183.2 min (969.7 - 786.5)

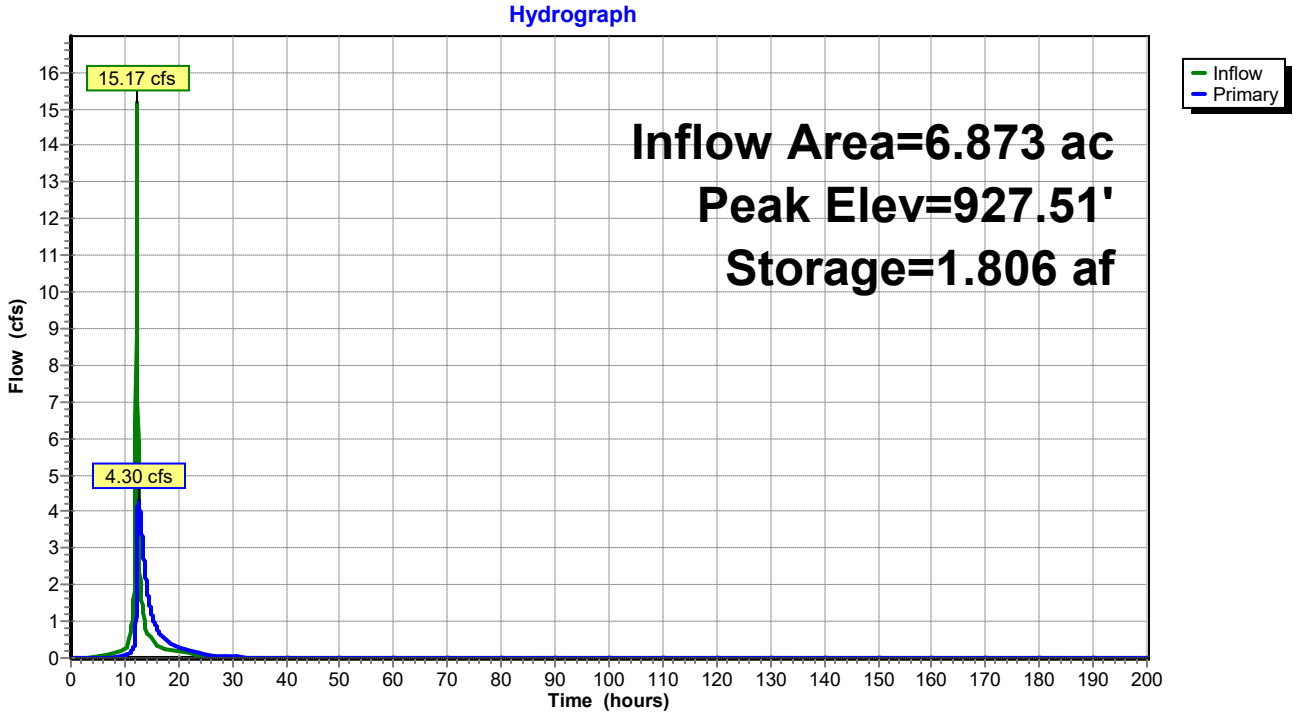
Volume	Invert	Avail.Storage	Storage Description
#1	918.50'	3.505 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
918.50	0.053	0.000	0.000
920.00	0.083	0.102	0.102
922.00	0.135	0.218	0.320
924.00	0.199	0.334	0.654
925.50	0.254	0.340	0.994
926.00	0.324	0.144	1.138
926.50	0.401	0.181	1.319
927.50	0.566	0.484	1.803
928.00	0.619	0.296	2.099
930.00	0.787	1.406	3.505

Device	Routing	Invert	Outlet Devices
#1	Primary	926.50'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.50' / 926.00' S= 0.0172 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	925.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=4.30 cfs @ 12.59 hrs HW=927.50' TW=924.96' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.30 cfs @ 3.41 fps)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**3=Culvert** (Passes 4.30 cfs of 8.53 cfs potential flow)

Pond 43P: Proposed East Central Pond



Summary for Pond 50P: Wetland 4B

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth = 0.66" for 2-year event
Inflow = 21.86 cfs @ 12.39 hrs, Volume= 2.164 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 940.27' @ 200.00 hrs Surf.Area= 80,972 sf Storage= 94,258 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

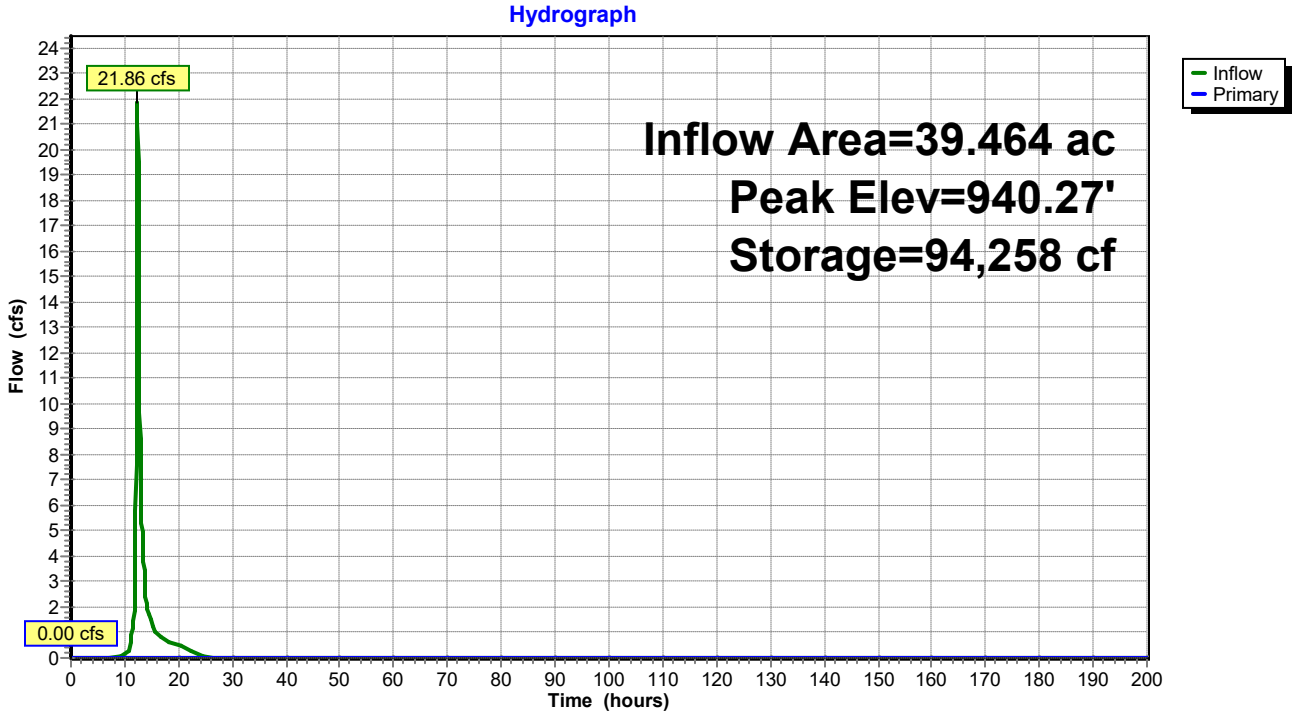
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	303,458 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
938.00	4,444	0	0
940.00	69,653	74,097	74,097
941.00	111,935	90,794	164,891
942.00	165,198	138,567	303,458

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=938.00' TW=923.90' (Dynamic Tailwater)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth > 16.77" for 2-year event
Inflow = 12.04 cfs @ 12.13 hrs, Volume= 5.255 af
Outflow = 7.32 cfs @ 12.25 hrs, Volume= 5.041 af, Atten= 39%, Lag= 6.8 min
Primary = 7.32 cfs @ 12.25 hrs, Volume= 5.041 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 938.67' @ 12.25 hrs Surf.Area= 11,311 sf Storage= 11,075 cf

Plug-Flow detention time= 163.1 min calculated for 5.040 af (96% of inflow)
Center-of-Mass det. time= 34.3 min (1,386.0 - 1,351.7)

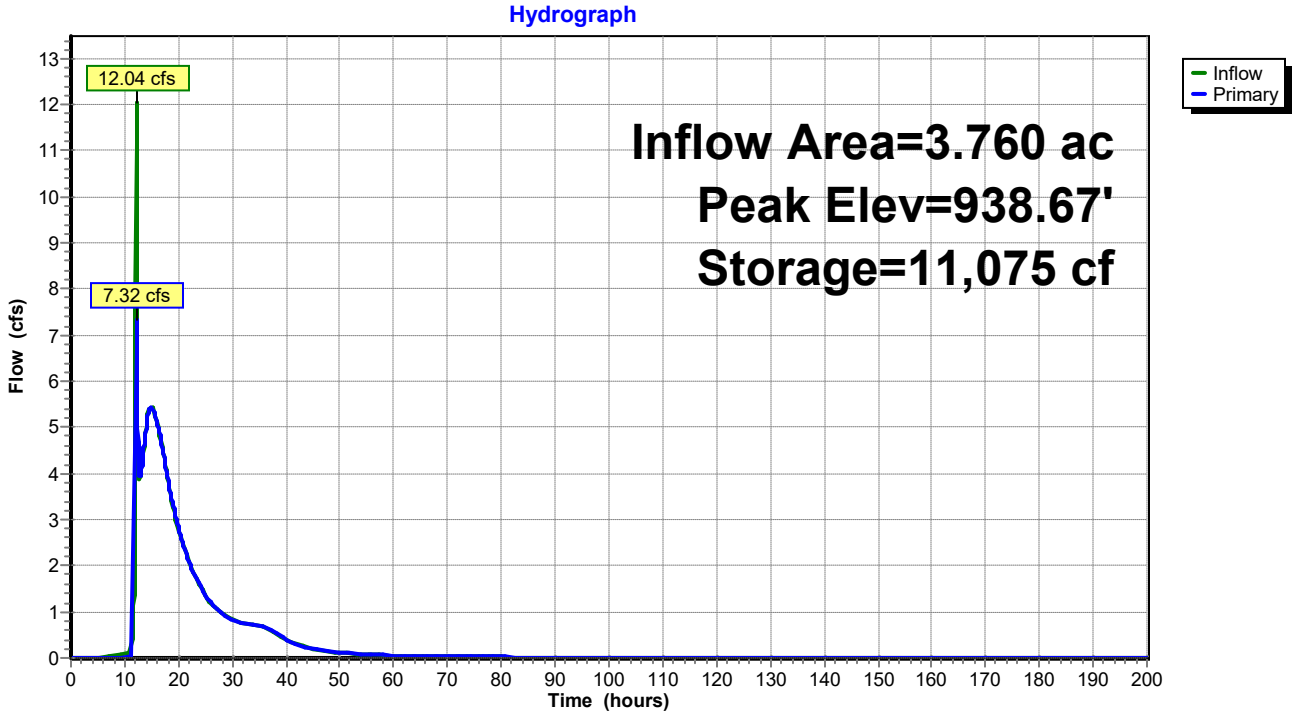
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	15,364 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
936.00	178	0	0
938.00	5,354	5,532	5,532
939.00	14,309	9,832	15,364

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=7.29 cfs @ 12.25 hrs HW=938.66' TW=924.52' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 7.29 cfs @ 1.30 fps)

Pond 60P: Wetland 5B



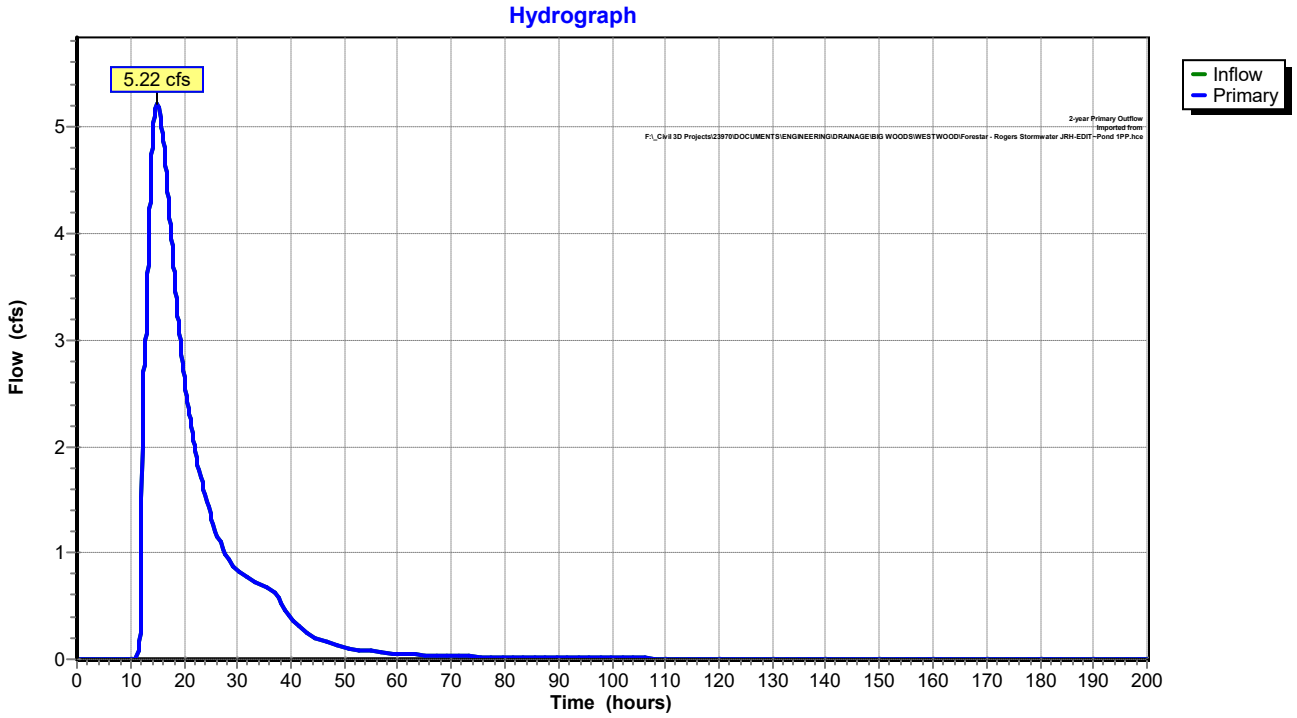
Summary for Link 1PP: Northwest Wetland

Inflow = 5.22 cfs @ 15.04 hrs, Volume= 4.759 af
Primary = 5.22 cfs @ 15.04 hrs, Volume= 4.759 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

2-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG WC

Link 1PP: Northwest Wetland



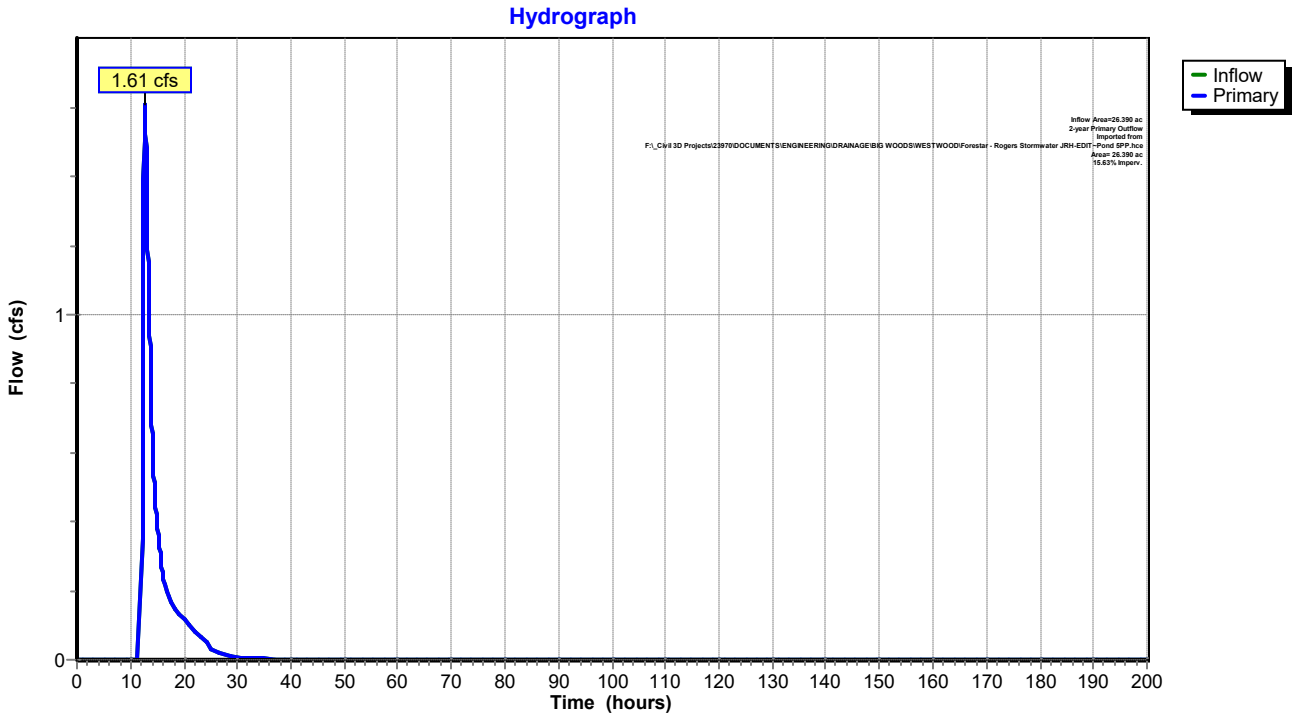
Summary for Link 5PP: Existing Pond

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth = 0.15" for 2-year event
Inflow = 1.61 cfs @ 12.68 hrs, Volume= 0.329 af
Primary = 1.61 cfs @ 12.68 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

2-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG WC

Link 5PP: Existing Pond



Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth=1.65"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min CN=72/0 Runoff=458.46 cfs 41.126 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=19.438 ac 21.11% Impervious Runoff Depth=3.05"
Flow Length=1,602' Tc=23.6 min CN=86/98 Runoff=58.41 cfs 4.932 af

Subcatchment 11S: Direct to Cowley Lake Runoff Area=6.152 ac 3.35% Impervious Runoff Depth=2.56"
Flow Length=1,308' Tc=15.2 min CN=83/98 Runoff=19.94 cfs 1.314 af

Subcatchment 12S: Fugitve to Fox Creek Runoff Area=0.547 ac 45.16% Impervious Runoff Depth=3.06"
Flow Length=165' Tc=8.1 min CN=80/98 Runoff=2.54 cfs 0.139 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=3.970 ac 7.66% Impervious Runoff Depth=2.32"
Flow Length=310' Tc=10.9 min CN=79/98 Runoff=13.33 cfs 0.767 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.782 ac 1.28% Impervious Runoff Depth=2.20"
Flow Length=392' Tc=17.3 min CN=79/98 Runoff=2.06 cfs 0.143 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=3.027 ac 10.37% Impervious Runoff Depth=2.37"
Flow Length=309' Tc=17.0 min CN=79/98 Runoff=8.50 cfs 0.597 af

Subcatchment 23S: Direct to Proposed Runoff Area=3.385 ac 0.68% Impervious Runoff Depth=2.35"
Flow Length=243' Tc=13.3 min CN=81/98 Runoff=10.81 cfs 0.664 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=7.873 ac 5.31% Impervious Runoff Depth=2.43"
Flow Length=407' Tc=11.1 min CN=81/98 Runoff=27.67 cfs 1.595 af

Subcatchment 25S: Direct to Proposed Runoff Area=15.059 ac 29.82% Impervious Runoff Depth=2.84"
Flow Length=1,817' Tc=17.1 min CN=81/98 Runoff=49.08 cfs 3.569 af

Subcatchment 26S: Direct to Proposed Runoff Area=4.398 ac 38.38% Impervious Runoff Depth=2.99"
Flow Length=621' Tc=8.6 min CN=81/98 Runoff=19.77 cfs 1.095 af

Subcatchment 27S: Direct to Proposed Runoff Area=3.120 ac 47.02% Impervious Runoff Depth=3.22"
Flow Length=621' Tc=8.6 min CN=83/98 Runoff=14.95 cfs 0.838 af

Subcatchment 28S: Direct to Proposed Runoff Area=7.153 ac 50.64% Impervious Runoff Depth=3.24"
Flow Length=1,013' Tc=14.4 min CN=82/98 Runoff=28.04 cfs 1.929 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=34.136 ac 8.50% Impervious Runoff Depth=2.56"
Flow Length=1,249' Tc=23.4 min CN=82/98 Runoff=88.46 cfs 7.290 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth=2.06"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min CN=74/98 Runoff=29.68 cfs 3.430 af

Subcatchment 32S: Direct to Proposed Runoff Area=3.686 ac 36.52% Impervious Runoff Depth=3.07"
Flow Length=440' Slope=0.0200 '/' Tc=7.1 min CN=83/98 Runoff=18.09 cfs 0.942 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=67.435 ac 2.92% Impervious Runoff Depth=3.00"
Flow Length=1,354' Tc=23.6 min CN=88/98 Runoff=203.62 cfs 16.869 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=2.50"
Flow Length=1,032' Tc=10.2 min CN=80/98 Runoff=50.10 cfs 2.852 af

Subcatchment 42S: Direct to Proposed Runoff Area=2.612 ac 32.54% Impervious Runoff Depth=2.83"
Flow Length=422' Tc=10.2 min CN=80/98 Runoff=10.46 cfs 0.617 af

Subcatchment 43S: Direct to Proposed Runoff Area=6.873 ac 41.00% Impervious Runoff Depth=3.08"
Flow Length=1,173' Tc=14.8 min CN=82/98 Runoff=25.57 cfs 1.765 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth=2.95"
Flow Length=734' Tc=26.4 min CN=87/98 Runoff=36.48 cfs 3.216 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=2.80"
Flow Length=531' Tc=5.6 min CN=82/98 Runoff=17.92 cfs 0.876 af

Reach 1R: Cowley Lake Outlet Channel Inflow=20.37 cfs 6.247 af
Outflow=20.37 cfs 6.247 af

Reach 2R: Cowley Lake Inflow=102.35 cfs 51.273 af
Outflow=102.35 cfs 51.273 af

Reach 21R: Proposed East Channel Avg. Flow Depth=0.97' Max Vel=5.52 fps Inflow=31.50 cfs 28.561 af
n=0.022 L=264.0' S=0.0125 '/' Capacity=149.23 cfs Outflow=31.50 cfs 28.561 af

Reach 23R: Existing West Channel Avg. Flow Depth=1.13' Max Vel=3.45 fps Inflow=40.88 cfs 16.184 af
n=0.022 L=251.0' S=0.0037 '/' Capacity=321.50 cfs Outflow=40.96 cfs 16.184 af

Pond 7P: Whiteford Lake and Wetlands Peak Elev=930.67' Storage=41.126 af Inflow=458.46 cfs 41.126 af
Outflow=0.00 cfs 0.000 af

Pond 10P: Proposed Northeast Peak Elev=922.92' Storage=5.677 af Inflow=58.41 cfs 4.932 af
Outflow=11.44 cfs 4.932 af

Pond 25P: Proposed Northwest Peak Elev=926.83' Storage=3.461 af Inflow=49.08 cfs 3.569 af
Outflow=3.59 cfs 3.569 af

Pond 26P: Proposed Northwest Central Peak Elev=925.37' Storage=2.103 af Inflow=21.83 cfs 1.930 af
Outflow=0.37 cfs 1.930 af

Pond 27P: Proposed Northwest Central Peak Elev=925.66' Storage=1.147 af Inflow=14.95 cfs 0.838 af
Outflow=3.32 cfs 0.835 af

Pond 28P: Proposed Northeast Central Peak Elev=923.13' Storage=1.589 af Inflow=28.04 cfs 1.929 af
Outflow=12.31 cfs 1.929 af

Pond 30P: Wetland 4A Peak Elev=926.28' Storage=4.311 af Inflow=111.13 cfs 11.661 af
Primary=25.52 cfs 8.706 af Secondary=3.17 cfs 2.955 af Outflow=28.68 cfs 11.661 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=933.39' Storage=0.381 af Inflow=29.68 cfs 3.430 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=20.21 cfs 3.430 af

Pond 32P: Proposed West Central Pond Peak Elev=928.64' Storage=1.500 af Inflow=18.09 cfs 0.942 af
Outflow=8.21 cfs 0.942 af

Pond 40P: Wetland 2B Peak Elev=925.64' Storage=11.791 af Inflow=224.73 cfs 28.418 af
60.0" x 36.0" Box Culvert n=0.013 L=138.0' S=0.0029 '/' Outflow=31.35 cfs 28.418 af

Pond 41P: Ex South Off-site Pond Peak Elev=940.11' Storage=2.852 af Inflow=50.10 cfs 2.852 af
Outflow=0.00 cfs 0.000 af

Pond 42P: Proposed South Central Pond Peak Elev=929.60' Storage=0.532 af Inflow=10.46 cfs 0.617 af
Outflow=4.06 cfs 0.616 af

Pond 43P: Proposed East Central Pond Peak Elev=928.01' Storage=2.107 af Inflow=25.57 cfs 1.765 af
Outflow=7.43 cfs 1.763 af

Pond 50P: Wetland 4B Peak Elev=941.05' Storage=170,853 cf Inflow=40.73 cfs 3.922 af
Outflow=0.00 cfs 0.000 af

Pond 60P: Wetland 5B Peak Elev=938.81' Storage=12,745 cf Inflow=21.34 cfs 9.384 af
Outflow=19.91 cfs 9.170 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=9.88 cfs 8.508 af
Primary=9.88 cfs 8.508 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=4.82 cfs 0.706 af
Area= 26.390 ac 15.63% Imperv. Primary=4.82 cfs 0.706 af

Total Runoff Area = 540.193 ac Runoff Volume = 96.566 af Average Runoff Depth = 2.15"
93.94% Pervious = 507.441 ac 6.06% Impervious = 32.752 ac

Summary for Subcatchment 7S: Approx DA to Lake

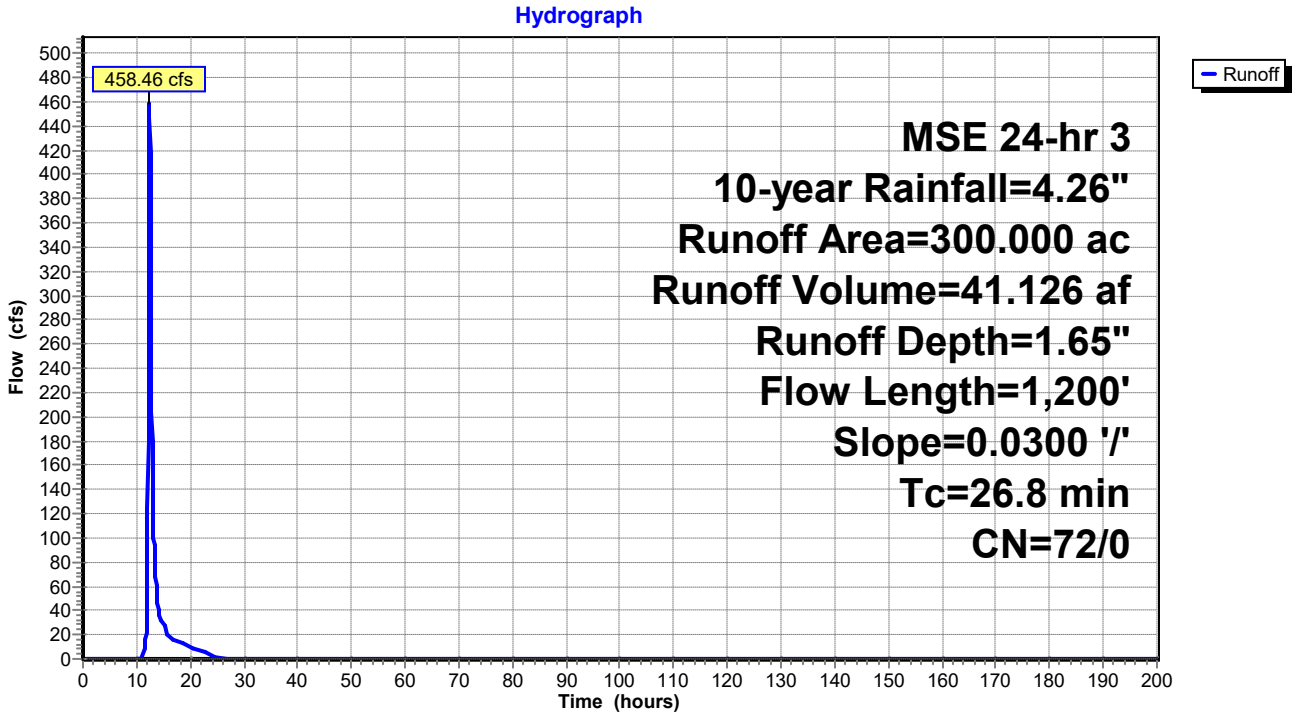
Runoff = 458.46 cfs @ 12.40 hrs, Volume= 41.126 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
300.000	72	Woods/grass comb., Good, HSG C
300.000	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

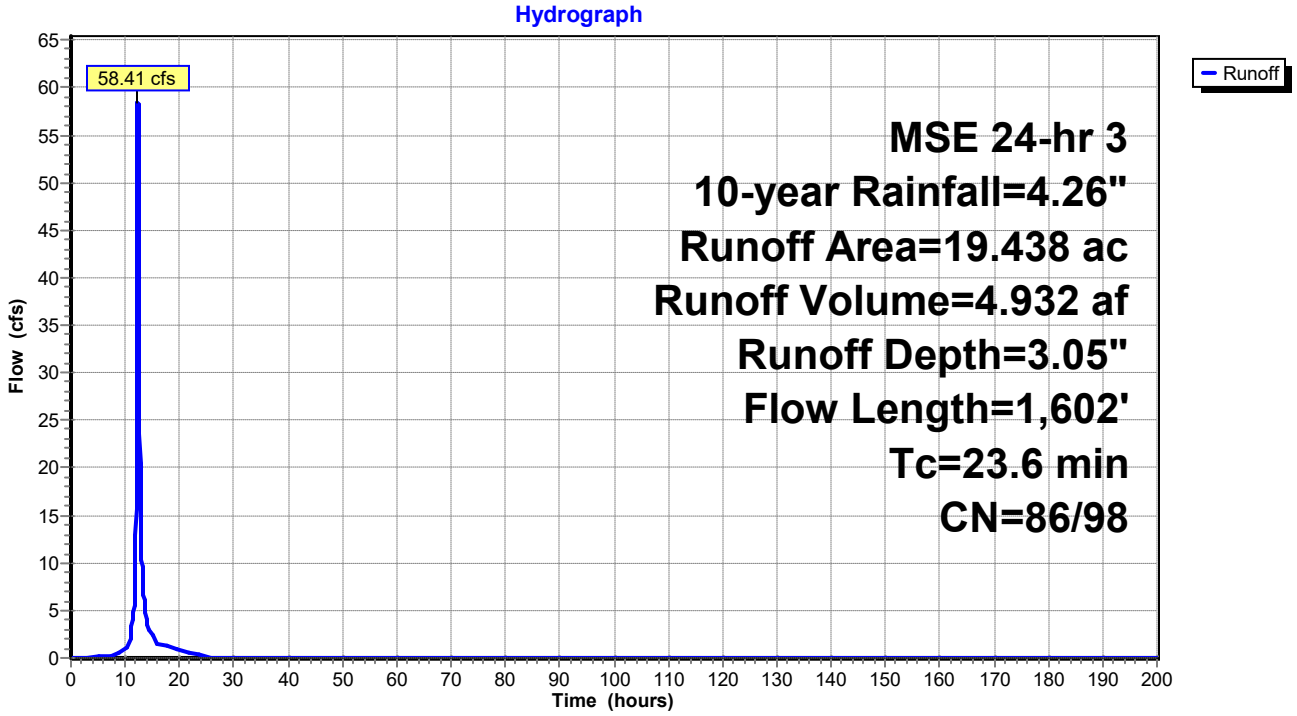
Runoff = 58.41 cfs @ 12.34 hrs, Volume= 4.932 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.399	98	Unconnected pavement, HSG D
1.088	98	Unconnected roofs, HSG D
1.617	98	Paved roads w/curbs & sewers, HSG D
0.606	98	Paved parking, HSG D
0.393	98	Roofs, HSG D
0.699	98	Water Surface, 0% imp, HSG D
8.527	89	Row crops, straight row, Good, HSG D
4.972	80	>75% Grass cover, Good, HSG D
1.137	78	Meadow, non-grazed, HSG D
19.438	88	Weighted Average
15.335	86	78.89% Pervious Area
4.103	98	21.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
14.6	842	0.0114	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.7	660		3.00		**Direct Entry, Pipe flow @ 3 fps**
23.6	1,602	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 11S: Direct to Cowley Lake Outlet Channel

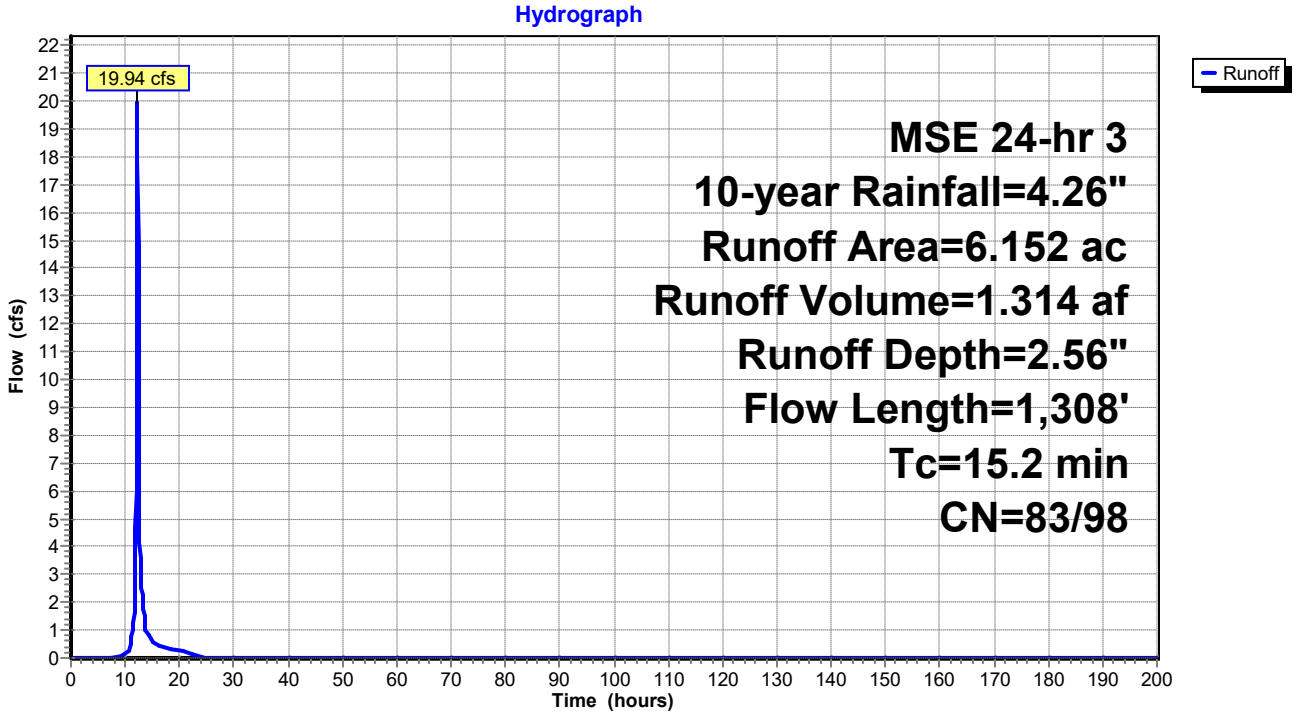
Runoff = 19.94 cfs @ 12.24 hrs, Volume= 1.314 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.024	98	Unconnected pavement, HSG D
0.182	98	Unconnected roofs, HSG D
1.316	98	Water Surface, 0% imp, HSG D
1.199	80	>75% Grass cover, Good, HSG D
2.901	78	Meadow, non-grazed, HSG D
0.530	77	Woods, Good, HSG D
6.152	83	Weighted Average
5.946	83	96.65% Pervious Area
0.206	98	3.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.8	114	0.0263	2.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	1,094	0.0024	3.27	46.64	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=1.50' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
15.2	1,308	Total			

Subcatchment 11S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 12S: Fugitve to Fox Creek West 5th Addition

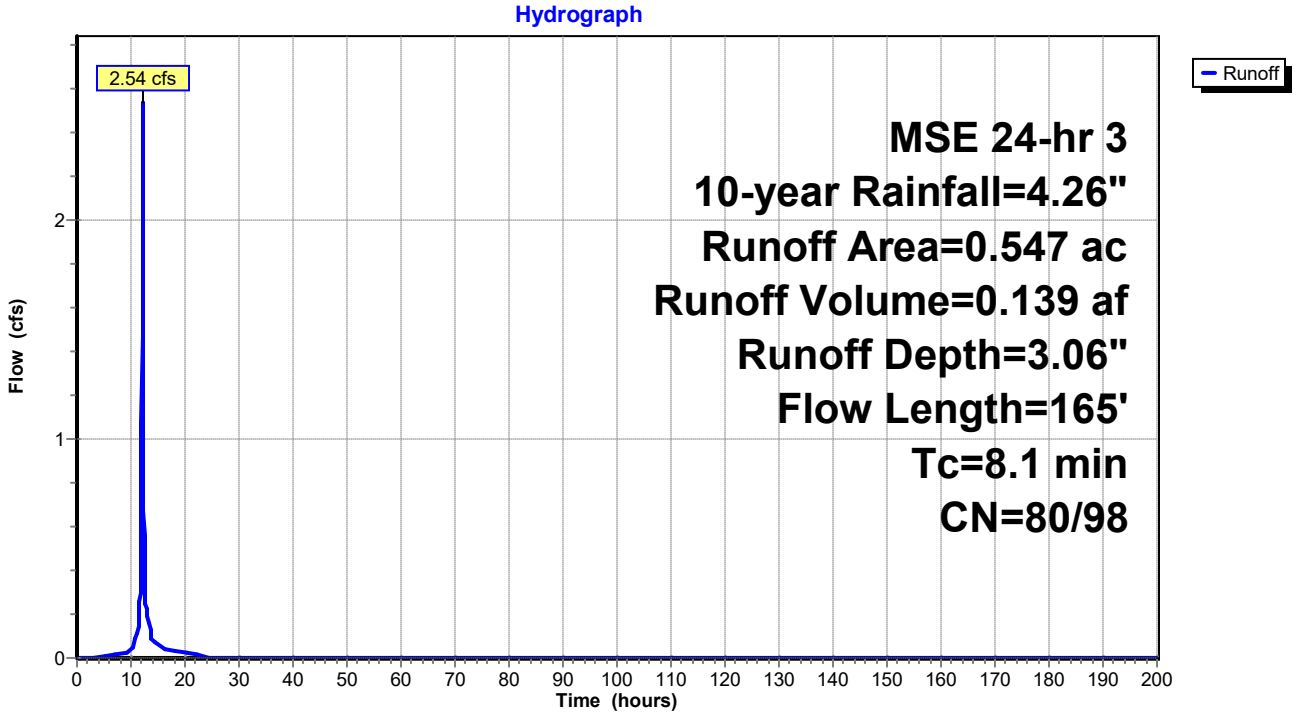
Runoff = 2.54 cfs @ 12.15 hrs, Volume= 0.139 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.015	98	Unconnected pavement, HSG D
0.043	98	Unconnected roofs, HSG D
0.104	98	Paved roads w/curbs & sewers, HSG D
0.051	98	Paved parking, HSG D
0.034	98	Roofs, HSG D
0.300	80	>75% Grass cover, Good, HSG D
0.547	88	Weighted Average
0.300	80	54.84% Pervious Area
0.247	98	45.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0440	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.3	40	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	25	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	165	Total			

Subcatchment 12S: Fugitve to Fox Creek West 5th Addition



Summary for Subcatchment 20S: Direct to Cowley Lake

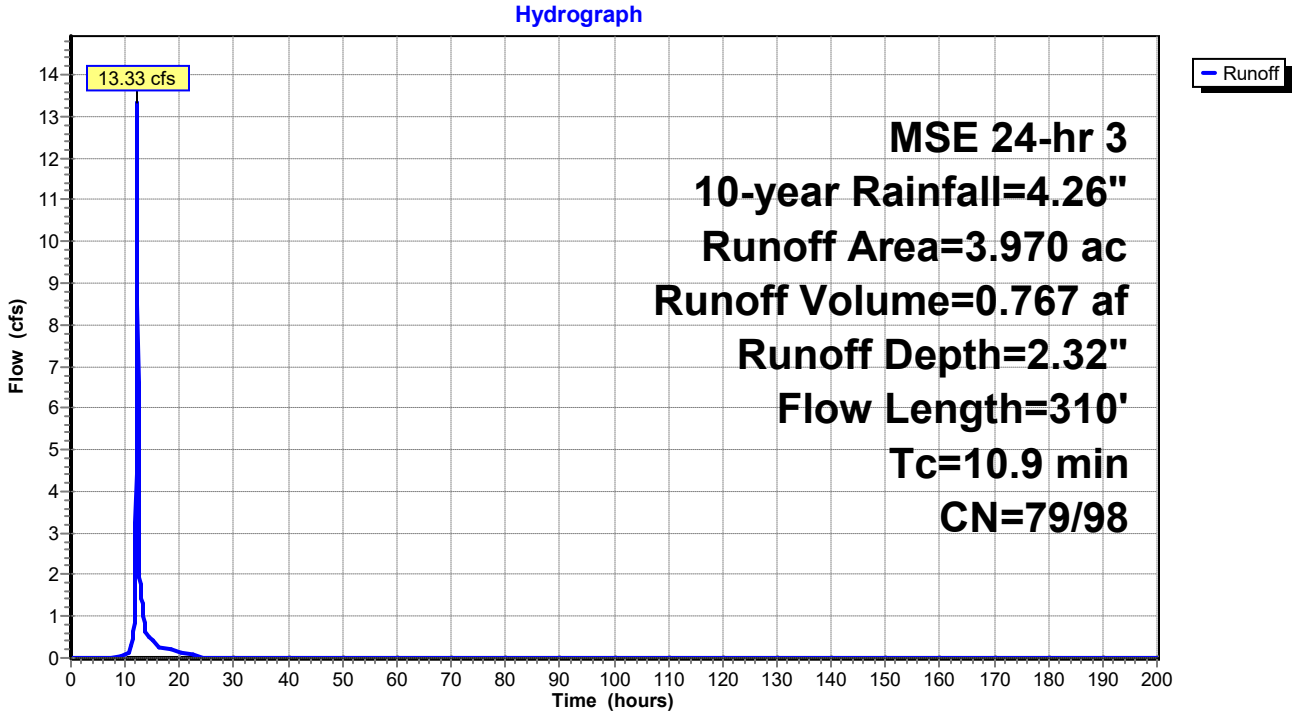
Runoff = 13.33 cfs @ 12.19 hrs, Volume= 0.767 af, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.046	98	Unconnected pavement, HSG D
0.258	98	Unconnected roofs, HSG D
0.122	98	Water Surface, 0% imp, HSG D
0.949	80	>75% Grass cover, Good, HSG D
1.018	78	Meadow, non-grazed, HSG D
1.577	77	Woods, Good, HSG D
3.970	80	Weighted Average
3.666	79	92.34% Pervious Area
0.304	98	7.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0270	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	72	0.0347	2.79		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.3	138	0.0667	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	310	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

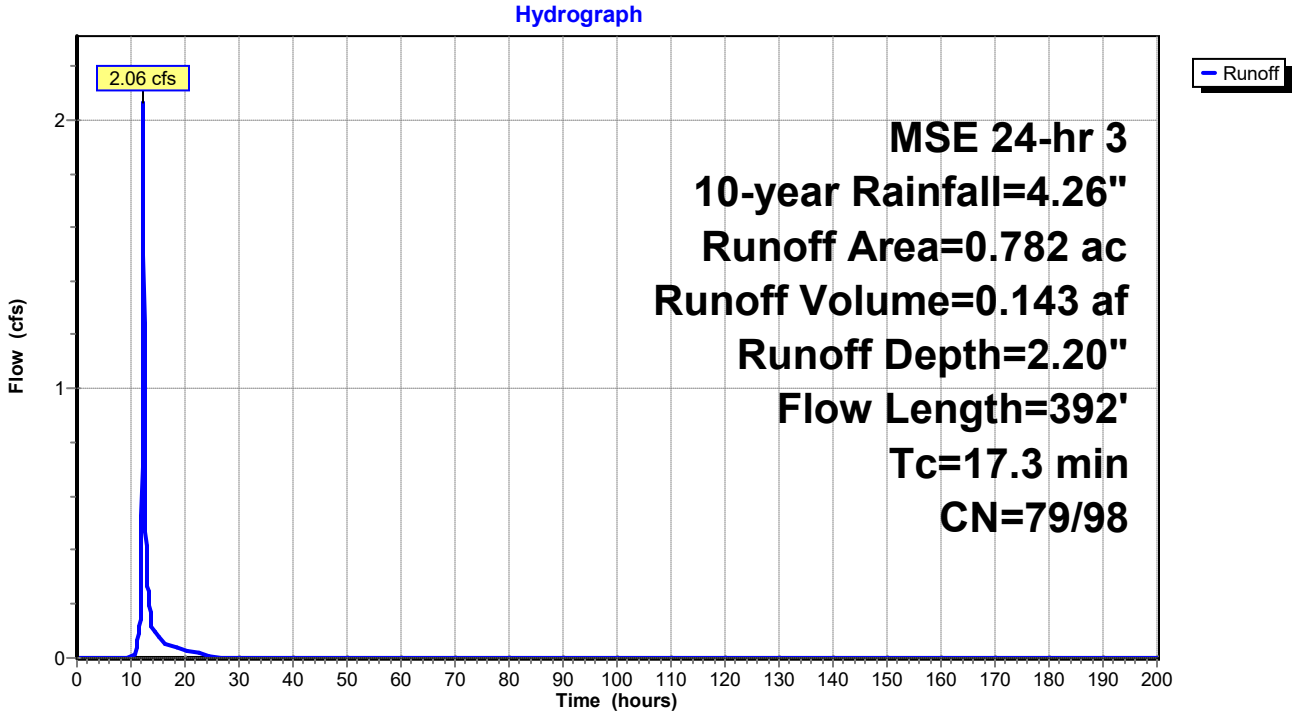
Runoff = 2.06 cfs @ 12.27 hrs, Volume= 0.143 af, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.010	98	Unconnected pavement, HSG D
0.054	98	Water Surface, 0% imp, HSG D
0.016	80	>75% Grass cover, Good, HSG D
0.162	78	Meadow, non-grazed, HSG D
0.540	77	Woods, Good, HSG D
0.782	79	Weighted Average
0.772	79	98.72% Pervious Area
0.010	98	1.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.8	100	0.0590	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.3	146	0.0452	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	146	0.0164	10.55	221.46	**Channel Flow,** Area= 21.0 sf Perim= 15.6' r= 1.35' n= 0.022 Earth, clean & straight
17.3	392	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

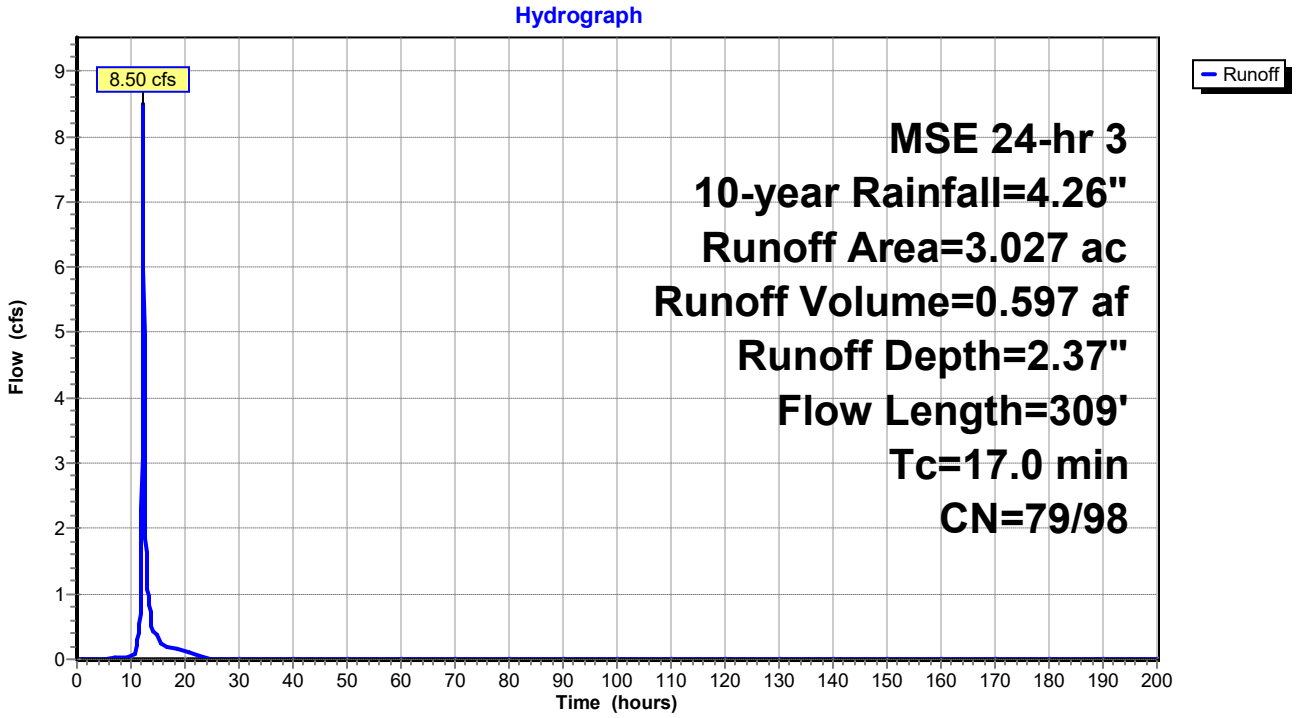
Runoff = 8.50 cfs @ 12.26 hrs, Volume= 0.597 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.125	98	Unconnected pavement, HSG D
0.189	98	Unconnected roofs, HSG D
0.031	98	Water Surface, 0% imp, HSG D
0.779	80	>75% Grass cover, Good, HSG D
1.348	78	Meadow, non-grazed, HSG D
0.555	77	Woods, Good, HSG D
3.027	81	Weighted Average
2.713	79	89.63% Pervious Area
0.314	98	10.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0220	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
2.4	209	0.0445	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.0	309	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Proposed West Channel

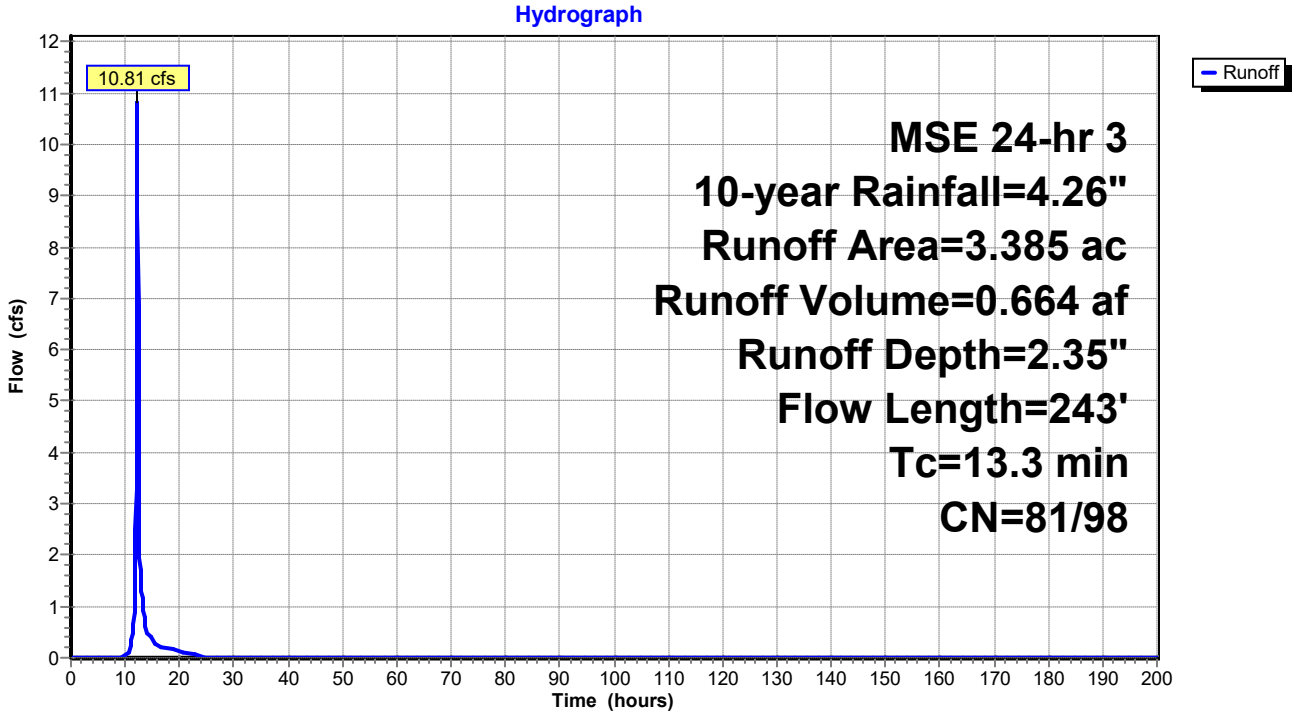
Runoff = 10.81 cfs @ 12.22 hrs, Volume= 0.664 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.023	98	Unconnected pavement, HSG D
0.467	98	Water Surface, 0% imp, HSG D
0.253	80	>75% Grass cover, Good, HSG D
1.225	78	Meadow, non-grazed, HSG D
1.417	77	Woods, Good, HSG D
3.385	81	Weighted Average
3.362	81	99.32% Pervious Area
0.023	98	0.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0520	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
3.0	143	0.0259	0.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	243	Total			

Subcatchment 23S: Direct to Proposed West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

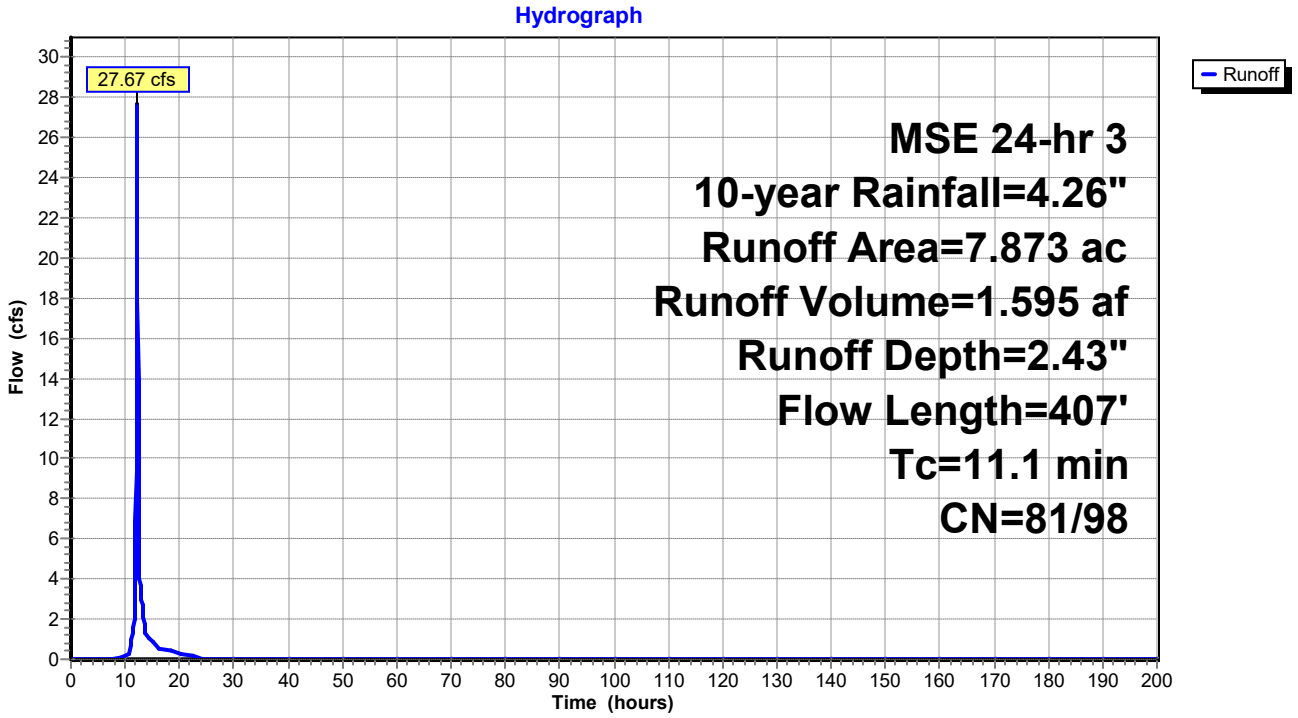
Runoff = 27.67 cfs @ 12.19 hrs, Volume= 1.595 af, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.039	98	Unconnected pavement, HSG D
0.379	98	Unconnected roofs, HSG D
0.980	98	Water Surface, 0% imp, HSG D
1.643	80	>75% Grass cover, Good, HSG D
2.538	78	Meadow, non-grazed, HSG D
2.294	77	Woods, Good, HSG D
7.873	82	Weighted Average
7.455	81	94.69% Pervious Area
0.418	98	5.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0600	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
4.4	307	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	407	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 25S: Direct to Proposed Northwest Pond

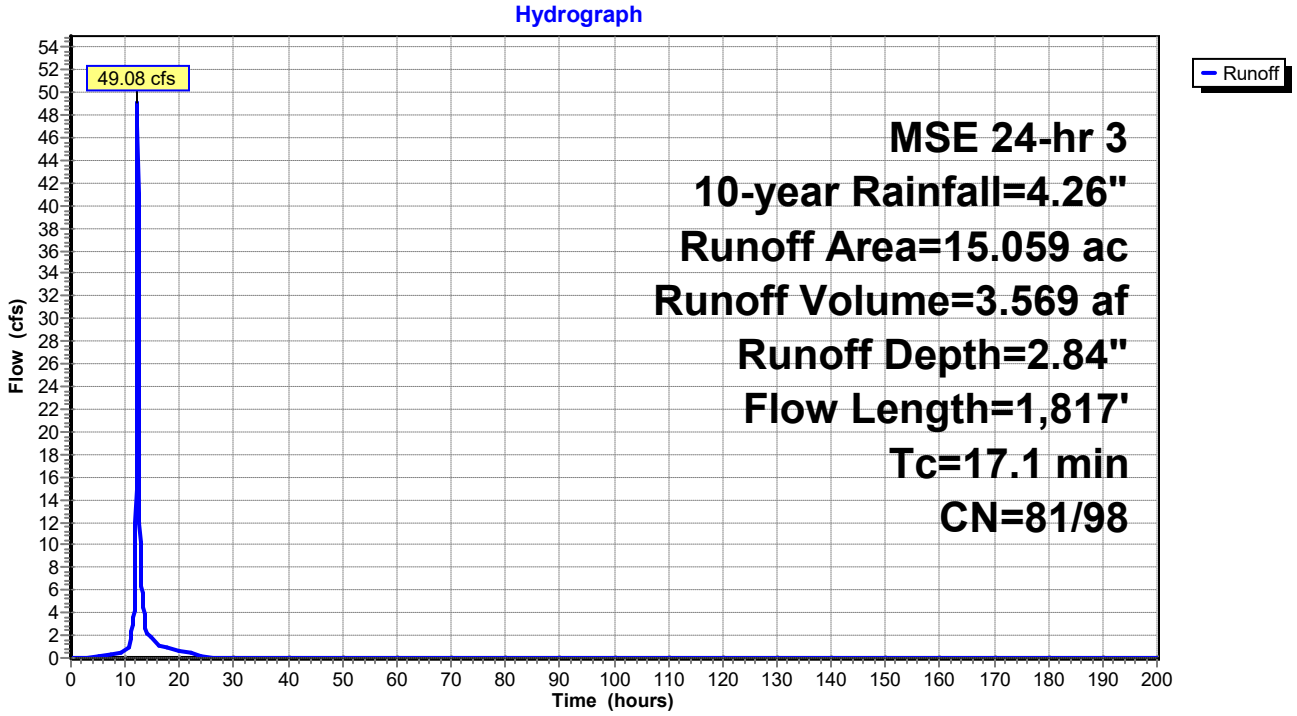
Runoff = 49.08 cfs @ 12.26 hrs, Volume= 3.569 af, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.652	98	Unconnected pavement, HSG D
1.214	98	Unconnected roofs, HSG D
1.443	98	Paved roads w/curbs & sewers, HSG D
0.758	98	Paved parking, HSG D
0.424	98	Roofs, HSG D
0.322	98	Water Surface, 0% imp, HSG D
0.084	96	Gravel surface, HSG D
0.179	89	Row crops, straight row, Good, HSG D
8.582	80	>75% Grass cover, Good, HSG D
1.401	78	Meadow, non-grazed, HSG D
15.059	86	Weighted Average
10.568	81	70.18% Pervious Area
4.491	98	29.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	90	0.0378	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	57	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.3	1,670		3.00		**Direct Entry, Pipe flow @ 3 fps**
17.1	1,817	Total			

Subcatchment 25S: Direct to Proposed Northwest Pond



Summary for Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration

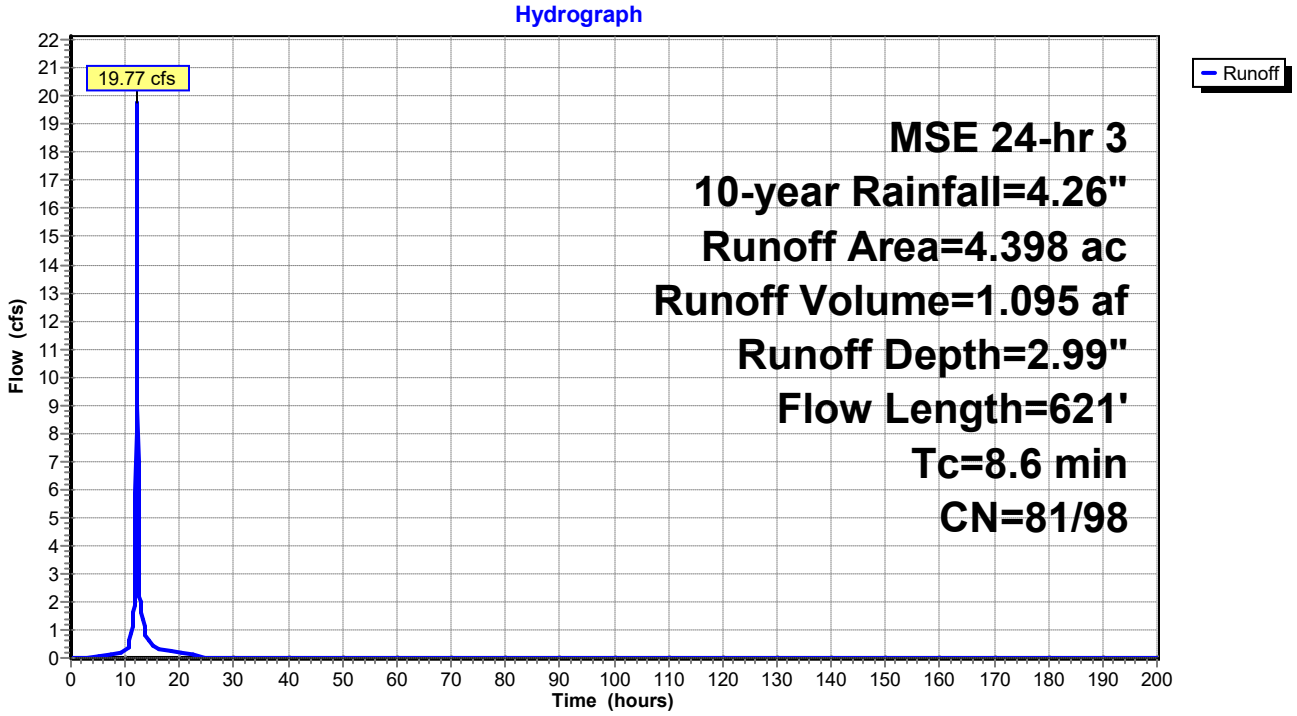
Runoff = 19.77 cfs @ 12.16 hrs, Volume= 1.095 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.170	98	Unconnected pavement, HSG D
0.393	98	Unconnected roofs, HSG D
0.551	98	Paved roads w/curbs & sewers, HSG D
0.354	98	Paved parking, HSG D
0.220	98	Roofs, HSG D
0.318	98	Water Surface, 0% imp, HSG D
1.487	80	>75% Grass cover, Good, HSG D
0.905	78	Meadow, non-grazed, HSG D
4.398	88	Weighted Average
2.710	81	61.62% Pervious Area
1.688	98	38.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration



Summary for Subcatchment 27S: Direct to Proposed Northwest Central Pond

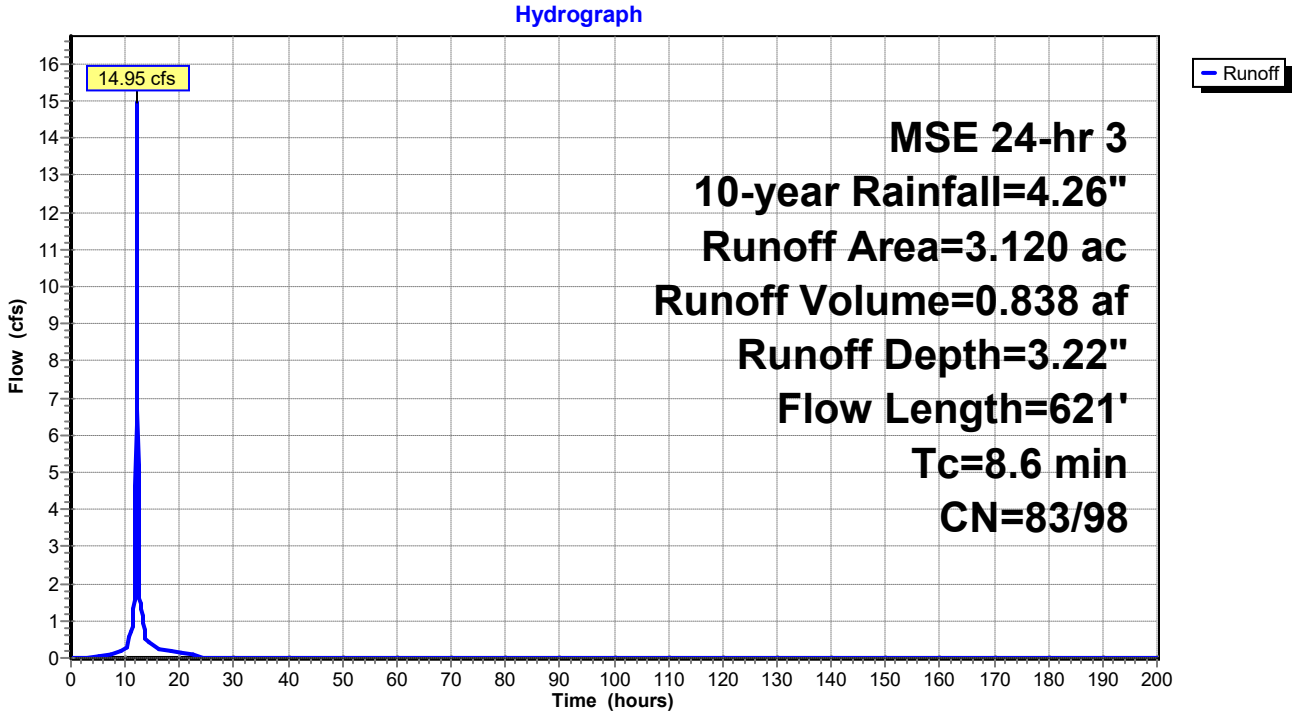
Runoff = 14.95 cfs @ 12.16 hrs, Volume= 0.838 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.134	98	Unconnected pavement, HSG D
0.275	98	Unconnected roofs, HSG D
0.506	98	Paved roads w/curbs & sewers, HSG D
0.328	98	Paved parking, HSG D
0.224	98	Roofs, HSG D
0.278	98	Water Surface, 0% imp, HSG D
0.979	80	>75% Grass cover, Good, HSG D
0.396	78	Meadow, non-grazed, HSG D
3.120	90	Weighted Average
1.653	83	52.98% Pervious Area
1.467	98	47.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 27S: Direct to Proposed Northwest Central Pond



Summary for Subcatchment 28S: Direct to Proposed Northeast Central Pond

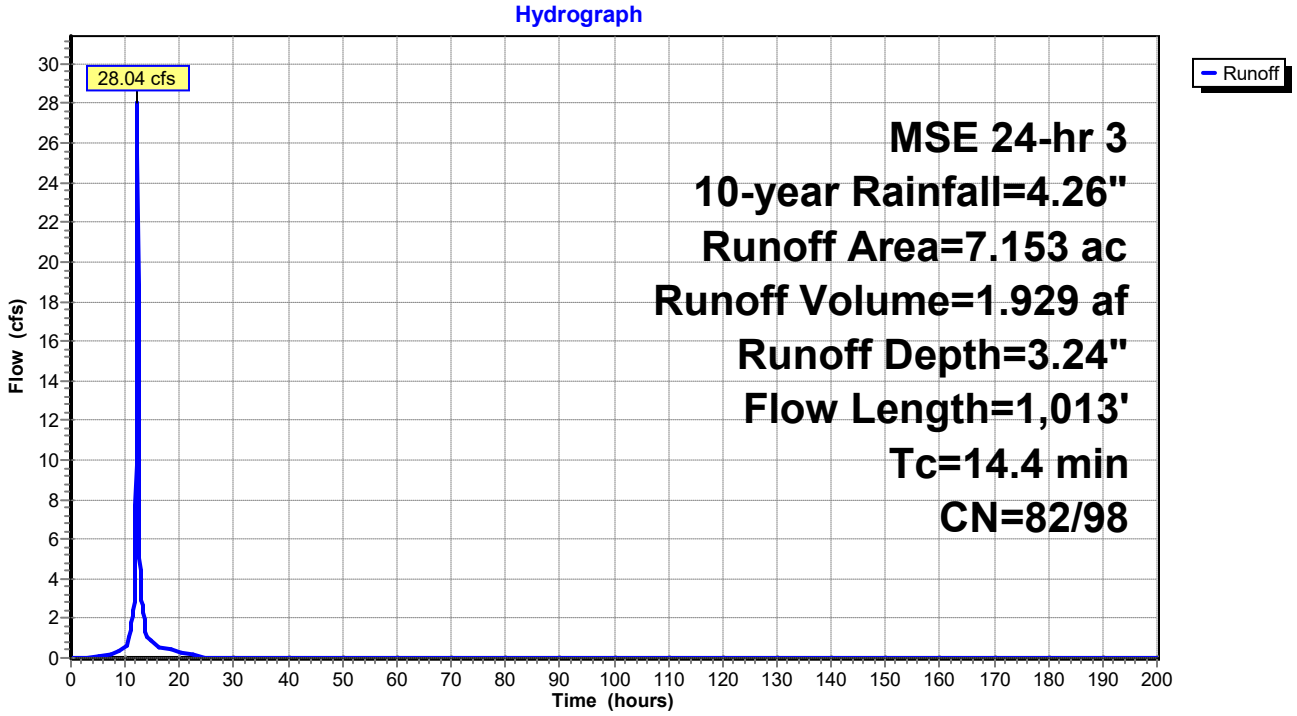
Runoff = 28.04 cfs @ 12.22 hrs, Volume= 1.929 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.152	98	Unconnected pavement, HSG D
0.932	98	Unconnected roofs, HSG D
0.930	98	Paved roads w/curbs & sewers, HSG D
1.004	98	Paved parking, HSG D
0.604	98	Roofs, HSG D
0.380	98	Water Surface, 0% imp, HSG D
2.416	80	>75% Grass cover, Good, HSG D
0.684	78	Meadow, non-grazed, HSG D
0.051	77	Woods, Good, HSG D
7.153	90	Weighted Average
3.531	82	49.36% Pervious Area
3.622	98	50.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	71	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.6	242	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	700		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.4	1,013	Total			

Subcatchment 28S: Direct to Proposed Northeast Central Pond



Summary for Subcatchment 30S: Direct to Wetland 4A

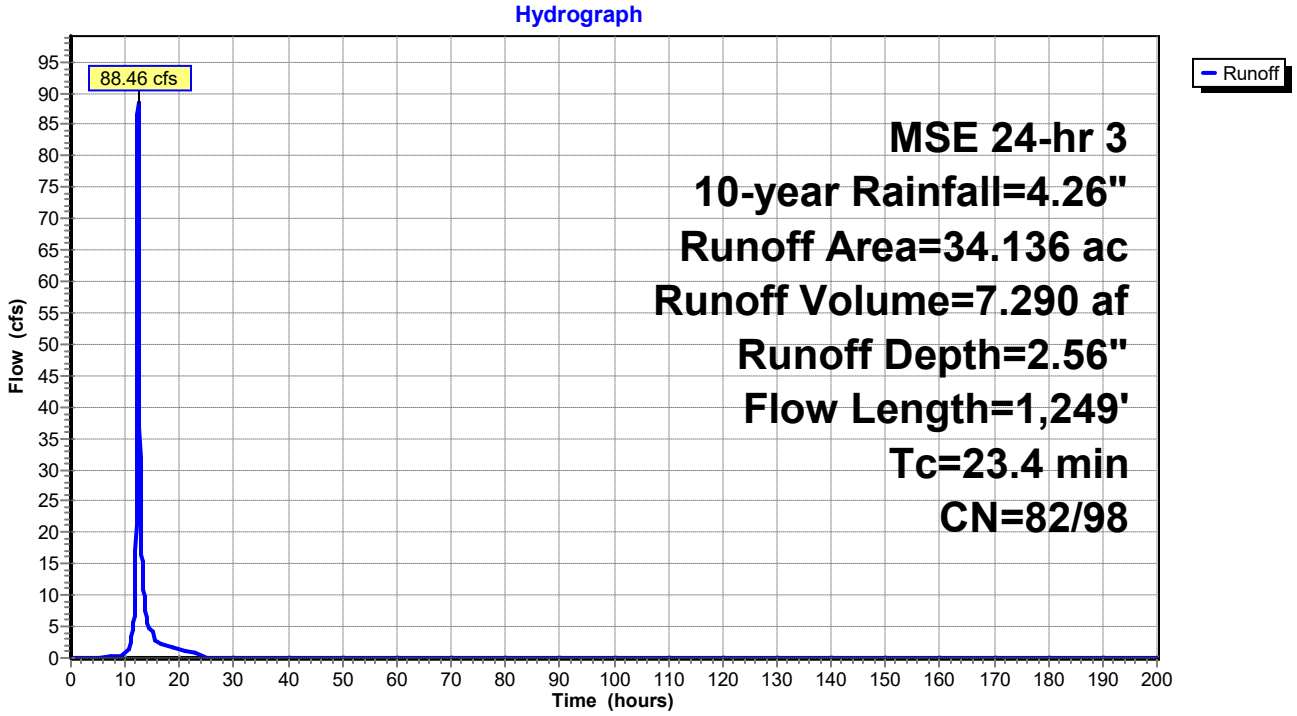
Runoff = 88.46 cfs @ 12.34 hrs, Volume= 7.290 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
1.401	98	Unconnected pavement, HSG D
1.502	98	Unconnected roofs, HSG D
0.939	96	Gravel surface, HSG D
6.512	89	Row crops, straight row, Good, HSG D
1.609	89	Pasture/grassland/range, Poor, HSG D
18.400	80	>75% Grass cover, Good, HSG D
3.773	77	Woods, Good, HSG D
34.136	84	Weighted Average
31.233	82	91.50% Pervious Area
2.903	98	8.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

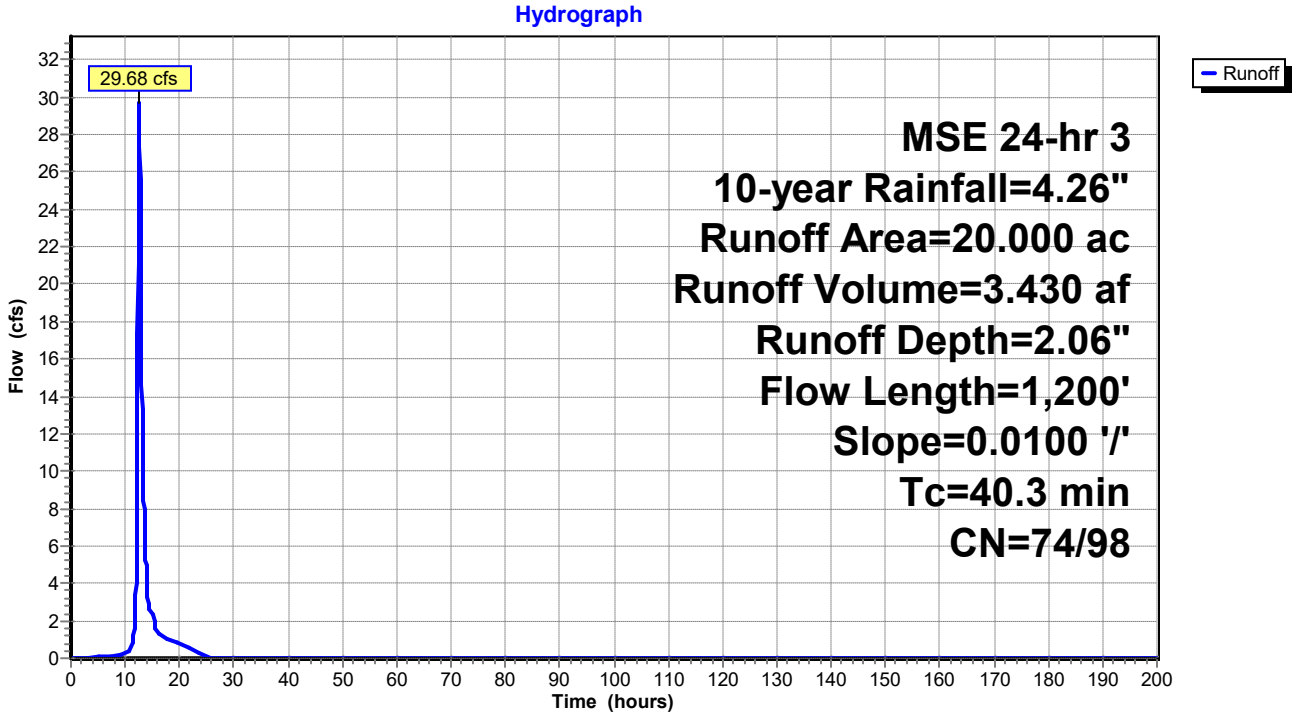
Runoff = 29.68 cfs @ 12.57 hrs, Volume= 3.430 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
20.000	77	2 acre lots, 12% imp, HSG C
17.600	74	88.00% Pervious Area
2.400	98	12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 32S: Direct to Proposed West Central Pond

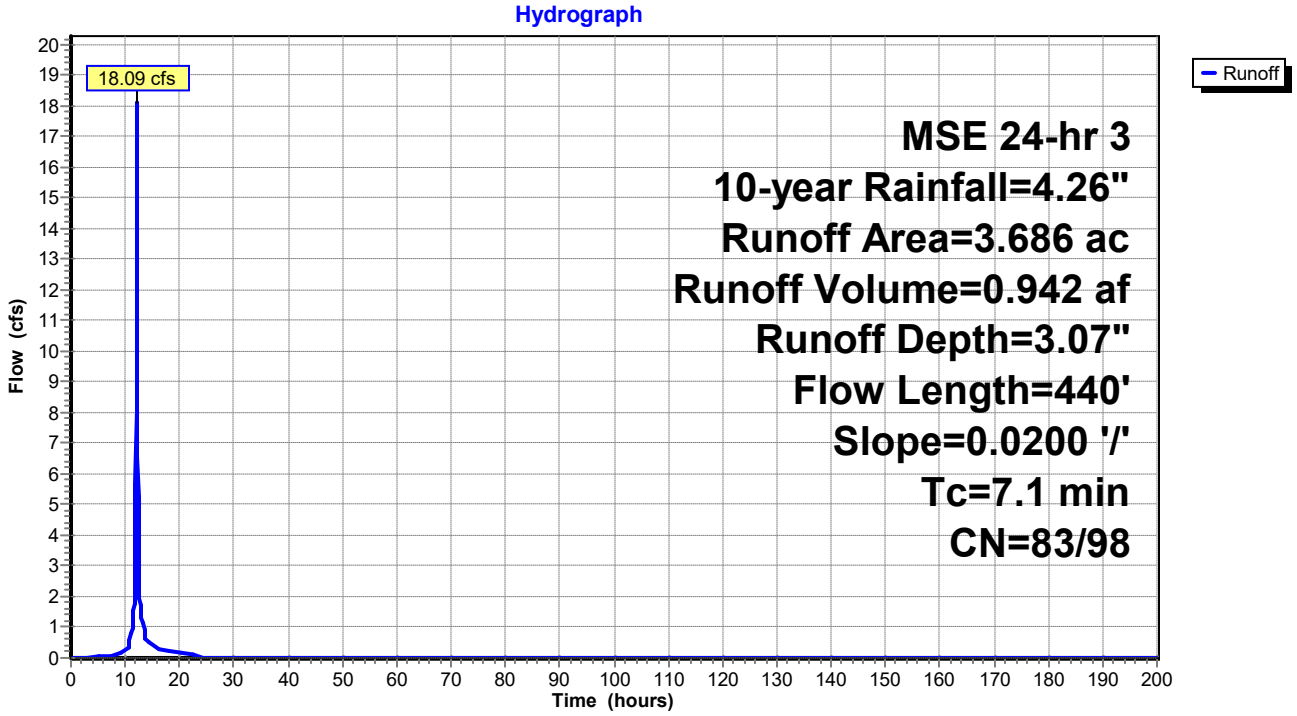
Runoff = 18.09 cfs @ 12.14 hrs, Volume= 0.942 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.039	98	Unconnected pavement, HSG D
0.438	98	Unconnected roofs, HSG D
0.377	98	Paved roads w/curbs & sewers, HSG D
0.298	98	Paved parking, HSG D
0.194	98	Roofs, HSG D
0.395	98	Water Surface, 0% imp, HSG D
1.443	80	>75% Grass cover, Good, HSG D
0.502	78	Meadow, non-grazed, HSG D
3.686	88	Weighted Average
2.340	83	63.48% Pervious Area
1.346	98	36.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.2	401		3.00		**Direct Entry,**
7.1	440	Total			

Subcatchment 32S: Direct to Proposed West Central Pond



Summary for Subcatchment 40S: Direct to Wetland 2B

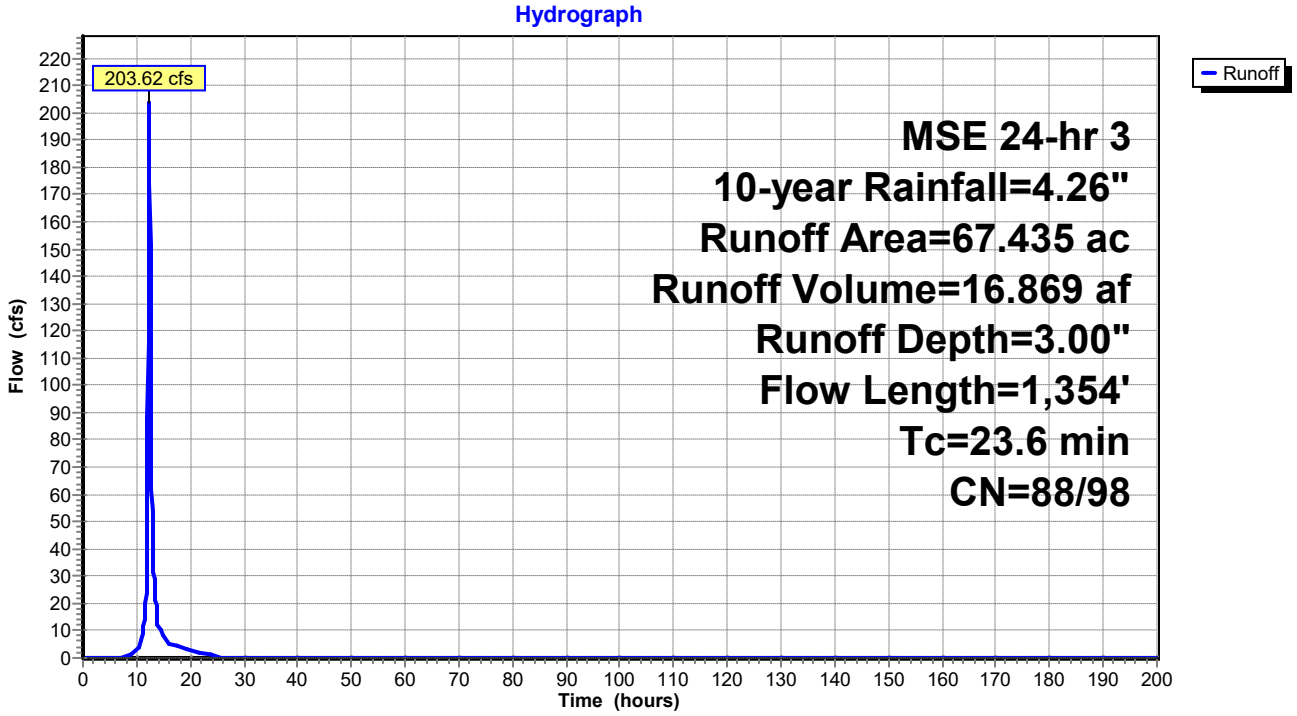
Runoff = 203.62 cfs @ 12.34 hrs, Volume= 16.869 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.965	98	Unconnected pavement, HSG D
1.003	98	Unconnected roofs, HSG D
17.214	98	Water Surface, 0% imp, HSG D
1.249	96	Gravel surface, HSG D
27.306	89	Row crops, straight row, Good, HSG D
0.208	89	Pasture/grassland/range, Poor, HSG D
9.713	80	>75% Grass cover, Good, HSG D
6.057	78	Meadow, non-grazed, HSG D
3.720	77	Woods, Good, HSG D
67.435	89	Weighted Average
65.467	88	97.08% Pervious Area
1.968	98	2.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

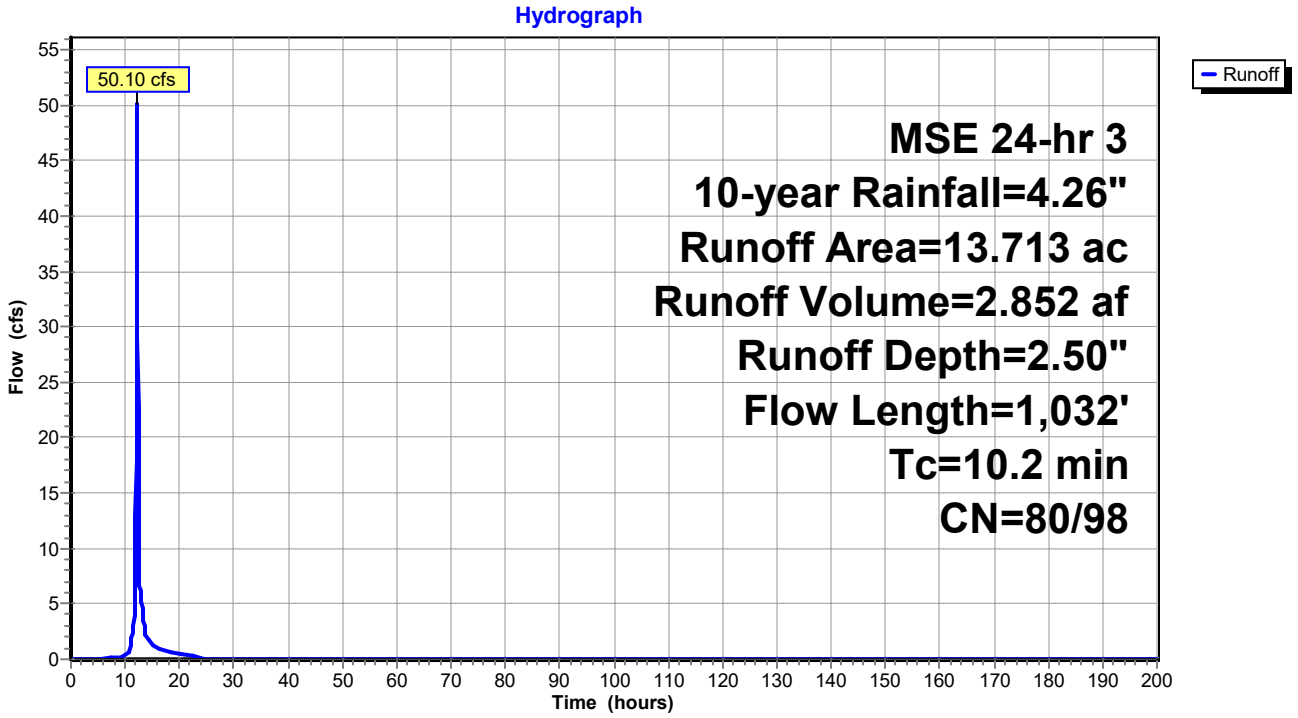
Runoff = 50.10 cfs @ 12.18 hrs, Volume= 2.852 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
1.568	98	Unconnected pavement, HSG D
0.273	98	Unconnected roofs, HSG D
0.107	98	Water Surface, 0% imp, HSG D
0.066	96	Gravel surface, HSG D
10.431	80	>75% Grass cover, Good, HSG D
1.268	78	Meadow, non-grazed, HSG D
13.713	82	Weighted Average
11.872	80	86.57% Pervious Area
1.841	98	13.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 42S: Direct to Proposed South Central Pond

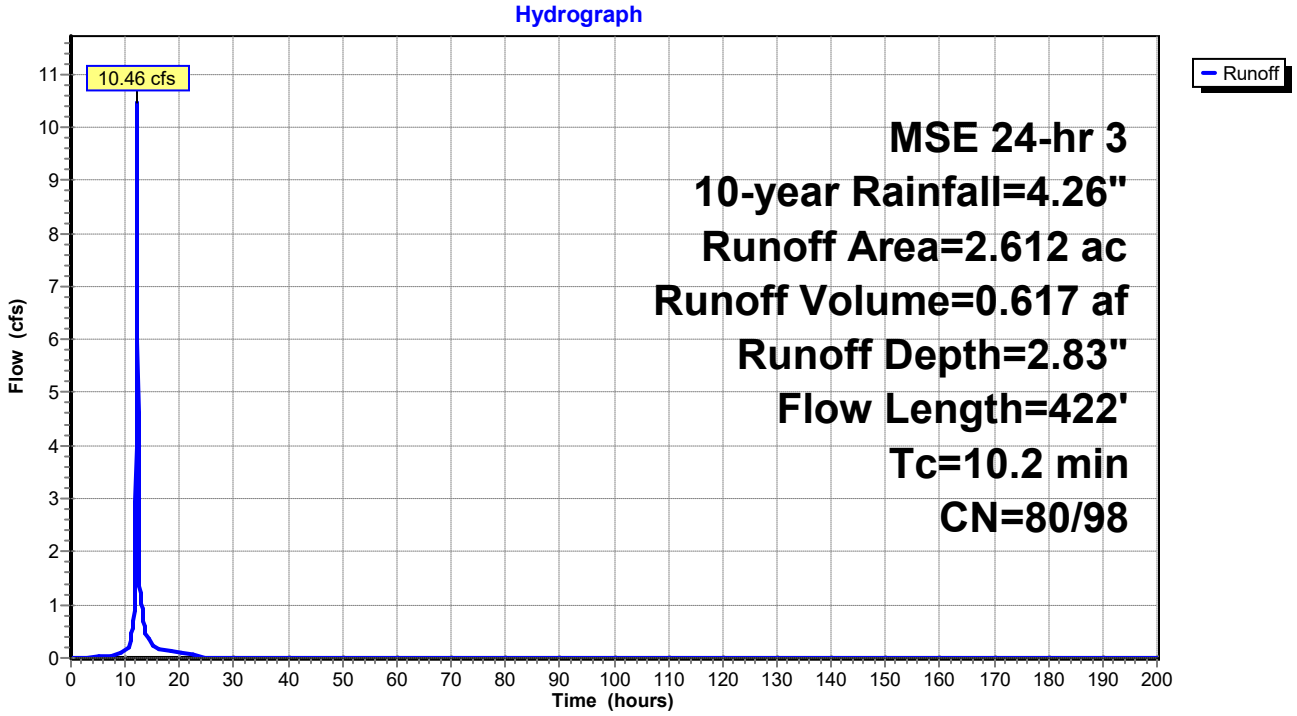
Runoff = 10.46 cfs @ 12.18 hrs, Volume= 0.617 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.013	98	Unconnected pavement, HSG D
0.362	98	Unconnected roofs, HSG D
0.246	98	Paved roads w/curbs & sewers, HSG D
0.145	98	Paved parking, HSG D
0.084	98	Roofs, HSG D
0.154	98	Water Surface, 0% imp, HSG D
0.600	80	>75% Grass cover, Good, HSG D
0.811	78	Meadow, non-grazed, HSG D
0.197	77	Woods, Good, HSG D
2.612	86	Weighted Average
1.762	80	67.46% Pervious Area
0.850	98	32.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.7	235	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	117		3.00		**Direct Entry, Pipe flow @ 3 fps**
10.2	422	Total			

Subcatchment 42S: Direct to Proposed South Central Pond



Summary for Subcatchment 43S: Direct to Proposed Central Pond

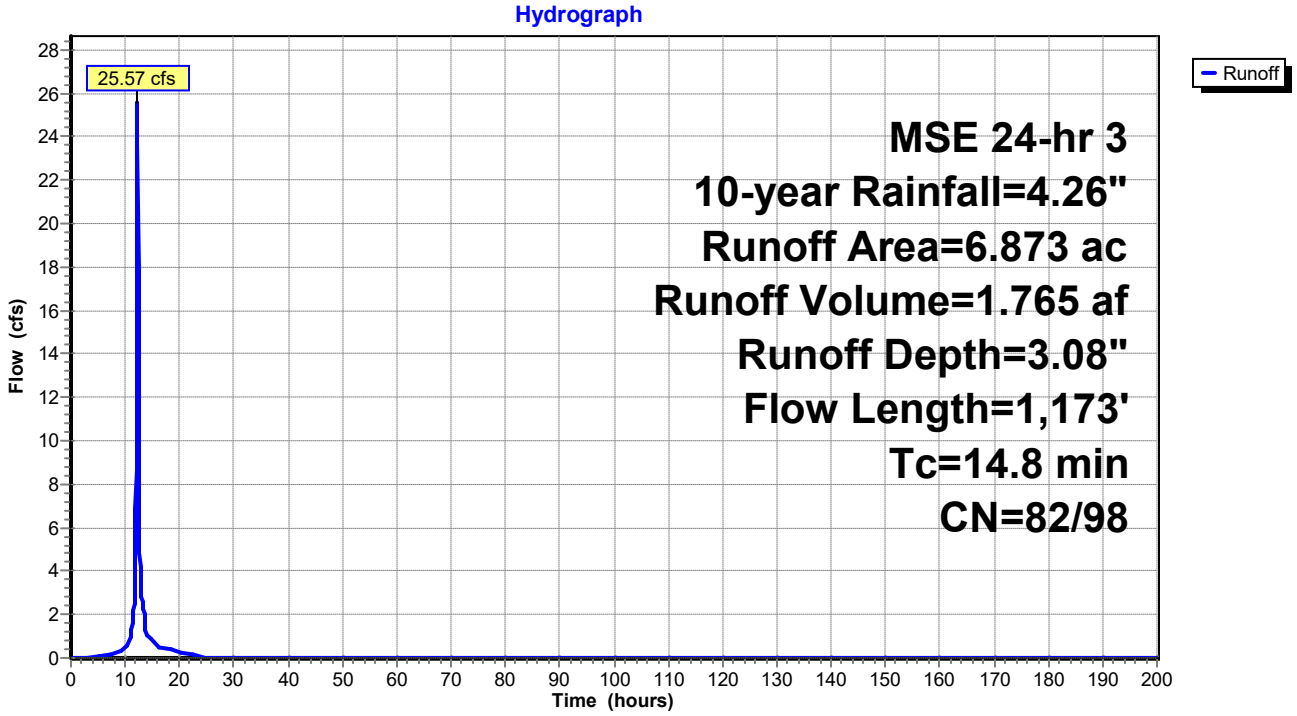
Runoff = 25.57 cfs @ 12.23 hrs, Volume= 1.765 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.205	98	Unconnected pavement, HSG D
0.855	98	Unconnected roofs, HSG D
0.896	98	Paved roads w/curbs & sewers, HSG D
0.530	98	Paved parking, HSG D
0.332	98	Roofs, HSG D
0.402	98	Water Surface, 0% imp, HSG D
0.383	89	Row crops, straight row, Good, HSG D
2.711	80	>75% Grass cover, Good, HSG D
0.559	78	Meadow, non-grazed, HSG D
6.873	89	Weighted Average
4.055	82	59.00% Pervious Area
2.818	98	41.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.5	286	0.0088	1.90		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	817		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.8	1,173	Total			

Subcatchment 43S: Direct to Proposed Central Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

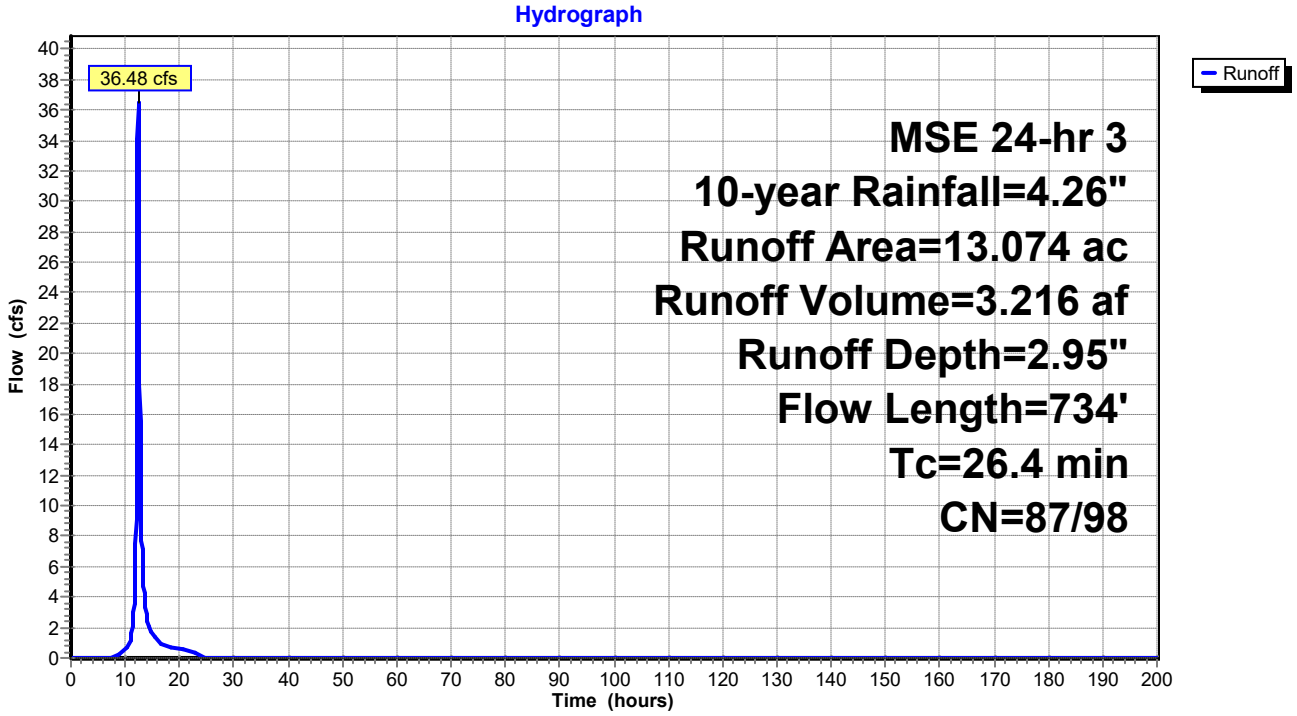
Runoff = 36.48 cfs @ 12.37 hrs, Volume= 3.216 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.523	98	Unconnected pavement, HSG D
0.339	98	Unconnected roofs, HSG D
0.175	98	Water Surface, 0% imp, HSG D
0.233	96	Gravel surface, HSG D
8.346	89	Row crops, straight row, Good, HSG D
0.958	89	Pasture/grassland/range, Poor, HSG D
2.500	80	>75% Grass cover, Good, HSG D
13.074	88	Weighted Average
12.212	87	93.41% Pervious Area
0.862	98	6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

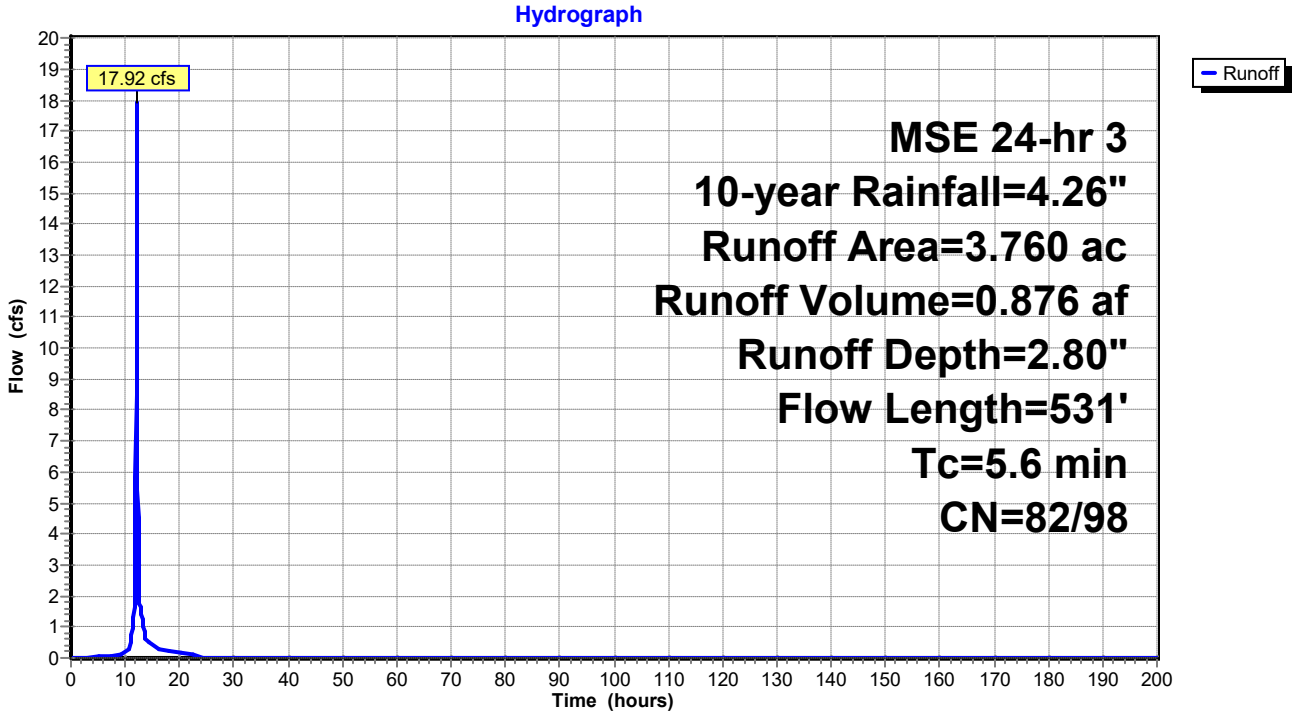
Runoff = 17.92 cfs @ 12.13 hrs, Volume= 0.876 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.428	98	Unconnected pavement, HSG D
0.443	98	Unconnected roofs, HSG D
0.064	98	Water Surface, 0% imp, HSG D
0.331	96	Gravel surface, HSG D
2.083	80	>75% Grass cover, Good, HSG D
0.411	77	Woods, Good, HSG D
3.760	86	Weighted Average
2.889	82	76.84% Pervious Area
0.871	98	23.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



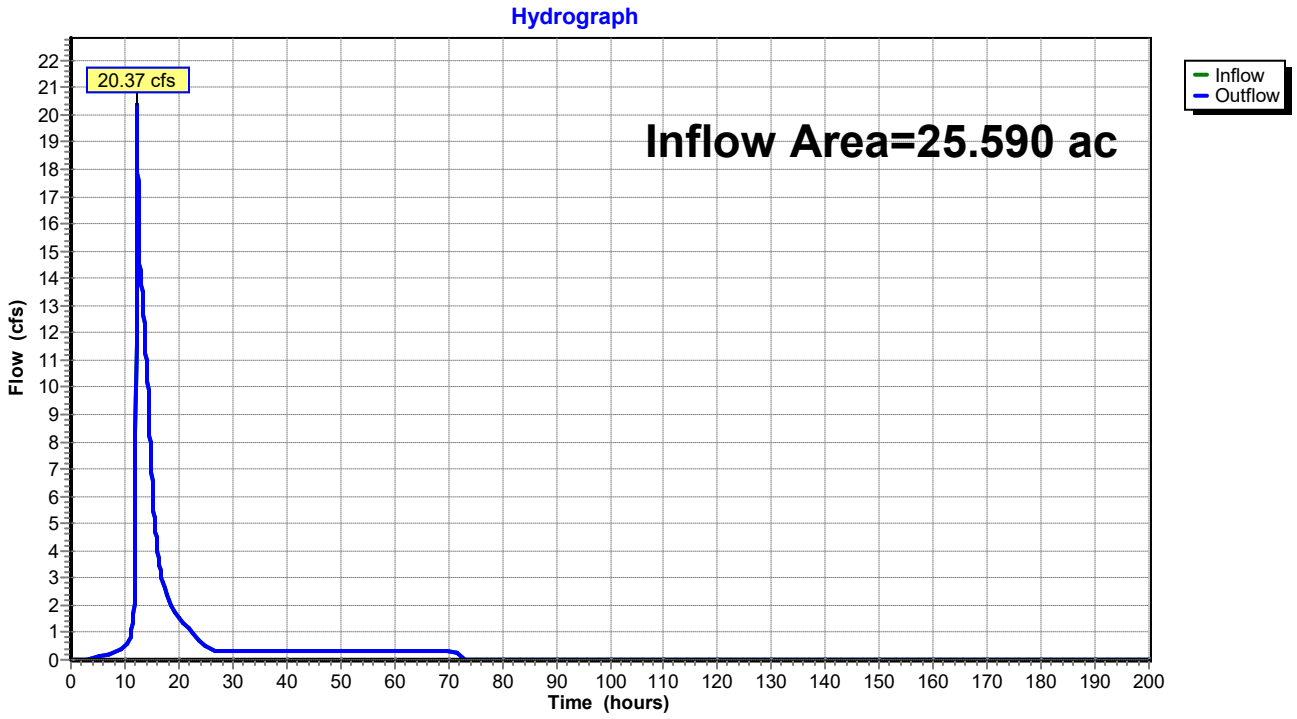
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.590 ac, 16.84% Impervious, Inflow Depth = 2.93" for 10-year event
Inflow = 20.37 cfs @ 12.25 hrs, Volume= 6.247 af
Outflow = 20.37 cfs @ 12.25 hrs, Volume= 6.247 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



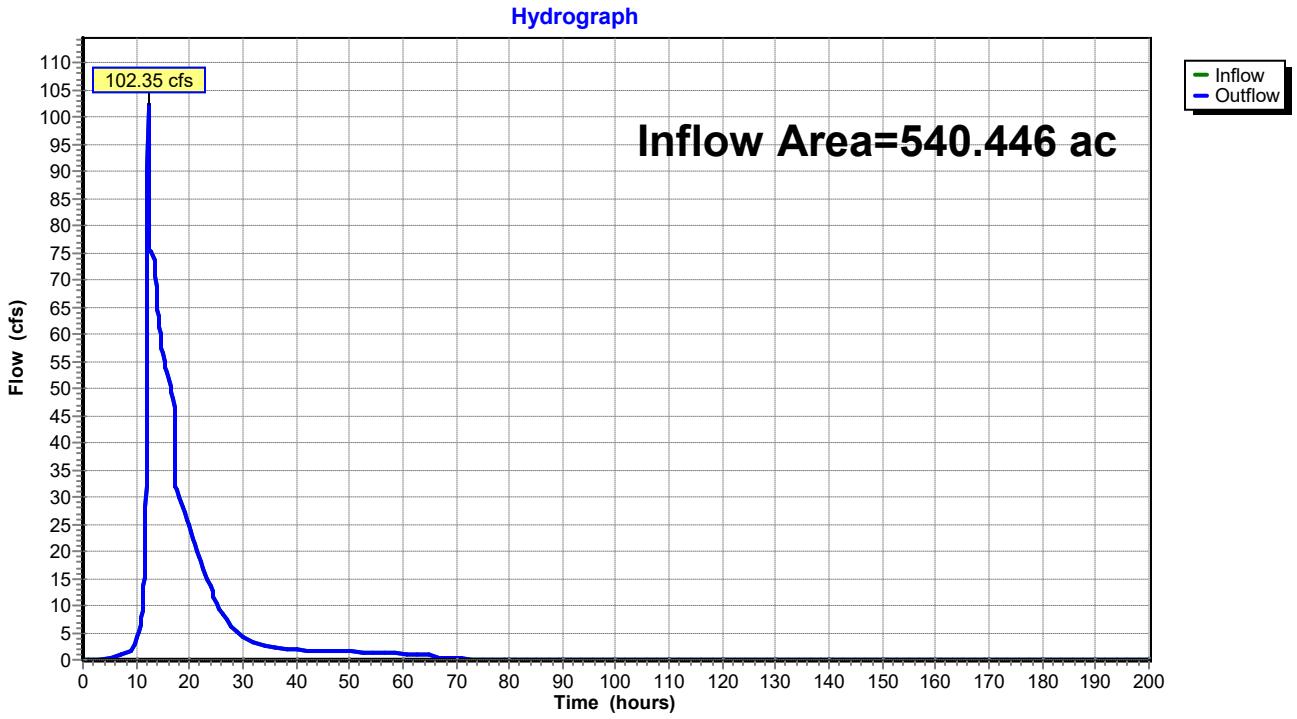
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.446 ac, 5.98% Impervious, Inflow Depth = 1.14" for 10-year event
Inflow = 102.35 cfs @ 12.22 hrs, Volume= 51.273 af
Outflow = 102.35 cfs @ 12.22 hrs, Volume= 51.273 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



Summary for Reach 21R: Proposed East Channel

Inflow Area = 134.639 ac, 9.91% Impervious, Inflow Depth = 2.55" for 10-year event
Inflow = 31.50 cfs @ 13.66 hrs, Volume= 28.561 af
Outflow = 31.50 cfs @ 13.67 hrs, Volume= 28.561 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.52 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 3.8 min

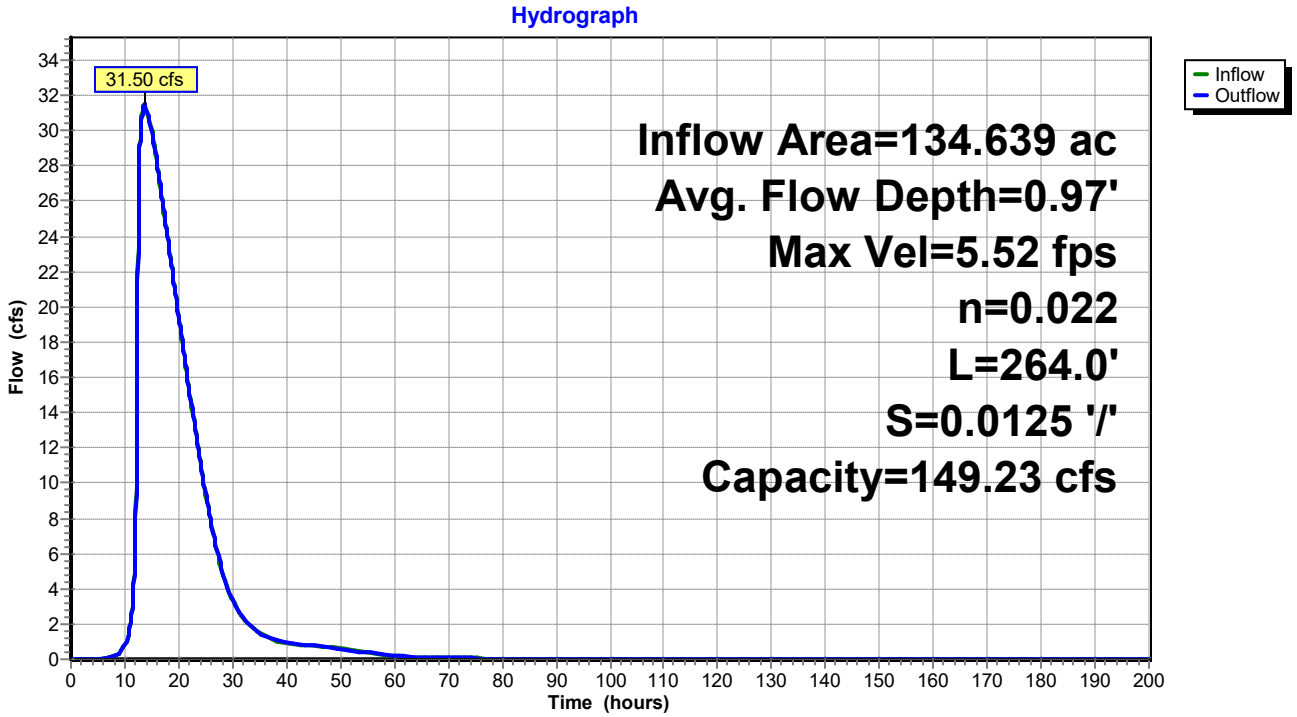
Peak Storage= 1,505 cf @ 13.67 hrs
Average Depth at Peak Storage= 0.97'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 149.23 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 264.0' Slope= 0.0125 '/'
Inlet Invert= 923.50', Outlet Invert= 920.20'



‡

Reach 21R: Proposed East Channel



Summary for Reach 23R: Existing West Channel

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 375.878 ac, 3.58% Impervious, Inflow Depth = 0.52" for 10-year event
Inflow = 40.88 cfs @ 12.25 hrs, Volume= 16.184 af
Outflow = 40.96 cfs @ 12.26 hrs, Volume= 16.184 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.45 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 6.8 min

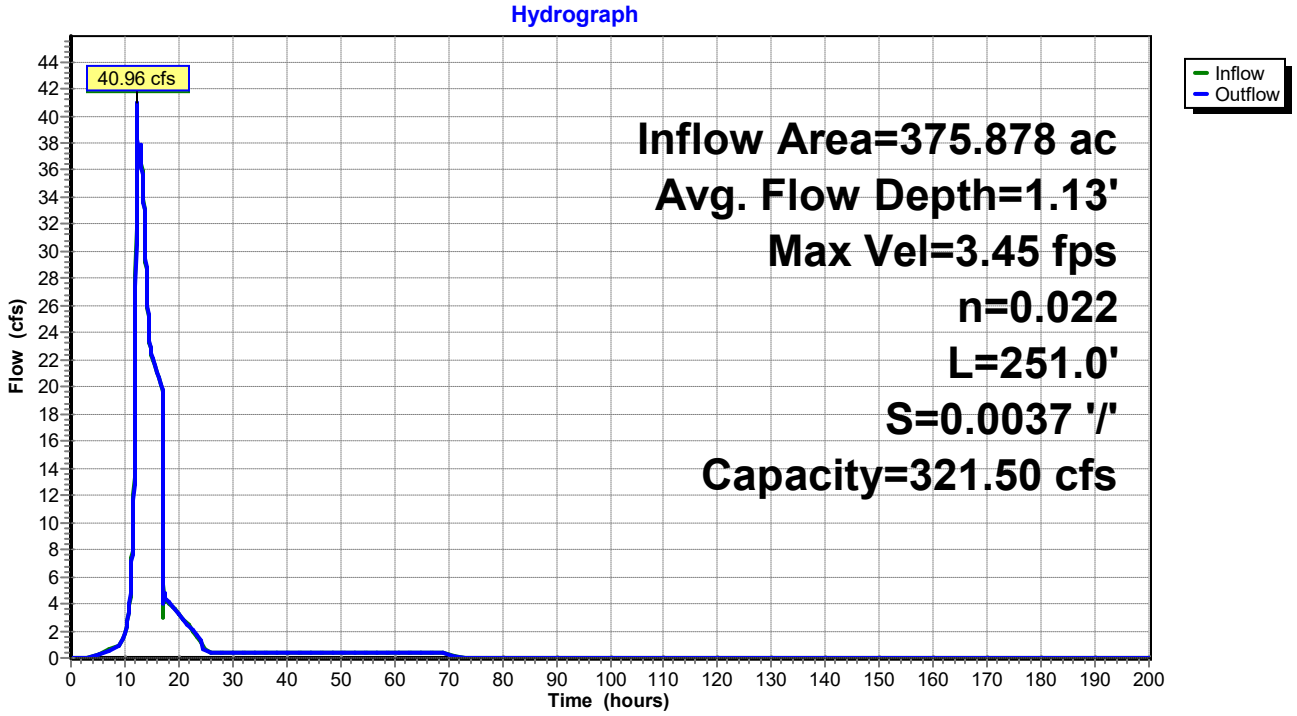
Peak Storage= 2,979 cf @ 12.26 hrs
Average Depth at Peak Storage= 1.13'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 321.50 cfs

6.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 4.0 '/' Top Width= 30.00'
Length= 251.0' Slope= 0.0037 '/'
Inlet Invert= 920.50', Outlet Invert= 919.58'



‡

Reach 23R: Existing West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth = 1.65" for 10-year event
Inflow = 458.46 cfs @ 12.40 hrs, Volume= 41.126 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 930.67' @ 25.55 hrs Surf.Area= 62.022 ac Storage= 41.126 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

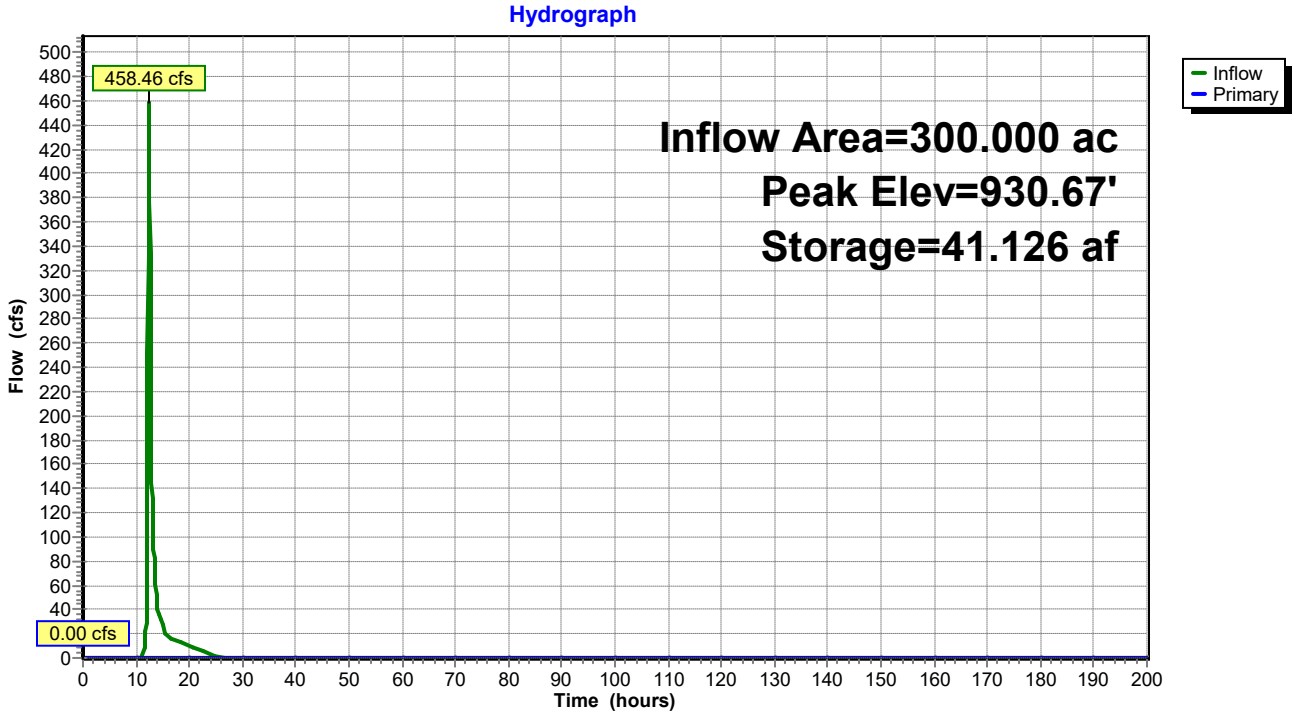
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=930.00' TW=930.22' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 10P: Proposed Northeast Pond/Filtration

[58] Hint: Peaked 0.92' above defined flood level

Inflow Area = 19.438 ac, 21.11% Impervious, Inflow Depth = 3.05" for 10-year event
Inflow = 58.41 cfs @ 12.34 hrs, Volume= 4.932 af
Outflow = 11.44 cfs @ 12.99 hrs, Volume= 4.932 af, Atten= 80%, Lag= 39.2 min
Primary = 11.44 cfs @ 12.99 hrs, Volume= 4.932 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 921.00' Surf.Area= 0.662 ac Storage= 2.955 af
Peak Elev= 922.92' @ 12.99 hrs Surf.Area= 1.668 ac Storage= 5.677 af (2.722 af above start)
Flood Elev= 922.00' Surf.Area= 1.255 ac Storage= 4.104 af (1.149 af above start)

Plug-Flow detention time= 1,552.4 min calculated for 1.977 af (40% of inflow)
Center-of-Mass det. time= 605.6 min (1,401.3 - 795.7)

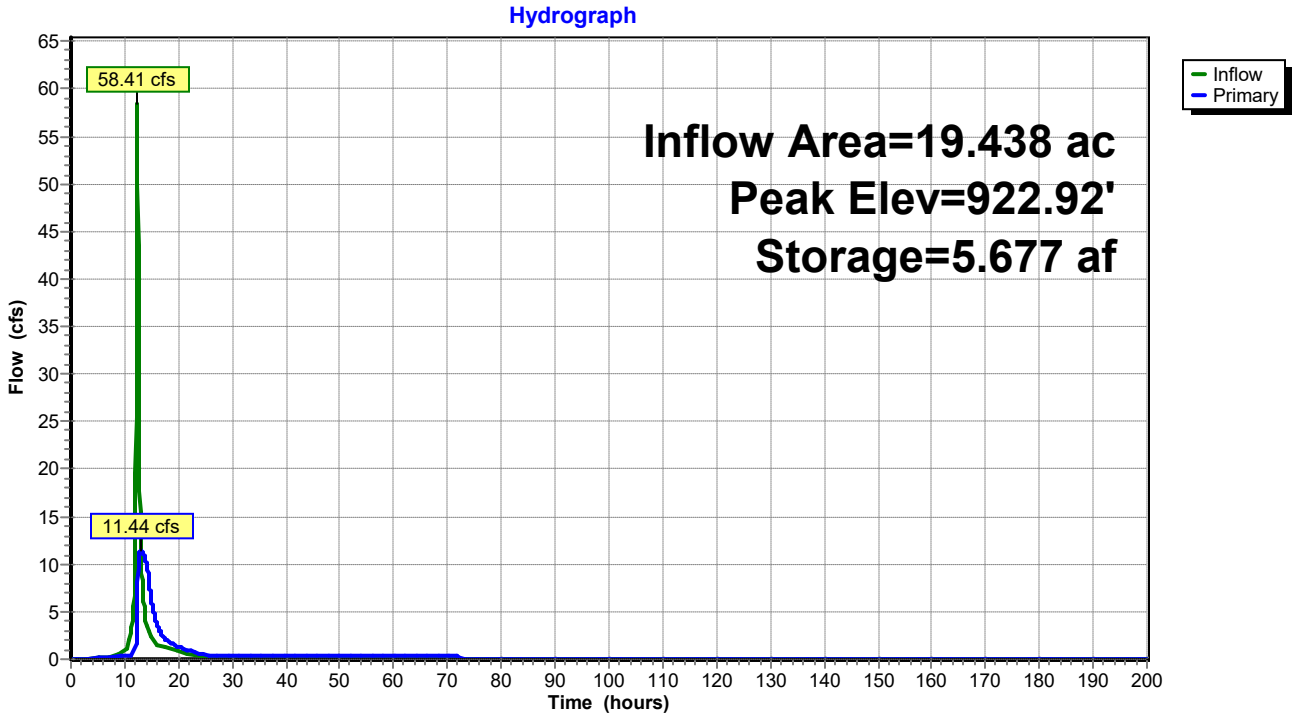
Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	9.359 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
913.00	0.209	0.000	0.000
914.00	0.242	0.226	0.226
916.00	0.314	0.556	0.781
918.00	0.396	0.710	1.491
920.00	0.491	0.887	2.378
921.00	0.662	0.576	2.955
921.01	1.049	0.009	2.964
922.00	1.255	1.140	4.104
924.00	2.149	3.404	7.508
925.00	1.553	1.851	9.359

Device	Routing	Invert	Outlet Devices
#1	Primary	918.50'	**36.0" Round Culvert** L= 113.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.50' / 918.00' S= 0.0044 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	922.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	923.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	920.00'	**21.0" Round Culvert** L= 45.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 920.00' S= -0.0444 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	921.00'	**0.31 cfs Exfiltration when above 921.00'** Phase-In= 0.01'

Primary OutFlow Max=11.44 cfs @ 12.99 hrs HW=922.92' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 11.44 cfs of 51.65 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Passes 11.13 cfs of 16.89 cfs potential flow)
  │ └─**4=Culvert** (Inlet Controls 11.13 cfs @ 4.63 fps)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Exfiltration** (Exfiltration Controls 0.31 cfs)

Pond 10P: Proposed Northeast Pond/Filtration



Summary for Pond 25P: Proposed Northwest Pond/Filtration

[58] Hint: Peaked 0.33' above defined flood level

Inflow Area = 15.059 ac, 29.82% Impervious, Inflow Depth = 2.84" for 10-year event
Inflow = 49.08 cfs @ 12.26 hrs, Volume= 3.569 af
Outflow = 3.59 cfs @ 13.62 hrs, Volume= 3.569 af, Atten= 93%, Lag= 81.4 min
Primary = 3.59 cfs @ 13.62 hrs, Volume= 3.569 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 925.00' Surf.Area= 0.322 ac Storage= 1.156 af
Peak Elev= 926.83' @ 13.62 hrs Surf.Area= 1.416 ac Storage= 3.461 af (2.305 af above start)
Flood Elev= 926.50' Surf.Area= 1.369 ac Storage= 3.002 af (1.846 af above start)

Plug-Flow detention time= 1,633.6 min calculated for 2.413 af (68% of inflow)
Center-of-Mass det. time= 1,059.5 min (1,849.0 - 789.5)

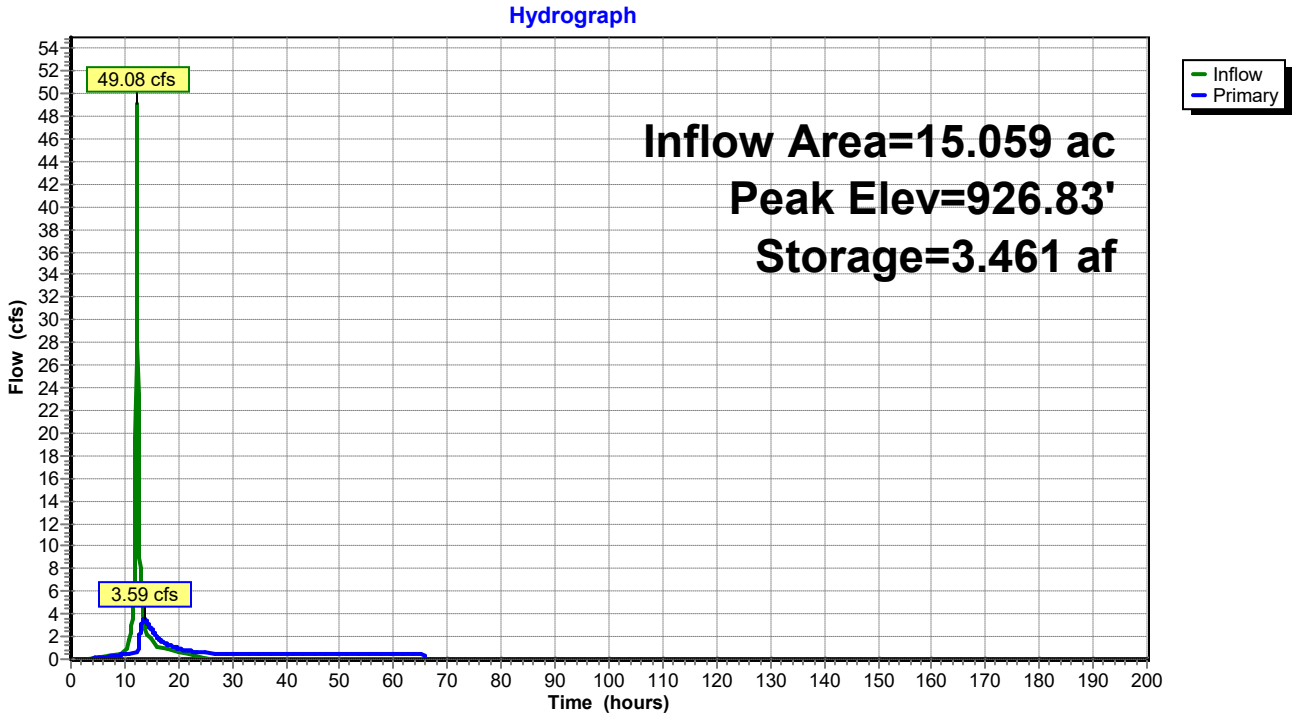
Volume	Invert	Avail.Storage	Storage Description
#1	917.00'	5.216 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
917.00	0.052	0.000	0.000
918.00	0.069	0.061	0.061
920.00	0.110	0.179	0.239
922.00	0.160	0.270	0.509
924.00	0.217	0.377	0.887
925.00	0.322	0.269	1.156
925.01	1.071	0.007	1.163
926.00	1.297	1.172	2.335
928.00	1.584	2.881	5.216

Device	Routing	Invert	Outlet Devices
#1	Primary	922.50'	**21.0" Round Culvert** L= 46.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.50' / 922.00' S= 0.0109 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	926.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	927.40'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	922.00'	**18.0" Round Culvert** L= 42.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 921.00' S= 0.0238 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#5	Device 1	925.00'	**0.54 cfs Exfiltration when above 925.00'** Phase-In= 0.01'

Primary OutFlow Max=3.59 cfs @ 13.62 hrs HW=926.83' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.59 cfs of 21.53 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Weir Controls 3.05 cfs @ 1.88 fps)
  │ └─**4=Culvert** (Passes 3.05 cfs of 4.89 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Exfiltration** (Exfiltration Controls 0.54 cfs)

Pond 25P: Proposed Northwest Pond/Filtration



Summary for Pond 26P: Proposed Northwest Central Pond/Filtration

Inflow Area = 7.518 ac, 41.97% Impervious, Inflow Depth = 3.08" for 10-year event
Inflow = 21.83 cfs @ 12.16 hrs, Volume= 1.930 af
Outflow = 0.37 cfs @ 10.60 hrs, Volume= 1.930 af, Atten= 98%, Lag= 0.0 min
Primary = 0.37 cfs @ 10.60 hrs, Volume= 1.930 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.00' Surf.Area= 0.318 ac Storage= 0.894 af
Peak Elev= 925.37' @ 19.10 hrs Surf.Area= 0.979 ac Storage= 2.103 af (1.209 af above start)
Flood Elev= 925.50' Surf.Area= 0.997 ac Storage= 2.227 af (1.333 af above start)

Plug-Flow detention time= 2,576.9 min calculated for 1.036 af (54% of inflow)
Center-of-Mass det. time= 1,327.5 min (2,399.8 - 1,072.3)

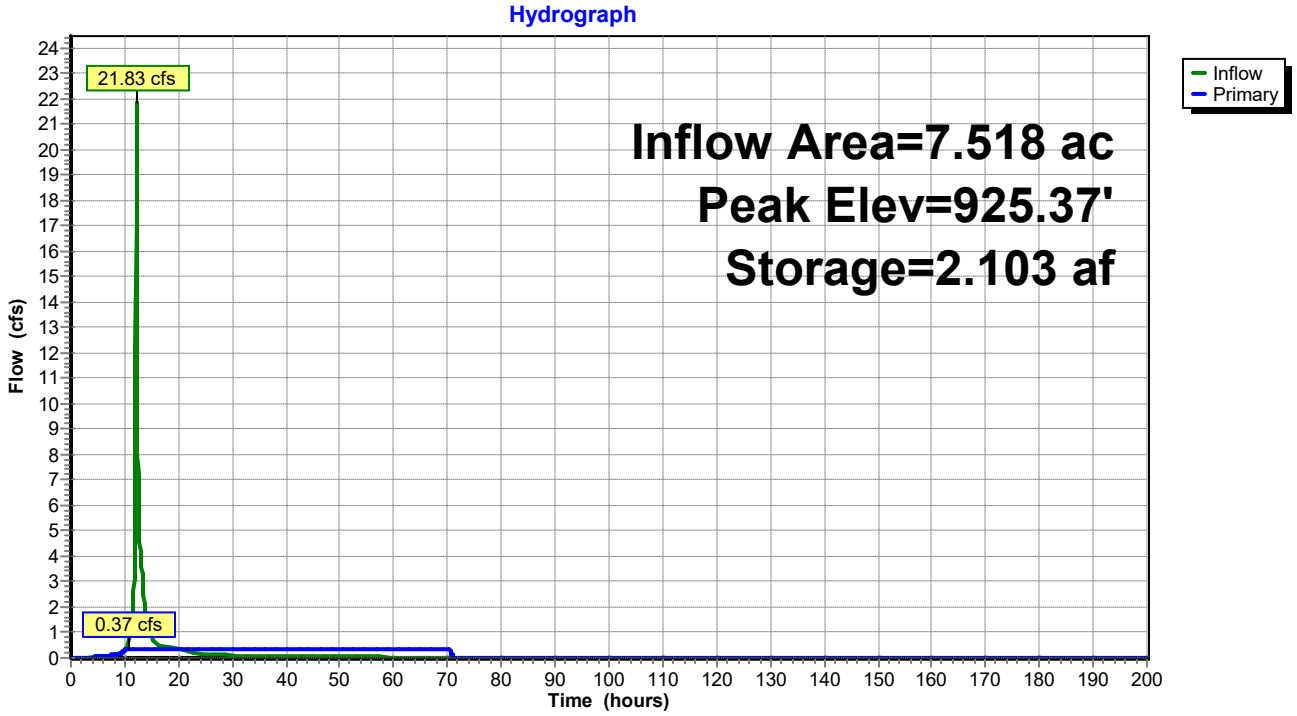
Volume	Invert	Avail.Storage	Storage Description
#1	916.00'	3.855 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.00	0.009	0.000	0.000
918.00	0.045	0.054	0.054
920.00	0.099	0.144	0.198
922.00	0.162	0.261	0.459
923.00	0.195	0.179	0.637
924.00	0.318	0.256	0.894
924.01	0.784	0.006	0.900
926.00	1.069	1.844	2.743
927.00	1.155	1.112	3.855

Device	Routing	Invert	Outlet Devices
#1	Primary	921.50'	**21.0" Round Culvert** L= 86.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.50' / 921.00' S= 0.0058 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	925.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	926.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	921.00'	**21.0" Round Culvert** L= 44.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 921.00' S= -0.0227 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	924.00'	**0.37 cfs Exfiltration when above 924.00'** Phase-In= 0.01'

Primary OutFlow Max=0.37 cfs @ 10.60 hrs HW=924.01' TW=920.76' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.37 cfs of 13.00 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
    - **4=Culvert** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Exfiltration** (Exfiltration Controls 0.37 cfs)

Pond 26P: Proposed Northwest Central Pond/Filtration



Summary for Pond 27P: Proposed Northwest Central Pond

Inflow Area = 3.120 ac, 47.02% Impervious, Inflow Depth = 3.22" for 10-year event
Inflow = 14.95 cfs @ 12.16 hrs, Volume= 0.838 af
Outflow = 3.32 cfs @ 12.47 hrs, Volume= 0.835 af, Atten= 78%, Lag= 18.6 min
Primary = 3.32 cfs @ 12.47 hrs, Volume= 0.835 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.50' Surf.Area= 0.278 ac Storage= 0.732 af
Peak Elev= 925.66' @ 12.47 hrs Surf.Area= 0.432 ac Storage= 1.147 af (0.416 af above start)

Plug-Flow detention time= 3,137.3 min calculated for 0.103 af (12% of inflow)
Center-of-Mass det. time= 689.6 min (1,460.4 - 770.9)

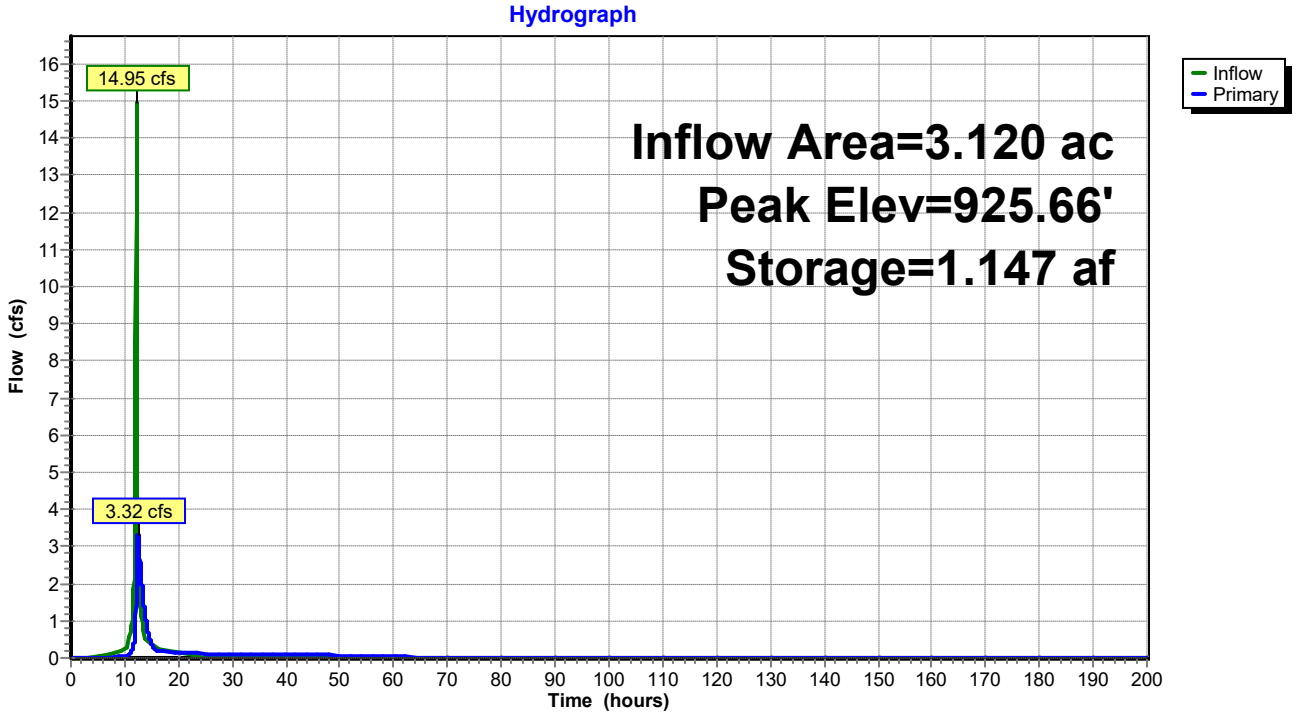
Volume	Invert	Avail.Storage	Storage Description
#1	916.50'	1.797 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.50	0.015	0.000	0.000
917.00	0.019	0.008	0.008
918.00	0.031	0.025	0.033
920.00	0.063	0.094	0.128
922.00	0.114	0.177	0.304
923.50	0.162	0.207	0.512
924.50	0.278	0.220	0.732
925.50	0.420	0.349	1.081
926.00	0.459	0.220	1.300
927.00	0.535	0.497	1.797

Device	Routing	Invert	Outlet Devices
#1	Primary	924.50'	**18.0" Round Culvert** L= 225.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.50' / 924.00' S= 0.0022 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	926.50'	**48.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 923.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=3.32 cfs @ 12.47 hrs HW=925.66' TW=924.84' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.32 cfs @ 3.13 fps)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**3=Culvert** (Passes 3.32 cfs of 7.69 cfs potential flow)

Pond 27P: Proposed Northwest Central Pond



Summary for Pond 28P: Proposed Northeast Central Pond

Inflow Area = 7.153 ac, 50.64% Impervious, Inflow Depth = 3.24" for 10-year event
Inflow = 28.04 cfs @ 12.22 hrs, Volume= 1.929 af
Outflow = 12.31 cfs @ 12.45 hrs, Volume= 1.929 af, Atten= 56%, Lag= 13.8 min
Primary = 12.31 cfs @ 12.45 hrs, Volume= 1.929 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 922.00' Surf.Area= 0.380 ac Storage= 1.043 af
Peak Elev= 923.13' @ 12.45 hrs Surf.Area= 0.575 ac Storage= 1.589 af (0.546 af above start)

Plug-Flow detention time= 246.9 min calculated for 0.886 af (46% of inflow)
Center-of-Mass det. time= 38.3 min (813.2 - 774.8)

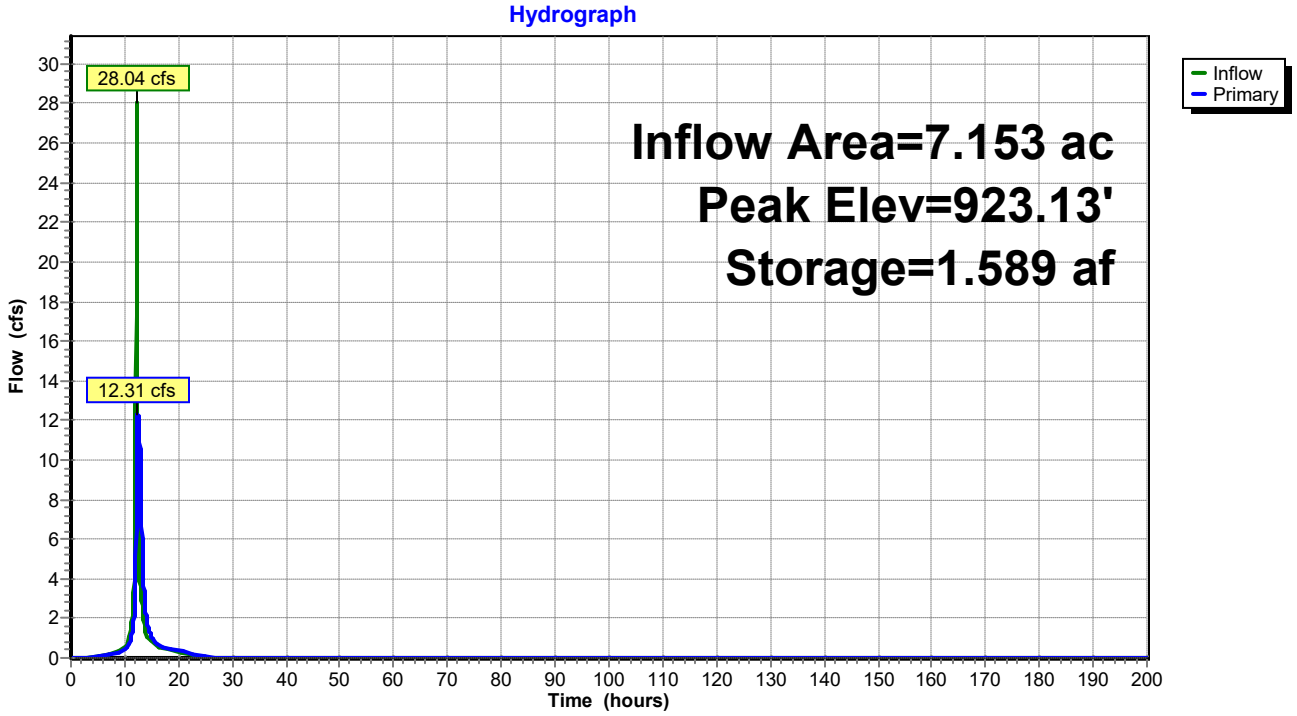
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	2.802 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.00	0.034	0.000	0.000
916.00	0.065	0.099	0.099
918.00	0.109	0.174	0.273
920.00	0.172	0.281	0.554
921.00	0.213	0.192	0.746
922.00	0.380	0.297	1.043
923.00	0.565	0.472	1.515
924.00	0.642	0.603	2.119
925.00	0.724	0.683	2.802

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**24.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.80' S= 0.0057 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	923.25'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	922.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 3	919.00'	**21.0" Round Culvert** L= 33.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 919.00' S= -0.0303 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=12.30 cfs @ 12.45 hrs HW=923.13' TW=921.58' (Dynamic Tailwater)
- **1=Culvert** (Passes 12.30 cfs of 13.63 cfs potential flow)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Sharp-Crested Rectangular Weir** (Passes 12.30 cfs of 18.72 cfs potential flow)
    - **4=Culvert** (Inlet Controls 12.30 cfs @ 5.12 fps)

Pond 28P: Proposed Northeast Central Pond



Summary for Pond 30P: Wetland 4A

[44] Hint: Outlet device #5 is below defined storage

Inflow Area = 357.822 ac, 1.86% Impervious, Inflow Depth = 0.39" for 10-year event
Inflow = 111.13 cfs @ 12.35 hrs, Volume= 11.661 af
Outflow = 28.68 cfs @ 13.46 hrs, Volume= 11.661 af, Atten= 74%, Lag= 66.8 min
Primary = 25.52 cfs @ 13.46 hrs, Volume= 8.706 af
Secondary = 3.17 cfs @ 13.81 hrs, Volume= 2.955 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 926.28' @ 13.46 hrs Surf.Area= 5.686 ac Storage= 4.311 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 65.1 min (883.6 - 818.5)

Volume	Invert	Avail.Storage	Storage Description
#1	923.50'	15.942 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

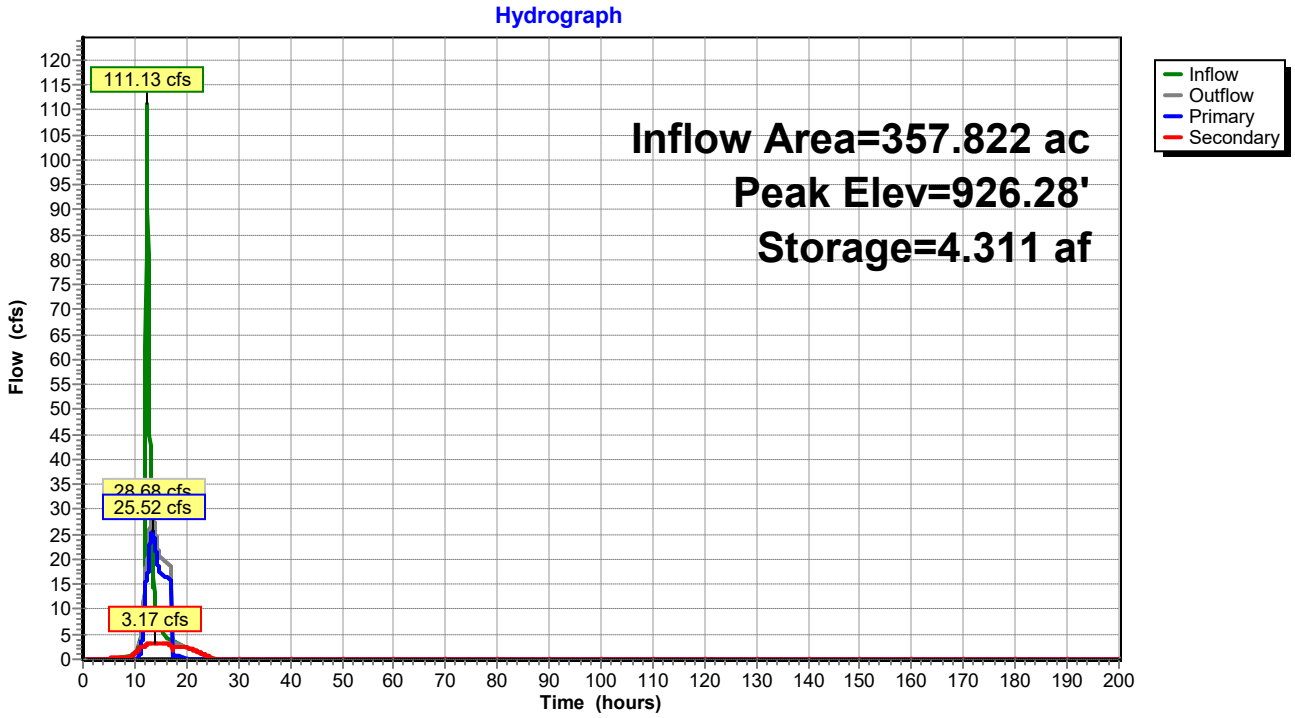
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.50	0.011	0.000	0.000
924.00	0.027	0.009	0.009
925.00	0.058	0.042	0.052
926.00	5.338	2.698	2.750
927.00	6.566	5.952	8.702
928.00	7.914	7.240	15.942

Device	Routing	Invert	Outlet Devices
#1	Primary	921.11'	**36.0" Round 36" RCP** L= 307.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.11' / 920.50' S= 0.0020 '/' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 7.07 sf
#2	Device 1	926.00'	**60.0" Horiz. CBMH-3003** C= 0.600 Limited to weir flow at low heads
#3	Device 1	921.17'	**18.0" Round 18" RCP** L= 23.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 921.17' / 921.11' S= 0.0026 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#4	Device 3	923.50'	**48.0" Horiz. CBMH-3004** C= 0.600 Limited to weir flow at low heads
#5	Secondary	919.60'	**12.0" Round 12" Draintile** L= 553.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.34' / 919.60' S= -0.0005 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=25.51 cfs @ 13.46 hrs HW=926.28' TW=921.53' (Dynamic Tailwater)
└─**1=36" RCP** (Passes 25.51 cfs of 49.01 cfs potential flow)
  └─**2=CBMH-3003** (Weir Controls 7.74 cfs @ 1.74 fps)
  └─**3=18" RCP** (Inlet Controls 17.77 cfs @ 10.06 fps)
    └─**4=CBMH-3004** (Passes 17.77 cfs of 100.94 cfs potential flow)

Secondary OutFlow Max=3.17 cfs @ 13.81 hrs HW=926.24' TW=921.47' (Dynamic Tailwater)
└─**5=12" Draintile** (Outlet Controls 3.17 cfs @ 4.03 fps)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)
[80] Warning: Exceeded Pond 7P by 3.03' @ 12.85 hrs (389.13 cfs 34.431 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth = 0.13" for 10-year event
Inflow = 29.68 cfs @ 12.57 hrs, Volume= 3.430 af
Outflow = 20.21 cfs @ 12.88 hrs, Volume= 3.430 af, Atten= 32%, Lag= 18.3 min
Primary = 20.21 cfs @ 12.88 hrs, Volume= 3.430 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 933.39' @ 12.88 hrs Surf.Area= 0.537 ac Storage= 0.381 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 5.1 min (837.1 - 832.0)

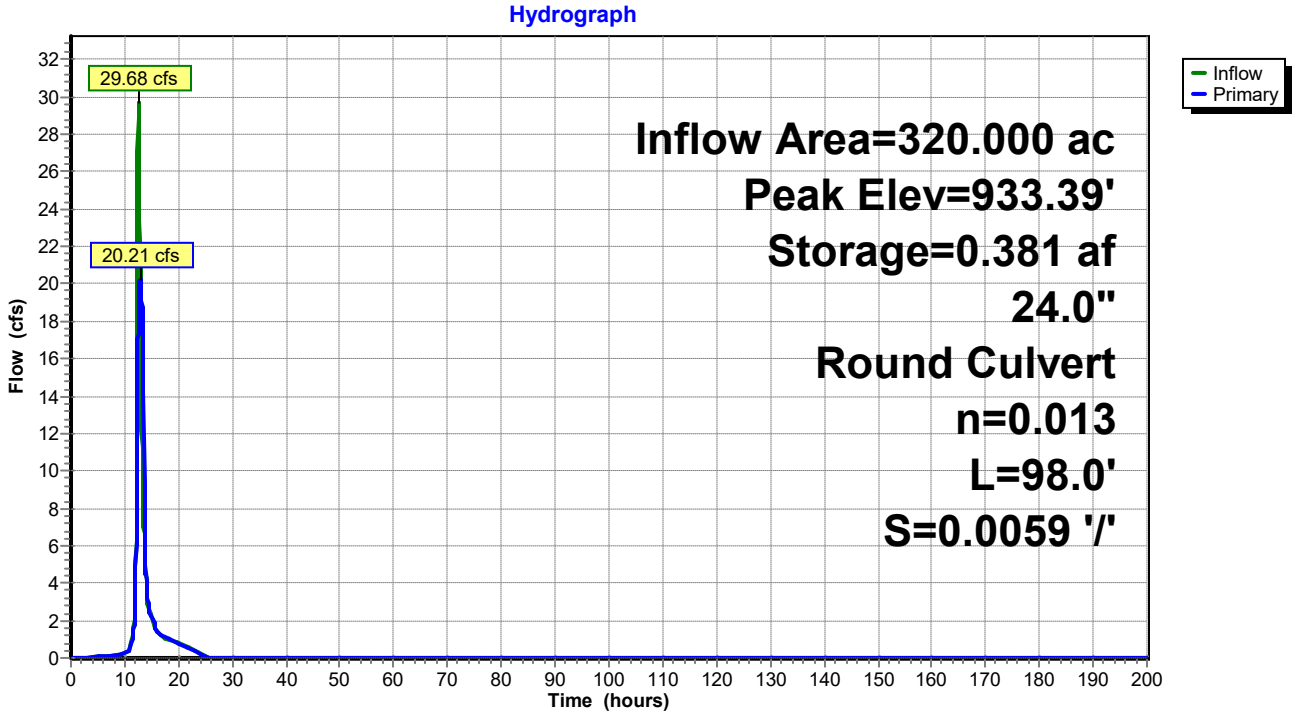
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=20.19 cfs @ 12.88 hrs HW=933.39' TW=926.21' (Dynamic Tailwater)
1=Culvert (Barrel Controls 20.19 cfs @ 6.43 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 32P: Proposed West Central Pond

Inflow Area = 3.686 ac, 36.52% Impervious, Inflow Depth = 3.07" for 10-year event
Inflow = 18.09 cfs @ 12.14 hrs, Volume= 0.942 af
Outflow = 8.21 cfs @ 12.27 hrs, Volume= 0.942 af, Atten= 55%, Lag= 7.7 min
Primary = 8.21 cfs @ 12.27 hrs, Volume= 0.942 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.00' Surf.Area= 0.395 ac Storage= 1.213 af
Peak Elev= 928.64' @ 12.27 hrs Surf.Area= 0.497 ac Storage= 1.500 af (0.287 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 45.5 min (820.4 - 774.9)

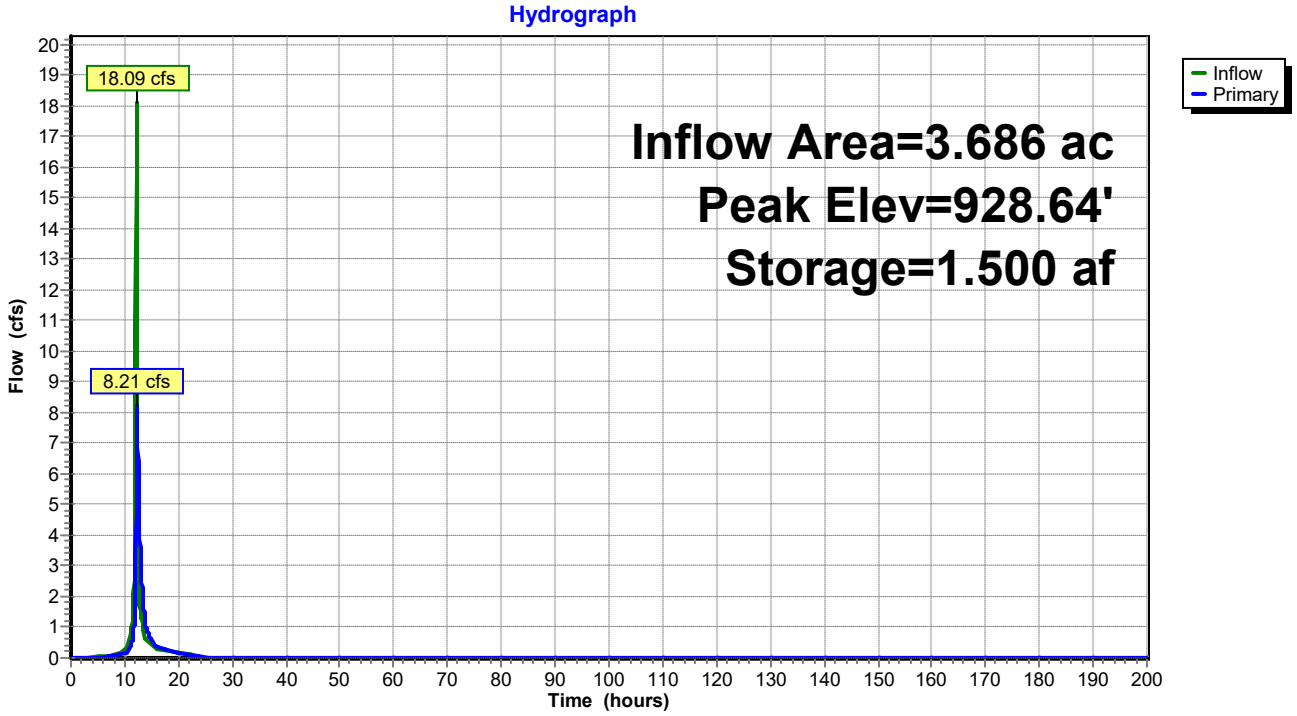
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	2.284 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.034	0.000	0.000
922.00	0.073	0.107	0.107
924.00	0.134	0.207	0.314
926.00	0.211	0.345	0.659
927.00	0.251	0.231	0.890
928.00	0.395	0.323	1.213
929.00	0.554	0.475	1.687
930.00	0.638	0.596	2.284

Device	Routing	Invert	Outlet Devices
#1	Primary	923.05'	**18.0" Round Culvert** L= 212.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.05' / 922.52' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	929.50'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	925.00'	**21.0" Round Culvert** L= 20.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0500 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=8.14 cfs @ 12.27 hrs HW=928.64' TW=925.59' (Dynamic Tailwater)
- **1=Culvert** (Passes 8.14 cfs of 10.68 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Weir Controls 8.14 cfs @ 2.61 fps)
    - **4=Culvert** (Passes 8.14 cfs of 9.26 cfs potential flow)
  - **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 32P: Proposed West Central Pond



Summary for Pond 40P: Wetland 2B

Inflow Area = 133.857 ac, 9.96% Impervious, Inflow Depth = 2.55" for 10-year event
Inflow = 224.73 cfs @ 12.33 hrs, Volume= 28.418 af
Outflow = 31.35 cfs @ 13.71 hrs, Volume= 28.418 af, Atten= 86%, Lag= 82.8 min
Primary = 31.35 cfs @ 13.71 hrs, Volume= 28.418 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 925.64' @ 13.71 hrs Surf.Area= 12.108 ac Storage= 11.791 af

Plug-Flow detention time= 244.2 min calculated for 28.411 af (100% of inflow)
Center-of-Mass det. time= 244.1 min (1,233.9 - 989.8)

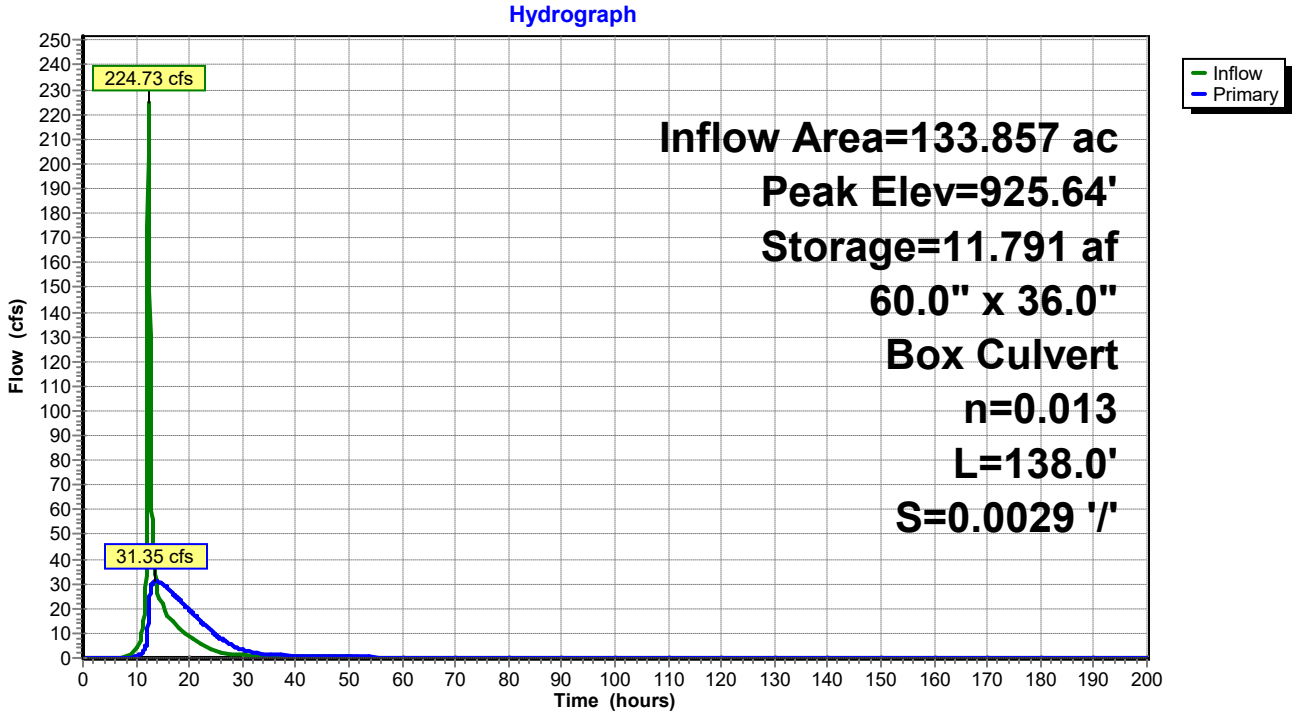
Volume	Invert	Avail.Storage	Storage Description
#1	923.90'	52.747 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.90	0.000	0.000	0.000
924.00	2.123	0.106	0.106
926.00	14.283	16.406	16.512
928.00	21.952	36.235	52.747

Device	Routing	Invert	Outlet Devices
#1	Primary	923.90'	**60.0" W x 36.0" H Box Culvert** L= 138.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.90' / 923.50' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 15.00 sf

Primary OutFlow Max=31.35 cfs @ 13.71 hrs HW=925.64' TW=924.47' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 31.35 cfs @ 4.80 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 2.50" for 10-year event
Inflow = 50.10 cfs @ 12.18 hrs, Volume= 2.852 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 940.11' @ 24.60 hrs Surf.Area= 2.036 ac Storage= 2.852 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

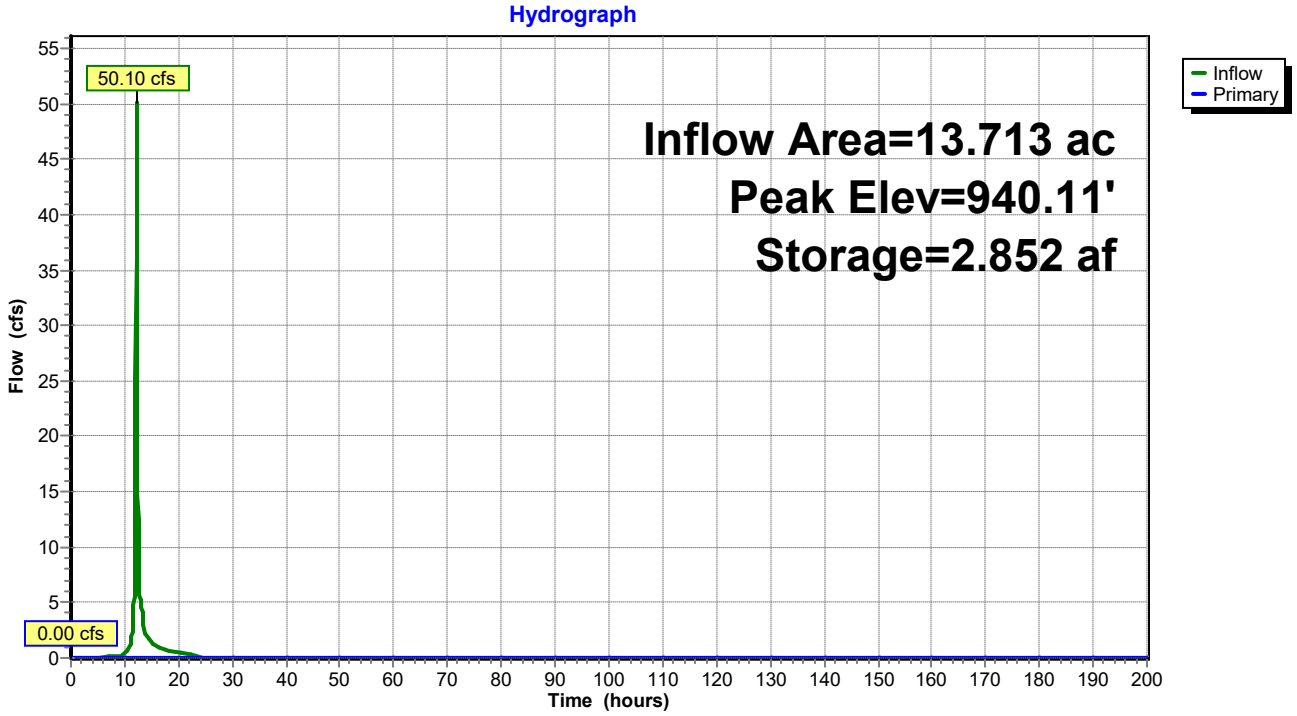
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=936.00' TW=923.90' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond 41P: Ex South Off-site Pond



Summary for Pond 42P: Proposed South Central Pond

Inflow Area = 2.612 ac, 32.54% Impervious, Inflow Depth = 2.83" for 10-year event
Inflow = 10.46 cfs @ 12.18 hrs, Volume= 0.617 af
Outflow = 4.06 cfs @ 12.38 hrs, Volume= 0.616 af, Atten= 61%, Lag= 12.2 min
Primary = 4.06 cfs @ 12.38 hrs, Volume= 0.616 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.50' Surf.Area= 0.154 ac Storage= 0.309 af
Peak Elev= 929.60' @ 12.38 hrs Surf.Area= 0.250 ac Storage= 0.532 af (0.223 af above start)

Plug-Flow detention time= 311.2 min calculated for 0.307 af (50% of inflow)
Center-of-Mass det. time= 87.9 min (869.9 - 782.0)

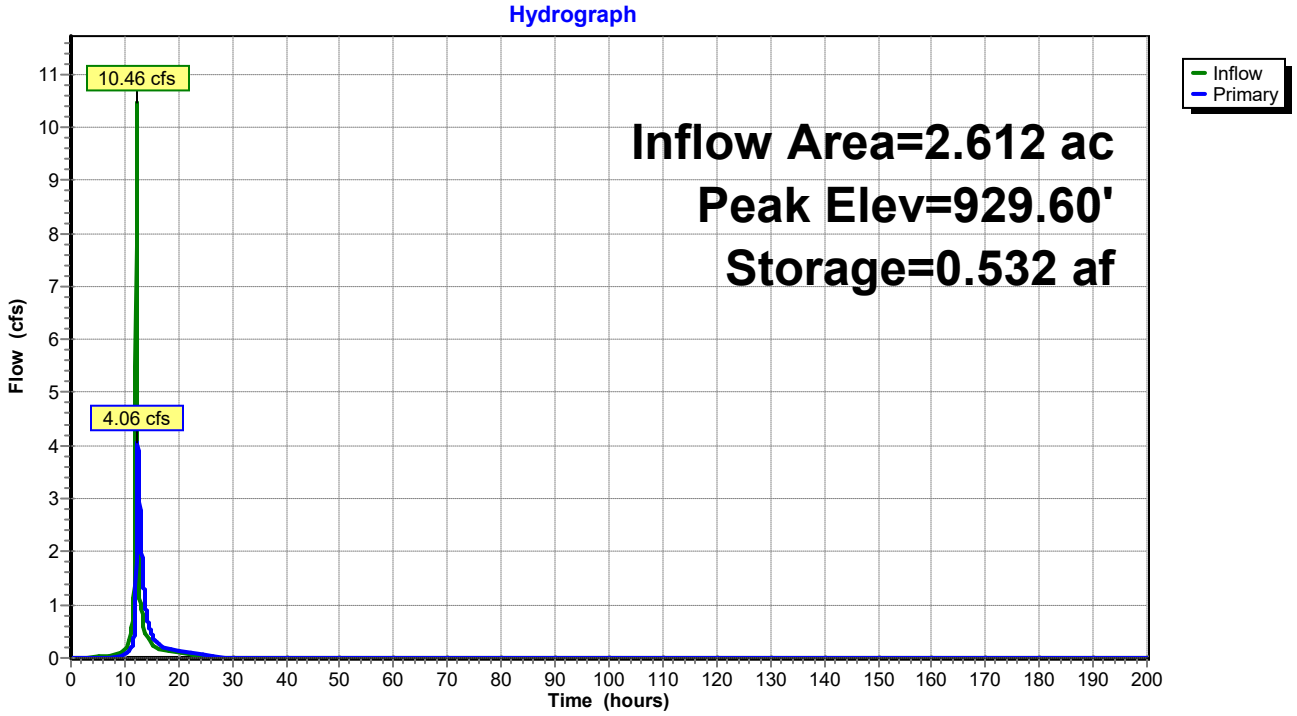
Volume	Invert	Avail.Storage	Storage Description
#1	922.00'	1.122 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
922.00	0.004	0.000	0.000
924.00	0.022	0.026	0.026
926.00	0.050	0.072	0.098
927.50	0.078	0.096	0.194
928.00	0.114	0.048	0.242
928.50	0.154	0.067	0.309
929.50	0.244	0.199	0.508
930.00	0.274	0.130	0.637
931.50	0.372	0.484	1.122

Device	Routing	Invert	Outlet Devices
#1	Primary	928.50'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 928.50' / 928.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	930.20'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	927.00'	**15.0" Round Culvert** L= 39.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.00' / 927.00' S= -0.0256 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

Primary OutFlow Max=4.06 cfs @ 12.38 hrs HW=929.59' TW=925.15' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 4.06 cfs @ 3.56 fps)
↑**2=Orifice/Grate** (Controls 0.00 cfs)
3=Culvert (Passes 4.06 cfs of 6.18 cfs potential flow)

Pond 42P: Proposed South Central Pond



Summary for Pond 43P: Proposed East Central Pond

Inflow Area = 6.873 ac, 41.00% Impervious, Inflow Depth = 3.08" for 10-year event
Inflow = 25.57 cfs @ 12.23 hrs, Volume= 1.765 af
Outflow = 7.43 cfs @ 12.58 hrs, Volume= 1.763 af, Atten= 71%, Lag= 20.8 min
Primary = 7.43 cfs @ 12.58 hrs, Volume= 1.763 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 926.50' Surf.Area= 0.401 ac Storage= 1.319 af
Peak Elev= 928.01' @ 12.58 hrs Surf.Area= 0.620 ac Storage= 2.107 af (0.787 af above start)

Plug-Flow detention time= 663.0 min calculated for 0.443 af (25% of inflow)
Center-of-Mass det. time= 143.3 min (923.5 - 780.2)

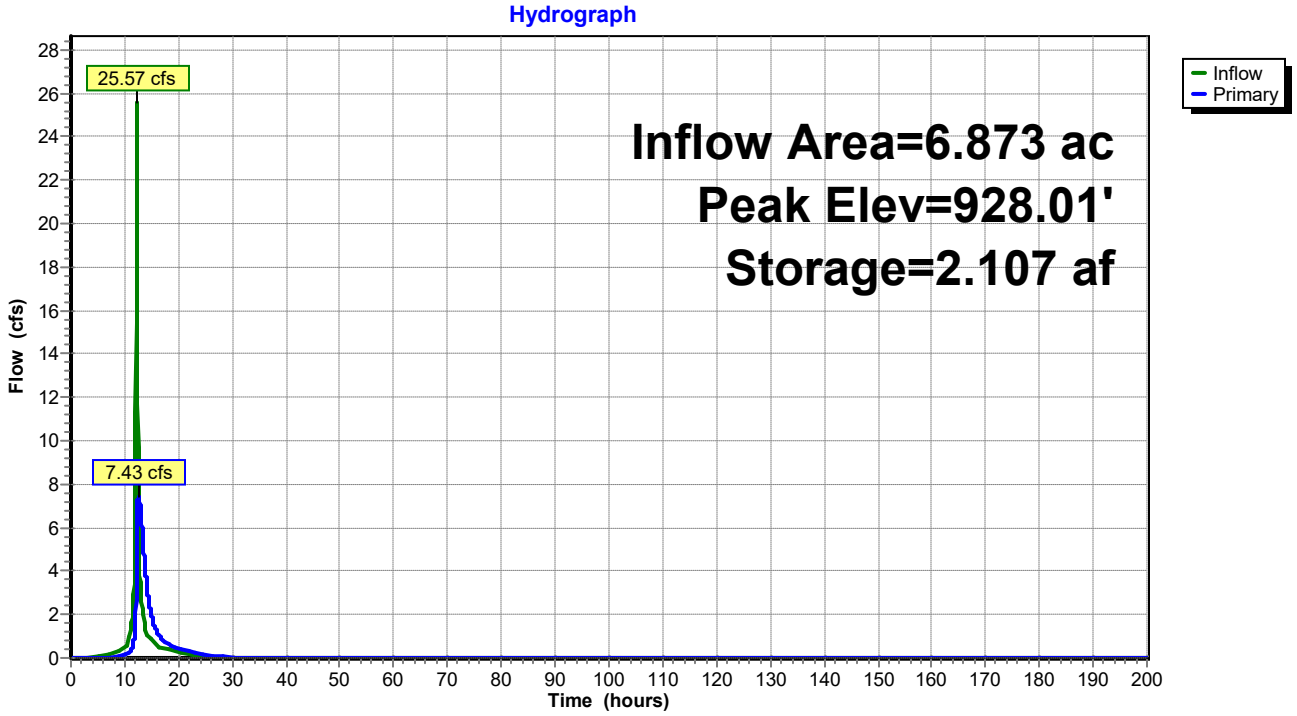
Volume	Invert	Avail.Storage	Storage Description
#1	918.50'	3.505 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
918.50	0.053	0.000	0.000
920.00	0.083	0.102	0.102
922.00	0.135	0.218	0.320
924.00	0.199	0.334	0.654
925.50	0.254	0.340	0.994
926.00	0.324	0.144	1.138
926.50	0.401	0.181	1.319
927.50	0.566	0.484	1.803
928.00	0.619	0.296	2.099
930.00	0.787	1.406	3.505

Device	Routing	Invert	Outlet Devices
#1	Primary	926.50'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.50' / 926.00' S= 0.0172 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	925.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=7.42 cfs @ 12.58 hrs HW=928.01' TW=925.41' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 7.42 cfs @ 4.20 fps)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**3=Culvert** (Passes 7.42 cfs of 10.46 cfs potential flow)

Pond 43P: Proposed East Central Pond



Summary for Pond 50P: Wetland 4B

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth = 1.19" for 10-year event
Inflow = 40.73 cfs @ 12.38 hrs, Volume= 3.922 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 941.05' @ 200.00 hrs Surf.Area= 114,737 sf Storage= 170,853 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

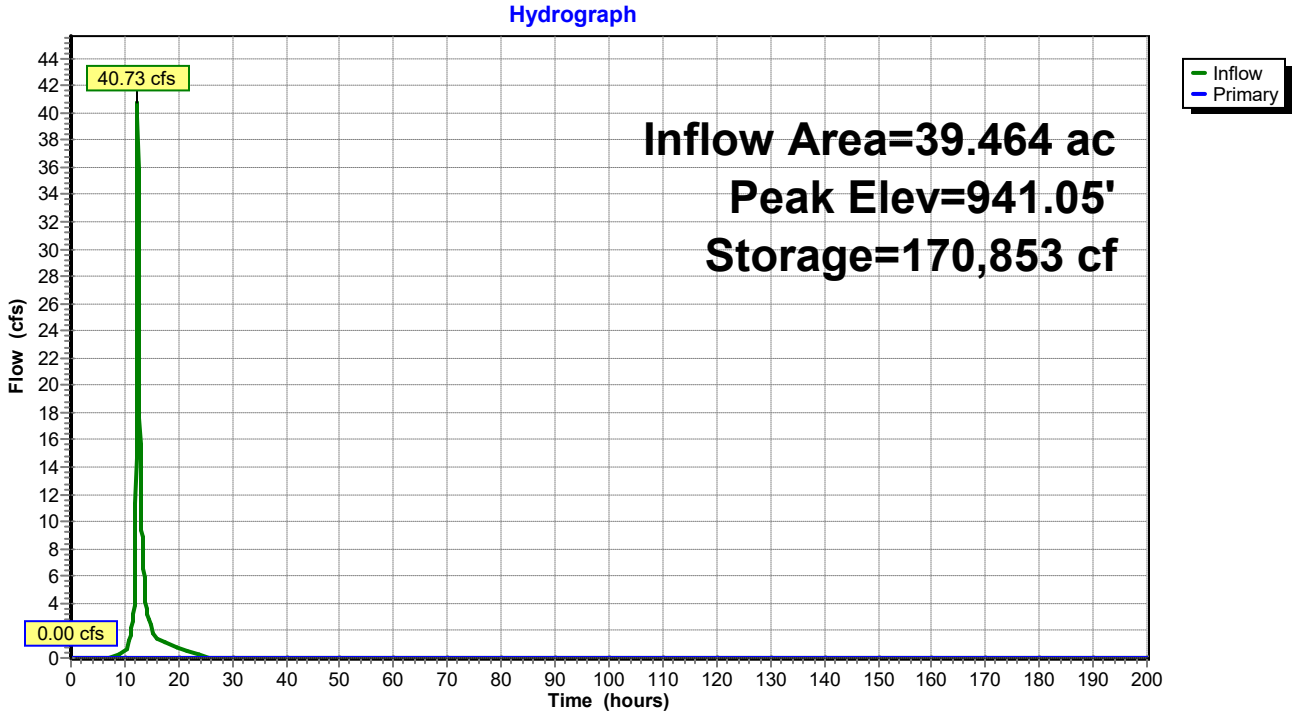
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	303,458 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
938.00	4,444	0	0
940.00	69,653	74,097	74,097
941.00	111,935	90,794	164,891
942.00	165,198	138,567	303,458

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=938.00' TW=923.90' (Dynamic Tailwater)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth > 29.95" for 10-year event
Inflow = 21.34 cfs @ 12.13 hrs, Volume= 9.384 af
Outflow = 19.91 cfs @ 12.16 hrs, Volume= 9.170 af, Atten= 7%, Lag= 1.8 min
Primary = 19.91 cfs @ 12.16 hrs, Volume= 9.170 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 938.81' @ 12.16 hrs Surf.Area= 12,564 sf Storage= 12,745 cf

Plug-Flow detention time= 104.5 min calculated for 9.167 af (98% of inflow)
Center-of-Mass det. time= 21.0 min (1,356.7 - 1,335.6)

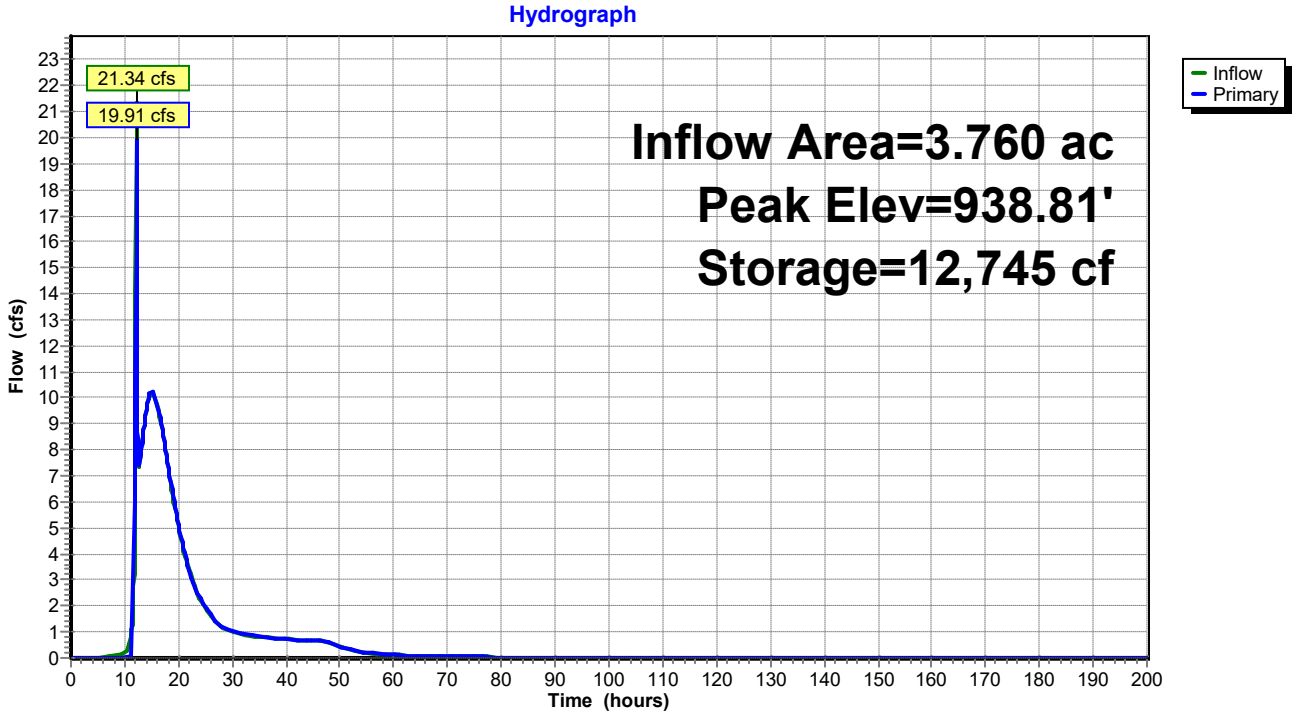
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	15,364 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
936.00	178	0	0
938.00	5,354	5,532	5,532
939.00	14,309	9,832	15,364

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=19.45 cfs @ 12.16 hrs HW=938.80' TW=924.72' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 19.45 cfs @ 1.72 fps)

Pond 60P: Wetland 5B



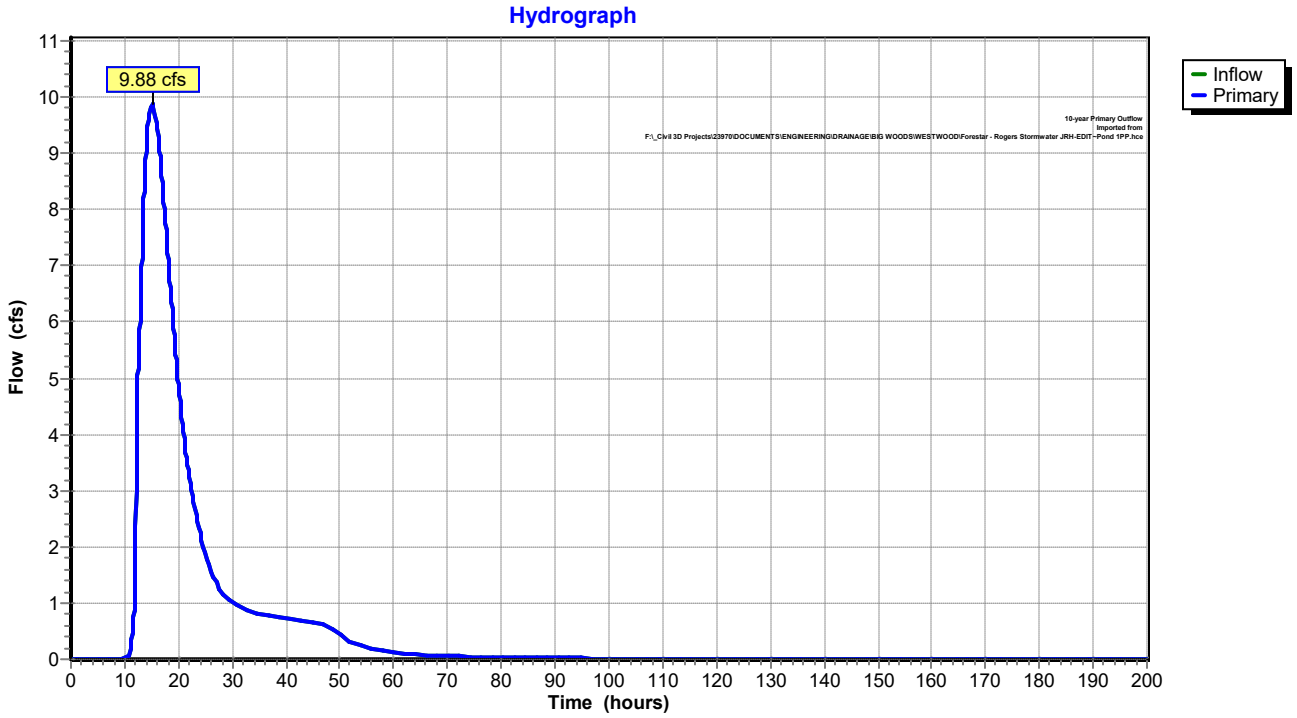
Summary for Link 1PP: Northwest Wetland

Inflow = 9.88 cfs @ 15.07 hrs, Volume= 8.508 af
Primary = 9.88 cfs @ 15.07 hrs, Volume= 8.508 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

10-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG W

Link 1PP: Northwest Wetland



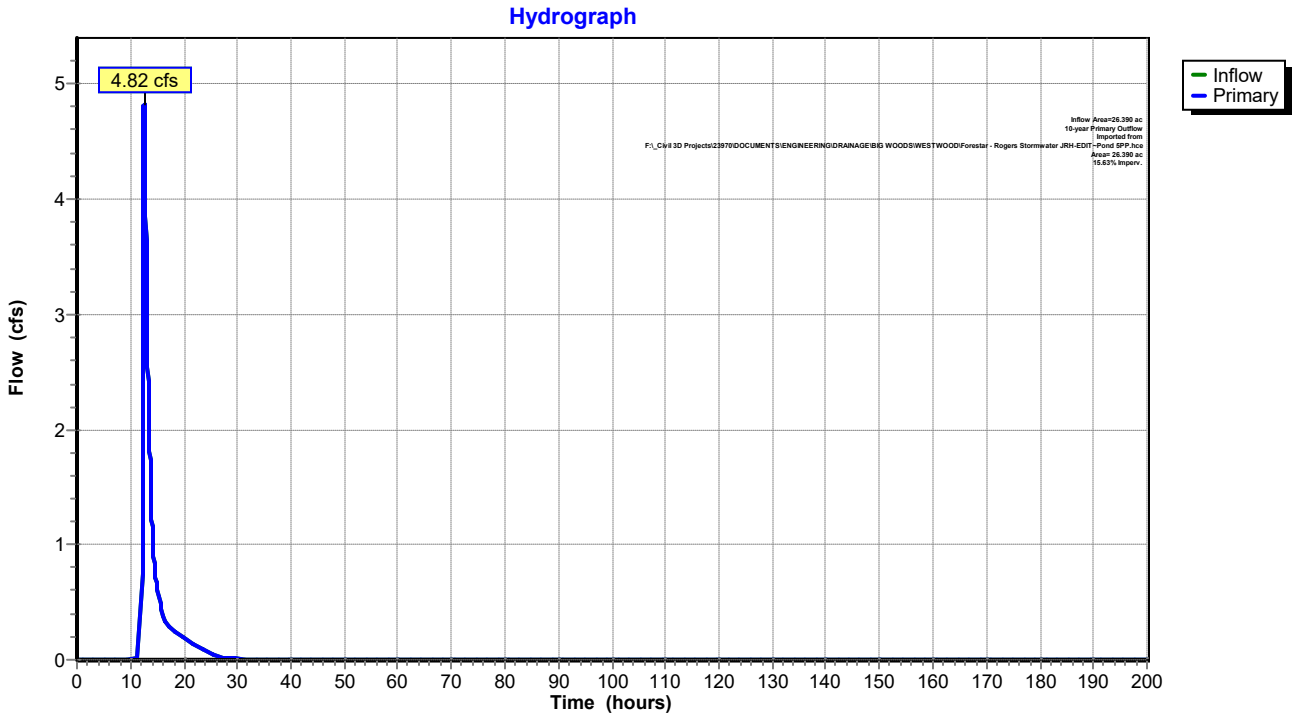
Summary for Link 5PP: Existing Pond

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth = 0.32" for 10-year event
Inflow = 4.82 cfs @ 12.52 hrs, Volume= 0.706 af
Primary = 4.82 cfs @ 12.52 hrs, Volume= 0.706 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

10-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG W

Link 5PP: Existing Pond



Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth=3.93"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min CN=72/0 Runoff=1,123.30 cfs 98.288 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=19.438 ac 21.11% Impervious Runoff Depth=5.78"
Flow Length=1,602' Tc=23.6 min CN=86/98 Runoff=108.68 cfs 9.357 af

Subcatchment 11S: Direct to Cowley Lake Runoff Area=6.152 ac 3.35% Impervious Runoff Depth=5.20"
Flow Length=1,308' Tc=15.2 min CN=83/98 Runoff=39.58 cfs 2.666 af

Subcatchment 12S: Fugitve to Fox Creek Runoff Area=0.547 ac 45.16% Impervious Runoff Depth=5.74"
Flow Length=165' Tc=8.1 min CN=80/98 Runoff=4.71 cfs 0.262 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=3.970 ac 7.66% Impervious Runoff Depth=4.86"
Flow Length=310' Tc=10.9 min CN=79/98 Runoff=27.57 cfs 1.608 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.782 ac 1.28% Impervious Runoff Depth=4.72"
Flow Length=392' Tc=17.3 min CN=79/98 Runoff=4.39 cfs 0.308 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=3.027 ac 10.37% Impervious Runoff Depth=4.92"
Flow Length=309' Tc=17.0 min CN=79/98 Runoff=17.55 cfs 1.241 af

Subcatchment 23S: Direct to Proposed Runoff Area=3.385 ac 0.68% Impervious Runoff Depth=4.93"
Flow Length=243' Tc=13.3 min CN=81/98 Runoff=22.25 cfs 1.391 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=7.873 ac 5.31% Impervious Runoff Depth=5.02"
Flow Length=407' Tc=11.1 min CN=81/98 Runoff=56.02 cfs 3.294 af

Subcatchment 25S: Direct to Proposed Runoff Area=15.059 ac 29.82% Impervious Runoff Depth=5.50"
Flow Length=1,817' Tc=17.1 min CN=81/98 Runoff=94.08 cfs 6.905 af

Subcatchment 26S: Direct to Proposed Runoff Area=4.398 ac 38.38% Impervious Runoff Depth=5.67"
Flow Length=621' Tc=8.6 min CN=81/98 Runoff=37.02 cfs 2.078 af

Subcatchment 27S: Direct to Proposed Runoff Area=3.120 ac 47.02% Impervious Runoff Depth=5.96"
Flow Length=621' Tc=8.6 min CN=83/98 Runoff=27.18 cfs 1.549 af

Subcatchment 28S: Direct to Proposed Runoff Area=7.153 ac 50.64% Impervious Runoff Depth=5.97"
Flow Length=1,013' Tc=14.4 min CN=82/98 Runoff=51.09 cfs 3.557 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=34.136 ac 8.50% Impervious Runoff Depth=5.19"
Flow Length=1,249' Tc=23.4 min CN=82/98 Runoff=176.81 cfs 14.753 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth=4.47"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min CN=74/98 Runoff=65.78 cfs 7.458 af

Subcatchment 32S: Direct to Proposed Runoff Area=3.686 ac 36.52% Impervious Runoff Depth=5.78"
Flow Length=440' Slope=0.0200 '/' Tc=7.1 min CN=83/98 Runoff=33.42 cfs 1.774 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=67.435 ac 2.92% Impervious Runoff Depth=5.74"
Flow Length=1,354' Tc=23.6 min CN=88/98 Runoff=379.24 cfs 32.280 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=5.08"
Flow Length=1,032' Tc=10.2 min CN=80/98 Runoff=100.55 cfs 5.810 af

Subcatchment 42S: Direct to Proposed Runoff Area=2.612 ac 32.54% Impervious Runoff Depth=5.48"
Flow Length=422' Tc=10.2 min CN=80/98 Runoff=20.03 cfs 1.193 af

Subcatchment 43S: Direct to Proposed Runoff Area=6.873 ac 41.00% Impervious Runoff Depth=5.79"
Flow Length=1,173' Tc=14.8 min CN=82/98 Runoff=47.43 cfs 3.315 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth=5.68"
Flow Length=734' Tc=26.4 min CN=87/98 Runoff=68.57 cfs 6.189 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=5.46"
Flow Length=531' Tc=5.6 min CN=82/98 Runoff=33.96 cfs 1.710 af

Reach 1R: Cowley Lake Outlet Channel Inflow=65.25 cfs 12.023 af
Outflow=65.25 cfs 12.023 af

Reach 2R: Cowley Lake Inflow=184.21 cfs 146.970 af
Outflow=184.21 cfs 146.970 af

Reach 21R: Proposed East Channel Avg. Flow Depth=1.28' Max Vel=6.46 fps Inflow=56.86 cfs 62.953 af
n=0.022 L=264.0' S=0.0125 '/' Capacity=149.23 cfs Outflow=56.86 cfs 62.953 af

Reach 23R: Existing West Channel Avg. Flow Depth=1.59' Max Vel=4.17 fps Inflow=82.09 cfs 70.970 af
n=0.022 L=251.0' S=0.0037 '/' Capacity=321.50 cfs Outflow=81.93 cfs 70.969 af

Pond 7P: Whiteford Lake and Peak Elev=931.48' Storage=92.213 af Inflow=1,123.30 cfs 98.288 af
Outflow=34.97 cfs 36.256 af

Pond 10P: Proposed Northeast Peak Elev=923.82' Storage=7.203 af Inflow=108.68 cfs 9.357 af
Outflow=54.13 cfs 9.357 af

Pond 25P: Proposed Northwest Peak Elev=927.80' Storage=4.908 af Inflow=94.08 cfs 6.905 af
Outflow=23.44 cfs 6.905 af

Pond 26P: Proposed Northwest Central Peak Elev=925.93' Storage=2.664 af Inflow=41.54 cfs 3.624 af
Outflow=4.83 cfs 3.624 af

Pond 27P: Proposed Northwest Central Peak Elev=926.35' Storage=1.466 af Inflow=27.18 cfs 1.549 af
Outflow=5.95 cfs 1.546 af

Pond 28P: Proposed Northeast Central Peak Elev=924.00' Storage=2.116 af Inflow=51.09 cfs 3.557 af
Outflow=19.81 cfs 3.557 af

Pond 30P: Wetland 4A Peak Elev=926.91' Storage=8.089 af Inflow=206.55 cfs 62.344 af
Primary=54.21 cfs 42.527 af Secondary=3.20 cfs 19.871 af Outflow=57.41 cfs 62.398 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=934.52' Storage=1.969 af Inflow=65.78 cfs 43.714 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=25.92 cfs 45.816 af

Pond 32P: Proposed West Central Pond Peak Elev=929.13' Storage=1.763 af Inflow=33.42 cfs 1.774 af
Outflow=11.07 cfs 1.774 af

Pond 40P: Wetland 2B Peak Elev=926.55' Storage=24.891 af Inflow=415.75 cfs 62.645 af
60.0" x 36.0" Box Culvert n=0.013 L=138.0' S=0.0029 '/' Outflow=56.67 cfs 62.645 af

Pond 41P: Ex South Off-site Pond Peak Elev=940.67' Storage=4.079 af Inflow=100.55 cfs 5.810 af
Outflow=7.88 cfs 2.123 af

Pond 42P: Proposed South Central Pond Peak Elev=930.36' Storage=0.739 af Inflow=20.03 cfs 1.193 af
Outflow=6.56 cfs 1.193 af

Pond 43P: Proposed East Central Pond Peak Elev=929.07' Storage=2.810 af Inflow=47.43 cfs 3.315 af
Outflow=11.48 cfs 3.313 af

Pond 50P: Wetland 4B Peak Elev=941.66' Storage=250,287 cf Inflow=78.67 cfs 10.852 af
Outflow=9.40 cfs 5.629 af

Pond 60P: Wetland 5B Peak Elev=938.96' Storage=14,745 cf Inflow=41.22 cfs 18.322 af
Outflow=39.47 cfs 18.108 af

Link DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=17.34 cfs 16.612 af
Primary=17.34 cfs 16.612 af

Link \DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=10.47 cfs 4.664 af
Area= 26.390 ac 15.63% Imperv. Primary=10.47 cfs 4.664 af

Total Runoff Area = 540.193 ac Runoff Volume = 206.987 af Average Runoff Depth = 4.60"
93.94% Pervious = 507.441 ac 6.06% Impervious = 32.752 ac

Summary for Subcatchment 7S: Approx DA to Lake

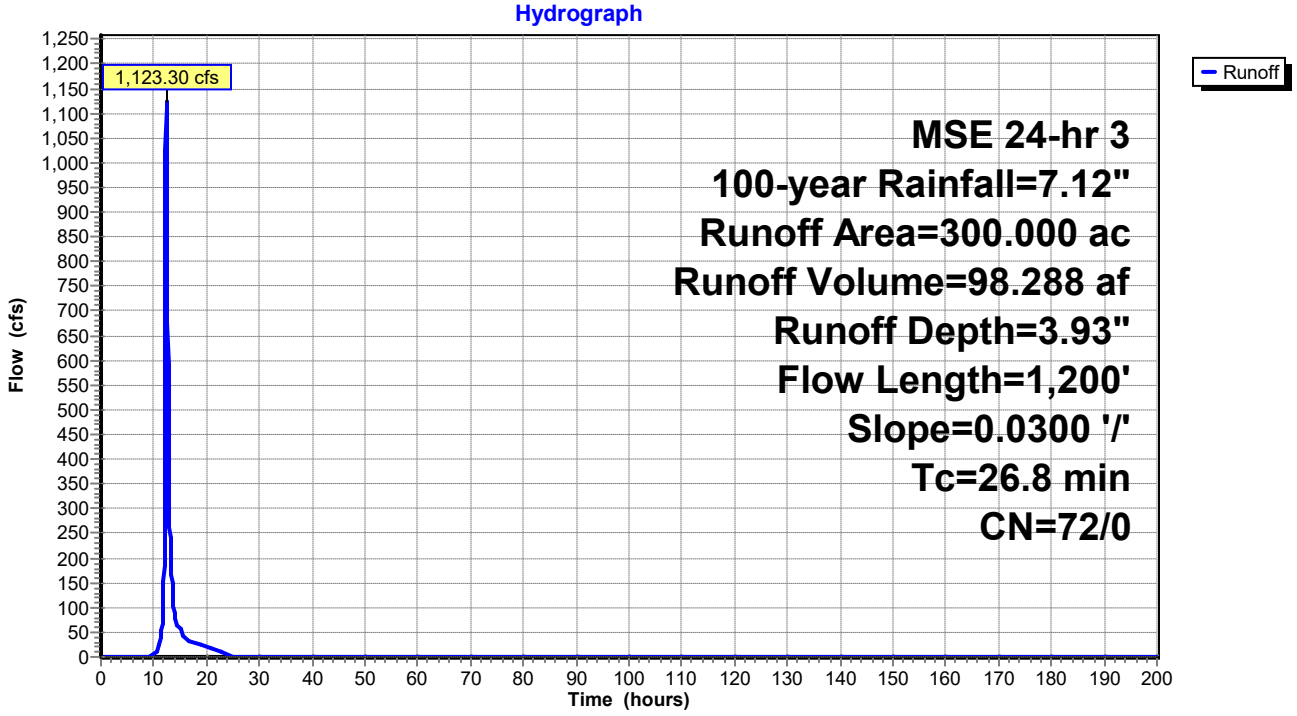
Runoff = 1,123.30 cfs @ 12.39 hrs, Volume= 98.288 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
300.000	72	Woods/grass comb., Good, HSG C
300.000	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

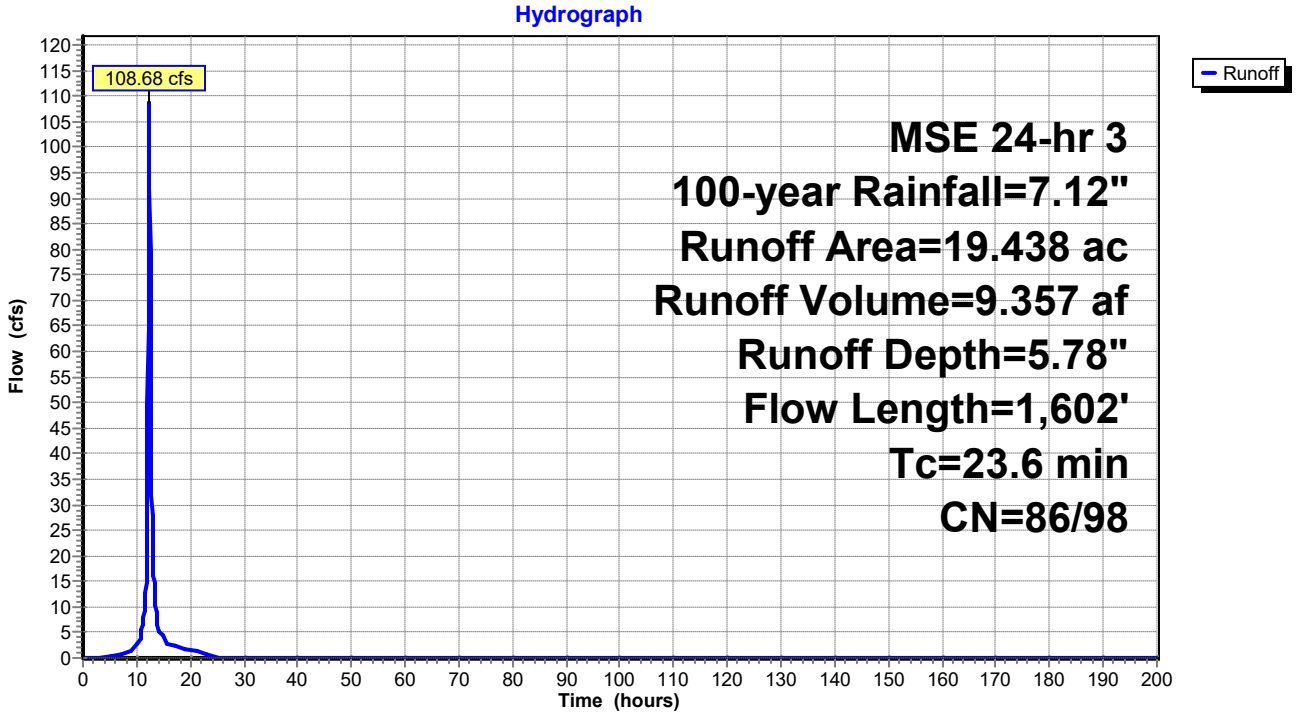
Runoff = 108.68 cfs @ 12.33 hrs, Volume= 9.357 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.399	98	Unconnected pavement, HSG D
1.088	98	Unconnected roofs, HSG D
1.617	98	Paved roads w/curbs & sewers, HSG D
0.606	98	Paved parking, HSG D
0.393	98	Roofs, HSG D
0.699	98	Water Surface, 0% imp, HSG D
8.527	89	Row crops, straight row, Good, HSG D
4.972	80	>75% Grass cover, Good, HSG D
1.137	78	Meadow, non-grazed, HSG D
19.438	88	Weighted Average
15.335	86	78.89% Pervious Area
4.103	98	21.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
14.6	842	0.0114	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.7	660		3.00		**Direct Entry, Pipe flow @ 3 fps**
23.6	1,602	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 11S: Direct to Cowley Lake Outlet Channel

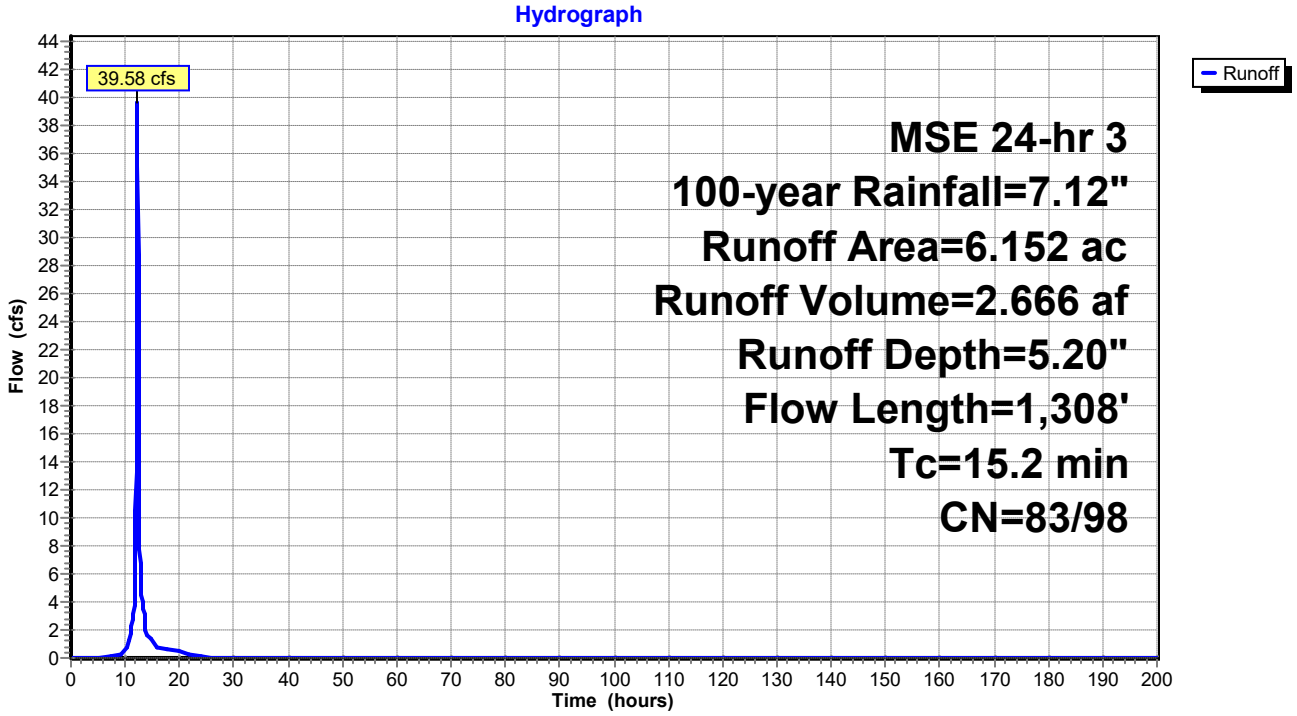
Runoff = 39.58 cfs @ 12.23 hrs, Volume= 2.666 af, Depth= 5.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.024	98	Unconnected pavement, HSG D
0.182	98	Unconnected roofs, HSG D
1.316	98	Water Surface, 0% imp, HSG D
1.199	80	>75% Grass cover, Good, HSG D
2.901	78	Meadow, non-grazed, HSG D
0.530	77	Woods, Good, HSG D
6.152	83	Weighted Average
5.946	83	96.65% Pervious Area
0.206	98	3.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.8	114	0.0263	2.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	1,094	0.0024	3.27	46.64	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=1.50' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
15.2	1,308	Total			

Subcatchment 11S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 12S: Fugitve to Fox Creek West 5th Addition

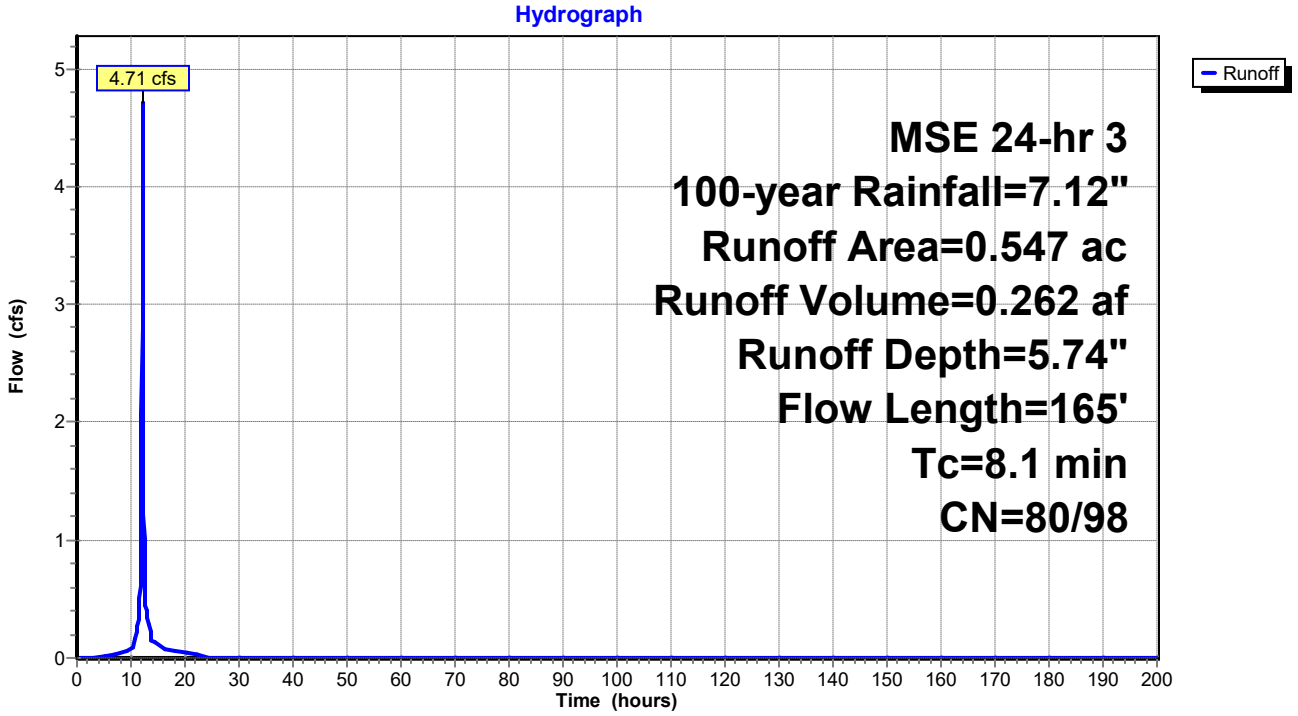
Runoff = 4.71 cfs @ 12.15 hrs, Volume= 0.262 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.015	98	Unconnected pavement, HSG D
0.043	98	Unconnected roofs, HSG D
0.104	98	Paved roads w/curbs & sewers, HSG D
0.051	98	Paved parking, HSG D
0.034	98	Roofs, HSG D
0.300	80	>75% Grass cover, Good, HSG D
0.547	88	Weighted Average
0.300	80	54.84% Pervious Area
0.247	98	45.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0440	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.3	40	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	25	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	165	Total			

Subcatchment 12S: Fugitve to Fox Creek West 5th Addition



Summary for Subcatchment 20S: Direct to Cowley Lake

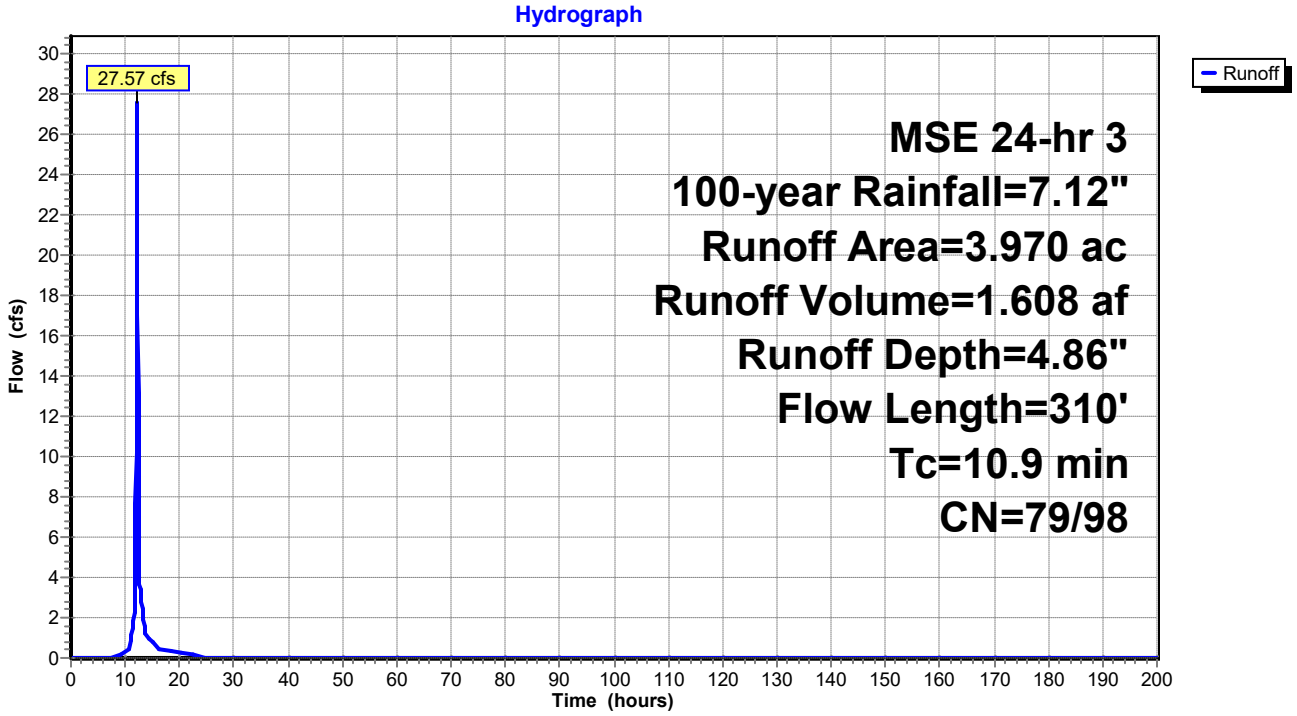
Runoff = 27.57 cfs @ 12.19 hrs, Volume= 1.608 af, Depth= 4.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.046	98	Unconnected pavement, HSG D
0.258	98	Unconnected roofs, HSG D
0.122	98	Water Surface, 0% imp, HSG D
0.949	80	>75% Grass cover, Good, HSG D
1.018	78	Meadow, non-grazed, HSG D
1.577	77	Woods, Good, HSG D
3.970	80	Weighted Average
3.666	79	92.34% Pervious Area
0.304	98	7.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0270	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	72	0.0347	2.79		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.3	138	0.0667	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	310	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

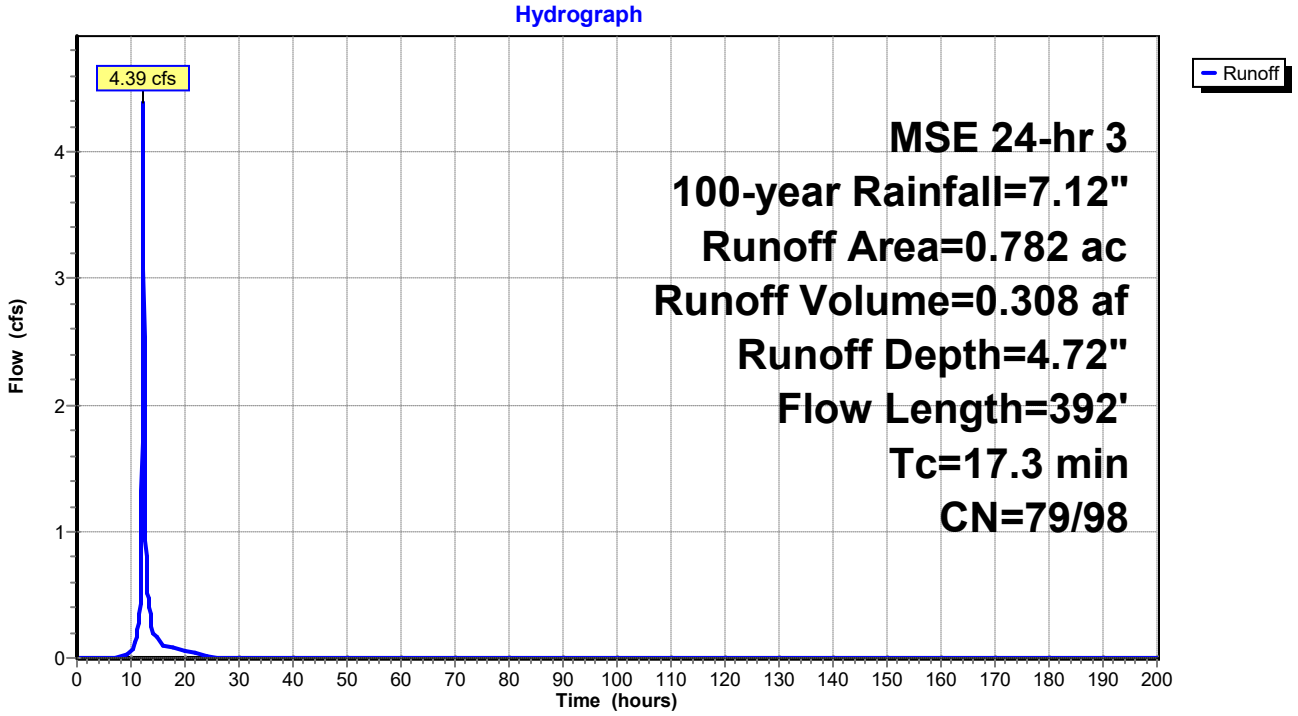
Runoff = 4.39 cfs @ 12.26 hrs, Volume= 0.308 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.010	98	Unconnected pavement, HSG D
0.054	98	Water Surface, 0% imp, HSG D
0.016	80	>75% Grass cover, Good, HSG D
0.162	78	Meadow, non-grazed, HSG D
0.540	77	Woods, Good, HSG D
0.782	79	Weighted Average
0.772	79	98.72% Pervious Area
0.010	98	1.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.8	100	0.0590	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.3	146	0.0452	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	146	0.0164	10.55	221.46	**Channel Flow,** Area= 21.0 sf Perim= 15.6' r= 1.35' n= 0.022 Earth, clean & straight
17.3	392	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

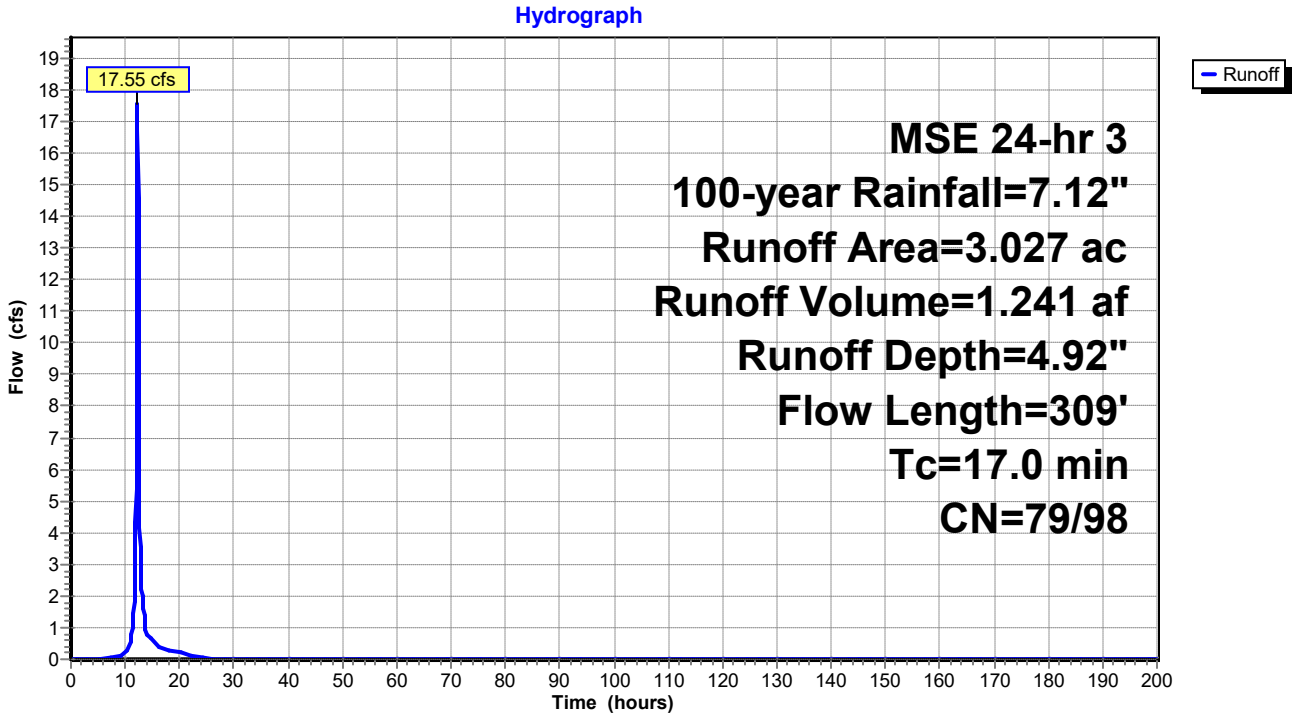
Runoff = 17.55 cfs @ 12.26 hrs, Volume= 1.241 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.125	98	Unconnected pavement, HSG D
0.189	98	Unconnected roofs, HSG D
0.031	98	Water Surface, 0% imp, HSG D
0.779	80	>75% Grass cover, Good, HSG D
1.348	78	Meadow, non-grazed, HSG D
0.555	77	Woods, Good, HSG D
3.027	81	Weighted Average
2.713	79	89.63% Pervious Area
0.314	98	10.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0220	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
2.4	209	0.0445	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.0	309	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Proposed West Channel

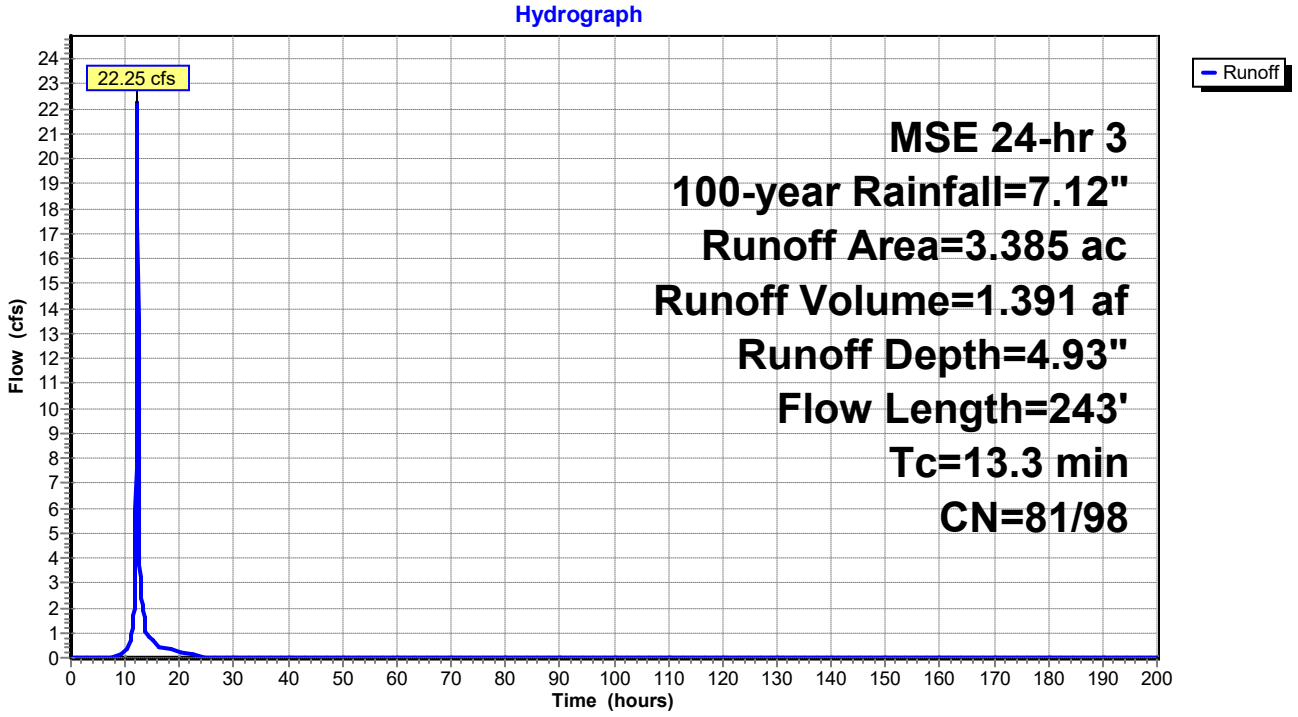
Runoff = 22.25 cfs @ 12.21 hrs, Volume= 1.391 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.023	98	Unconnected pavement, HSG D
0.467	98	Water Surface, 0% imp, HSG D
0.253	80	>75% Grass cover, Good, HSG D
1.225	78	Meadow, non-grazed, HSG D
1.417	77	Woods, Good, HSG D
3.385	81	Weighted Average
3.362	81	99.32% Pervious Area
0.023	98	0.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0520	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
3.0	143	0.0259	0.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	243	Total			

Subcatchment 23S: Direct to Proposed West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

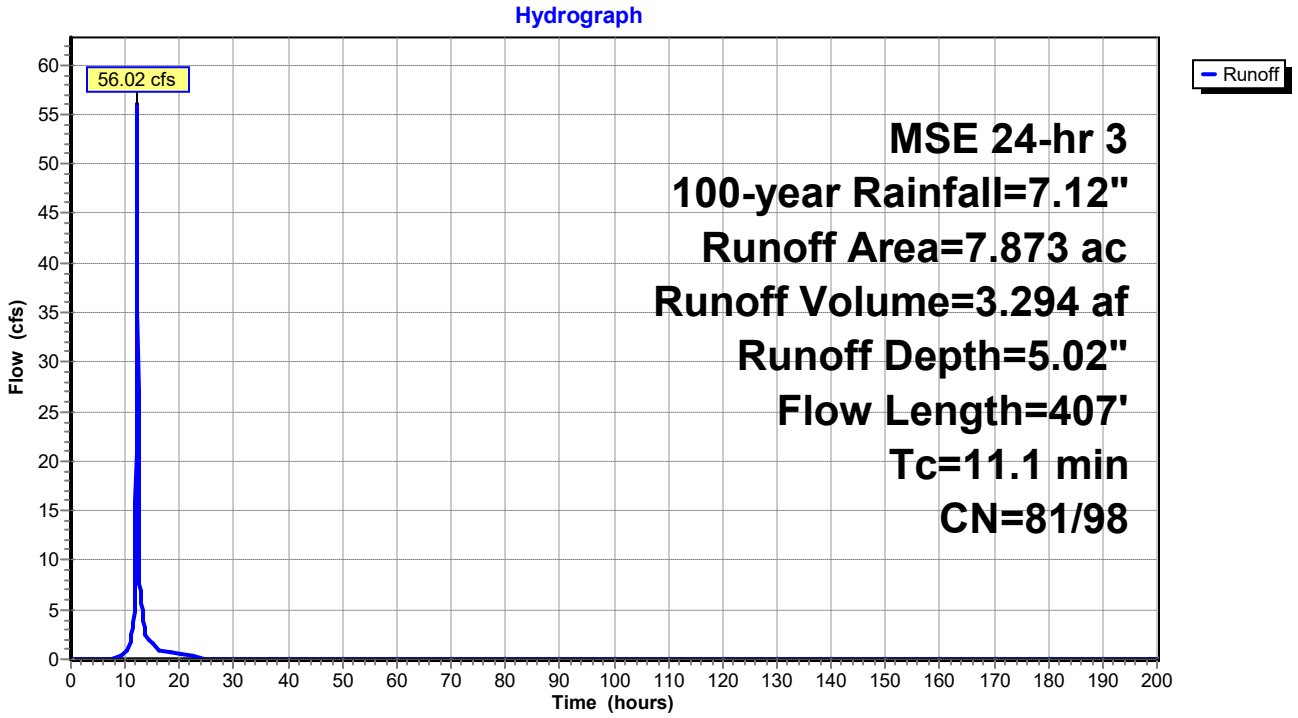
Runoff = 56.02 cfs @ 12.19 hrs, Volume= 3.294 af, Depth= 5.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.039	98	Unconnected pavement, HSG D
0.379	98	Unconnected roofs, HSG D
0.980	98	Water Surface, 0% imp, HSG D
1.643	80	>75% Grass cover, Good, HSG D
2.538	78	Meadow, non-grazed, HSG D
2.294	77	Woods, Good, HSG D
7.873	82	Weighted Average
7.455	81	94.69% Pervious Area
0.418	98	5.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0600	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
4.4	307	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	407	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 25S: Direct to Proposed Northwest Pond

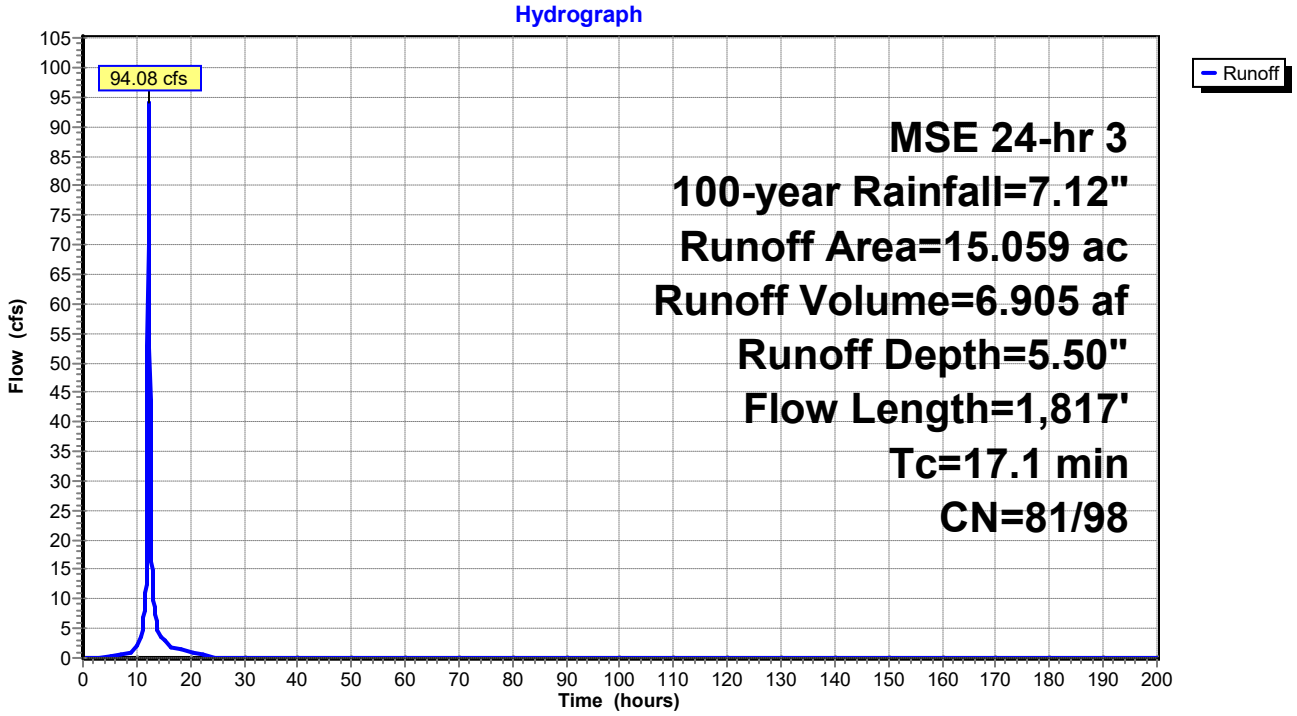
Runoff = 94.08 cfs @ 12.26 hrs, Volume= 6.905 af, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.652	98	Unconnected pavement, HSG D
1.214	98	Unconnected roofs, HSG D
1.443	98	Paved roads w/curbs & sewers, HSG D
0.758	98	Paved parking, HSG D
0.424	98	Roofs, HSG D
0.322	98	Water Surface, 0% imp, HSG D
0.084	96	Gravel surface, HSG D
0.179	89	Row crops, straight row, Good, HSG D
8.582	80	>75% Grass cover, Good, HSG D
1.401	78	Meadow, non-grazed, HSG D
15.059	86	Weighted Average
10.568	81	70.18% Pervious Area
4.491	98	29.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	90	0.0378	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	57	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.3	1,670		3.00		**Direct Entry, Pipe flow @ 3 fps**
17.1	1,817	Total			

Subcatchment 25S: Direct to Proposed Northwest Pond



Summary for Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration

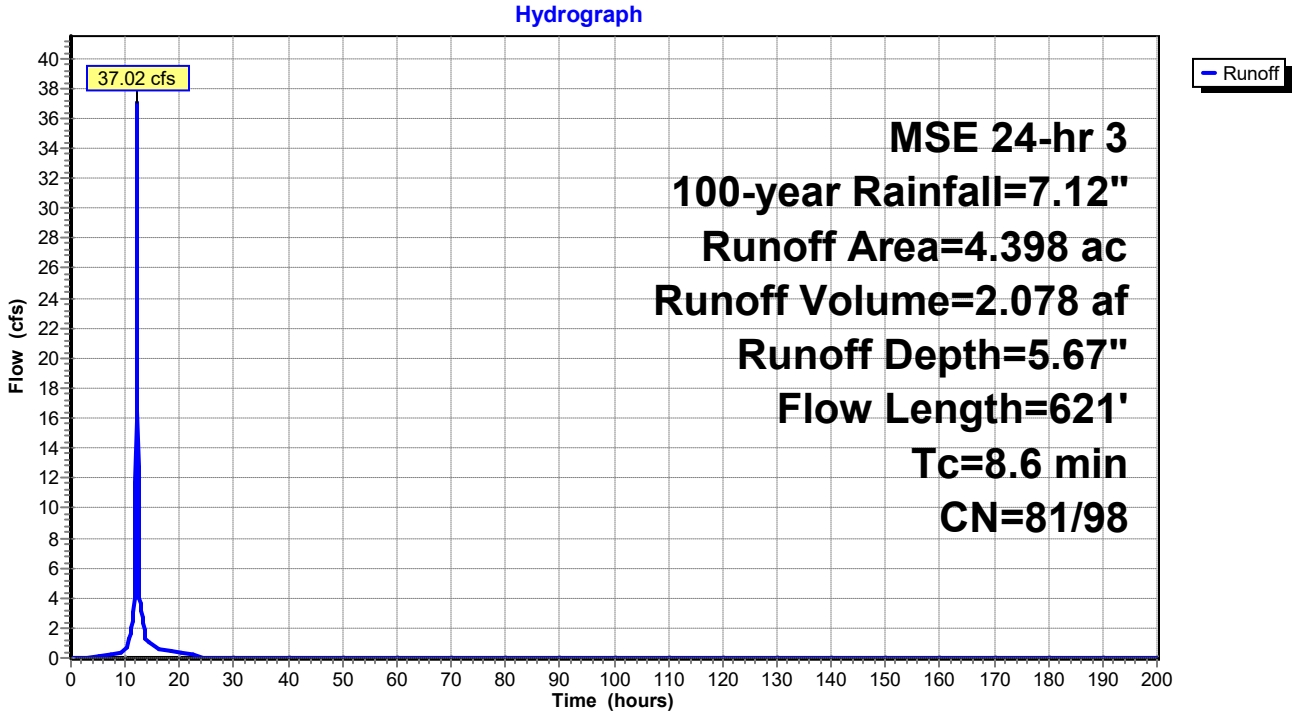
Runoff = 37.02 cfs @ 12.16 hrs, Volume= 2.078 af, Depth= 5.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.170	98	Unconnected pavement, HSG D
0.393	98	Unconnected roofs, HSG D
0.551	98	Paved roads w/curbs & sewers, HSG D
0.354	98	Paved parking, HSG D
0.220	98	Roofs, HSG D
0.318	98	Water Surface, 0% imp, HSG D
1.487	80	>75% Grass cover, Good, HSG D
0.905	78	Meadow, non-grazed, HSG D
4.398	88	Weighted Average
2.710	81	61.62% Pervious Area
1.688	98	38.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration



Summary for Subcatchment 27S: Direct to Proposed Northwest Central Pond

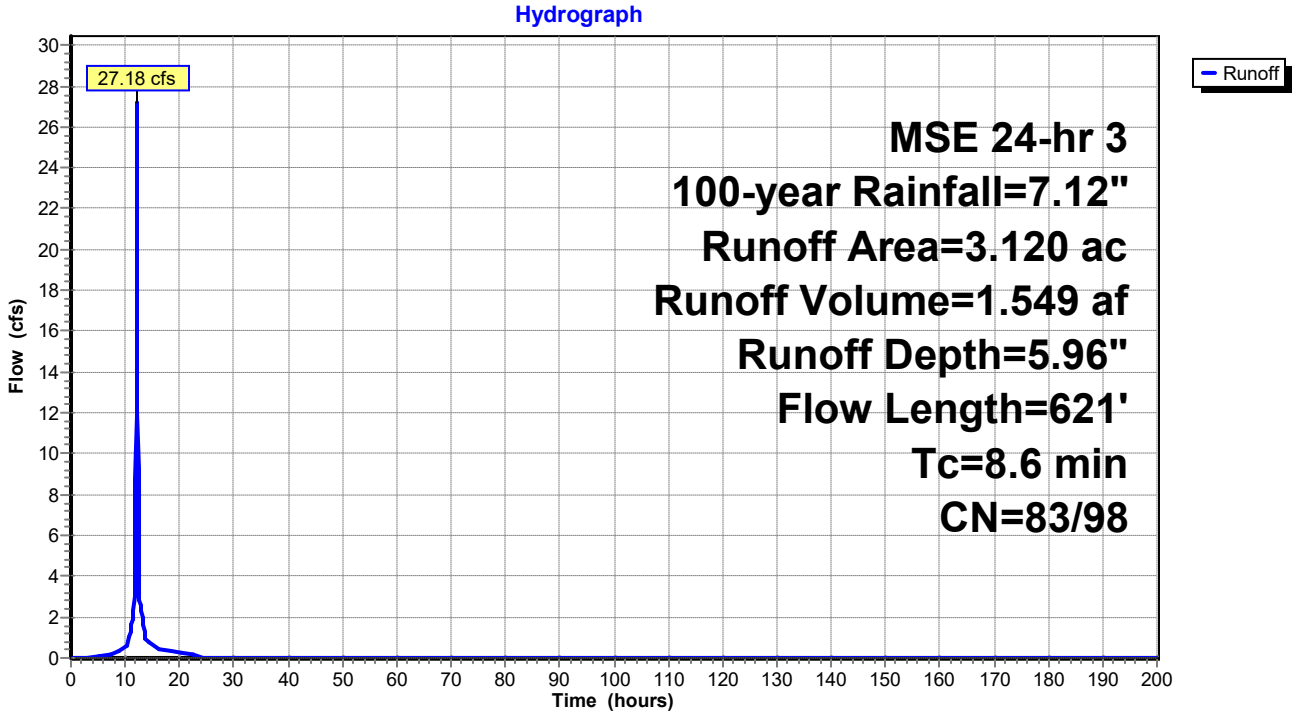
Runoff = 27.18 cfs @ 12.15 hrs, Volume= 1.549 af, Depth= 5.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.134	98	Unconnected pavement, HSG D
0.275	98	Unconnected roofs, HSG D
0.506	98	Paved roads w/curbs & sewers, HSG D
0.328	98	Paved parking, HSG D
0.224	98	Roofs, HSG D
0.278	98	Water Surface, 0% imp, HSG D
0.979	80	>75% Grass cover, Good, HSG D
0.396	78	Meadow, non-grazed, HSG D
3.120	90	Weighted Average
1.653	83	52.98% Pervious Area
1.467	98	47.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 27S: Direct to Proposed Northwest Central Pond



Summary for Subcatchment 28S: Direct to Proposed Northeast Central Pond

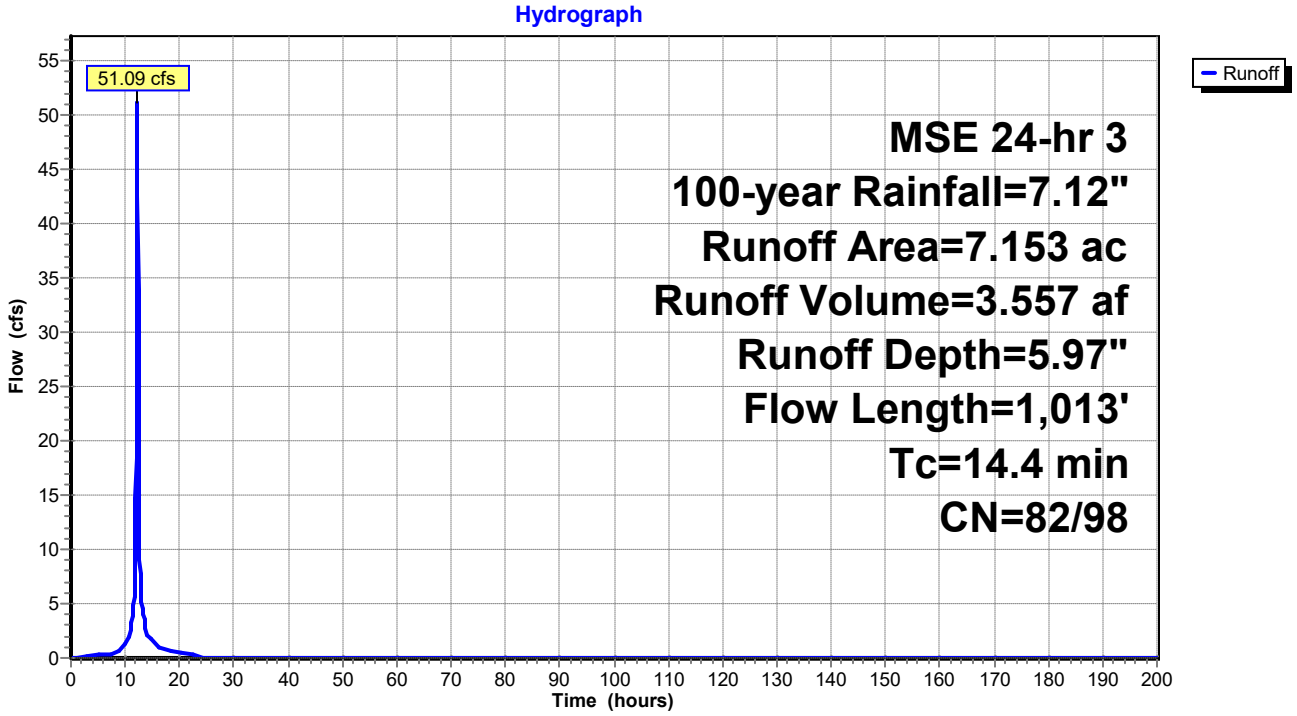
Runoff = 51.09 cfs @ 12.22 hrs, Volume= 3.557 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.152	98	Unconnected pavement, HSG D
0.932	98	Unconnected roofs, HSG D
0.930	98	Paved roads w/curbs & sewers, HSG D
1.004	98	Paved parking, HSG D
0.604	98	Roofs, HSG D
0.380	98	Water Surface, 0% imp, HSG D
2.416	80	>75% Grass cover, Good, HSG D
0.684	78	Meadow, non-grazed, HSG D
0.051	77	Woods, Good, HSG D
7.153	90	Weighted Average
3.531	82	49.36% Pervious Area
3.622	98	50.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	71	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.6	242	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	700		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.4	1,013	Total			

Subcatchment 28S: Direct to Proposed Northeast Central Pond



Summary for Subcatchment 30S: Direct to Wetland 4A

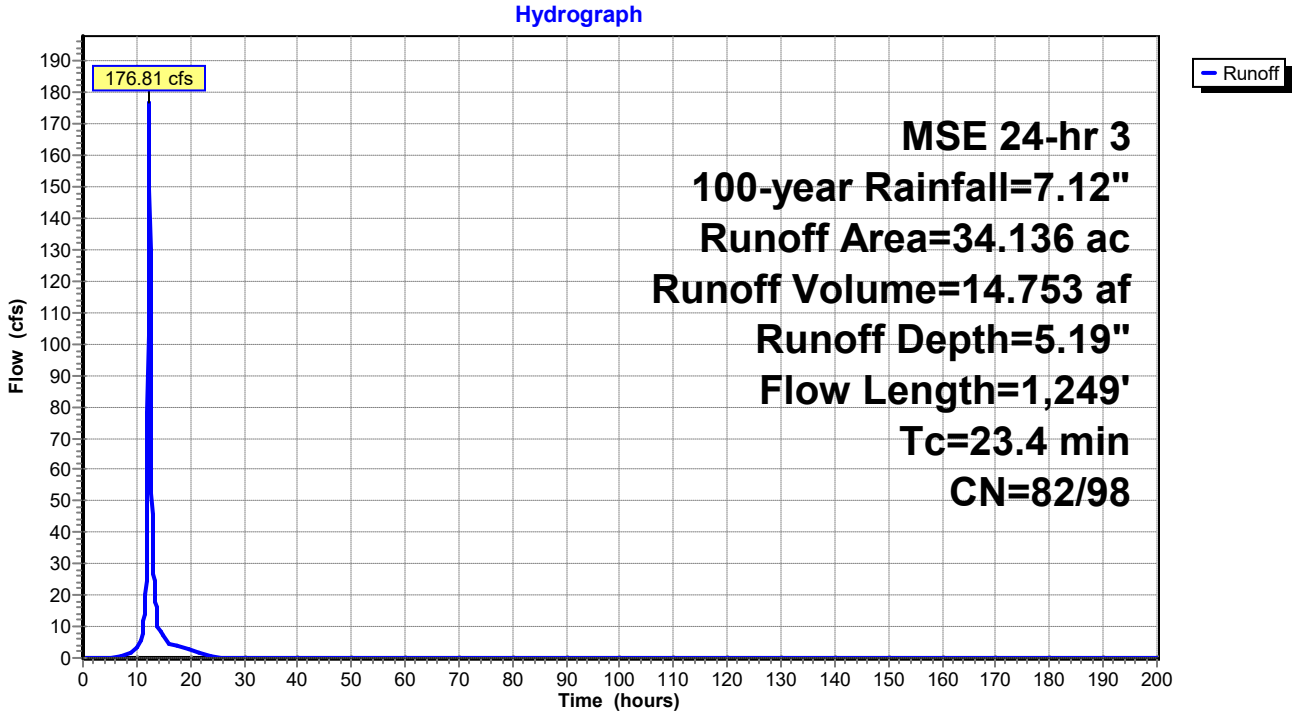
Runoff = 176.81 cfs @ 12.33 hrs, Volume= 14.753 af, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
1.401	98	Unconnected pavement, HSG D
1.502	98	Unconnected roofs, HSG D
0.939	96	Gravel surface, HSG D
6.512	89	Row crops, straight row, Good, HSG D
1.609	89	Pasture/grassland/range, Poor, HSG D
18.400	80	>75% Grass cover, Good, HSG D
3.773	77	Woods, Good, HSG D
34.136	84	Weighted Average
31.233	82	91.50% Pervious Area
2.903	98	8.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

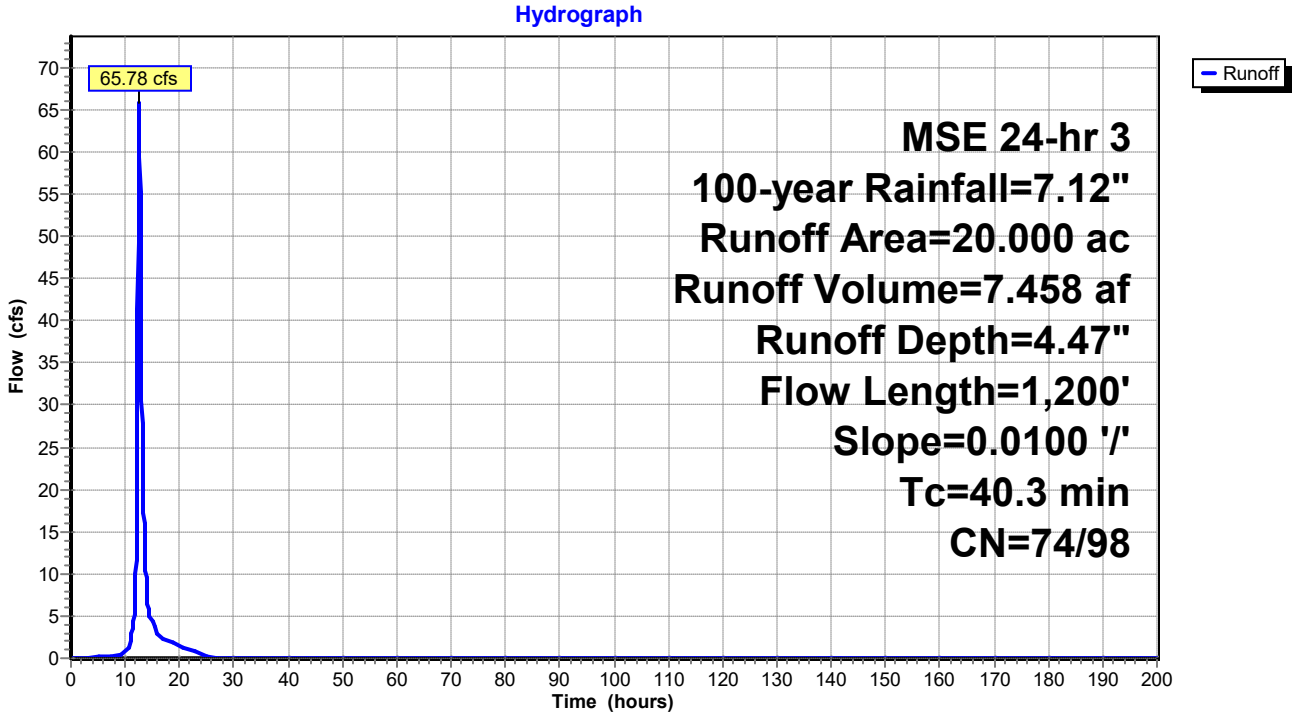
Runoff = 65.78 cfs @ 12.56 hrs, Volume= 7.458 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
20.000	77	2 acre lots, 12% imp, HSG C
17.600	74	88.00% Pervious Area
2.400	98	12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 32S: Direct to Proposed West Central Pond

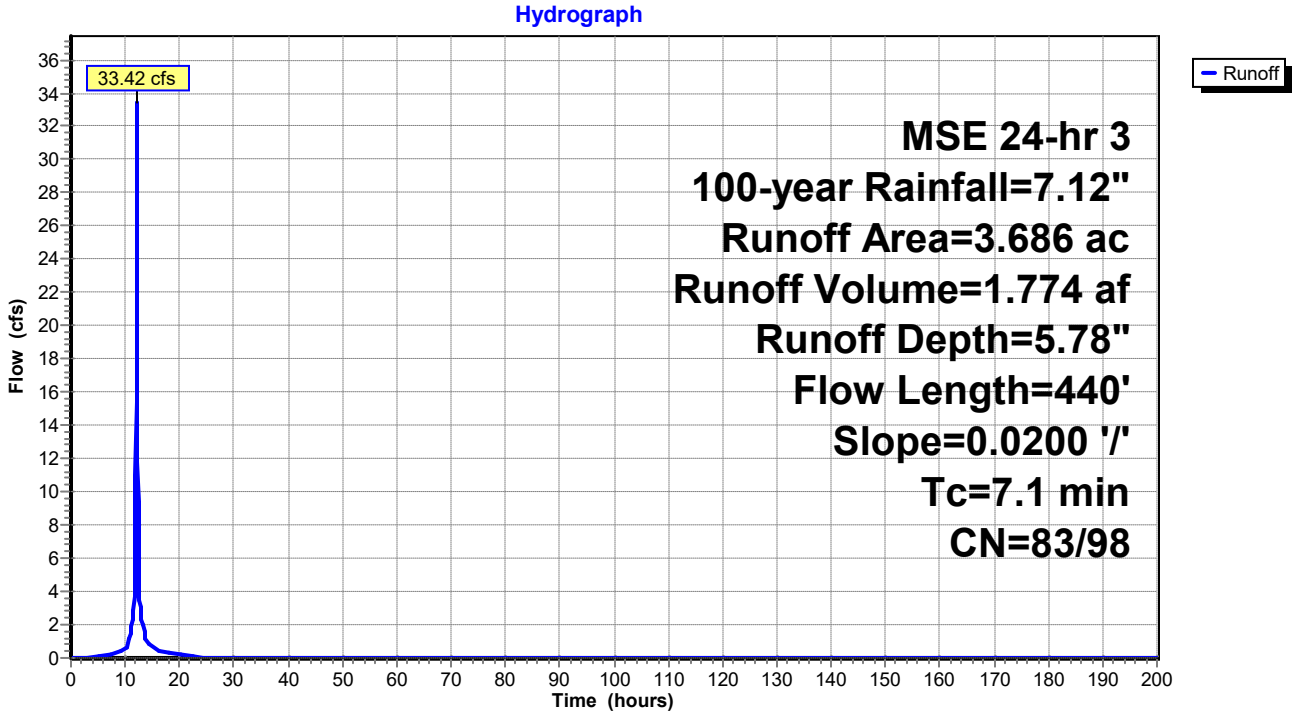
Runoff = 33.42 cfs @ 12.14 hrs, Volume= 1.774 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.039	98	Unconnected pavement, HSG D
0.438	98	Unconnected roofs, HSG D
0.377	98	Paved roads w/curbs & sewers, HSG D
0.298	98	Paved parking, HSG D
0.194	98	Roofs, HSG D
0.395	98	Water Surface, 0% imp, HSG D
1.443	80	>75% Grass cover, Good, HSG D
0.502	78	Meadow, non-grazed, HSG D
3.686	88	Weighted Average
2.340	83	63.48% Pervious Area
1.346	98	36.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.2	401		3.00		**Direct Entry,**
7.1	440	Total			

Subcatchment 32S: Direct to Proposed West Central Pond



Summary for Subcatchment 40S: Direct to Wetland 2B

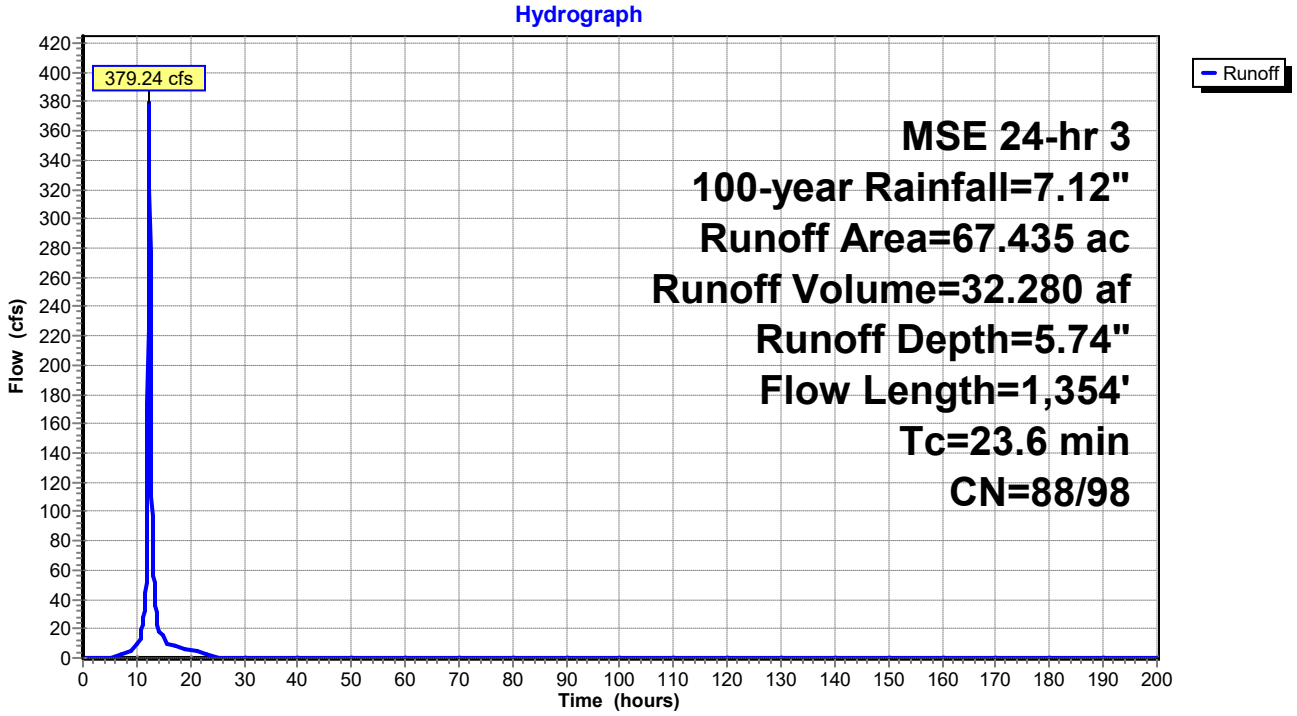
Runoff = 379.24 cfs @ 12.33 hrs, Volume= 32.280 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.965	98	Unconnected pavement, HSG D
1.003	98	Unconnected roofs, HSG D
17.214	98	Water Surface, 0% imp, HSG D
1.249	96	Gravel surface, HSG D
27.306	89	Row crops, straight row, Good, HSG D
0.208	89	Pasture/grassland/range, Poor, HSG D
9.713	80	>75% Grass cover, Good, HSG D
6.057	78	Meadow, non-grazed, HSG D
3.720	77	Woods, Good, HSG D
67.435	89	Weighted Average
65.467	88	97.08% Pervious Area
1.968	98	2.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

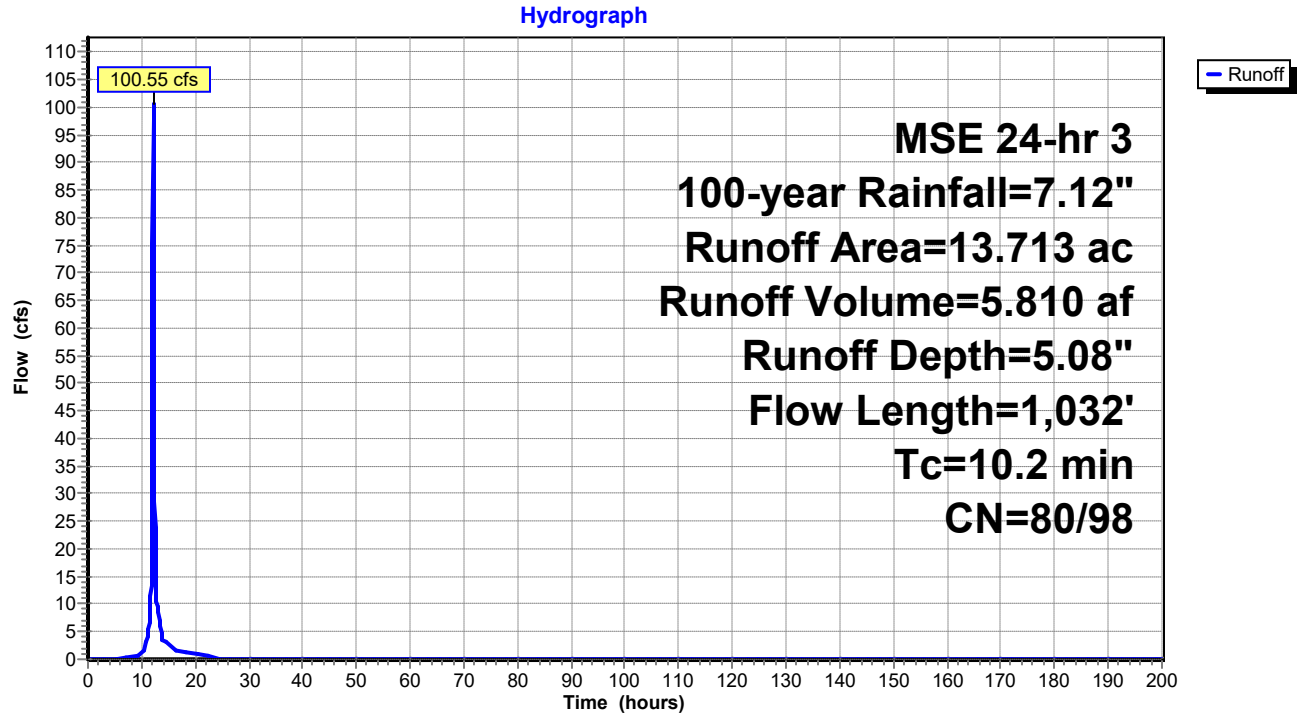
Runoff = 100.55 cfs @ 12.18 hrs, Volume= 5.810 af, Depth= 5.08"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
1.568	98	Unconnected pavement, HSG D
0.273	98	Unconnected roofs, HSG D
0.107	98	Water Surface, 0% imp, HSG D
0.066	96	Gravel surface, HSG D
10.431	80	>75% Grass cover, Good, HSG D
1.268	78	Meadow, non-grazed, HSG D
13.713	82	Weighted Average
11.872	80	86.57% Pervious Area
1.841	98	13.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 42S: Direct to Proposed South Central Pond

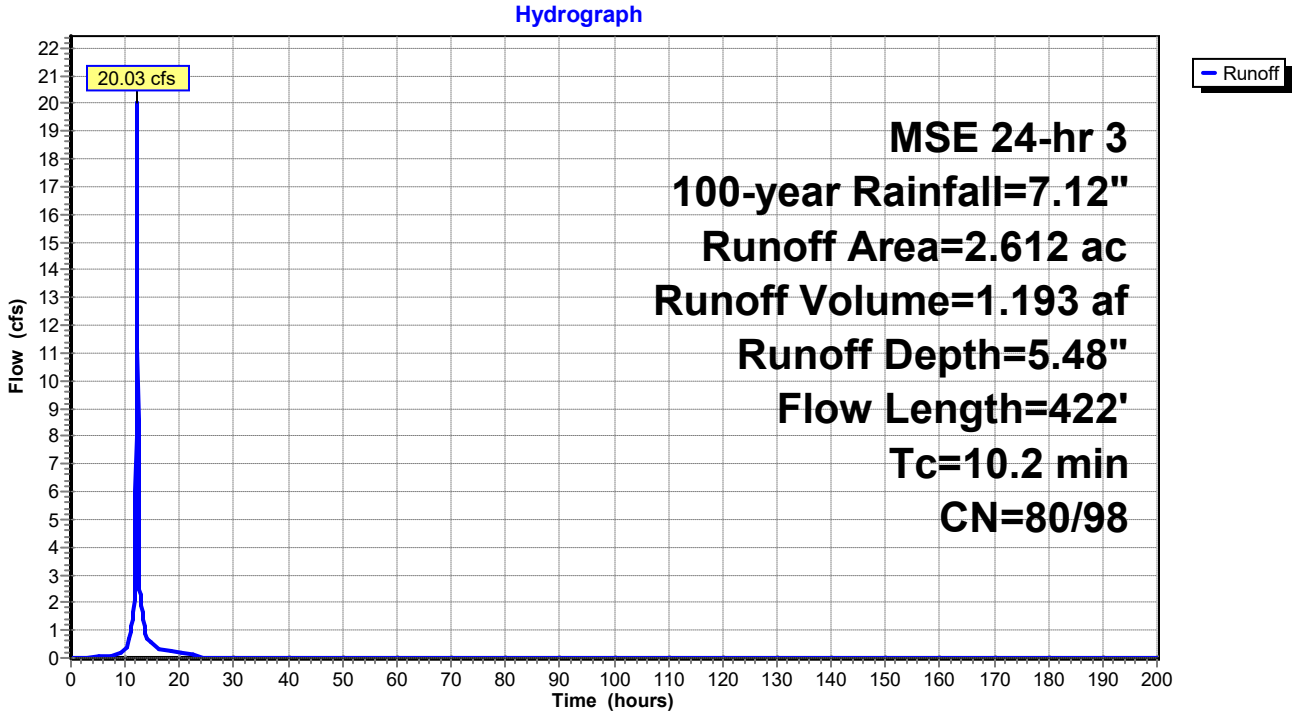
Runoff = 20.03 cfs @ 12.17 hrs, Volume= 1.193 af, Depth= 5.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.013	98	Unconnected pavement, HSG D
0.362	98	Unconnected roofs, HSG D
0.246	98	Paved roads w/curbs & sewers, HSG D
0.145	98	Paved parking, HSG D
0.084	98	Roofs, HSG D
0.154	98	Water Surface, 0% imp, HSG D
0.600	80	>75% Grass cover, Good, HSG D
0.811	78	Meadow, non-grazed, HSG D
0.197	77	Woods, Good, HSG D
2.612	86	Weighted Average
1.762	80	67.46% Pervious Area
0.850	98	32.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.7	235	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	117		3.00		**Direct Entry, Pipe flow @ 3 fps**
10.2	422	Total			

Subcatchment 42S: Direct to Proposed South Central Pond



Summary for Subcatchment 43S: Direct to Proposed Central Pond

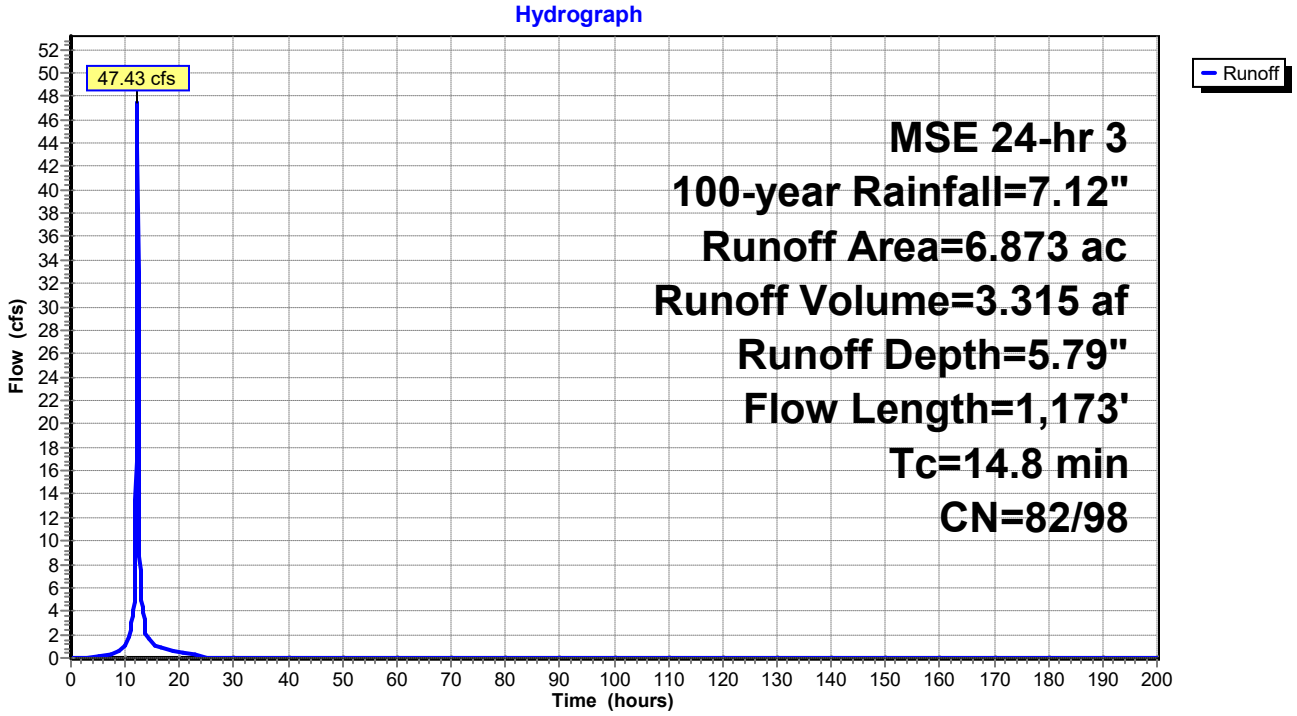
Runoff = 47.43 cfs @ 12.23 hrs, Volume= 3.315 af, Depth= 5.79"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.205	98	Unconnected pavement, HSG D
0.855	98	Unconnected roofs, HSG D
0.896	98	Paved roads w/curbs & sewers, HSG D
0.530	98	Paved parking, HSG D
0.332	98	Roofs, HSG D
0.402	98	Water Surface, 0% imp, HSG D
0.383	89	Row crops, straight row, Good, HSG D
2.711	80	>75% Grass cover, Good, HSG D
0.559	78	Meadow, non-grazed, HSG D
6.873	89	Weighted Average
4.055	82	59.00% Pervious Area
2.818	98	41.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.5	286	0.0088	1.90		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	817		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.8	1,173	Total			

Subcatchment 43S: Direct to Proposed Central Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

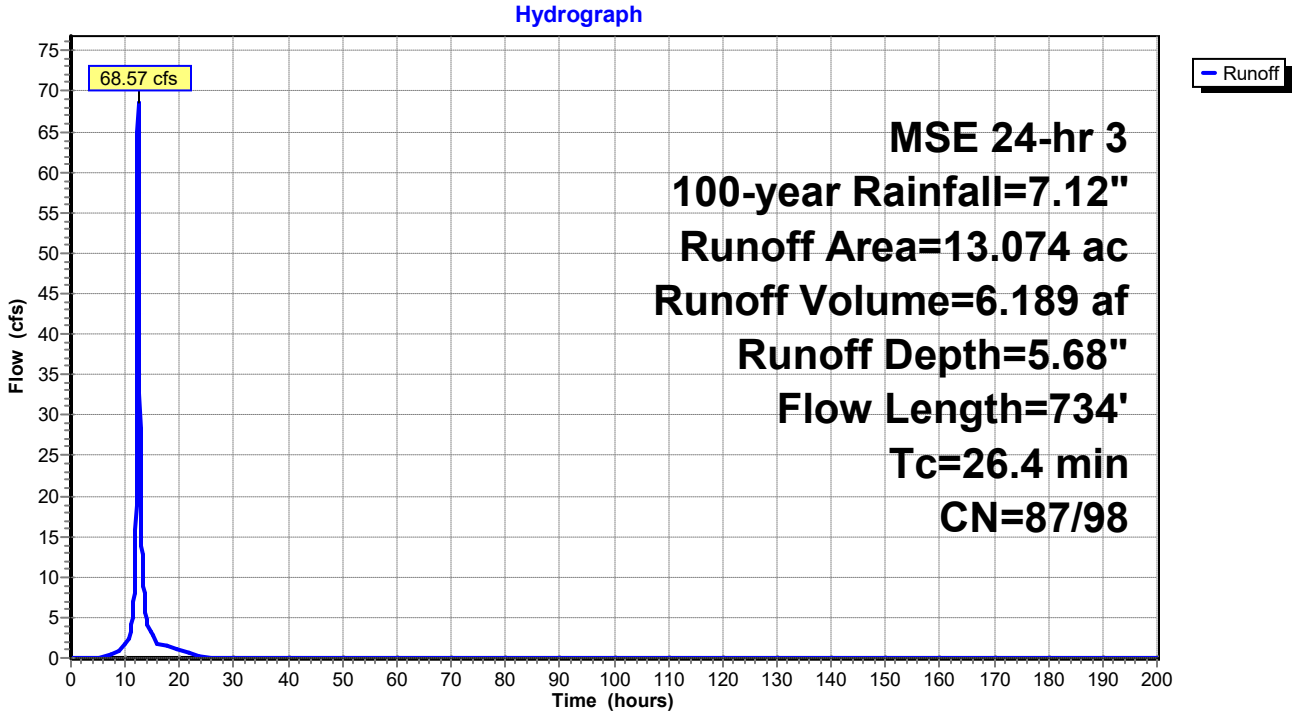
Runoff = 68.57 cfs @ 12.37 hrs, Volume= 6.189 af, Depth= 5.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.523	98	Unconnected pavement, HSG D
0.339	98	Unconnected roofs, HSG D
0.175	98	Water Surface, 0% imp, HSG D
0.233	96	Gravel surface, HSG D
8.346	89	Row crops, straight row, Good, HSG D
0.958	89	Pasture/grassland/range, Poor, HSG D
2.500	80	>75% Grass cover, Good, HSG D
13.074	88	Weighted Average
12.212	87	93.41% Pervious Area
0.862	98	6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

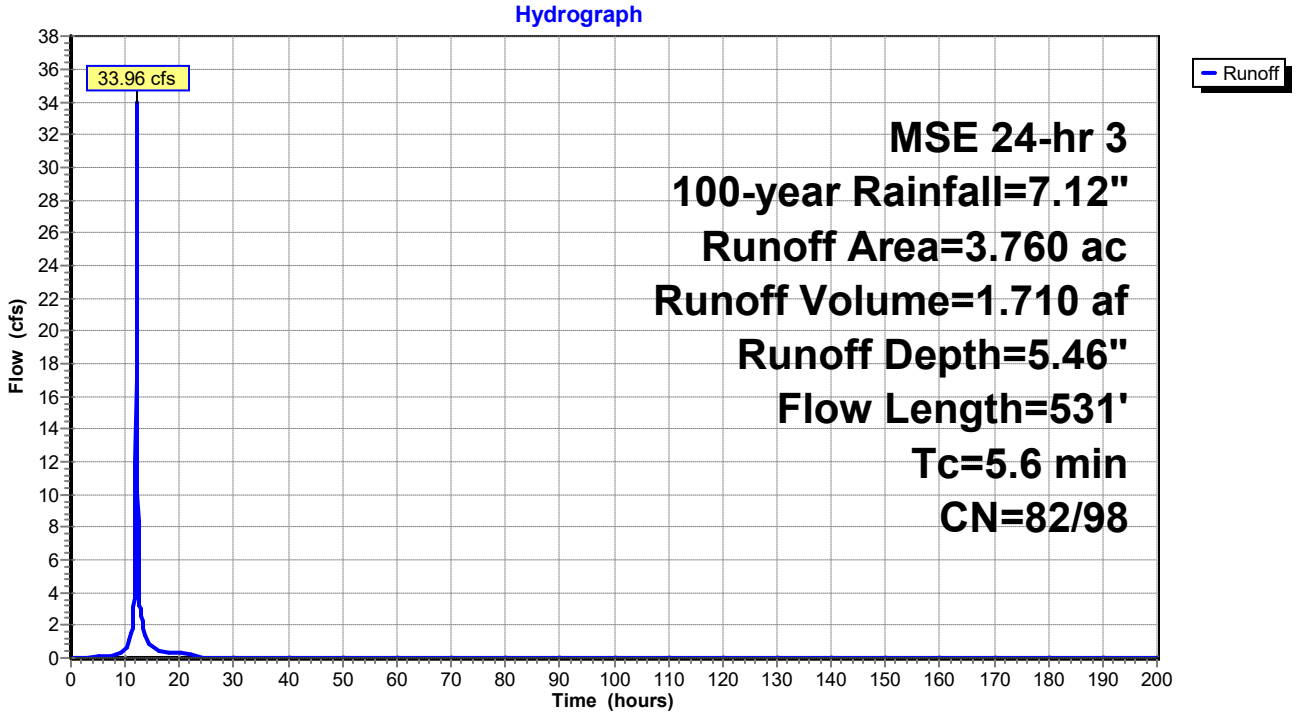
Runoff = 33.96 cfs @ 12.12 hrs, Volume= 1.710 af, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.428	98	Unconnected pavement, HSG D
0.443	98	Unconnected roofs, HSG D
0.064	98	Water Surface, 0% imp, HSG D
0.331	96	Gravel surface, HSG D
2.083	80	>75% Grass cover, Good, HSG D
0.411	77	Woods, Good, HSG D
3.760	86	Weighted Average
2.889	82	76.84% Pervious Area
0.871	98	23.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



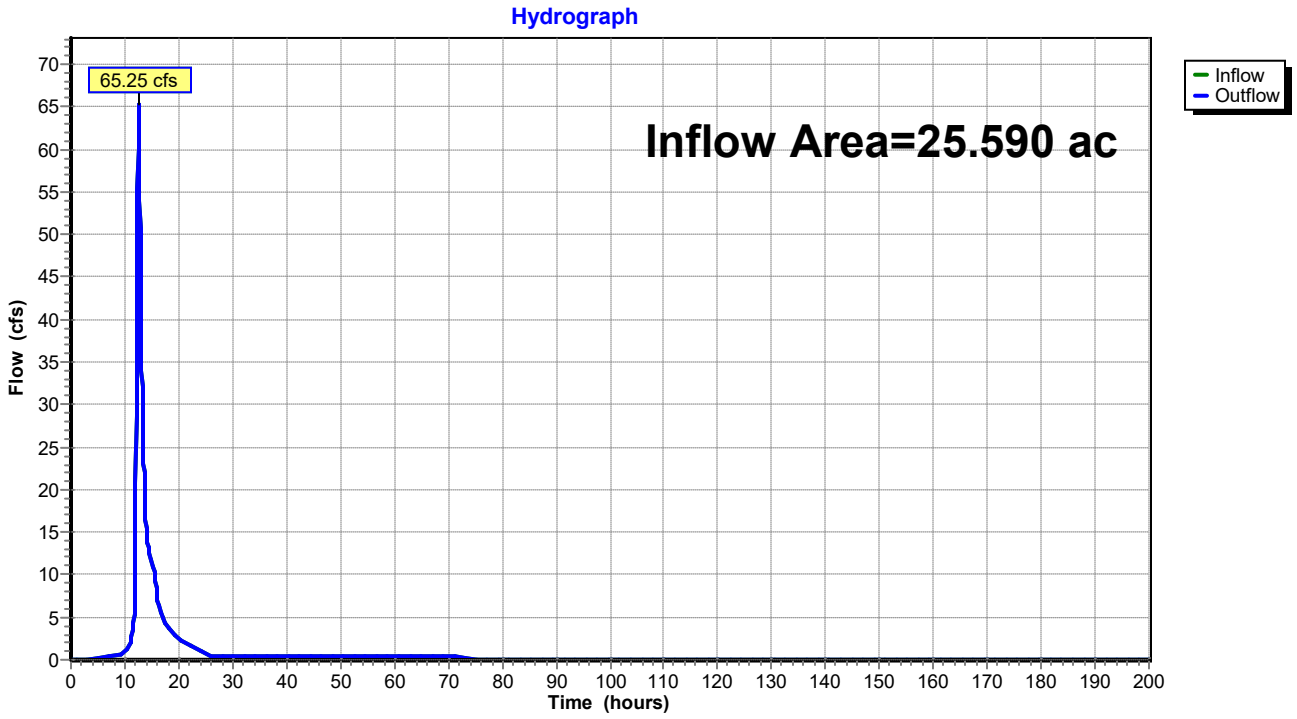
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.590 ac, 16.84% Impervious, Inflow Depth = 5.64" for 100-year event
Inflow = 65.25 cfs @ 12.57 hrs, Volume= 12.023 af
Outflow = 65.25 cfs @ 12.57 hrs, Volume= 12.023 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



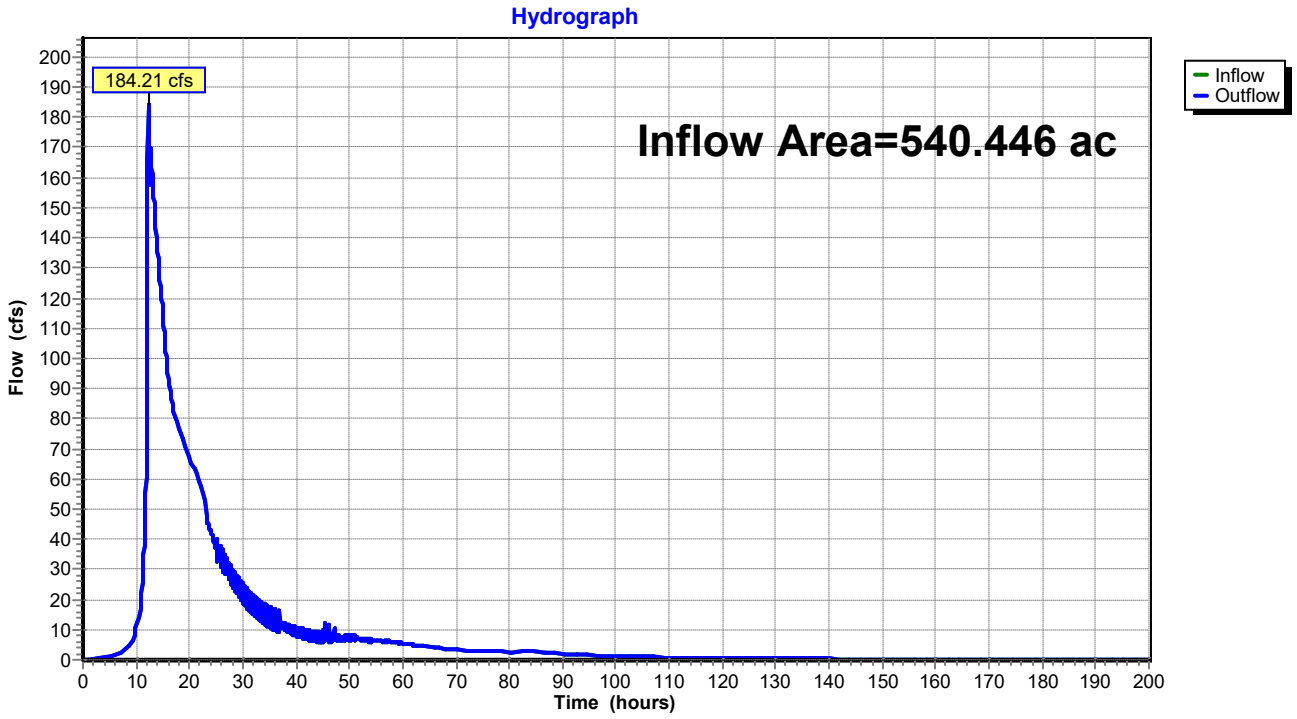
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.446 ac, 5.98% Impervious, Inflow Depth > 3.26" for 100-year event
Inflow = 184.21 cfs @ 12.22 hrs, Volume= 146.970 af
Outflow = 184.21 cfs @ 12.22 hrs, Volume= 146.970 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



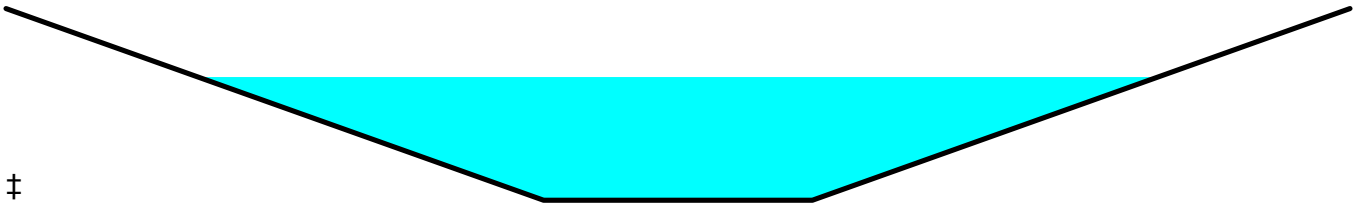
Summary for Reach 21R: Proposed East Channel

Inflow Area = 134.639 ac, 9.91% Impervious, Inflow Depth = 5.61" for 100-year event
Inflow = 56.86 cfs @ 14.34 hrs, Volume= 62.953 af
Outflow = 56.86 cfs @ 14.35 hrs, Volume= 62.953 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.46 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 3.2 min

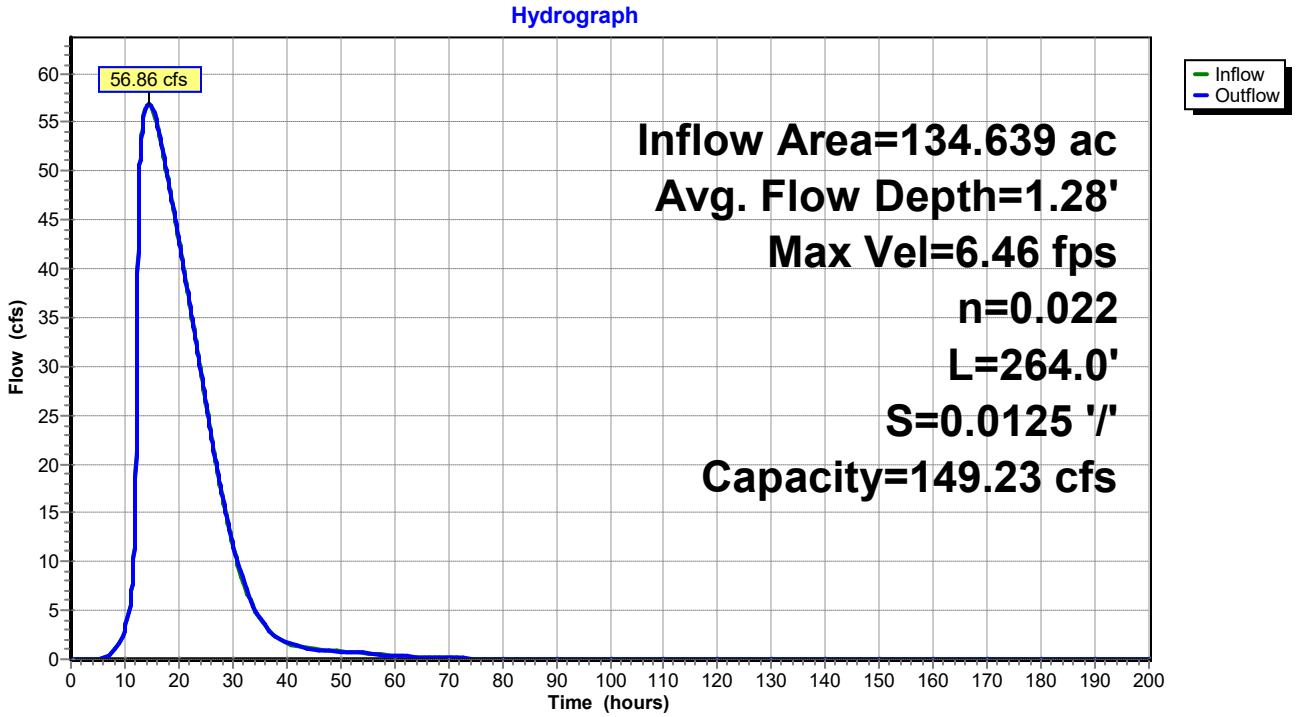
Peak Storage= 2,323 cf @ 14.35 hrs
Average Depth at Peak Storage= 1.28'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 149.23 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 264.0' Slope= 0.0125 '/'
Inlet Invert= 923.50', Outlet Invert= 920.20'



‡

Reach 21R: Proposed East Channel



Summary for Reach 23R: Existing West Channel

Inflow Area = 375.878 ac, 3.58% Impervious, Inflow Depth > 2.27" for 100-year event
Inflow = 82.09 cfs @ 12.67 hrs, Volume= 70.970 af
Outflow = 81.93 cfs @ 12.70 hrs, Volume= 70.969 af, Atten= 0%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.17 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 3.3 min

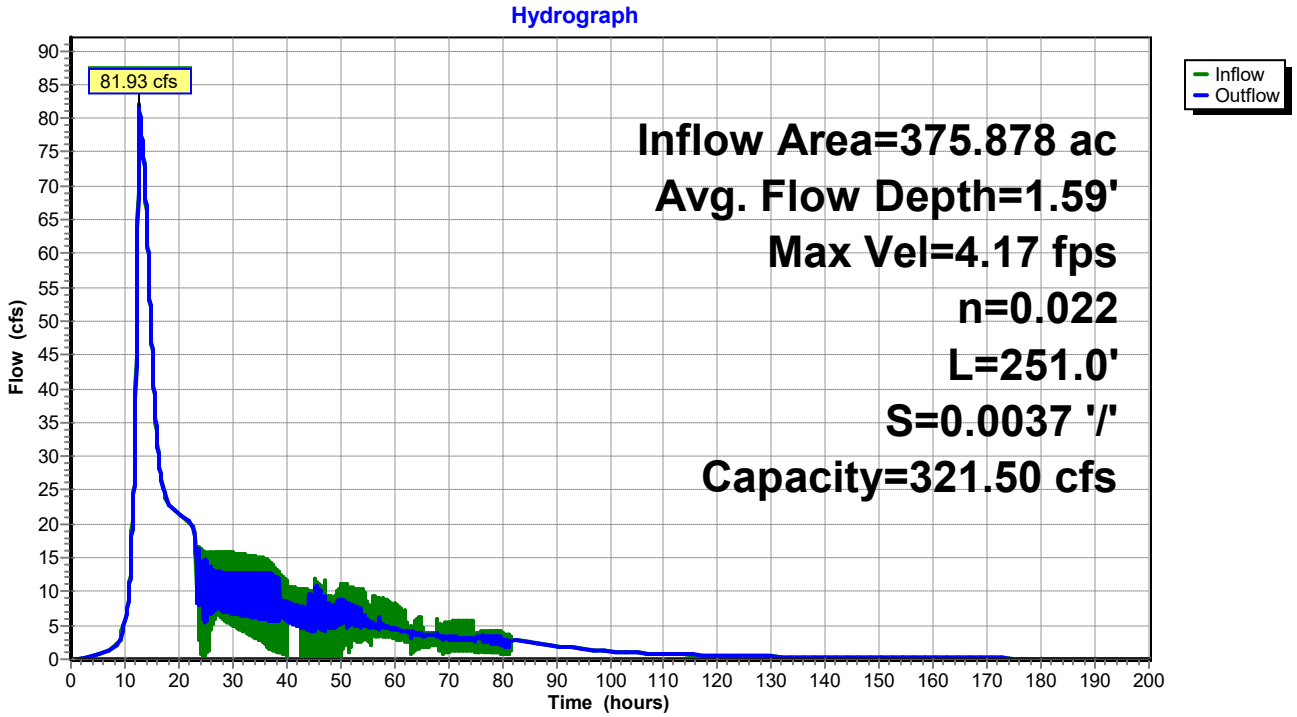
Peak Storage= 4,935 cf @ 12.70 hrs
Average Depth at Peak Storage= 1.59'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 321.50 cfs

6.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 4.0 '/' Top Width= 30.00'
Length= 251.0' Slope= 0.0037 '/'
Inlet Invert= 920.50', Outlet Invert= 919.58'



‡

Reach 23R: Existing West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=488)

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth = 3.93" for 100-year event
Inflow = 1,123.30 cfs @ 12.39 hrs, Volume= 98.288 af
Outflow = 34.97 cfs @ 23.30 hrs, Volume= 36.256 af, Atten= 97%, Lag= 654.8 min
Primary = 34.97 cfs @ 23.30 hrs, Volume= 36.256 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 931.48' @ 23.25 hrs Surf.Area= 64.446 ac Storage= 92.213 af

Plug-Flow detention time= 2,358.7 min calculated for 36.256 af (37% of inflow)
Center-of-Mass det. time= 2,265.8 min (3,087.3 - 821.5)

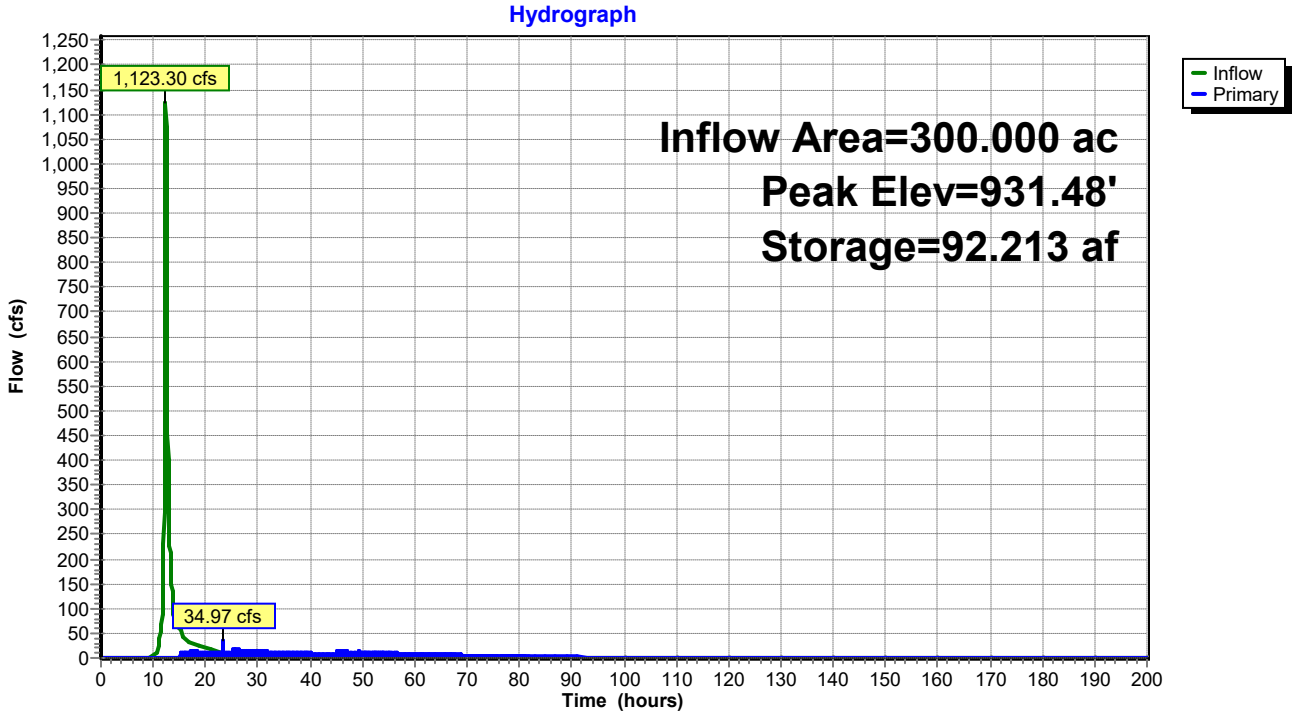
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 23.30 hrs HW=931.48' TW=932.44' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 10P: Proposed Northeast Pond/Filtration

[58] Hint: Peaked 1.82' above defined flood level

Inflow Area = 19.438 ac, 21.11% Impervious, Inflow Depth = 5.78" for 100-year event
Inflow = 108.68 cfs @ 12.33 hrs, Volume= 9.357 af
Outflow = 54.13 cfs @ 12.63 hrs, Volume= 9.357 af, Atten= 50%, Lag= 17.6 min
Primary = 54.13 cfs @ 12.63 hrs, Volume= 9.357 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 921.00' Surf.Area= 0.662 ac Storage= 2.955 af
Peak Elev= 923.82' @ 12.63 hrs Surf.Area= 2.069 ac Storage= 7.203 af (4.248 af above start)
Flood Elev= 922.00' Surf.Area= 1.255 ac Storage= 4.104 af (1.149 af above start)

Plug-Flow detention time= 622.5 min calculated for 6.402 af (68% of inflow)
Center-of-Mass det. time= 362.9 min (1,148.0 - 785.2)

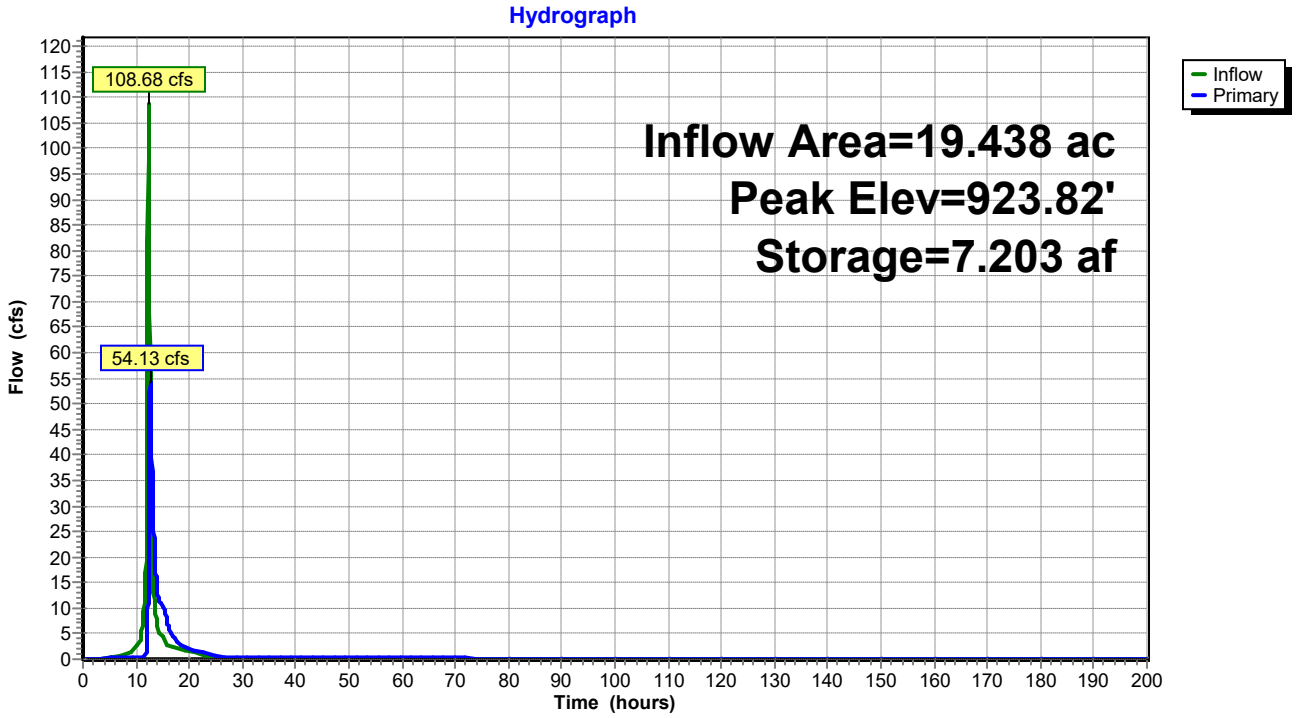
Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	9.359 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
913.00	0.209	0.000	0.000
914.00	0.242	0.226	0.226
916.00	0.314	0.556	0.781
918.00	0.396	0.710	1.491
920.00	0.491	0.887	2.378
921.00	0.662	0.576	2.955
921.01	1.049	0.009	2.964
922.00	1.255	1.140	4.104
924.00	2.149	3.404	7.508
925.00	1.553	1.851	9.359

Device	Routing	Invert	Outlet Devices
#1	Primary	918.50'	**36.0" Round Culvert** L= 113.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.50' / 918.00' S= 0.0044 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	922.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	923.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	920.00'	**21.0" Round Culvert** L= 45.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 920.00' S= -0.0444 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	921.00'	**0.31 cfs Exfiltration when above 921.00'** Phase-In= 0.01'

Primary OutFlow Max=53.98 cfs @ 12.63 hrs HW=923.82' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 53.98 cfs of 62.52 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Passes 15.62 cfs of 45.20 cfs potential flow)
  │ └─**4=Culvert** (Inlet Controls 15.62 cfs @ 6.49 fps)
  ├─**3=Orifice/Grate** (Weir Controls 38.05 cfs @ 2.96 fps)
  └─**5=Exfiltration** (Exfiltration Controls 0.31 cfs)

Pond 10P: Proposed Northeast Pond/Filtration



Summary for Pond 25P: Proposed Northwest Pond/Filtration

[58] Hint: Peaked 1.30' above defined flood level

Inflow Area = 15.059 ac, 29.82% Impervious, Inflow Depth = 5.50" for 100-year event
Inflow = 94.08 cfs @ 12.26 hrs, Volume= 6.905 af
Outflow = 23.44 cfs @ 12.68 hrs, Volume= 6.905 af, Atten= 75%, Lag= 25.5 min
Primary = 23.44 cfs @ 12.68 hrs, Volume= 6.905 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 925.00' Surf.Area= 0.322 ac Storage= 1.156 af
Peak Elev= 927.80' @ 12.68 hrs Surf.Area= 1.556 ac Storage= 4.908 af (3.752 af above start)
Flood Elev= 926.50' Surf.Area= 1.369 ac Storage= 3.002 af (1.846 af above start)

Plug-Flow detention time= 815.4 min calculated for 5.749 af (83% of inflow)
Center-of-Mass det. time= 616.0 min (1,396.5 - 780.5)

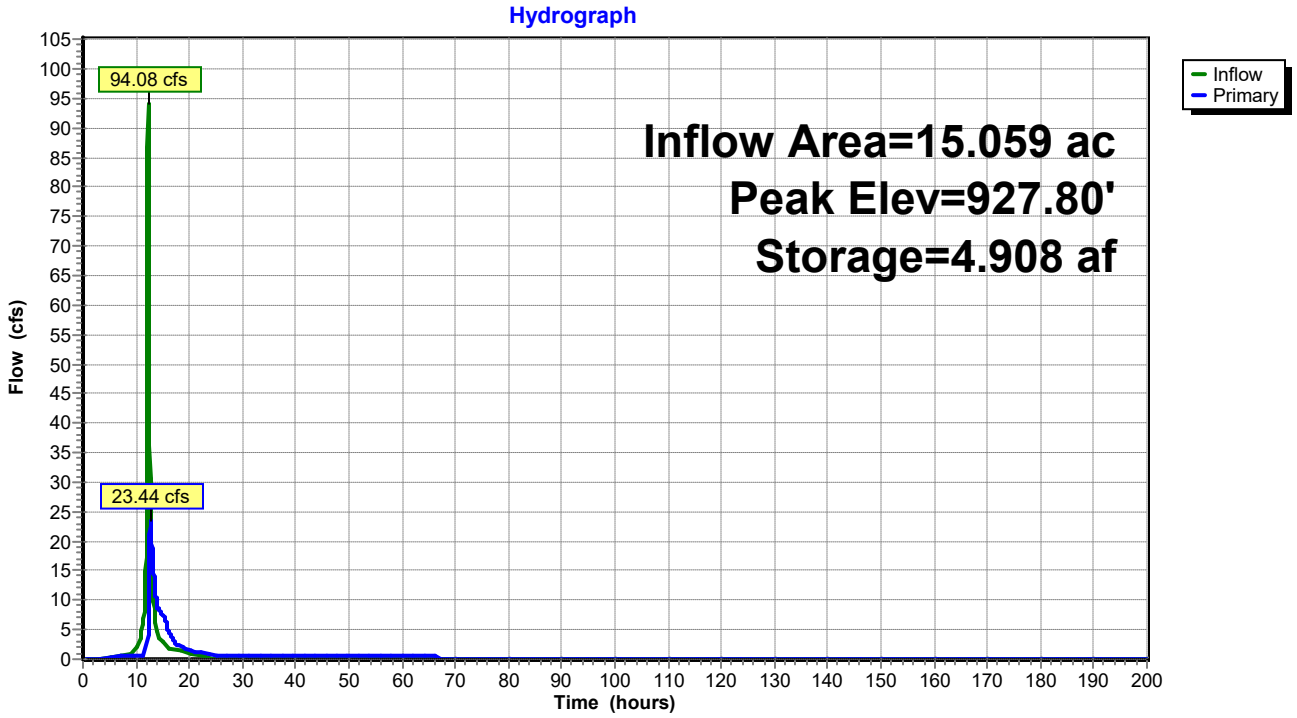
Volume	Invert	Avail.Storage	Storage Description
#1	917.00'	5.216 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
917.00	0.052	0.000	0.000
918.00	0.069	0.061	0.061
920.00	0.110	0.179	0.239
922.00	0.160	0.270	0.509
924.00	0.217	0.377	0.887
925.00	0.322	0.269	1.156
925.01	1.071	0.007	1.163
926.00	1.297	1.172	2.335
928.00	1.584	2.881	5.216

Device	Routing	Invert	Outlet Devices
#1	Primary	922.50'	**21.0" Round Culvert** L= 46.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.50' / 922.00' S= 0.0109 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	926.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	927.40'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	922.00'	**18.0" Round Culvert** L= 42.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 921.00' S= 0.0238 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#5	Device 1	925.00'	**0.54 cfs Exfiltration when above 925.00'** Phase-In= 0.01'

Primary OutFlow Max=23.38 cfs @ 12.68 hrs HW=927.80' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 23.38 cfs of 24.37 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Passes 9.71 cfs of 23.05 cfs potential flow)
  │ └─**4=Culvert** (Inlet Controls 9.71 cfs @ 5.50 fps)
  ├─**3=Orifice/Grate** (Weir Controls 13.13 cfs @ 2.08 fps)
  └─**5=Exfiltration** (Exfiltration Controls 0.54 cfs)

Pond 25P: Proposed Northwest Pond/Filtration



Summary for Pond 26P: Proposed Northwest Central Pond/Filtration

[58] Hint: Peaked 0.43' above defined flood level

Inflow Area = 7.518 ac, 41.97% Impervious, Inflow Depth = 5.78" for 100-year event
Inflow = 41.54 cfs @ 12.16 hrs, Volume= 3.624 af
Outflow = 4.83 cfs @ 13.41 hrs, Volume= 3.624 af, Atten= 88%, Lag= 74.8 min
Primary = 4.83 cfs @ 13.41 hrs, Volume= 3.624 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.00' Surf.Area= 0.318 ac Storage= 0.894 af
Peak Elev= 925.93' @ 13.41 hrs Surf.Area= 1.058 ac Storage= 2.664 af (1.770 af above start)
Flood Elev= 925.50' Surf.Area= 0.997 ac Storage= 2.227 af (1.333 af above start)

Plug-Flow detention time= 1,637.8 min calculated for 2.730 af (75% of inflow)
Center-of-Mass det. time= 971.5 min (1,978.4 - 1,006.8)

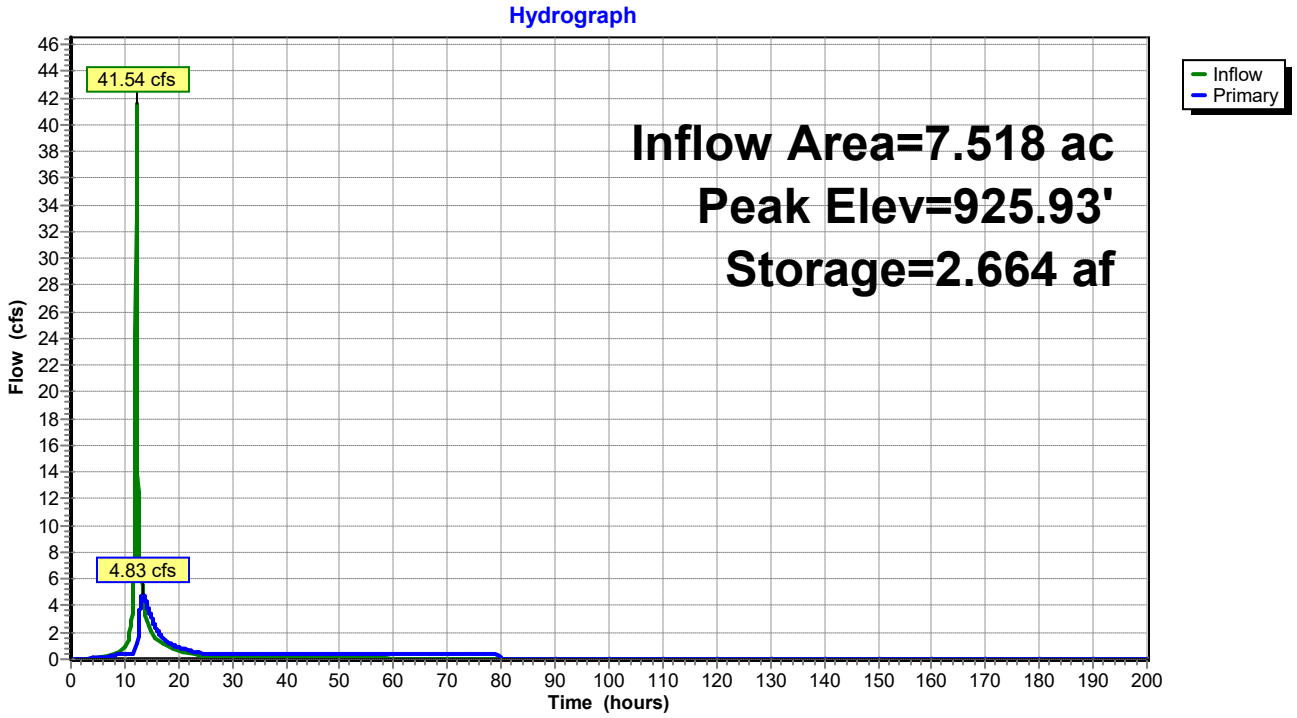
Volume	Invert	Avail.Storage	Storage Description
#1	916.00'	3.855 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.00	0.009	0.000	0.000
918.00	0.045	0.054	0.054
920.00	0.099	0.144	0.198
922.00	0.162	0.261	0.459
923.00	0.195	0.179	0.637
924.00	0.318	0.256	0.894
924.01	0.784	0.006	0.900
926.00	1.069	1.844	2.743
927.00	1.155	1.112	3.855

Device	Routing	Invert	Outlet Devices
#1	Primary	921.50'	**21.0" Round Culvert** L= 86.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.50' / 921.00' S= 0.0058 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	925.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	926.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	921.00'	**21.0" Round Culvert** L= 44.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 921.00' S= -0.0227 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	924.00'	**0.37 cfs Exfiltration when above 924.00'** Phase-In= 0.01'

Primary OutFlow Max=4.83 cfs @ 13.41 hrs HW=925.93' TW=922.02' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.83 cfs of 20.63 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Weir Controls 4.46 cfs @ 2.13 fps)
  │ └─**4=Culvert** (Passes 4.46 cfs of 7.55 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Exfiltration** (Exfiltration Controls 0.37 cfs)

Pond 26P: Proposed Northwest Central Pond/Filtration



Summary for Pond 27P: Proposed Northwest Central Pond

Inflow Area = 3.120 ac, 47.02% Impervious, Inflow Depth = 5.96" for 100-year event
Inflow = 27.18 cfs @ 12.15 hrs, Volume= 1.549 af
Outflow = 5.95 cfs @ 12.31 hrs, Volume= 1.546 af, Atten= 78%, Lag= 9.2 min
Primary = 5.95 cfs @ 12.31 hrs, Volume= 1.546 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.50' Surf.Area= 0.278 ac Storage= 0.732 af
Peak Elev= 926.35' @ 12.50 hrs Surf.Area= 0.486 ac Storage= 1.466 af (0.734 af above start)

Plug-Flow detention time= 1,168.6 min calculated for 0.814 af (53% of inflow)
Center-of-Mass det. time= 564.5 min (1,327.5 - 763.0)

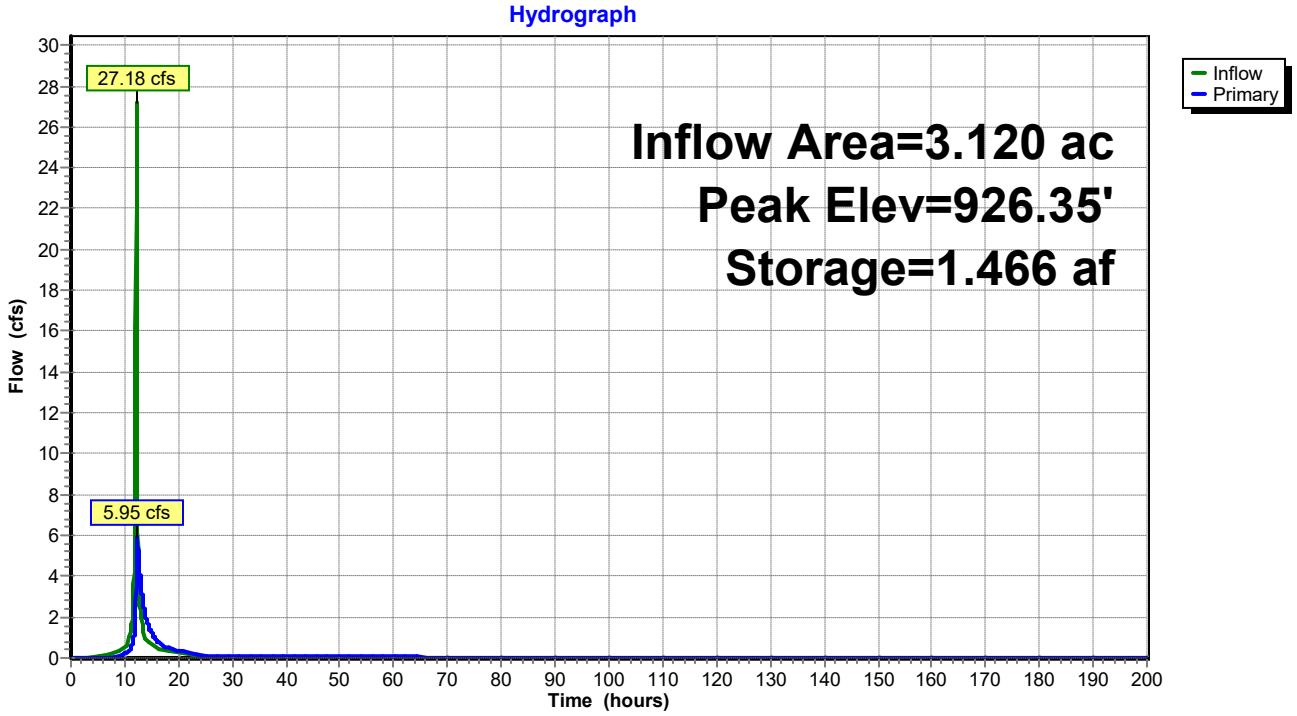
Volume	Invert	Avail.Storage	Storage Description
#1	916.50'	1.797 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.50	0.015	0.000	0.000
917.00	0.019	0.008	0.008
918.00	0.031	0.025	0.033
920.00	0.063	0.094	0.128
922.00	0.114	0.177	0.304
923.50	0.162	0.207	0.512
924.50	0.278	0.220	0.732
925.50	0.420	0.349	1.081
926.00	0.459	0.220	1.300
927.00	0.535	0.497	1.797

Device	Routing	Invert	Outlet Devices
#1	Primary	924.50'	**18.0" Round Culvert** L= 225.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.50' / 924.00' S= 0.0022 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	926.50'	**48.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 923.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=5.61 cfs @ 12.31 hrs HW=926.28' TW=925.44' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 5.61 cfs @ 3.38 fps)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**3=Culvert** (Passes 5.61 cfs of 7.79 cfs potential flow)

Pond 27P: Proposed Northwest Central Pond



Summary for Pond 28P: Proposed Northeast Central Pond

Inflow Area = 7.153 ac, 50.64% Impervious, Inflow Depth = 5.97" for 100-year event
Inflow = 51.09 cfs @ 12.22 hrs, Volume= 3.557 af
Outflow = 19.81 cfs @ 12.48 hrs, Volume= 3.557 af, Atten= 61%, Lag= 15.4 min
Primary = 19.81 cfs @ 12.48 hrs, Volume= 3.557 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 922.00' Surf.Area= 0.380 ac Storage= 1.043 af
Peak Elev= 924.00' @ 12.48 hrs Surf.Area= 0.642 ac Storage= 2.116 af (1.073 af above start)

Plug-Flow detention time= 164.9 min calculated for 2.513 af (71% of inflow)
Center-of-Mass det. time= 37.9 min (805.3 - 767.4)

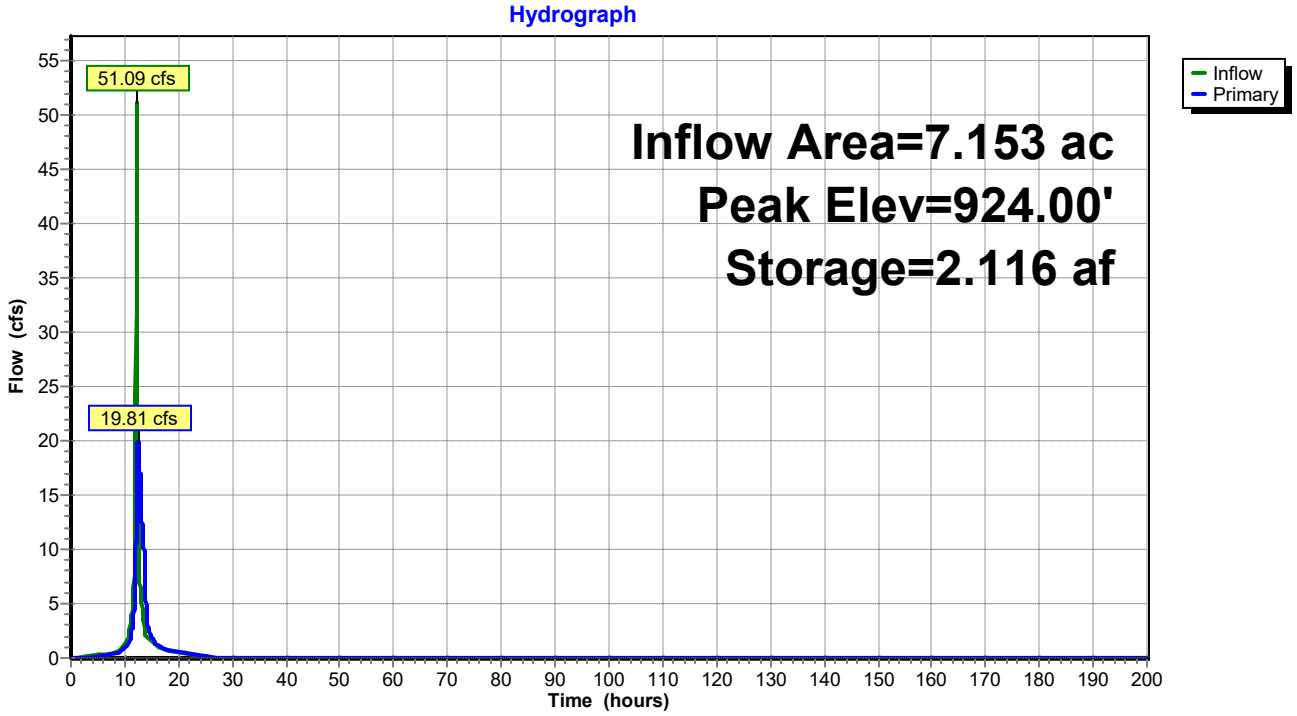
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	2.802 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.00	0.034	0.000	0.000
916.00	0.065	0.099	0.099
918.00	0.109	0.174	0.273
920.00	0.172	0.281	0.554
921.00	0.213	0.192	0.746
922.00	0.380	0.297	1.043
923.00	0.565	0.472	1.515
924.00	0.642	0.603	2.119
925.00	0.724	0.683	2.802

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**24.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.80' S= 0.0057 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	923.25'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	922.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 3	919.00'	**21.0" Round Culvert** L= 33.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 919.00' S= -0.0303 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=19.79 cfs @ 12.48 hrs HW=923.99' TW=921.98' (Dynamic Tailwater)
- **1=Culvert** (Barrel Controls 19.79 cfs @ 6.30 fps)
- **2=Orifice/Grate** (Passes < 32.86 cfs potential flow)
- **3=Sharp-Crested Rectangular Weir** (Passes < 42.32 cfs potential flow)
  - **4=Culvert** (Passes < 16.35 cfs potential flow)

Pond 28P: Proposed Northeast Central Pond



Summary for Pond 30P: Wetland 4A

[44] Hint: Outlet device #5 is below defined storage

Inflow Area = 357.822 ac, 1.86% Impervious, Inflow Depth > 2.09" for 100-year event
Inflow = 206.55 cfs @ 12.34 hrs, Volume= 62.344 af
Outflow = 57.41 cfs @ 13.19 hrs, Volume= 62.398 af, Atten= 72%, Lag= 51.0 min
Primary = 54.21 cfs @ 13.18 hrs, Volume= 42.527 af
Secondary = 3.20 cfs @ 13.34 hrs, Volume= 19.871 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 926.91' @ 13.18 hrs Surf.Area= 6.450 ac Storage= 8.089 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 37.8 min (2,218.9 - 2,181.1)

Volume	Invert	Avail.Storage	Storage Description
#1	923.50'	15.942 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

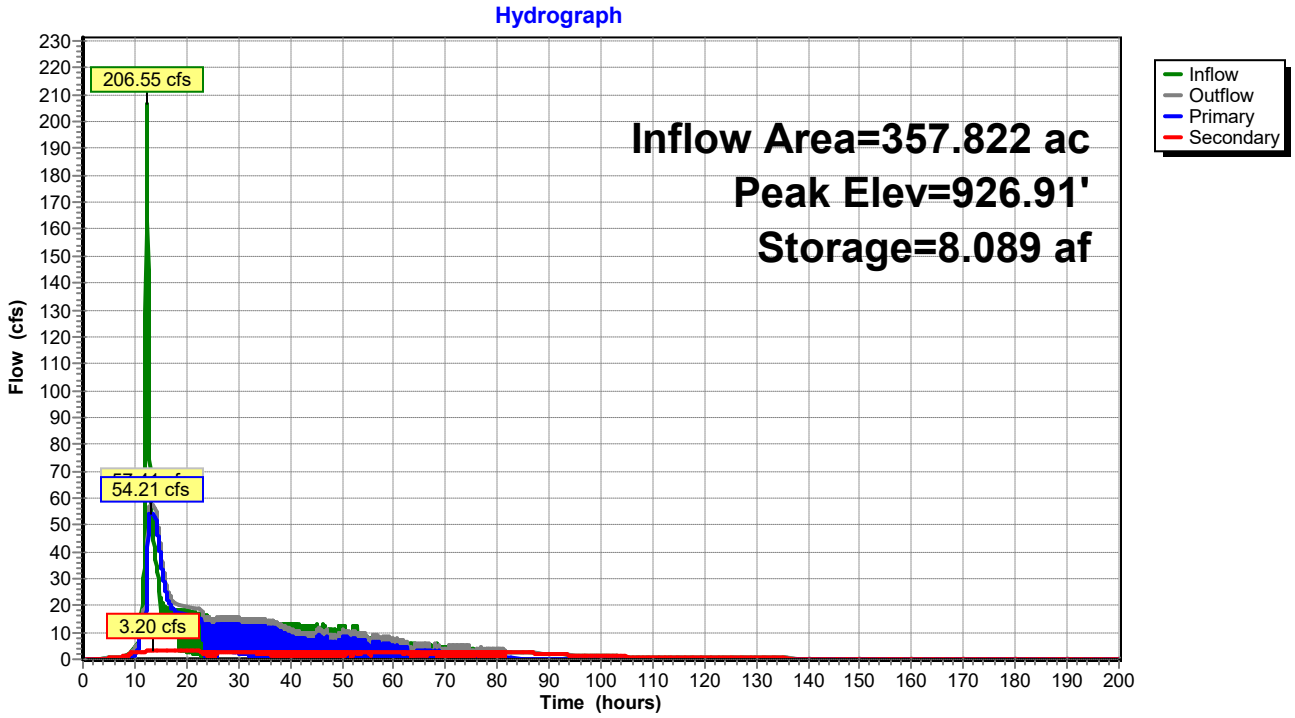
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.50	0.011	0.000	0.000
924.00	0.027	0.009	0.009
925.00	0.058	0.042	0.052
926.00	5.338	2.698	2.750
927.00	6.566	5.952	8.702
928.00	7.914	7.240	15.942

Device	Routing	Invert	Outlet Devices
#1	Primary	921.11'	**36.0" Round 36" RCP** L= 307.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.11' / 920.50' S= 0.0020 '/' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 7.07 sf
#2	Device 1	926.00'	**60.0" Horiz. CBMH-3003** C= 0.600 Limited to weir flow at low heads
#3	Device 1	921.17'	**18.0" Round 18" RCP** L= 23.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 921.17' / 921.11' S= 0.0026 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#4	Device 3	923.50'	**48.0" Horiz. CBMH-3004** C= 0.600 Limited to weir flow at low heads
#5	Secondary	919.60'	**12.0" Round 12" Draintile** L= 553.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.34' / 919.60' S= -0.0005 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=54.21 cfs @ 13.18 hrs HW=926.91' TW=922.04' (Dynamic Tailwater)
└─**1=36" RCP** (Barrel Controls 54.21 cfs @ 7.67 fps)
  ├─**2=CBMH-3003** (Passes < 44.27 cfs potential flow)
  └─**3=18" RCP** (Passes < 18.77 cfs potential flow)
    └─**4=CBMH-3004** (Passes < 111.66 cfs potential flow)

Secondary OutFlow Max=3.20 cfs @ 13.34 hrs HW=926.90' TW=922.03' (Dynamic Tailwater)
└─**5=12" Draintile** (Outlet Controls 3.20 cfs @ 4.08 fps)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)
[80] Warning: Exceeded Pond 7P by 3.52' @ 12.80 hrs (671.90 cfs 382.412 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth > 1.64" for 100-year event
Inflow = 65.78 cfs @ 12.56 hrs, Volume= 43.714 af
Outflow = 25.92 cfs @ 13.14 hrs, Volume= 45.816 af, Atten= 61%, Lag= 34.9 min
Primary = 25.92 cfs @ 13.14 hrs, Volume= 45.816 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 934.52' @ 13.14 hrs Surf.Area= 3.819 ac Storage= 1.969 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

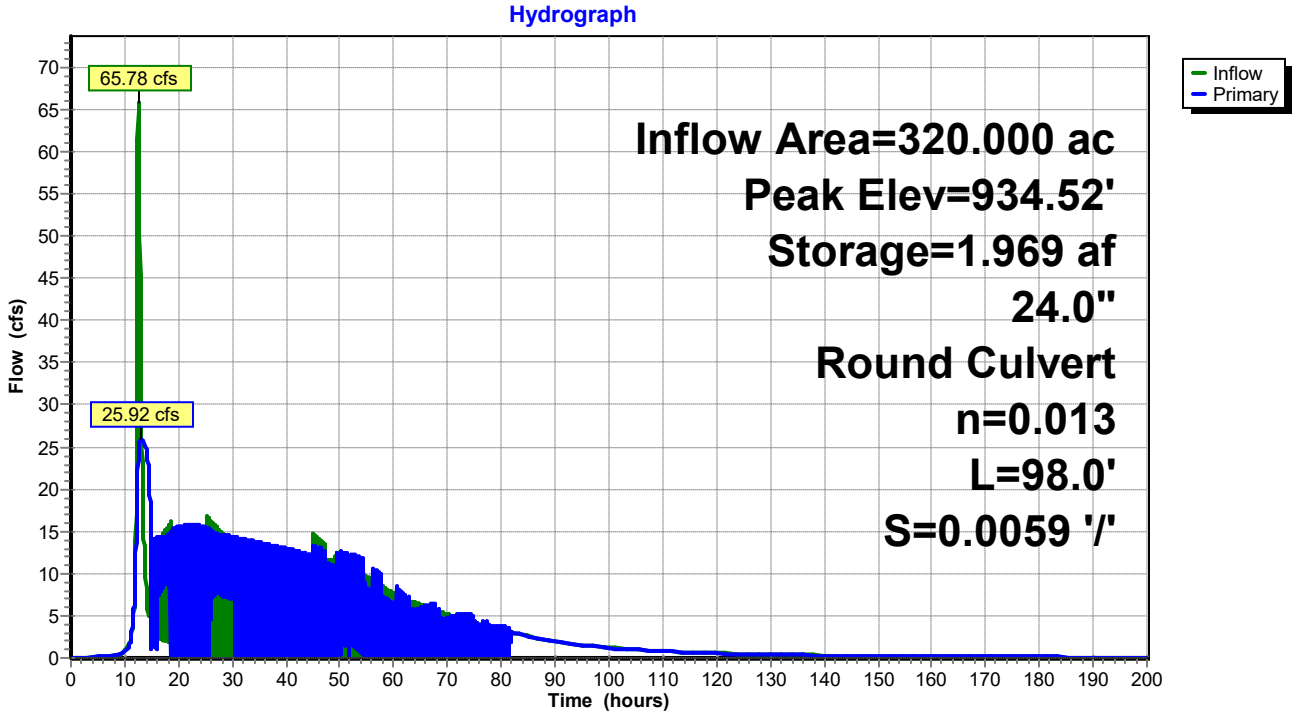
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=25.92 cfs @ 13.14 hrs HW=934.52' TW=926.91' (Dynamic Tailwater)
1=Culvert (Barrel Controls 25.92 cfs @ 8.25 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 32P: Proposed West Central Pond

Inflow Area = 3.686 ac, 36.52% Impervious, Inflow Depth = 5.78" for 100-year event
Inflow = 33.42 cfs @ 12.14 hrs, Volume= 1.774 af
Outflow = 11.07 cfs @ 12.20 hrs, Volume= 1.774 af, Atten= 67%, Lag= 3.4 min
Primary = 11.07 cfs @ 12.20 hrs, Volume= 1.774 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.00' Surf.Area= 0.395 ac Storage= 1.213 af
Peak Elev= 929.13' @ 12.32 hrs Surf.Area= 0.565 ac Storage= 1.763 af (0.550 af above start)

Plug-Flow detention time= 331.2 min calculated for 0.561 af (32% of inflow)
Center-of-Mass det. time= 41.6 min (807.9 - 766.3)

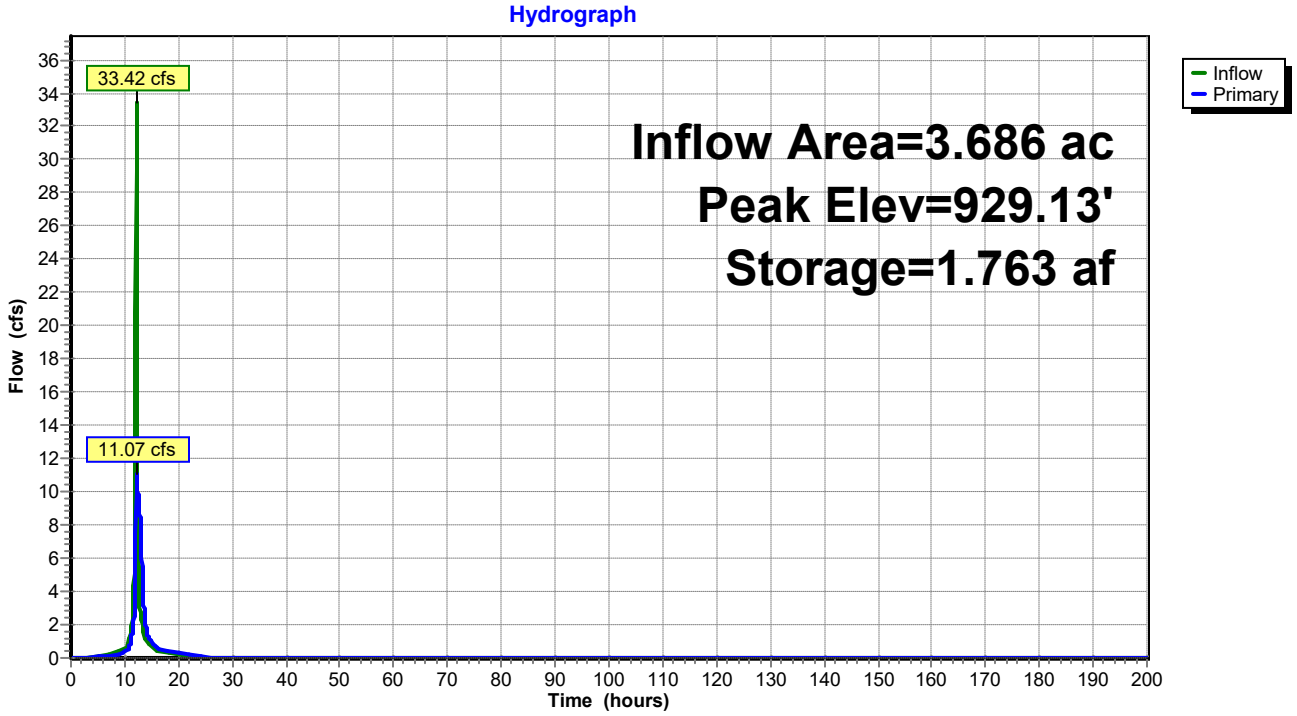
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	2.284 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.034	0.000	0.000
922.00	0.073	0.107	0.107
924.00	0.134	0.207	0.314
926.00	0.211	0.345	0.659
927.00	0.251	0.231	0.890
928.00	0.395	0.323	1.213
929.00	0.554	0.475	1.687
930.00	0.638	0.596	2.284

Device	Routing	Invert	Outlet Devices
#1	Primary	923.05'	**18.0" Round Culvert** L= 212.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.05' / 922.52' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	929.50'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	925.00'	**21.0" Round Culvert** L= 20.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0500 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=10.87 cfs @ 12.20 hrs HW=929.03' TW=925.87' (Dynamic Tailwater)
- **1=Culvert** (Outlet Controls 10.87 cfs @ 6.15 fps)
  - **2=Sharp-Crested Rectangular Weir** (Passes 10.87 cfs of 16.44 cfs potential flow)
    - **4=Culvert** (Passes 10.87 cfs of 11.77 cfs potential flow)
  - **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 32P: Proposed West Central Pond



Summary for Pond 40P: Wetland 2B

Inflow Area = 133.857 ac, 9.96% Impervious, Inflow Depth = 5.62" for 100-year event
Inflow = 415.75 cfs @ 12.33 hrs, Volume= 62.645 af
Outflow = 56.67 cfs @ 14.36 hrs, Volume= 62.645 af, Atten= 86%, Lag= 121.8 min
Primary = 56.67 cfs @ 14.36 hrs, Volume= 62.645 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 926.55' @ 14.36 hrs Surf.Area= 16.379 ac Storage= 24.891 af

Plug-Flow detention time= 283.5 min calculated for 62.645 af (100% of inflow)
Center-of-Mass det. time= 283.5 min (1,256.3 - 972.8)

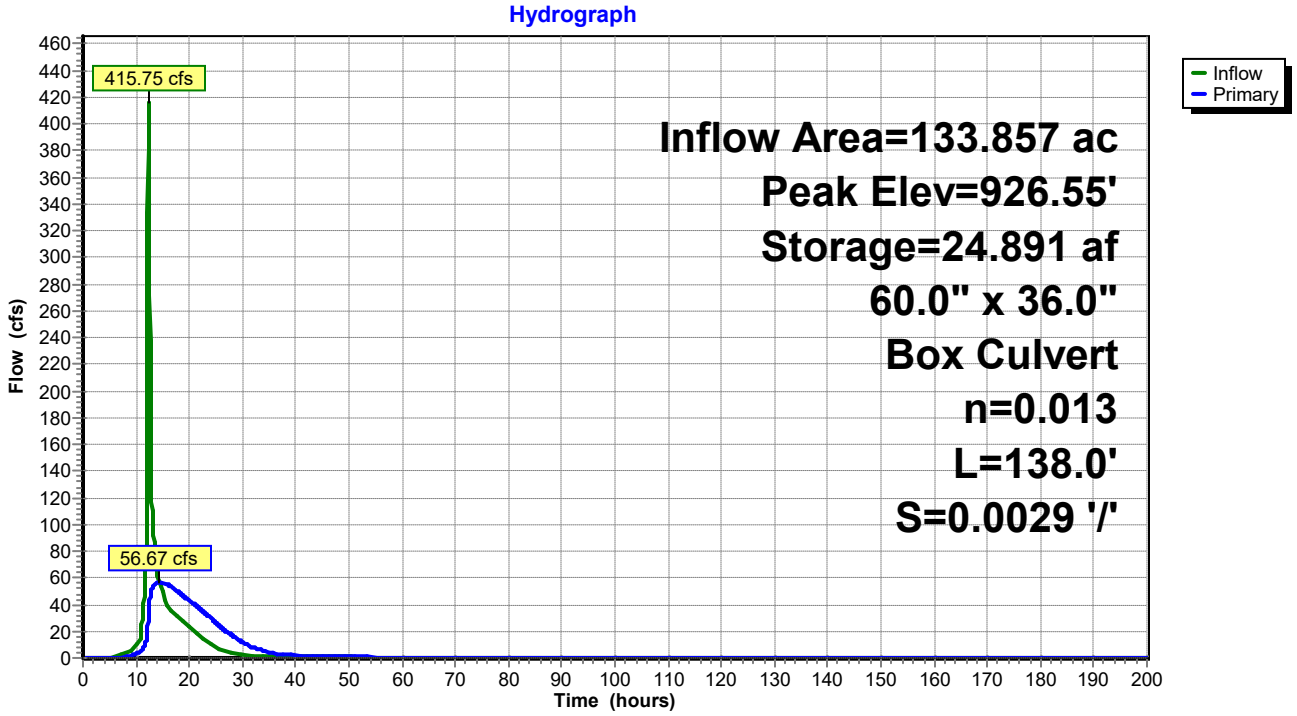
Volume	Invert	Avail.Storage	Storage Description
#1	923.90'	52.747 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.90	0.000	0.000	0.000
924.00	2.123	0.106	0.106
926.00	14.283	16.406	16.512
928.00	21.952	36.235	52.747

Device	Routing	Invert	Outlet Devices
#1	Primary	923.90'	**60.0" W x 36.0" H Box Culvert** L= 138.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.90' / 923.50' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 15.00 sf

Primary OutFlow Max=56.67 cfs @ 14.36 hrs HW=926.55' TW=924.78' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 56.67 cfs @ 5.71 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 5.08" for 100-year event
Inflow = 100.55 cfs @ 12.18 hrs, Volume= 5.810 af
Outflow = 7.88 cfs @ 13.21 hrs, Volume= 2.123 af, Atten= 92%, Lag= 62.0 min
Primary = 7.88 cfs @ 13.21 hrs, Volume= 2.123 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 940.67' @ 13.21 hrs Surf.Area= 2.395 ac Storage= 4.079 af

Plug-Flow detention time= 289.5 min calculated for 2.123 af (37% of inflow)
Center-of-Mass det. time= 192.8 min (977.2 - 784.4)

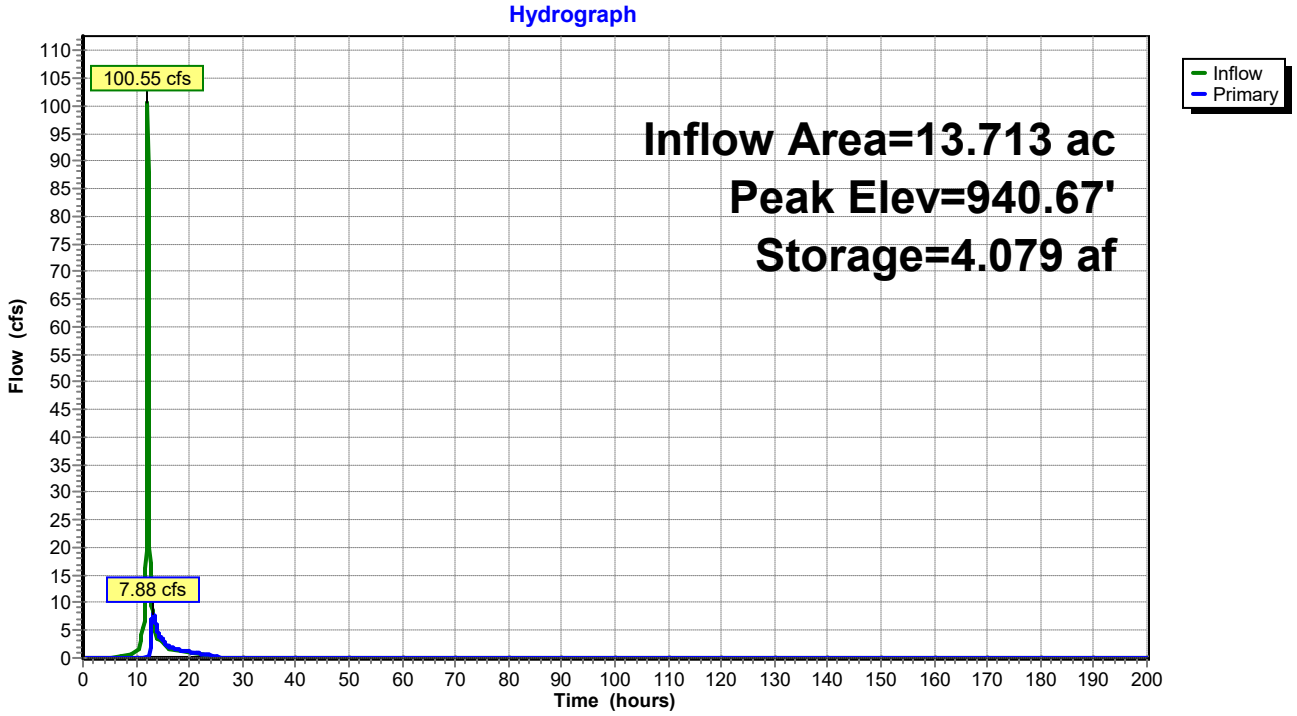
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=7.87 cfs @ 13.21 hrs HW=940.67' TW=926.45' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Weir Controls 7.87 cfs @ 1.25 fps)

Pond 41P: Ex South Off-site Pond



Summary for Pond 42P: Proposed South Central Pond

Inflow Area = 2.612 ac, 32.54% Impervious, Inflow Depth = 5.48" for 100-year event
Inflow = 20.03 cfs @ 12.17 hrs, Volume= 1.193 af
Outflow = 6.56 cfs @ 12.41 hrs, Volume= 1.193 af, Atten= 67%, Lag= 14.3 min
Primary = 6.56 cfs @ 12.41 hrs, Volume= 1.193 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.50' Surf.Area= 0.154 ac Storage= 0.309 af
Peak Elev= 930.36' @ 12.41 hrs Surf.Area= 0.297 ac Storage= 0.739 af (0.430 af above start)

Plug-Flow detention time= 186.6 min calculated for 0.883 af (74% of inflow)
Center-of-Mass det. time= 69.7 min (843.2 - 773.4)

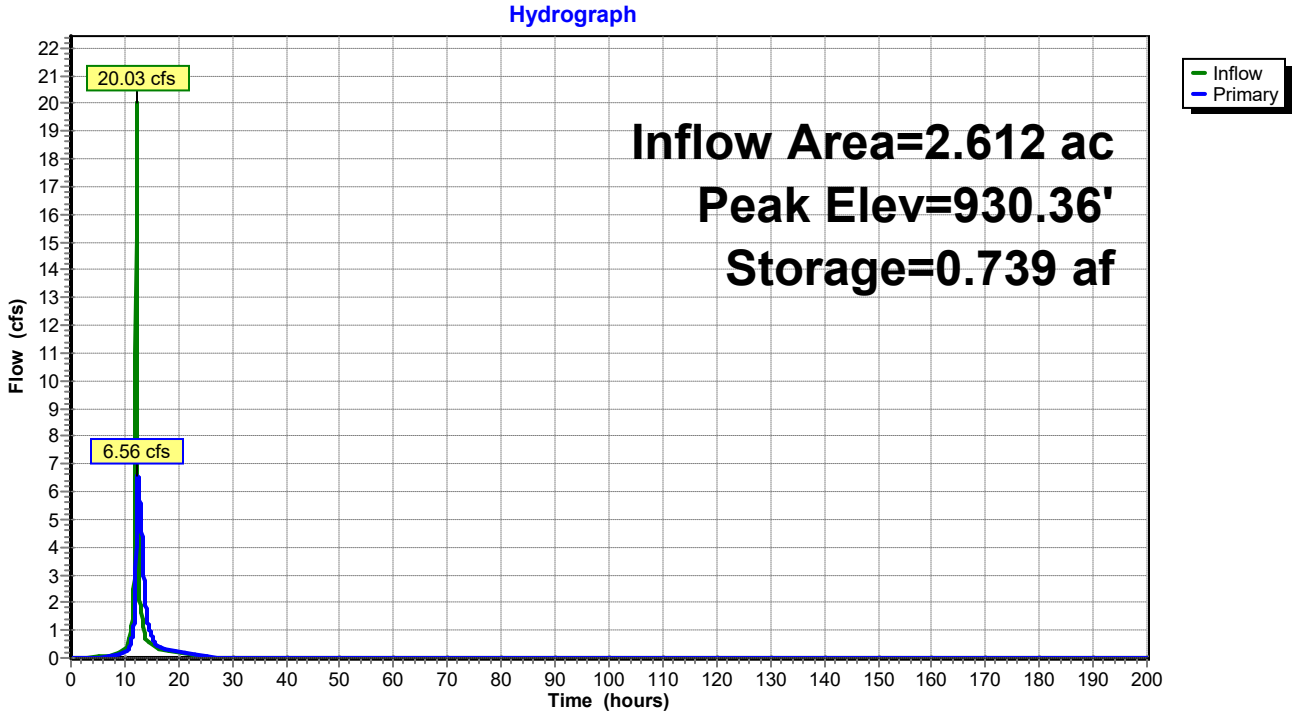
Volume	Invert	Avail.Storage	Storage Description
#1	922.00'	1.122 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
922.00	0.004	0.000	0.000
924.00	0.022	0.026	0.026
926.00	0.050	0.072	0.098
927.50	0.078	0.096	0.194
928.00	0.114	0.048	0.242
928.50	0.154	0.067	0.309
929.50	0.244	0.199	0.508
930.00	0.274	0.130	0.637
931.50	0.372	0.484	1.122

Device	Routing	Invert	Outlet Devices
#1	Primary	928.50'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 928.50' / 928.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	930.20'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	927.00'	**15.0" Round Culvert** L= 39.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.00' / 927.00' S= -0.0256 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

Primary OutFlow Max=6.55 cfs @ 12.41 hrs HW=930.35' TW=925.88' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 6.55 cfs @ 5.34 fps)
↑**2=Orifice/Grate** (Passes < 2.49 cfs potential flow)
3=Culvert (Passes < 8.05 cfs potential flow)

Pond 42P: Proposed South Central Pond



Summary for Pond 43P: Proposed East Central Pond

Inflow Area = 6.873 ac, 41.00% Impervious, Inflow Depth = 5.79" for 100-year event
Inflow = 47.43 cfs @ 12.23 hrs, Volume= 3.315 af
Outflow = 11.48 cfs @ 12.62 hrs, Volume= 3.313 af, Atten= 76%, Lag= 23.6 min
Primary = 11.48 cfs @ 12.62 hrs, Volume= 3.313 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 926.50' Surf.Area= 0.401 ac Storage= 1.319 af
Peak Elev= 929.07' @ 12.62 hrs Surf.Area= 0.709 ac Storage= 2.810 af (1.491 af above start)

Plug-Flow detention time= 301.1 min calculated for 1.993 af (60% of inflow)
Center-of-Mass det. time= 119.9 min (892.0 - 772.1)

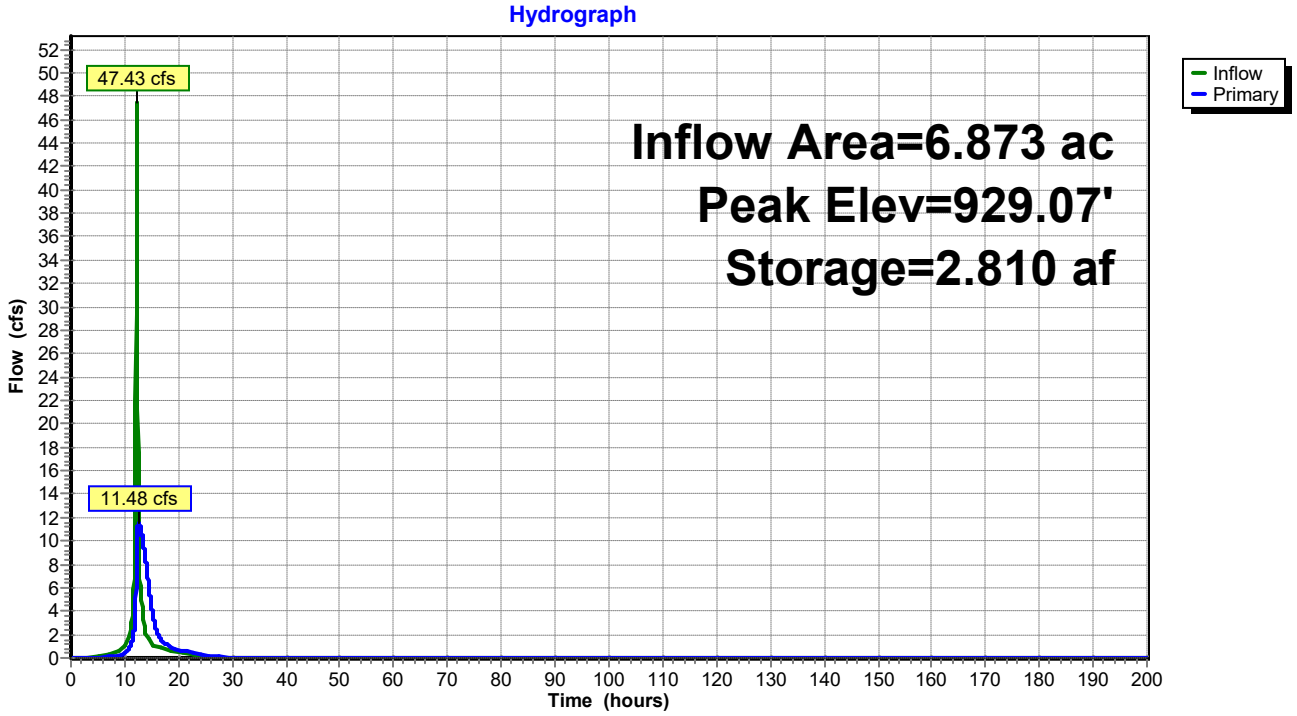
Volume	Invert	Avail.Storage	Storage Description
#1	918.50'	3.505 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
918.50	0.053	0.000	0.000
920.00	0.083	0.102	0.102
922.00	0.135	0.218	0.320
924.00	0.199	0.334	0.654
925.50	0.254	0.340	0.994
926.00	0.324	0.144	1.138
926.50	0.401	0.181	1.319
927.50	0.566	0.484	1.803
928.00	0.619	0.296	2.099
930.00	0.787	1.406	3.505

Device	Routing	Invert	Outlet Devices
#1	Primary	926.50'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.50' / 926.00' S= 0.0172 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	925.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=11.48 cfs @ 12.62 hrs HW=929.07' TW=926.18' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.48 cfs @ 6.49 fps)
  └─**2=Orifice/Grate** (Passes < 17.65 cfs potential flow)
  └─**3=Culvert** (Passes < 13.64 cfs potential flow)

Pond 43P: Proposed East Central Pond



Summary for Pond 50P: Wetland 4B

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth = 3.30" for 100-year event
Inflow = 78.67 cfs @ 12.37 hrs, Volume= 10.852 af
Outflow = 9.40 cfs @ 14.02 hrs, Volume= 5.629 af, Atten= 88%, Lag= 98.7 min
Primary = 9.40 cfs @ 14.02 hrs, Volume= 5.629 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 941.66' @ 14.02 hrs Surf.Area= 147,059 sf Storage= 250,287 cf

Plug-Flow detention time= 441.5 min calculated for 5.627 af (52% of inflow)
Center-of-Mass det. time= 246.7 min (1,177.4 - 930.7)

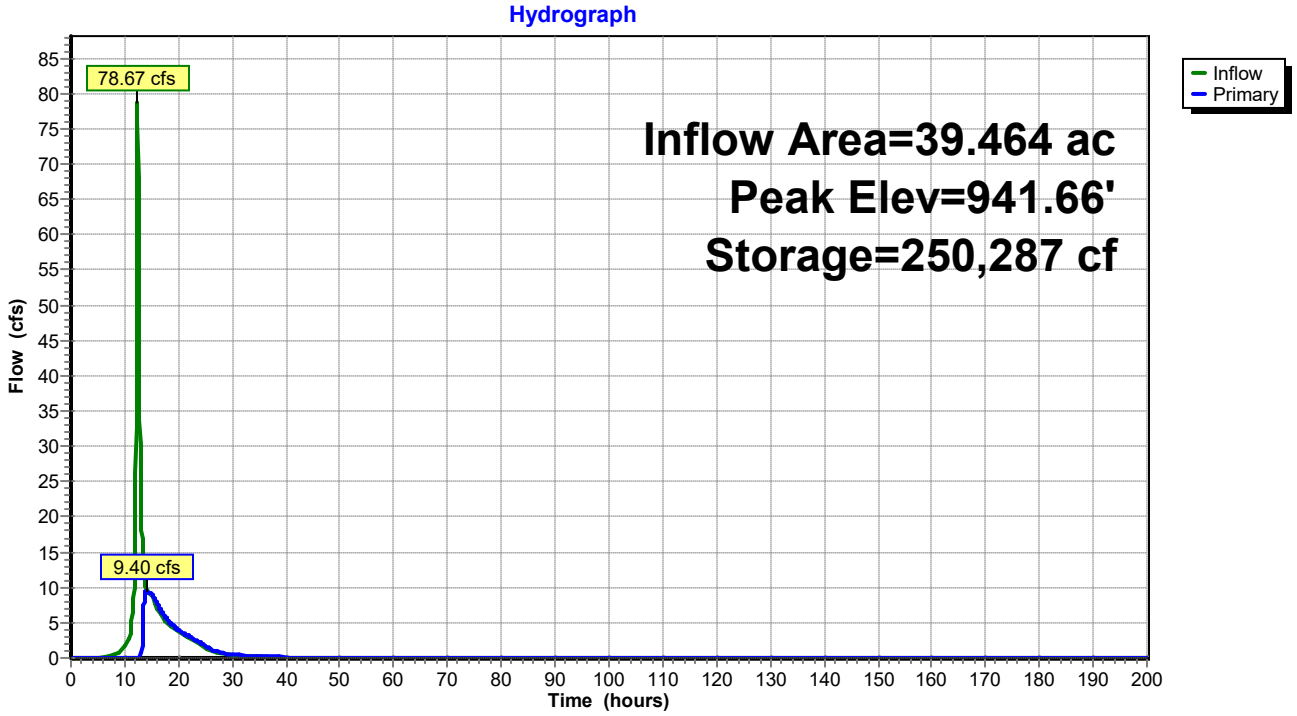
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	303,458 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
938.00	4,444	0	0
940.00	69,653	74,097	74,097
941.00	111,935	90,794	164,891
942.00	165,198	138,567	303,458

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=9.40 cfs @ 14.02 hrs HW=941.66' TW=926.54' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Weir Controls 9.40 cfs @ 1.27 fps)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth = 58.48" for 100-year event
Inflow = 41.22 cfs @ 12.13 hrs, Volume= 18.322 af
Outflow = 39.47 cfs @ 12.15 hrs, Volume= 18.108 af, Atten= 4%, Lag= 1.5 min
Primary = 39.47 cfs @ 12.15 hrs, Volume= 18.108 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 938.96' @ 12.15 hrs Surf.Area= 13,916 sf Storage= 14,745 cf

Plug-Flow detention time= 58.8 min calculated for 18.108 af (99% of inflow)
Center-of-Mass det. time= 12.0 min (1,259.6 - 1,247.5)

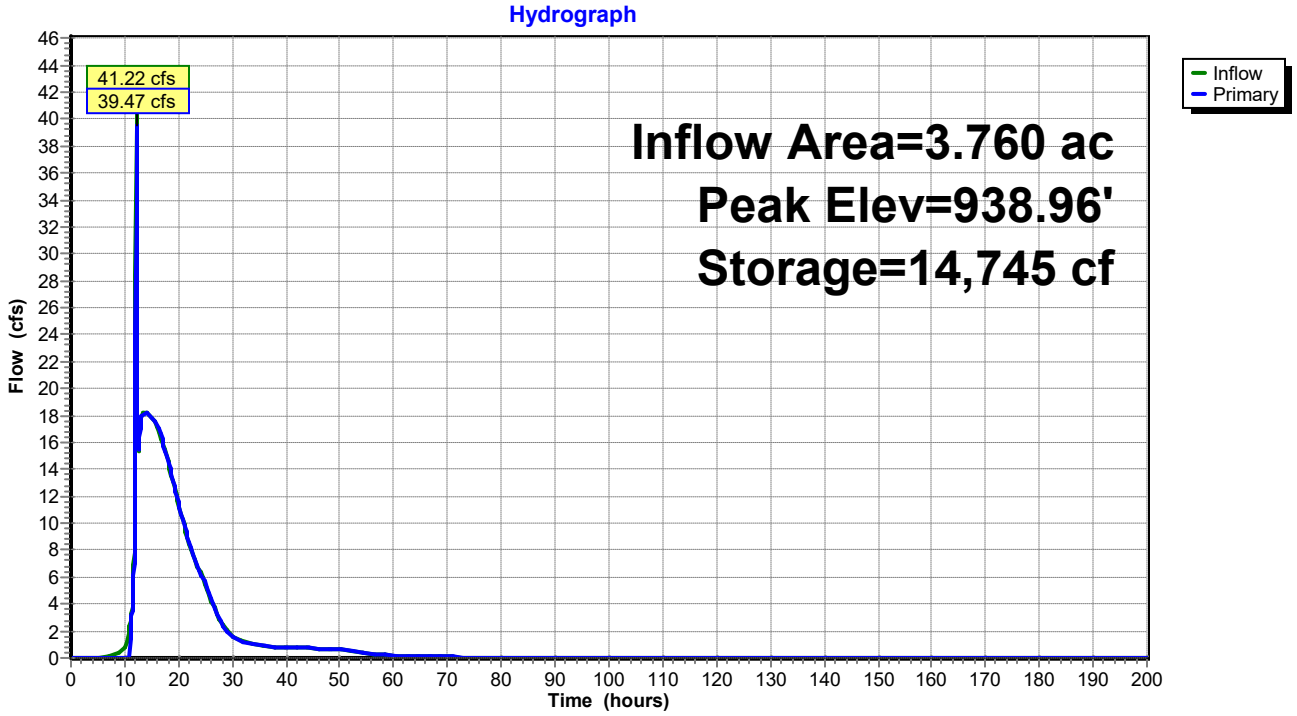
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	15,364 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
936.00	178	0	0
938.00	5,354	5,532	5,532
939.00	14,309	9,832	15,364

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=39.18 cfs @ 12.15 hrs HW=938.95' TW=925.23' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 39.18 cfs @ 2.09 fps)

Pond 60P: Wetland 5B



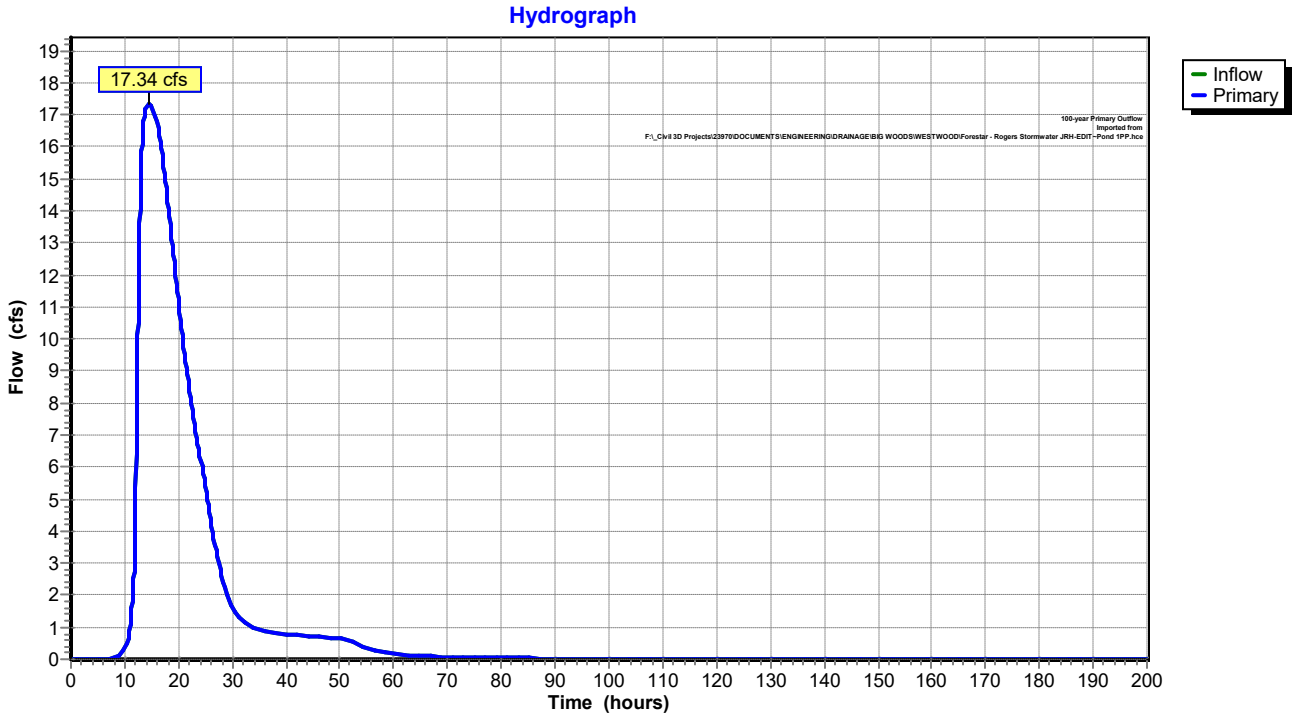
Summary for Link 1PP: Northwest Wetland

Inflow = 17.34 cfs @ 14.37 hrs, Volume= 16.612 af
Primary = 17.34 cfs @ 14.37 hrs, Volume= 16.612 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

100-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG W

Link 1PP: Northwest Wetland



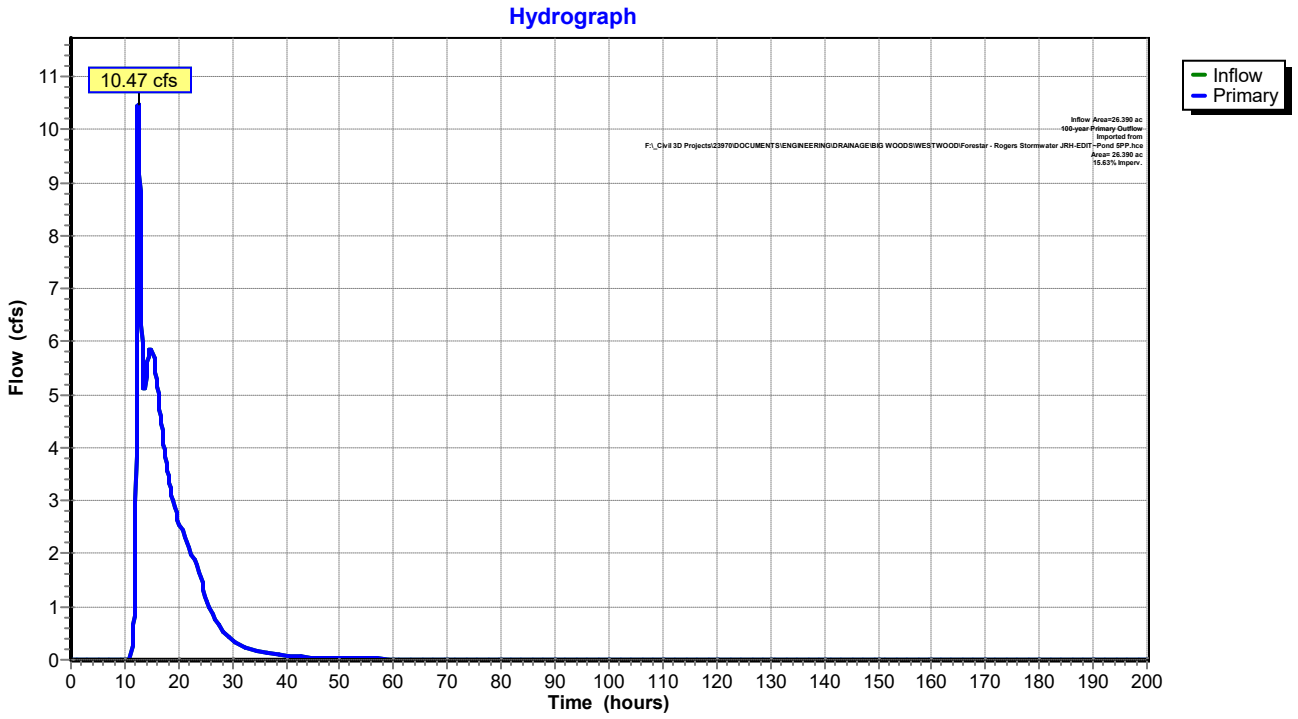
Summary for Link 5PP: Existing Pond

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth = 2.12" for 100-year event
Inflow = 10.47 cfs @ 12.49 hrs, Volume= 4.664 af
Primary = 10.47 cfs @ 12.49 hrs, Volume= 4.664 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

100-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG W

Link 5PP: Existing Pond



Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth>6.47"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min AMC Adjusted CN=98/98 Runoff=139.00 cfs 161.795 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=19.438 ac 21.11% Impervious Runoff Depth>6.47"
Flow Length=1,602' Tc=23.6 min AMC Adjusted CN=98/98 Runoff=9.06 cfs 10.485 af

Subcatchment 11S: Direct to Cowley Lake Runoff Area=6.152 ac 3.35% Impervious Runoff Depth>6.47"
Flow Length=1,308' Tc=15.2 min AMC Adjusted CN=98/98 Runoff=2.91 cfs 3.319 af

Subcatchment 12S: Fugitve to Fox Creek Runoff Area=0.547 ac 45.16% Impervious Runoff Depth>6.48"
Flow Length=165' Tc=8.1 min AMC Adjusted CN=98/98 Runoff=0.26 cfs 0.295 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=3.970 ac 7.66% Impervious Runoff Depth>6.48"
Flow Length=310' Tc=10.9 min AMC Adjusted CN=98/98 Runoff=1.89 cfs 2.142 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.782 ac 1.28% Impervious Runoff Depth>6.47"
Flow Length=392' Tc=17.3 min AMC Adjusted CN=98/98 Runoff=0.37 cfs 0.422 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=3.027 ac 10.37% Impervious Runoff Depth>6.47"
Flow Length=309' Tc=17.0 min AMC Adjusted CN=98/98 Runoff=1.43 cfs 1.633 af

Subcatchment 23S: Direct to Proposed Runoff Area=3.385 ac 0.68% Impervious Runoff Depth>6.48"
Flow Length=243' Tc=13.3 min AMC Adjusted CN=98/98 Runoff=1.60 cfs 1.827 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=7.873 ac 5.31% Impervious Runoff Depth>6.48"
Flow Length=407' Tc=11.1 min AMC Adjusted CN=98/98 Runoff=3.75 cfs 4.249 af

Subcatchment 25S: Direct to Proposed Runoff Area=15.059 ac 29.82% Impervious Runoff Depth>6.47"
Flow Length=1,817' Tc=17.1 min AMC Adjusted CN=98/98 Runoff=7.10 cfs 8.125 af

Subcatchment 26S: Direct to Proposed Runoff Area=4.398 ac 38.38% Impervious Runoff Depth>6.48"
Flow Length=621' Tc=8.6 min AMC Adjusted CN=98/98 Runoff=2.10 cfs 2.374 af

Subcatchment 27S: Direct to Proposed Runoff Area=3.120 ac 47.02% Impervious Runoff Depth>6.48"
Flow Length=621' Tc=8.6 min AMC Adjusted CN=98/98 Runoff=1.49 cfs 1.684 af

Subcatchment 28S: Direct to Proposed Runoff Area=7.153 ac 50.64% Impervious Runoff Depth>6.47"
Flow Length=1,013' Tc=14.4 min AMC Adjusted CN=98/98 Runoff=3.39 cfs 3.860 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=34.136 ac 8.50% Impervious Runoff Depth>6.47"
Flow Length=1,249' Tc=23.4 min AMC Adjusted CN=98/98 Runoff=15.91 cfs 18.412 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth>6.47"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min AMC Adjusted CN=98/98 Runoff=9.05 cfs 10.781 af

Subcatchment 32S: Direct to Proposed Runoff Area=3.686 ac 36.52% Impervious Runoff Depth>6.48"
Flow Length=440' Slope=0.0200 '/' Tc=7.1 min AMC Adjusted CN=98/98 Runoff=1.77 cfs 1.989 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=67.435 ac 2.92% Impervious Runoff Depth>6.47"
Flow Length=1,354' Tc=23.6 min AMC Adjusted CN=98/98 Runoff=31.42 cfs 36.373 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth>6.48"
Flow Length=1,032' Tc=10.2 min AMC Adjusted CN=98/98 Runoff=6.54 cfs 7.400 af

Subcatchment 42S: Direct to Proposed Runoff Area=2.612 ac 32.54% Impervious Runoff Depth>6.48"
Flow Length=422' Tc=10.2 min AMC Adjusted CN=98/98 Runoff=1.24 cfs 1.410 af

Subcatchment 43S: Direct to Proposed Runoff Area=6.873 ac 41.00% Impervious Runoff Depth>6.47"
Flow Length=1,173' Tc=14.8 min AMC Adjusted CN=98/98 Runoff=3.25 cfs 3.708 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth>6.47"
Flow Length=734' Tc=26.4 min AMC Adjusted CN=98/98 Runoff=6.06 cfs 7.051 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth>6.48"
Flow Length=531' Tc=5.6 min AMC Adjusted CN=98/98 Runoff=1.81 cfs 2.029 af

Reach 1R: Cowley Lake Outlet Channel Inflow=9.57 cfs 12.642 af
Outflow=9.57 cfs 12.642 af

Reach 2R: Cowley Lake Inflow=50.41 cfs 205.650 af
Outflow=50.41 cfs 205.650 af

Reach 21R: Proposed East Channel Avg. Flow Depth=0.85' Max Vel=5.16 fps Inflow=24.39 cfs 75.080 af
n=0.022 L=264.0' S=0.0125 '/' Capacity=149.23 cfs Outflow=24.39 cfs 75.074 af

Reach 23R: Existing West Channel Avg. Flow Depth=0.85' Max Vel=2.96 fps Inflow=23.84 cfs 115.333 af
n=0.022 L=251.0' S=0.0037 '/' Capacity=321.50 cfs Outflow=23.84 cfs 115.316 af

Pond 7P: Whiteford Lake and Peak Elev=931.78' Storage=111.745 af Inflow=139.00 cfs 161.795 af
Outflow=74.34 cfs 71.447 af

Pond 10P: Proposed Northeast Peak Elev=922.51' Storage=4.965 af Inflow=9.06 cfs 10.485 af
Outflow=7.25 cfs 9.322 af

Pond 25P: Proposed Northwest Peak Elev=926.68' Storage=3.248 af Inflow=7.10 cfs 8.125 af
Outflow=1.76 cfs 7.235 af

Pond 26P: Proposed Northwest Central Peak Elev=925.11' Storage=1.848 af Inflow=2.98 cfs 4.013 af
Outflow=0.37 cfs 3.913 af

Pond 27P: Proposed Northwest Central Peak Elev=925.15' Storage=0.943 af Inflow=1.49 cfs 1.684 af
Outflow=0.98 cfs 1.640 af

Pond 28P: Proposed Northeast Central Pond Peak Elev=922.34' Storage=1.182 af Inflow=3.39 cfs 3.860 af
Outflow=3.16 cfs 3.846 af

Pond 30P: Wetland 4A Peak Elev=925.62' Storage=1.102 af Inflow=27.57 cfs 105.725 af
Primary=16.37 cfs 77.567 af Secondary=3.01 cfs 28.180 af Outflow=19.38 cfs 105.747 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=933.01' Storage=0.206 af Inflow=75.18 cfs 82.228 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=17.90 cfs 85.332 af

Pond 32P: Proposed West Central Pond Peak Elev=928.21' Storage=1.301 af Inflow=1.77 cfs 1.989 af
Outflow=1.60 cfs 1.980 af

Pond 40P: Wetland 2B Peak Elev=925.36' Storage=8.572 af Inflow=43.96 cfs 75.483 af
60.0" x 36.0" Box Culvert n=0.013 L=138.0' S=0.0029 '/' Outflow=24.29 cfs 74.658 af

Pond 41P: Ex South Off-site Pond Peak Elev=940.62' Storage=3.976 af Inflow=6.54 cfs 7.400 af
Outflow=4.65 cfs 3.670 af

Pond 42P: Proposed South Central Pond Peak Elev=929.00' Storage=0.397 af Inflow=1.24 cfs 1.410 af
Outflow=1.09 cfs 1.395 af

Pond 43P: Proposed East Central Pond Peak Elev=927.25' Storage=1.665 af Inflow=3.25 cfs 3.708 af
Outflow=2.59 cfs 3.649 af

Pond 50P: Wetland 4B Peak Elev=941.60' Storage=241,706 cf Inflow=7.65 cfs 13.885 af
Outflow=4.51 cfs 8.571 af

Pond 60P: Wetland 5B Peak Elev=938.67' Storage=11,107 cf Inflow=7.53 cfs 22.047 af
Outflow=7.53 cfs 21.824 af

Link \DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=6.94 cfs 20.018 af
Primary=6.94 cfs 20.018 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=2.94 cfs 6.834 af
Area= 26.390 ac 15.63% Imperv. Primary=2.94 cfs 6.834 af

Total Runoff Area = 540.193 ac Runoff Volume = 291.363 af Average Runoff Depth = 6.47"
93.94% Pervious = 507.441 ac 6.06% Impervious = 32.752 ac

Summary for Subcatchment 7S: Approx DA to Lake

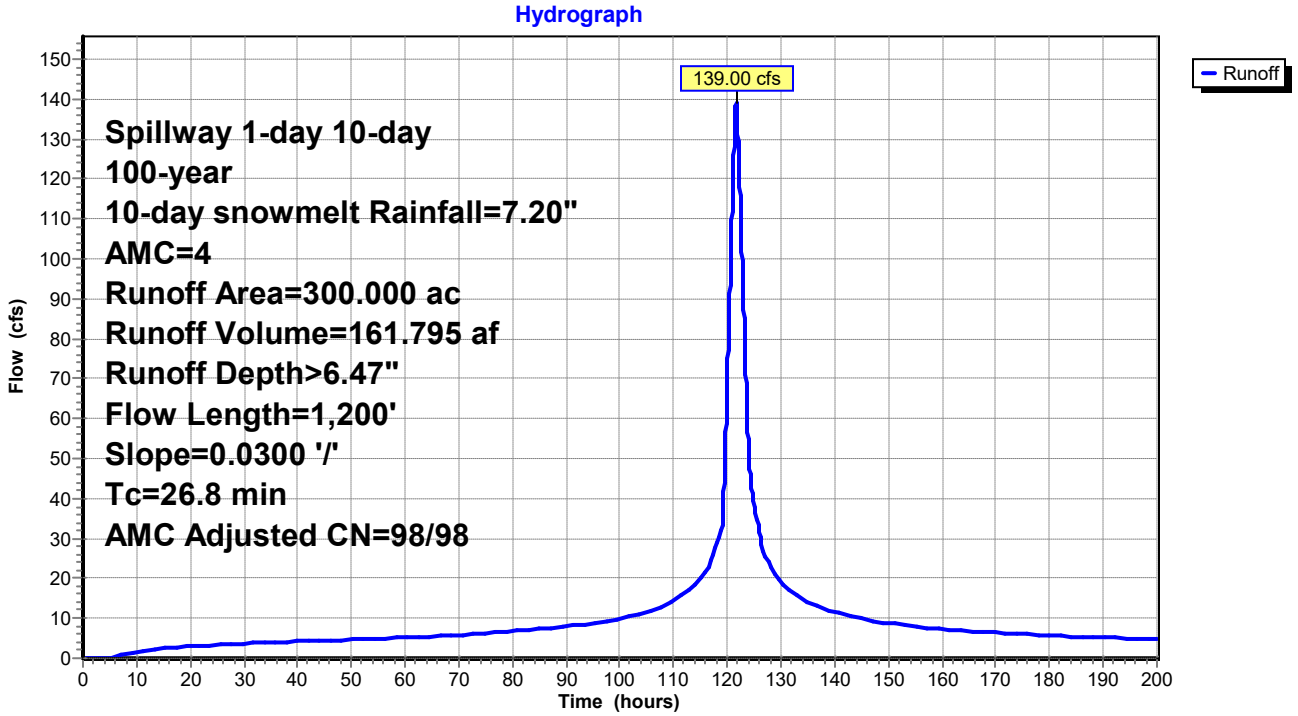
Runoff = 139.00 cfs @ 121.61 hrs, Volume= 161.795 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
300.000	72		Woods/grass comb., Good, HSG C
300.000	72	98	Weighted Average, AMC Adjusted
300.000	72	98	100.00% Pervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

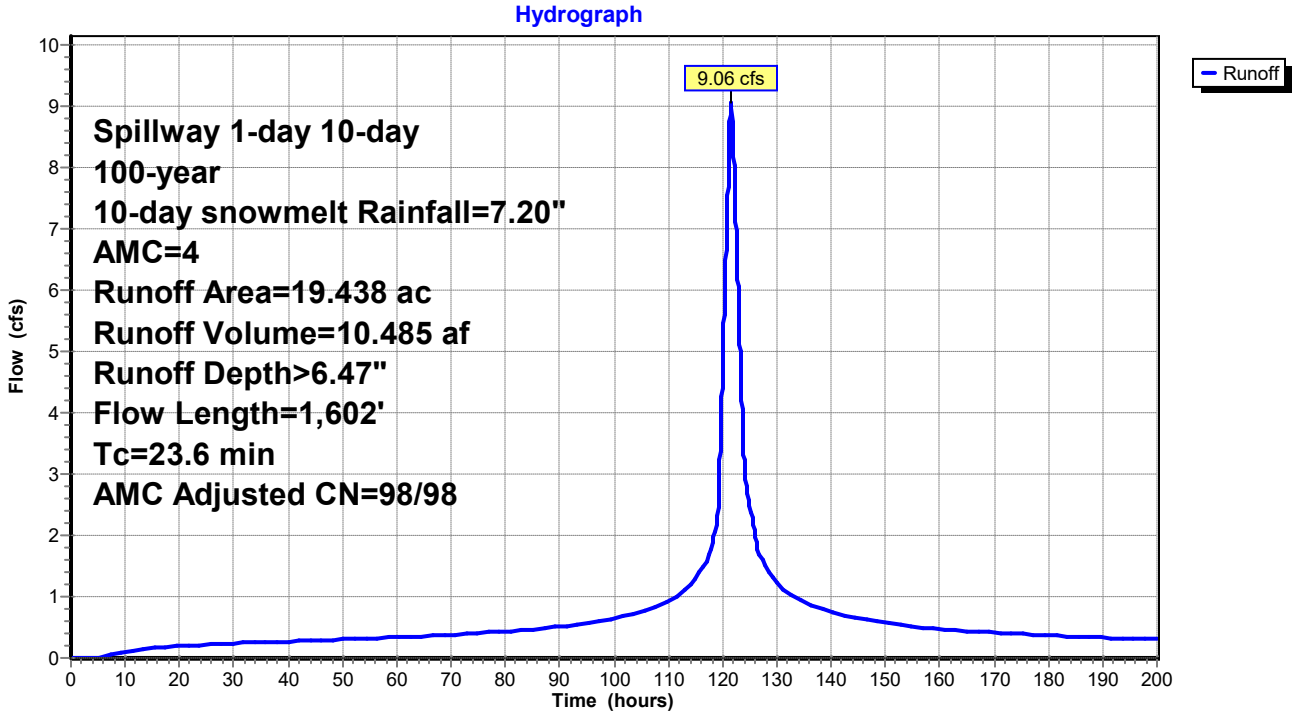
Runoff = 9.06 cfs @ 121.56 hrs, Volume= 10.485 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.399	98		Unconnected pavement, HSG D
1.088	98		Unconnected roofs, HSG D
1.617	98		Paved roads w/curbs & sewers, HSG D
0.606	98		Paved parking, HSG D
0.393	98		Roofs, HSG D
0.699	98		Water Surface, 0% imp, HSG D
8.527	89		Row crops, straight row, Good, HSG D
4.972	80		>75% Grass cover, Good, HSG D
1.137	78		Meadow, non-grazed, HSG D
19.438	88	98	Weighted Average, AMC Adjusted
15.335	86	98	78.89% Pervious Area, AMC Adjusted
4.103	98	98	21.11% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
14.6	842	0.0114	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.7	660		3.00		**Direct Entry, Pipe flow @ 3 fps**
23.6	1,602	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 11S: Direct to Cowley Lake Outlet Channel

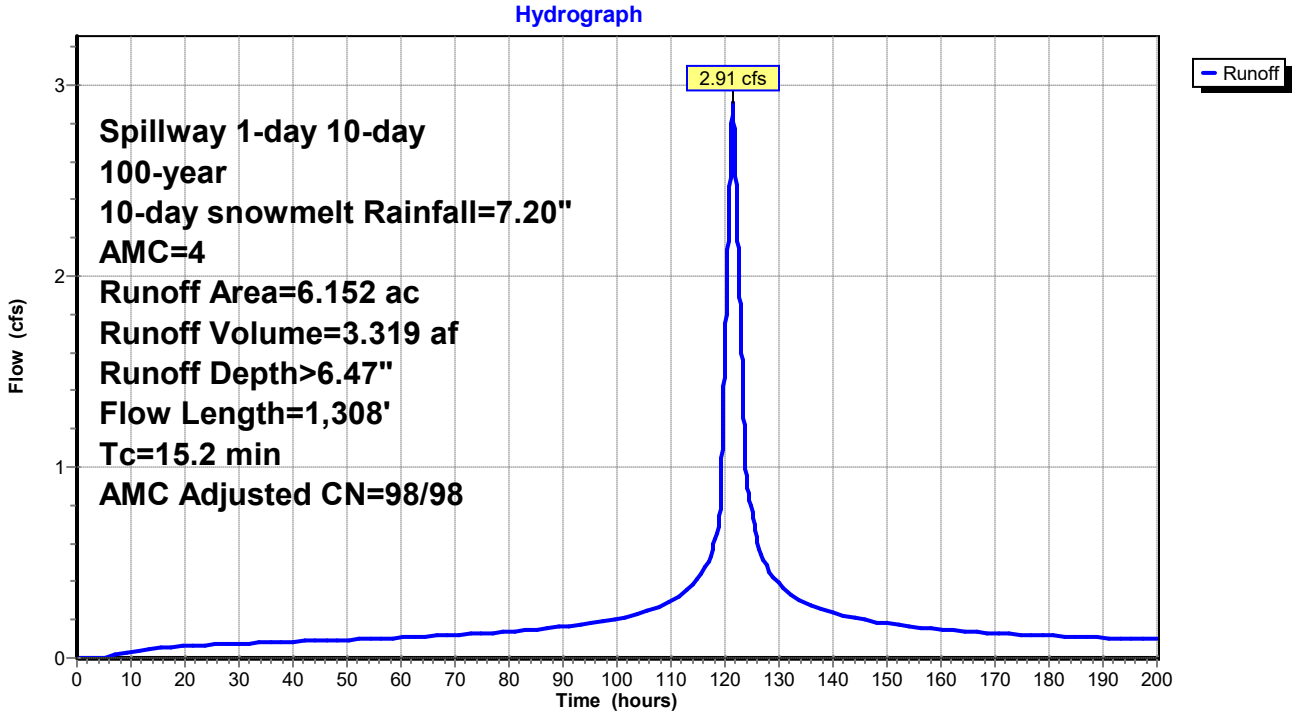
Runoff = 2.91 cfs @ 121.43 hrs, Volume= 3.319 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.024	98		Unconnected pavement, HSG D
0.182	98		Unconnected roofs, HSG D
1.316	98		Water Surface, 0% imp, HSG D
1.199	80		>75% Grass cover, Good, HSG D
2.901	78		Meadow, non-grazed, HSG D
0.530	77		Woods, Good, HSG D
6.152	83	98	Weighted Average, AMC Adjusted
5.946	83	98	96.65% Pervious Area, AMC Adjusted
0.206	98	98	3.35% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.8	114	0.0263	2.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	1,094	0.0024	3.27	46.64	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=1.50' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
15.2	1,308	Total			

Subcatchment 11S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 12S: Fugitve to Fox Creek West 5th Addition

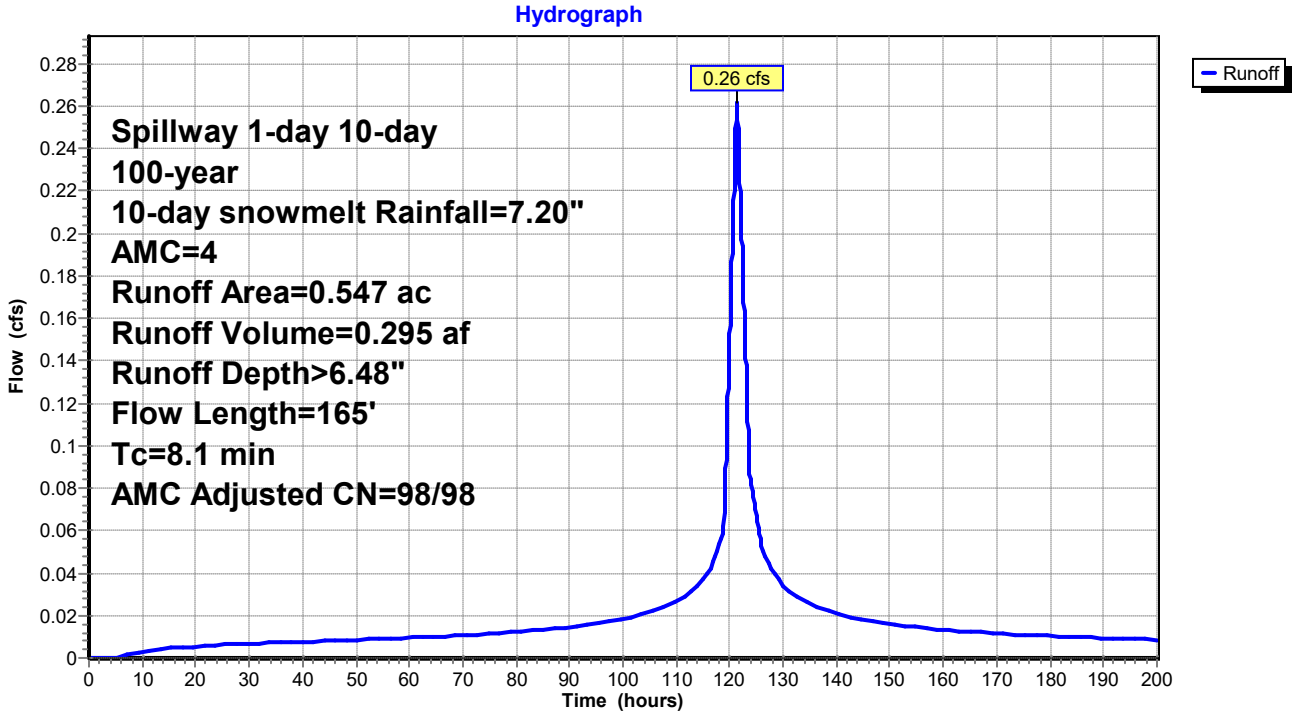
Runoff = 0.26 cfs @ 121.33 hrs, Volume= 0.295 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.015	98		Unconnected pavement, HSG D
0.043	98		Unconnected roofs, HSG D
0.104	98		Paved roads w/curbs & sewers, HSG D
0.051	98		Paved parking, HSG D
0.034	98		Roofs, HSG D
0.300	80		>75% Grass cover, Good, HSG D
0.547	88	98	Weighted Average, AMC Adjusted
0.300	80	98	54.84% Pervious Area, AMC Adjusted
0.247	98	98	45.16% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0440	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.3	40	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	25	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	165	Total			

Subcatchment 12S: Fugitve to Fox Creek West 5th Addition



Summary for Subcatchment 20S: Direct to Cowley Lake

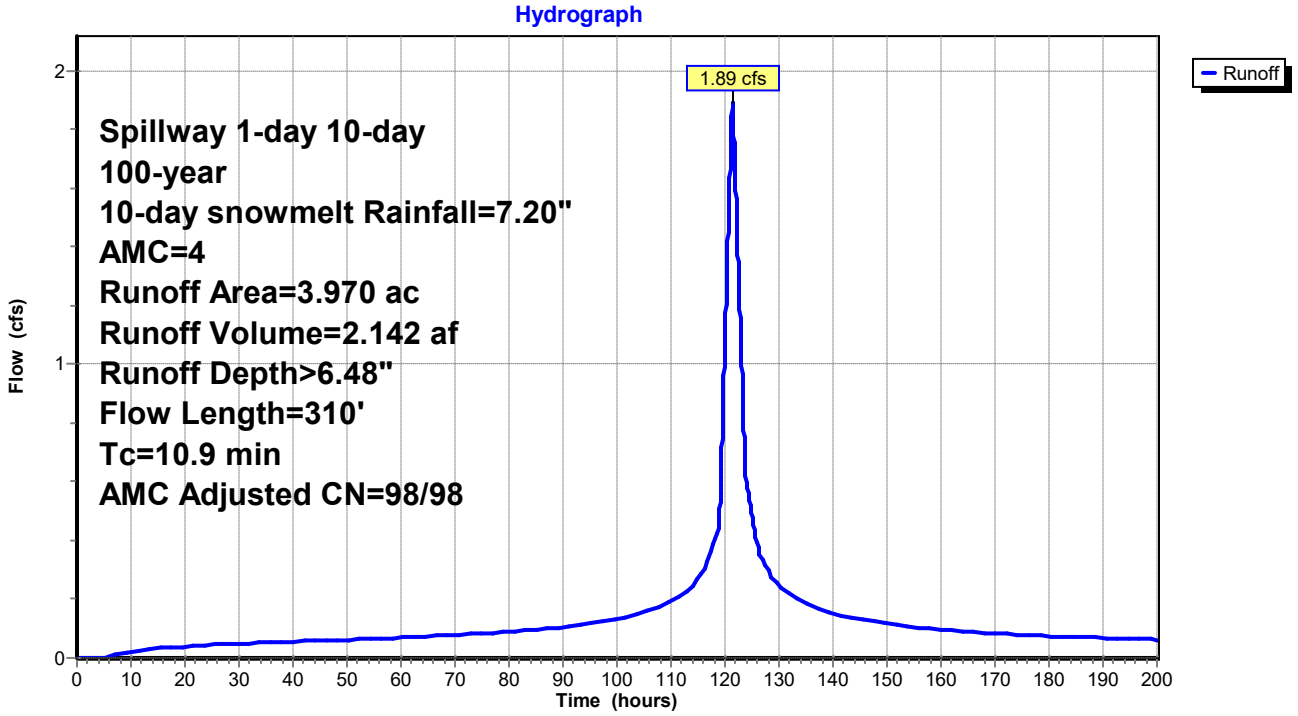
Runoff = 1.89 cfs @ 121.37 hrs, Volume= 2.142 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.046	98		Unconnected pavement, HSG D
0.258	98		Unconnected roofs, HSG D
0.122	98		Water Surface, 0% imp, HSG D
0.949	80		>75% Grass cover, Good, HSG D
1.018	78		Meadow, non-grazed, HSG D
1.577	77		Woods, Good, HSG D
3.970	80	98	Weighted Average, AMC Adjusted
3.666	79	98	92.34% Pervious Area, AMC Adjusted
0.304	98	98	7.66% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0270	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	72	0.0347	2.79		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.3	138	0.0667	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	310	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

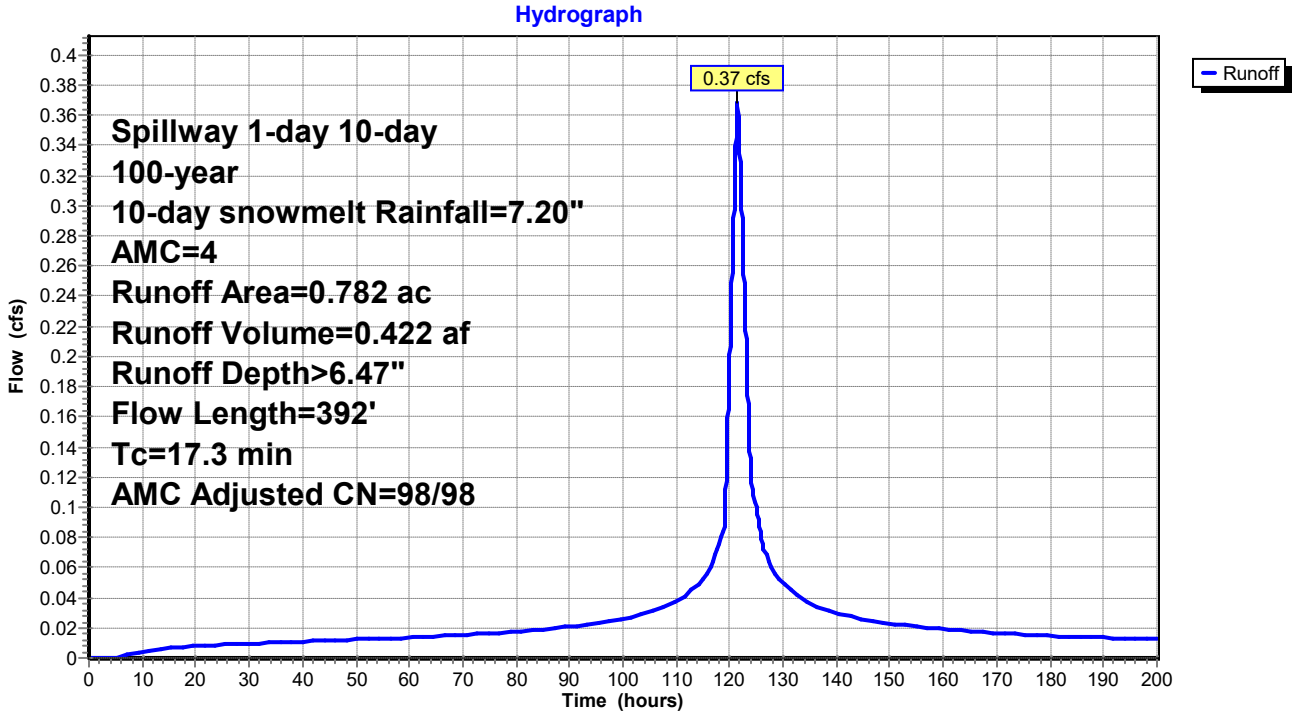
Runoff = 0.37 cfs @ 121.46 hrs, Volume= 0.422 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.010	98		Unconnected pavement, HSG D
0.054	98		Water Surface, 0% imp, HSG D
0.016	80		>75% Grass cover, Good, HSG D
0.162	78		Meadow, non-grazed, HSG D
0.540	77		Woods, Good, HSG D
0.782	79	98	Weighted Average, AMC Adjusted
0.772	79	98	98.72% Pervious Area, AMC Adjusted
0.010	98	98	1.28% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.8	100	0.0590	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.3	146	0.0452	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	146	0.0164	10.55	221.46	**Channel Flow,** Area= 21.0 sf Perim= 15.6' r= 1.35' n= 0.022 Earth, clean & straight
17.3	392	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

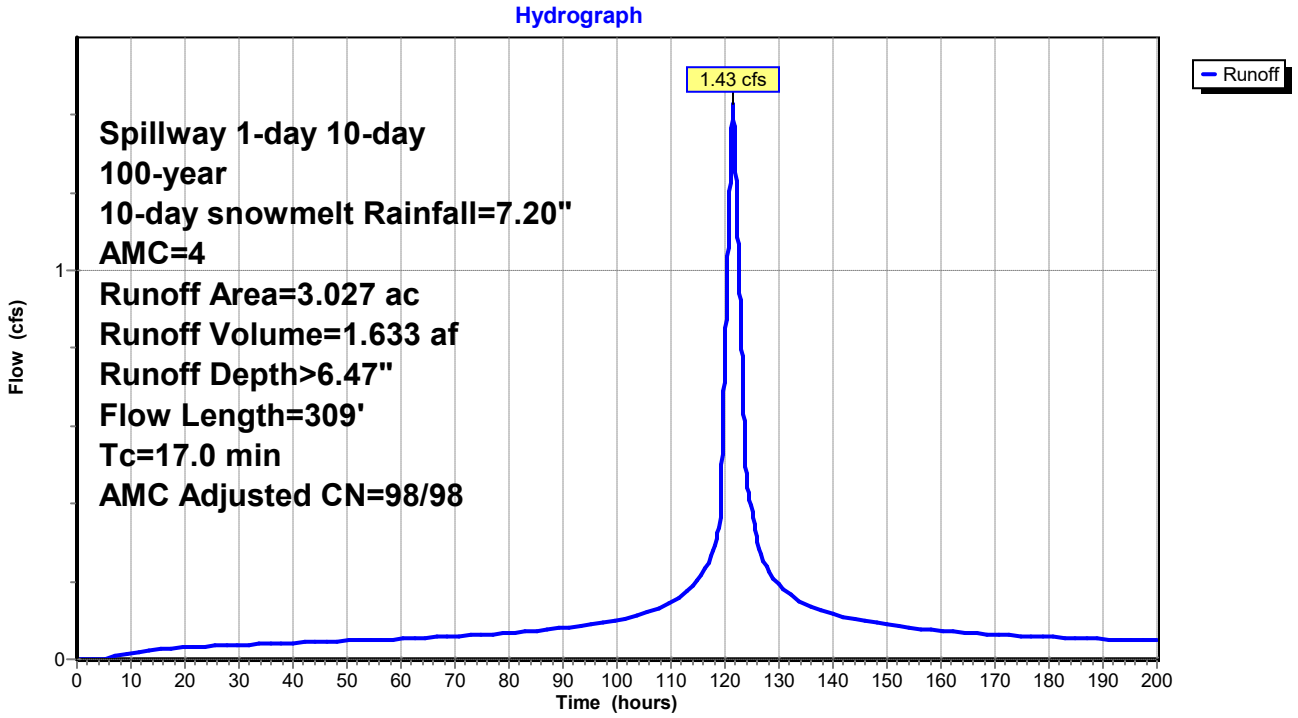
Runoff = 1.43 cfs @ 121.46 hrs, Volume= 1.633 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.125	98		Unconnected pavement, HSG D
0.189	98		Unconnected roofs, HSG D
0.031	98		Water Surface, 0% imp, HSG D
0.779	80		>75% Grass cover, Good, HSG D
1.348	78		Meadow, non-grazed, HSG D
0.555	77		Woods, Good, HSG D
3.027	81	98	Weighted Average, AMC Adjusted
2.713	79	98	89.63% Pervious Area, AMC Adjusted
0.314	98	98	10.37% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0220	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
2.4	209	0.0445	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.0	309	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Proposed West Channel

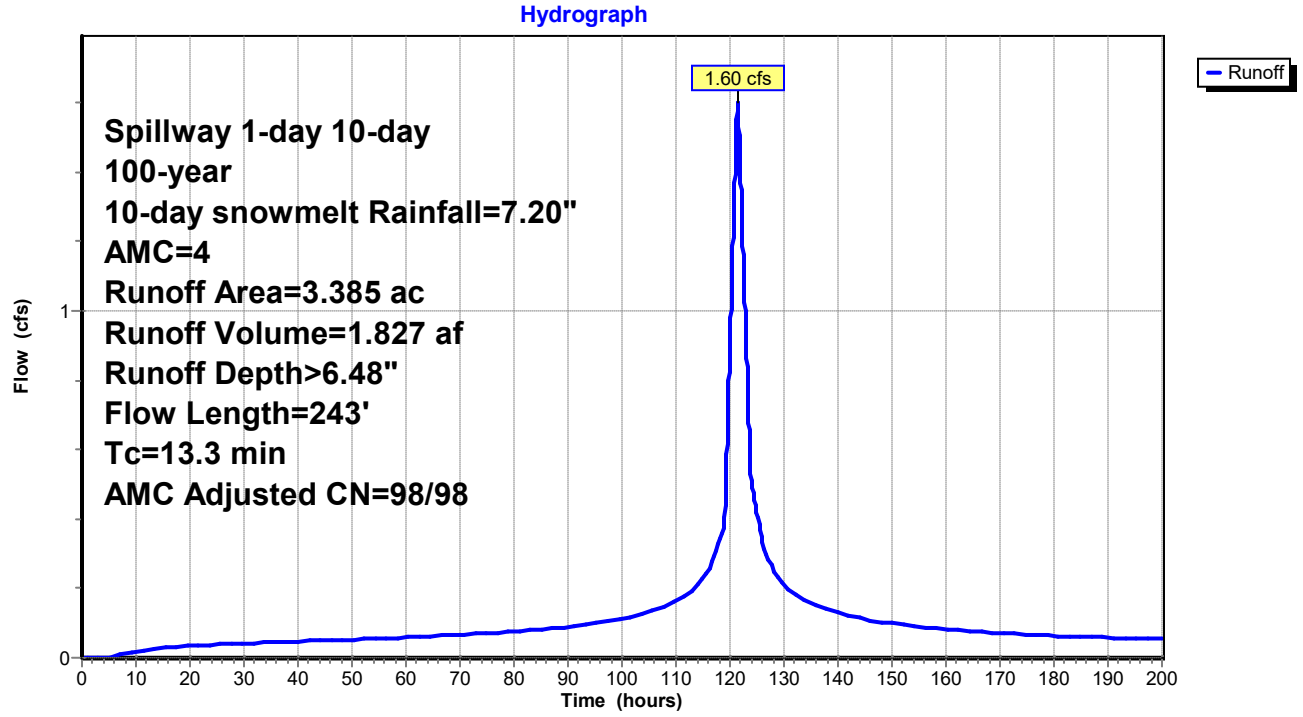
Runoff = 1.60 cfs @ 121.41 hrs, Volume= 1.827 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.023	98		Unconnected pavement, HSG D
0.467	98		Water Surface, 0% imp, HSG D
0.253	80		>75% Grass cover, Good, HSG D
1.225	78		Meadow, non-grazed, HSG D
1.417	77		Woods, Good, HSG D
3.385	81	98	Weighted Average, AMC Adjusted
3.362	81	98	99.32% Pervious Area, AMC Adjusted
0.023	98	98	0.68% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0520	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
3.0	143	0.0259	0.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	243	Total			

Subcatchment 23S: Direct to Proposed West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

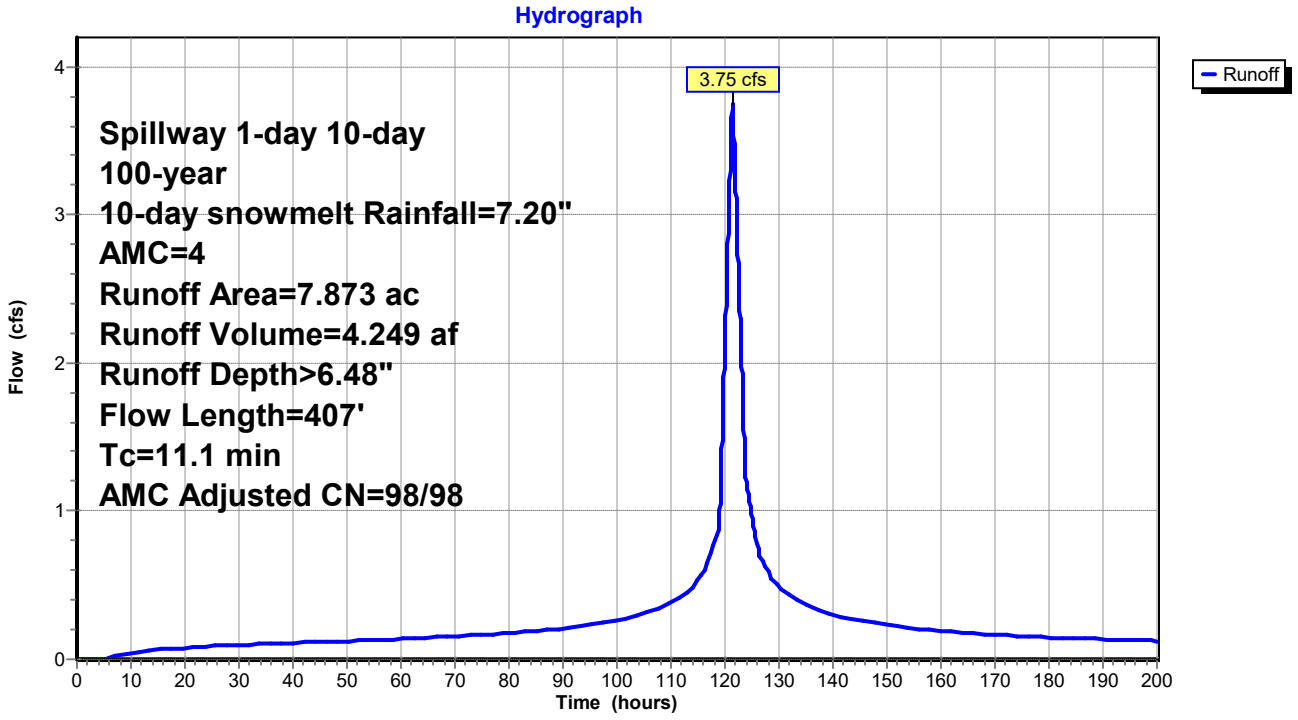
Runoff = 3.75 cfs @ 121.38 hrs, Volume= 4.249 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.039	98		Unconnected pavement, HSG D
0.379	98		Unconnected roofs, HSG D
0.980	98		Water Surface, 0% imp, HSG D
1.643	80		>75% Grass cover, Good, HSG D
2.538	78		Meadow, non-grazed, HSG D
2.294	77		Woods, Good, HSG D
7.873	82	98	Weighted Average, AMC Adjusted
7.455	81	98	94.69% Pervious Area, AMC Adjusted
0.418	98	98	5.31% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0600	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
4.4	307	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	407	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 25S: Direct to Proposed Northwest Pond

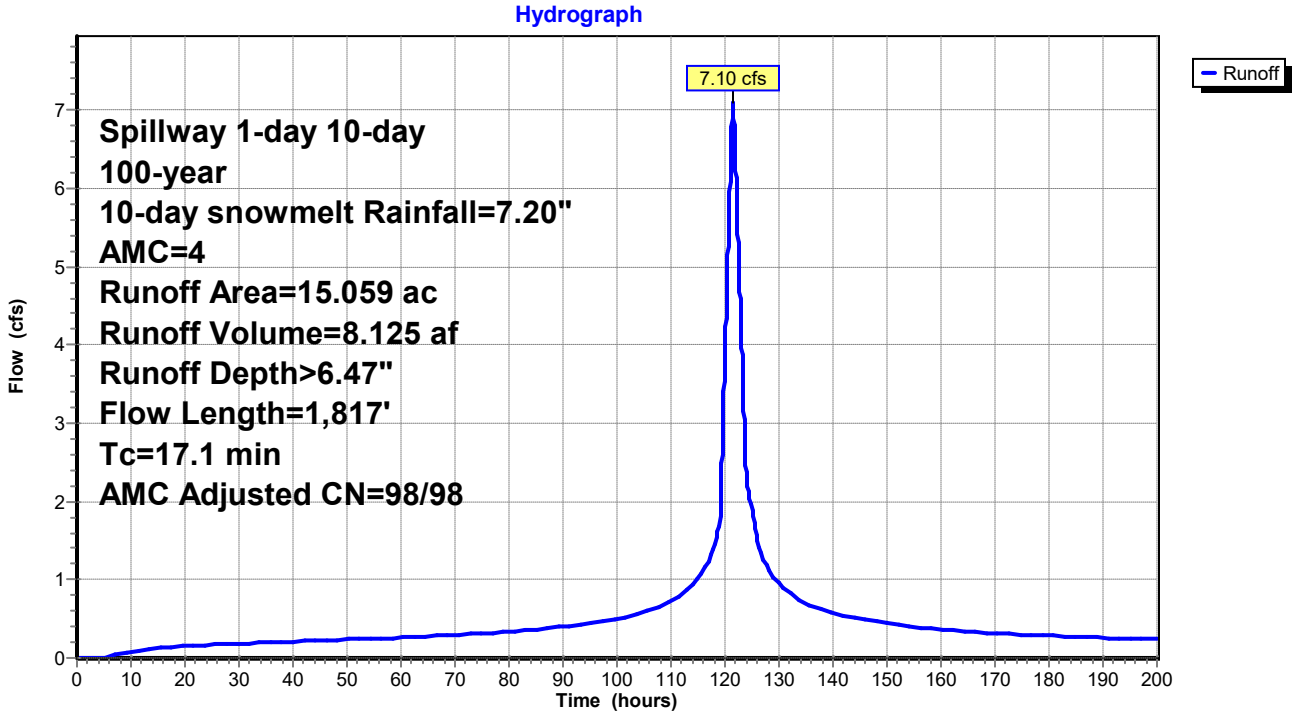
Runoff = 7.10 cfs @ 121.46 hrs, Volume= 8.125 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.652	98		Unconnected pavement, HSG D
1.214	98		Unconnected roofs, HSG D
1.443	98		Paved roads w/curbs & sewers, HSG D
0.758	98		Paved parking, HSG D
0.424	98		Roofs, HSG D
0.322	98		Water Surface, 0% imp, HSG D
0.084	96		Gravel surface, HSG D
0.179	89		Row crops, straight row, Good, HSG D
8.582	80		>75% Grass cover, Good, HSG D
1.401	78		Meadow, non-grazed, HSG D
15.059	86	98	Weighted Average, AMC Adjusted
10.568	81	98	70.18% Pervious Area, AMC Adjusted
4.491	98	98	29.82% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	90	0.0378	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	57	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.3	1,670		3.00		**Direct Entry, Pipe flow @ 3 fps**
17.1	1,817	Total			

Subcatchment 25S: Direct to Proposed Northwest Pond



Summary for Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration

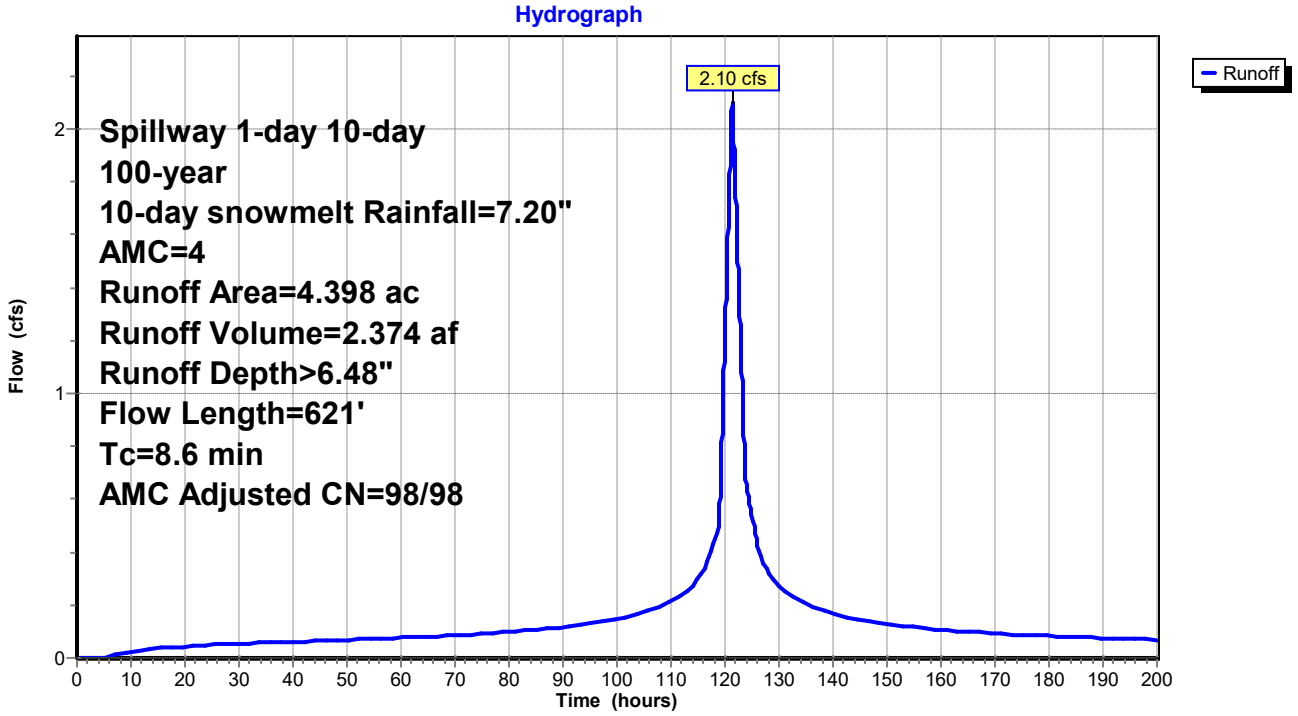
Runoff = 2.10 cfs @ 121.34 hrs, Volume= 2.374 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.170	98		Unconnected pavement, HSG D
0.393	98		Unconnected roofs, HSG D
0.551	98		Paved roads w/curbs & sewers, HSG D
0.354	98		Paved parking, HSG D
0.220	98		Roofs, HSG D
0.318	98		Water Surface, 0% imp, HSG D
1.487	80		>75% Grass cover, Good, HSG D
0.905	78		Meadow, non-grazed, HSG D
4.398	88	98	Weighted Average, AMC Adjusted
2.710	81	98	61.62% Pervious Area, AMC Adjusted
1.688	98	98	38.38% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration



Summary for Subcatchment 27S: Direct to Proposed Northwest Central Pond

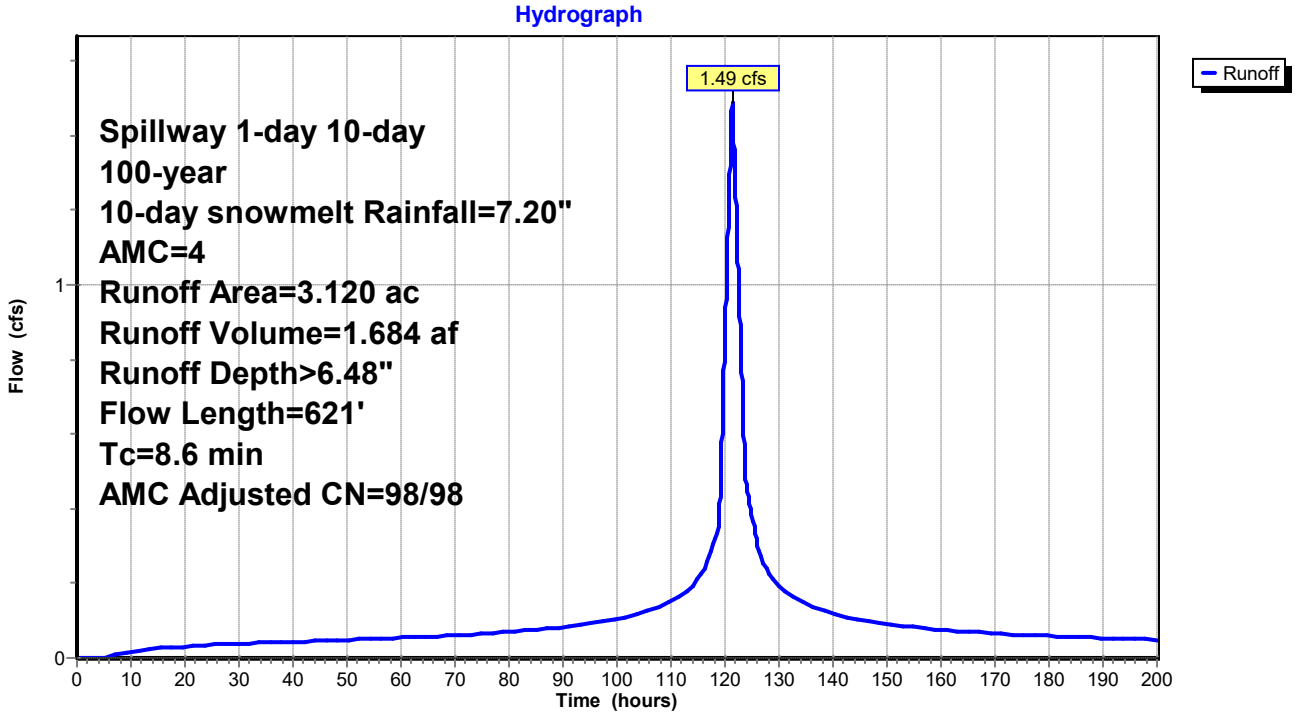
Runoff = 1.49 cfs @ 121.34 hrs, Volume= 1.684 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.134	98		Unconnected pavement, HSG D
0.275	98		Unconnected roofs, HSG D
0.506	98		Paved roads w/curbs & sewers, HSG D
0.328	98		Paved parking, HSG D
0.224	98		Roofs, HSG D
0.278	98		Water Surface, 0% imp, HSG D
0.979	80		>75% Grass cover, Good, HSG D
0.396	78		Meadow, non-grazed, HSG D
3.120	90	98	Weighted Average, AMC Adjusted
1.653	83	98	52.98% Pervious Area, AMC Adjusted
1.467	98	98	47.02% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 27S: Direct to Proposed Northwest Central Pond



Summary for Subcatchment 28S: Direct to Proposed Northeast Central Pond

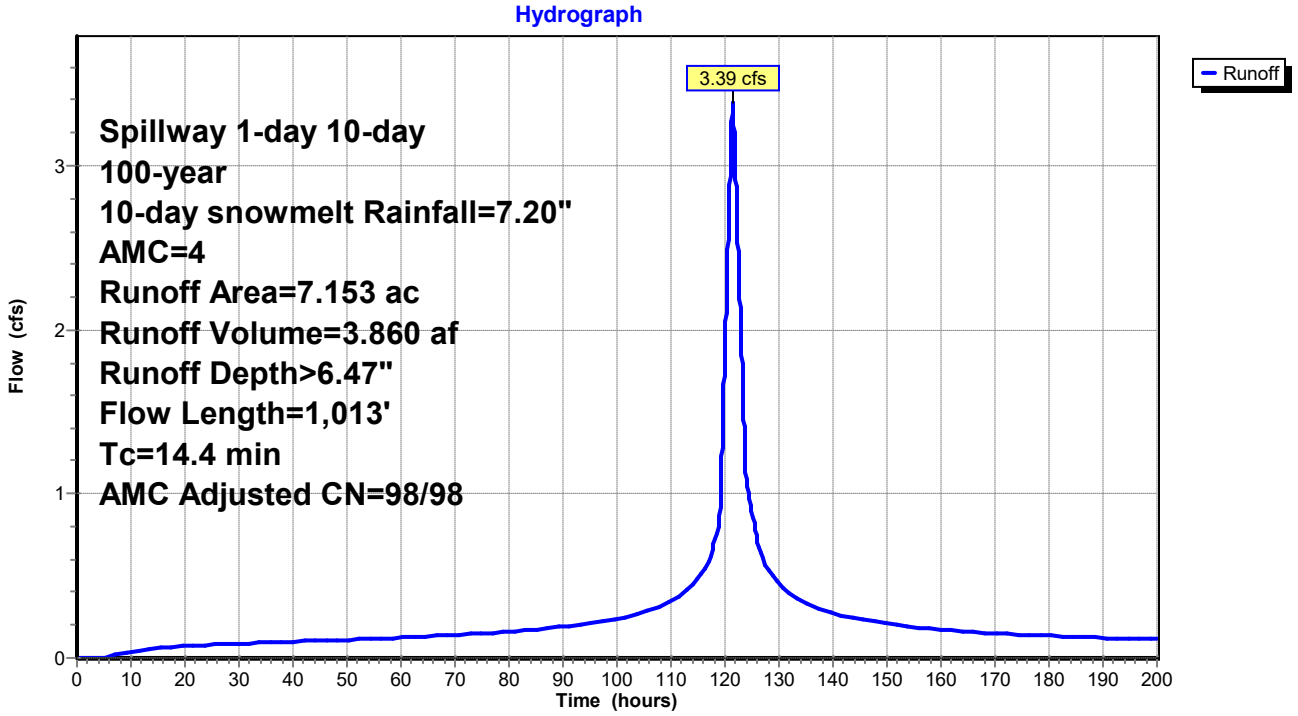
Runoff = 3.39 cfs @ 121.42 hrs, Volume= 3.860 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.152	98		Unconnected pavement, HSG D
0.932	98		Unconnected roofs, HSG D
0.930	98		Paved roads w/curbs & sewers, HSG D
1.004	98		Paved parking, HSG D
0.604	98		Roofs, HSG D
0.380	98		Water Surface, 0% imp, HSG D
2.416	80		>75% Grass cover, Good, HSG D
0.684	78		Meadow, non-grazed, HSG D
0.051	77		Woods, Good, HSG D
7.153	90	98	Weighted Average, AMC Adjusted
3.531	82	98	49.36% Pervious Area, AMC Adjusted
3.622	98	98	50.64% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	71	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.6	242	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	700		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.4	1,013	Total			

Subcatchment 28S: Direct to Proposed Northeast Central Pond



Summary for Subcatchment 30S: Direct to Wetland 4A

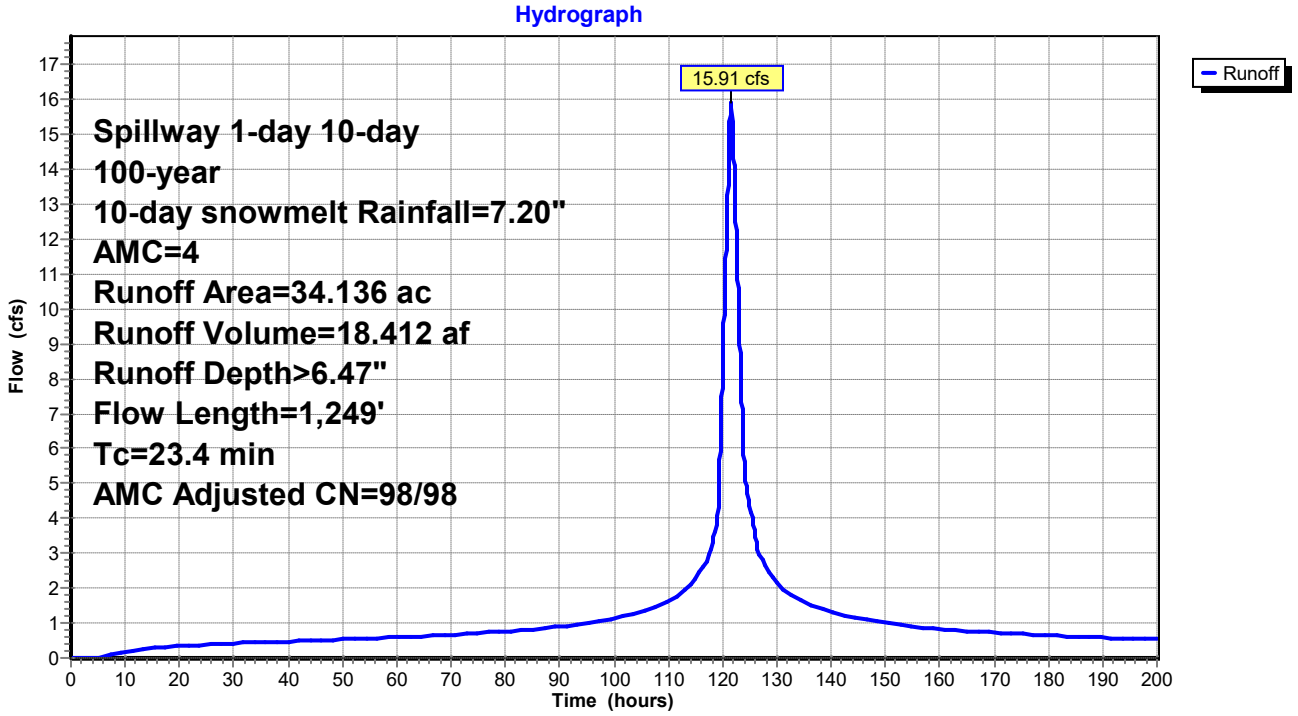
Runoff = 15.91 cfs @ 121.56 hrs, Volume= 18.412 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
1.401	98		Unconnected pavement, HSG D
1.502	98		Unconnected roofs, HSG D
0.939	96		Gravel surface, HSG D
6.512	89		Row crops, straight row, Good, HSG D
1.609	89		Pasture/grassland/range, Poor, HSG D
18.400	80		>75% Grass cover, Good, HSG D
3.773	77		Woods, Good, HSG D
34.136	84	98	Weighted Average, AMC Adjusted
31.233	82	98	91.50% Pervious Area, AMC Adjusted
2.903	98	98	8.50% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

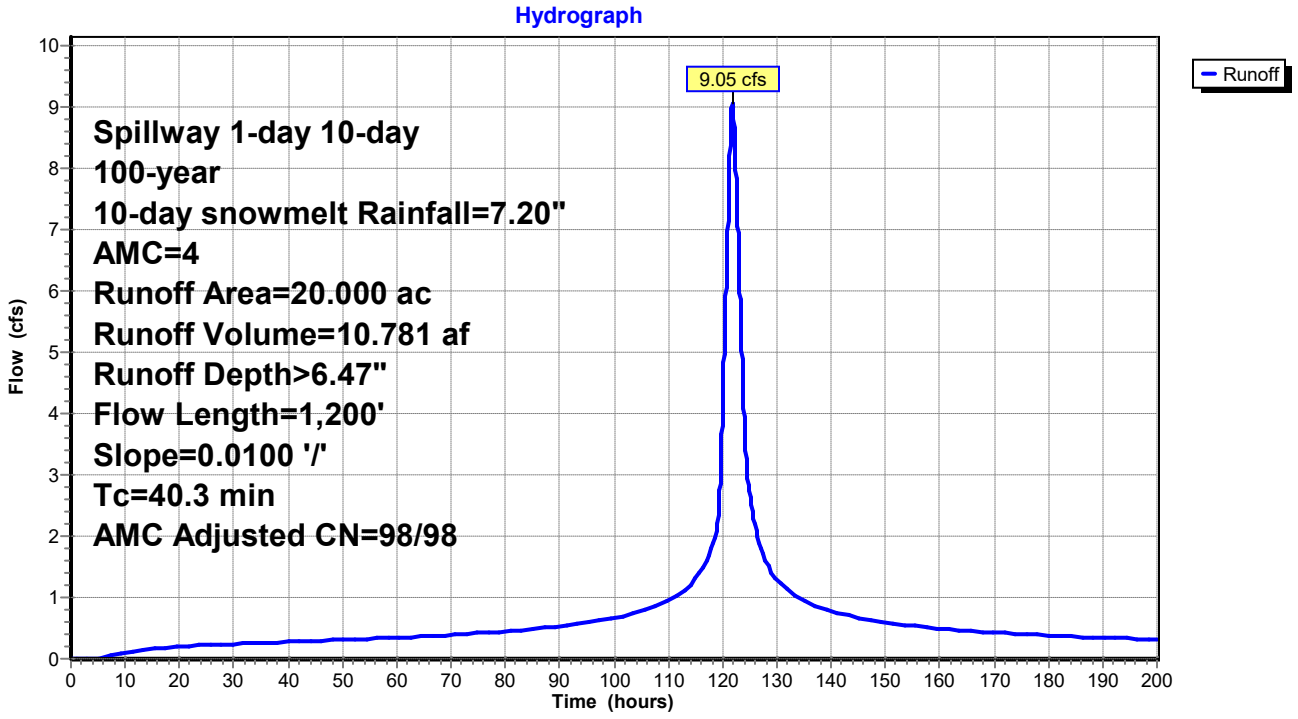
Runoff = 9.05 cfs @ 121.80 hrs, Volume= 10.781 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
20.000	77		2 acre lots, 12% imp, HSG C
20.000	77	98	Weighted Average, AMC Adjusted
17.600	74	98	88.00% Pervious Area, AMC Adjusted
2.400	98	98	12.00% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 32S: Direct to Proposed West Central Pond

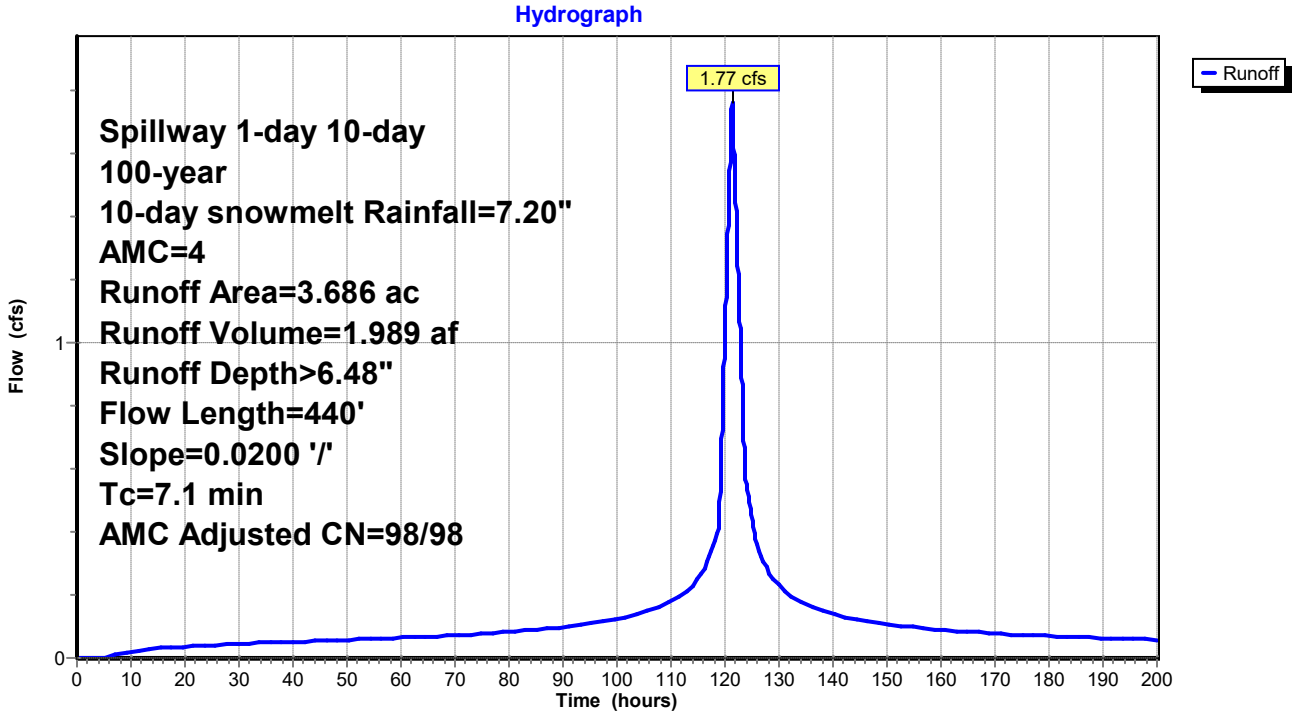
Runoff = 1.77 cfs @ 121.32 hrs, Volume= 1.989 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.039	98		Unconnected pavement, HSG D
0.438	98		Unconnected roofs, HSG D
0.377	98		Paved roads w/curbs & sewers, HSG D
0.298	98		Paved parking, HSG D
0.194	98		Roofs, HSG D
0.395	98		Water Surface, 0% imp, HSG D
1.443	80		>75% Grass cover, Good, HSG D
0.502	78		Meadow, non-grazed, HSG D
3.686	88	98	Weighted Average, AMC Adjusted
2.340	83	98	63.48% Pervious Area, AMC Adjusted
1.346	98	98	36.52% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.2	401		3.00		**Direct Entry,**
7.1	440	Total			

Subcatchment 32S: Direct to Proposed West Central Pond



Summary for Subcatchment 40S: Direct to Wetland 2B

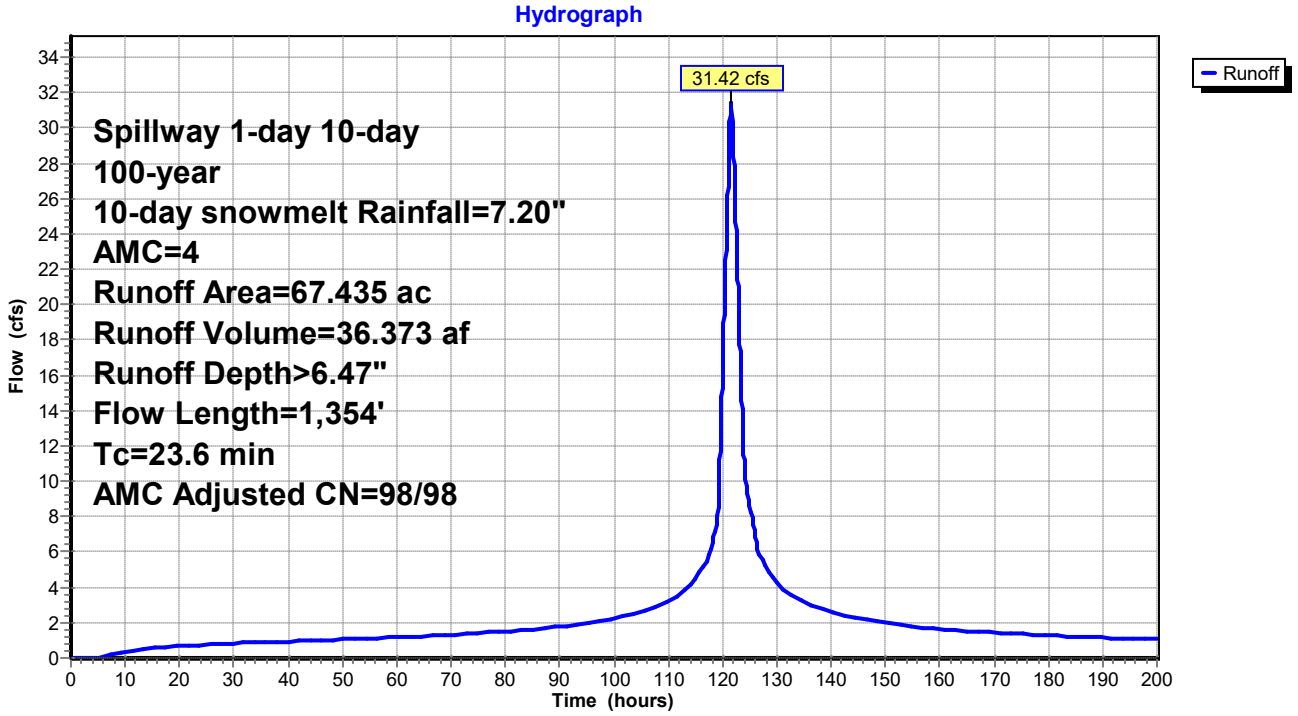
Runoff = 31.42 cfs @ 121.56 hrs, Volume= 36.373 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.965	98		Unconnected pavement, HSG D
1.003	98		Unconnected roofs, HSG D
17.214	98		Water Surface, 0% imp, HSG D
1.249	96		Gravel surface, HSG D
27.306	89		Row crops, straight row, Good, HSG D
0.208	89		Pasture/grassland/range, Poor, HSG D
9.713	80		>75% Grass cover, Good, HSG D
6.057	78		Meadow, non-grazed, HSG D
3.720	77		Woods, Good, HSG D
67.435	89	98	Weighted Average, AMC Adjusted
65.467	88	98	97.08% Pervious Area, AMC Adjusted
1.968	98	98	2.92% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

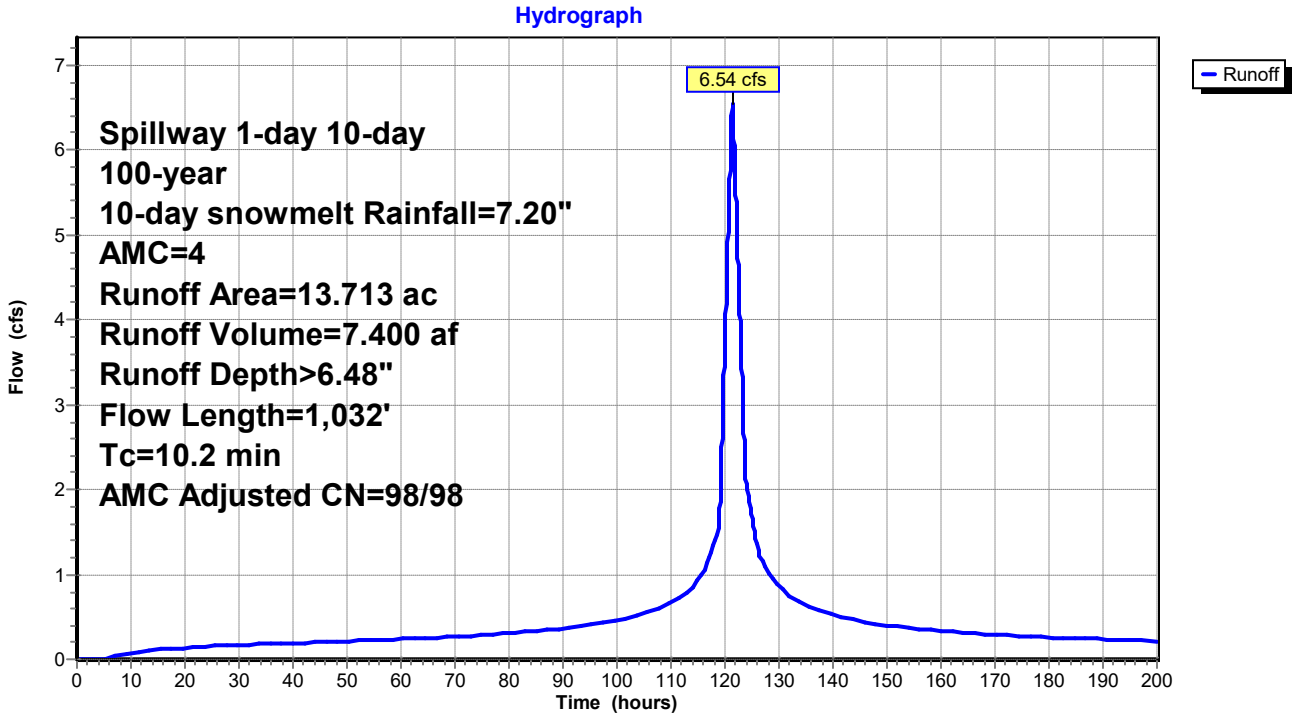
Runoff = 6.54 cfs @ 121.36 hrs, Volume= 7.400 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
1.568	98		Unconnected pavement, HSG D
0.273	98		Unconnected roofs, HSG D
0.107	98		Water Surface, 0% imp, HSG D
0.066	96		Gravel surface, HSG D
10.431	80		>75% Grass cover, Good, HSG D
1.268	78		Meadow, non-grazed, HSG D
13.713	82	98	Weighted Average, AMC Adjusted
11.872	80	98	86.57% Pervious Area, AMC Adjusted
1.841	98	98	13.43% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 42S: Direct to Proposed South Central Pond

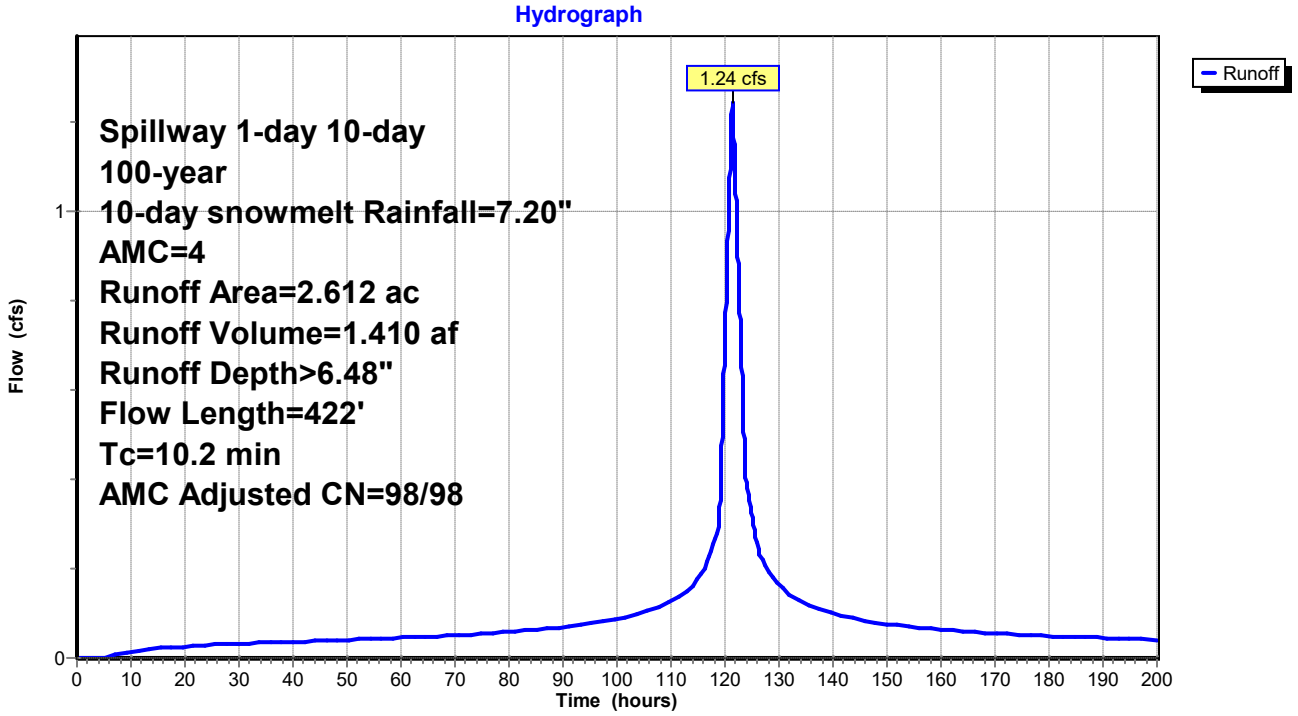
Runoff = 1.24 cfs @ 121.36 hrs, Volume= 1.410 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.013	98		Unconnected pavement, HSG D
0.362	98		Unconnected roofs, HSG D
0.246	98		Paved roads w/curbs & sewers, HSG D
0.145	98		Paved parking, HSG D
0.084	98		Roofs, HSG D
0.154	98		Water Surface, 0% imp, HSG D
0.600	80		>75% Grass cover, Good, HSG D
0.811	78		Meadow, non-grazed, HSG D
0.197	77		Woods, Good, HSG D
2.612	86	98	Weighted Average, AMC Adjusted
1.762	80	98	67.46% Pervious Area, AMC Adjusted
0.850	98	98	32.54% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.7	235	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	117		3.00		**Direct Entry, Pipe flow @ 3 fps**
10.2	422	Total			

Subcatchment 42S: Direct to Proposed South Central Pond



Summary for Subcatchment 43S: Direct to Proposed Central Pond

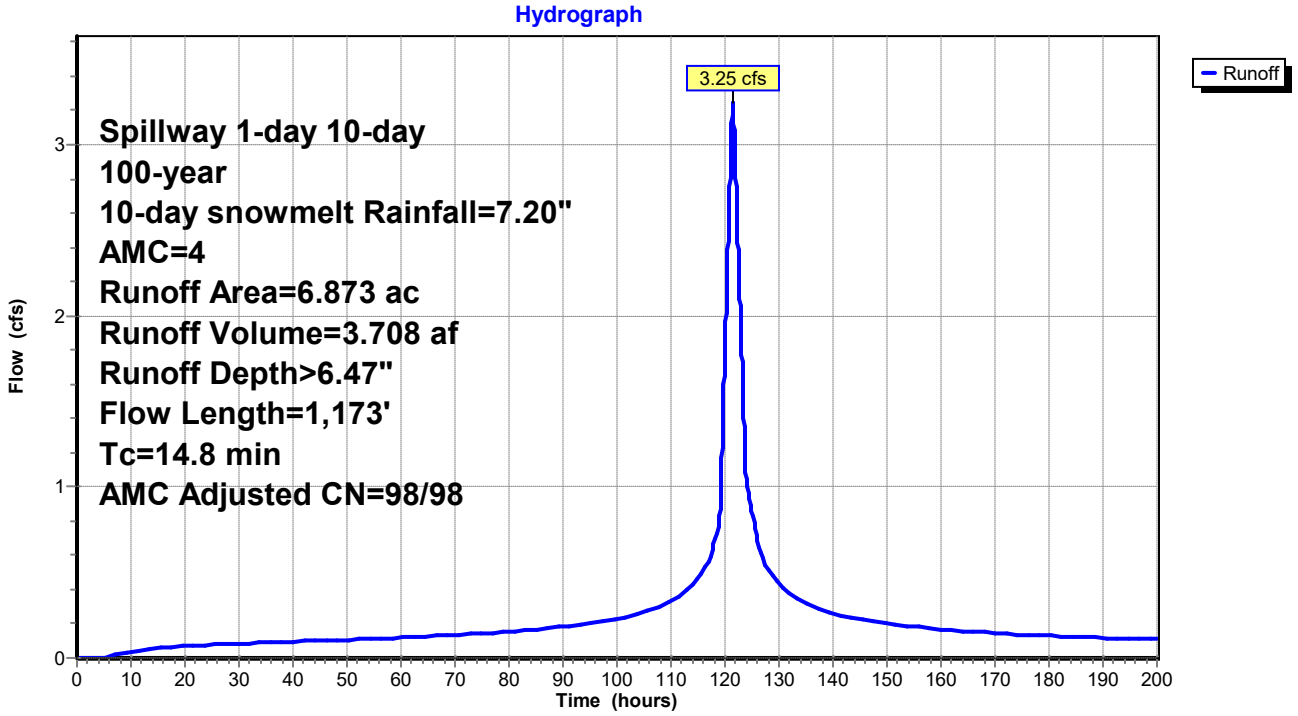
Runoff = 3.25 cfs @ 121.43 hrs, Volume= 3.708 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.205	98		Unconnected pavement, HSG D
0.855	98		Unconnected roofs, HSG D
0.896	98		Paved roads w/curbs & sewers, HSG D
0.530	98		Paved parking, HSG D
0.332	98		Roofs, HSG D
0.402	98		Water Surface, 0% imp, HSG D
0.383	89		Row crops, straight row, Good, HSG D
2.711	80		>75% Grass cover, Good, HSG D
0.559	78		Meadow, non-grazed, HSG D
6.873	89	98	Weighted Average, AMC Adjusted
4.055	82	98	59.00% Pervious Area, AMC Adjusted
2.818	98	98	41.00% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.5	286	0.0088	1.90		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	817		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.8	1,173	Total			

Subcatchment 43S: Direct to Proposed Central Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

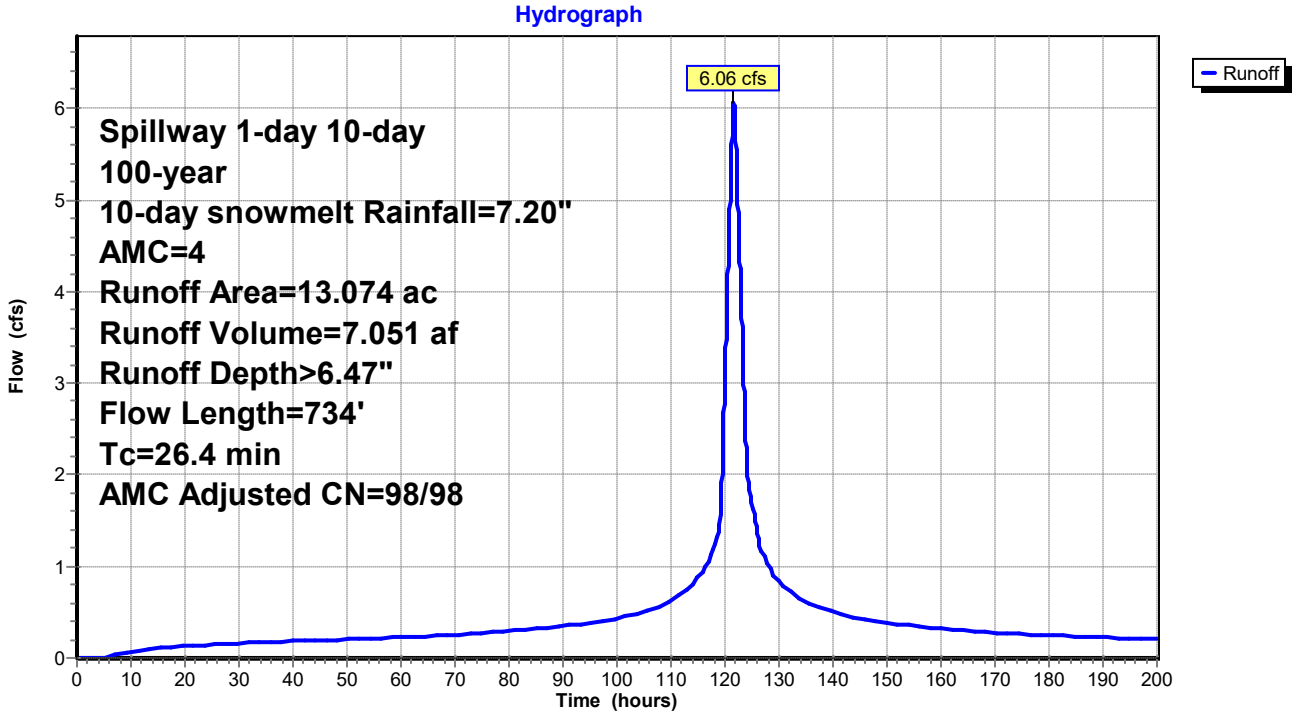
Runoff = 6.06 cfs @ 121.60 hrs, Volume= 7.051 af, Depth> 6.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.523	98		Unconnected pavement, HSG D
0.339	98		Unconnected roofs, HSG D
0.175	98		Water Surface, 0% imp, HSG D
0.233	96		Gravel surface, HSG D
8.346	89		Row crops, straight row, Good, HSG D
0.958	89		Pasture/grassland/range, Poor, HSG D
2.500	80		>75% Grass cover, Good, HSG D
13.074	88	98	Weighted Average, AMC Adjusted
12.212	87	98	93.41% Pervious Area, AMC Adjusted
0.862	98	98	6.59% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

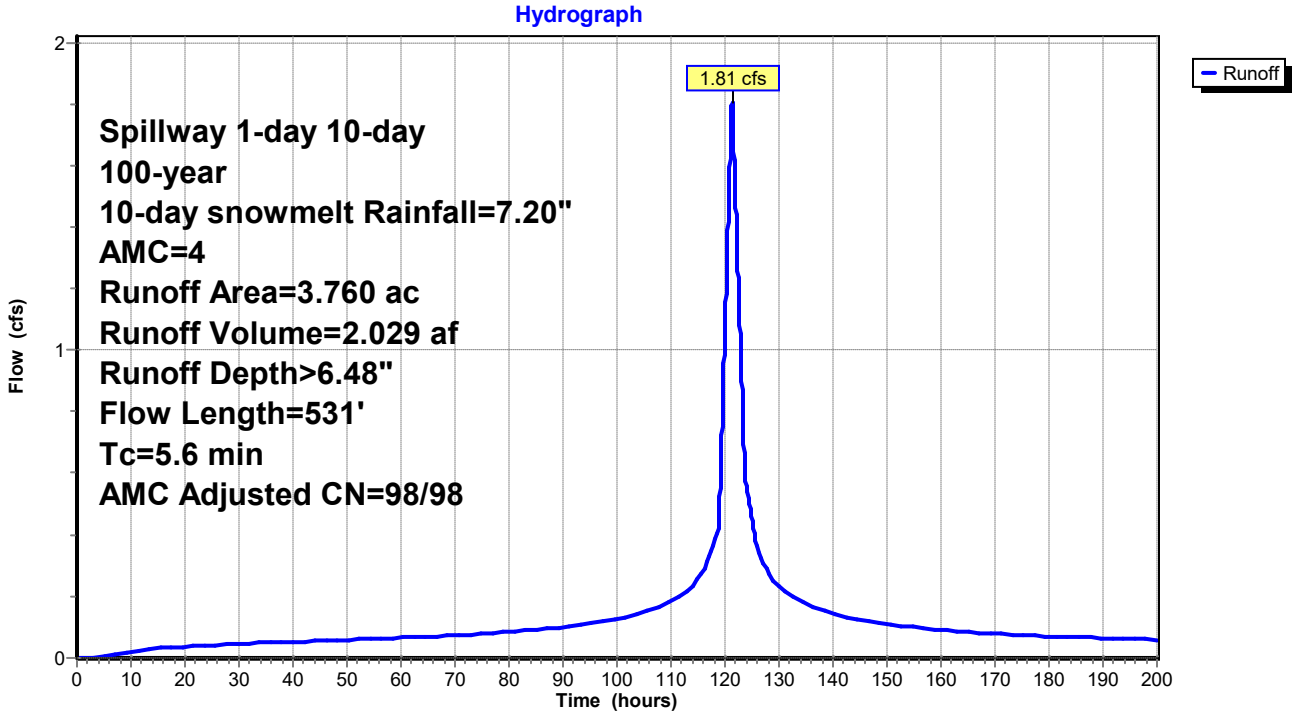
Runoff = 1.81 cfs @ 121.30 hrs, Volume= 2.029 af, Depth> 6.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.428	98		Unconnected pavement, HSG D
0.443	98		Unconnected roofs, HSG D
0.064	98		Water Surface, 0% imp, HSG D
0.331	96		Gravel surface, HSG D
2.083	80		>75% Grass cover, Good, HSG D
0.411	77		Woods, Good, HSG D
3.760	86	98	Weighted Average, AMC Adjusted
2.889	82	98	76.84% Pervious Area, AMC Adjusted
0.871	98	98	23.16% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



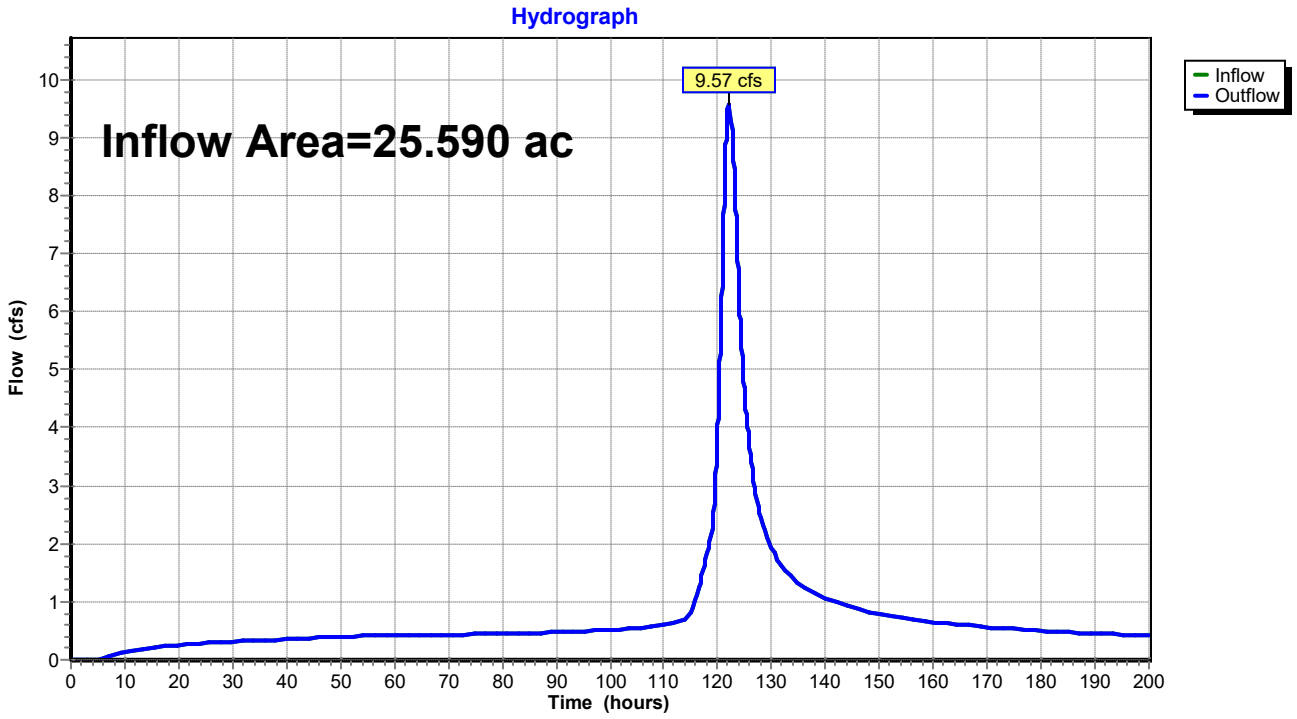
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.590 ac, 16.84% Impervious, Inflow Depth > 5.93" for 100-year, 10-day snowmelt event
Inflow = 9.57 cfs @ 122.11 hrs, Volume= 12.642 af
Outflow = 9.57 cfs @ 122.11 hrs, Volume= 12.642 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



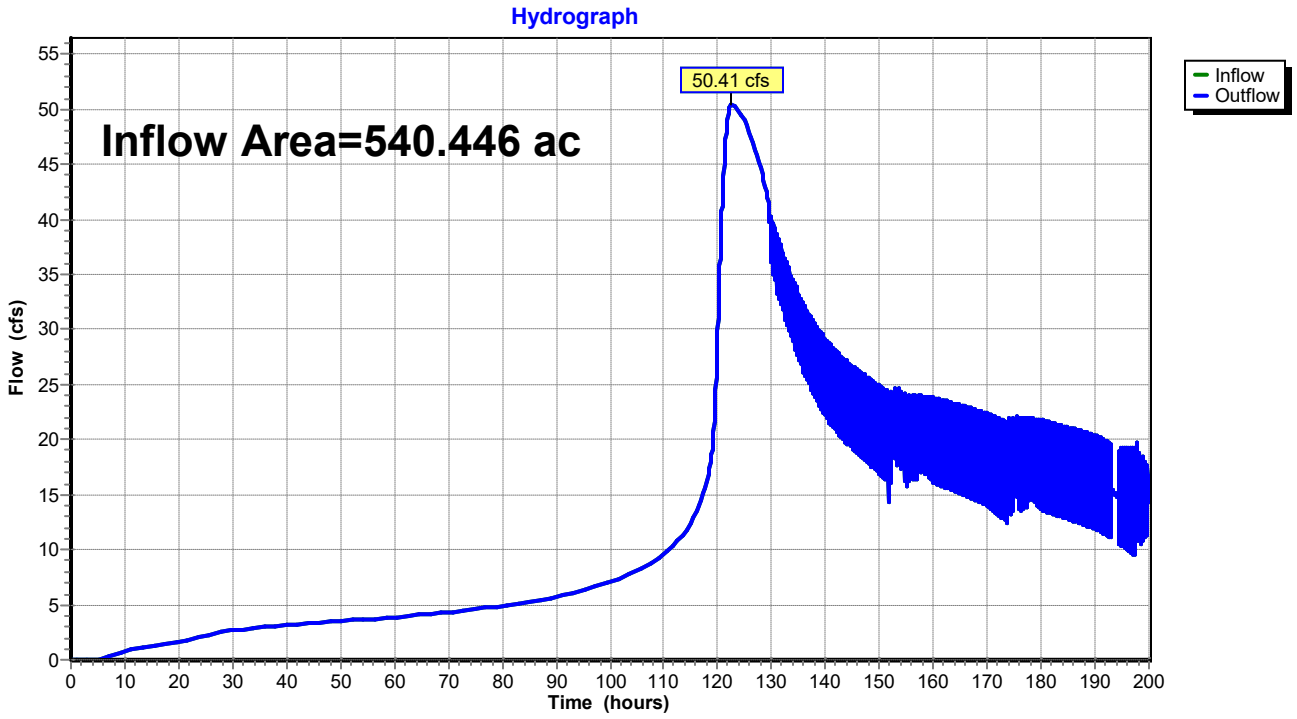
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.446 ac, 5.98% Impervious, Inflow Depth > 4.57" for 100-year, 10-day snowmelt event
Inflow = 50.41 cfs @ 122.63 hrs, Volume= 205.650 af
Outflow = 50.41 cfs @ 122.63 hrs, Volume= 205.650 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



Summary for Reach 21R: Proposed East Channel

Inflow Area = 134.639 ac, 9.91% Impervious, Inflow Depth > 6.69" for 100-year, 10-day snowmelt event
Inflow = 24.39 cfs @ 124.87 hrs, Volume= 75.080 af
Outflow = 24.39 cfs @ 124.88 hrs, Volume= 75.074 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.16 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.89 fps, Avg. Travel Time= 1.5 min

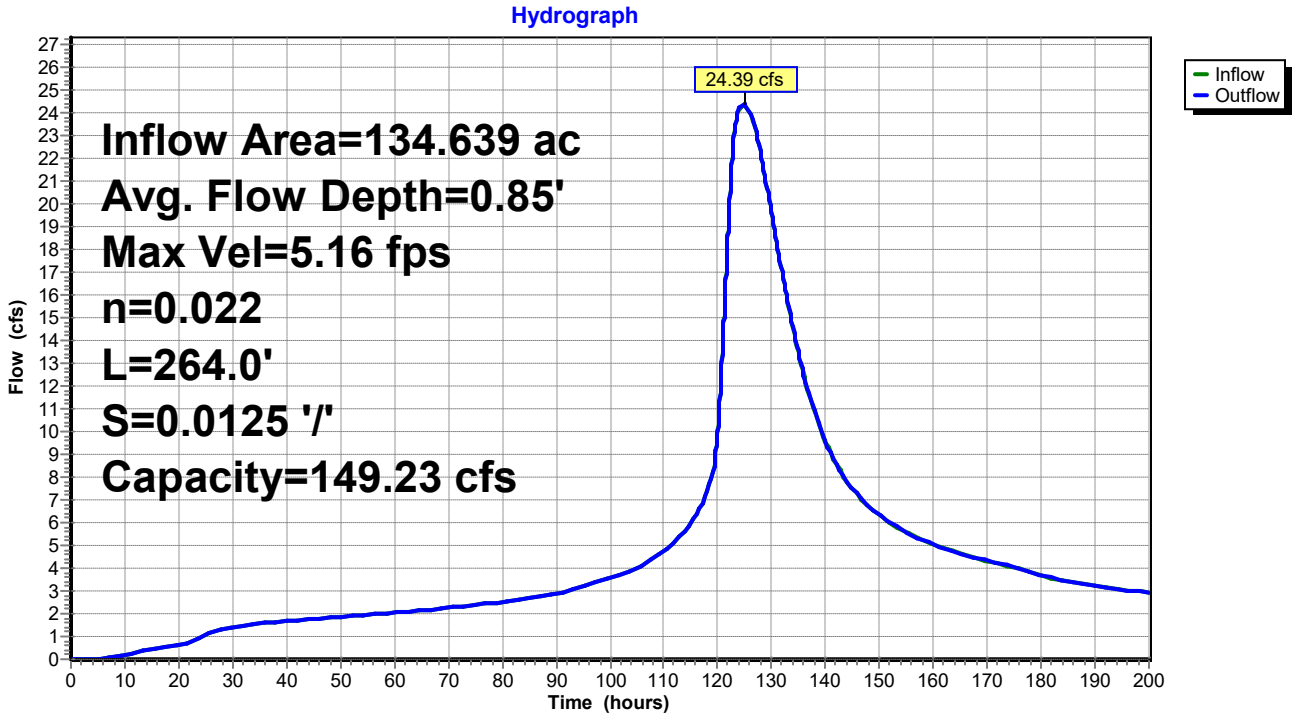
Peak Storage= 1,249 cf @ 124.88 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 149.23 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 264.0' Slope= 0.0125 '/'
Inlet Invert= 923.50', Outlet Invert= 920.20'



‡

Reach 21R: Proposed East Channel



Summary for Reach 23R: Existing West Channel

Inflow Area = 375.878 ac, 3.58% Impervious, Inflow Depth > 3.68" for 100-year, 10-day snowmelt event
Inflow = 23.84 cfs @ 121.84 hrs, Volume= 115.333 af
Outflow = 23.84 cfs @ 121.85 hrs, Volume= 115.316 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 2.4 min

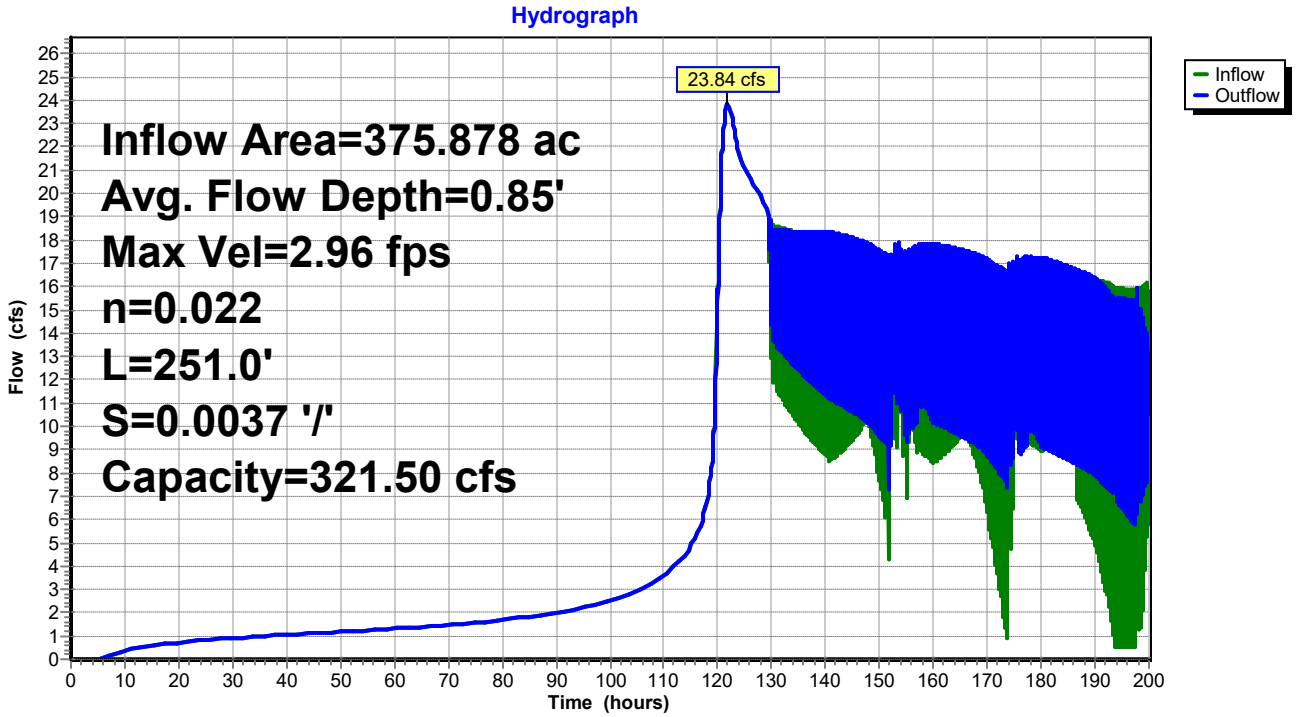
Peak Storage= 2,019 cf @ 121.85 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 321.50 cfs

6.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 4.0 '/' Top Width= 30.00'
Length= 251.0' Slope= 0.0037 '/'
Inlet Invert= 920.50', Outlet Invert= 919.58'



‡

Reach 23R: Existing West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=327)

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth > 6.47" for 100-year, 10-day snowmelt event
Inflow = 139.00 cfs @ 121.61 hrs, Volume= 161.795 af
Outflow = 74.34 cfs @ 138.05 hrs, Volume= 71.447 af, Atten= 47%, Lag= 986.6 min
Primary = 74.34 cfs @ 138.05 hrs, Volume= 71.447 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 931.78' @ 137.99 hrs Surf.Area= 65.349 ac Storage= 111.745 af

Plug-Flow detention time= 4,421.3 min calculated for 71.429 af (44% of inflow)
Center-of-Mass det. time= 2,592.8 min (9,597.9 - 7,005.1)

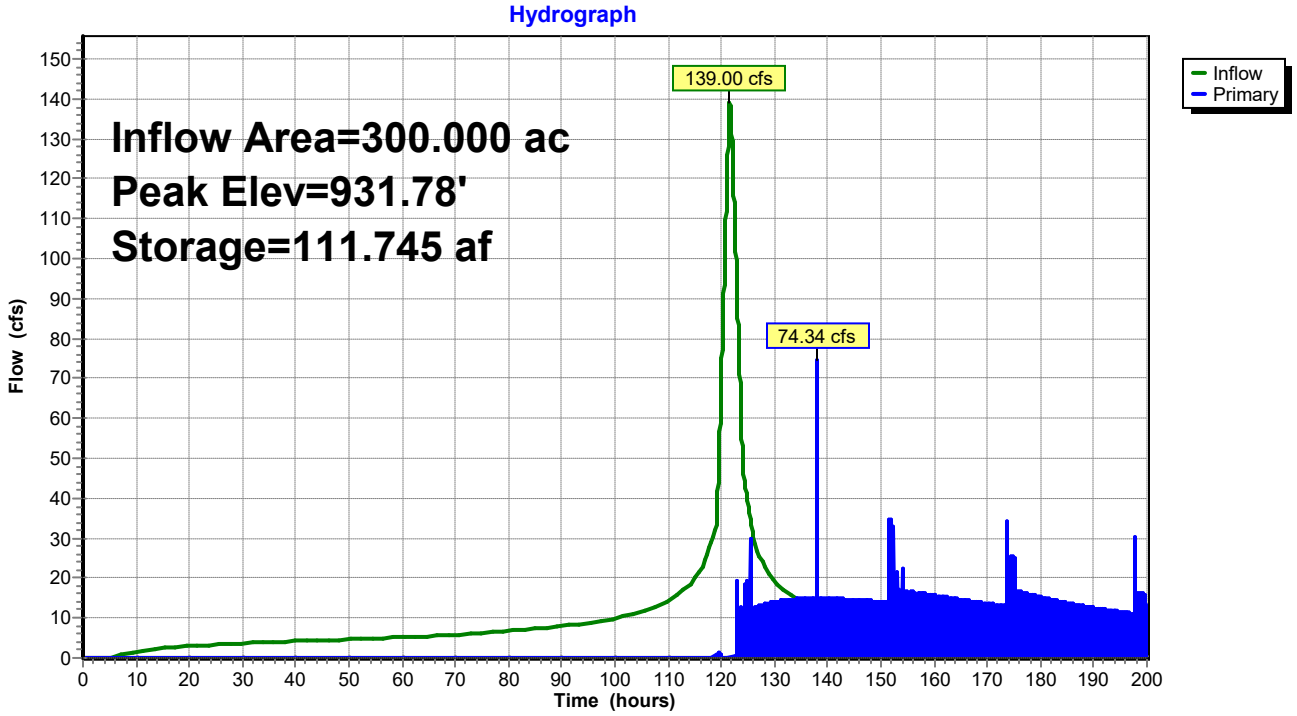
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 138.05 hrs HW=931.78' TW=932.77' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 10P: Proposed Northeast Pond/Filtration

[58] Hint: Peaked 0.51' above defined flood level

Inflow Area = 19.438 ac, 21.11% Impervious, Inflow Depth > 6.47" for 100-year, 10-day snowmelt event
Inflow = 9.06 cfs @ 121.56 hrs, Volume= 10.485 af
Outflow = 7.25 cfs @ 122.40 hrs, Volume= 9.322 af, Atten= 20%, Lag= 50.3 min
Primary = 7.25 cfs @ 122.40 hrs, Volume= 9.322 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 921.00' Surf.Area= 0.662 ac Storage= 2.955 af
Peak Elev= 922.51' @ 122.40 hrs Surf.Area= 1.481 ac Storage= 4.965 af (2.010 af above start)
Flood Elev= 922.00' Surf.Area= 1.255 ac Storage= 4.104 af (1.149 af above start)

Plug-Flow detention time= 2,688.9 min calculated for 6.367 af (61% of inflow)
Center-of-Mass det. time= 205.4 min (7,208.1 - 7,002.7)

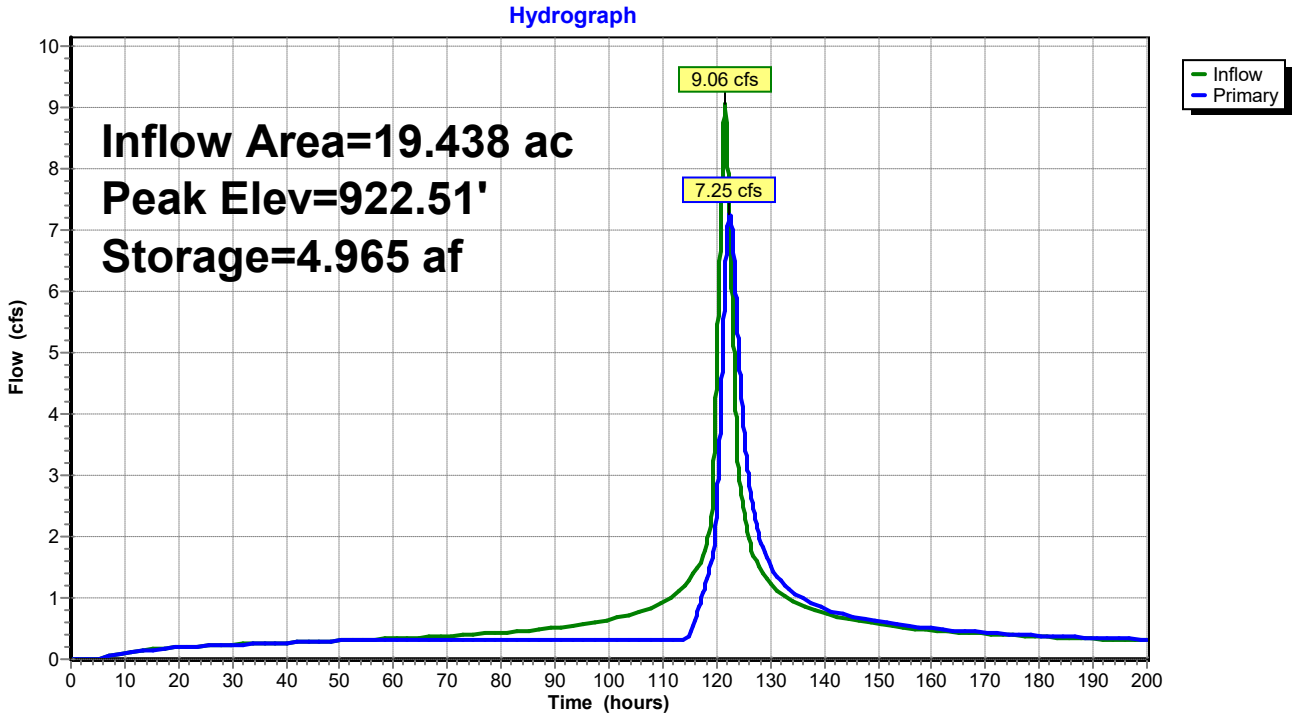
Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	9.359 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
913.00	0.209	0.000	0.000
914.00	0.242	0.226	0.226
916.00	0.314	0.556	0.781
918.00	0.396	0.710	1.491
920.00	0.491	0.887	2.378
921.00	0.662	0.576	2.955
921.01	1.049	0.009	2.964
922.00	1.255	1.140	4.104
924.00	2.149	3.404	7.508
925.00	1.553	1.851	9.359

Device	Routing	Invert	Outlet Devices
#1	Primary	918.50'	**36.0" Round Culvert** L= 113.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.50' / 918.00' S= 0.0044 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	922.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	923.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	920.00'	**21.0" Round Culvert** L= 45.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 920.00' S= -0.0444 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	921.00'	**0.31 cfs Exfiltration when above 921.00'** Phase-In= 0.01'

Primary OutFlow Max=7.25 cfs @ 122.40 hrs HW=922.51' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 7.25 cfs of 45.70 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Weir Controls 6.94 cfs @ 2.33 fps)
  │ └─**4=Culvert** (Passes 6.94 cfs of 8.24 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Exfiltration** (Exfiltration Controls 0.31 cfs)

Pond 10P: Proposed Northeast Pond/Filtration



Summary for Pond 25P: Proposed Northwest Pond/Filtration

[58] Hint: Peaked 0.18' above defined flood level

Inflow Area = 15.059 ac, 29.82% Impervious, Inflow Depth > 6.47" for 100-year, 10-day snowmelt event
Inflow = 7.10 cfs @ 121.46 hrs, Volume= 8.125 af
Outflow = 1.76 cfs @ 125.34 hrs, Volume= 7.235 af, Atten= 75%, Lag= 232.5 min
Primary = 1.76 cfs @ 125.34 hrs, Volume= 7.235 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 925.00' Surf.Area= 0.322 ac Storage= 1.156 af
Peak Elev= 926.68' @ 125.34 hrs Surf.Area= 1.394 ac Storage= 3.248 af (2.092 af above start)
Flood Elev= 926.50' Surf.Area= 1.369 ac Storage= 3.002 af (1.846 af above start)

Plug-Flow detention time= 2,241.7 min calculated for 6.078 af (75% of inflow)
Center-of-Mass det. time= 464.0 min (7,461.9 - 6,997.9)

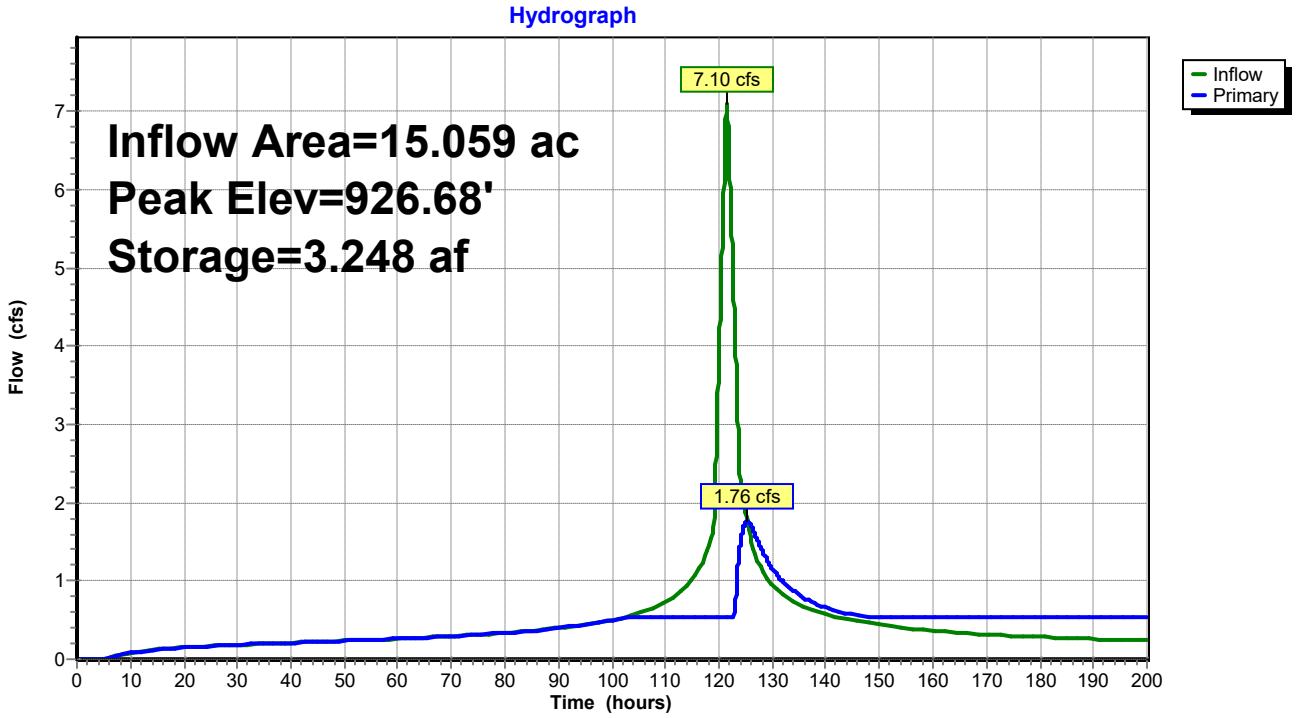
Volume	Invert	Avail.Storage	Storage Description
#1	917.00'	5.216 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
917.00	0.052	0.000	0.000
918.00	0.069	0.061	0.061
920.00	0.110	0.179	0.239
922.00	0.160	0.270	0.509
924.00	0.217	0.377	0.887
925.00	0.322	0.269	1.156
925.01	1.071	0.007	1.163
926.00	1.297	1.172	2.335
928.00	1.584	2.881	5.216

Device	Routing	Invert	Outlet Devices
#1	Primary	922.50'	**21.0" Round Culvert** L= 46.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.50' / 922.00' S= 0.0109 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	926.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	927.40'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	922.00'	**18.0" Round Culvert** L= 42.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 921.00' S= 0.0238 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#5	Device 1	925.00'	**0.54 cfs Exfiltration when above 925.00'** Phase-In= 0.01'

Primary OutFlow Max=1.76 cfs @ 125.34 hrs HW=926.68' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.76 cfs of 21.05 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.22 cfs @ 1.38 fps)
  │ └─**4=Culvert** (Passes 1.22 cfs of 3.59 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Exfiltration** (Exfiltration Controls 0.54 cfs)

Pond 25P: Proposed Northwest Pond/Filtration



Summary for Pond 26P: Proposed Northwest Central Pond/Filtration

Inflow Area = 7.518 ac, 41.97% Impervious, Inflow Depth > 6.41" for 100-year, 10-day snowmelt event
Inflow = 2.98 cfs @ 121.39 hrs, Volume= 4.013 af
Outflow = 0.37 cfs @ 111.70 hrs, Volume= 3.913 af, Atten= 88%, Lag= 0.0 min
Primary = 0.37 cfs @ 111.70 hrs, Volume= 3.913 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.00' Surf.Area= 0.318 ac Storage= 0.894 af
Peak Elev= 925.11' @ 133.87 hrs Surf.Area= 0.942 ac Storage= 1.848 af (0.954 af above start)
Flood Elev= 925.50' Surf.Area= 0.997 ac Storage= 2.227 af (1.333 af above start)

Plug-Flow detention time= 2,787.5 min calculated for 3.018 af (75% of inflow)
Center-of-Mass det. time= 686.4 min (7,849.0 - 7,162.6)

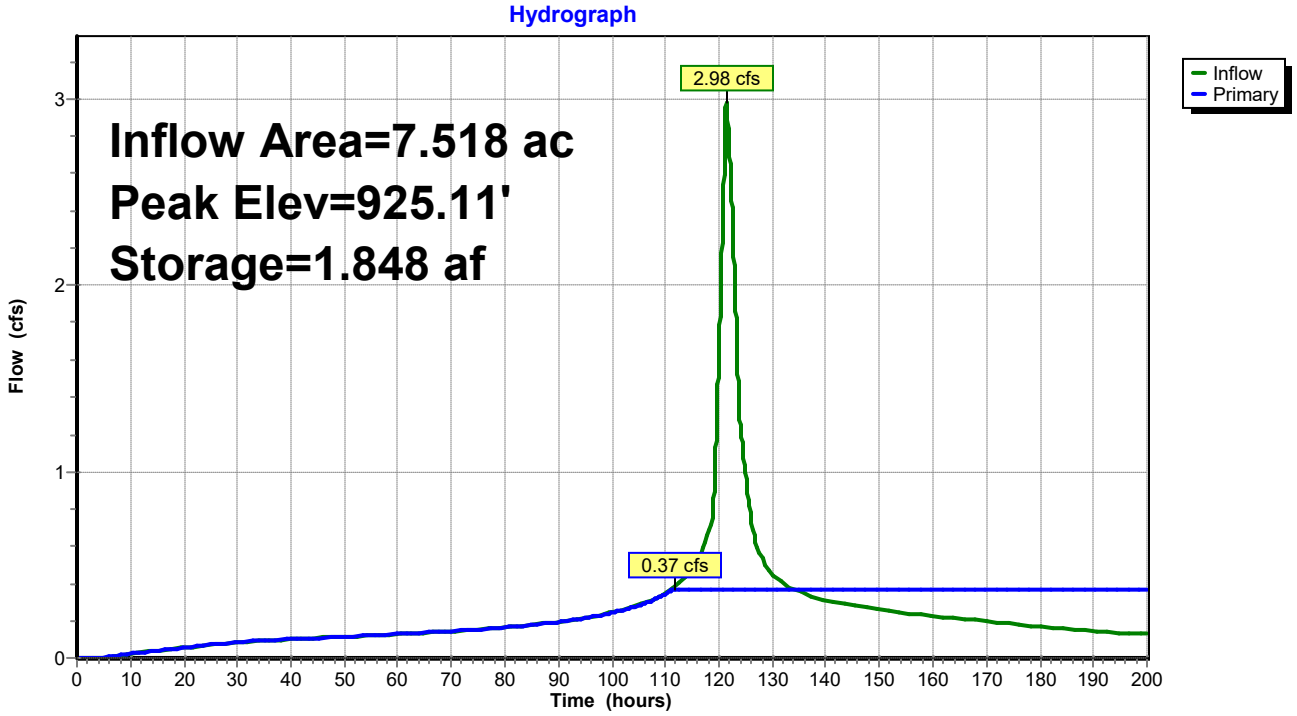
Volume	Invert	Avail.Storage	Storage Description
#1	916.00'	3.855 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.00	0.009	0.000	0.000
918.00	0.045	0.054	0.054
920.00	0.099	0.144	0.198
922.00	0.162	0.261	0.459
923.00	0.195	0.179	0.637
924.00	0.318	0.256	0.894
924.01	0.784	0.006	0.900
926.00	1.069	1.844	2.743
927.00	1.155	1.112	3.855

Device	Routing	Invert	Outlet Devices
#1	Primary	921.50'	**21.0" Round Culvert** L= 86.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.50' / 921.00' S= 0.0058 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	925.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	926.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	921.00'	**21.0" Round Culvert** L= 44.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 921.00' S= -0.0227 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	924.00'	**0.37 cfs Exfiltration when above 924.00'** Phase-In= 0.01'

Primary OutFlow Max=0.37 cfs @ 111.70 hrs HW=924.01' TW=920.82' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.37 cfs of 12.99 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
    - **4=Culvert** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Exfiltration** (Exfiltration Controls 0.37 cfs)

Pond 26P: Proposed Northwest Central Pond/Filtration



Summary for Pond 27P: Proposed Northwest Central Pond

Inflow Area = 3.120 ac, 47.02% Impervious, Inflow Depth > 6.48" for 100-year, 10-day snowmelt event
Inflow = 1.49 cfs @ 121.34 hrs, Volume= 1.684 af
Outflow = 0.98 cfs @ 122.01 hrs, Volume= 1.640 af, Atten= 34%, Lag= 40.1 min
Primary = 0.98 cfs @ 122.01 hrs, Volume= 1.640 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.50' Surf.Area= 0.278 ac Storage= 0.732 af
Peak Elev= 925.15' @ 122.82 hrs Surf.Area= 0.371 ac Storage= 0.943 af (0.212 af above start)

Plug-Flow detention time= 3,381.8 min calculated for 0.908 af (54% of inflow)
Center-of-Mass det. time= 418.6 min (7,410.2 - 6,991.6)

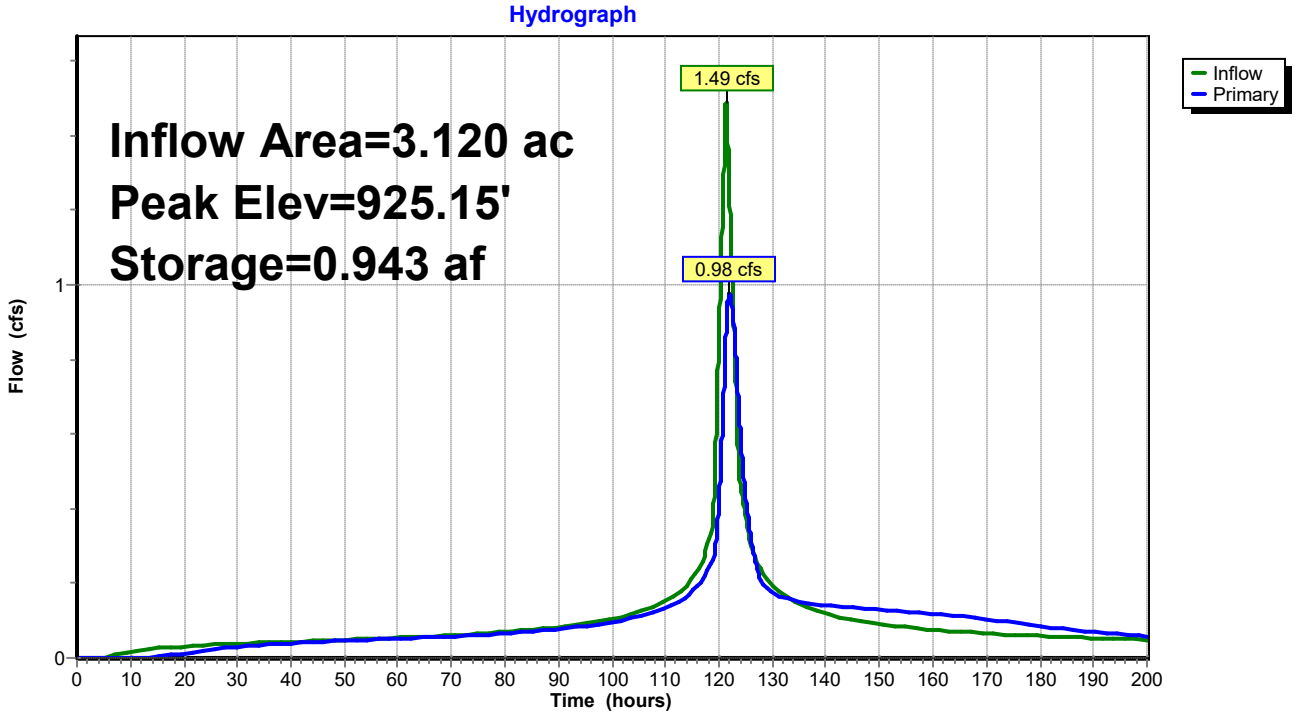
Volume	Invert	Avail.Storage	Storage Description
#1	916.50'	1.797 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.50	0.015	0.000	0.000
917.00	0.019	0.008	0.008
918.00	0.031	0.025	0.033
920.00	0.063	0.094	0.128
922.00	0.114	0.177	0.304
923.50	0.162	0.207	0.512
924.50	0.278	0.220	0.732
925.50	0.420	0.349	1.081
926.00	0.459	0.220	1.300
927.00	0.535	0.497	1.797

Device	Routing	Invert	Outlet Devices
#1	Primary	924.50'	**18.0" Round Culvert** L= 225.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.50' / 924.00' S= 0.0022 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	926.50'	**48.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 923.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=0.97 cfs @ 122.01 hrs HW=925.13' TW=924.63' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.97 cfs @ 2.02 fps)
↑**2=Orifice/Grate** (Controls 0.00 cfs)
3=Culvert (Passes 0.97 cfs of 6.03 cfs potential flow)

Pond 27P: Proposed Northwest Central Pond



Summary for Pond 28P: Proposed Northeast Central Pond

Inflow Area = 7.153 ac, 50.64% Impervious, Inflow Depth > 6.47" for 100-year, 10-day snowmelt event
Inflow = 3.39 cfs @ 121.42 hrs, Volume= 3.860 af
Outflow = 3.16 cfs @ 121.75 hrs, Volume= 3.846 af, Atten= 7%, Lag= 19.7 min
Primary = 3.16 cfs @ 121.75 hrs, Volume= 3.846 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 922.00' Surf.Area= 0.380 ac Storage= 1.043 af
Peak Elev= 922.34' @ 121.75 hrs Surf.Area= 0.442 ac Storage= 1.182 af (0.139 af above start)

Plug-Flow detention time= 2,069.1 min calculated for 2.803 af (73% of inflow)
Center-of-Mass det. time= 45.5 min (7,041.4 - 6,995.9)

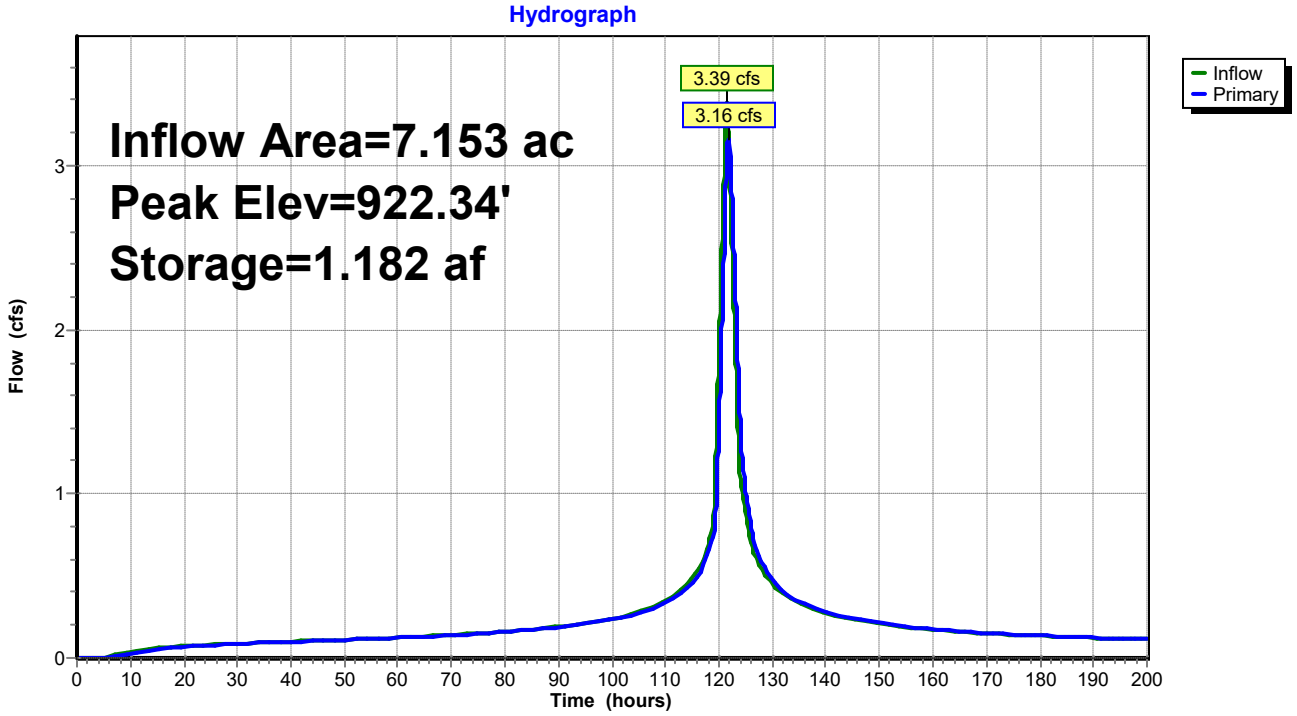
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	2.802 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.00	0.034	0.000	0.000
916.00	0.065	0.099	0.099
918.00	0.109	0.174	0.273
920.00	0.172	0.281	0.554
921.00	0.213	0.192	0.746
922.00	0.380	0.297	1.043
923.00	0.565	0.472	1.515
924.00	0.642	0.603	2.119
925.00	0.724	0.683	2.802

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**24.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.80' S= 0.0057 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	923.25'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	922.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 3	919.00'	**21.0" Round Culvert** L= 33.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 919.00' S= -0.0303 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=3.16 cfs @ 121.75 hrs HW=922.34' TW=921.35' (Dynamic Tailwater)
- **1=Culvert** (Passes 3.16 cfs of 6.65 cfs potential flow)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Sharp-Crested Rectangular Weir** (Weir Controls 3.16 cfs @ 1.90 fps)
    - **4=Culvert** (Passes 3.16 cfs of 6.73 cfs potential flow)

Pond 28P: Proposed Northeast Central Pond



Summary for Pond 30P: Wetland 4A

[44] Hint: Outlet device #5 is below defined storage

Inflow Area = 357.822 ac, 1.86% Impervious, Inflow Depth > 3.55" for 100-year, 10-day snowmelt event
Inflow = 27.57 cfs @ 123.09 hrs, Volume= 105.725 af
Outflow = 19.38 cfs @ 124.01 hrs, Volume= 105.747 af, Atten= 30%, Lag= 55.0 min
Primary = 16.37 cfs @ 124.01 hrs, Volume= 77.567 af
Secondary = 3.01 cfs @ 124.01 hrs, Volume= 28.180 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 925.62' @ 124.01 hrs Surf.Area= 3.331 ac Storage= 1.102 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.6 min (8,852.9 - 8,848.3)

Volume	Invert	Avail.Storage	Storage Description
#1	923.50'	15.942 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

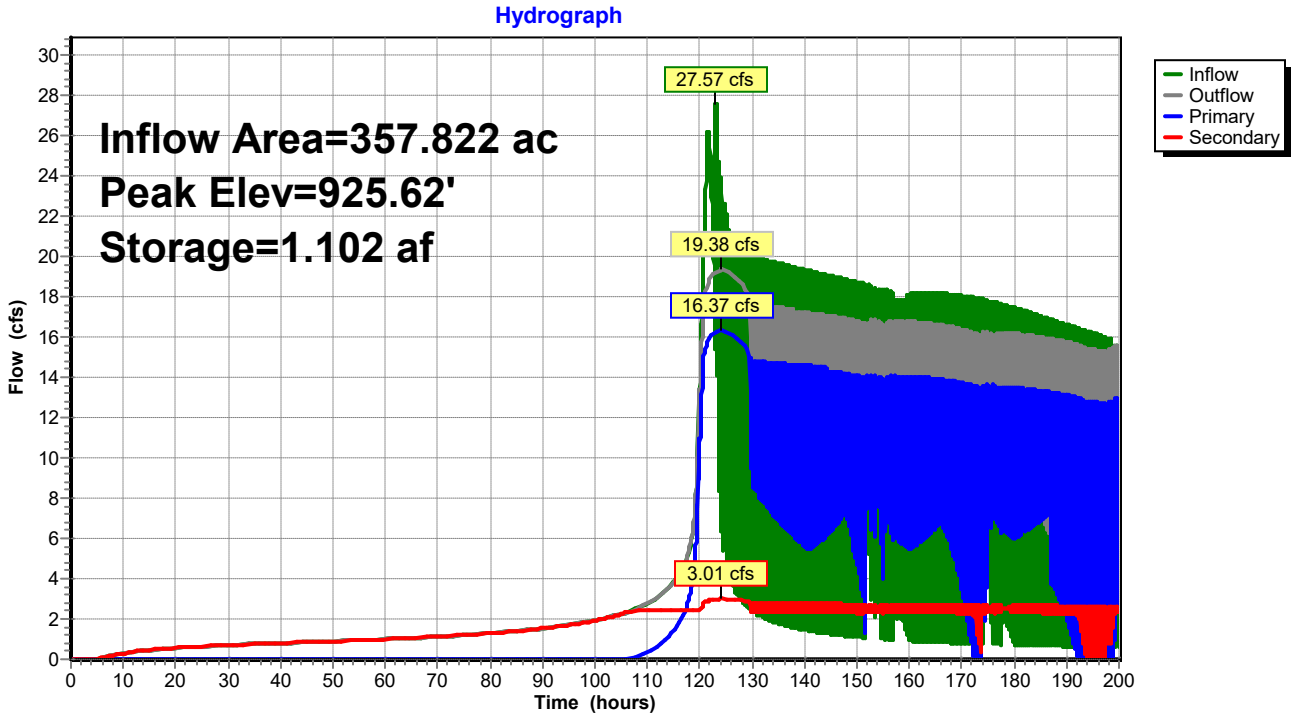
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.50	0.011	0.000	0.000
924.00	0.027	0.009	0.009
925.00	0.058	0.042	0.052
926.00	5.338	2.698	2.750
927.00	6.566	5.952	8.702
928.00	7.914	7.240	15.942

Device	Routing	Invert	Outlet Devices
#1	Primary	921.11'	**36.0" Round 36" RCP** L= 307.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.11' / 920.50' S= 0.0020 '/' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 7.07 sf
#2	Device 1	926.00'	**60.0" Horiz. CBMH-3003** C= 0.600 Limited to weir flow at low heads
#3	Device 1	921.17'	**18.0" Round 18" RCP** L= 23.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 921.17' / 921.11' S= 0.0026 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#4	Device 3	923.50'	**48.0" Horiz. CBMH-3004** C= 0.600 Limited to weir flow at low heads
#5	Secondary	919.60'	**12.0" Round 12" Draintile** L= 553.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.34' / 919.60' S= -0.0005 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=16.37 cfs @ 124.01 hrs HW=925.62' TW=921.31' (Dynamic Tailwater)
└─**1=36" RCP** (Passes 16.37 cfs of 42.77 cfs potential flow)
  ├─**2=CBMH-3003** (Controls 0.00 cfs)
  └─**3=18" RCP** (Inlet Controls 16.37 cfs @ 9.26 fps)
    └─**4=CBMH-3004** (Passes 16.37 cfs of 88.09 cfs potential flow)

Secondary OutFlow Max=3.01 cfs @ 124.01 hrs HW=925.62' TW=921.31' (Dynamic Tailwater)
└─**5=12" Draintile** (Outlet Controls 3.01 cfs @ 3.83 fps)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[80] Warning: Exceeded Pond 7P by 1.23' @ 135.40 hrs (270.84 cfs 901.086 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth > 3.08" for 100-year, 10-day snowmelt event
Inflow = 75.18 cfs @ 137.75 hrs, Volume= 82.228 af
Outflow = 17.90 cfs @ 137.20 hrs, Volume= 85.332 af, Atten= 76%, Lag= 0.0 min
Primary = 17.90 cfs @ 137.20 hrs, Volume= 85.332 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 933.01' @ 137.20 hrs Surf.Area= 0.394 ac Storage= 0.206 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 29.1 min (9,288.3 - 9,259.2)

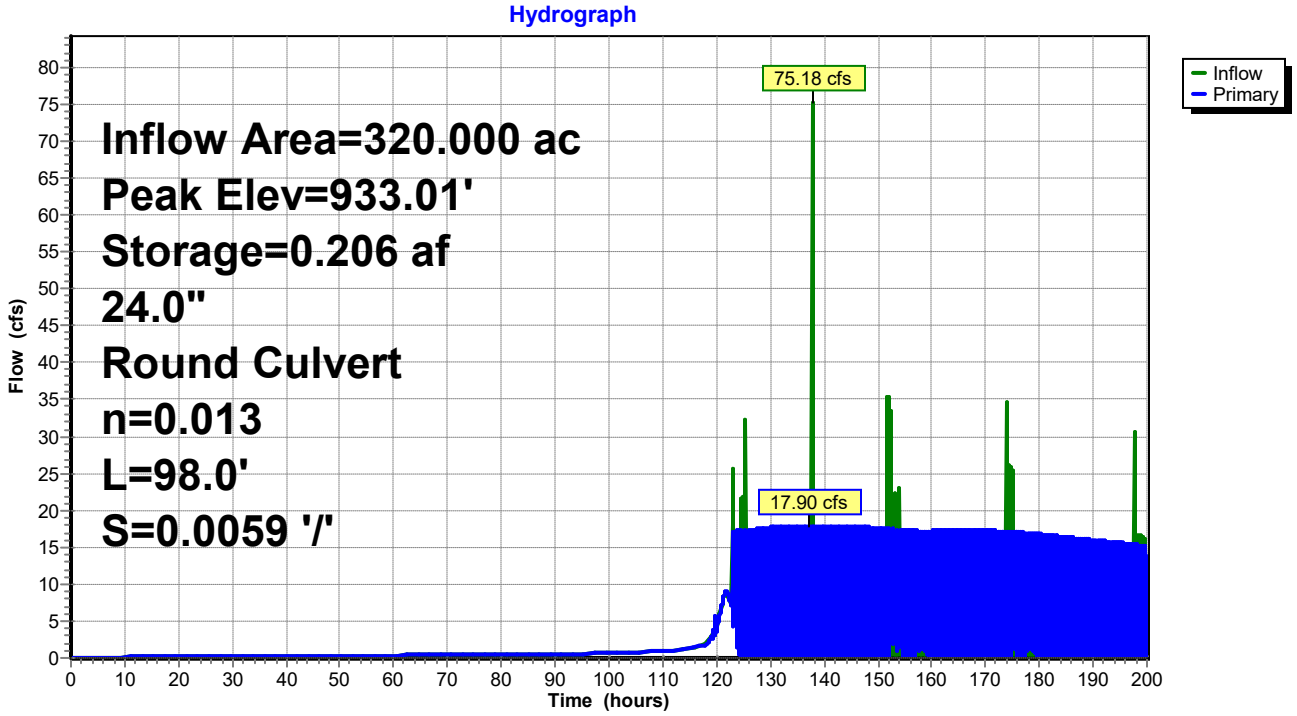
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=17.85 cfs @ 137.20 hrs HW=933.00' TW=924.61' (Dynamic Tailwater)
1=Culvert (Barrel Controls 17.85 cfs @ 5.68 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 32P: Proposed West Central Pond

Inflow Area = 3.686 ac, 36.52% Impervious, Inflow Depth > 6.48" for 100-year, 10-day snowmelt event
Inflow = 1.77 cfs @ 121.32 hrs, Volume= 1.989 af
Outflow = 1.60 cfs @ 121.70 hrs, Volume= 1.980 af, Atten= 9%, Lag= 22.8 min
Primary = 1.60 cfs @ 121.70 hrs, Volume= 1.980 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.00' Surf.Area= 0.395 ac Storage= 1.213 af
Peak Elev= 928.21' @ 121.70 hrs Surf.Area= 0.429 ac Storage= 1.301 af (0.088 af above start)

Plug-Flow detention time= 4,115.2 min calculated for 0.767 af (39% of inflow)
Center-of-Mass det. time= 58.1 min (7,048.6 - 6,990.5)

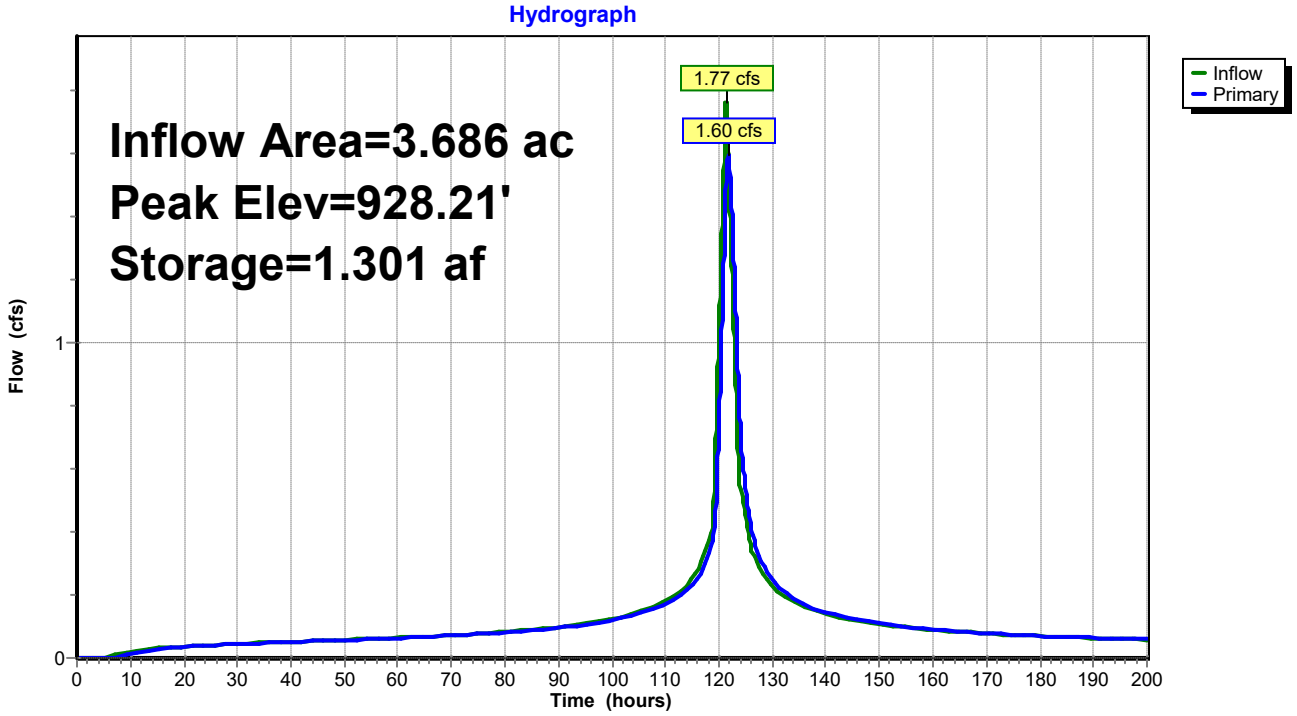
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	2.284 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.034	0.000	0.000
922.00	0.073	0.107	0.107
924.00	0.134	0.207	0.314
926.00	0.211	0.345	0.659
927.00	0.251	0.231	0.890
928.00	0.395	0.323	1.213
929.00	0.554	0.475	1.687
930.00	0.638	0.596	2.284

Device	Routing	Invert	Outlet Devices
#1	Primary	923.05'	**18.0" Round Culvert** L= 212.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.05' / 922.52' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	929.50'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	925.00'	**21.0" Round Culvert** L= 20.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0500 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=1.60 cfs @ 121.70 hrs HW=928.21' TW=925.39' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.60 cfs of 10.27 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Weir Controls 1.60 cfs @ 1.51 fps)
    - **4=Culvert** (Passes 1.60 cfs of 5.35 cfs potential flow)
  - **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 32P: Proposed West Central Pond



Summary for Pond 40P: Wetland 2B

Inflow Area = 133.857 ac, 9.96% Impervious, Inflow Depth > 6.77" for 100-year, 10-day snowmelt event
Inflow = 43.96 cfs @ 121.77 hrs, Volume= 75.483 af
Outflow = 24.29 cfs @ 124.91 hrs, Volume= 74.658 af, Atten= 45%, Lag= 188.3 min
Primary = 24.29 cfs @ 124.91 hrs, Volume= 74.658 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 925.36' @ 124.91 hrs Surf.Area= 10.366 ac Storage= 8.572 af

Plug-Flow detention time= 218.7 min calculated for 74.640 af (99% of inflow)
Center-of-Mass det. time= 169.0 min (7,566.4 - 7,397.4)

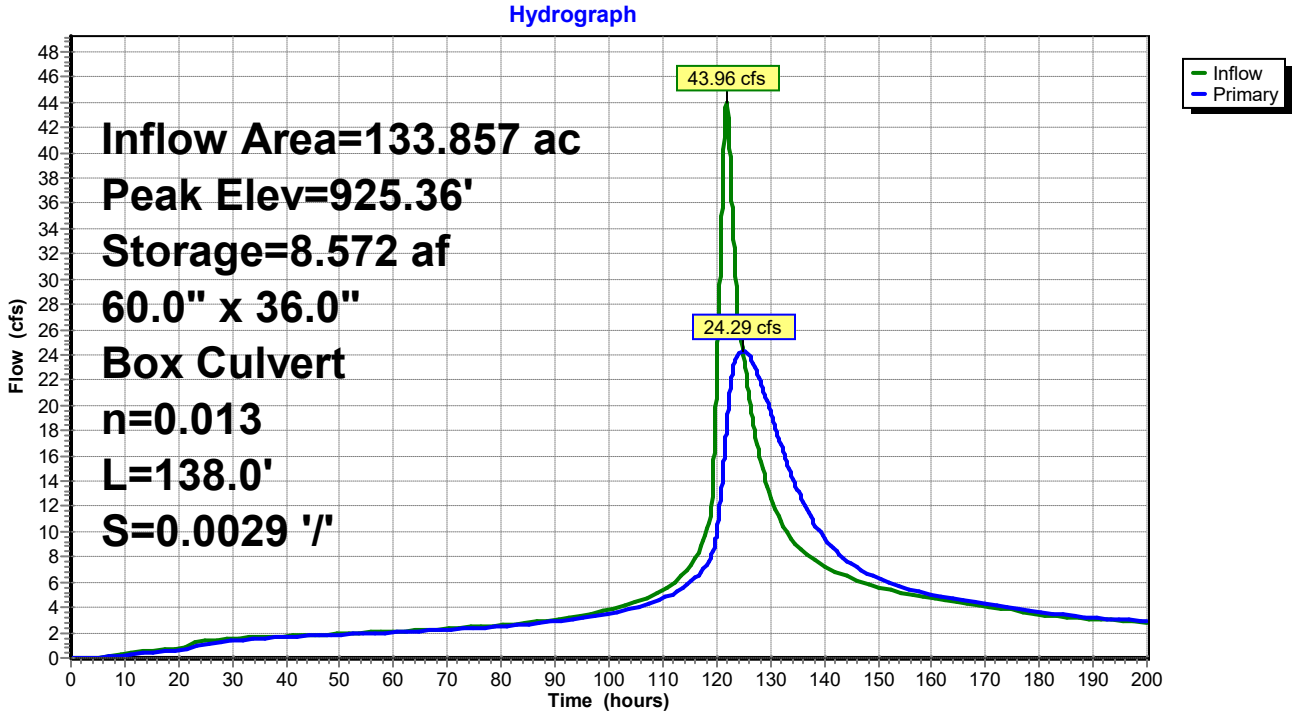
Volume	Invert	Avail.Storage	Storage Description
#1	923.90'	52.747 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.90	0.000	0.000	0.000
924.00	2.123	0.106	0.106
926.00	14.283	16.406	16.512
928.00	21.952	36.235	52.747

Device	Routing	Invert	Outlet Devices
#1	Primary	923.90'	**60.0" W x 36.0" H Box Culvert** L= 138.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.90' / 923.50' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 15.00 sf

Primary OutFlow Max=24.29 cfs @ 124.91 hrs HW=925.36' TW=924.35' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 24.29 cfs @ 4.45 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth > 6.48" for 100-year, 10-day snowmelt event
Inflow = 6.54 cfs @ 121.36 hrs, Volume= 7.400 af
Outflow = 4.65 cfs @ 122.44 hrs, Volume= 3.670 af, Atten= 29%, Lag= 64.8 min
Primary = 4.65 cfs @ 122.44 hrs, Volume= 3.670 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 940.62' @ 122.44 hrs Surf.Area= 2.367 ac Storage= 3.976 af

Plug-Flow detention time= 3,237.6 min calculated for 3.670 af (50% of inflow)
Center-of-Mass det. time= 1,635.7 min (8,628.5 - 6,992.8)

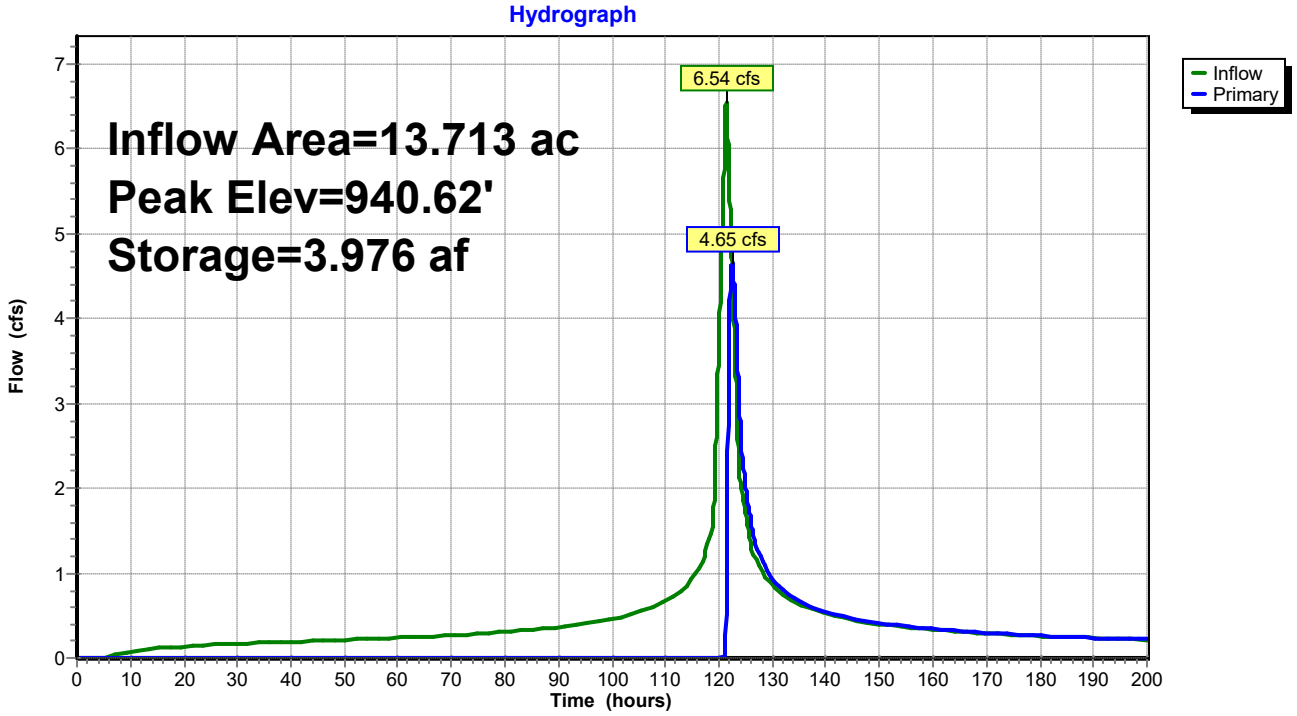
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=4.65 cfs @ 122.44 hrs HW=940.62' TW=925.21' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Weir Controls 4.65 cfs @ 1.09 fps)

Pond 41P: Ex South Off-site Pond



Summary for Pond 42P: Proposed South Central Pond

Inflow Area = 2.612 ac, 32.54% Impervious, Inflow Depth > 6.48" for 100-year, 10-day snowmelt event
Inflow = 1.24 cfs @ 121.36 hrs, Volume= 1.410 af
Outflow = 1.09 cfs @ 121.86 hrs, Volume= 1.395 af, Atten= 12%, Lag= 29.6 min
Primary = 1.09 cfs @ 121.86 hrs, Volume= 1.395 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.50' Surf.Area= 0.154 ac Storage= 0.309 af
Peak Elev= 929.00' @ 121.86 hrs Surf.Area= 0.199 ac Storage= 0.397 af (0.088 af above start)

Plug-Flow detention time= 1,867.0 min calculated for 1.086 af (77% of inflow)
Center-of-Mass det. time= 107.3 min (7,100.1 - 6,992.8)

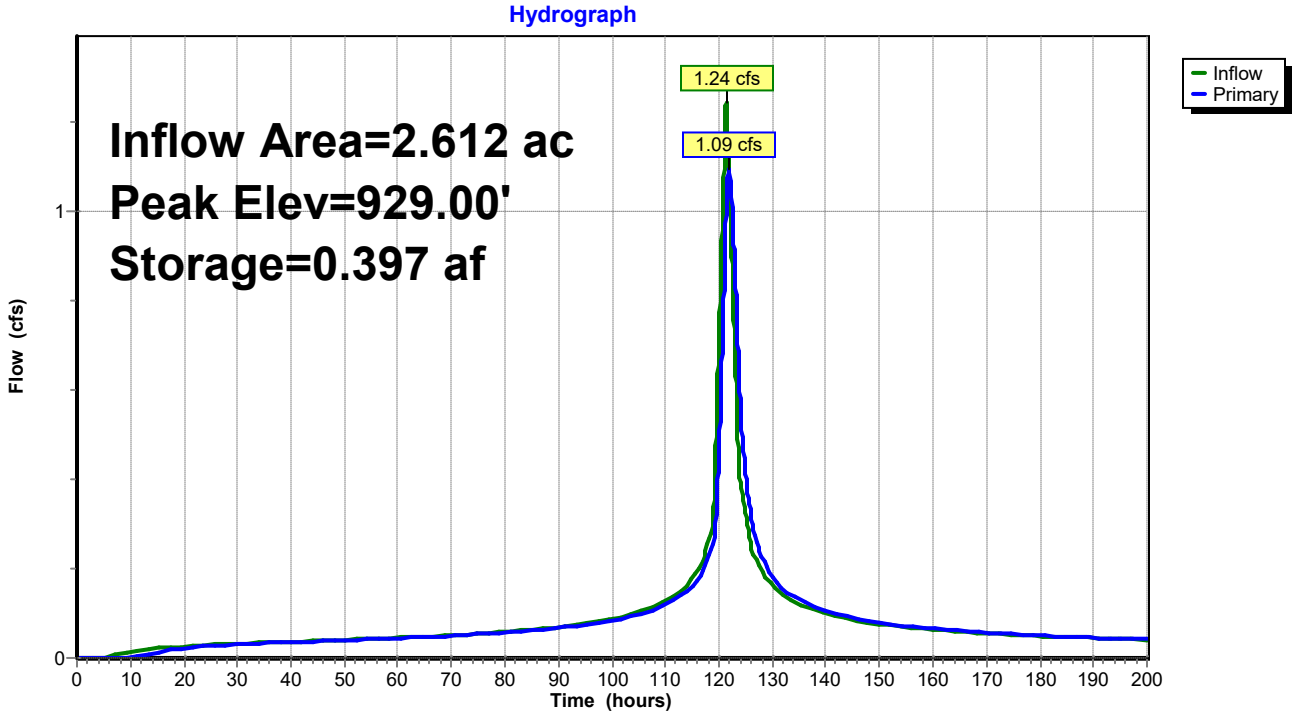
Volume	Invert	Avail.Storage	Storage Description
#1	922.00'	1.122 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
922.00	0.004	0.000	0.000
924.00	0.022	0.026	0.026
926.00	0.050	0.072	0.098
927.50	0.078	0.096	0.194
928.00	0.114	0.048	0.242
928.50	0.154	0.067	0.309
929.50	0.244	0.199	0.508
930.00	0.274	0.130	0.637
931.50	0.372	0.484	1.122

Device	Routing	Invert	Outlet Devices
#1	Primary	928.50'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 928.50' / 928.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	930.20'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	927.00'	**15.0" Round Culvert** L= 39.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.00' / 927.00' S= -0.0256 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

Primary OutFlow Max=1.09 cfs @ 121.86 hrs HW=929.00' TW=925.09' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 1.09 cfs @ 2.40 fps)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Culvert** (Passes 1.09 cfs of 4.17 cfs potential flow)

Pond 42P: Proposed South Central Pond



Summary for Pond 43P: Proposed East Central Pond

Inflow Area = 6.873 ac, 41.00% Impervious, Inflow Depth > 6.47" for 100-year, 10-day snowmelt event
Inflow = 3.25 cfs @ 121.43 hrs, Volume= 3.708 af
Outflow = 2.59 cfs @ 122.24 hrs, Volume= 3.649 af, Atten= 20%, Lag= 48.6 min
Primary = 2.59 cfs @ 122.24 hrs, Volume= 3.649 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 926.50' Surf.Area= 0.401 ac Storage= 1.319 af
Peak Elev= 927.25' @ 122.24 hrs Surf.Area= 0.524 ac Storage= 1.665 af (0.346 af above start)

Plug-Flow detention time= 2,578.8 min calculated for 2.330 af (63% of inflow)
Center-of-Mass det. time= 165.7 min (7,161.9 - 6,996.2)

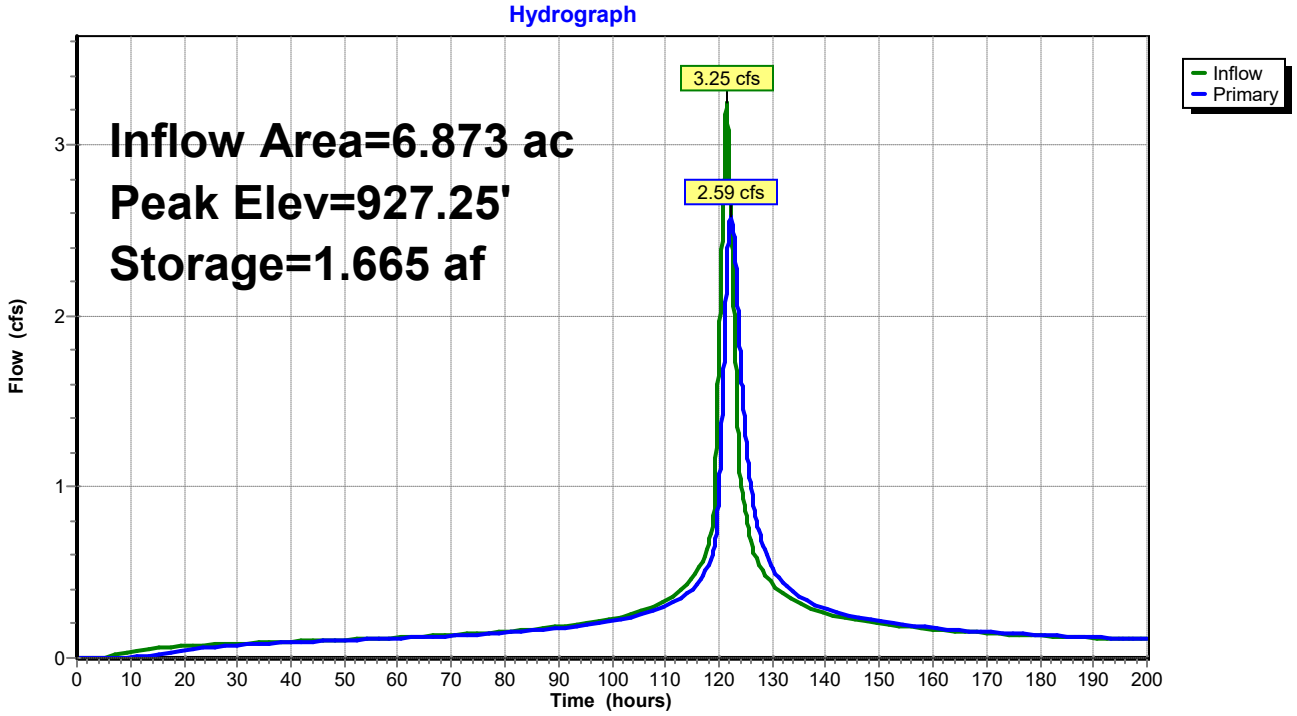
Volume	Invert	Avail.Storage	Storage Description
#1	918.50'	3.505 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
918.50	0.053	0.000	0.000
920.00	0.083	0.102	0.102
922.00	0.135	0.218	0.320
924.00	0.199	0.334	0.654
925.50	0.254	0.340	0.994
926.00	0.324	0.144	1.138
926.50	0.401	0.181	1.319
927.50	0.566	0.484	1.803
928.00	0.619	0.296	2.099
930.00	0.787	1.406	3.505

Device	Routing	Invert	Outlet Devices
#1	Primary	926.50'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.50' / 926.00' S= 0.0172 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	925.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=2.59 cfs @ 122.24 hrs HW=927.25' TW=925.18' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 2.59 cfs @ 2.94 fps)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Culvert** (Passes 2.59 cfs of 7.35 cfs potential flow)

Pond 43P: Proposed East Central Pond



Summary for Pond 50P: Wetland 4B

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth > 4.22" for 100-year, 10-day snowmelt event
Inflow = 7.65 cfs @ 121.64 hrs, Volume= 13.885 af
Outflow = 4.51 cfs @ 125.37 hrs, Volume= 8.571 af, Atten= 41%, Lag= 224.1 min
Primary = 4.51 cfs @ 125.37 hrs, Volume= 8.571 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 941.60' @ 125.37 hrs Surf.Area= 143,918 sf Storage= 241,706 cf

Plug-Flow detention time= 2,457.6 min calculated for 8.571 af (62% of inflow)
Center-of-Mass det. time= 1,231.3 min (8,990.5 - 7,759.2)

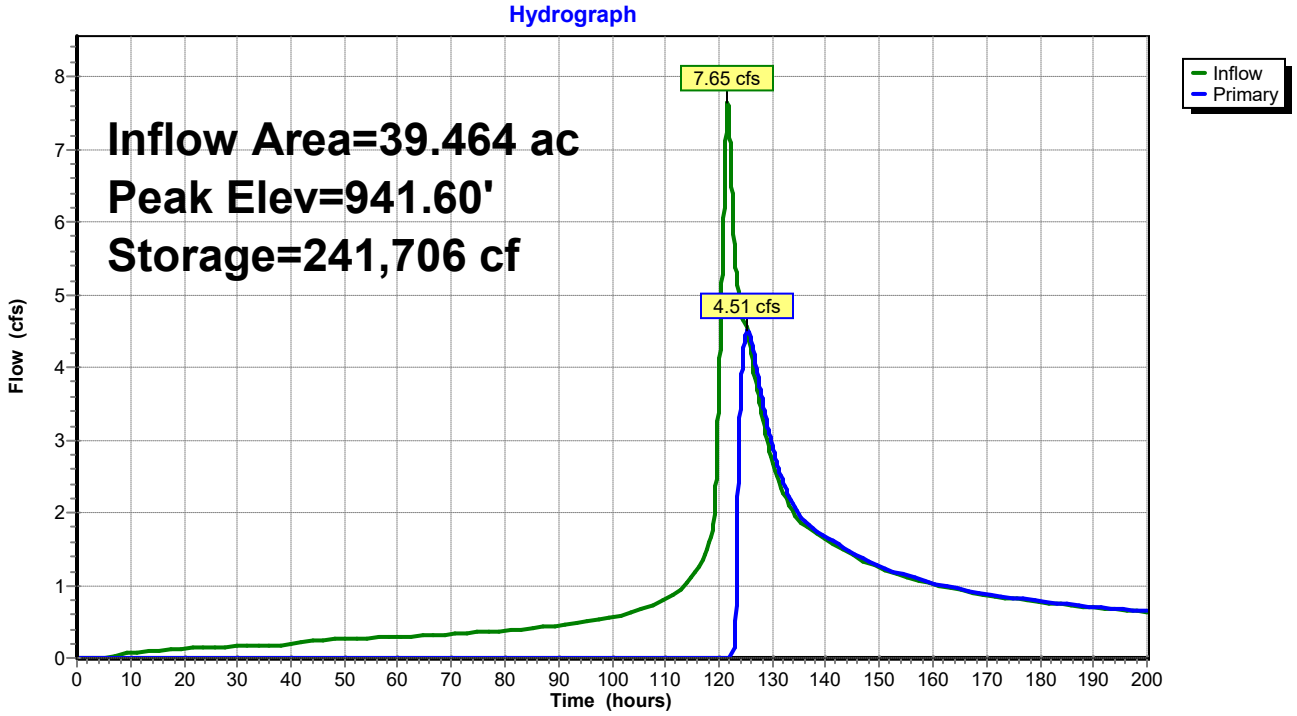
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	303,458 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
938.00	4,444	0	0
940.00	69,653	74,097	74,097
941.00	111,935	90,794	164,891
942.00	165,198	138,567	303,458

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=4.51 cfs @ 125.37 hrs HW=941.60' TW=925.35' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Weir Controls 4.51 cfs @ 1.02 fps)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth > 70.36" for 100-year, 10-day snowmelt event
Inflow = 7.53 cfs @ 123.33 hrs, Volume= 22.047 af
Outflow = 7.53 cfs @ 123.37 hrs, Volume= 21.824 af, Atten= 0%, Lag= 2.6 min
Primary = 7.53 cfs @ 123.37 hrs, Volume= 21.824 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 938.67' @ 123.37 hrs Surf.Area= 11,337 sf Storage= 11,107 cf

Plug-Flow detention time= 112.7 min calculated for 21.819 af (99% of inflow)
Center-of-Mass det. time= 65.0 min (7,280.9 - 7,215.9)

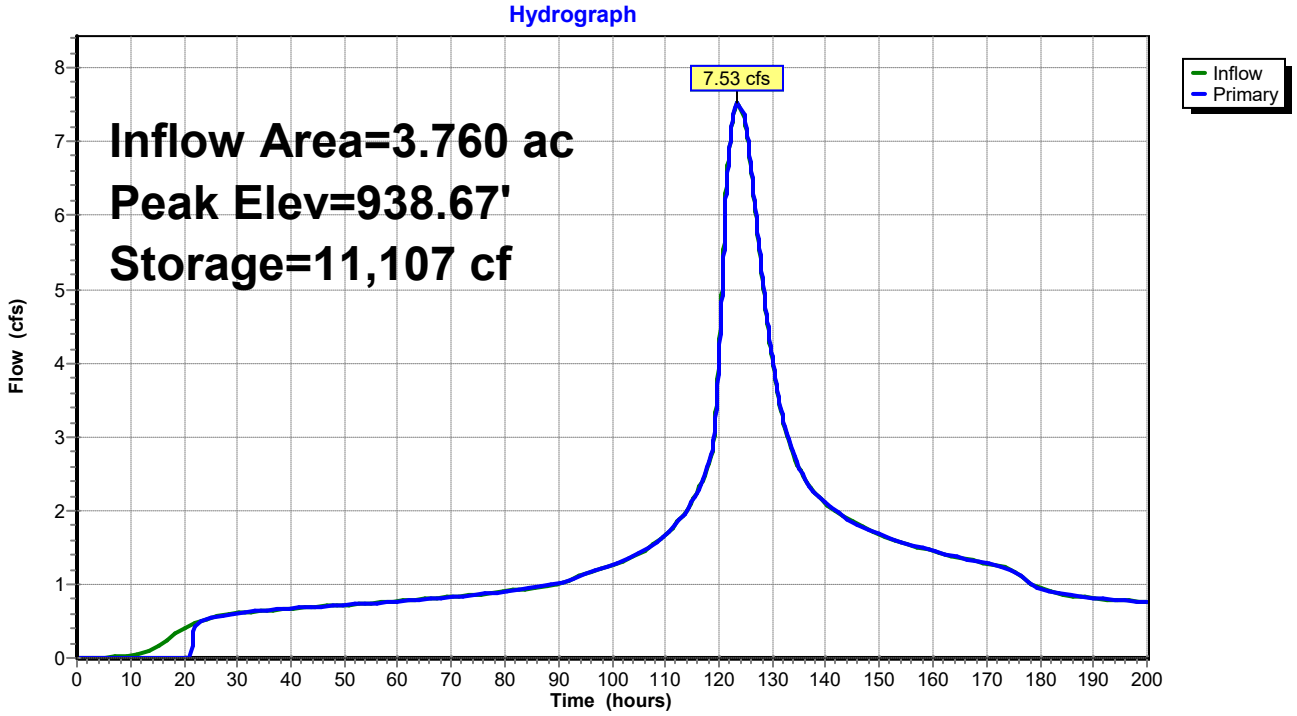
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	15,364 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
936.00	178	0	0
938.00	5,354	5,532	5,532
939.00	14,309	9,832	15,364

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=7.53 cfs @ 123.37 hrs HW=938.67' TW=925.32' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 7.53 cfs @ 1.31 fps)

Pond 60P: Wetland 5B



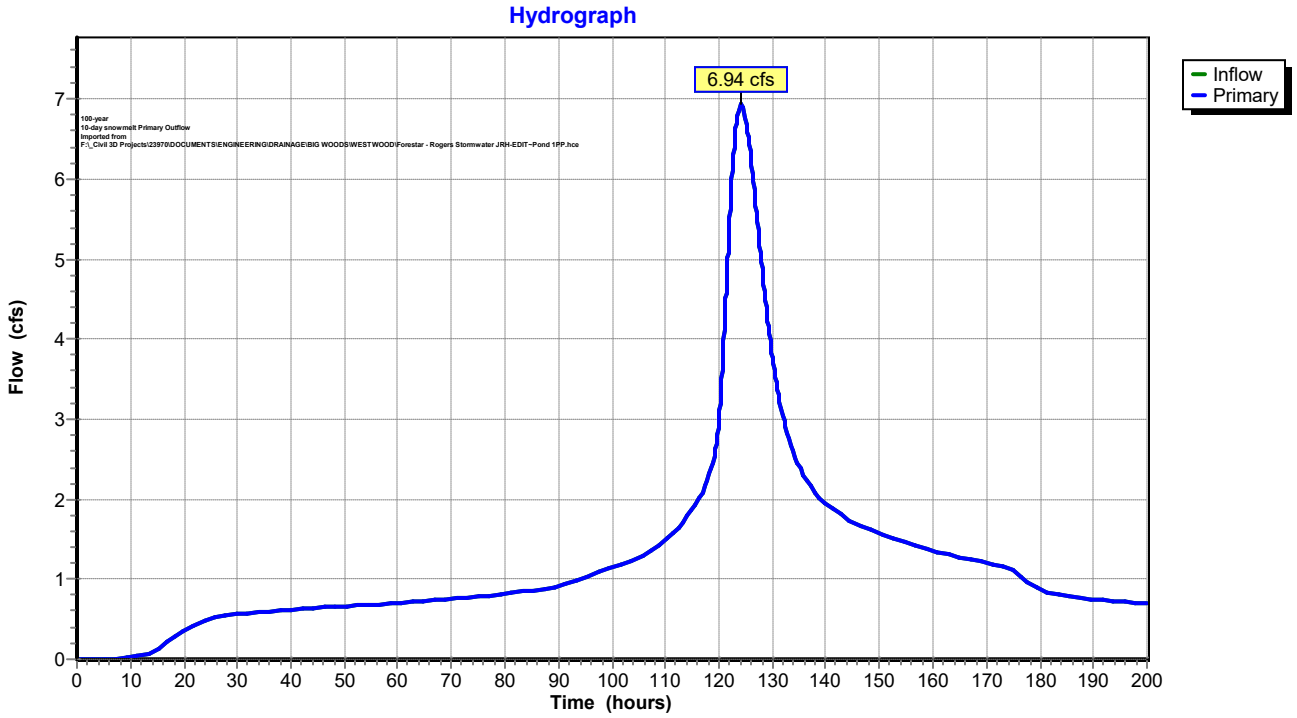
Summary for Link 1PP: Northwest Wetland

Inflow = 6.94 cfs @ 124.13 hrs, Volume= 20.018 af
Primary = 6.94 cfs @ 124.13 hrs, Volume= 20.018 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

100-year, 10-day snowmelt Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\

Link 1PP: Northwest Wetland



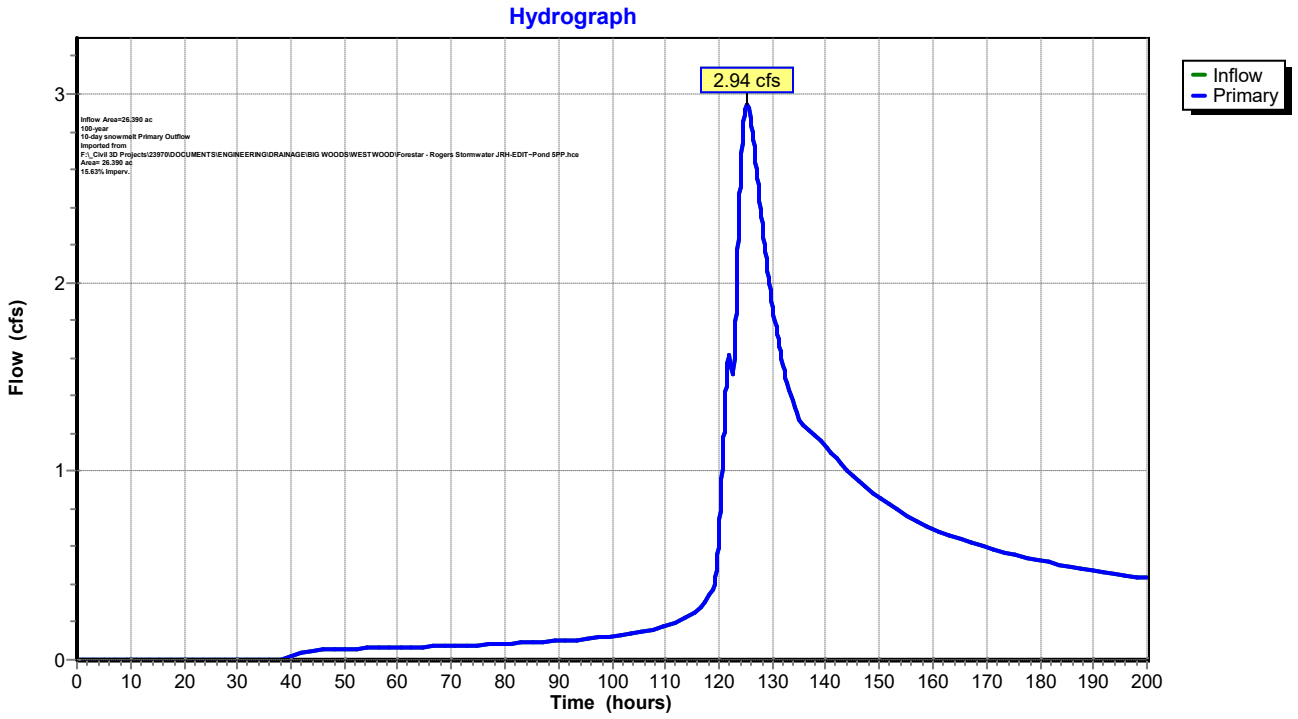
Summary for Link 5PP: Existing Pond

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth > 3.11" for 100-year, 10-day snowmelt event
Inflow = 2.94 cfs @ 125.27 hrs, Volume= 6.834 af
Primary = 2.94 cfs @ 125.27 hrs, Volume= 6.834 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

100-year, 10-day snowmelt Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\

Link 5PP: Existing Pond



Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth=0.53"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min CN=72/0 Runoff=127.59 cfs 13.215 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=19.438 ac 21.11% Impervious Runoff Depth=1.46"
Flow Length=1,602' Tc=23.6 min CN=86/98 Runoff=28.13 cfs 2.365 af

Subcatchment 11S: Direct to Cowley Lake Runoff Area=6.152 ac 3.35% Impervious Runoff Depth=1.10"
Flow Length=1,308' Tc=15.2 min CN=83/98 Runoff=8.48 cfs 0.562 af

Subcatchment 12S: Fugitve to Fox Creek Runoff Area=0.547 ac 45.16% Impervious Runoff Depth=1.51"
Flow Length=165' Tc=8.1 min CN=80/98 Runoff=1.25 cfs 0.069 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=3.970 ac 7.66% Impervious Runoff Depth=0.95"
Flow Length=310' Tc=10.9 min CN=79/98 Runoff=5.31 cfs 0.313 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.782 ac 1.28% Impervious Runoff Depth=0.86"
Flow Length=392' Tc=17.3 min CN=79/98 Runoff=0.77 cfs 0.056 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=3.027 ac 10.37% Impervious Runoff Depth=0.99"
Flow Length=309' Tc=17.0 min CN=79/98 Runoff=3.42 cfs 0.249 af

Subcatchment 23S: Direct to Proposed Runoff Area=3.385 ac 0.68% Impervious Runoff Depth=0.95"
Flow Length=243' Tc=13.3 min CN=81/98 Runoff=4.30 cfs 0.268 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=7.873 ac 5.31% Impervious Runoff Depth=1.01"
Flow Length=407' Tc=11.1 min CN=81/98 Runoff=11.40 cfs 0.665 af

Subcatchment 25S: Direct to Proposed Runoff Area=15.059 ac 29.82% Impervious Runoff Depth=1.34"
Flow Length=1,817' Tc=17.1 min CN=81/98 Runoff=22.84 cfs 1.680 af

Subcatchment 26S: Direct to Proposed Runoff Area=4.398 ac 38.38% Impervious Runoff Depth=1.45"
Flow Length=621' Tc=8.6 min CN=81/98 Runoff=9.59 cfs 0.532 af

Subcatchment 27S: Direct to Proposed Runoff Area=3.120 ac 47.02% Impervious Runoff Depth=1.63"
Flow Length=621' Tc=8.6 min CN=83/98 Runoff=7.60 cfs 0.423 af

Subcatchment 28S: Direct to Proposed Runoff Area=7.153 ac 50.64% Impervious Runoff Depth=1.64"
Flow Length=1,013' Tc=14.4 min CN=82/98 Runoff=14.27 cfs 0.979 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=34.136 ac 8.50% Impervious Runoff Depth=1.11"
Flow Length=1,249' Tc=23.4 min CN=82/98 Runoff=37.52 cfs 3.147 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth=0.81"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min CN=74/98 Runoff=10.74 cfs 1.346 af

Subcatchment 32S: Direct to Proposed Runoff Area=3.686 ac 36.52% Impervious Runoff Depth=1.50"
Flow Length=440' Slope=0.0200 '/' Tc=7.1 min CN=83/98 Runoff=8.91 cfs 0.461 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=67.435 ac 2.92% Impervious Runoff Depth=1.41"
Flow Length=1,354' Tc=23.6 min CN=88/98 Runoff=96.69 cfs 7.909 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=1.07"
Flow Length=1,032' Tc=10.2 min CN=80/98 Runoff=21.24 cfs 1.228 af

Subcatchment 42S: Direct to Proposed Runoff Area=2.612 ac 32.54% Impervious Runoff Depth=1.34"
Flow Length=422' Tc=10.2 min CN=80/98 Runoff=4.90 cfs 0.291 af

Subcatchment 43S: Direct to Proposed Runoff Area=6.873 ac 41.00% Impervious Runoff Depth=1.52"
Flow Length=1,173' Tc=14.8 min CN=82/98 Runoff=12.59 cfs 0.870 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth=1.37"
Flow Length=734' Tc=26.4 min CN=87/98 Runoff=17.08 cfs 1.497 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=1.29"
Flow Length=531' Tc=5.6 min CN=82/98 Runoff=8.31 cfs 0.405 af

Reach 1R: Cowley Lake Outlet Channel Inflow=8.79 cfs 2.928 af
Outflow=8.79 cfs 2.928 af

Reach 2R: Cowley Lake Inflow=52.83 cfs 23.224 af
Outflow=52.83 cfs 23.224 af

Reach 21R: Proposed East Channel Avg. Flow Depth=0.68' Max Vel=4.58 fps Inflow=15.82 cfs 13.164 af
n=0.022 L=264.0' S=0.0125 '/' Capacity=149.23 cfs Outflow=15.82 cfs 13.164 af

Reach 23R: Existing West Channel Avg. Flow Depth=0.95' Max Vel=3.15 fps Inflow=29.45 cfs 7.154 af
n=0.022 L=251.0' S=0.0037 '/' Capacity=321.50 cfs Outflow=29.45 cfs 7.154 af

Pond 7P: Whiteford Lake and Wetlands Peak Elev=930.22' Storage=13.215 af Inflow=127.59 cfs 13.215 af
Outflow=0.00 cfs 0.000 af

Pond 10P: Proposed Northeast Peak Elev=922.23' Storage=4.487 af Inflow=28.13 cfs 2.365 af
Outflow=2.39 cfs 2.365 af

Pond 25P: Proposed Northwest Peak Elev=925.98' Storage=2.306 af Inflow=22.84 cfs 1.680 af
Outflow=0.54 cfs 1.680 af

Pond 26P: Proposed Northwest Central Peak Elev=924.65' Storage=1.427 af Inflow=10.27 cfs 0.953 af
Outflow=0.37 cfs 0.953 af

Pond 27P: Proposed Northwest Central Peak Elev=925.19' Storage=0.958 af Inflow=7.60 cfs 0.423 af
Outflow=1.32 cfs 0.420 af

Pond 28P: Proposed Northeast Central Peak Elev=922.62' Storage=1.314 af Inflow=14.27 cfs 0.979 af
Outflow=7.78 cfs 0.979 af

Pond 30P: Wetland 4A Peak Elev=925.60' Storage=1.044 af Inflow=47.98 cfs 4.954 af
Primary=16.33 cfs 3.025 af Secondary=2.99 cfs 1.929 af Outflow=19.31 cfs 4.954 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=931.92' Storage=0.004 af Inflow=10.74 cfs 1.346 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=10.74 cfs 1.346 af

Pond 32P: Proposed West Central Pond Peak Elev=928.36' Storage=1.366 af Inflow=8.91 cfs 0.461 af
Outflow=3.50 cfs 0.461 af

Pond 40P: Wetland 2B Peak Elev=924.97' Storage=5.065 af Inflow=105.34 cfs 13.108 af
60.0" x 36.0" Box Culvert n=0.013 L=138.0' S=0.0029 '/' Outflow=15.75 cfs 13.108 af

Pond 41P: Ex South Off-site Pond Peak Elev=939.12' Storage=1.228 af Inflow=21.24 cfs 1.228 af
Outflow=0.00 cfs 0.000 af

Pond 42P: Proposed South Central Pond Peak Elev=929.13' Storage=0.424 af Inflow=4.90 cfs 0.291 af
Outflow=1.68 cfs 0.291 af

Pond 43P: Proposed East Central Pond Peak Elev=927.37' Storage=1.733 af Inflow=12.59 cfs 0.870 af
Outflow=3.40 cfs 0.868 af

Pond 50P: Wetland 4B Peak Elev=940.02' Storage=75,669 cf Inflow=17.34 cfs 1.737 af
Outflow=0.00 cfs 0.000 af

Pond 60P: Wetland 5B Peak Elev=938.62' Storage=10,559 cf Inflow=9.74 cfs 4.254 af
Outflow=4.34 cfs 4.040 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=4.11 cfs 3.849 af
Primary=4.11 cfs 3.849 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=0.93 cfs 0.240 af
Area= 26.390 ac 15.63% Imperv. Primary=0.93 cfs 0.240 af

Total Runoff Area = 540.193 ac Runoff Volume = 38.531 af Average Runoff Depth = 0.86"
93.94% Pervious = 507.441 ac 6.06% Impervious = 32.752 ac

Summary for Subcatchment 7S: Approx DA to Lake

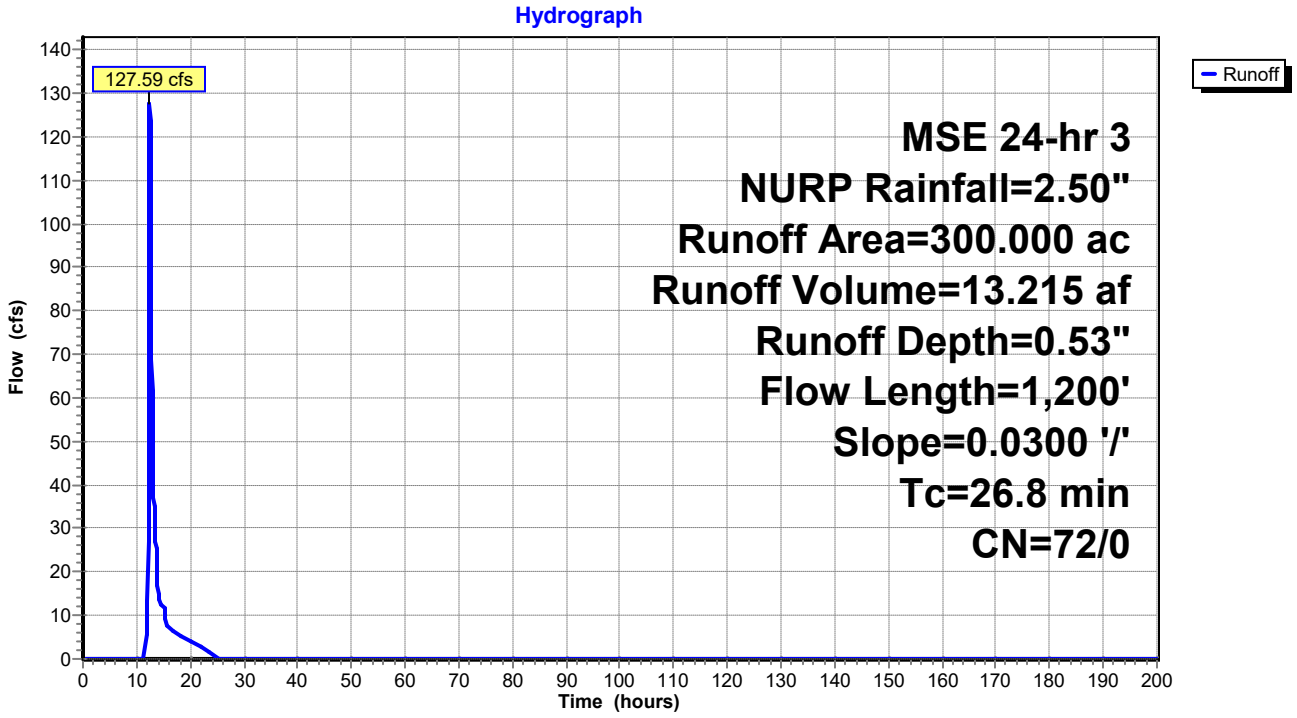
Runoff = 127.59 cfs @ 12.44 hrs, Volume= 13.215 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
300.000	72	Woods/grass comb., Good, HSG C
300.000	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

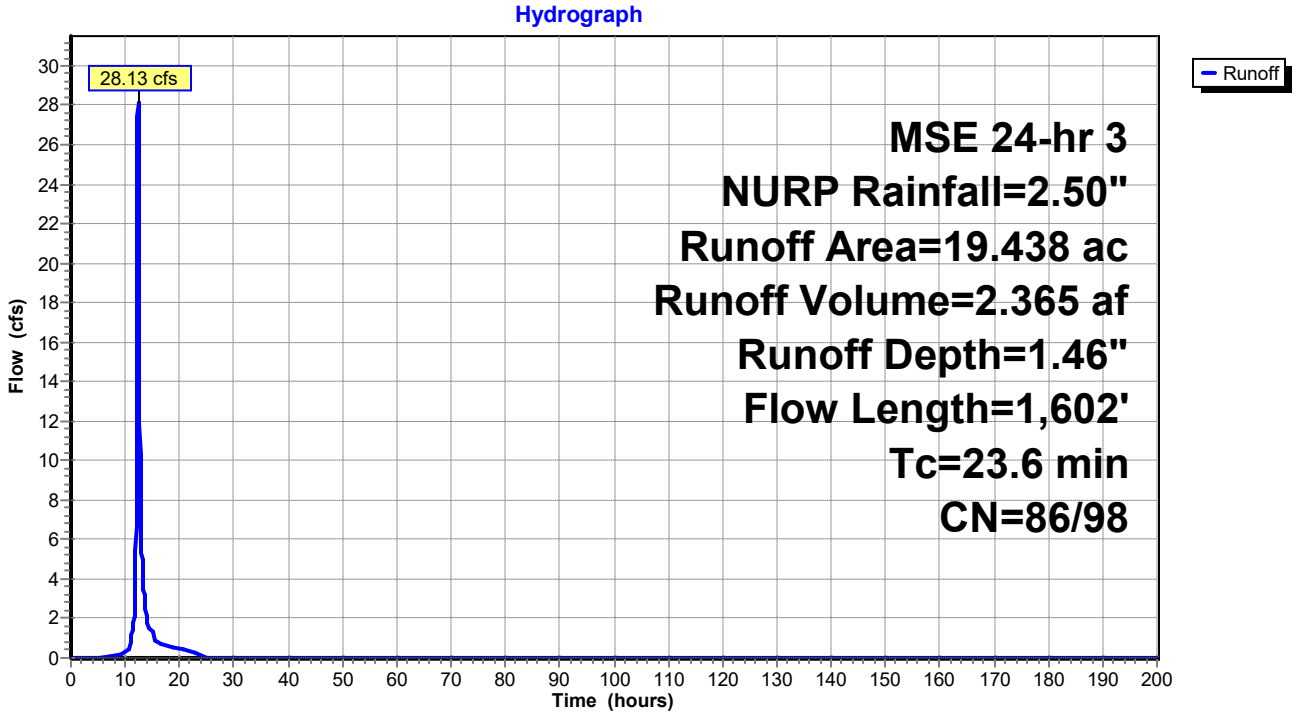
Runoff = 28.13 cfs @ 12.34 hrs, Volume= 2.365 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.399	98	Unconnected pavement, HSG D
1.088	98	Unconnected roofs, HSG D
1.617	98	Paved roads w/curbs & sewers, HSG D
0.606	98	Paved parking, HSG D
0.393	98	Roofs, HSG D
0.699	98	Water Surface, 0% imp, HSG D
8.527	89	Row crops, straight row, Good, HSG D
4.972	80	>75% Grass cover, Good, HSG D
1.137	78	Meadow, non-grazed, HSG D
19.438	88	Weighted Average
15.335	86	78.89% Pervious Area
4.103	98	21.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
14.6	842	0.0114	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.7	660		3.00		**Direct Entry, Pipe flow @ 3 fps**
23.6	1,602	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 11S: Direct to Cowley Lake Outlet Channel

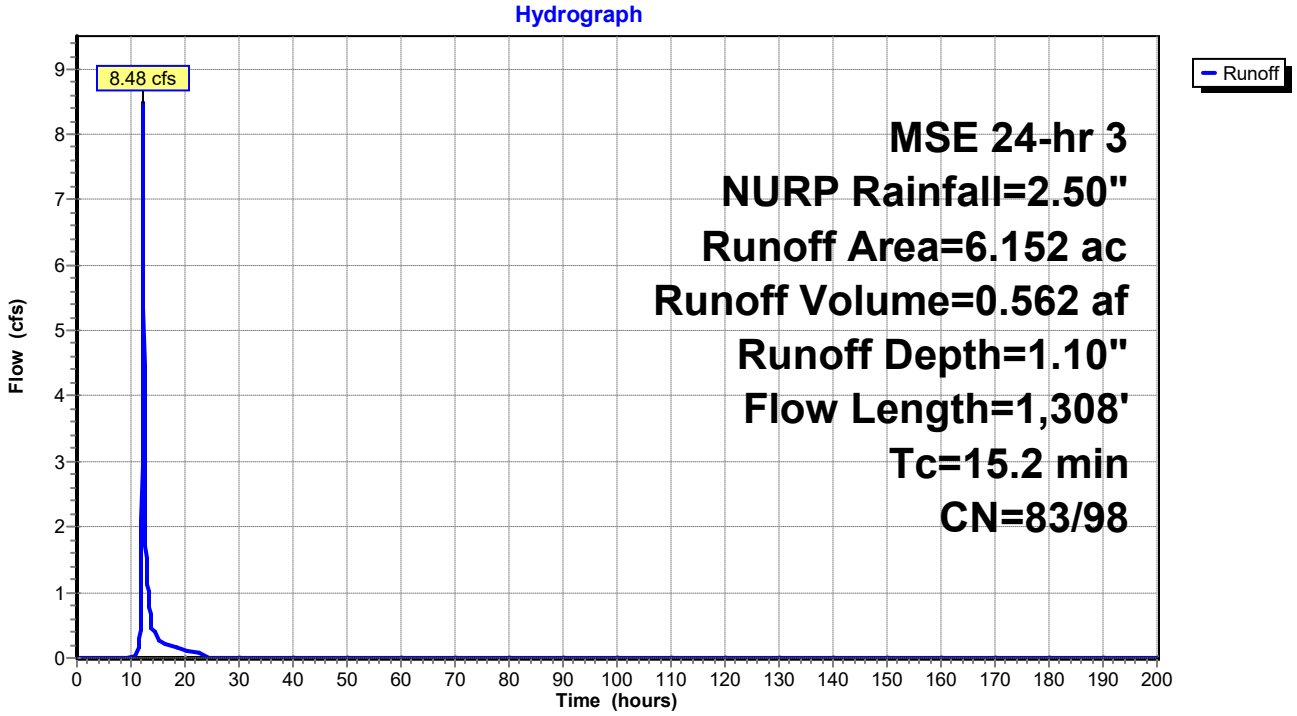
Runoff = 8.48 cfs @ 12.25 hrs, Volume= 0.562 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.024	98	Unconnected pavement, HSG D
0.182	98	Unconnected roofs, HSG D
1.316	98	Water Surface, 0% imp, HSG D
1.199	80	>75% Grass cover, Good, HSG D
2.901	78	Meadow, non-grazed, HSG D
0.530	77	Woods, Good, HSG D
6.152	83	Weighted Average
5.946	83	96.65% Pervious Area
0.206	98	3.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.8	114	0.0263	2.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	1,094	0.0024	3.27	46.64	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=1.50' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
15.2	1,308	Total			

Subcatchment 11S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 12S: Fugitve to Fox Creek West 5th Addition

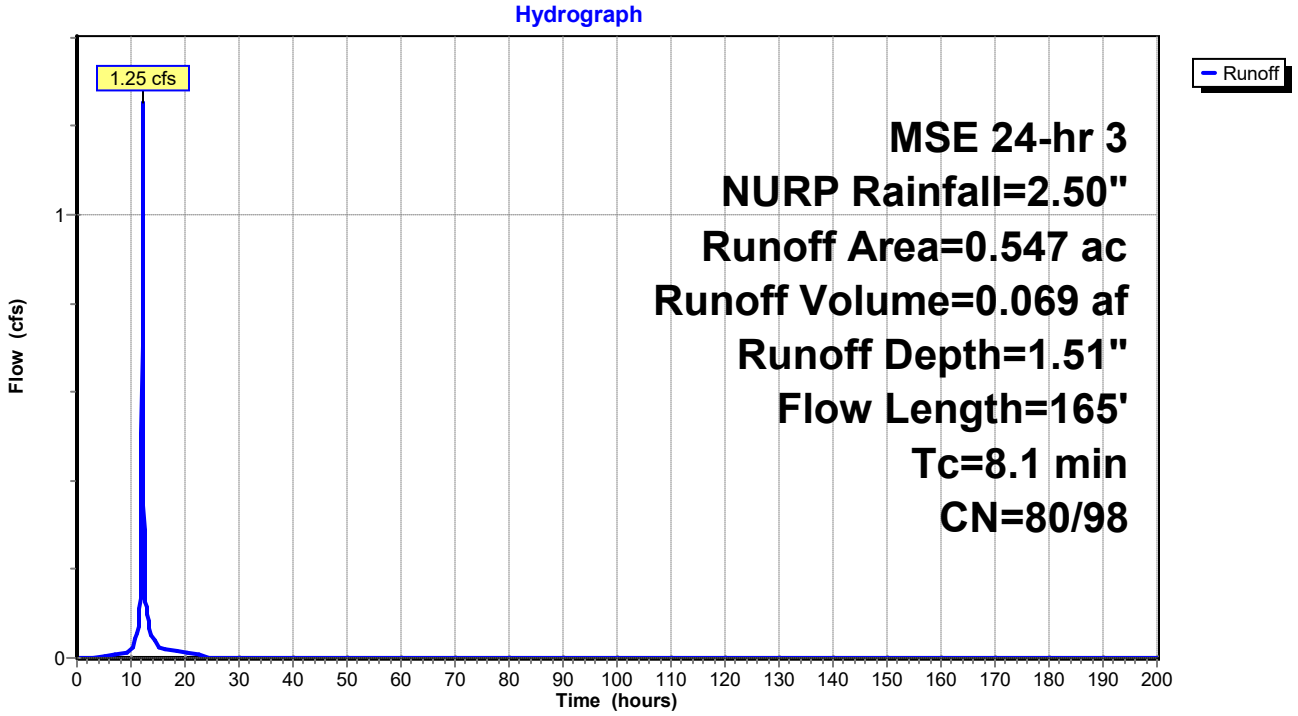
Runoff = 1.25 cfs @ 12.15 hrs, Volume= 0.069 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.015	98	Unconnected pavement, HSG D
0.043	98	Unconnected roofs, HSG D
0.104	98	Paved roads w/curbs & sewers, HSG D
0.051	98	Paved parking, HSG D
0.034	98	Roofs, HSG D
0.300	80	>75% Grass cover, Good, HSG D
0.547	88	Weighted Average
0.300	80	54.84% Pervious Area
0.247	98	45.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0440	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.3	40	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	25	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	165	Total			

Subcatchment 12S: Fugitve to Fox Creek West 5th Addition



Summary for Subcatchment 20S: Direct to Cowley Lake

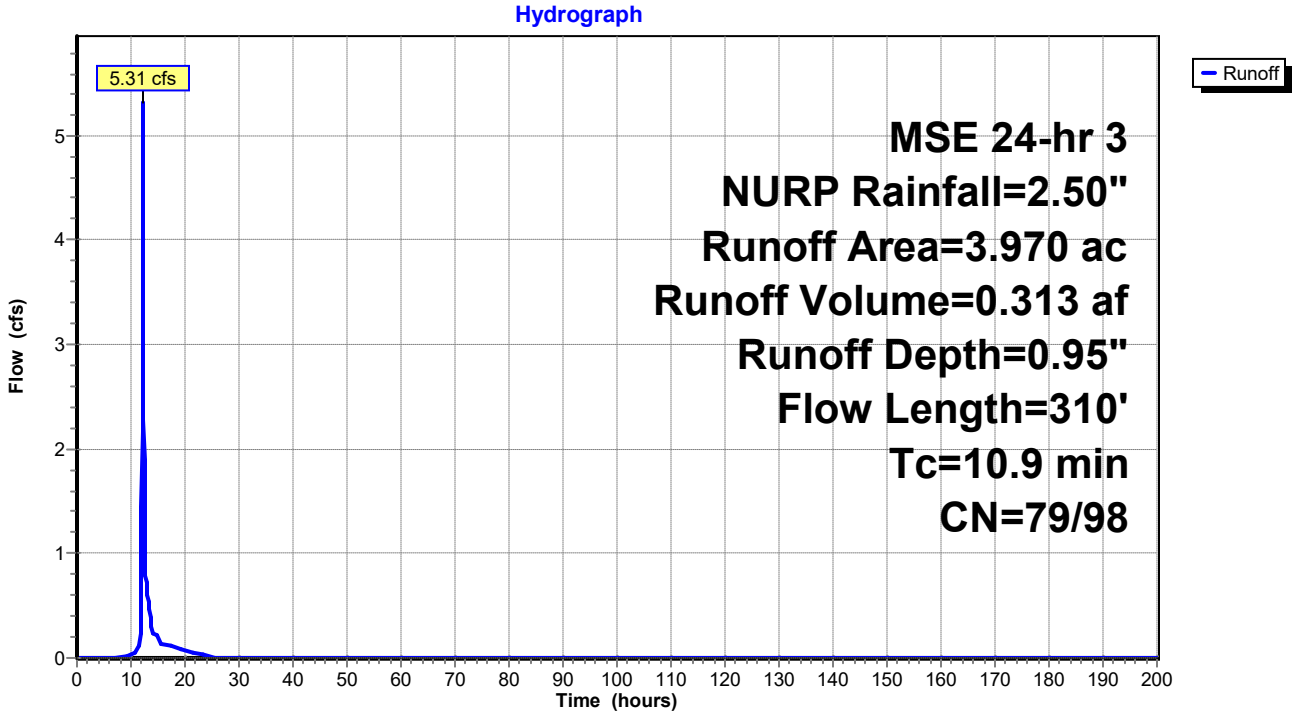
Runoff = 5.31 cfs @ 12.20 hrs, Volume= 0.313 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.046	98	Unconnected pavement, HSG D
0.258	98	Unconnected roofs, HSG D
0.122	98	Water Surface, 0% imp, HSG D
0.949	80	>75% Grass cover, Good, HSG D
1.018	78	Meadow, non-grazed, HSG D
1.577	77	Woods, Good, HSG D
3.970	80	Weighted Average
3.666	79	92.34% Pervious Area
0.304	98	7.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0270	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	72	0.0347	2.79		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.3	138	0.0667	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	310	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

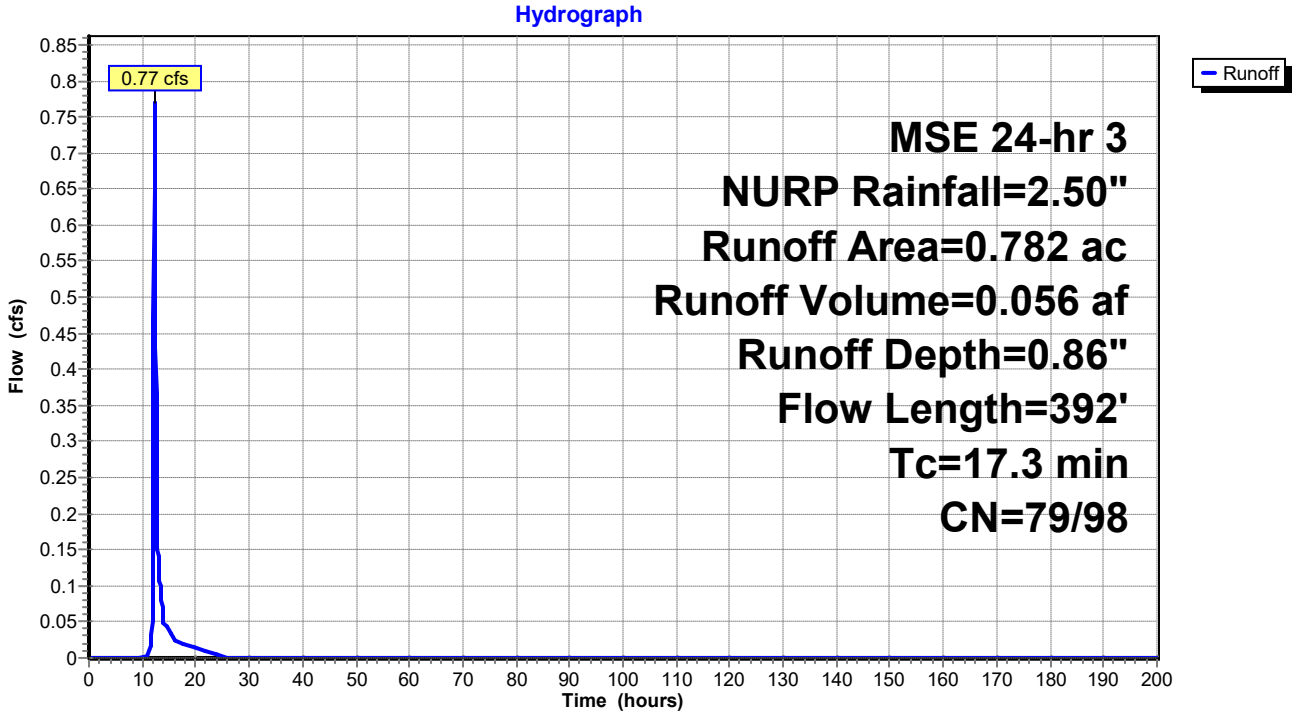
Runoff = 0.77 cfs @ 12.28 hrs, Volume= 0.056 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.010	98	Unconnected pavement, HSG D
0.054	98	Water Surface, 0% imp, HSG D
0.016	80	>75% Grass cover, Good, HSG D
0.162	78	Meadow, non-grazed, HSG D
0.540	77	Woods, Good, HSG D
0.782	79	Weighted Average
0.772	79	98.72% Pervious Area
0.010	98	1.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.8	100	0.0590	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
2.3	146	0.0452	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	146	0.0164	10.55	221.46	**Channel Flow,** Area= 21.0 sf Perim= 15.6' r= 1.35' n= 0.022 Earth, clean & straight
17.3	392	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

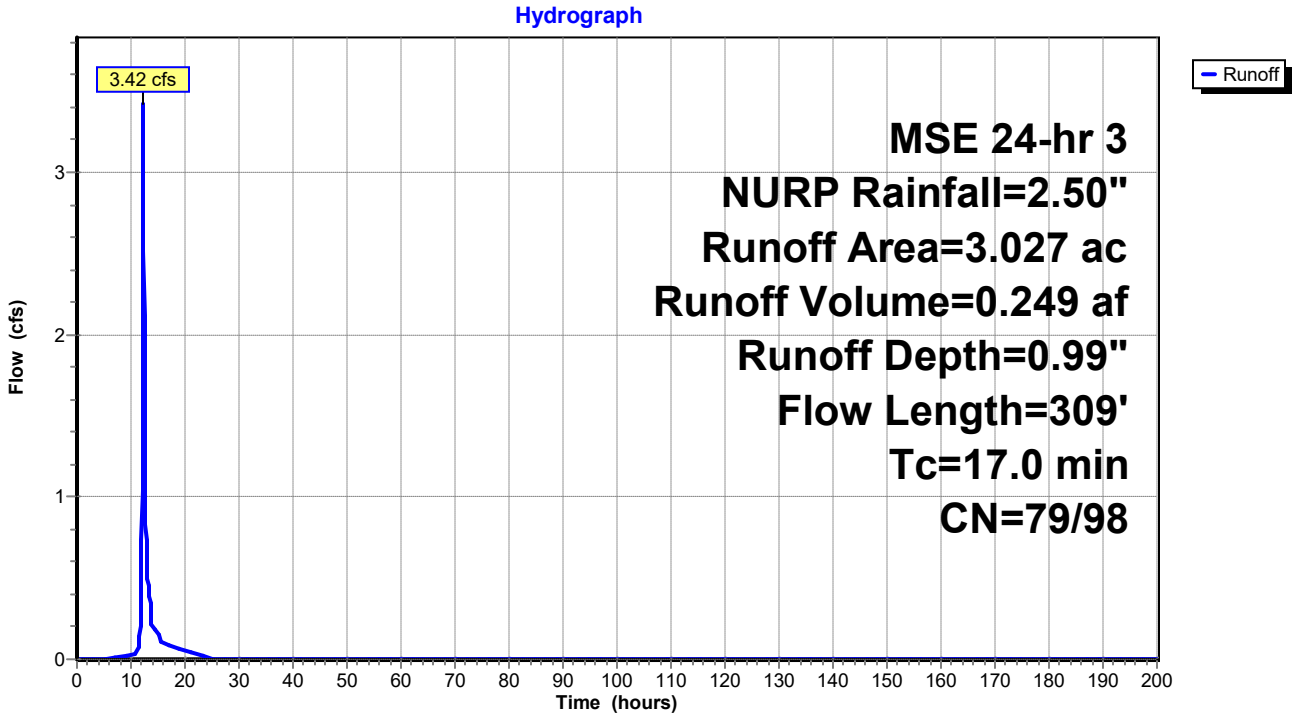
Runoff = 3.42 cfs @ 12.27 hrs, Volume= 0.249 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.125	98	Unconnected pavement, HSG D
0.189	98	Unconnected roofs, HSG D
0.031	98	Water Surface, 0% imp, HSG D
0.779	80	>75% Grass cover, Good, HSG D
1.348	78	Meadow, non-grazed, HSG D
0.555	77	Woods, Good, HSG D
3.027	81	Weighted Average
2.713	79	89.63% Pervious Area
0.314	98	10.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0220	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
2.4	209	0.0445	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.0	309	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Proposed West Channel

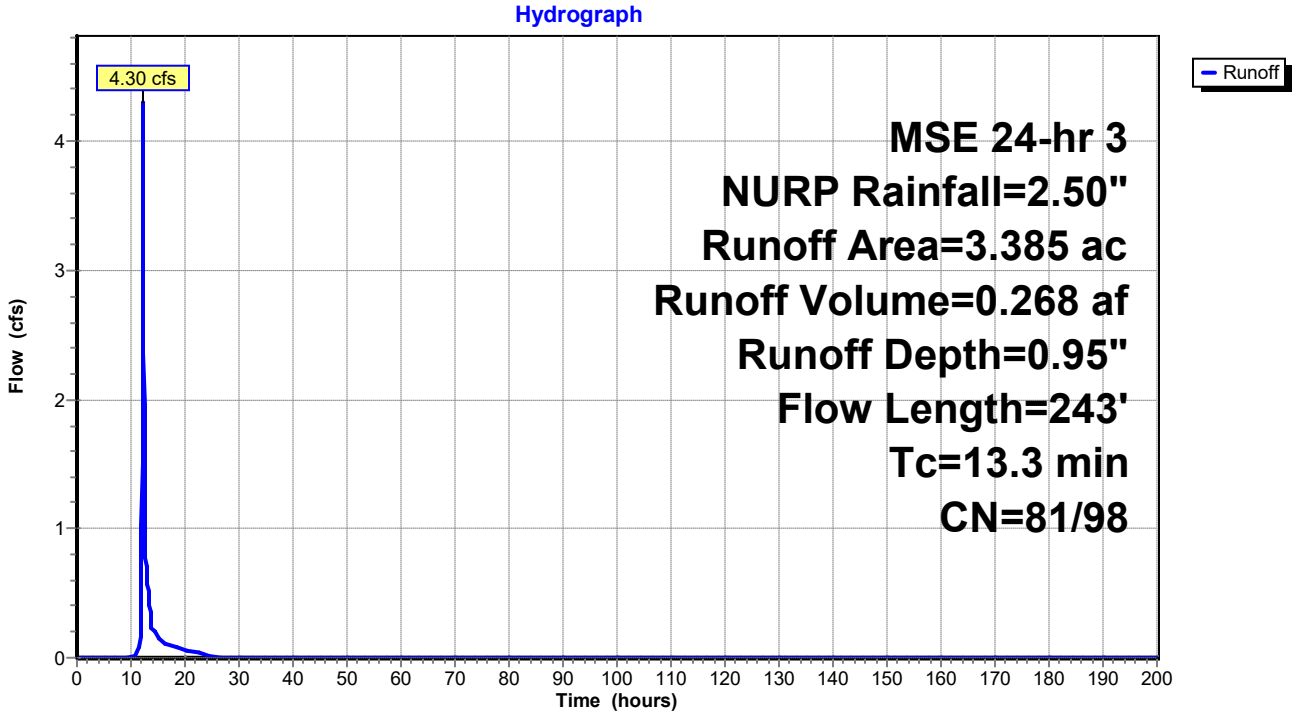
Runoff = 4.30 cfs @ 12.22 hrs, Volume= 0.268 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.023	98	Unconnected pavement, HSG D
0.467	98	Water Surface, 0% imp, HSG D
0.253	80	>75% Grass cover, Good, HSG D
1.225	78	Meadow, non-grazed, HSG D
1.417	77	Woods, Good, HSG D
3.385	81	Weighted Average
3.362	81	99.32% Pervious Area
0.023	98	0.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0520	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.84"
3.0	143	0.0259	0.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	243	Total			

Subcatchment 23S: Direct to Proposed West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

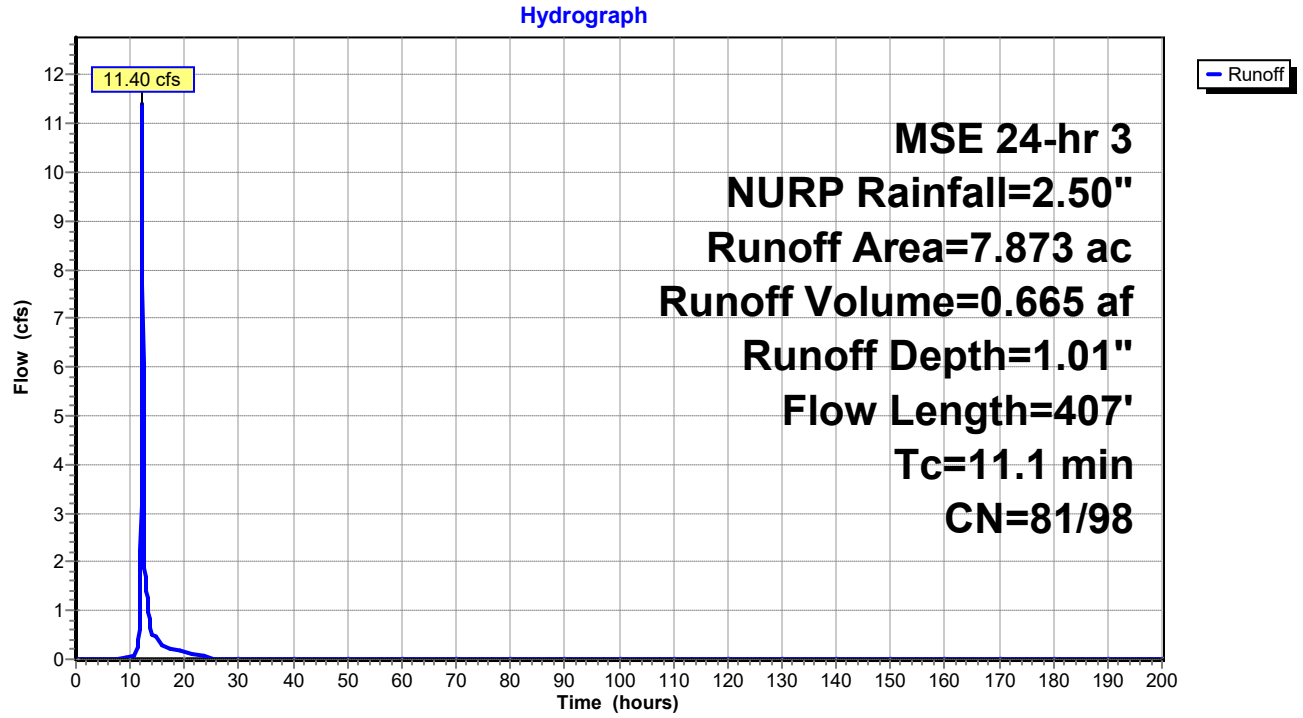
Runoff = 11.40 cfs @ 12.20 hrs, Volume= 0.665 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.039	98	Unconnected pavement, HSG D
0.379	98	Unconnected roofs, HSG D
0.980	98	Water Surface, 0% imp, HSG D
1.643	80	>75% Grass cover, Good, HSG D
2.538	78	Meadow, non-grazed, HSG D
2.294	77	Woods, Good, HSG D
7.873	82	Weighted Average
7.455	81	94.69% Pervious Area
0.418	98	5.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0600	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
4.4	307	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	407	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 25S: Direct to Proposed Northwest Pond

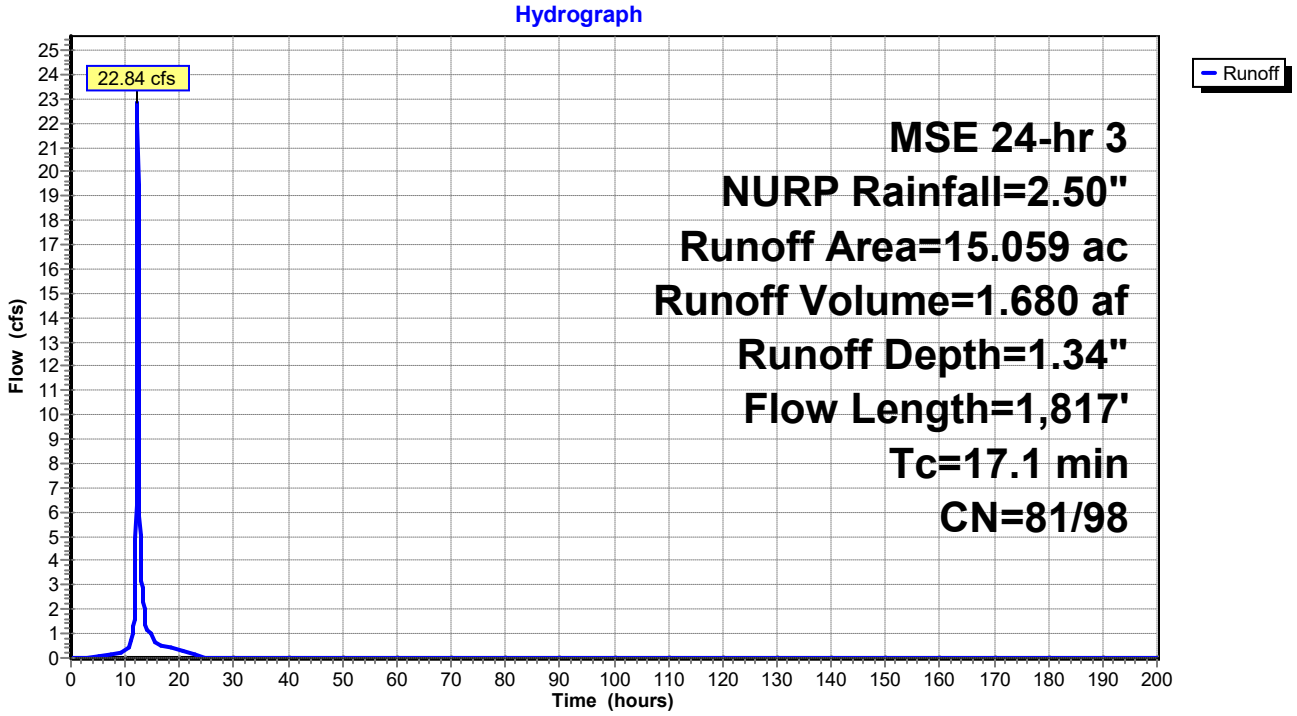
Runoff = 22.84 cfs @ 12.26 hrs, Volume= 1.680 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.652	98	Unconnected pavement, HSG D
1.214	98	Unconnected roofs, HSG D
1.443	98	Paved roads w/curbs & sewers, HSG D
0.758	98	Paved parking, HSG D
0.424	98	Roofs, HSG D
0.322	98	Water Surface, 0% imp, HSG D
0.084	96	Gravel surface, HSG D
0.179	89	Row crops, straight row, Good, HSG D
8.582	80	>75% Grass cover, Good, HSG D
1.401	78	Meadow, non-grazed, HSG D
15.059	86	Weighted Average
10.568	81	70.18% Pervious Area
4.491	98	29.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	90	0.0378	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
0.4	57	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.3	1,670		3.00		**Direct Entry, Pipe flow @ 3 fps**
17.1	1,817	Total			

Subcatchment 25S: Direct to Proposed Northwest Pond



Summary for Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration

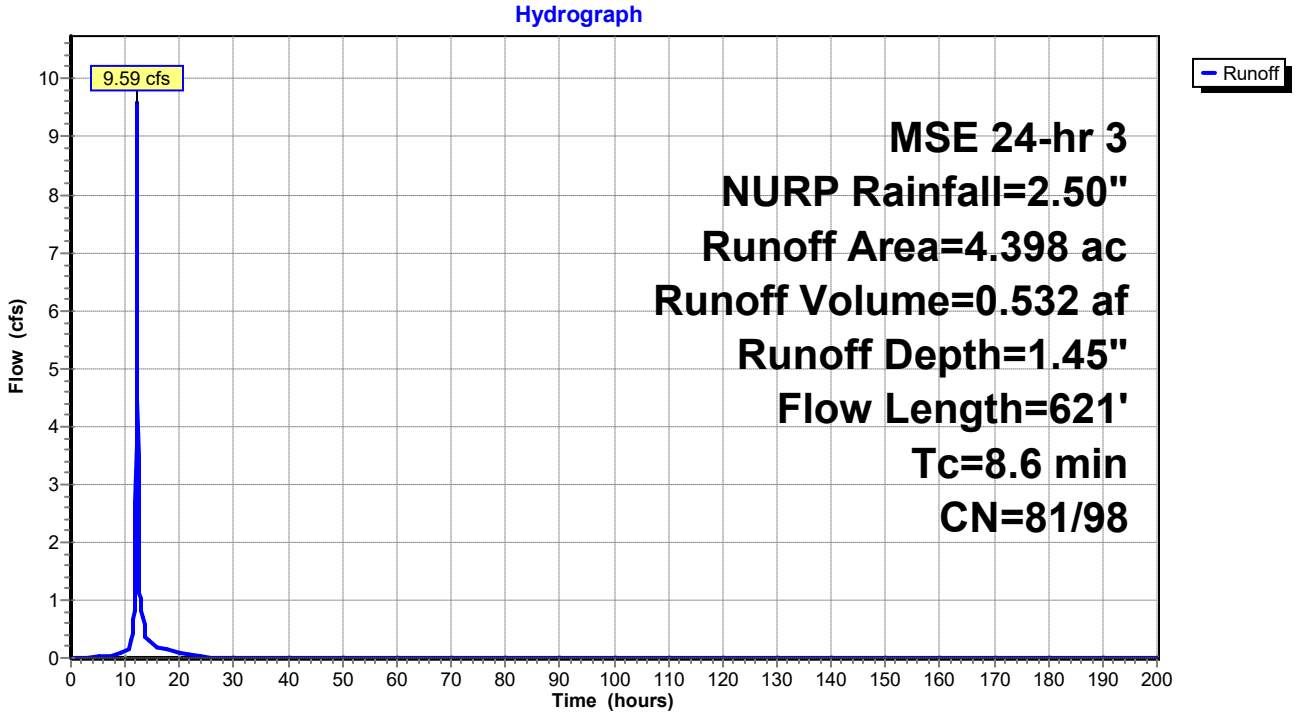
Runoff = 9.59 cfs @ 12.16 hrs, Volume= 0.532 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.170	98	Unconnected pavement, HSG D
0.393	98	Unconnected roofs, HSG D
0.551	98	Paved roads w/curbs & sewers, HSG D
0.354	98	Paved parking, HSG D
0.220	98	Roofs, HSG D
0.318	98	Water Surface, 0% imp, HSG D
1.487	80	>75% Grass cover, Good, HSG D
0.905	78	Meadow, non-grazed, HSG D
4.398	88	Weighted Average
2.710	81	61.62% Pervious Area
1.688	98	38.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 26S: Direct to Proposed Northwest Central Pond/Filtration



Summary for Subcatchment 27S: Direct to Proposed Northwest Central Pond

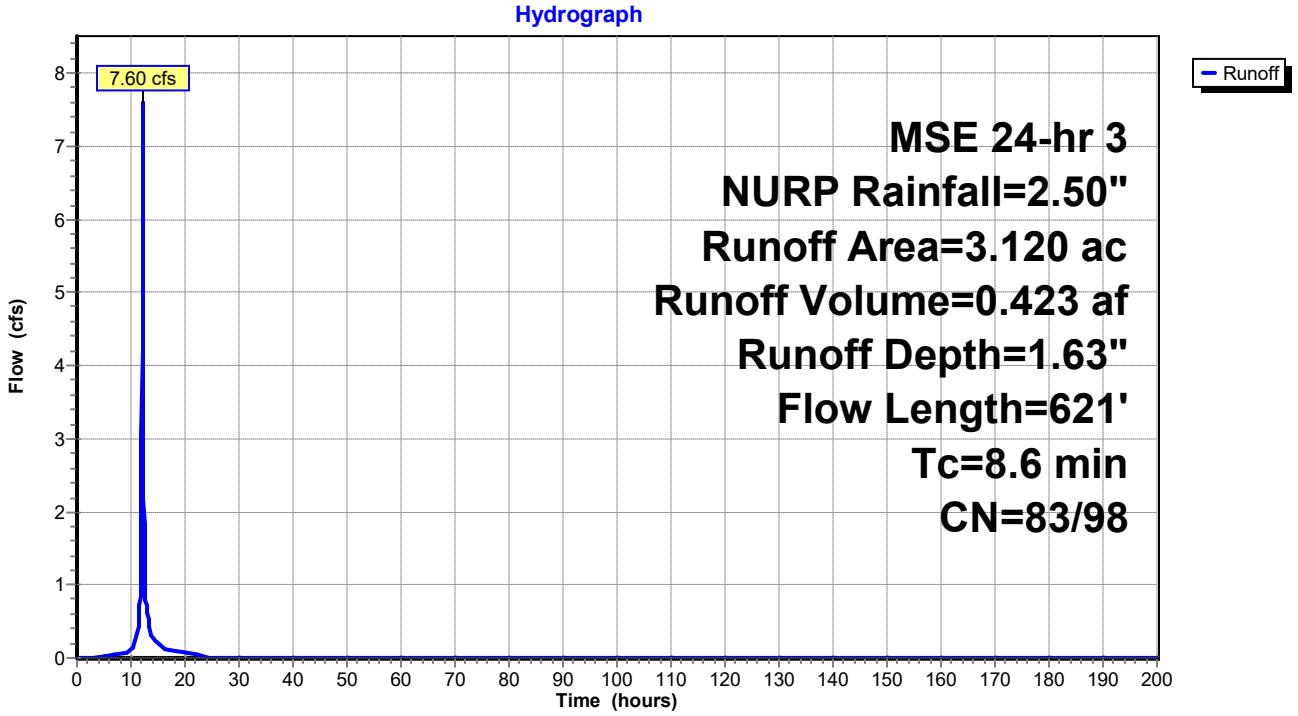
Runoff = 7.60 cfs @ 12.16 hrs, Volume= 0.423 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.134	98	Unconnected pavement, HSG D
0.275	98	Unconnected roofs, HSG D
0.506	98	Paved roads w/curbs & sewers, HSG D
0.328	98	Paved parking, HSG D
0.224	98	Roofs, HSG D
0.278	98	Water Surface, 0% imp, HSG D
0.979	80	>75% Grass cover, Good, HSG D
0.396	78	Meadow, non-grazed, HSG D
3.120	90	Weighted Average
1.653	83	52.98% Pervious Area
1.467	98	47.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	288	0.0132	2.33		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	294		3.00		**Direct Entry, Pipe flow @ 3 fps**
8.6	621	Total			

Subcatchment 27S: Direct to Proposed Northwest Central Pond



Summary for Subcatchment 28S: Direct to Proposed Northeast Central Pond

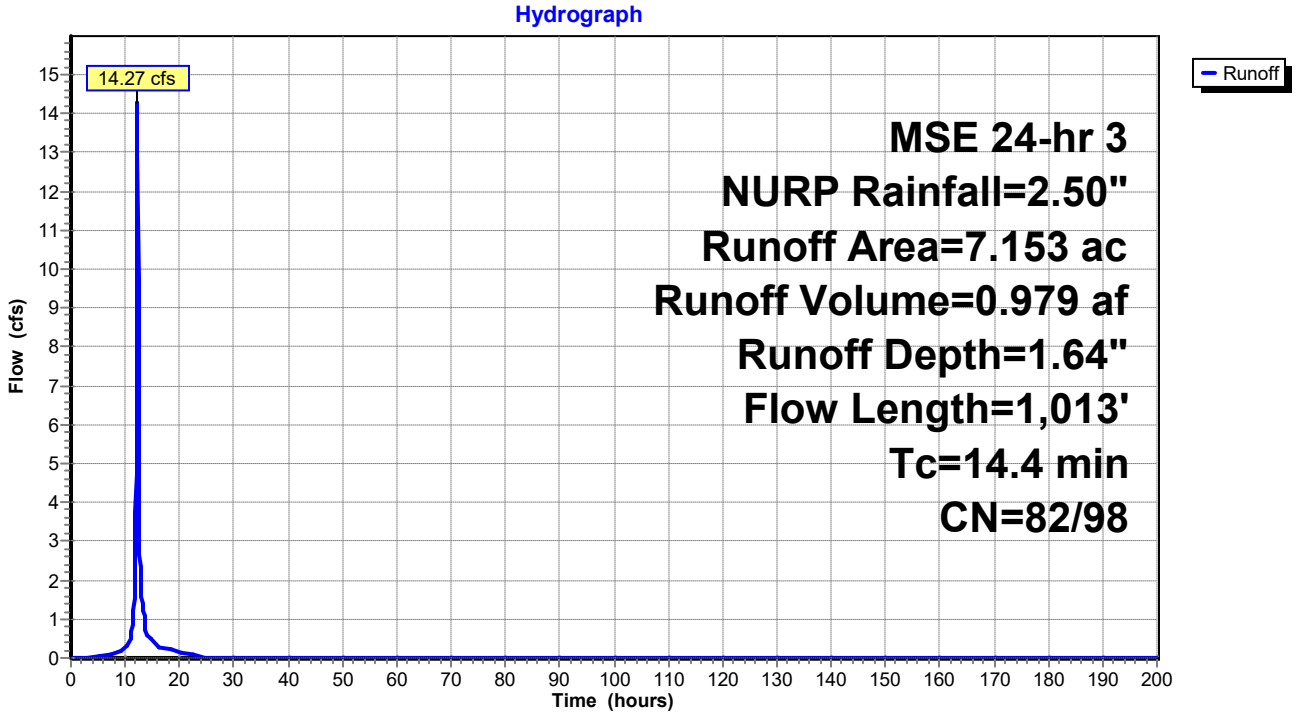
Runoff = 14.27 cfs @ 12.22 hrs, Volume= 0.979 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.152	98	Unconnected pavement, HSG D
0.932	98	Unconnected roofs, HSG D
0.930	98	Paved roads w/curbs & sewers, HSG D
1.004	98	Paved parking, HSG D
0.604	98	Roofs, HSG D
0.380	98	Water Surface, 0% imp, HSG D
2.416	80	>75% Grass cover, Good, HSG D
0.684	78	Meadow, non-grazed, HSG D
0.051	77	Woods, Good, HSG D
7.153	90	Weighted Average
3.531	82	49.36% Pervious Area
3.622	98	50.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	71	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.6	242	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	700		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.4	1,013	Total			

Subcatchment 28S: Direct to Proposed Northeast Central Pond



Summary for Subcatchment 30S: Direct to Wetland 4A

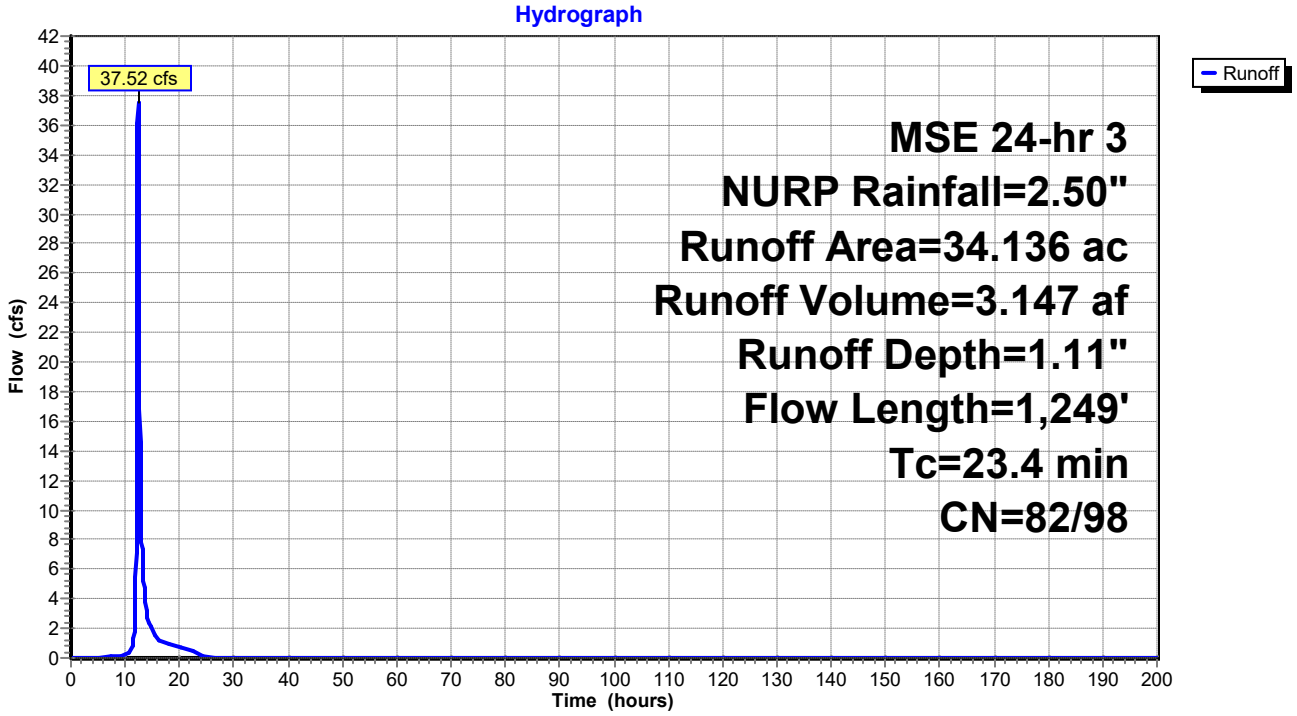
Runoff = 37.52 cfs @ 12.35 hrs, Volume= 3.147 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
1.401	98	Unconnected pavement, HSG D
1.502	98	Unconnected roofs, HSG D
0.939	96	Gravel surface, HSG D
6.512	89	Row crops, straight row, Good, HSG D
1.609	89	Pasture/grassland/range, Poor, HSG D
18.400	80	>75% Grass cover, Good, HSG D
3.773	77	Woods, Good, HSG D
34.136	84	Weighted Average
31.233	82	91.50% Pervious Area
2.903	98	8.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

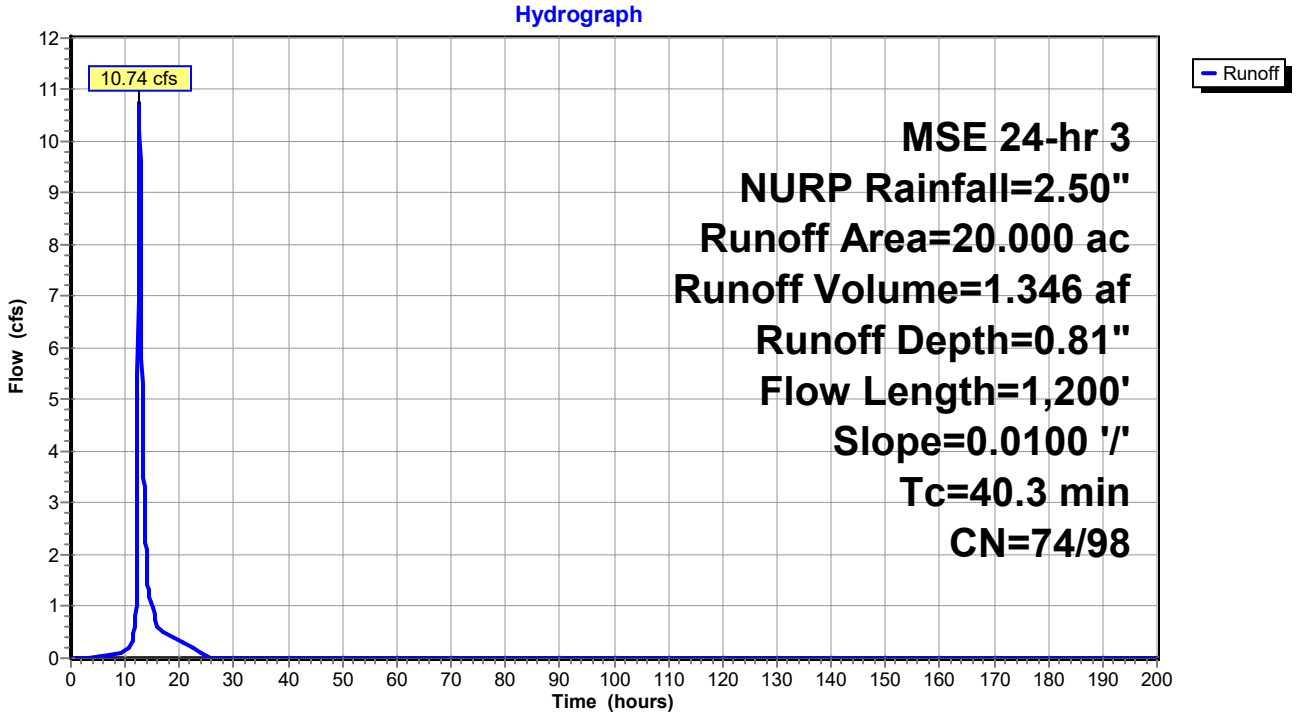
Runoff = 10.74 cfs @ 12.60 hrs, Volume= 1.346 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
20.000	77	2 acre lots, 12% imp, HSG C
17.600	74	88.00% Pervious Area
2.400	98	12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 32S: Direct to Proposed West Central Pond

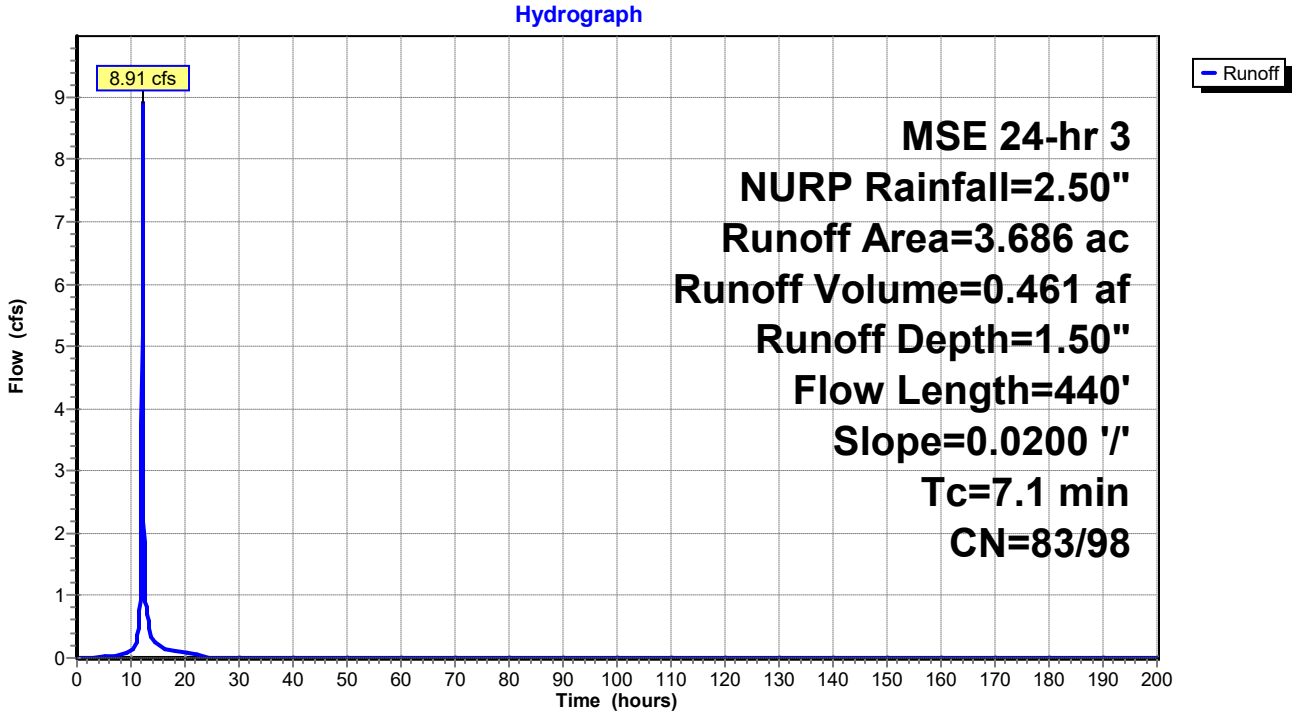
Runoff = 8.91 cfs @ 12.14 hrs, Volume= 0.461 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.039	98	Unconnected pavement, HSG D
0.438	98	Unconnected roofs, HSG D
0.377	98	Paved roads w/curbs & sewers, HSG D
0.298	98	Paved parking, HSG D
0.194	98	Roofs, HSG D
0.395	98	Water Surface, 0% imp, HSG D
1.443	80	>75% Grass cover, Good, HSG D
0.502	78	Meadow, non-grazed, HSG D
3.686	88	Weighted Average
2.340	83	63.48% Pervious Area
1.346	98	36.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	39	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.2	401		3.00		**Direct Entry,**
7.1	440	Total			

Subcatchment 32S: Direct to Proposed West Central Pond



Summary for Subcatchment 40S: Direct to Wetland 2B

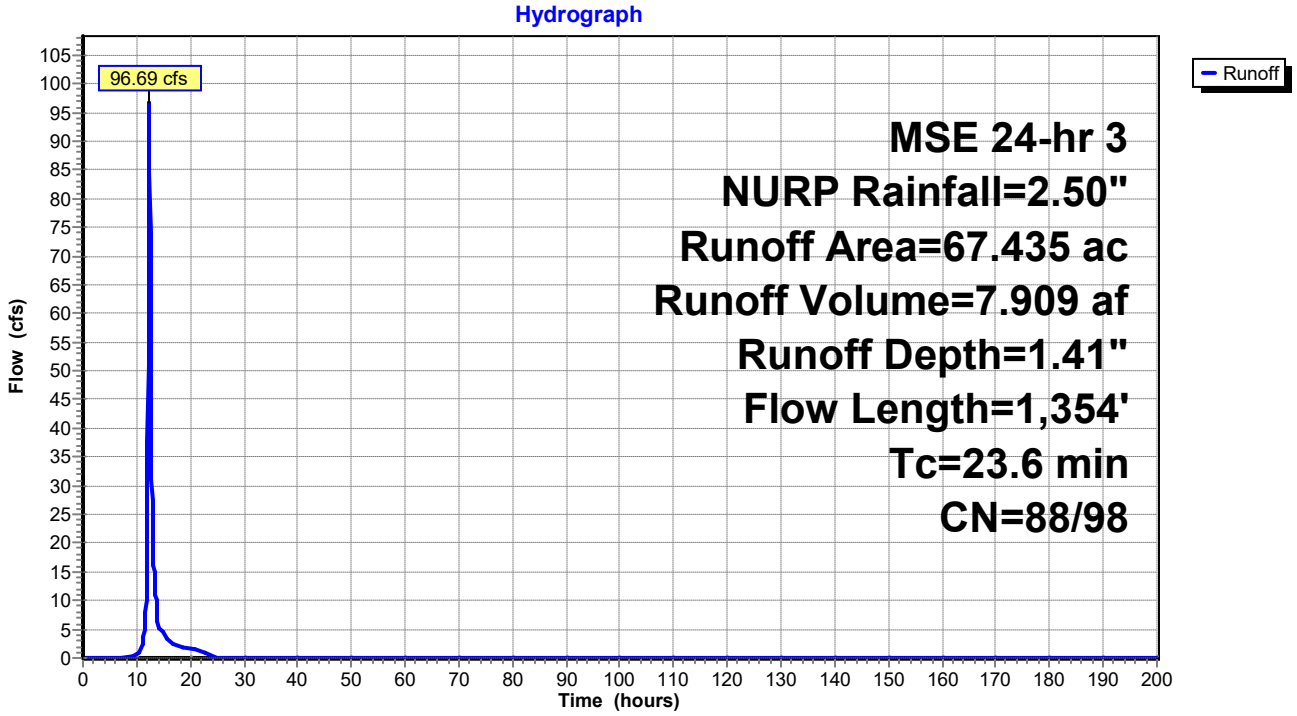
Runoff = 96.69 cfs @ 12.35 hrs, Volume= 7.909 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.965	98	Unconnected pavement, HSG D
1.003	98	Unconnected roofs, HSG D
17.214	98	Water Surface, 0% imp, HSG D
1.249	96	Gravel surface, HSG D
27.306	89	Row crops, straight row, Good, HSG D
0.208	89	Pasture/grassland/range, Poor, HSG D
9.713	80	>75% Grass cover, Good, HSG D
6.057	78	Meadow, non-grazed, HSG D
3.720	77	Woods, Good, HSG D
67.435	89	Weighted Average
65.467	88	97.08% Pervious Area
1.968	98	2.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

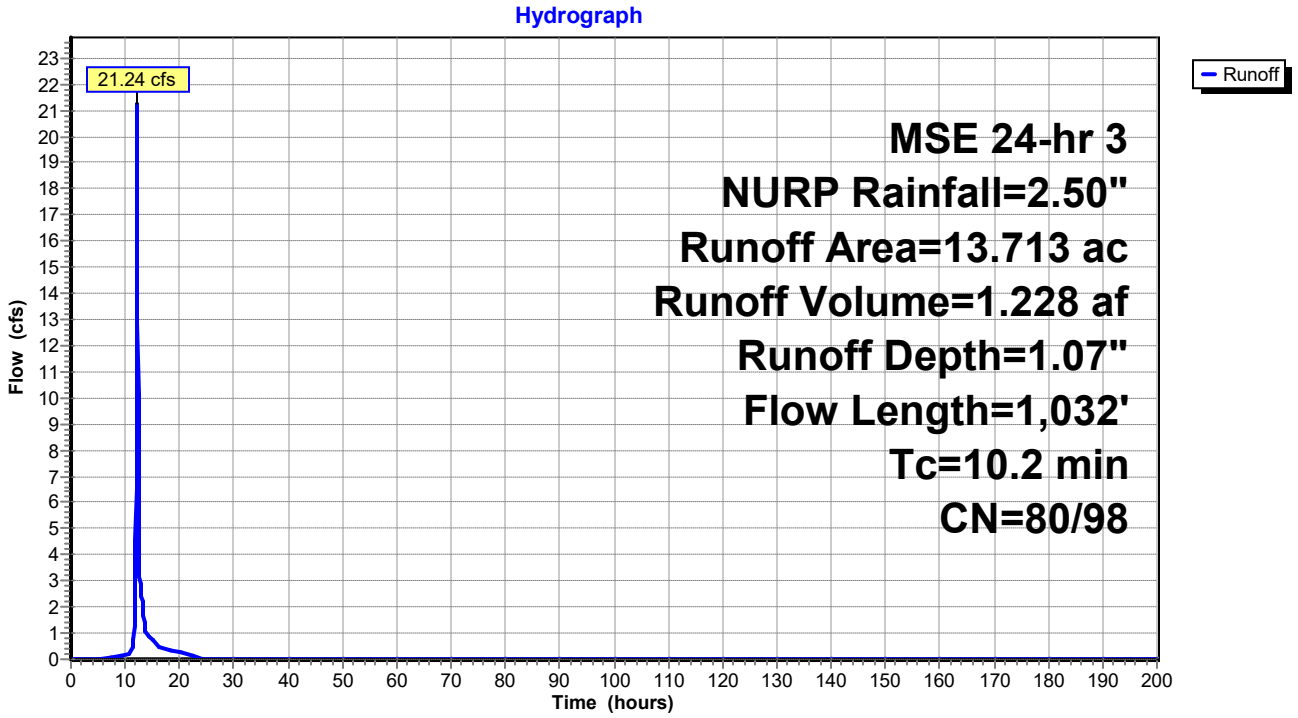
Runoff = 21.24 cfs @ 12.18 hrs, Volume= 1.228 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
1.568	98	Unconnected pavement, HSG D
0.273	98	Unconnected roofs, HSG D
0.107	98	Water Surface, 0% imp, HSG D
0.066	96	Gravel surface, HSG D
10.431	80	>75% Grass cover, Good, HSG D
1.268	78	Meadow, non-grazed, HSG D
13.713	82	Weighted Average
11.872	80	86.57% Pervious Area
1.841	98	13.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 42S: Direct to Proposed South Central Pond

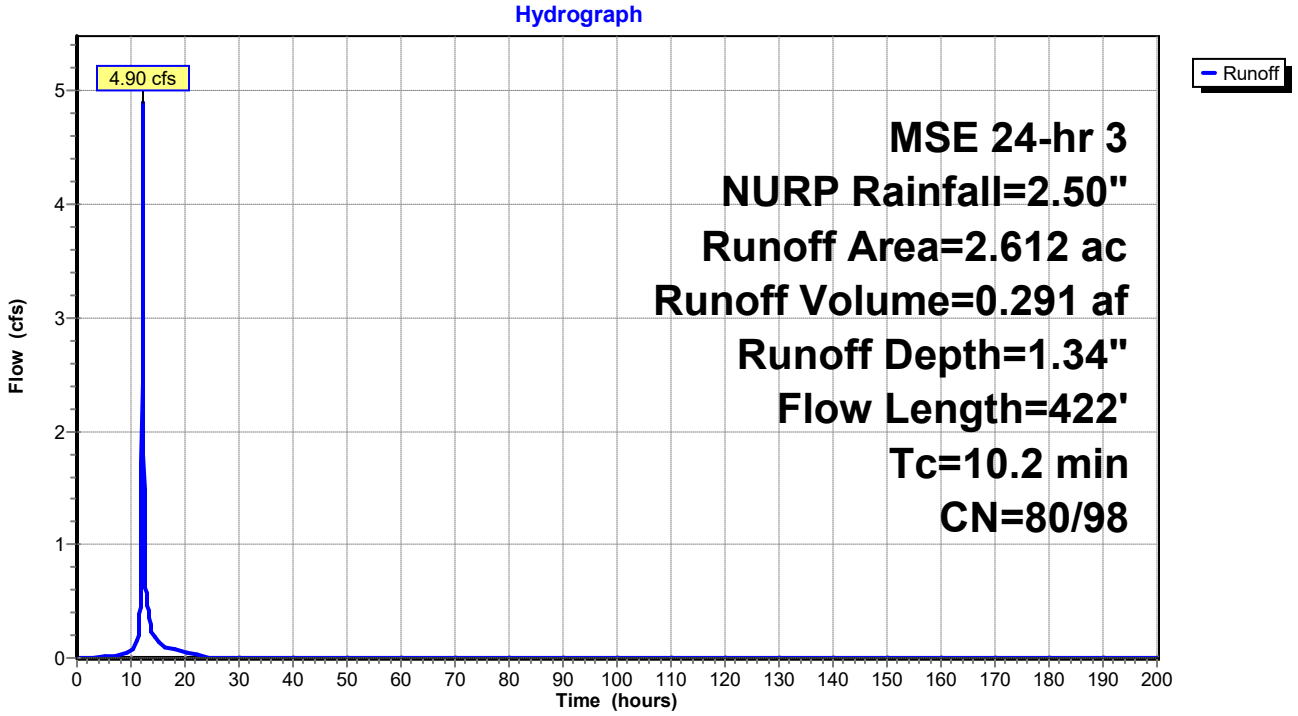
Runoff = 4.90 cfs @ 12.18 hrs, Volume= 0.291 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.013	98	Unconnected pavement, HSG D
0.362	98	Unconnected roofs, HSG D
0.246	98	Paved roads w/curbs & sewers, HSG D
0.145	98	Paved parking, HSG D
0.084	98	Roofs, HSG D
0.154	98	Water Surface, 0% imp, HSG D
0.600	80	>75% Grass cover, Good, HSG D
0.811	78	Meadow, non-grazed, HSG D
0.197	77	Woods, Good, HSG D
2.612	86	Weighted Average
1.762	80	67.46% Pervious Area
0.850	98	32.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.7	235	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	117		3.00		**Direct Entry, Pipe flow @ 3 fps**
10.2	422	Total			

Subcatchment 42S: Direct to Proposed South Central Pond



Summary for Subcatchment 43S: Direct to Proposed Central Pond

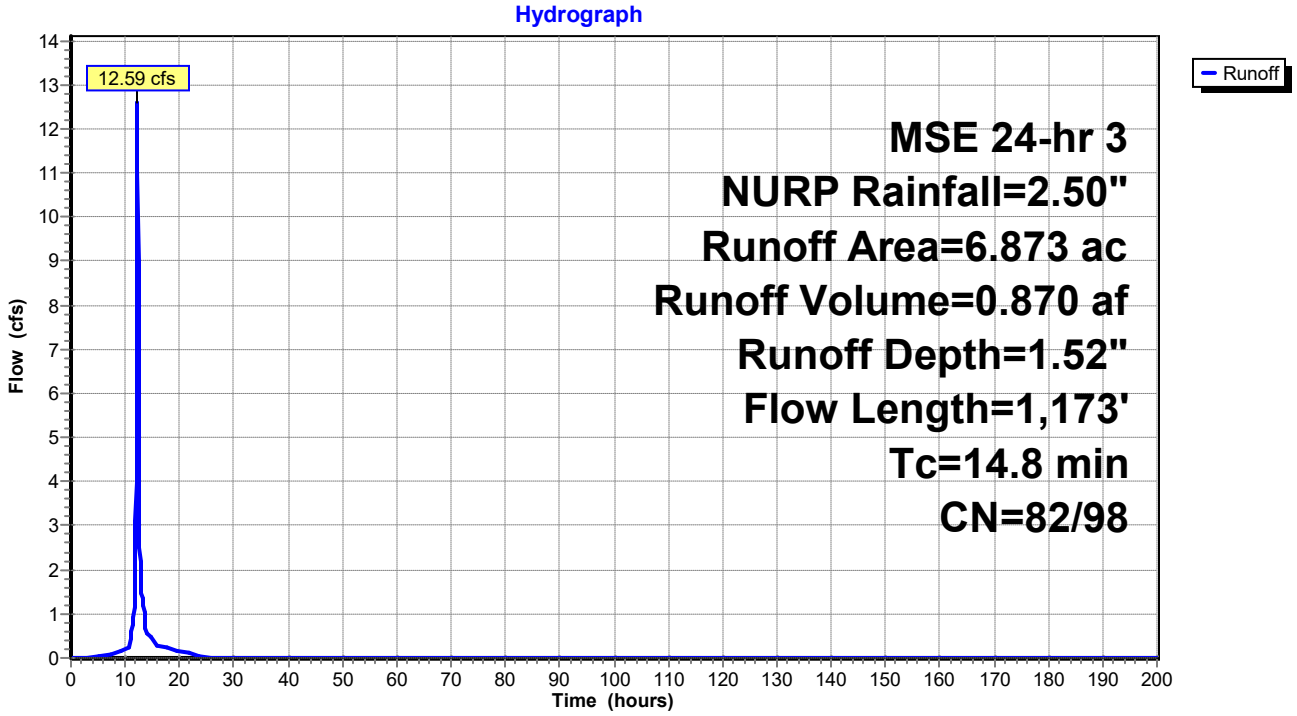
Runoff = 12.59 cfs @ 12.23 hrs, Volume= 0.870 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.205	98	Unconnected pavement, HSG D
0.855	98	Unconnected roofs, HSG D
0.896	98	Paved roads w/curbs & sewers, HSG D
0.530	98	Paved parking, HSG D
0.332	98	Roofs, HSG D
0.402	98	Water Surface, 0% imp, HSG D
0.383	89	Row crops, straight row, Good, HSG D
2.711	80	>75% Grass cover, Good, HSG D
0.559	78	Meadow, non-grazed, HSG D
6.873	89	Weighted Average
4.055	82	59.00% Pervious Area
2.818	98	41.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	70	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.5	286	0.0088	1.90		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	817		3.00		**Direct Entry, Pipe flow @ 3 fps**
14.8	1,173	Total			

Subcatchment 43S: Direct to Proposed Central Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

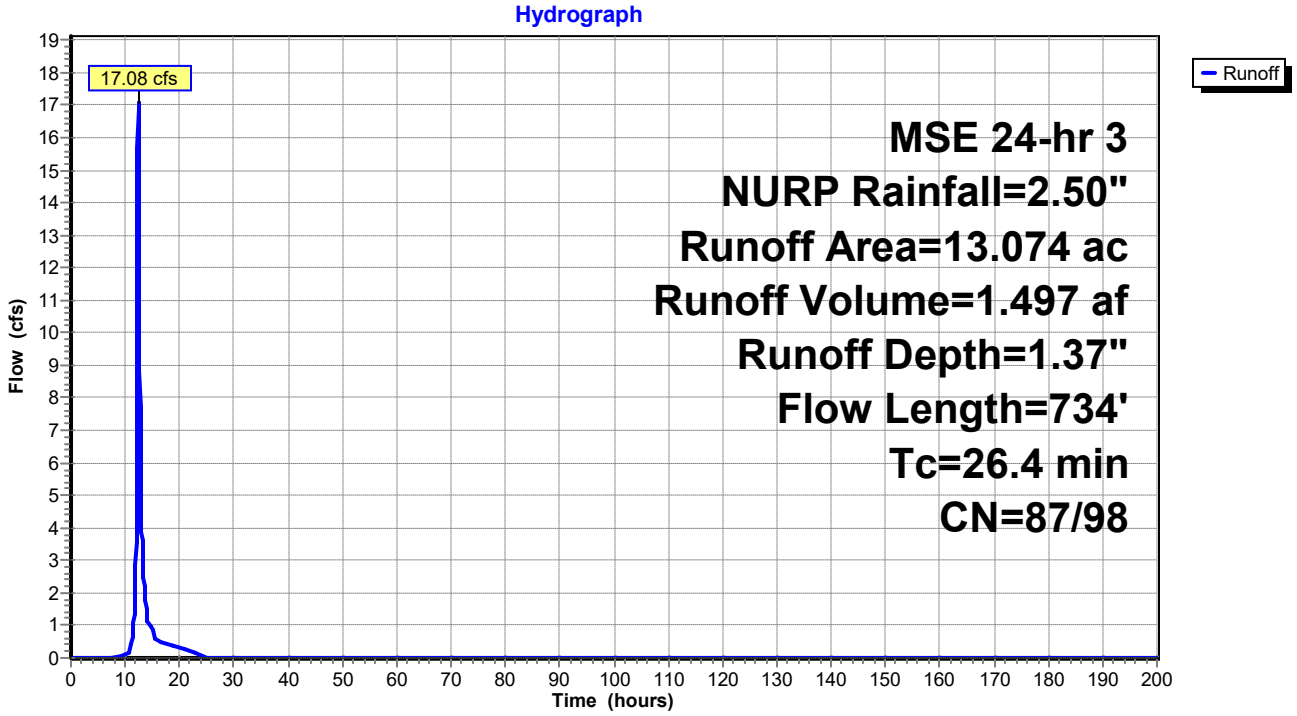
Runoff = 17.08 cfs @ 12.38 hrs, Volume= 1.497 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.523	98	Unconnected pavement, HSG D
0.339	98	Unconnected roofs, HSG D
0.175	98	Water Surface, 0% imp, HSG D
0.233	96	Gravel surface, HSG D
8.346	89	Row crops, straight row, Good, HSG D
0.958	89	Pasture/grassland/range, Poor, HSG D
2.500	80	>75% Grass cover, Good, HSG D
13.074	88	Weighted Average
12.212	87	93.41% Pervious Area
0.862	98	6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

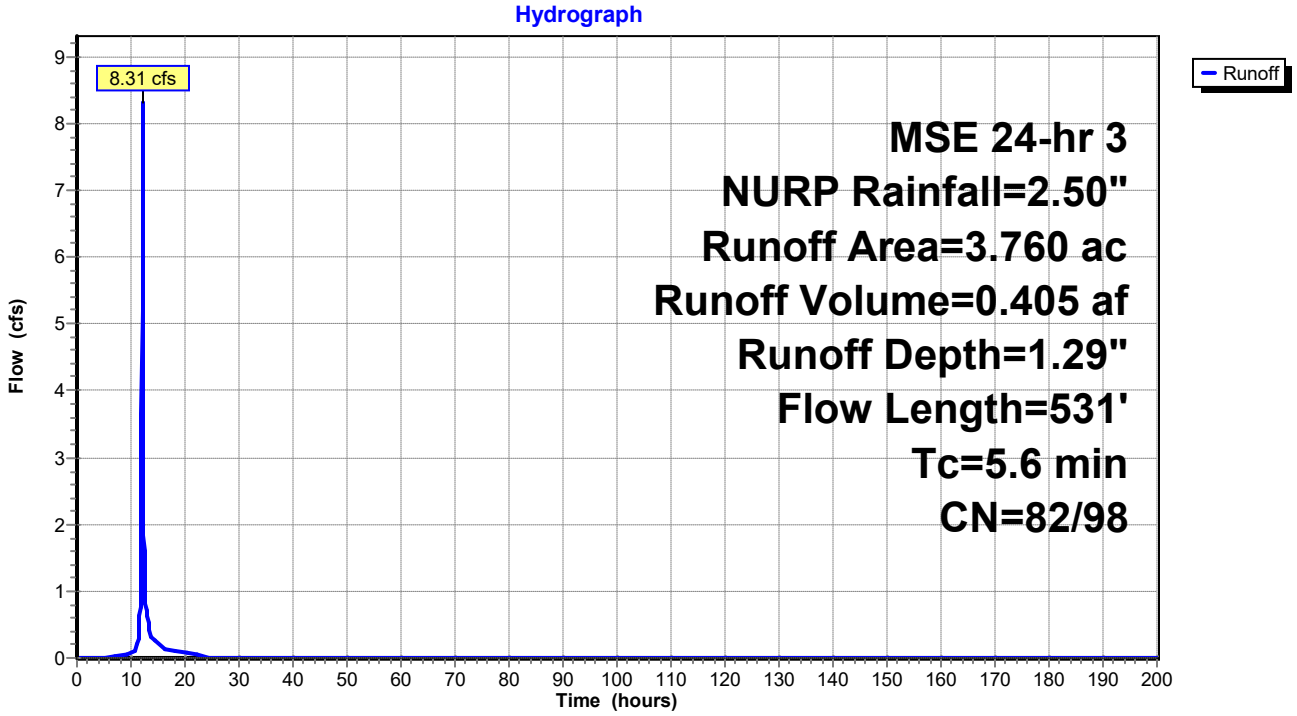
Runoff = 8.31 cfs @ 12.13 hrs, Volume= 0.405 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.428	98	Unconnected pavement, HSG D
0.443	98	Unconnected roofs, HSG D
0.064	98	Water Surface, 0% imp, HSG D
0.331	96	Gravel surface, HSG D
2.083	80	>75% Grass cover, Good, HSG D
0.411	77	Woods, Good, HSG D
3.760	86	Weighted Average
2.889	82	76.84% Pervious Area
0.871	98	23.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



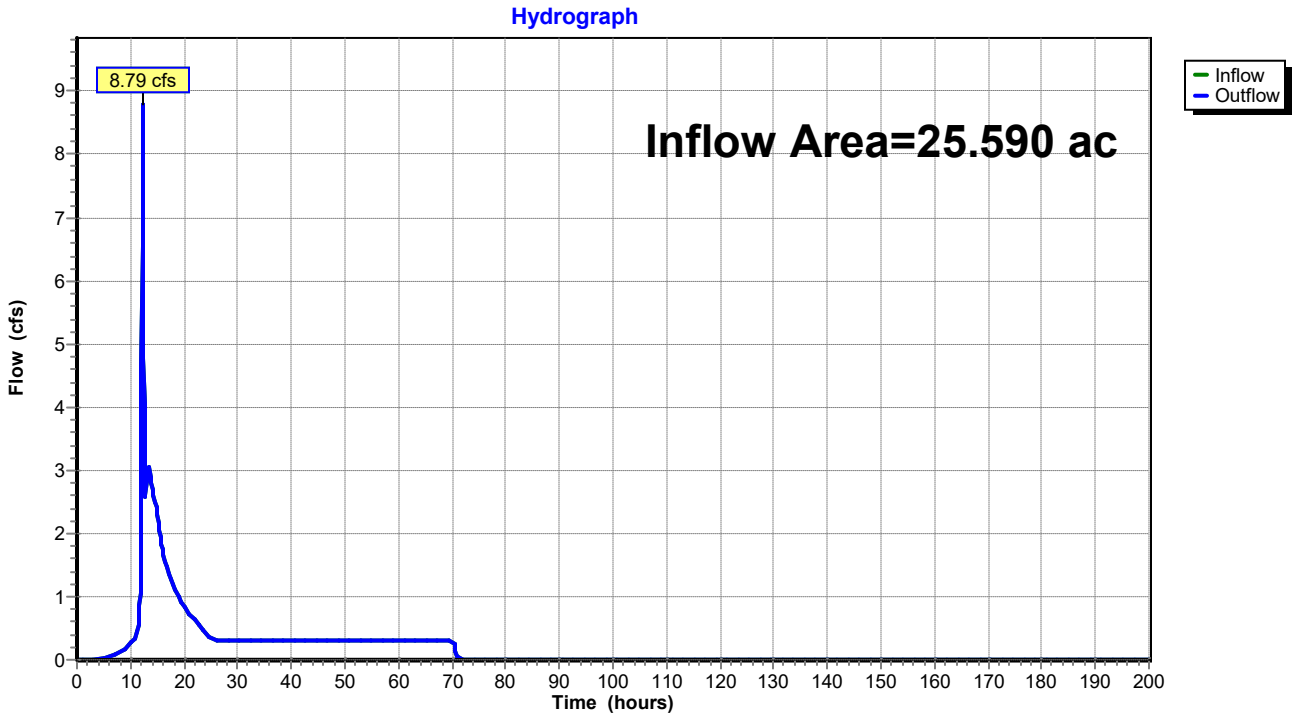
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.590 ac, 16.84% Impervious, Inflow Depth = 1.37" for NURP event
Inflow = 8.79 cfs @ 12.25 hrs, Volume= 2.928 af
Outflow = 8.79 cfs @ 12.25 hrs, Volume= 2.928 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



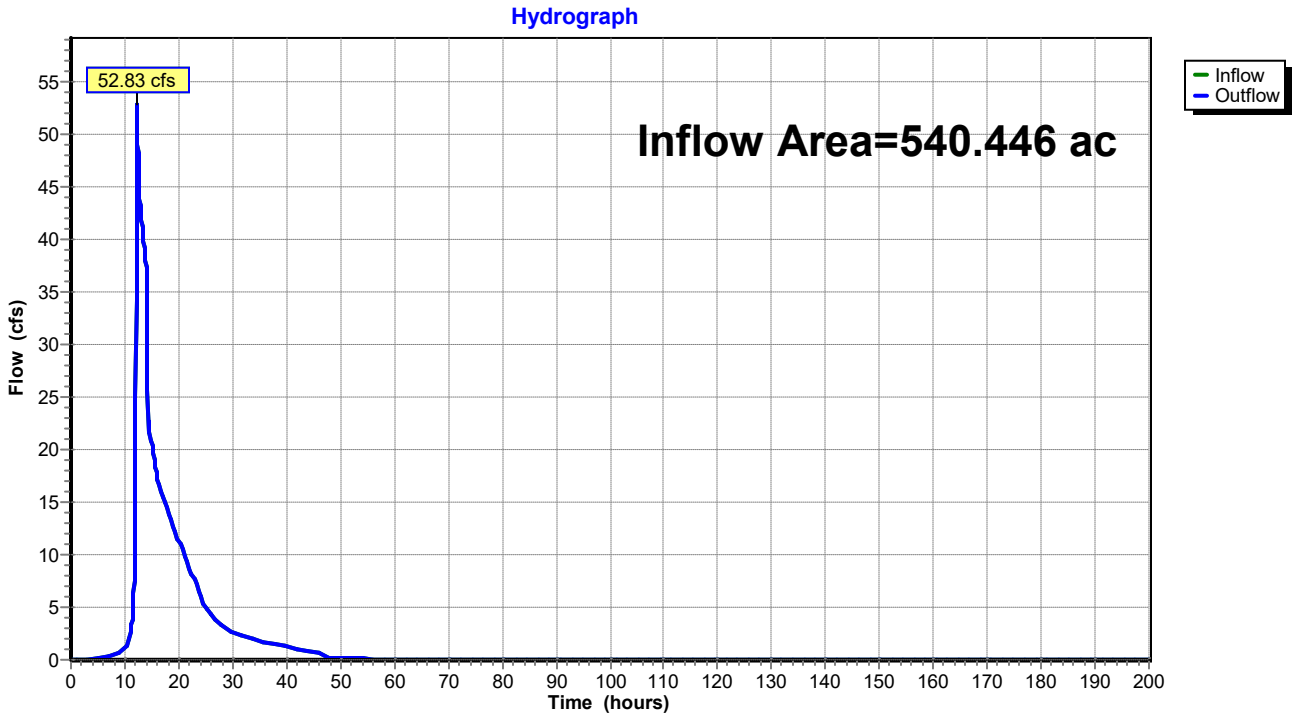
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.446 ac, 5.98% Impervious, Inflow Depth = 0.52" for NURP event
Inflow = 52.83 cfs @ 12.25 hrs, Volume= 23.224 af
Outflow = 52.83 cfs @ 12.25 hrs, Volume= 23.224 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



Summary for Reach 21R: Proposed East Channel

Inflow Area = 134.639 ac, 9.91% Impervious, Inflow Depth > 1.17" for NURP event
Inflow = 15.82 cfs @ 13.62 hrs, Volume= 13.164 af
Outflow = 15.82 cfs @ 13.63 hrs, Volume= 13.164 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.58 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 4.6 min

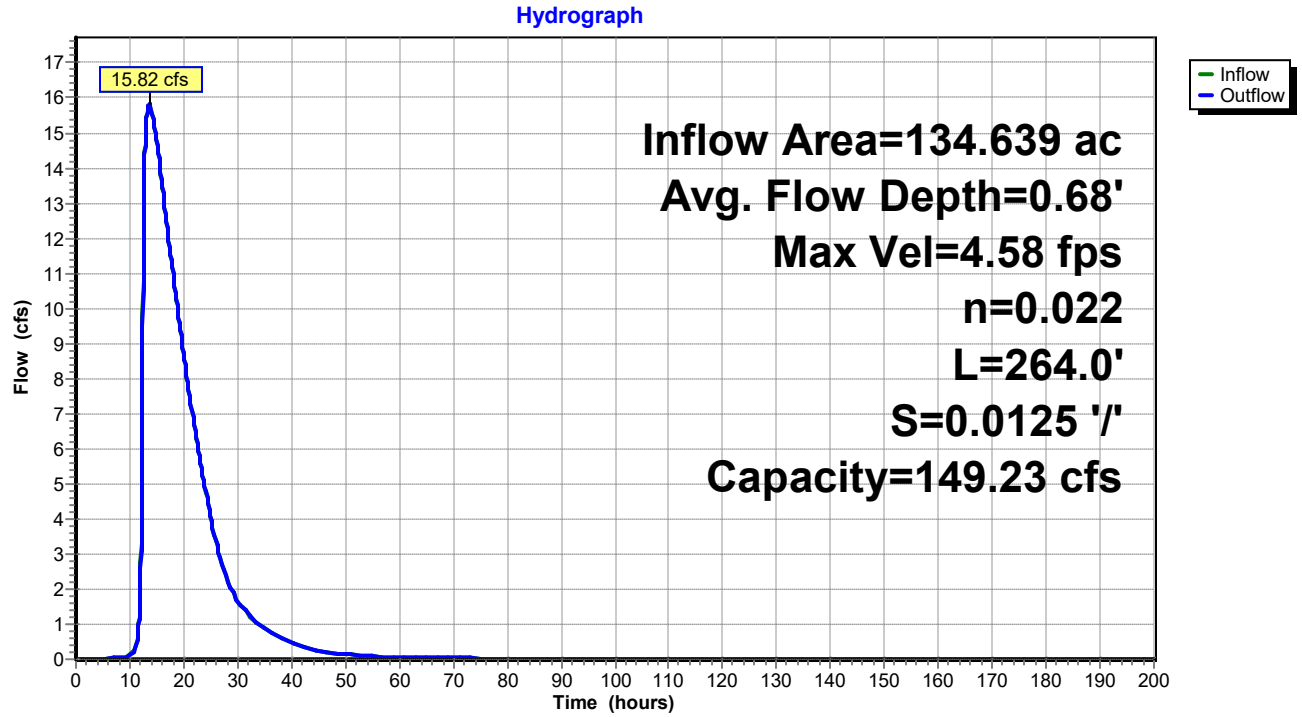
Peak Storage= 913 cf @ 13.63 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 149.23 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 264.0' Slope= 0.0125 '/'
Inlet Invert= 923.50', Outlet Invert= 920.20'



‡

Reach 21R: Proposed East Channel



Summary for Reach 23R: Existing West Channel

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 375.878 ac, 3.58% Impervious, Inflow Depth = 0.23" for NURP event
Inflow = 29.45 cfs @ 12.33 hrs, Volume= 7.154 af
Outflow = 29.45 cfs @ 12.35 hrs, Volume= 7.154 af, Atten= 0%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.15 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 8.1 min

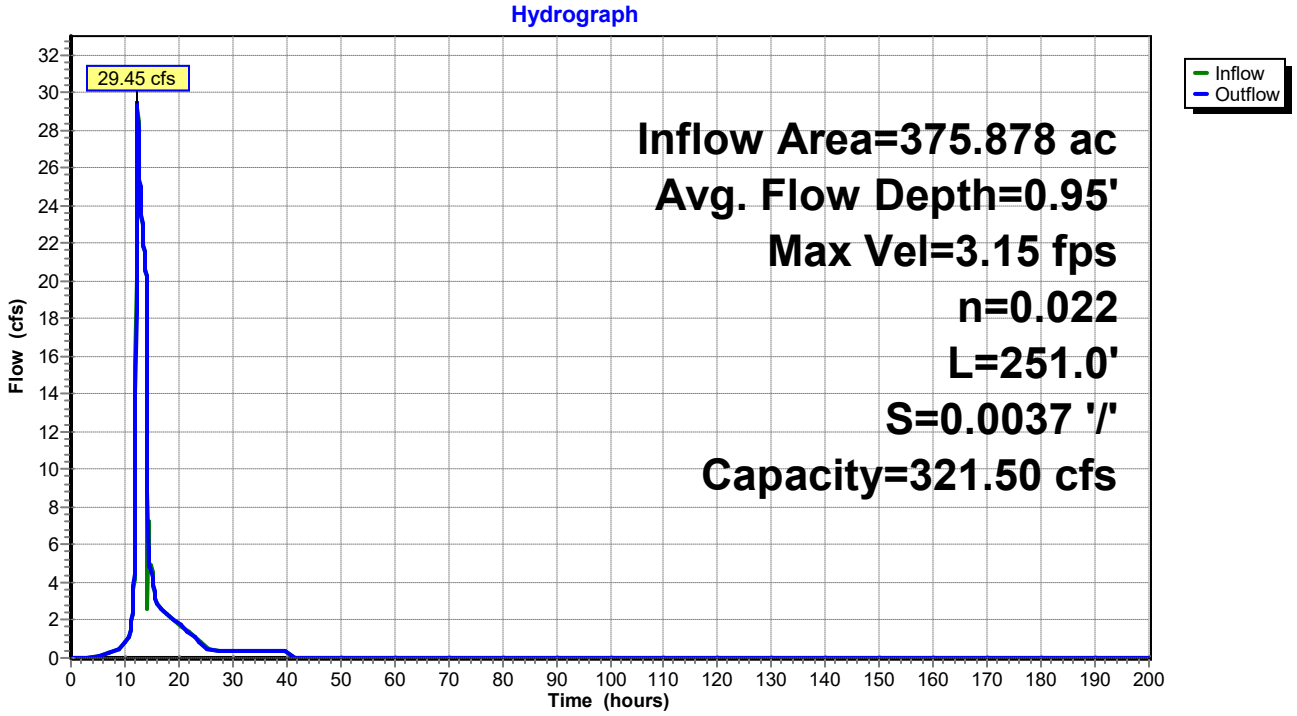
Peak Storage= 2,349 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 321.50 cfs

6.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 4.0 '/' Top Width= 30.00'
Length= 251.0' Slope= 0.0037 '/'
Inlet Invert= 920.50', Outlet Invert= 919.58'



‡

Reach 23R: Existing West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth = 0.53" for NURP event
Inflow = 127.59 cfs @ 12.44 hrs, Volume= 13.215 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 930.22' @ 25.55 hrs Surf.Area= 60.657 ac Storage= 13.215 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

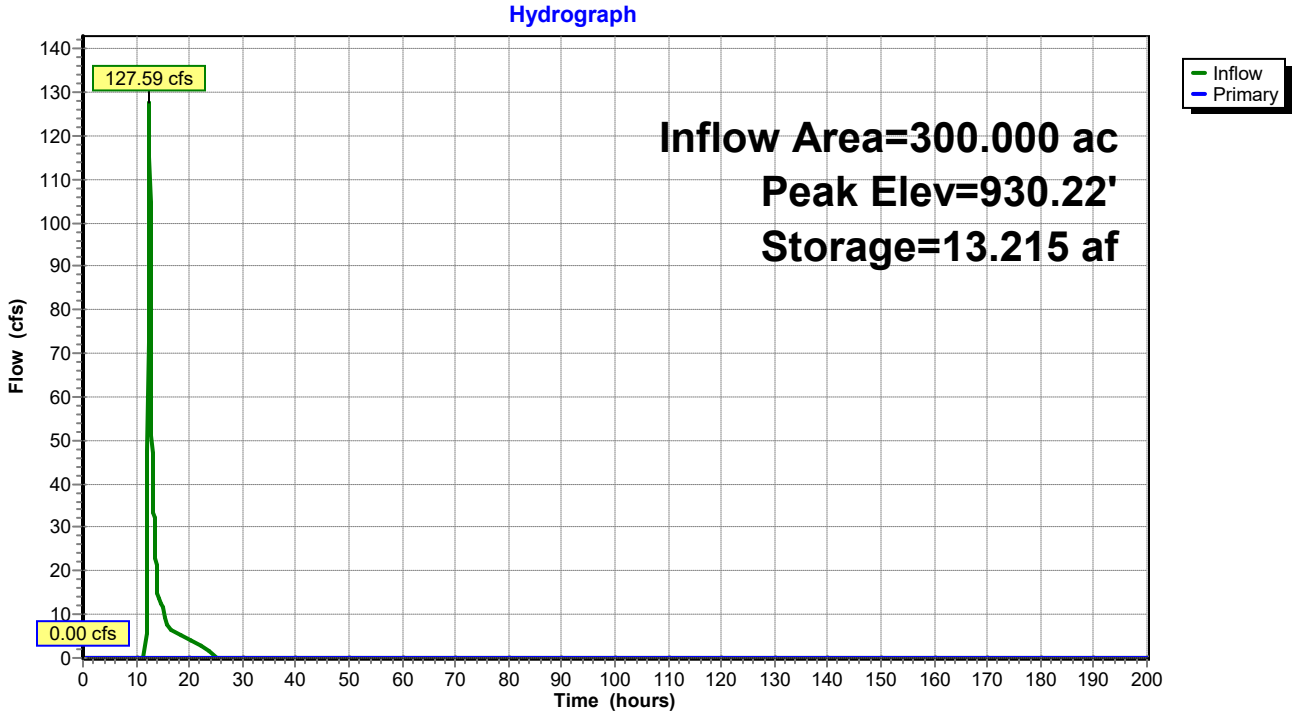
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=930.00' TW=930.22' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 10P: Proposed Northeast Pond/Filtration

[58] Hint: Peaked 0.23' above defined flood level

Inflow Area = 19.438 ac, 21.11% Impervious, Inflow Depth = 1.46" for NURP event
Inflow = 28.13 cfs @ 12.34 hrs, Volume= 2.365 af
Outflow = 2.39 cfs @ 13.75 hrs, Volume= 2.365 af, Atten= 92%, Lag= 84.5 min
Primary = 2.39 cfs @ 13.75 hrs, Volume= 2.365 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 921.00' Surf.Area= 0.662 ac Storage= 2.955 af
Peak Elev= 922.23' @ 13.75 hrs Surf.Area= 1.356 ac Storage= 4.487 af (1.532 af above start)
Flood Elev= 922.00' Surf.Area= 1.255 ac Storage= 4.104 af (1.149 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 1,106.1 min (1,913.4 - 807.2)

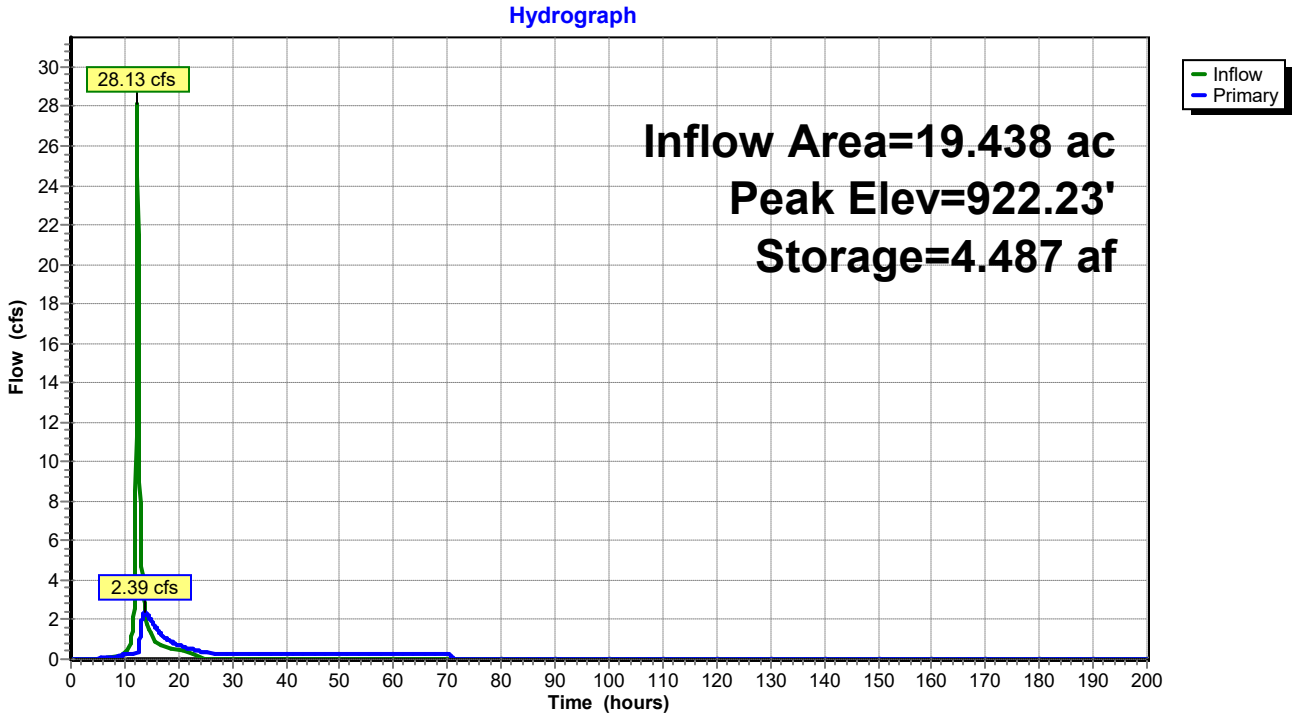
Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	9.359 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
913.00	0.209	0.000	0.000
914.00	0.242	0.226	0.226
916.00	0.314	0.556	0.781
918.00	0.396	0.710	1.491
920.00	0.491	0.887	2.378
921.00	0.662	0.576	2.955
921.01	1.049	0.009	2.964
922.00	1.255	1.140	4.104
924.00	2.149	3.404	7.508
925.00	1.553	1.851	9.359

Device	Routing	Invert	Outlet Devices
#1	Primary	918.50'	**36.0" Round Culvert** L= 113.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.50' / 918.00' S= 0.0044 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	922.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	923.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	920.00'	**21.0" Round Culvert** L= 45.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 920.00' S= -0.0444 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	921.00'	**0.31 cfs Exfiltration when above 921.00'** Phase-In= 0.01'

Primary OutFlow Max=2.39 cfs @ 13.75 hrs HW=922.23' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.39 cfs of 44.71 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Weir Controls 2.08 cfs @ 1.55 fps)
  │ └─**4=Culvert** (Passes 2.08 cfs of 5.49 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Exfiltration** (Exfiltration Controls 0.31 cfs)

Pond 10P: Proposed Northeast Pond/Filtration



Summary for Pond 25P: Proposed Northwest Pond/Filtration

Inflow Area = 15.059 ac, 29.82% Impervious, Inflow Depth = 1.34" for NURP event
Inflow = 22.84 cfs @ 12.26 hrs, Volume= 1.680 af
Outflow = 0.54 cfs @ 11.00 hrs, Volume= 1.680 af, Atten= 98%, Lag= 0.0 min
Primary = 0.54 cfs @ 11.00 hrs, Volume= 1.680 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 925.00' Surf.Area= 0.322 ac Storage= 1.156 af
Peak Elev= 925.98' @ 16.27 hrs Surf.Area= 1.292 ac Storage= 2.306 af (1.150 af above start)
Flood Elev= 926.50' Surf.Area= 1.369 ac Storage= 3.002 af (1.846 af above start)

Plug-Flow detention time= 1,761.9 min calculated for 0.524 af (31% of inflow)
Center-of-Mass det. time= 868.3 min (1,667.0 - 798.7)

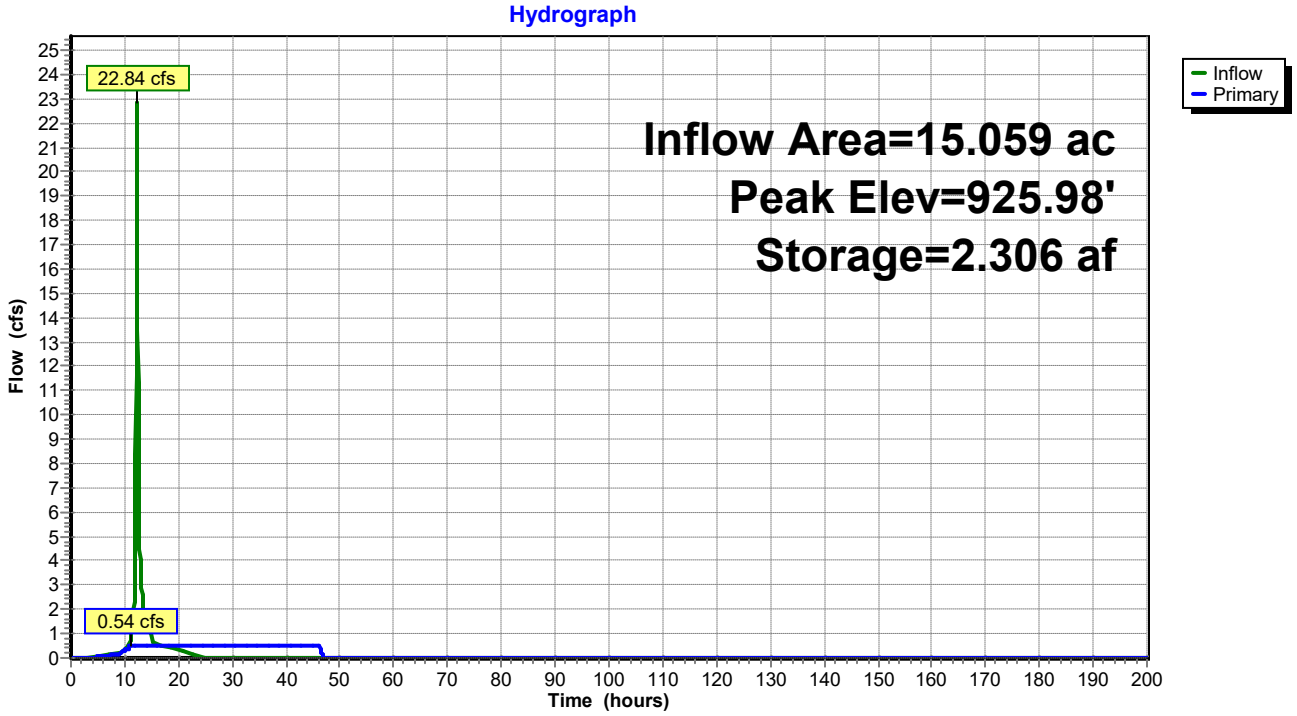
Volume	Invert	Avail.Storage	Storage Description
#1	917.00'	5.216 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
917.00	0.052	0.000	0.000
918.00	0.069	0.061	0.061
920.00	0.110	0.179	0.239
922.00	0.160	0.270	0.509
924.00	0.217	0.377	0.887
925.00	0.322	0.269	1.156
925.01	1.071	0.007	1.163
926.00	1.297	1.172	2.335
928.00	1.584	2.881	5.216

Device	Routing	Invert	Outlet Devices
#1	Primary	922.50'	**21.0" Round Culvert** L= 46.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.50' / 922.00' S= 0.0109 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	926.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	927.40'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	922.00'	**18.0" Round Culvert** L= 42.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 921.00' S= 0.0238 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#5	Device 1	925.00'	**0.54 cfs Exfiltration when above 925.00'** Phase-In= 0.01'

Primary OutFlow Max=0.54 cfs @ 11.00 hrs HW=925.01' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.54 cfs of 14.66 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
    - **4=Culvert** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Exfiltration** (Exfiltration Controls 0.54 cfs)

Pond 25P: Proposed Northwest Pond/Filtration



Summary for Pond 26P: Proposed Northwest Central Pond/Filtration

Inflow Area = 7.518 ac, 41.97% Impervious, Inflow Depth = 1.52" for NURP event
Inflow = 10.27 cfs @ 12.16 hrs, Volume= 0.953 af
Outflow = 0.37 cfs @ 11.30 hrs, Volume= 0.953 af, Atten= 96%, Lag= 0.0 min
Primary = 0.37 cfs @ 11.30 hrs, Volume= 0.953 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.00' Surf.Area= 0.318 ac Storage= 0.894 af
Peak Elev= 924.65' @ 17.18 hrs Surf.Area= 0.875 ac Storage= 1.427 af (0.533 af above start)
Flood Elev= 925.50' Surf.Area= 0.997 ac Storage= 2.227 af (1.333 af above start)

Plug-Flow detention time= 2,381.8 min calculated for 0.059 af (6% of inflow)
Center-of-Mass det. time= 605.1 min (1,554.1 - 949.0)

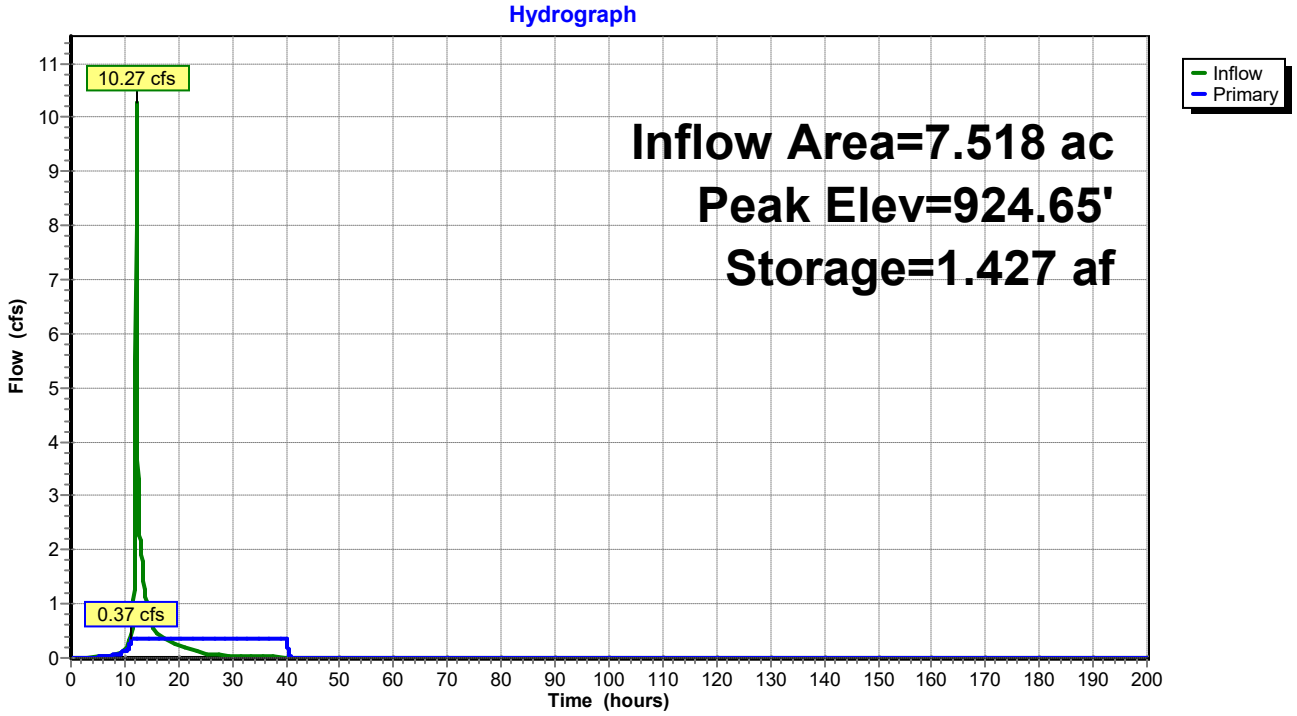
Volume	Invert	Avail.Storage	Storage Description
#1	916.00'	3.855 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.00	0.009	0.000	0.000
918.00	0.045	0.054	0.054
920.00	0.099	0.144	0.198
922.00	0.162	0.261	0.459
923.00	0.195	0.179	0.637
924.00	0.318	0.256	0.894
924.01	0.784	0.006	0.900
926.00	1.069	1.844	2.743
927.00	1.155	1.112	3.855

Device	Routing	Invert	Outlet Devices
#1	Primary	921.50'	**21.0" Round Culvert** L= 86.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.50' / 921.00' S= 0.0058 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#2	Device 1	925.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	926.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	921.00'	**21.0" Round Culvert** L= 44.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 921.00' S= -0.0227 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf
#5	Device 1	924.00'	**0.37 cfs Exfiltration when above 924.00'** Phase-In= 0.01'

Primary OutFlow Max=0.37 cfs @ 11.30 hrs HW=924.01' TW=920.72' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.37 cfs of 12.99 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
    - **4=Culvert** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Exfiltration** (Exfiltration Controls 0.37 cfs)

Pond 26P: Proposed Northwest Central Pond/Filtration



Summary for Pond 27P: Proposed Northwest Central Pond

Inflow Area = 3.120 ac, 47.02% Impervious, Inflow Depth = 1.63" for NURP event
Inflow = 7.60 cfs @ 12.16 hrs, Volume= 0.423 af
Outflow = 1.32 cfs @ 12.55 hrs, Volume= 0.420 af, Atten= 83%, Lag= 23.7 min
Primary = 1.32 cfs @ 12.55 hrs, Volume= 0.420 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 924.50' Surf.Area= 0.278 ac Storage= 0.732 af
Peak Elev= 925.19' @ 12.55 hrs Surf.Area= 0.376 ac Storage= 0.958 af (0.226 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 378.0 min (1,157.1 - 779.1)

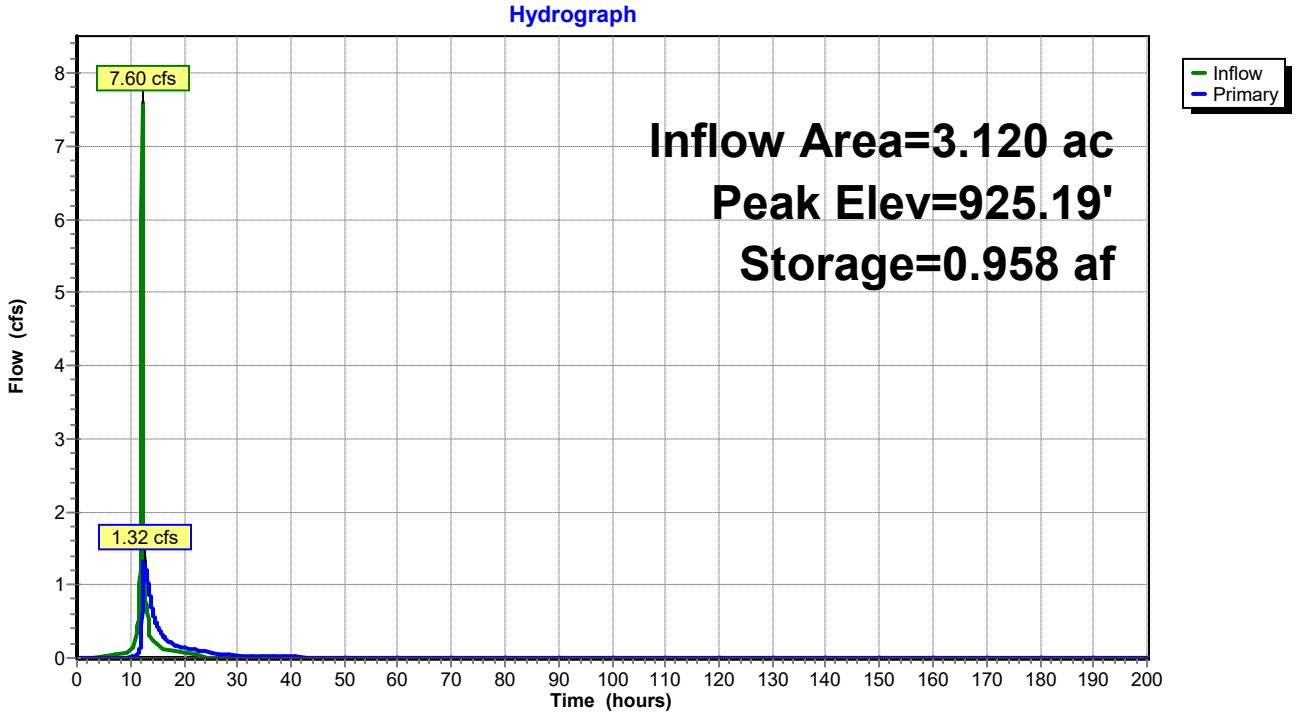
Volume	Invert	Avail.Storage	Storage Description
#1	916.50'	1.797 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
916.50	0.015	0.000	0.000
917.00	0.019	0.008	0.008
918.00	0.031	0.025	0.033
920.00	0.063	0.094	0.128
922.00	0.114	0.177	0.304
923.50	0.162	0.207	0.512
924.50	0.278	0.220	0.732
925.50	0.420	0.349	1.081
926.00	0.459	0.220	1.300
927.00	0.535	0.497	1.797

Device	Routing	Invert	Outlet Devices
#1	Primary	924.50'	**18.0" Round Culvert** L= 225.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.50' / 924.00' S= 0.0022 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	926.50'	**48.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.00' / 923.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=1.32 cfs @ 12.55 hrs HW=925.19' TW=924.38' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.32 cfs @ 2.43 fps)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**3=Culvert** (Passes 1.32 cfs of 7.08 cfs potential flow)

Pond 27P: Proposed Northwest Central Pond



Summary for Pond 28P: Proposed Northeast Central Pond

Inflow Area = 7.153 ac, 50.64% Impervious, Inflow Depth = 1.64" for NURP event
Inflow = 14.27 cfs @ 12.22 hrs, Volume= 0.979 af
Outflow = 7.78 cfs @ 12.41 hrs, Volume= 0.979 af, Atten= 45%, Lag= 10.9 min
Primary = 7.78 cfs @ 12.41 hrs, Volume= 0.979 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 922.00' Surf.Area= 0.380 ac Storage= 1.043 af
Peak Elev= 922.62' @ 12.41 hrs Surf.Area= 0.495 ac Storage= 1.314 af (0.271 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 43.8 min (826.5 - 782.7)

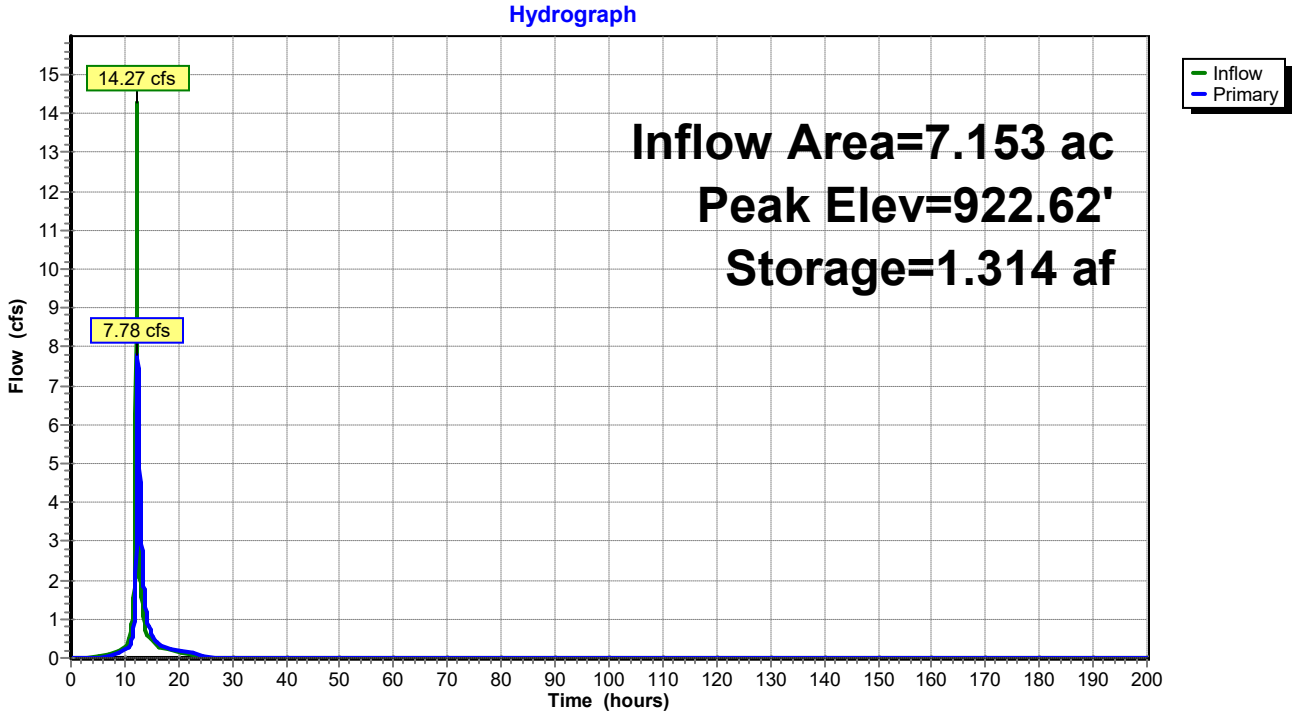
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	2.802 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.00	0.034	0.000	0.000
916.00	0.065	0.099	0.099
918.00	0.109	0.174	0.273
920.00	0.172	0.281	0.554
921.00	0.213	0.192	0.746
922.00	0.380	0.297	1.043
923.00	0.565	0.472	1.515
924.00	0.642	0.603	2.119
925.00	0.724	0.683	2.802

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**24.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.80' S= 0.0057 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	923.25'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	922.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 3	919.00'	**21.0" Round Culvert** L= 33.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 918.00' / 919.00' S= -0.0303 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=7.77 cfs @ 12.41 hrs HW=922.62' TW=921.45' (Dynamic Tailwater)
- **1=Culvert** (Passes 7.77 cfs of 9.09 cfs potential flow)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Sharp-Crested Rectangular Weir** (Weir Controls 7.77 cfs @ 2.57 fps)
  - **4=Culvert** (Passes 7.77 cfs of 9.11 cfs potential flow)

Pond 28P: Proposed Northeast Central Pond



Summary for Pond 30P: Wetland 4A

[44] Hint: Outlet device #5 is below defined storage
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 357.822 ac, 1.86% Impervious, Inflow Depth = 0.17" for NURP event
Inflow = 47.98 cfs @ 12.38 hrs, Volume= 4.954 af
Outflow = 19.31 cfs @ 12.92 hrs, Volume= 4.954 af, Atten= 60%, Lag= 32.9 min
Primary = 16.33 cfs @ 12.90 hrs, Volume= 3.025 af
Secondary = 2.99 cfs @ 13.05 hrs, Volume= 1.929 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 925.60' @ 12.90 hrs Surf.Area= 3.237 ac Storage= 1.044 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 16.0 min (847.2 - 831.2)

Volume	Invert	Avail.Storage	Storage Description
#1	923.50'	15.942 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

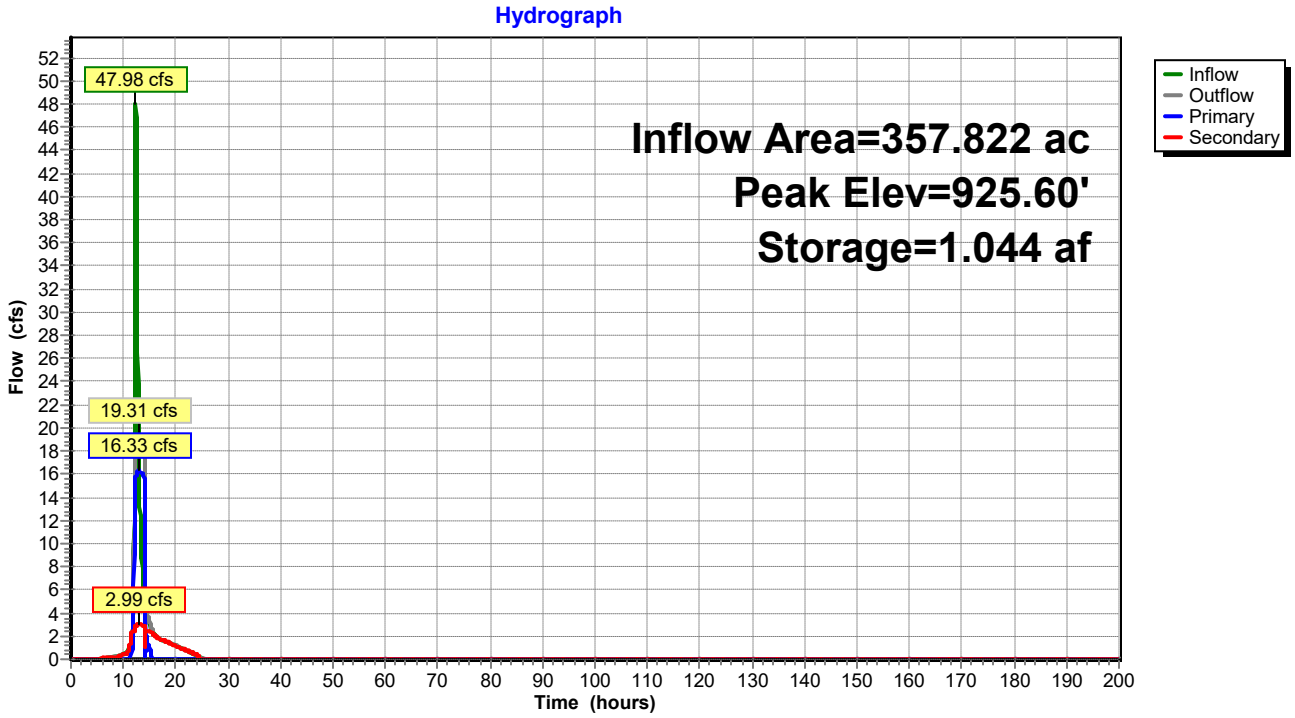
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.50	0.011	0.000	0.000
924.00	0.027	0.009	0.009
925.00	0.058	0.042	0.052
926.00	5.338	2.698	2.750
927.00	6.566	5.952	8.702
928.00	7.914	7.240	15.942

Device	Routing	Invert	Outlet Devices
#1	Primary	921.11'	**36.0" Round 36" RCP** L= 307.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 921.11' / 920.50' S= 0.0020 '/' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 7.07 sf
#2	Device 1	926.00'	**60.0" Horiz. CBMH-3003** C= 0.600 Limited to weir flow at low heads
#3	Device 1	921.17'	**18.0" Round 18" RCP** L= 23.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 921.17' / 921.11' S= 0.0026 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#4	Device 3	923.50'	**48.0" Horiz. CBMH-3004** C= 0.600 Limited to weir flow at low heads
#5	Secondary	919.60'	**12.0" Round 12" Draintile** L= 553.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.34' / 919.60' S= -0.0005 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=16.33 cfs @ 12.90 hrs HW=925.60' TW=921.37' (Dynamic Tailwater)
└─**1=36" RCP** (Passes 16.33 cfs of 42.59 cfs potential flow)
  └─**2=CBMH-3003** (Controls 0.00 cfs)
  └─**3=18" RCP** (Inlet Controls 16.33 cfs @ 9.24 fps)
    └─**4=CBMH-3004** (Passes 16.33 cfs of 87.73 cfs potential flow)

Secondary OutFlow Max=2.99 cfs @ 13.05 hrs HW=925.59' TW=921.35' (Dynamic Tailwater)
└─**5=12" Draintile** (Outlet Controls 2.99 cfs @ 3.81 fps)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[80] Warning: Exceeded Pond 7P by 1.86' @ 12.60 hrs (95.23 cfs 4.382 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth = 0.05" for NURP event
Inflow = 10.74 cfs @ 12.60 hrs, Volume= 1.346 af
Outflow = 10.74 cfs @ 12.60 hrs, Volume= 1.346 af, Atten= 0%, Lag= 0.4 min
Primary = 10.74 cfs @ 12.60 hrs, Volume= 1.346 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 931.92' @ 12.60 hrs Surf.Area= 0.005 ac Storage= 0.004 af

Plug-Flow detention time= 0.2 min calculated for 1.346 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (844.7 - 844.5)

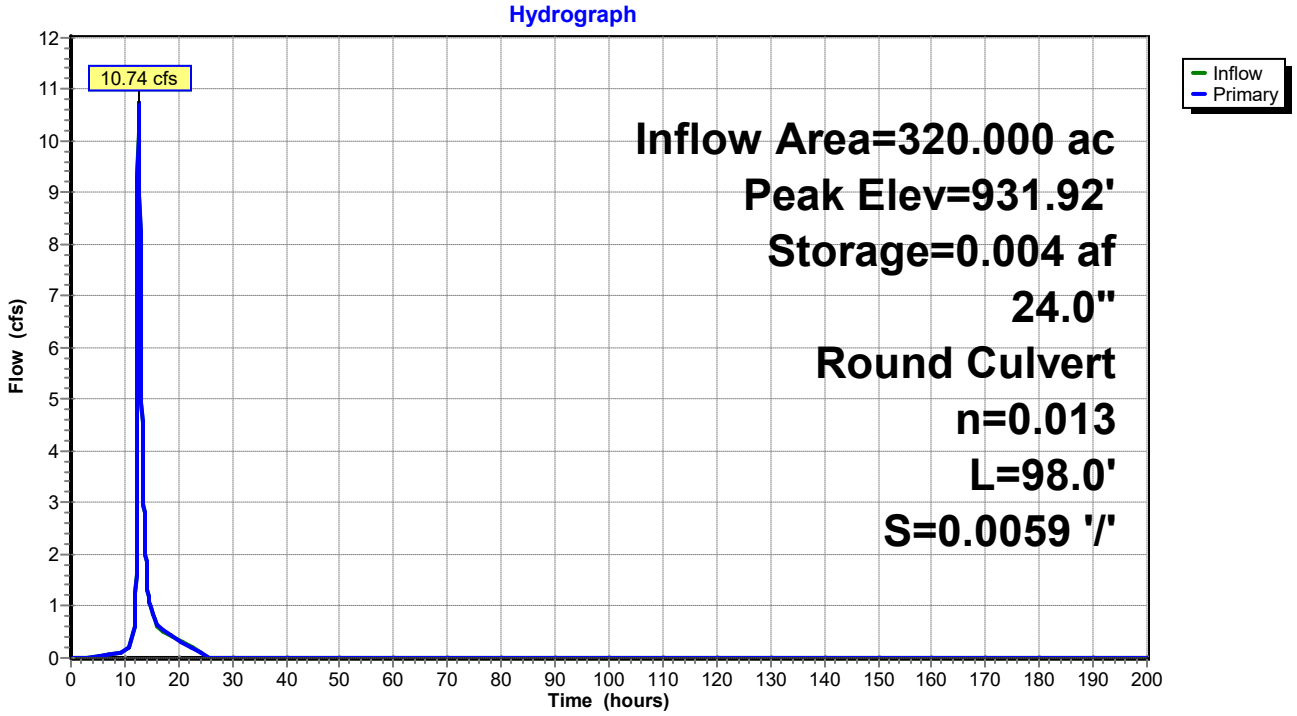
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=10.73 cfs @ 12.60 hrs HW=931.92' TW=925.54' (Dynamic Tailwater)
1=Culvert (Barrel Controls 10.73 cfs @ 5.07 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 32P: Proposed West Central Pond

Inflow Area = 3.686 ac, 36.52% Impervious, Inflow Depth = 1.50" for NURP event
Inflow = 8.91 cfs @ 12.14 hrs, Volume= 0.461 af
Outflow = 3.50 cfs @ 12.30 hrs, Volume= 0.461 af, Atten= 61%, Lag= 9.3 min
Primary = 3.50 cfs @ 12.30 hrs, Volume= 0.461 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.00' Surf.Area= 0.395 ac Storage= 1.213 af
Peak Elev= 928.36' @ 12.30 hrs Surf.Area= 0.452 ac Storage= 1.366 af (0.153 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 57.5 min (841.4 - 783.9)

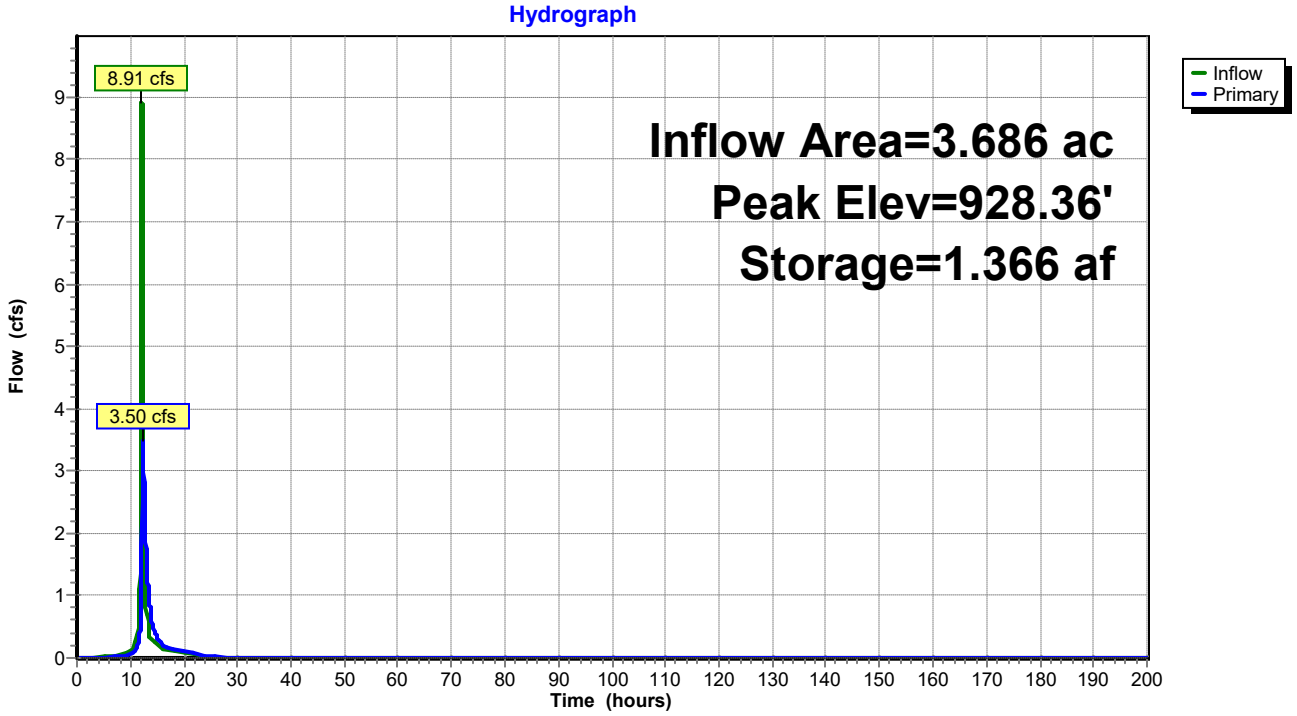
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	2.284 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.034	0.000	0.000
922.00	0.073	0.107	0.107
924.00	0.134	0.207	0.314
926.00	0.211	0.345	0.659
927.00	0.251	0.231	0.890
928.00	0.395	0.323	1.213
929.00	0.554	0.475	1.687
930.00	0.638	0.596	2.284

Device	Routing	Invert	Outlet Devices
#1	Primary	923.05'	**18.0" Round Culvert** L= 212.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.05' / 922.52' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	929.50'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	925.00'	**21.0" Round Culvert** L= 20.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0500 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 2.41 sf

Primary OutFlow Max=3.50 cfs @ 12.30 hrs HW=928.36' TW=925.25' (Dynamic Tailwater)
- **1=Culvert** (Passes 3.50 cfs of 10.78 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Weir Controls 3.50 cfs @ 1.96 fps)
    - **4=Culvert** (Passes 3.50 cfs of 6.96 cfs potential flow)
  - **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 32P: Proposed West Central Pond



Summary for Pond 40P: Wetland 2B

Inflow Area = 133.857 ac, 9.96% Impervious, Inflow Depth = 1.18" for NURP event
Inflow = 105.34 cfs @ 12.35 hrs, Volume= 13.108 af
Outflow = 15.75 cfs @ 13.66 hrs, Volume= 13.108 af, Atten= 85%, Lag= 78.7 min
Primary = 15.75 cfs @ 13.66 hrs, Volume= 13.108 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 924.97' @ 13.66 hrs Surf.Area= 8.050 ac Storage= 5.065 af

Plug-Flow detention time= 216.9 min calculated for 13.108 af (100% of inflow)
Center-of-Mass det. time= 216.9 min (1,224.8 - 1,007.9)

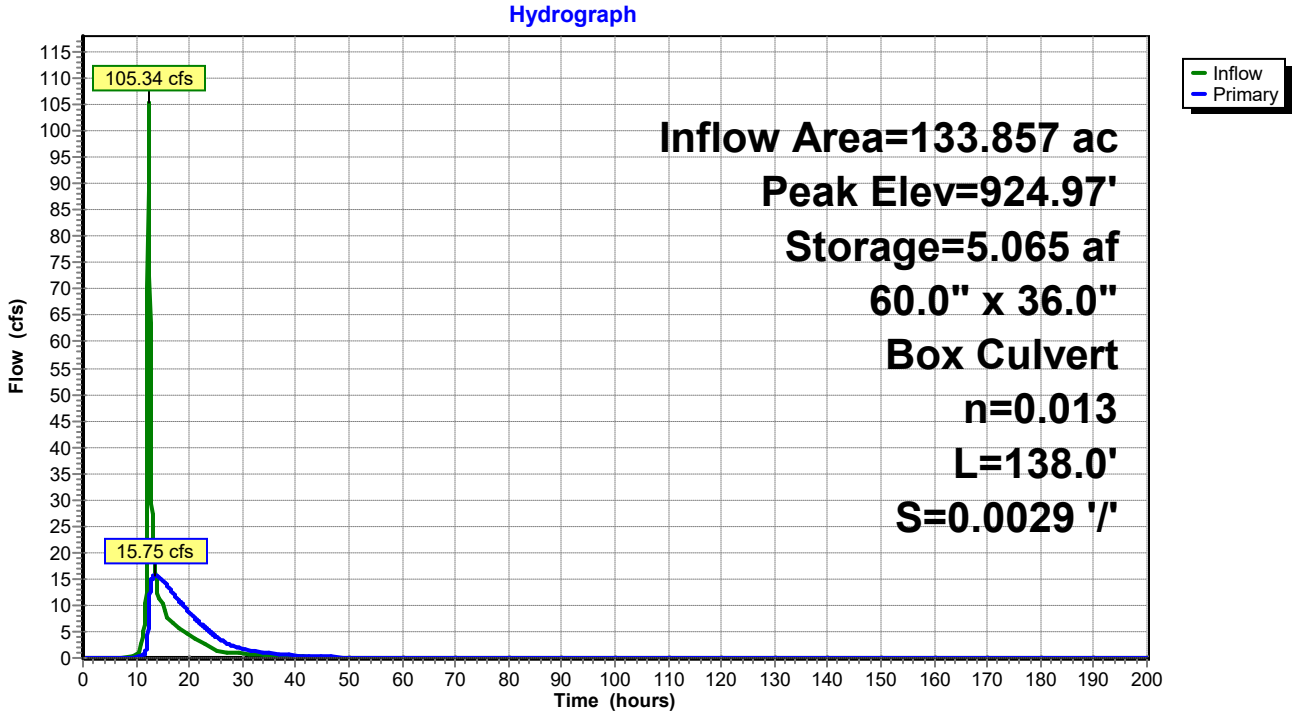
Volume	Invert	Avail.Storage	Storage Description
#1	923.90'	52.747 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.90	0.000	0.000	0.000
924.00	2.123	0.106	0.106
926.00	14.283	16.406	16.512
928.00	21.952	36.235	52.747

Device	Routing	Invert	Outlet Devices
#1	Primary	923.90'	**60.0" W x 36.0" H Box Culvert** L= 138.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 923.90' / 923.50' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 15.00 sf

Primary OutFlow Max=15.75 cfs @ 13.66 hrs HW=924.97' TW=924.18' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 15.75 cfs @ 3.91 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 1.07" for NURP event
Inflow = 21.24 cfs @ 12.18 hrs, Volume= 1.228 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 939.12' @ 24.60 hrs Surf.Area= 1.223 ac Storage= 1.228 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

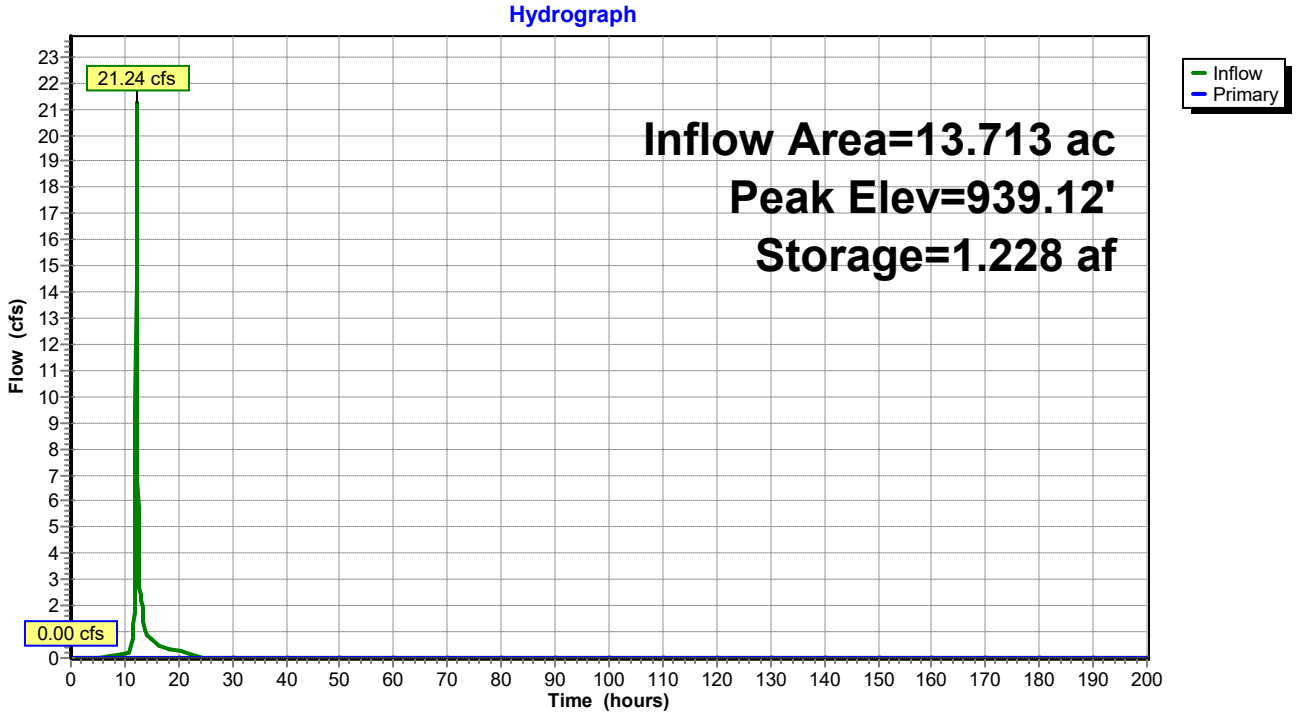
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=936.00' TW=923.90' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond 41P: Ex South Off-site Pond



Summary for Pond 42P: Proposed South Central Pond

Inflow Area = 2.612 ac, 32.54% Impervious, Inflow Depth = 1.34" for NURP event
Inflow = 4.90 cfs @ 12.18 hrs, Volume= 0.291 af
Outflow = 1.68 cfs @ 12.42 hrs, Volume= 0.291 af, Atten= 66%, Lag= 14.4 min
Primary = 1.68 cfs @ 12.42 hrs, Volume= 0.291 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 928.50' Surf.Area= 0.154 ac Storage= 0.309 af
Peak Elev= 929.13' @ 12.42 hrs Surf.Area= 0.211 ac Storage= 0.424 af (0.115 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 128.5 min (919.0 - 790.5)

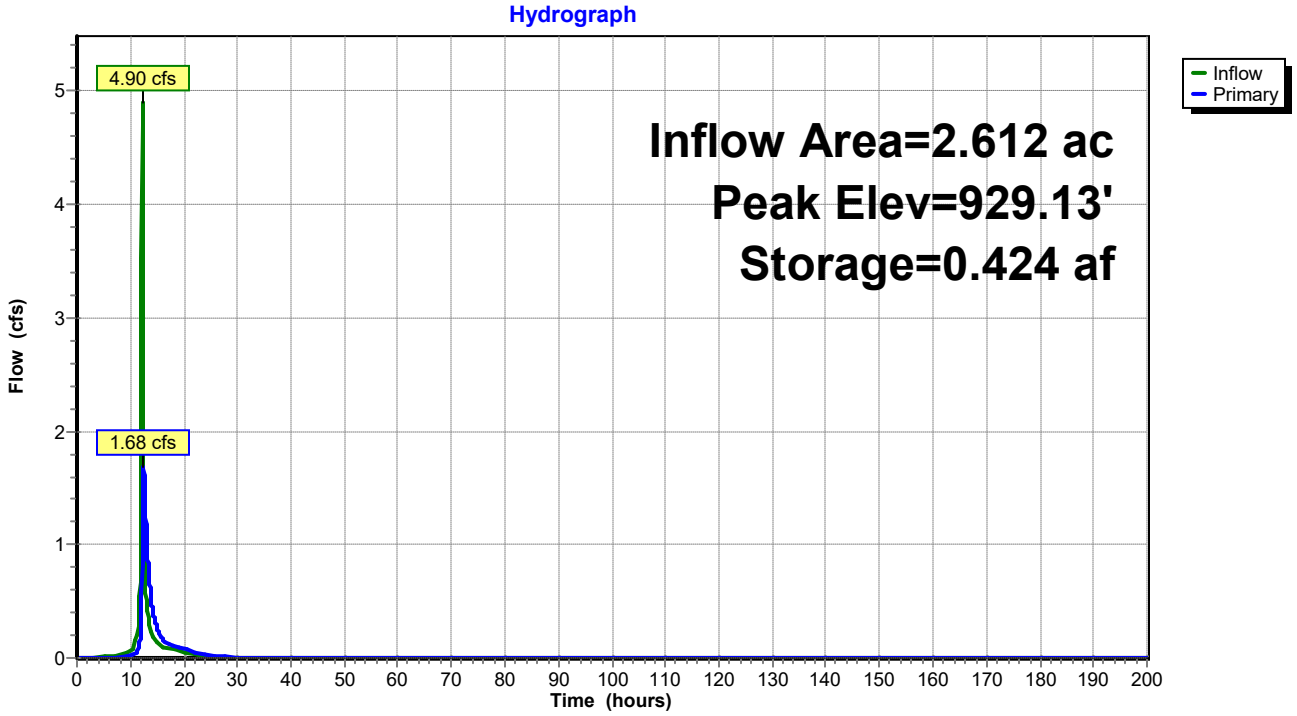
Volume	Invert	Avail.Storage	Storage Description
#1	922.00'	1.122 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
922.00	0.004	0.000	0.000
924.00	0.022	0.026	0.026
926.00	0.050	0.072	0.098
927.50	0.078	0.096	0.194
928.00	0.114	0.048	0.242
928.50	0.154	0.067	0.309
929.50	0.244	0.199	0.508
930.00	0.274	0.130	0.637
931.50	0.372	0.484	1.122

Device	Routing	Invert	Outlet Devices
#1	Primary	928.50'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 928.50' / 928.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	930.20'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	927.00'	**15.0" Round Culvert** L= 39.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.00' / 927.00' S= -0.0256 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

Primary OutFlow Max=1.68 cfs @ 12.42 hrs HW=929.13' TW=924.66' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.68 cfs @ 2.70 fps)
↑**2=Orifice/Grate** (Controls 0.00 cfs)
3=Culvert (Passes 1.68 cfs of 4.69 cfs potential flow)

Pond 42P: Proposed South Central Pond



Summary for Pond 43P: Proposed East Central Pond

Inflow Area = 6.873 ac, 41.00% Impervious, Inflow Depth = 1.52" for NURP event
Inflow = 12.59 cfs @ 12.23 hrs, Volume= 0.870 af
Outflow = 3.40 cfs @ 12.61 hrs, Volume= 0.868 af, Atten= 73%, Lag= 22.7 min
Primary = 3.40 cfs @ 12.61 hrs, Volume= 0.868 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Starting Elev= 926.50' Surf.Area= 0.401 ac Storage= 1.319 af
Peak Elev= 927.37' @ 12.61 hrs Surf.Area= 0.545 ac Storage= 1.733 af (0.413 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 201.8 min (990.4 - 788.5)

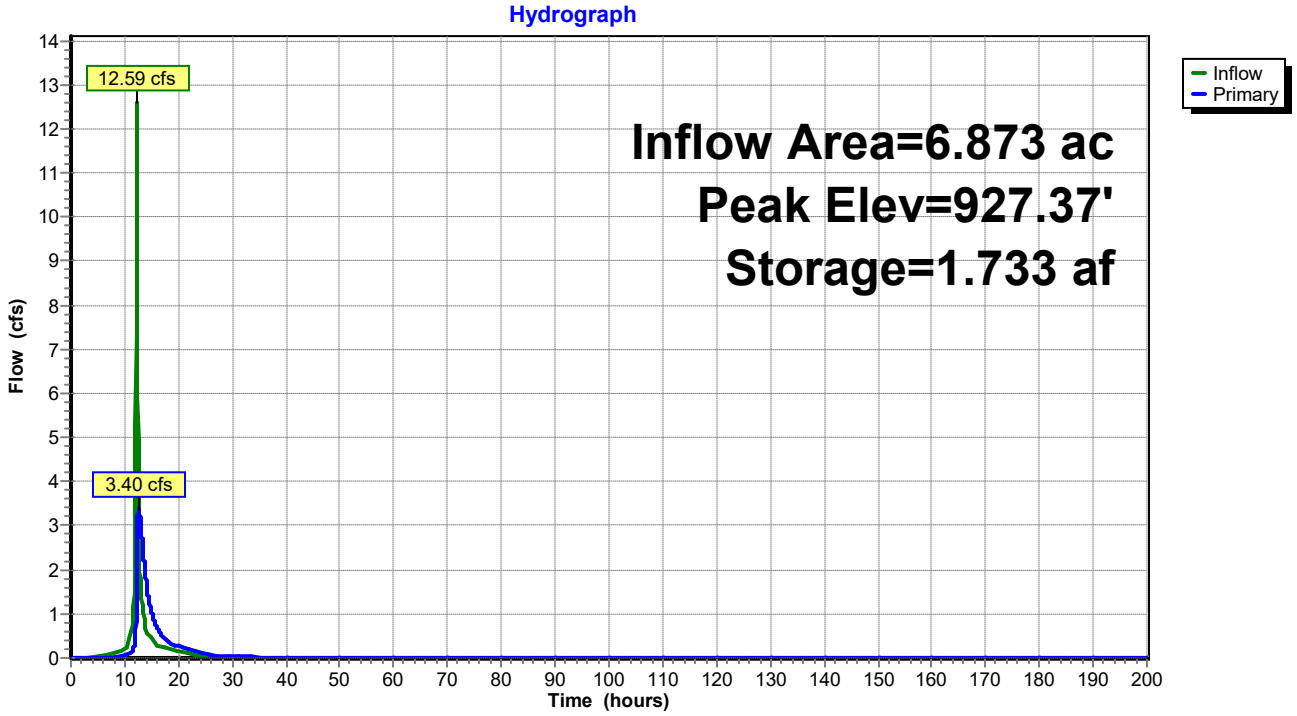
Volume	Invert	Avail.Storage	Storage Description
#1	918.50'	3.505 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
918.50	0.053	0.000	0.000
920.00	0.083	0.102	0.102
922.00	0.135	0.218	0.320
924.00	0.199	0.334	0.654
925.50	0.254	0.340	0.994
926.00	0.324	0.144	1.138
926.50	0.401	0.181	1.319
927.50	0.566	0.484	1.803
928.00	0.619	0.296	2.099
930.00	0.787	1.406	3.505

Device	Routing	Invert	Outlet Devices
#1	Primary	926.50'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.50' / 926.00' S= 0.0172 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	928.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	925.00'	**18.0" Round Culvert** L= 29.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 924.00' / 925.00' S= -0.0345 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=3.39 cfs @ 12.61 hrs HW=927.37' TW=924.83' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 3.39 cfs @ 3.18 fps)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Culvert** (Passes 3.39 cfs of 7.95 cfs potential flow)

Pond 43P: Proposed East Central Pond



Summary for Pond 50P: Wetland 4B

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth = 0.53" for NURP event
Inflow = 17.34 cfs @ 12.39 hrs, Volume= 1.737 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 940.02' @ 200.00 hrs Surf.Area= 70,601 sf Storage= 75,669 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

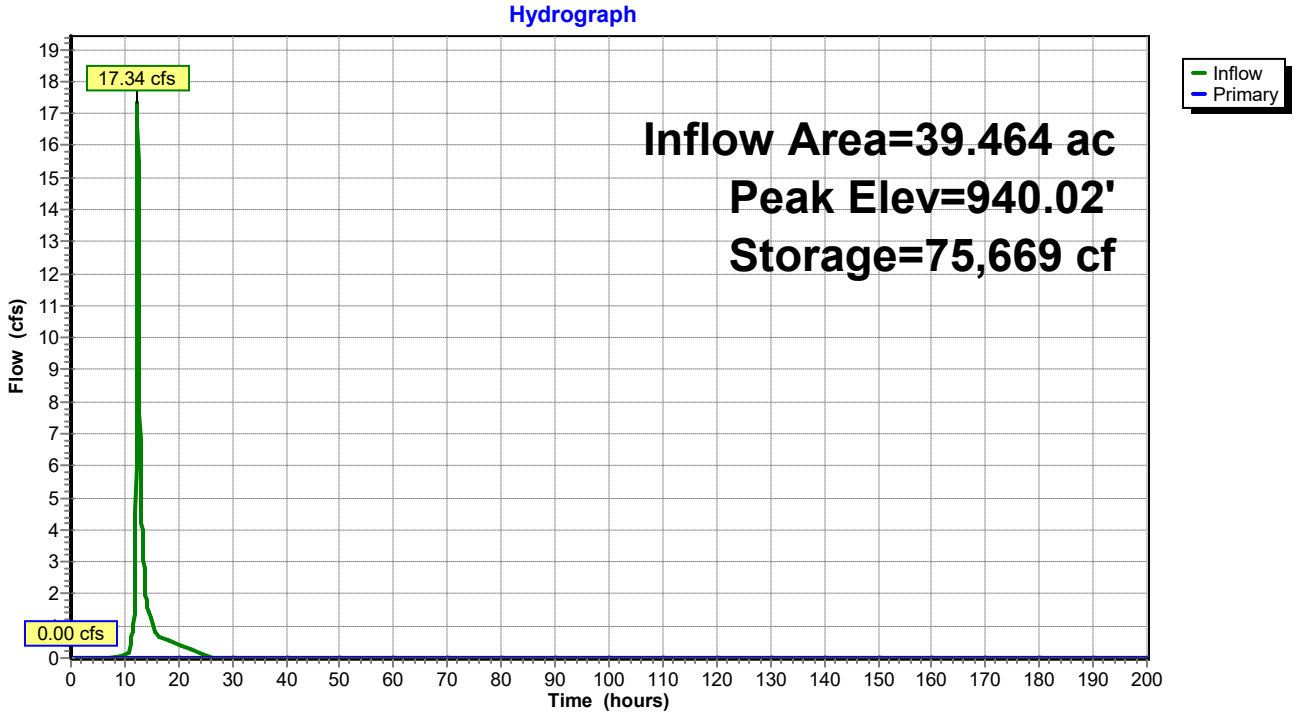
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	303,458 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
938.00	4,444	0	0
940.00	69,653	74,097	74,097
941.00	111,935	90,794	164,891
942.00	165,198	138,567	303,458

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=938.00' TW=923.90' (Dynamic Tailwater)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth > 13.58" for NURP event
Inflow = 9.74 cfs @ 12.13 hrs, Volume= 4.254 af
Outflow = 4.34 cfs @ 15.02 hrs, Volume= 4.040 af, Atten= 55%, Lag= 173.4 min
Primary = 4.34 cfs @ 15.02 hrs, Volume= 4.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 938.62' @ 15.02 hrs Surf.Area= 10,895 sf Storage= 10,559 cf

Plug-Flow detention time= 194.0 min calculated for 4.040 af (95% of inflow)
Center-of-Mass det. time= 41.2 min (1,393.1 - 1,351.9)

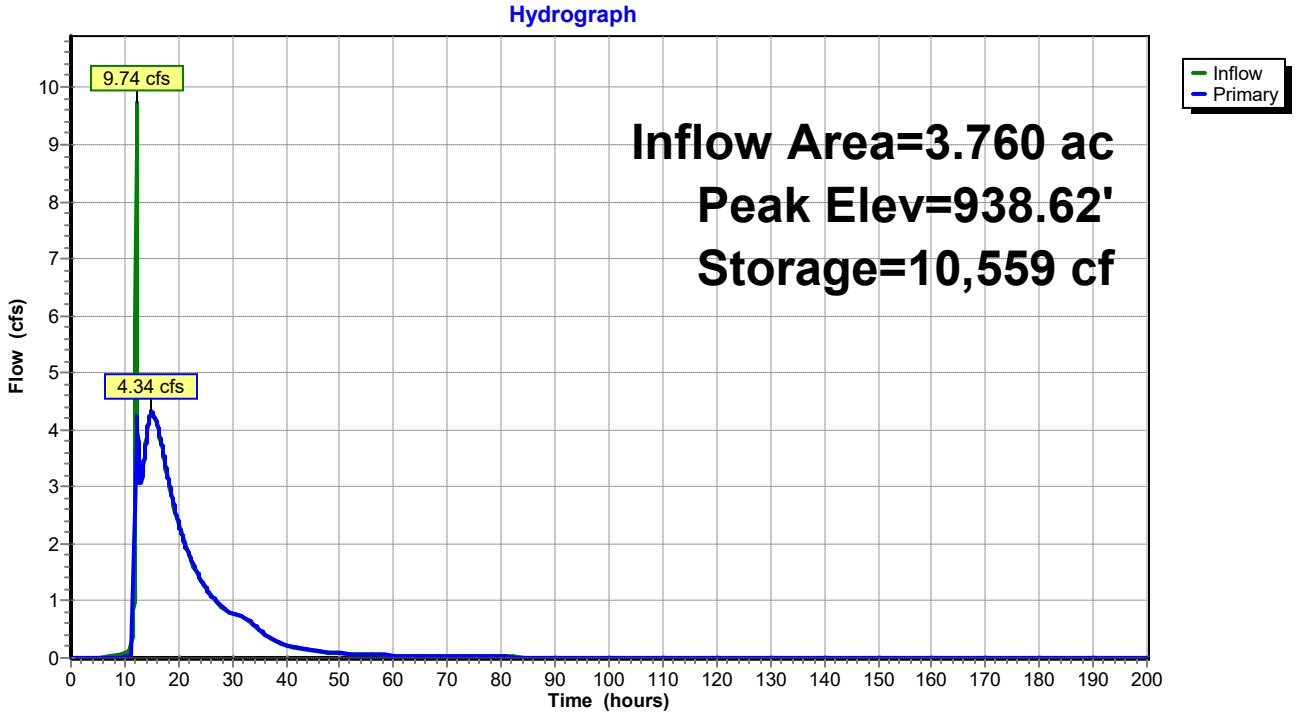
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	15,364 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
936.00	178	0	0
938.00	5,354	5,532	5,532
939.00	14,309	9,832	15,364

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=4.34 cfs @ 15.02 hrs HW=938.62' TW=924.92' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 4.34 cfs @ 1.11 fps)

Pond 60P: Wetland 5B



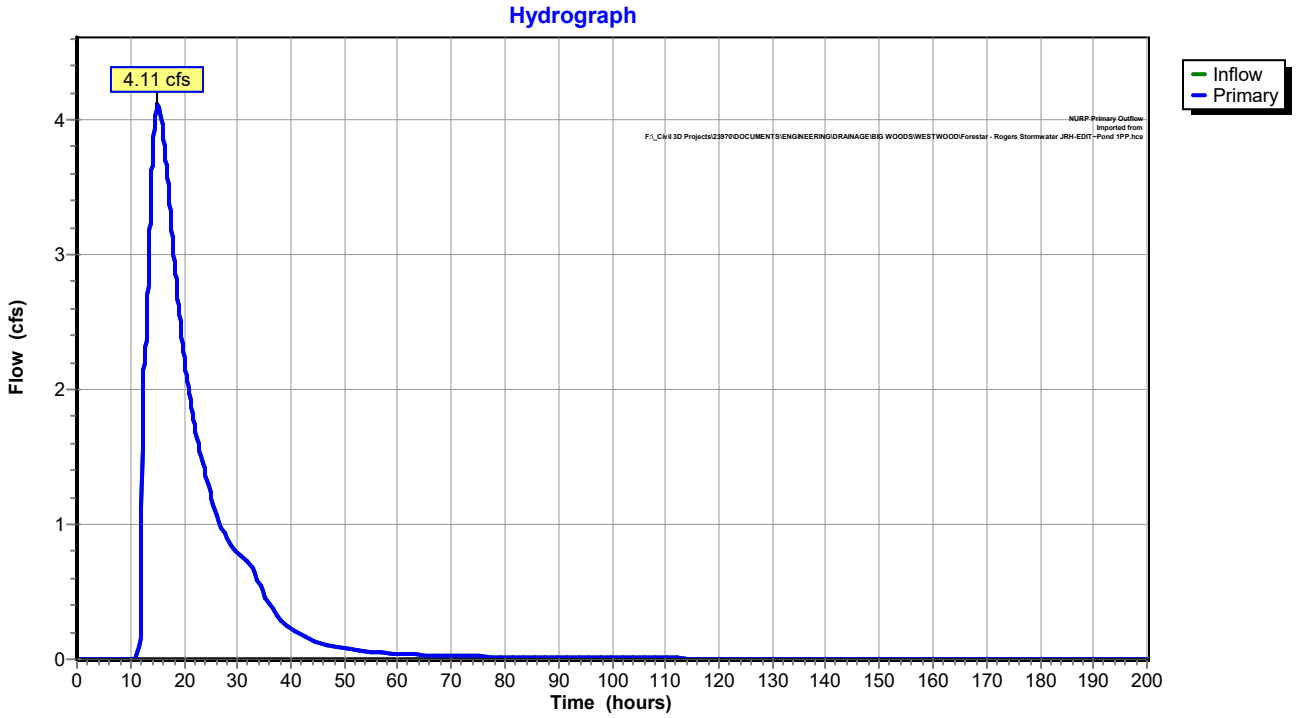
Summary for Link 1PP: Northwest Wetland

Inflow = 4.11 cfs @ 15.12 hrs, Volume= 3.849 af
Primary = 4.11 cfs @ 15.12 hrs, Volume= 3.849 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

NURP Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG WC

Link 1PP: Northwest Wetland



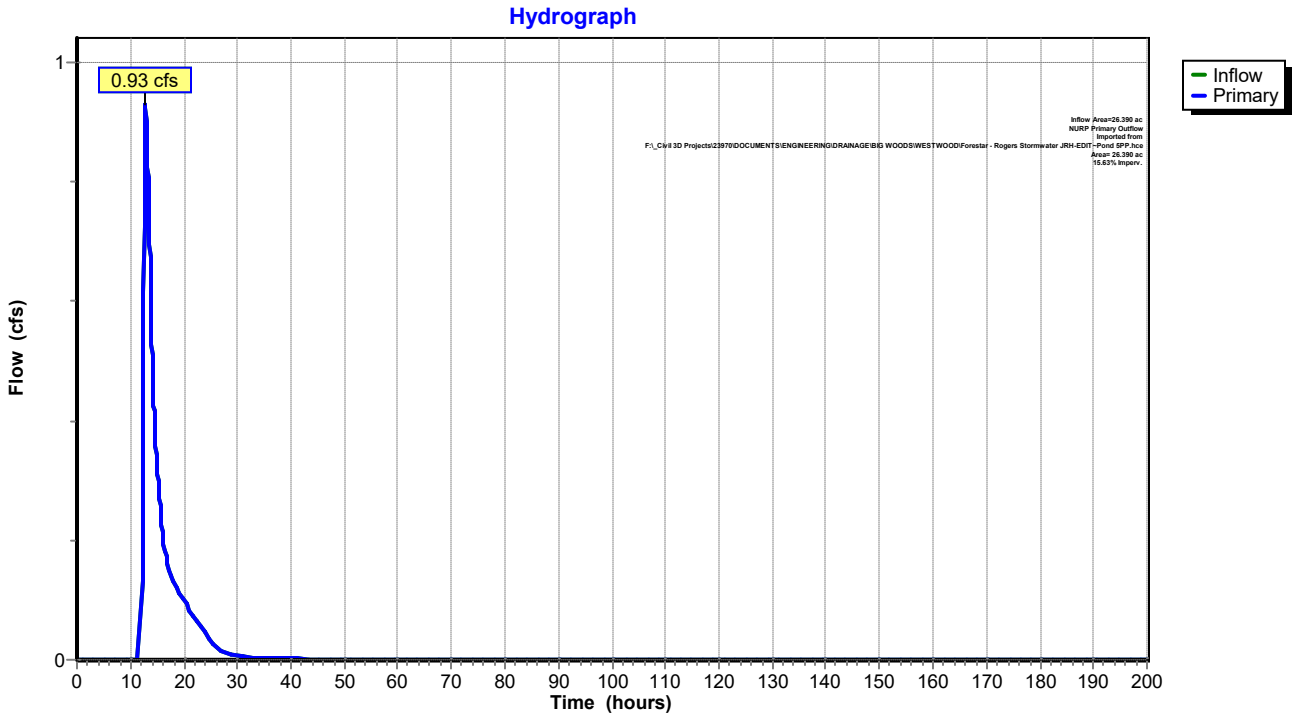
Summary for Link 5PP: Existing Pond

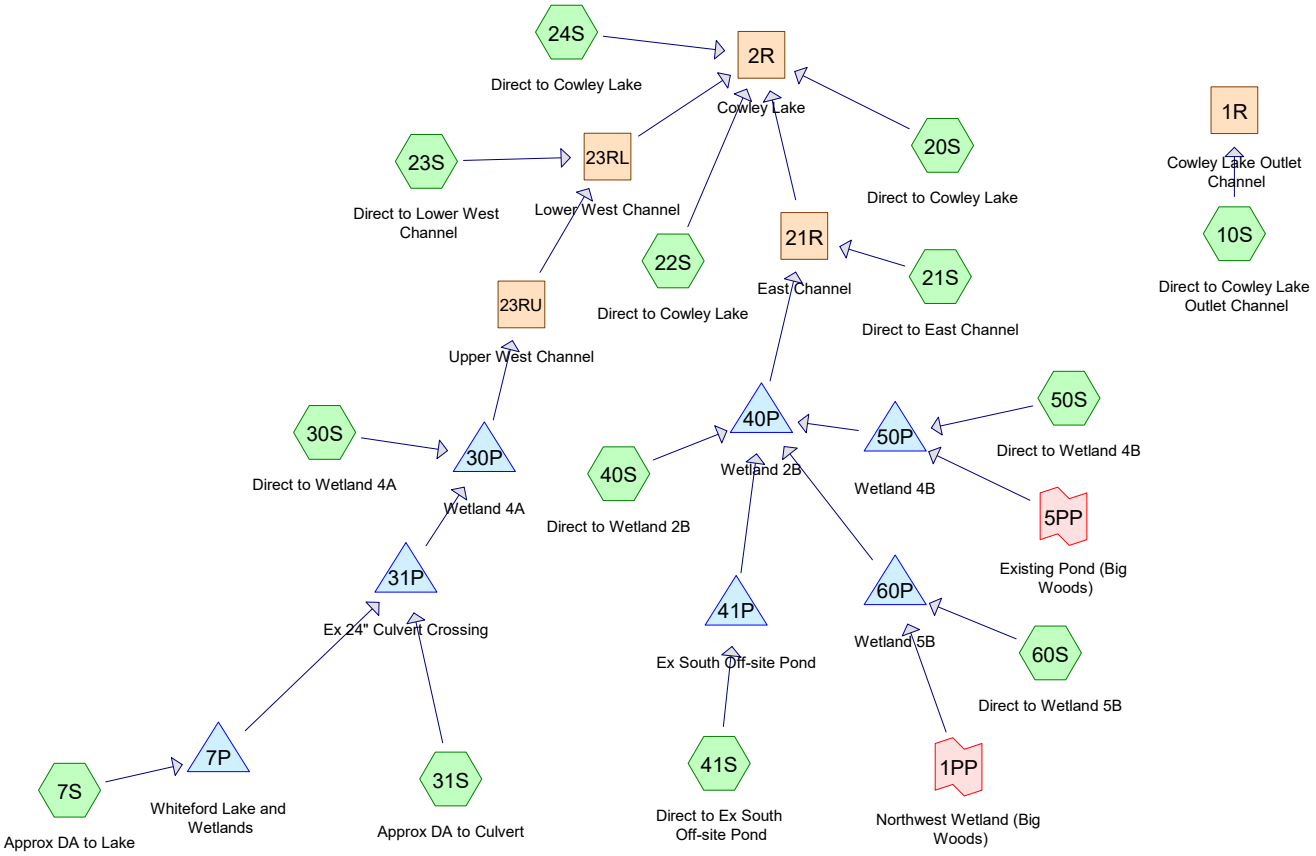
Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth = 0.11" for NURP event
Inflow = 0.93 cfs @ 12.82 hrs, Volume= 0.240 af
Primary = 0.93 cfs @ 12.82 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

NURP Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG WC

Link 5PP: Existing Pond





Subcat Reach Pond Link

Routing Diagram for COWLEY LAKE PRESERVE - EXISTING Rev 1
Prepared by James R. Hill, Inc., Printed 4/15/2025
HydroCAD® 10.00-25 s/n 00744 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
20.000	77	2 acre lots, 12% imp, HSG C (31S)
39.707	80	>75% Grass cover, Good, HSG D (10S, 24S, 30S, 40S, 41S, 50S, 60S)
2.908	96	Gravel surface, HSG D (24S, 30S, 40S, 41S, 50S, 60S)
9.291	78	Meadow, non-grazed, HSG D (10S, 22S, 23S, 24S, 30S, 40S, 41S)
2.775	89	Pasture/grassland/range, Poor, HSG D (30S, 40S, 50S)
120.604	89	Row crops, straight row, Good, HSG D (10S, 20S, 21S, 22S, 23S, 24S, 30S, 40S, 50S)
5.387	98	Unconnected pavement, HSG D (10S, 24S, 30S, 40S, 41S, 50S, 60S)
2.612	98	Unconnected roofs, HSG D (10S, 30S, 40S, 41S, 50S, 60S)
20.608	98	Water Surface, 0% imp, HSG D (10S, 20S, 21S, 22S, 23S, 24S, 40S, 41S, 50S, 60S)
16.301	77	Woods, Good, HSG D (10S, 20S, 21S, 22S, 23S, 24S, 30S, 40S, 60S)
300.000	72	Woods/grass comb., Good, HSG C (7S)
540.193	**78**	**TOTAL AREA**

Time span=0.00-240.00 hrs, dt=0.05 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth=0.73"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min CN=72/0 Runoff=185.67 cfs 18.153 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=25.761 ac 0.80% Impervious Runoff Depth=1.70"
Flow Length=2,175' Tc=29.4 min CN=88/98 Runoff=39.59 cfs 3.653 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=6.216 ac 0.00% Impervious Runoff Depth=1.54"
Flow Length=586' Tc=8.9 min CN=86/0 Runoff=15.30 cfs 0.799 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=1.09"
Flow Length=247' Tc=20.0 min CN=79/0 Runoff=1.07 cfs 0.082 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=5.776 ac 0.00% Impervious Runoff Depth=1.54"
Flow Length=737' Tc=11.1 min CN=86/0 Runoff=13.05 cfs 0.743 af

Subcatchment 23S: Direct to Lower West Runoff Area=9.551 ac 0.00% Impervious Runoff Depth=1.62"
Flow Length=391' Tc=9.5 min CN=87/0 Runoff=23.94 cfs 1.287 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=26.075 ac 1.14% Impervious Runoff Depth=1.70"
Flow Length=998' Tc=13.6 min CN=88/98 Runoff=59.53 cfs 3.705 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=41.507 ac 5.85% Impervious Runoff Depth=1.47"
Flow Length=1,249' Tc=23.4 min CN=84/98 Runoff=62.00 cfs 5.097 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth=1.04"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min CN=74/98 Runoff=14.22 cfs 1.729 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=73.860 ac 2.02% Impervious Runoff Depth=1.79"
Flow Length=1,354' Tc=23.6 min CN=89/98 Runoff=134.60 cfs 11.024 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=1.35"
Flow Length=1,032' Tc=10.2 min CN=80/98 Runoff=26.82 cfs 1.537 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth=1.68"
Flow Length=734' Tc=26.4 min CN=87/98 Runoff=20.94 cfs 1.835 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=1.58"
Flow Length=531' Tc=5.6 min CN=82/98 Runoff=10.21 cfs 0.496 af

Reach 1R: Cowley Lake Outlet Channel Inflow=39.59 cfs 3.653 af
Outflow=39.59 cfs 3.653 af

Reach 2R: Cowley Lake Inflow=111.83 cfs 26.839 af
Outflow=111.83 cfs 26.839 af

Reach 21R: East Channel Avg. Flow Depth=0.76' Max Vel=4.27 fps Inflow=17.07 cfs 16.147 af
n=0.022 L=382.0' S=0.0097 '/' Capacity=131.71 cfs Outflow=17.07 cfs 16.147 af

Reach 23RL: Lower West Channel Avg. Flow Depth=0.77' Max Vel=1.91 fps Inflow=23.94 cfs 5.445 af
n=0.022 L=534.0' S=0.0014 '/' Capacity=257.71 cfs Outflow=21.28 cfs 5.445 af

Reach 23RU: Upper West Channel Avg. Flow Depth=0.31' Max Vel=1.58 fps Inflow=6.48 cfs 4.158 af
n=0.022 L=490.0' S=0.0057 '/' Capacity=766.18 cfs Outflow=6.47 cfs 4.157 af

Pond 7P: Whiteford Lake and Wetlands Peak Elev=930.30' Storage=18.153 af Inflow=185.67 cfs 18.153 af
Outflow=0.00 cfs 0.000 af

Pond 30P: Wetland 4A Peak Elev=926.32' Storage=4.577 af Inflow=71.45 cfs 6.827 af
Outflow=6.48 cfs 4.158 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=932.25' Storage=0.018 af Inflow=14.22 cfs 1.729 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=13.72 cfs 1.729 af

Pond 40P: Wetland 2B Peak Elev=925.21' Storage=7.098 af Inflow=140.55 cfs 16.070 af
Outflow=16.97 cfs 16.066 af

Pond 41P: Ex South Off-site Pond Peak Elev=939.36' Storage=1.537 af Inflow=26.82 cfs 1.537 af
Outflow=0.00 cfs 0.000 af

Pond 50P: Wetland 4B Peak Elev=940.27' Storage=2.164 af Inflow=21.86 cfs 2.164 af
Outflow=0.00 cfs 0.000 af

Pond 60P: Wetland 5B Peak Elev=938.67' Storage=0.254 af Inflow=12.04 cfs 5.261 af
Outflow=7.33 cfs 5.046 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=5.22 cfs 4.764 af
Primary=5.22 cfs 4.764 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=1.61 cfs 0.329 af
Area= 26.390 ac 15.63% Imperv. Primary=1.61 cfs 0.329 af

Total Runoff Area = 540.193 ac Runoff Volume = 50.141 af Average Runoff Depth = 1.11"
98.07% Pervious = 529.794 ac 1.93% Impervious = 10.399 ac

Summary for Subcatchment 7S: Approx DA to Lake

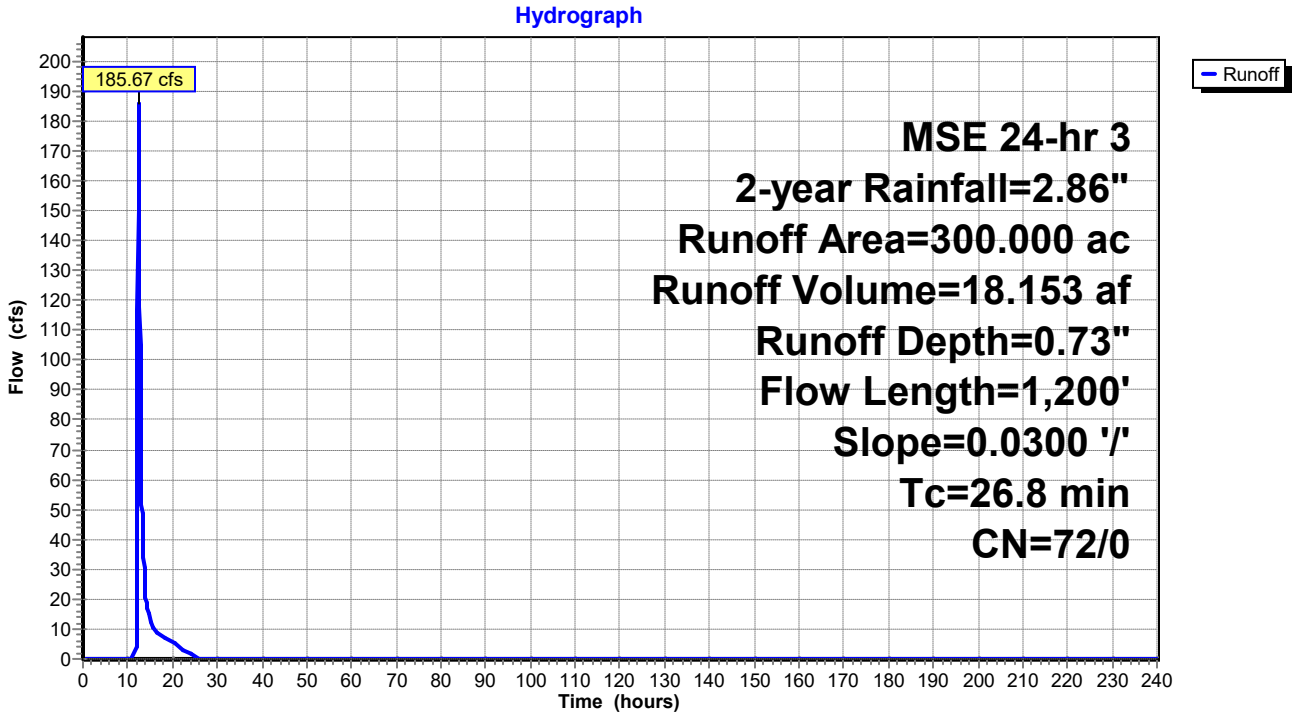
Runoff = 185.67 cfs @ 12.43 hrs, Volume= 18.153 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
300.000	72	Woods/grass comb., Good, HSG C
300.000	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

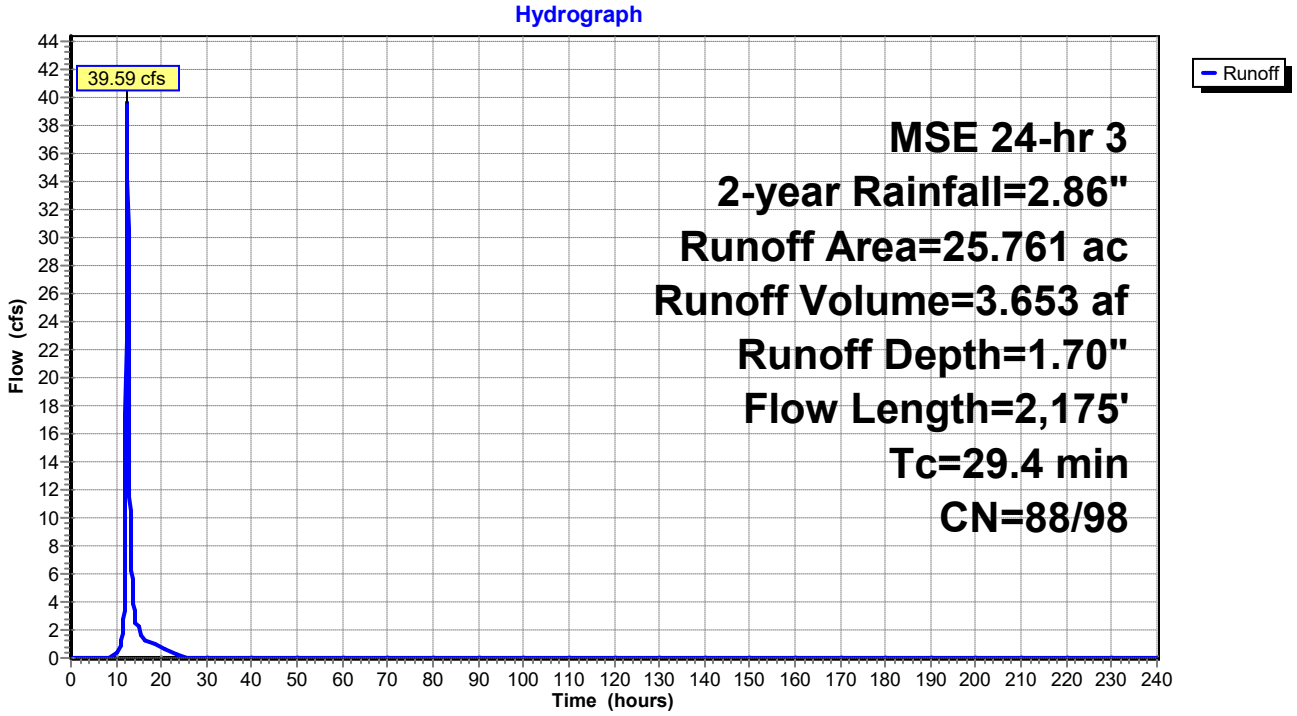
Runoff = 39.59 cfs @ 12.42 hrs, Volume= 3.653 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.136	98	Unconnected pavement, HSG D
0.070	98	Unconnected roofs, HSG D
1.380	98	Water Surface, 0% imp, HSG D
21.395	89	Row crops, straight row, Good, HSG D
1.284	80	>75% Grass cover, Good, HSG D
0.797	78	Meadow, non-grazed, HSG D
0.699	77	Woods, Good, HSG D
25.761	88	Weighted Average
25.555	88	99.20% Pervious Area
0.206	98	0.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
20.2	1,454	0.0177	1.20		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.9	621	0.0020	2.64	68.60	**Channel Flow,** Area= 26.0 sf Perim= 20.0' r= 1.30' n= 0.030 Earth, grassed & winding
29.4	2,175	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 20S: Direct to Cowley Lake

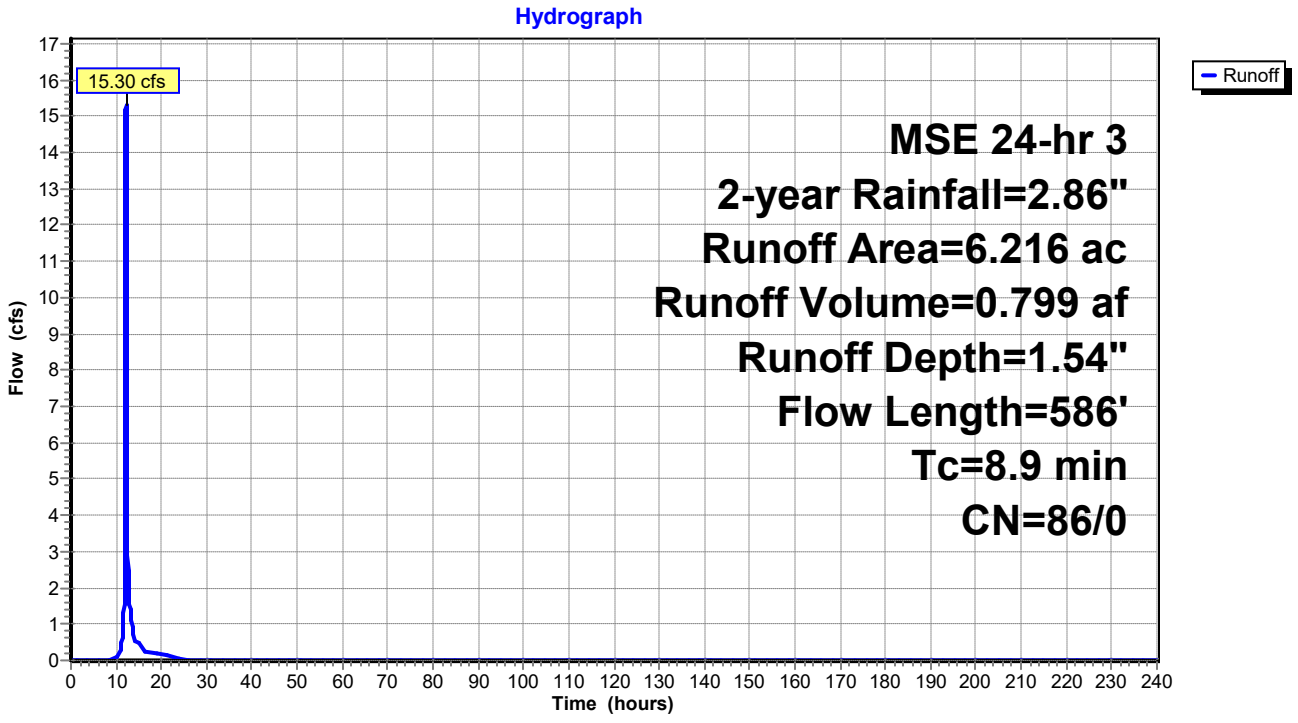
Runoff = 15.30 cfs @ 12.16 hrs, Volume= 0.799 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.123	98	Water Surface, 0% imp, HSG D
4.384	89	Row crops, straight row, Good, HSG D
1.709	77	Woods, Good, HSG D
6.216	86	Weighted Average
6.216	86	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.0240	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
4.3	486	0.0440	1.89		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
8.9	586	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

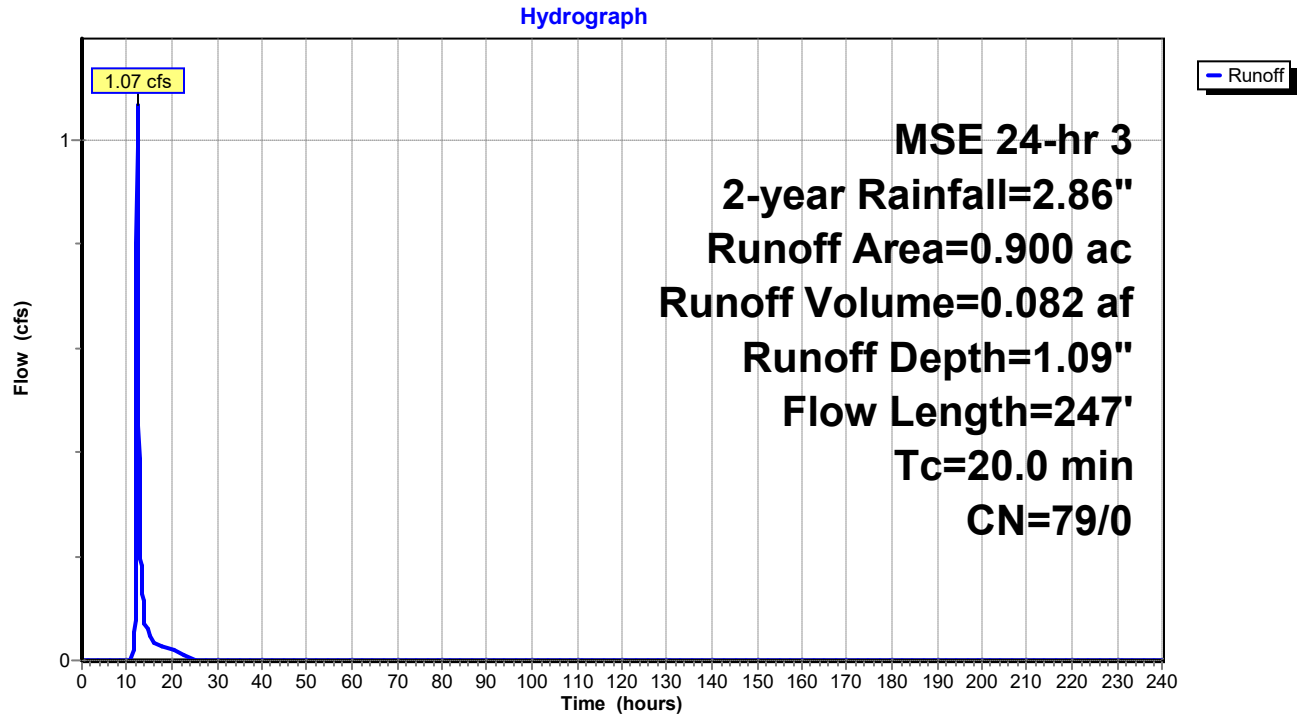
Runoff = 1.07 cfs @ 12.31 hrs, Volume= 0.082 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.074	98	Water Surface, 0% imp, HSG D
0.005	89	Row crops, straight row, Good, HSG D
0.821	77	Woods, Good, HSG D
0.900	79	Weighted Average
0.900	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0350	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.8	147	0.0721	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.0	247	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

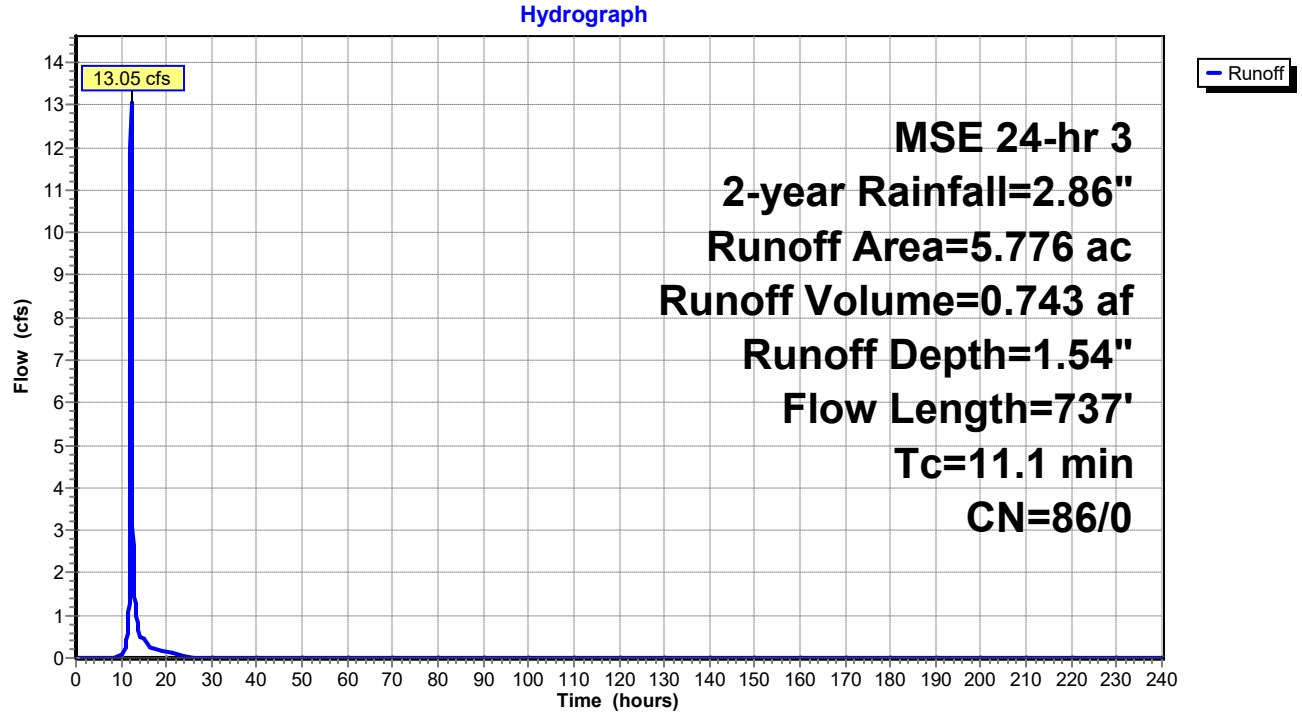
Runoff = 13.05 cfs @ 12.19 hrs, Volume= 0.743 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.031	98	Water Surface, 0% imp, HSG D
4.386	89	Row crops, straight row, Good, HSG D
0.729	78	Meadow, non-grazed, HSG D
0.630	77	Woods, Good, HSG D
5.776	86	Weighted Average
5.776	86	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.0440	0.46		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
7.5	637	0.0248	1.42		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.1	737	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Lower West Channel

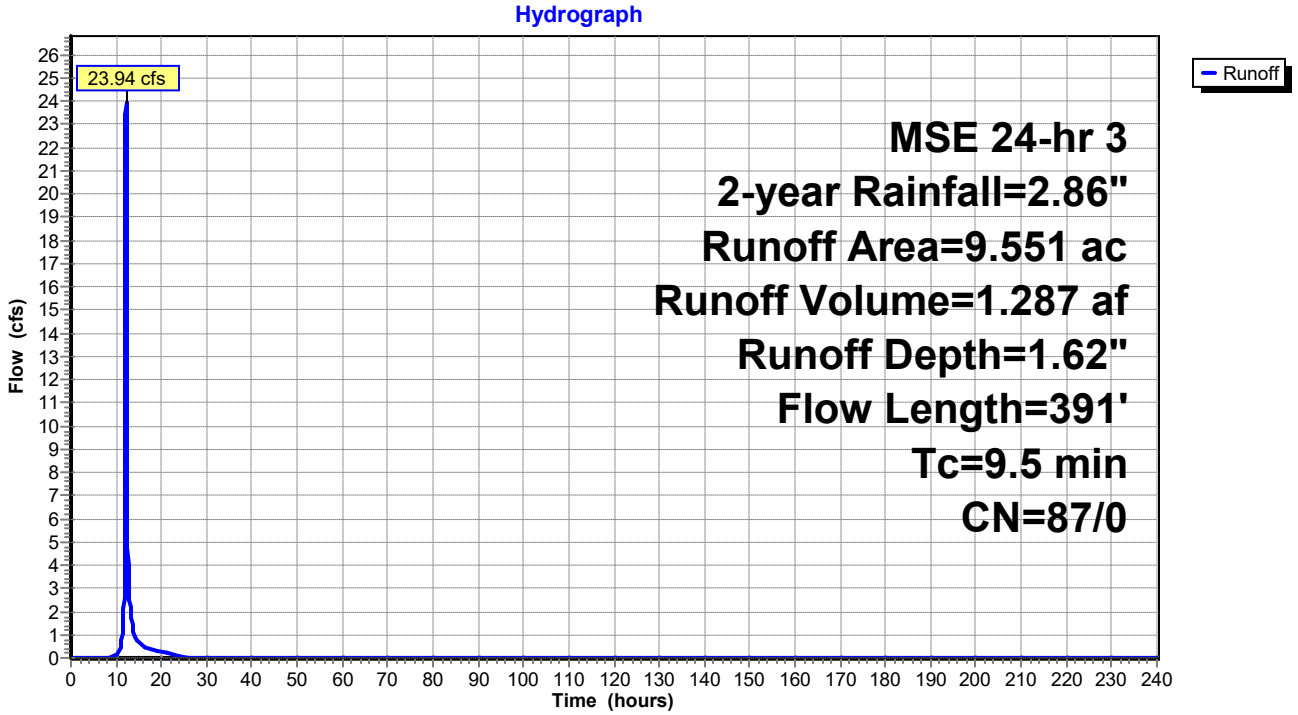
Runoff = 23.94 cfs @ 12.17 hrs, Volume= 1.287 af, Depth= 1.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.467	98	Water Surface, 0% imp, HSG D
7.263	89	Row crops, straight row, Good, HSG D
0.213	78	Meadow, non-grazed, HSG D
1.608	77	Woods, Good, HSG D
9.551	87	Weighted Average
9.551	87	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0090	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
2.6	291	0.0433	1.87		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.5	391	Total			

Subcatchment 23S: Direct to Lower West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

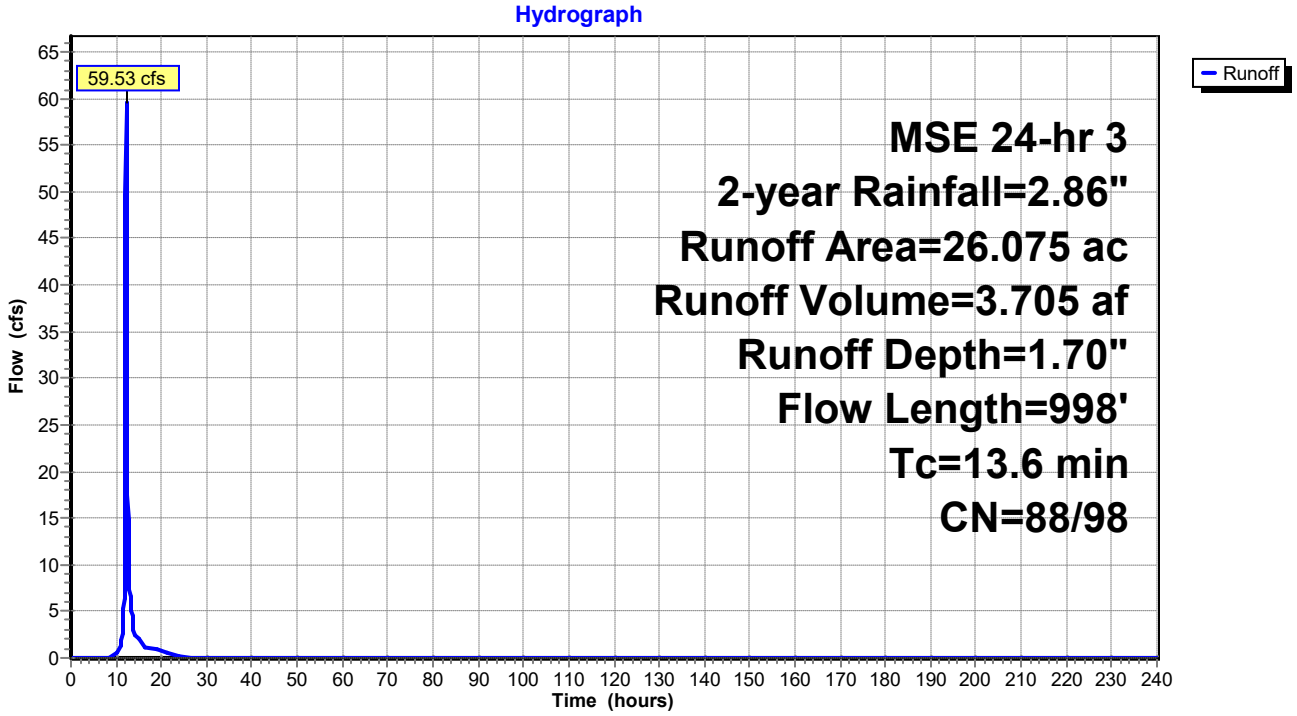
Runoff = 59.53 cfs @ 12.22 hrs, Volume= 3.705 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.298	98	Unconnected pavement, HSG D
0.980	98	Water Surface, 0% imp, HSG D
0.082	96	Gravel surface, HSG D
0.357	80	>75% Grass cover, Good, HSG D
21.863	89	Row crops, straight row, Good, HSG D
0.151	78	Meadow, non-grazed, HSG D
2.344	77	Woods, Good, HSG D
26.075	88	Weighted Average
25.777	88	98.86% Pervious Area
0.298	98	1.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0200	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
10.3	819	0.0217	1.33		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.8	149	0.0315	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.6	998	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 30S: Direct to Wetland 4A

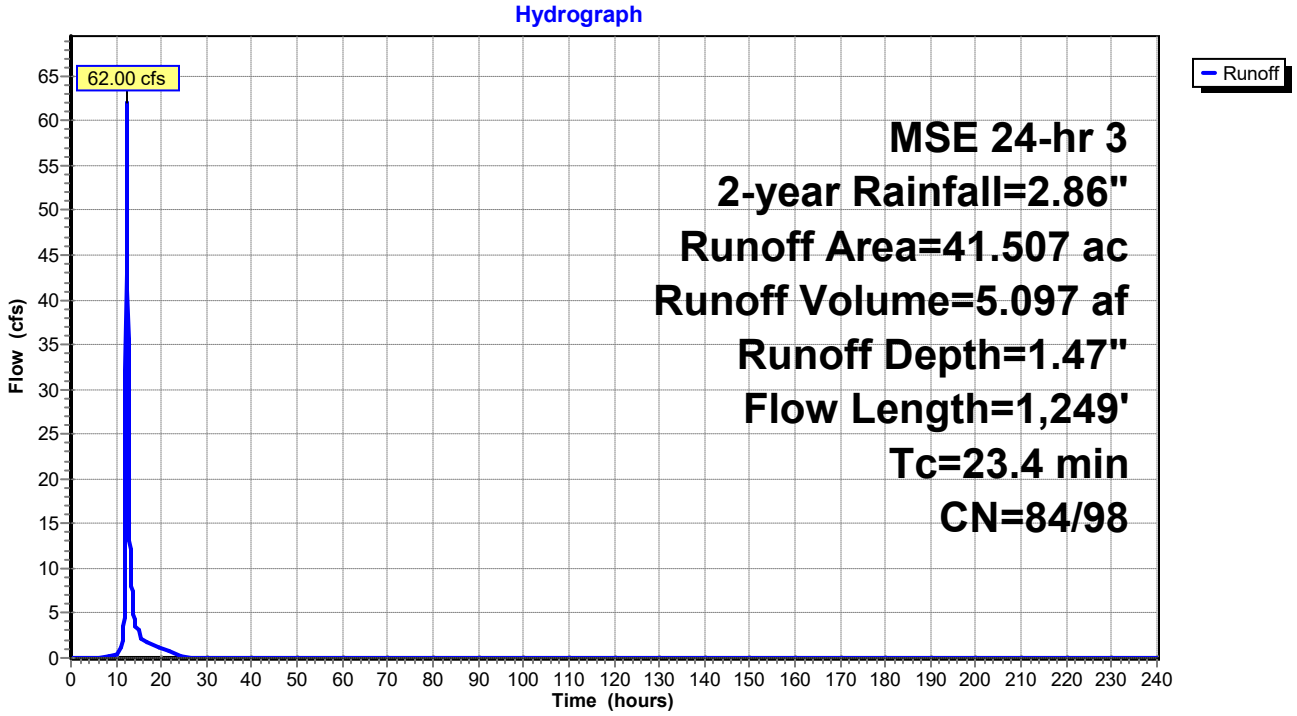
Runoff = 62.00 cfs @ 12.35 hrs, Volume= 5.097 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
1.469	98	Unconnected pavement, HSG D
0.959	98	Unconnected roofs, HSG D
0.947	96	Gravel surface, HSG D
17.469	89	Row crops, straight row, Good, HSG D
1.609	89	Pasture/grassland/range, Poor, HSG D
14.597	80	>75% Grass cover, Good, HSG D
0.684	78	Meadow, non-grazed, HSG D
3.773	77	Woods, Good, HSG D
41.507	85	Weighted Average
39.079	84	94.15% Pervious Area
2.428	98	5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

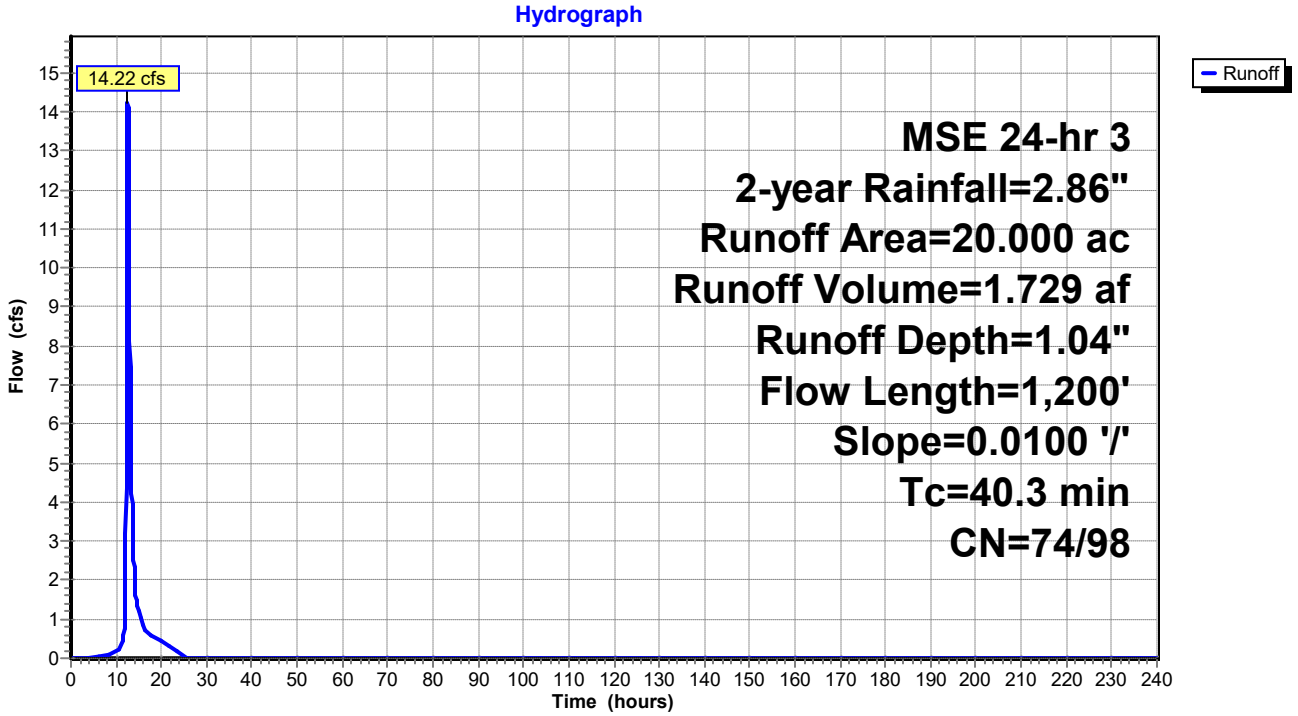
Runoff = 14.22 cfs @ 12.59 hrs, Volume= 1.729 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
20.000	77	2 acre lots, 12% imp, HSG C
17.600	74	88.00% Pervious Area
2.400	98	12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 40S: Direct to Wetland 2B

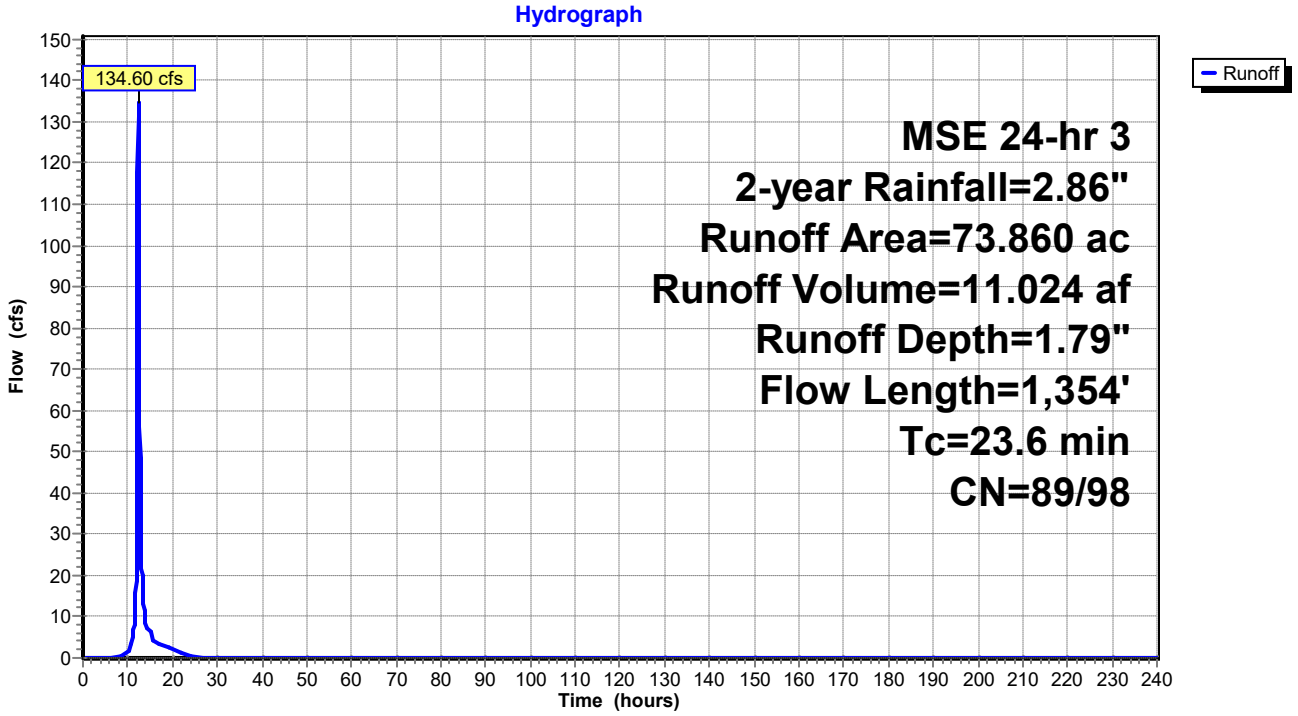
Runoff = 134.60 cfs @ 12.34 hrs, Volume= 11.024 af, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.965	98	Unconnected pavement, HSG D
0.528	98	Unconnected roofs, HSG D
17.207	98	Water Surface, 0% imp, HSG D
1.249	96	Gravel surface, HSG D
35.493	89	Row crops, straight row, Good, HSG D
0.208	89	Pasture/grassland/range, Poor, HSG D
8.455	80	>75% Grass cover, Good, HSG D
5.449	78	Meadow, non-grazed, HSG D
4.306	77	Woods, Good, HSG D
73.860	89	Weighted Average
72.367	89	97.98% Pervious Area
1.493	98	2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

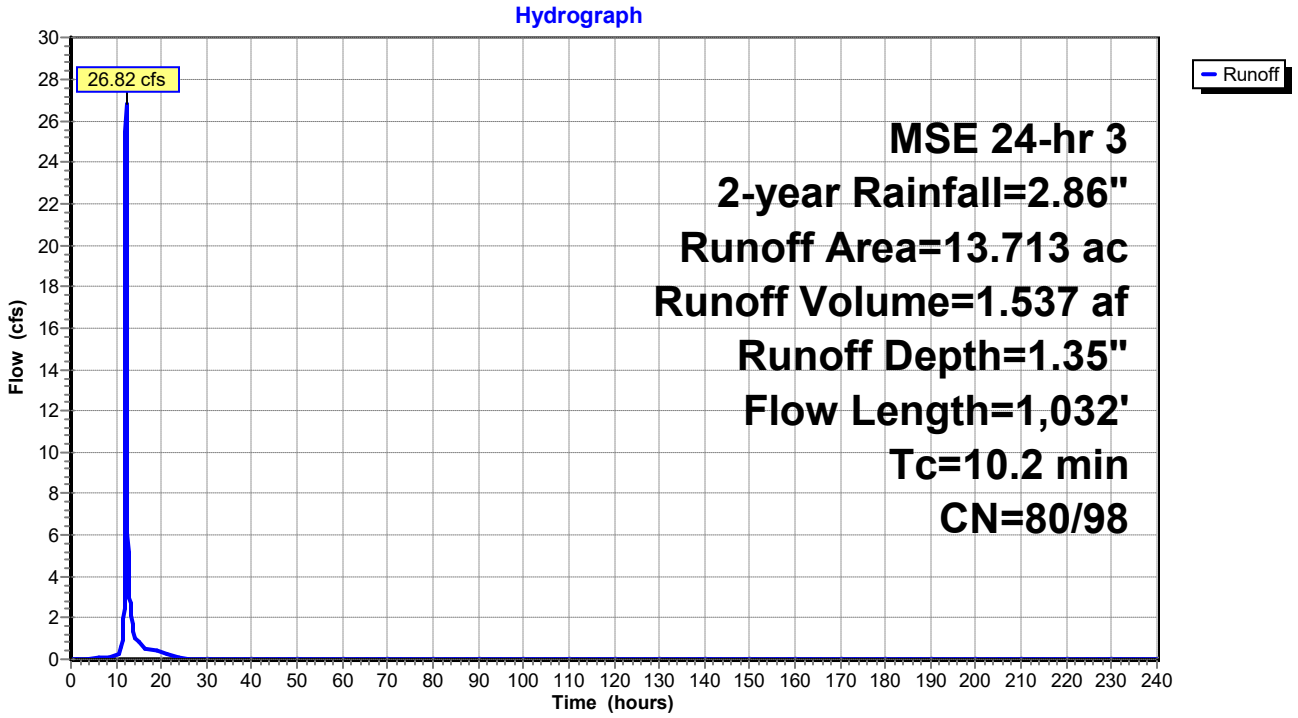
Runoff = 26.82 cfs @ 12.18 hrs, Volume= 1.537 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
1.568	98	Unconnected pavement, HSG D
0.273	98	Unconnected roofs, HSG D
0.107	98	Water Surface, 0% imp, HSG D
0.066	96	Gravel surface, HSG D
10.431	80	>75% Grass cover, Good, HSG D
1.268	78	Meadow, non-grazed, HSG D
13.713	82	Weighted Average
11.872	80	86.57% Pervious Area
1.841	98	13.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

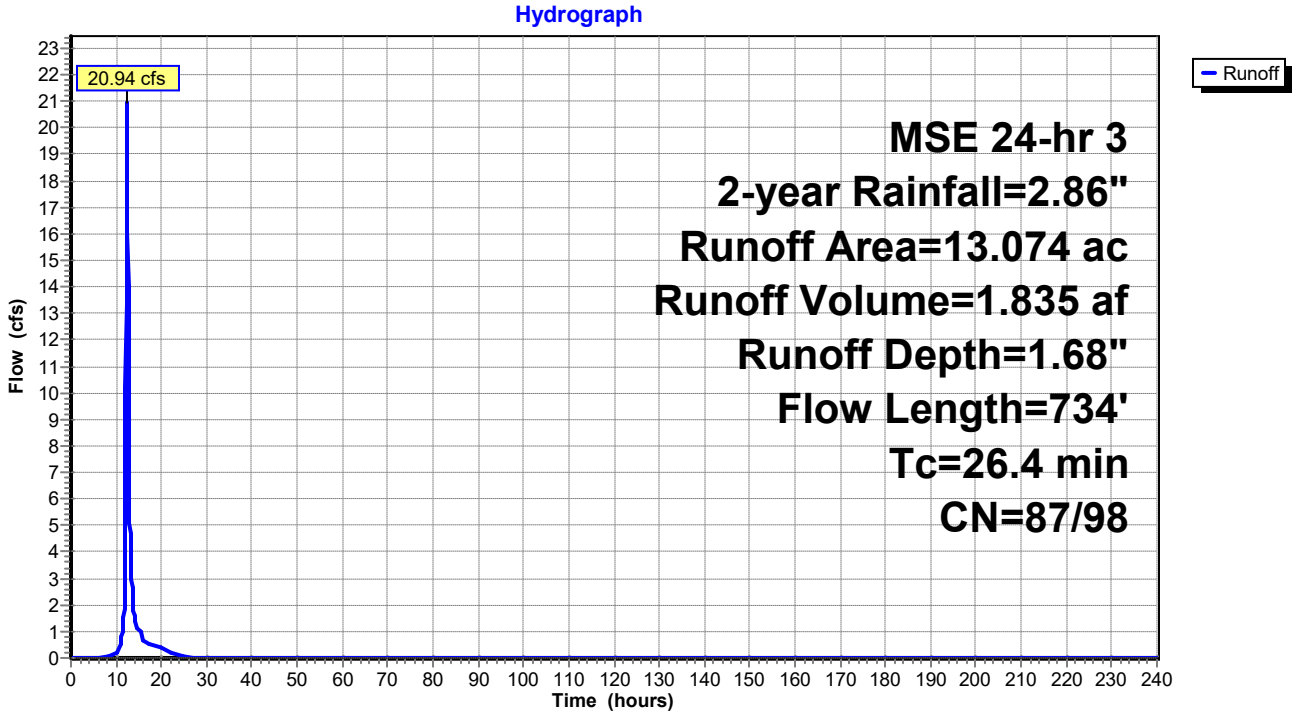
Runoff = 20.94 cfs @ 12.38 hrs, Volume= 1.835 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.523	98	Unconnected pavement, HSG D
0.339	98	Unconnected roofs, HSG D
0.175	98	Water Surface, 0% imp, HSG D
0.233	96	Gravel surface, HSG D
8.346	89	Row crops, straight row, Good, HSG D
0.958	89	Pasture/grassland/range, Poor, HSG D
2.500	80	>75% Grass cover, Good, HSG D
13.074	88	Weighted Average
12.212	87	93.41% Pervious Area
0.862	98	6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

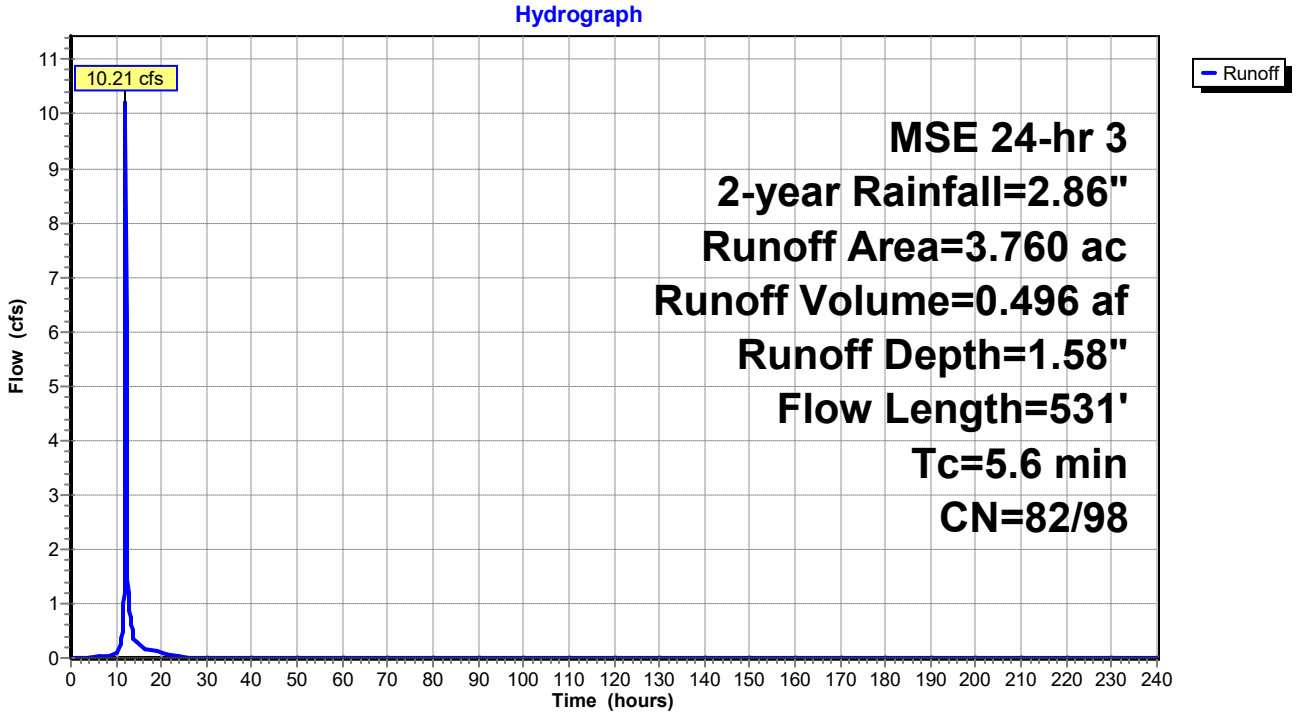
Runoff = 10.21 cfs @ 12.13 hrs, Volume= 0.496 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.86"

Area (ac)	CN	Description
0.428	98	Unconnected pavement, HSG D
0.443	98	Unconnected roofs, HSG D
0.064	98	Water Surface, 0% imp, HSG D
0.331	96	Gravel surface, HSG D
2.083	80	>75% Grass cover, Good, HSG D
0.411	77	Woods, Good, HSG D
3.760	86	Weighted Average
2.889	82	76.84% Pervious Area
0.871	98	23.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



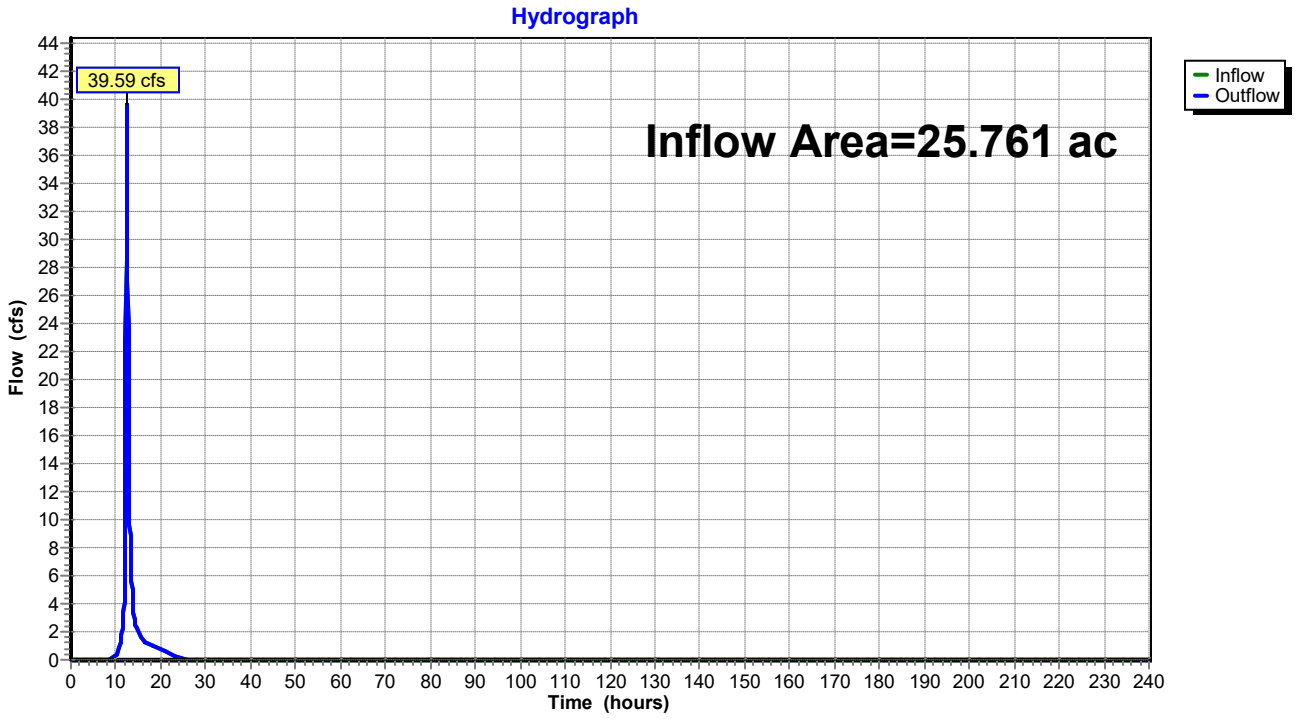
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.761 ac, 0.80% Impervious, Inflow Depth = 1.70" for 2-year event
Inflow = 39.59 cfs @ 12.42 hrs, Volume= 3.653 af
Outflow = 39.59 cfs @ 12.42 hrs, Volume= 3.653 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



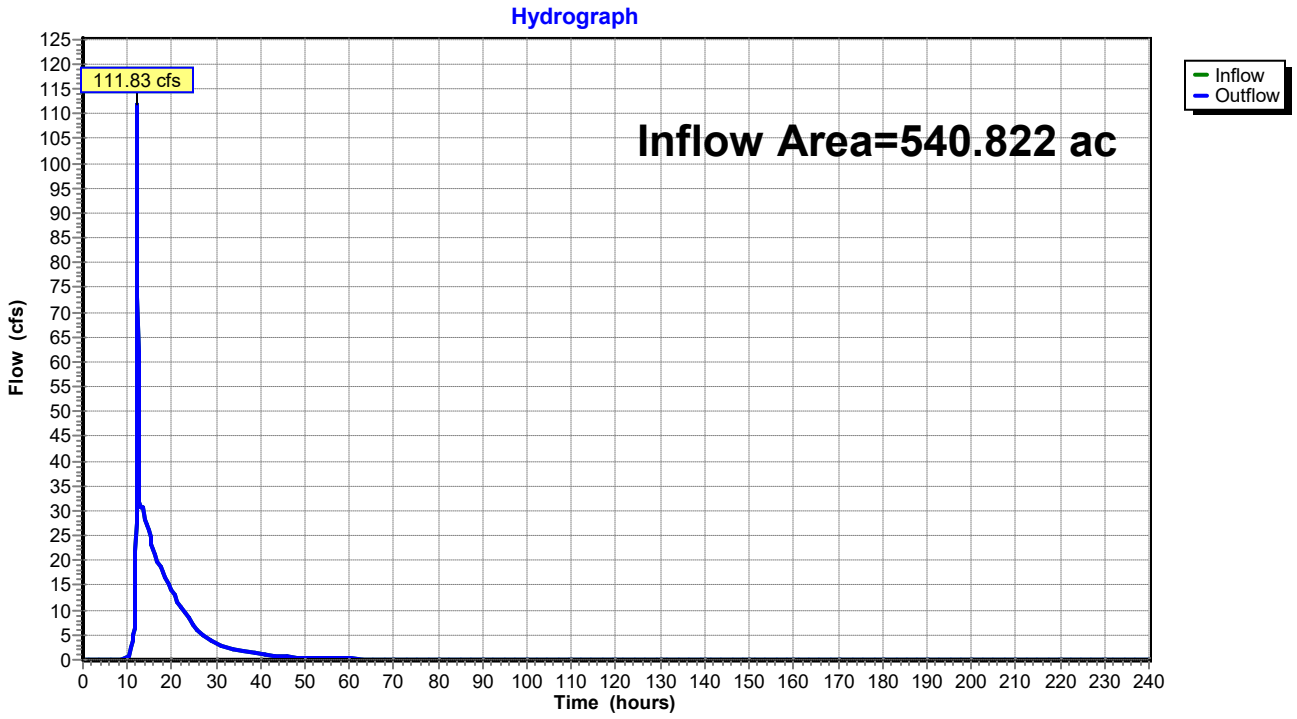
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.822 ac, 2.65% Impervious, Inflow Depth = 0.60" for 2-year event
Inflow = 111.83 cfs @ 12.21 hrs, Volume= 26.839 af
Outflow = 111.83 cfs @ 12.21 hrs, Volume= 26.839 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



Summary for Reach 21R: East Channel

Inflow Area = 131.697 ac, 6.98% Impervious, Inflow Depth > 1.47" for 2-year event
Inflow = 17.07 cfs @ 13.63 hrs, Volume= 16.147 af
Outflow = 17.07 cfs @ 13.65 hrs, Volume= 16.147 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.27 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 7.3 min

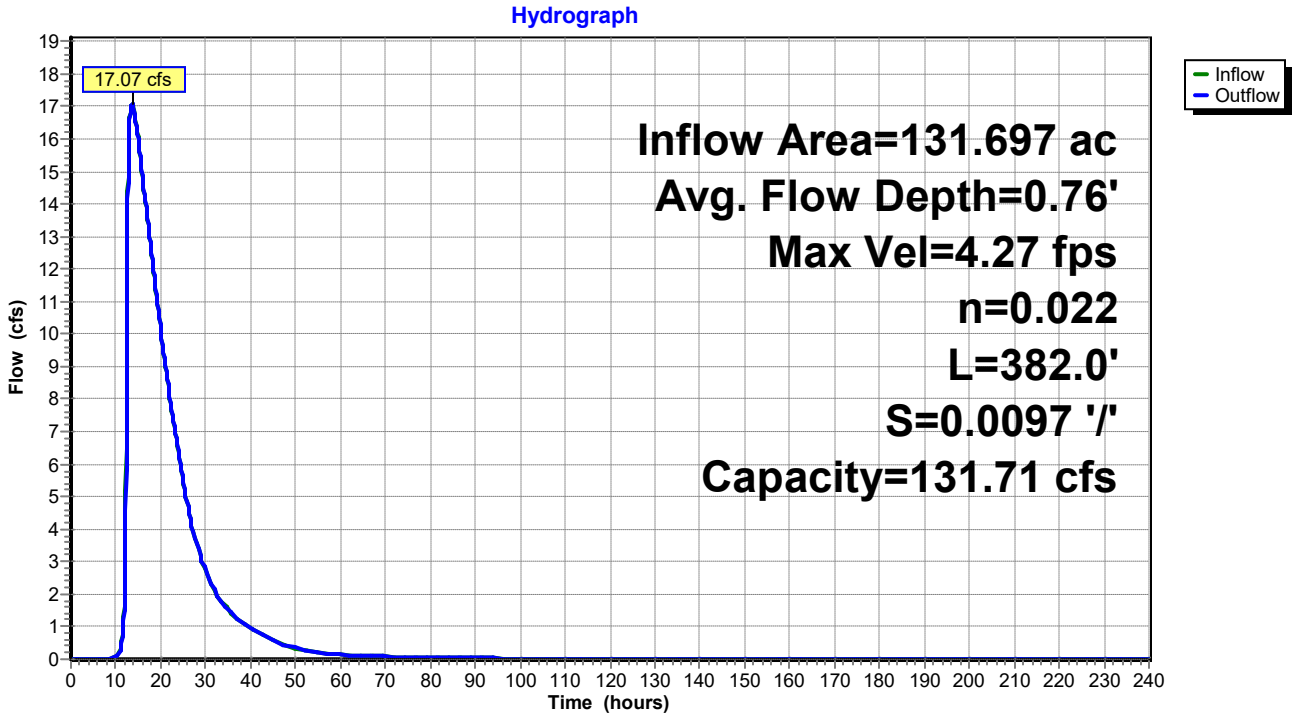
Peak Storage= 1,527 cf @ 13.65 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 131.71 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 382.0' Slope= 0.0097 '/'
Inlet Invert= 923.92', Outlet Invert= 920.20'



‡

Reach 21R: East Channel



Summary for Reach 23RL: Lower West Channel

Inflow Area = 371.058 ac, 1.30% Impervious, Inflow Depth > 0.18" for 2-year event
Inflow = 23.94 cfs @ 12.17 hrs, Volume= 5.445 af
Outflow = 21.28 cfs @ 12.22 hrs, Volume= 5.445 af, Atten= 11%, Lag= 2.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.91 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 29.1 min

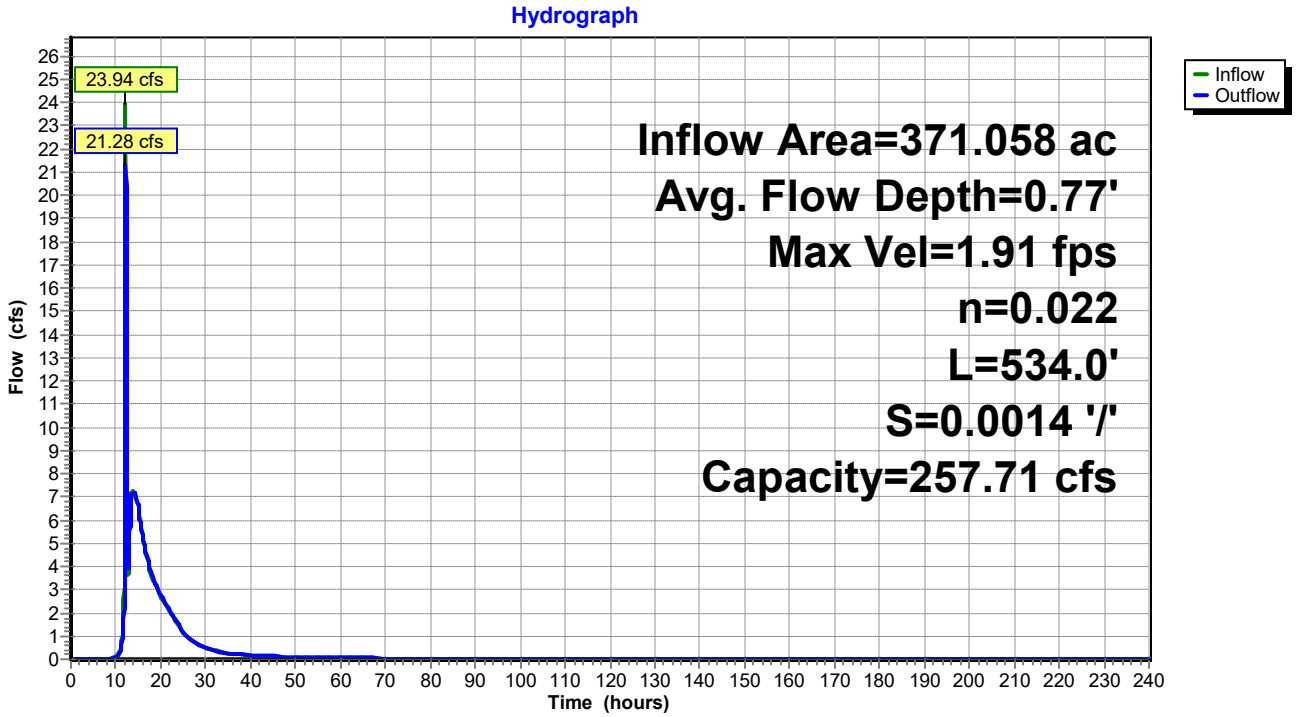
Peak Storage= 5,912 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 3.00' Flow Area= 63.0 sf, Capacity= 257.71 cfs

12.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 30.00'
Length= 534.0' Slope= 0.0014 '/'
Inlet Invert= 919.58', Outlet Invert= 918.82'



‡

Reach 23RL: Lower West Channel



Summary for Reach 23RU: Upper West Channel

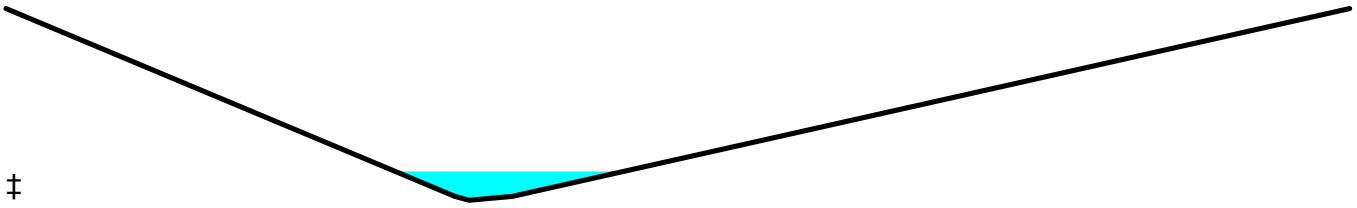
[80] Warning: Exceeded Pond 30P by 0.96' @ 0.00 hrs (0.58 cfs 0.685 af)

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth > 0.14" for 2-year event
Inflow = 6.48 cfs @ 13.89 hrs, Volume= 4.158 af
Outflow = 6.47 cfs @ 13.97 hrs, Volume= 4.157 af, Atten= 0%, Lag= 4.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.58 fps, Min. Travel Time= 5.2 min
Avg. Velocity = 0.37 fps, Avg. Travel Time= 21.8 min

Peak Storage= 2,011 cf @ 13.97 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 2.04' Flow Area= 146.2 sf, Capacity= 766.18 cfs

Custom cross-section, Length= 490.0' Slope= 0.0057 '/'
Constant n= 0.022 Earth, clean & straight
Inlet Invert= 925.96', Outlet Invert= 923.17'

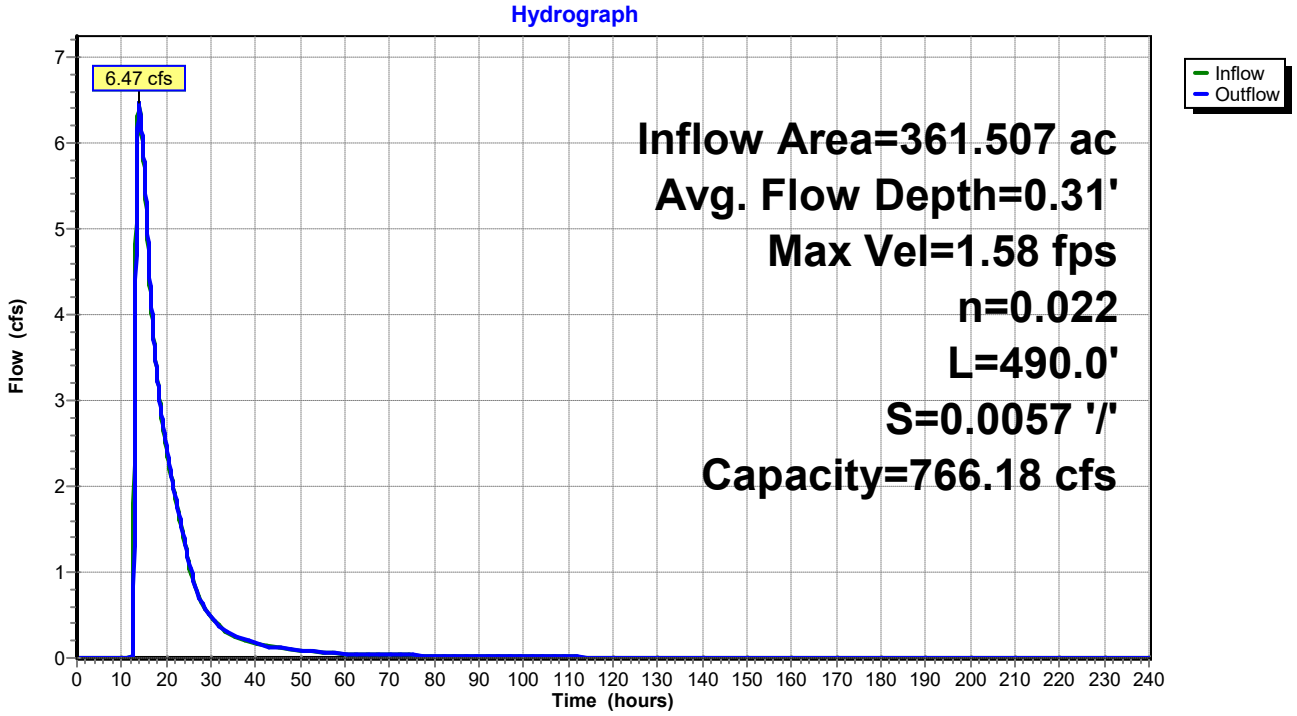


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-48.27	928.00	0.00
-1.47	926.00	2.00
0.00	925.96	2.04
4.51	926.00	2.00
91.79	928.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.1	6.0	59	0.05
2.04	146.2	140.1	71,618	766.18

Reach 23RU: Upper West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth = 0.73" for 2-year event
Inflow = 185.67 cfs @ 12.43 hrs, Volume= 18.153 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 930.30' @ 25.55 hrs Surf.Area= 60.901 ac Storage= 18.153 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

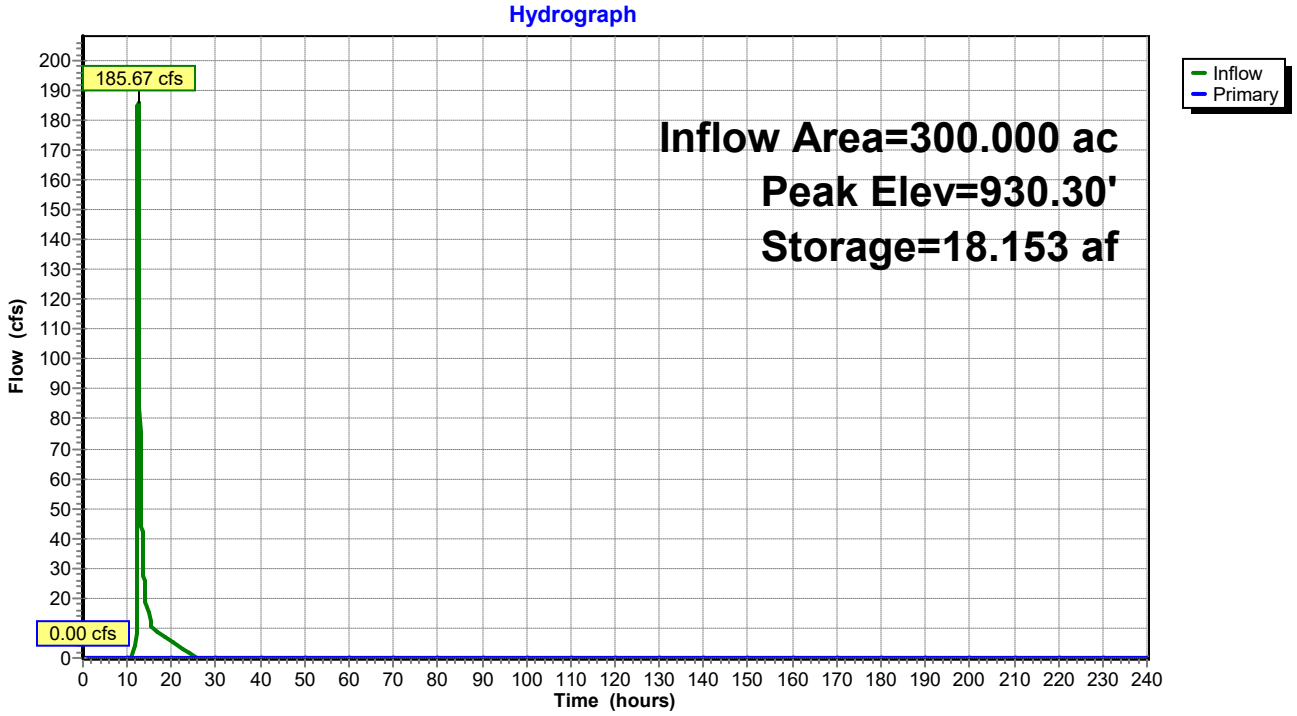
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=930.00' TW=930.22' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 30P: Wetland 4A

[58] Hint: Peaked 0.36' above defined flood level

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth = 0.23" for 2-year event
Inflow = 71.45 cfs @ 12.37 hrs, Volume= 6.827 af
Outflow = 6.48 cfs @ 13.89 hrs, Volume= 4.158 af, Atten= 91%, Lag= 91.6 min
Primary = 6.48 cfs @ 13.89 hrs, Volume= 4.158 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 926.32' @ 13.96 hrs Surf.Area= 5.727 ac Storage= 4.577 af
Flood Elev= 925.96' Surf.Area= 5.112 ac Storage= 2.616 af

Plug-Flow detention time= 687.2 min calculated for 4.157 af (61% of inflow)
Center-of-Mass det. time= 603.5 min (1,428.3 - 824.8)

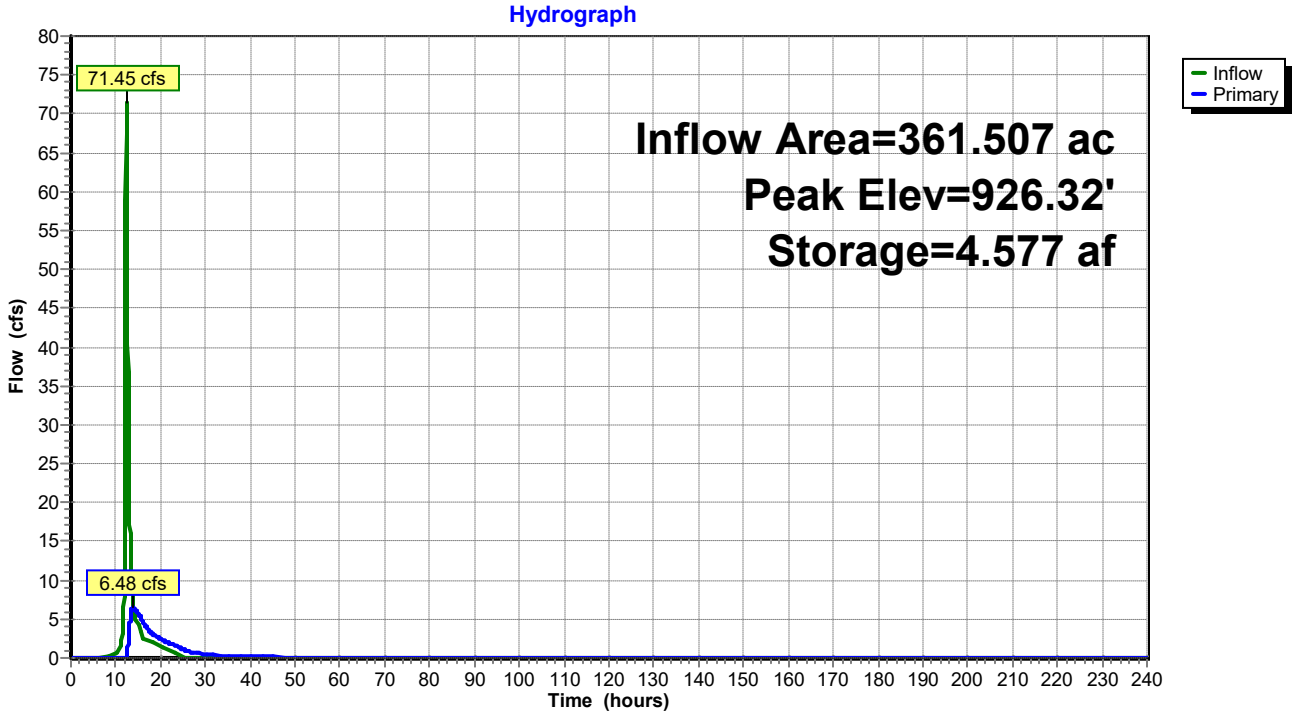
Volume	Invert	Avail.Storage	Storage Description
#1	925.00'	16.212 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
925.00	0.338	0.000	0.000
926.00	5.311	2.824	2.824
927.00	6.620	5.965	8.790
928.00	8.223	7.422	16.212

Device	Routing	Invert	Outlet Devices
#1	Primary	925.96'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.04 1.04 2.04 Width (feet) 0.00 6.00 90.00 140.00
#2	Primary	919.70'	**10.0" Round Culvert** L= 1,310.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.30' / 919.70' S= -0.0003 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#3	Device 2	925.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=6.45 cfs @ 13.89 hrs HW=926.32' TW=926.27' (Dynamic Tailwater)
- **1=Custom Weir/Orifice** (Weir Controls 6.32 cfs @ 1.01 fps)
- **2=Culvert** (Outlet Controls 0.13 cfs @ 0.25 fps)
  - **3=Orifice/Grate** (Passes 0.13 cfs of 0.59 cfs potential flow)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[80] Warning: Exceeded Pond 7P by 2.14' @ 12.65 hrs (149.57 cfs 7.851 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth = 0.06" for 2-year event
Inflow = 14.22 cfs @ 12.59 hrs, Volume= 1.729 af
Outflow = 13.72 cfs @ 12.67 hrs, Volume= 1.729 af, Atten= 4%, Lag= 4.9 min
Primary = 13.72 cfs @ 12.67 hrs, Volume= 1.729 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 932.25' @ 12.67 hrs Surf.Area= 0.101 ac Storage= 0.018 af

Plug-Flow detention time= 0.3 min calculated for 1.729 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (841.7 - 841.4)

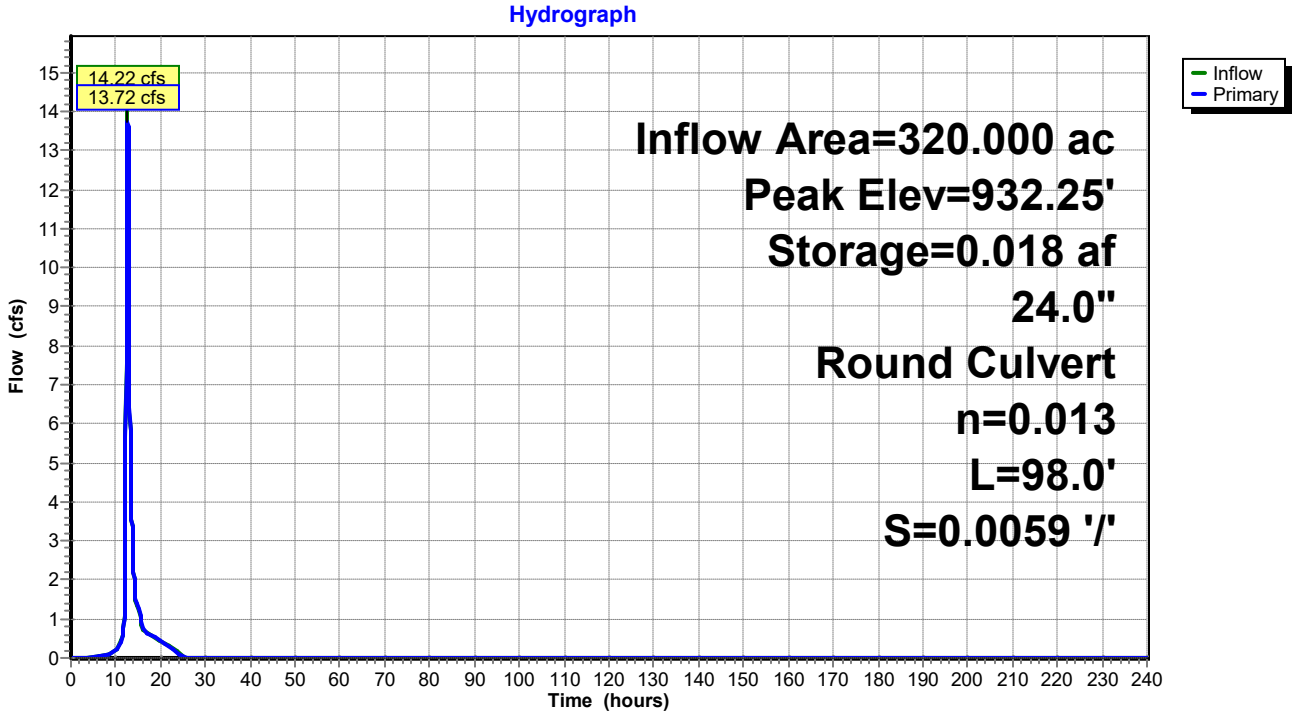
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=13.70 cfs @ 12.67 hrs HW=932.25' TW=926.08' (Dynamic Tailwater)
1=Culvert (Barrel Controls 13.70 cfs @ 5.35 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 40P: Wetland 2B

Inflow Area = 130.797 ac, 7.03% Impervious, Inflow Depth = 1.47" for 2-year event
Inflow = 140.55 cfs @ 12.34 hrs, Volume= 16.070 af
Outflow = 16.97 cfs @ 13.67 hrs, Volume= 16.066 af, Atten= 88%, Lag= 80.2 min
Primary = 16.97 cfs @ 13.67 hrs, Volume= 16.066 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 925.21' @ 13.68 hrs Surf.Area= 9.475 ac Storage= 7.098 af

Plug-Flow detention time= 347.5 min calculated for 16.062 af (100% of inflow)
Center-of-Mass det. time= 344.4 min (1,339.3 - 994.9)

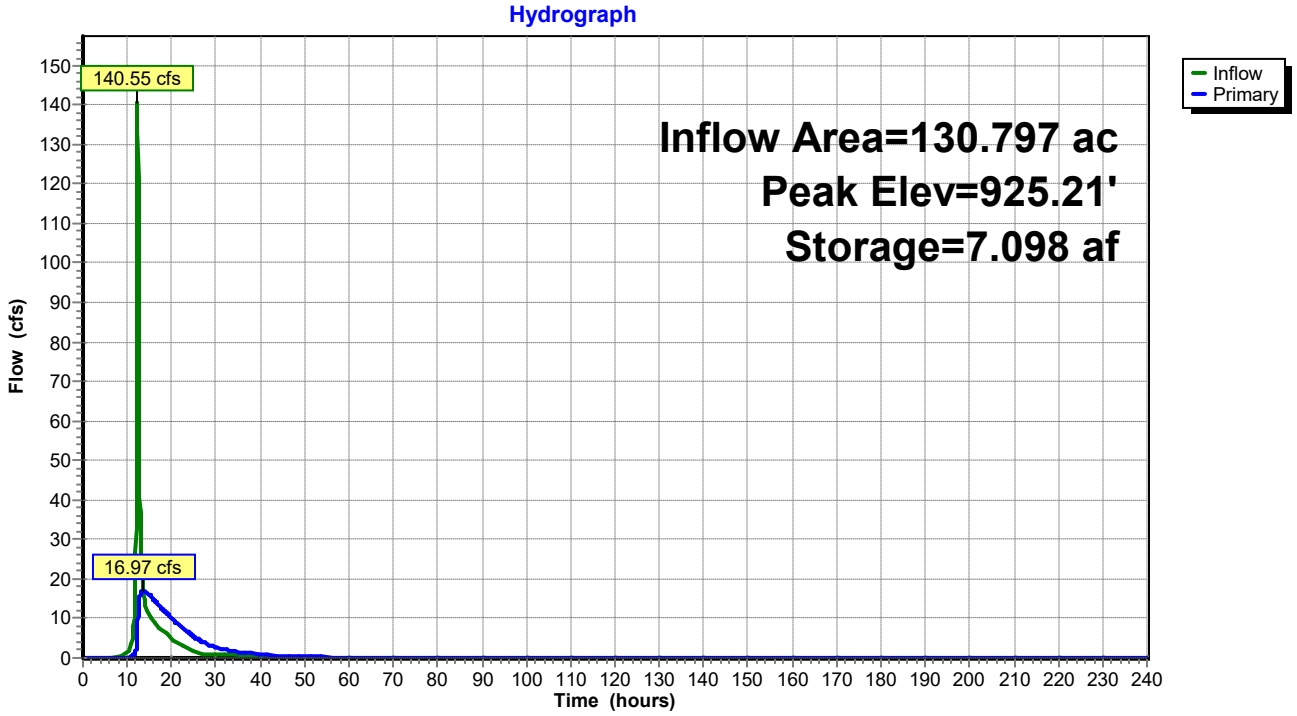
Volume	Invert	Avail.Storage	Storage Description
#1	923.92'	52.726 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.92	0.000	0.000	0.000
924.00	2.123	0.085	0.085
926.00	14.283	16.406	16.491
928.00	21.952	36.235	52.726

Device	Routing	Invert	Outlet Devices
#1	Primary	923.58'	**Asymmetrical Weir, C= 3.27**
			Offset (feet) -12.19 0.00 7.43 15.99
			Height (feet) 3.38 0.00 0.09 3.38
#2	Device 1	923.92'	**Asymmetrical Weir, C= 3.27**
			Offset (feet) -56.17 -5.92 -1.08 0.00 3.27 6.37 30.87 135.00
			Height (feet) 4.08 2.08 1.66 0.00 0.12 1.87 2.08 4.08

Primary OutFlow Max=16.96 cfs @ 13.67 hrs HW=925.21' TW=924.68' (Dynamic Tailwater)
↑**1=Asymmetrical Weir** (Passes 16.96 cfs of 59.88 cfs potential flow)
↑**2=Asymmetrical Weir** (Weir Controls 16.96 cfs @ 2.20 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 1.35" for 2-year event
Inflow = 26.82 cfs @ 12.18 hrs, Volume= 1.537 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 939.36' @ 24.60 hrs Surf.Area= 1.420 ac Storage= 1.537 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

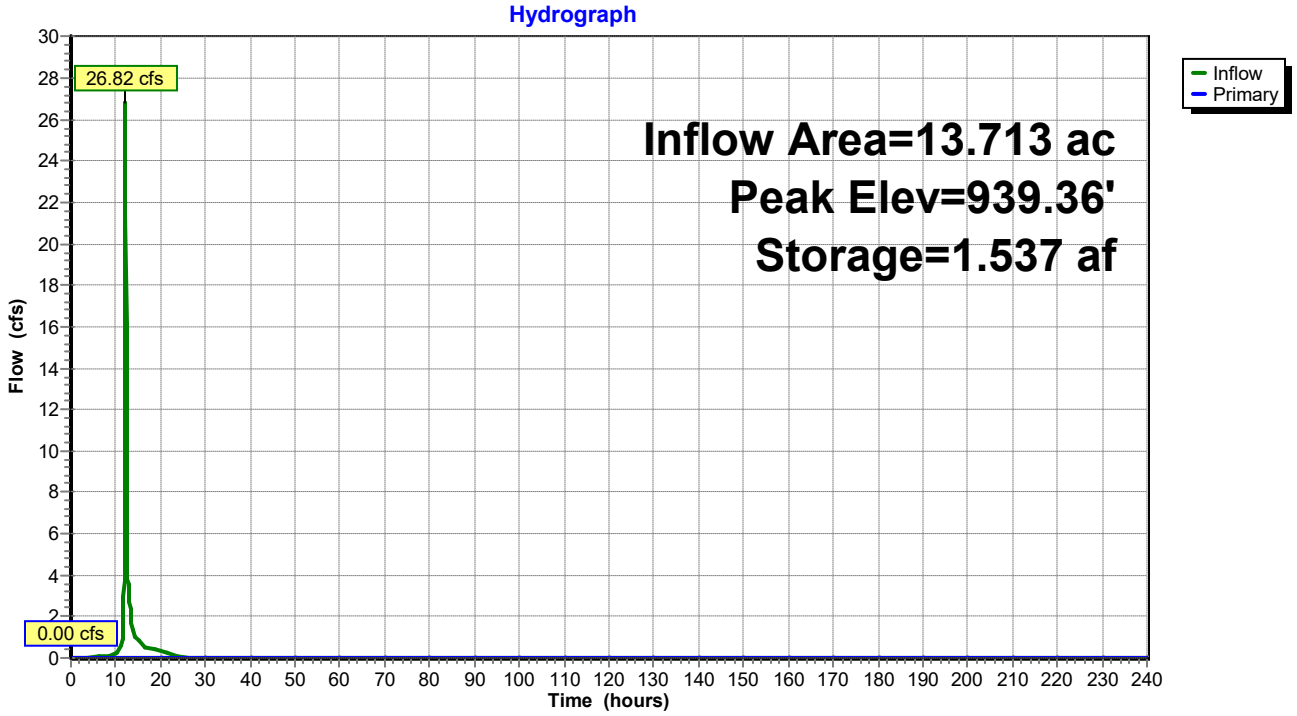
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=936.00' TW=923.92' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond 41P: Ex South Off-site Pond



Summary for Pond 50P: Wetland 4B

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth = 0.66" for 2-year event
Inflow = 21.86 cfs @ 12.39 hrs, Volume= 2.164 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 940.27' @ 240.00 hrs Surf.Area= 1.859 ac Storage= 2.164 af
Flood Elev= 941.50' Surf.Area= 3.181 ac Storage= 5.223 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

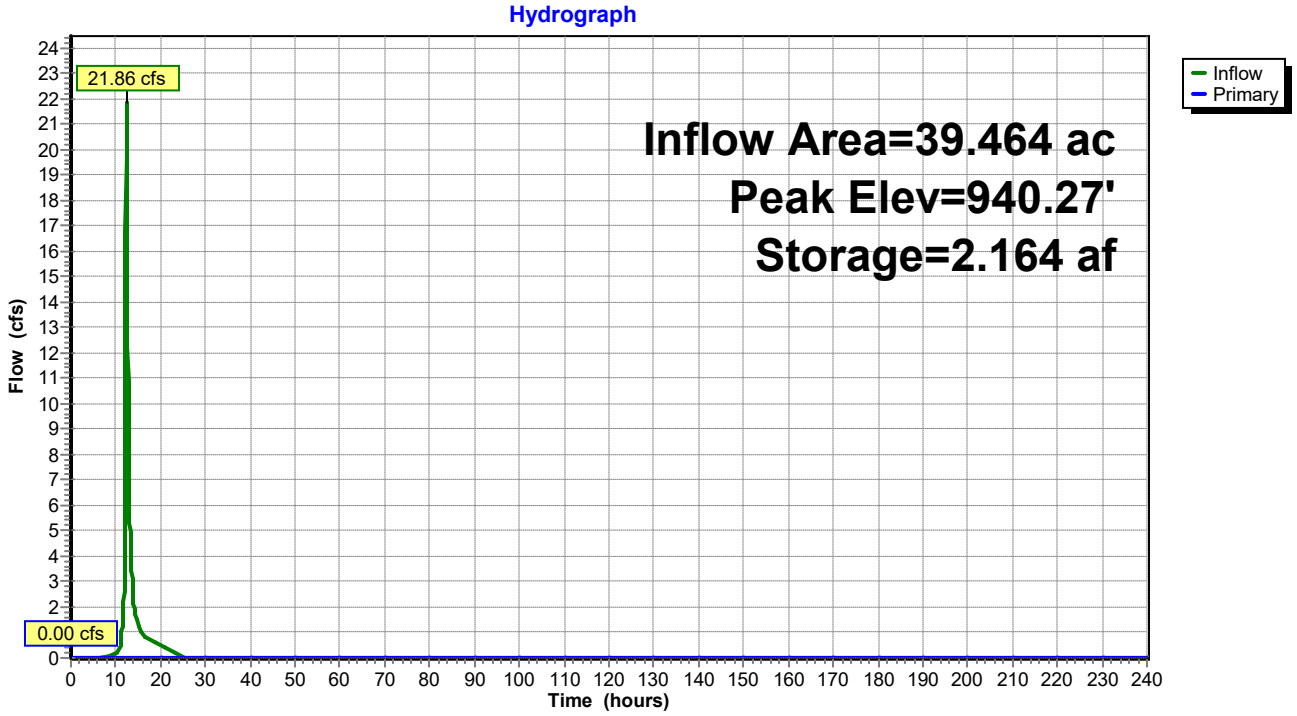
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	6.966 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
938.00	0.102	0.000	0.000
940.00	1.599	1.701	1.701
941.00	2.570	2.085	3.785
942.00	3.792	3.181	6.966

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=938.00' TW=923.92' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

[58] Hint: Peaked 0.17' above defined flood level

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth > 16.79" for 2-year event
Inflow = 12.04 cfs @ 12.13 hrs, Volume= 5.261 af
Outflow = 7.33 cfs @ 12.25 hrs, Volume= 5.046 af, Atten= 39%, Lag= 6.8 min
Primary = 7.33 cfs @ 12.25 hrs, Volume= 5.046 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 938.67' @ 12.25 hrs Surf.Area= 0.259 ac Storage= 0.254 af
Flood Elev= 938.50' Surf.Area= 0.226 ac Storage= 0.214 af

Plug-Flow detention time= 173.4 min calculated for 5.045 af (96% of inflow)
Center-of-Mass det. time= 34.8 min (1,398.0 - 1,363.2)

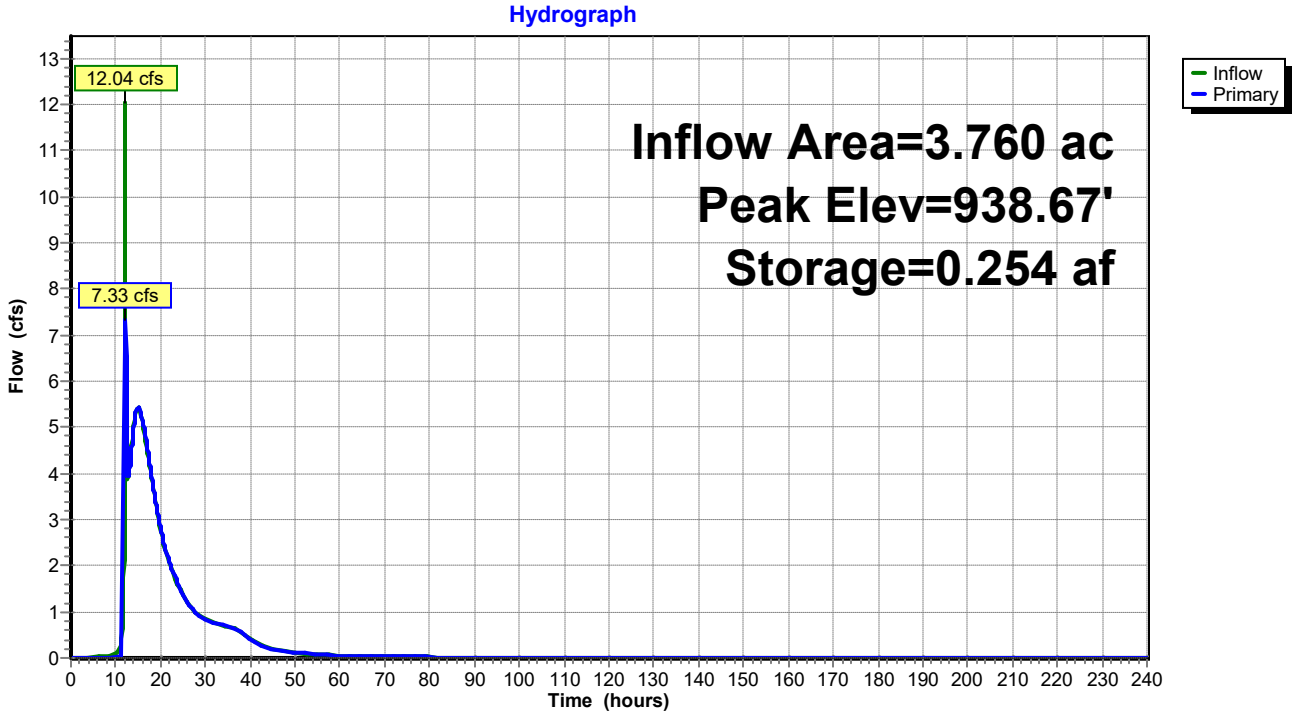
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	0.353 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.004	0.000	0.000
938.00	0.123	0.127	0.127
939.00	0.328	0.226	0.353

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=7.29 cfs @ 12.25 hrs HW=938.66' TW=924.60' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 7.29 cfs @ 1.30 fps)

Pond 60P: Wetland 5B



Summary for Link 1PP: Northwest Wetland (Big Woods)

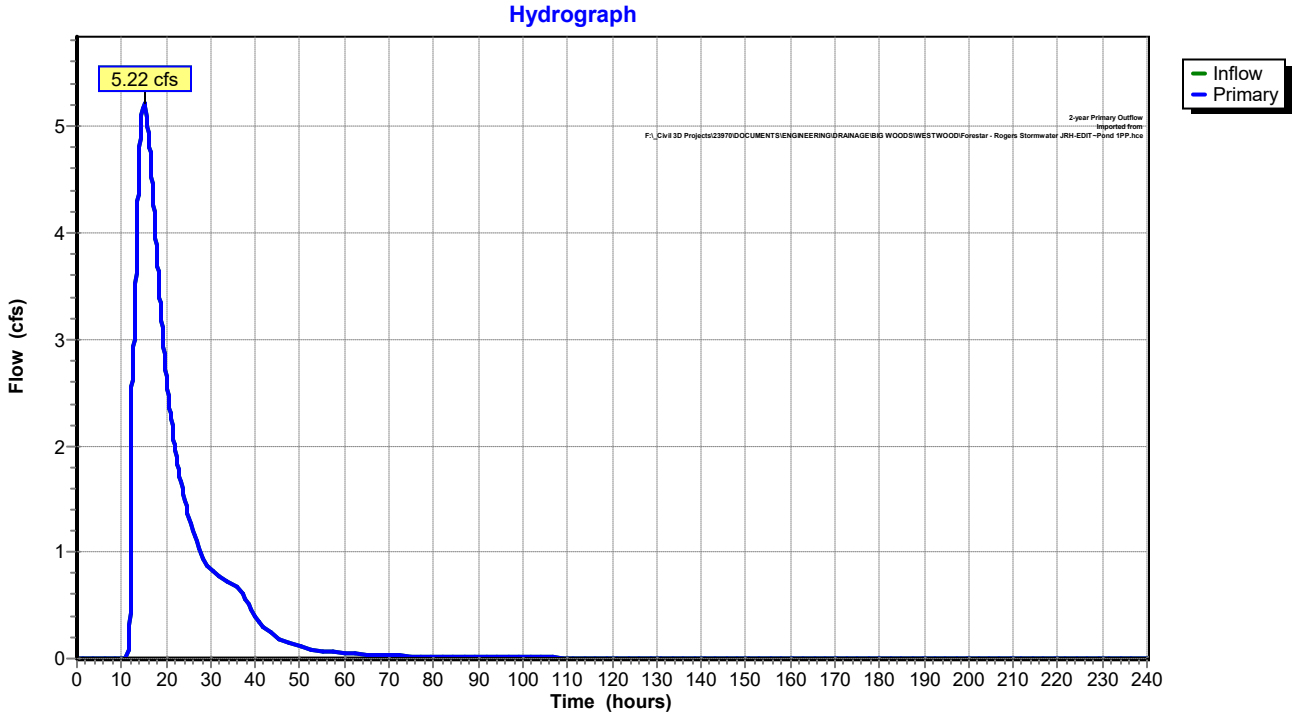
From the Big Woods development drainage model prepared by Westwood.

Inflow	=	5.22 cfs @	15.04 hrs, Volume=	4.764 af
Primary	=	5.22 cfs @	15.04 hrs, Volume=	4.764 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

2-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG WC

Link 1PP: Northwest Wetland (Big Woods)



Summary for Link 5PP: Existing Pond (Big Woods)

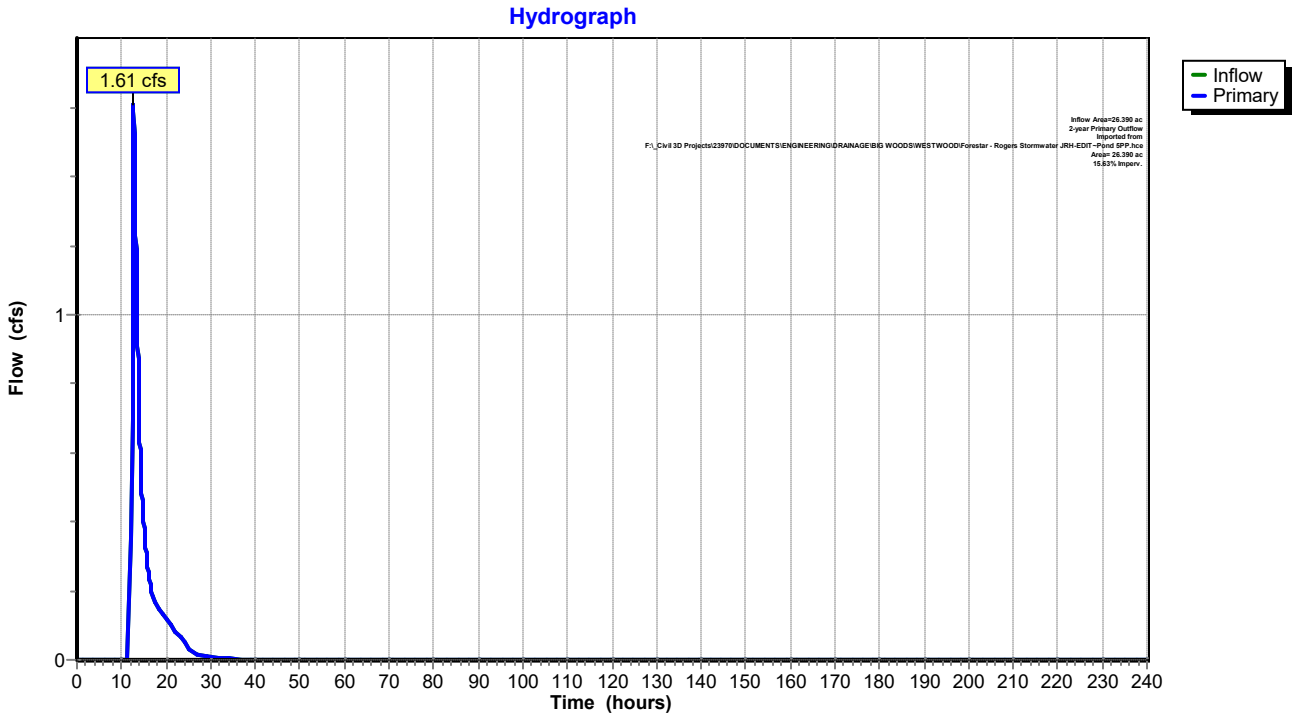
From the Big Woods development drainage model prepared by Westwood.

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth = 0.15" for 2-year event
Inflow = 1.61 cfs @ 12.68 hrs, Volume= 0.329 af
Primary = 1.61 cfs @ 12.68 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

2-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG WC

Link 5PP: Existing Pond (Big Woods)



Time span=0.00-240.00 hrs, dt=0.05 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth=1.65"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min CN=72/0 Runoff=458.46 cfs 41.126 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=25.761 ac 0.80% Impervious Runoff Depth=2.98"
Flow Length=2,175' Tc=29.4 min CN=88/98 Runoff=68.61 cfs 6.396 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=6.216 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=586' Tc=8.9 min CN=86/0 Runoff=27.18 cfs 1.442 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=2.18"
Flow Length=247' Tc=20.0 min CN=79/0 Runoff=2.18 cfs 0.163 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=5.776 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=737' Tc=11.1 min CN=86/0 Runoff=23.19 cfs 1.340 af

Subcatchment 23S: Direct to Lower West Runoff Area=9.551 ac 0.00% Impervious Runoff Depth=2.88"
Flow Length=391' Tc=9.5 min CN=87/0 Runoff=41.83 cfs 2.289 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=26.075 ac 1.14% Impervious Runoff Depth=2.98"
Flow Length=998' Tc=13.6 min CN=88/98 Runoff=102.44 cfs 6.482 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=41.507 ac 5.85% Impervious Runoff Depth=2.68"
Flow Length=1,249' Tc=23.4 min CN=84/98 Runoff=113.08 cfs 9.287 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth=2.06"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min CN=74/98 Runoff=29.68 cfs 3.430 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=73.860 ac 2.02% Impervious Runoff Depth=3.09"
Flow Length=1,354' Tc=23.6 min CN=89/98 Runoff=228.63 cfs 19.002 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=2.50"
Flow Length=1,032' Tc=10.2 min CN=80/98 Runoff=50.10 cfs 2.852 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth=2.95"
Flow Length=734' Tc=26.4 min CN=87/98 Runoff=36.48 cfs 3.216 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=2.80"
Flow Length=531' Tc=5.6 min CN=82/98 Runoff=17.92 cfs 0.876 af

Reach 1R: Cowley Lake Outlet Channel Inflow=68.61 cfs 6.396 af
Outflow=68.61 cfs 6.396 af

Reach 2R: Cowley Lake Inflow=198.51 cfs 49.934 af
Outflow=198.51 cfs 49.934 af

Reach 21R: East Channel Avg. Flow Depth=1.03' Max Vel=5.05 fps Inflow=31.62 cfs 28.336 af
n=0.022 L=382.0' S=0.0097 '/' Capacity=131.71 cfs Outflow=31.62 cfs 28.336 af

Reach 23RL: Lower West Channel Avg. Flow Depth=1.08' Max Vel=2.33 fps Inflow=41.83 cfs 12.336 af
n=0.022 L=534.0' S=0.0014 '/' Capacity=257.71 cfs Outflow=38.29 cfs 12.336 af

Reach 23RU: Upper West Channel Avg. Flow Depth=0.60' Max Vel=2.39 fps Inflow=33.63 cfs 10.047 af
n=0.022 L=490.0' S=0.0057 '/' Capacity=766.18 cfs Outflow=33.59 cfs 10.047 af

Pond 7P: Whiteford Lake and Wetlands Peak Elev=930.67' Storage=41.126 af Inflow=458.46 cfs 41.126 af
Outflow=0.00 cfs 0.000 af

Pond 30P: Wetland 4A Peak Elev=926.67' Storage=6.665 af Inflow=127.90 cfs 12.716 af
Outflow=33.63 cfs 10.047 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=933.39' Storage=0.381 af Inflow=29.68 cfs 3.430 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=20.21 cfs 3.430 af

Pond 40P: Wetland 2B Peak Elev=925.70' Storage=12.456 af Inflow=239.10 cfs 28.177 af
Outflow=31.39 cfs 28.172 af

Pond 41P: Ex South Off-site Pond Peak Elev=940.11' Storage=2.852 af Inflow=50.10 cfs 2.852 af
Outflow=0.00 cfs 0.000 af

Pond 50P: Wetland 4B Peak Elev=941.05' Storage=3.922 af Inflow=40.73 cfs 3.922 af
Outflow=0.00 cfs 0.000 af

Pond 60P: Wetland 5B Peak Elev=938.81' Storage=0.292 af Inflow=21.34 cfs 9.390 af
Outflow=19.92 cfs 9.176 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=9.88 cfs 8.513 af
Primary=9.88 cfs 8.513 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=4.82 cfs 0.706 af
Area= 26.390 ac 15.63% Imperv. Primary=4.82 cfs 0.706 af

Total Runoff Area = 540.193 ac Runoff Volume = 97.901 af Average Runoff Depth = 2.17"
98.07% Pervious = 529.794 ac 1.93% Impervious = 10.399 ac

Summary for Subcatchment 7S: Approx DA to Lake

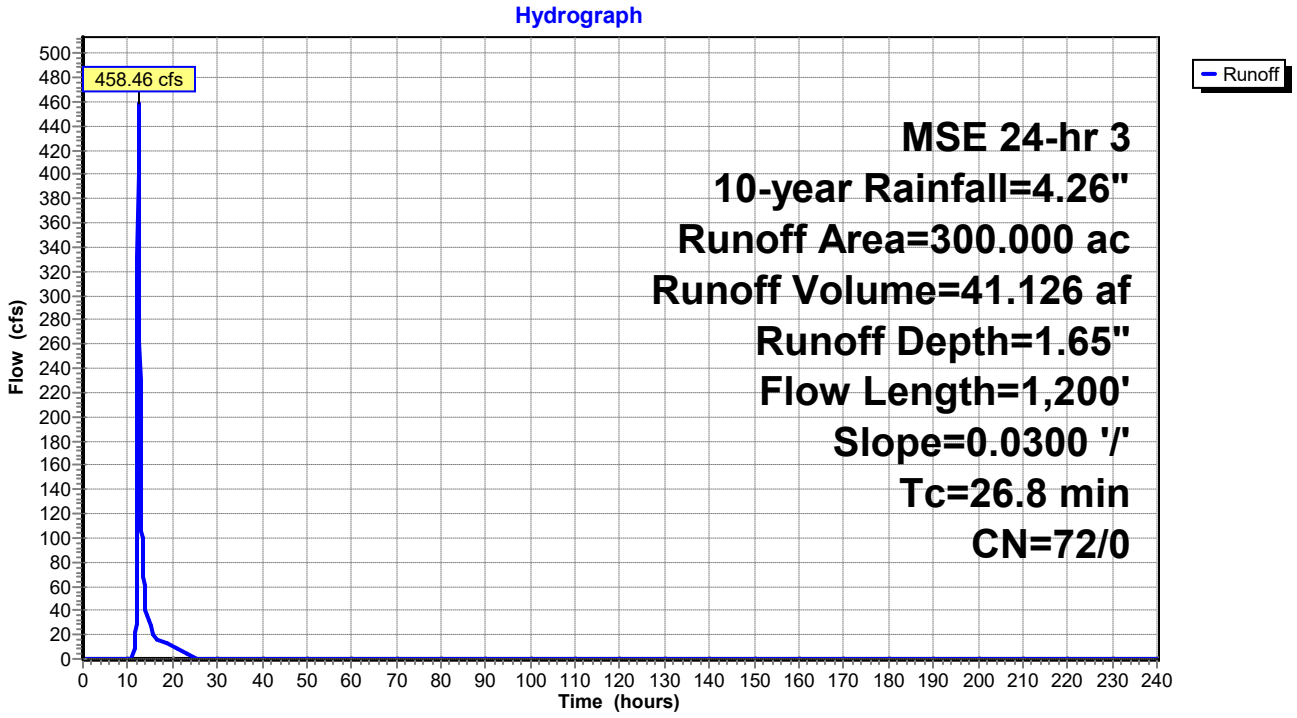
Runoff = 458.46 cfs @ 12.40 hrs, Volume= 41.126 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
300.000	72	Woods/grass comb., Good, HSG C
300.000	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

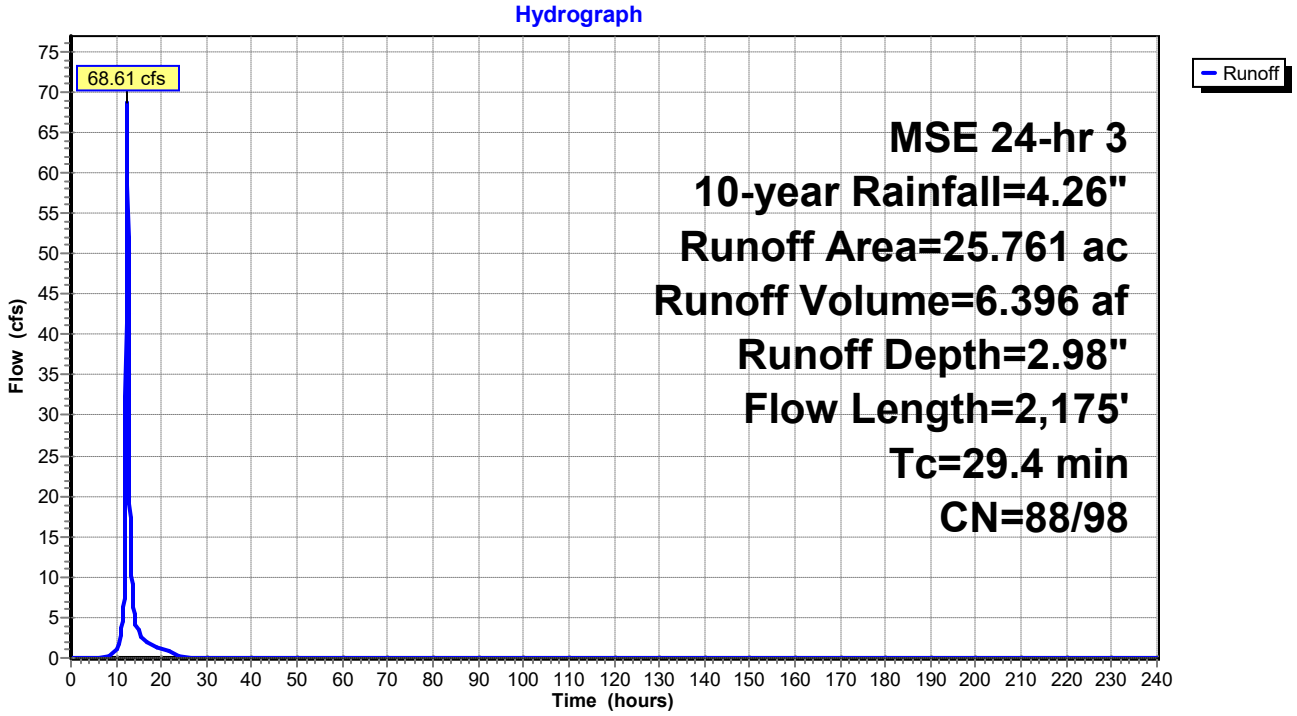
Runoff = 68.61 cfs @ 12.41 hrs, Volume= 6.396 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.136	98	Unconnected pavement, HSG D
0.070	98	Unconnected roofs, HSG D
1.380	98	Water Surface, 0% imp, HSG D
21.395	89	Row crops, straight row, Good, HSG D
1.284	80	>75% Grass cover, Good, HSG D
0.797	78	Meadow, non-grazed, HSG D
0.699	77	Woods, Good, HSG D
25.761	88	Weighted Average
25.555	88	99.20% Pervious Area
0.206	98	0.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
20.2	1,454	0.0177	1.20		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.9	621	0.0020	2.64	68.60	**Channel Flow,** Area= 26.0 sf Perim= 20.0' r= 1.30' n= 0.030 Earth, grassed & winding
29.4	2,175	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 20S: Direct to Cowley Lake

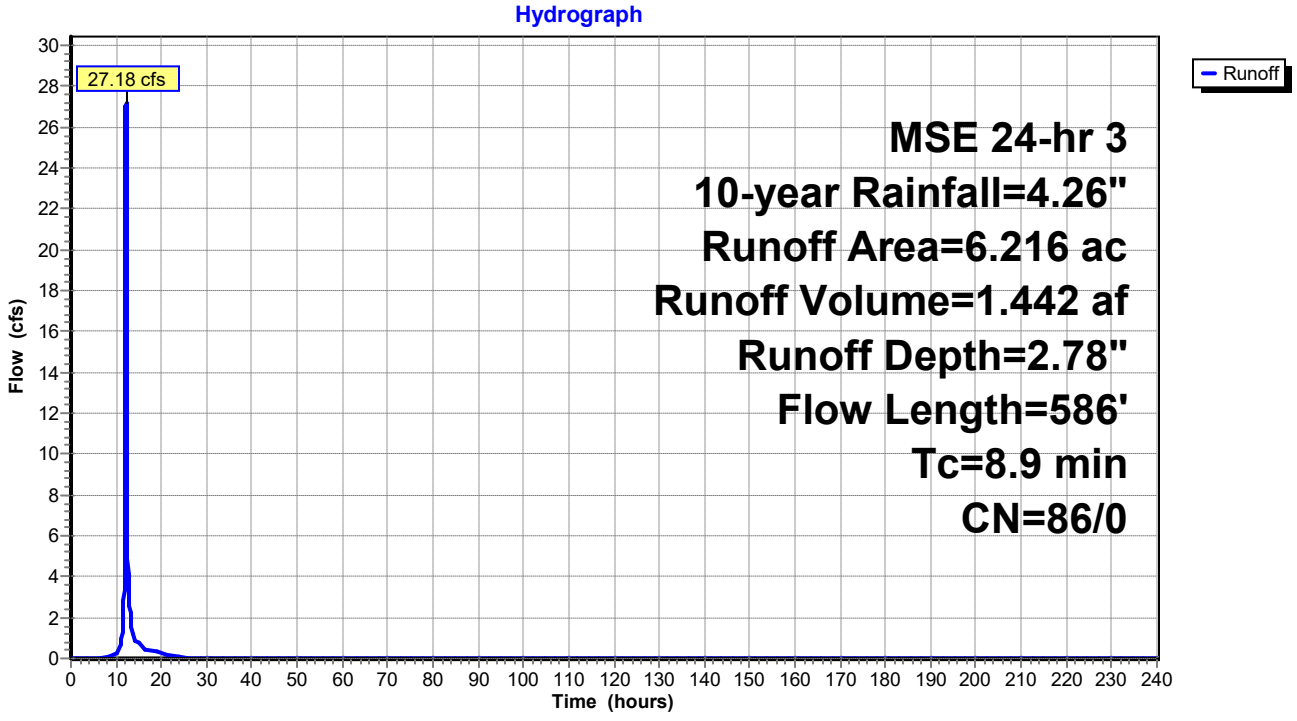
Runoff = 27.18 cfs @ 12.16 hrs, Volume= 1.442 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.123	98	Water Surface, 0% imp, HSG D
4.384	89	Row crops, straight row, Good, HSG D
1.709	77	Woods, Good, HSG D
6.216	86	Weighted Average
6.216	86	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.0240	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
4.3	486	0.0440	1.89		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
8.9	586	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

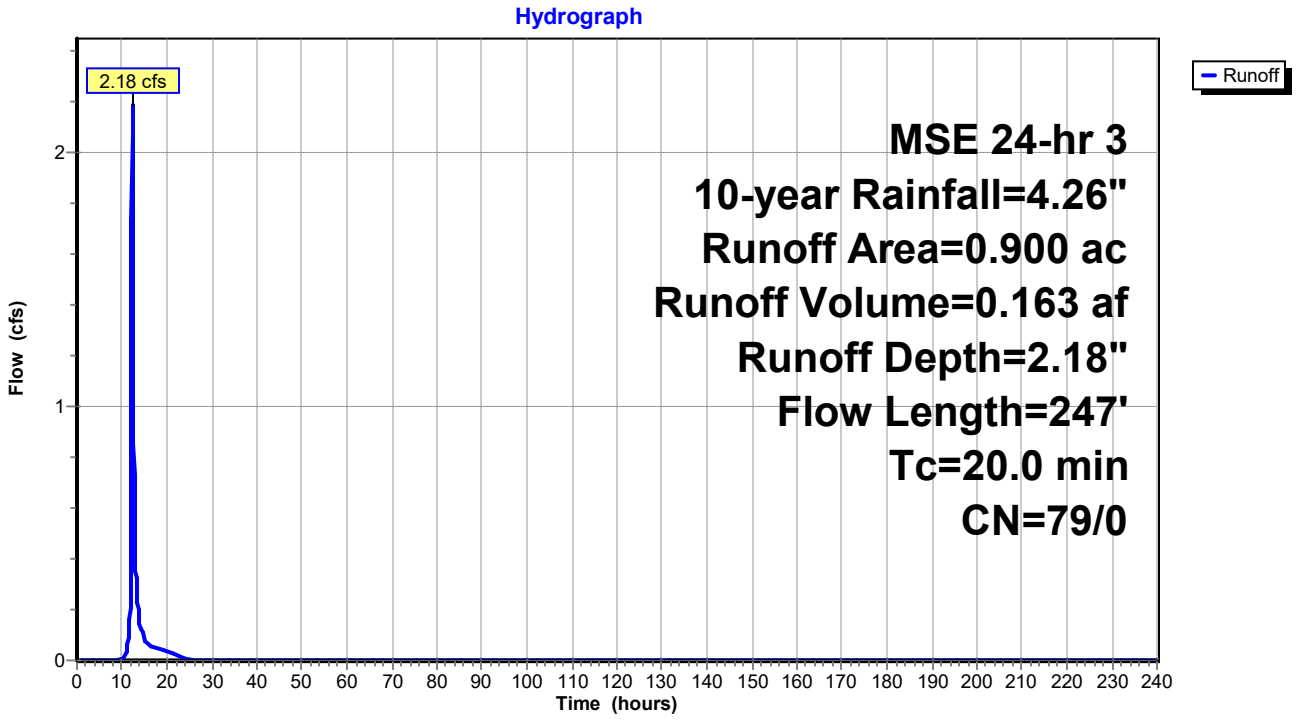
Runoff = 2.18 cfs @ 12.30 hrs, Volume= 0.163 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.074	98	Water Surface, 0% imp, HSG D
0.005	89	Row crops, straight row, Good, HSG D
0.821	77	Woods, Good, HSG D
0.900	79	Weighted Average
0.900	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0350	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.8	147	0.0721	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.0	247	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

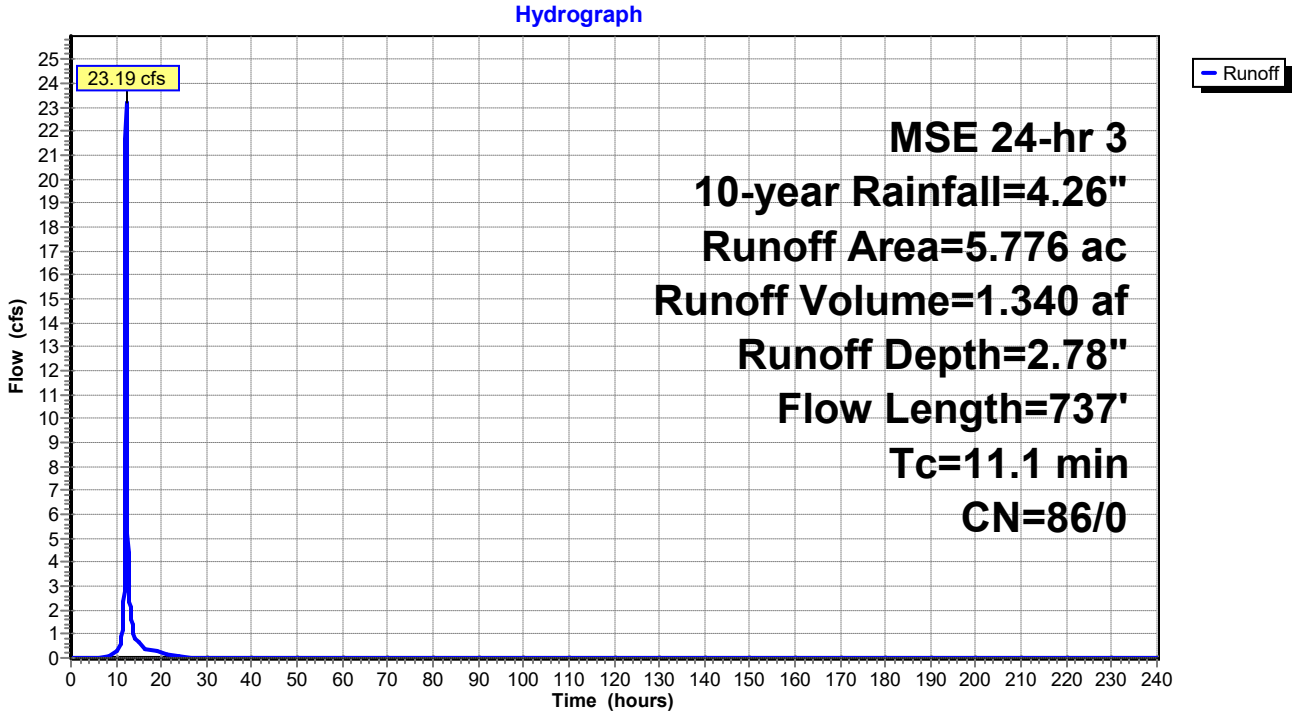
Runoff = 23.19 cfs @ 12.19 hrs, Volume= 1.340 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.031	98	Water Surface, 0% imp, HSG D
4.386	89	Row crops, straight row, Good, HSG D
0.729	78	Meadow, non-grazed, HSG D
0.630	77	Woods, Good, HSG D
5.776	86	Weighted Average
5.776	86	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.0440	0.46		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
7.5	637	0.0248	1.42		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.1	737	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Lower West Channel

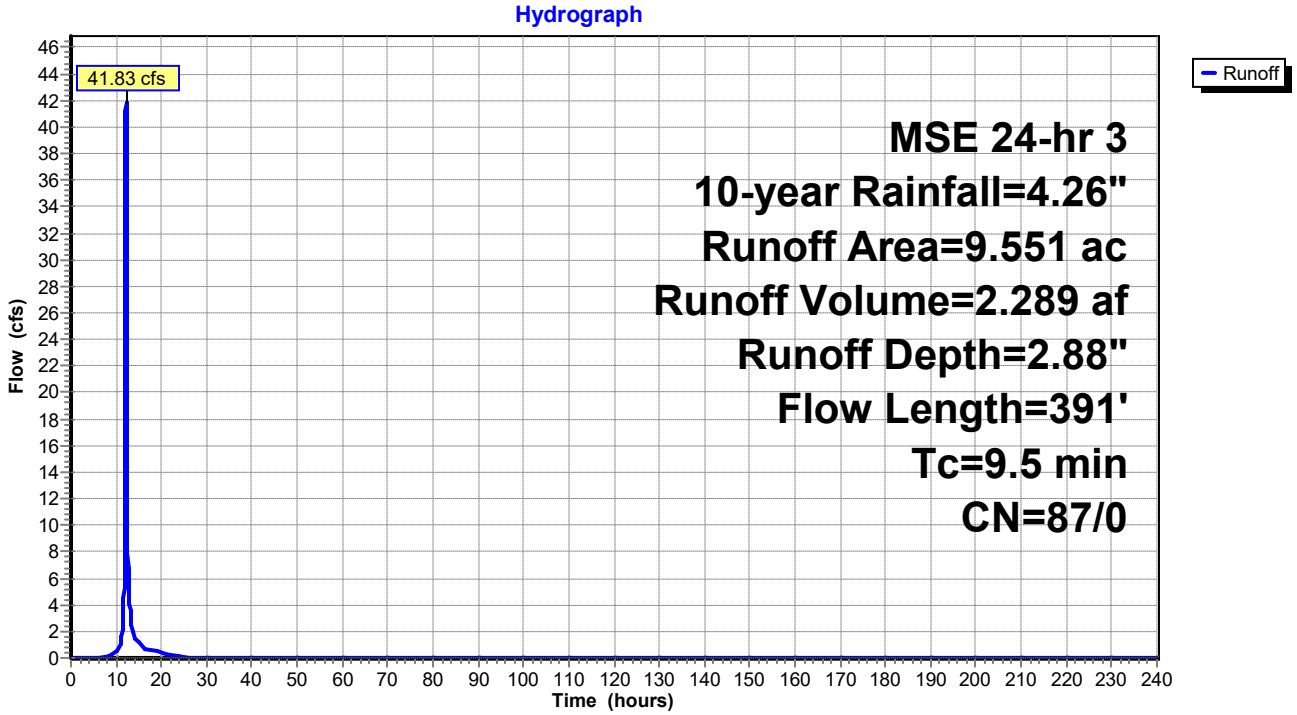
Runoff = 41.83 cfs @ 12.17 hrs, Volume= 2.289 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.467	98	Water Surface, 0% imp, HSG D
7.263	89	Row crops, straight row, Good, HSG D
0.213	78	Meadow, non-grazed, HSG D
1.608	77	Woods, Good, HSG D
9.551	87	Weighted Average
9.551	87	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0090	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
2.6	291	0.0433	1.87		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.5	391	Total			

Subcatchment 23S: Direct to Lower West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

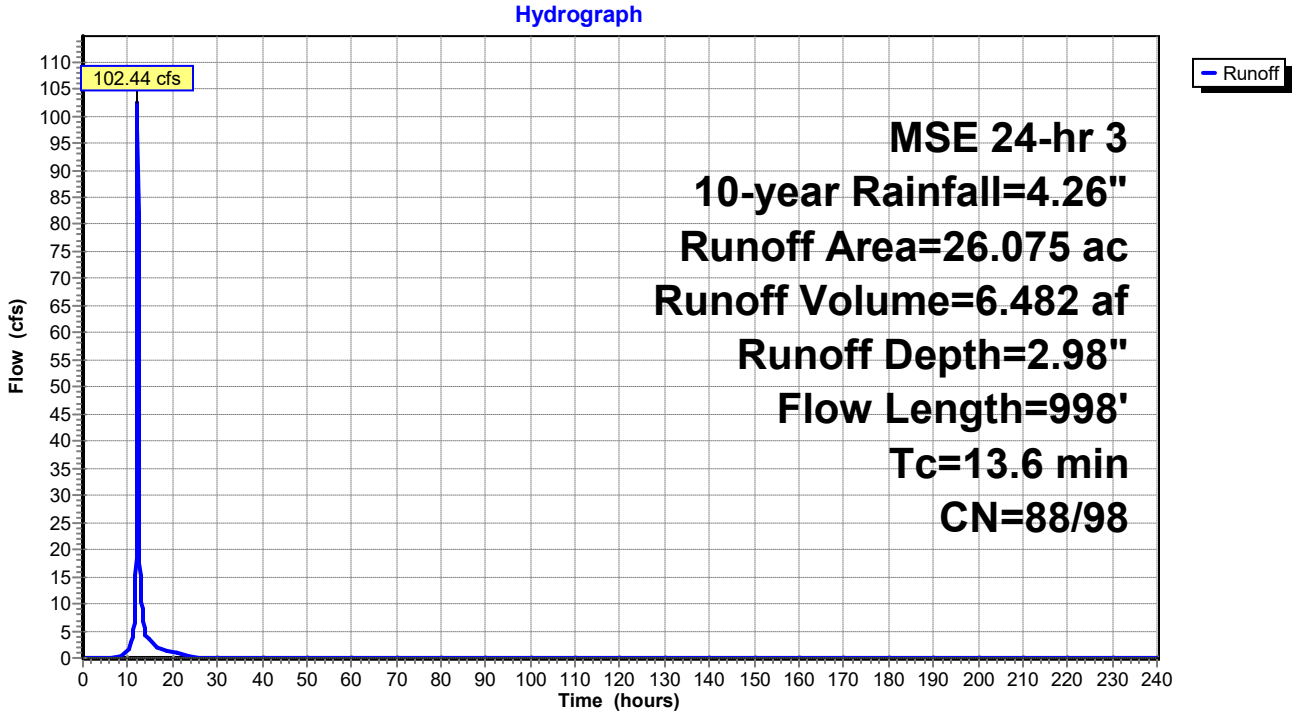
Runoff = 102.44 cfs @ 12.22 hrs, Volume= 6.482 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.298	98	Unconnected pavement, HSG D
0.980	98	Water Surface, 0% imp, HSG D
0.082	96	Gravel surface, HSG D
0.357	80	>75% Grass cover, Good, HSG D
21.863	89	Row crops, straight row, Good, HSG D
0.151	78	Meadow, non-grazed, HSG D
2.344	77	Woods, Good, HSG D
26.075	88	Weighted Average
25.777	88	98.86% Pervious Area
0.298	98	1.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0200	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
10.3	819	0.0217	1.33		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.8	149	0.0315	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.6	998	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 30S: Direct to Wetland 4A

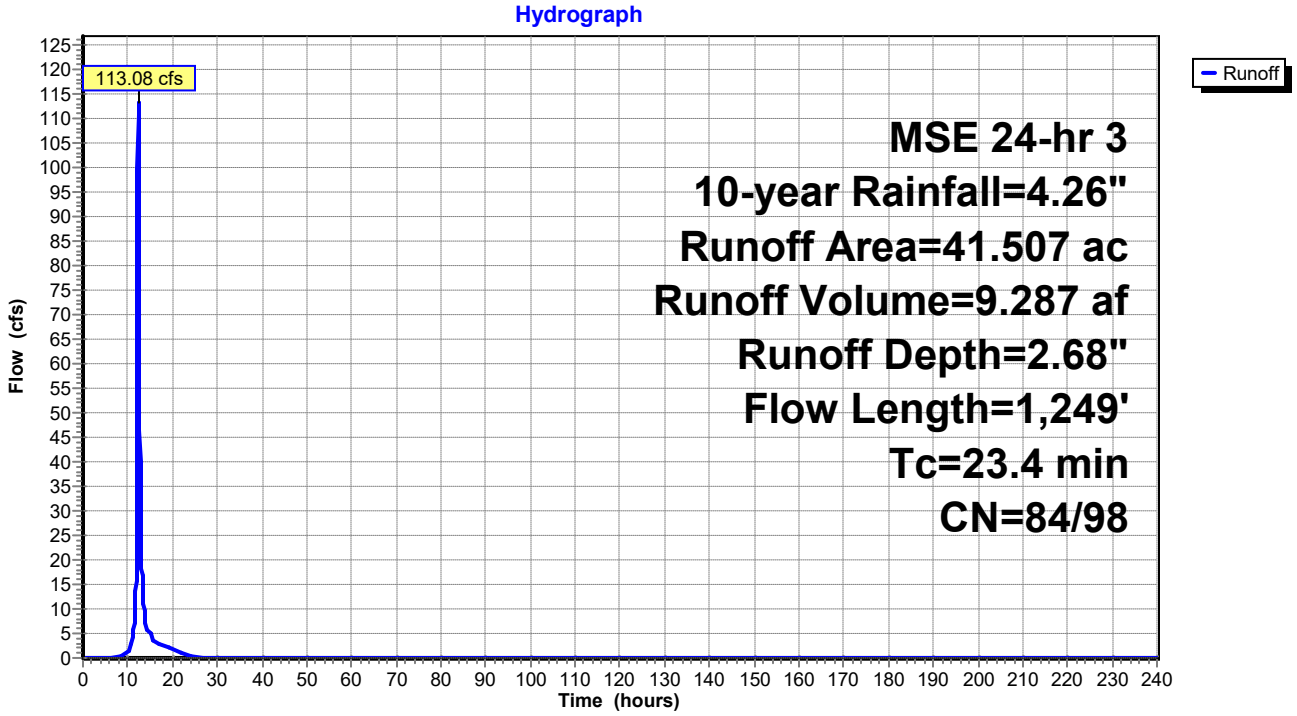
Runoff = 113.08 cfs @ 12.34 hrs, Volume= 9.287 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
1.469	98	Unconnected pavement, HSG D
0.959	98	Unconnected roofs, HSG D
0.947	96	Gravel surface, HSG D
17.469	89	Row crops, straight row, Good, HSG D
1.609	89	Pasture/grassland/range, Poor, HSG D
14.597	80	>75% Grass cover, Good, HSG D
0.684	78	Meadow, non-grazed, HSG D
3.773	77	Woods, Good, HSG D
41.507	85	Weighted Average
39.079	84	94.15% Pervious Area
2.428	98	5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

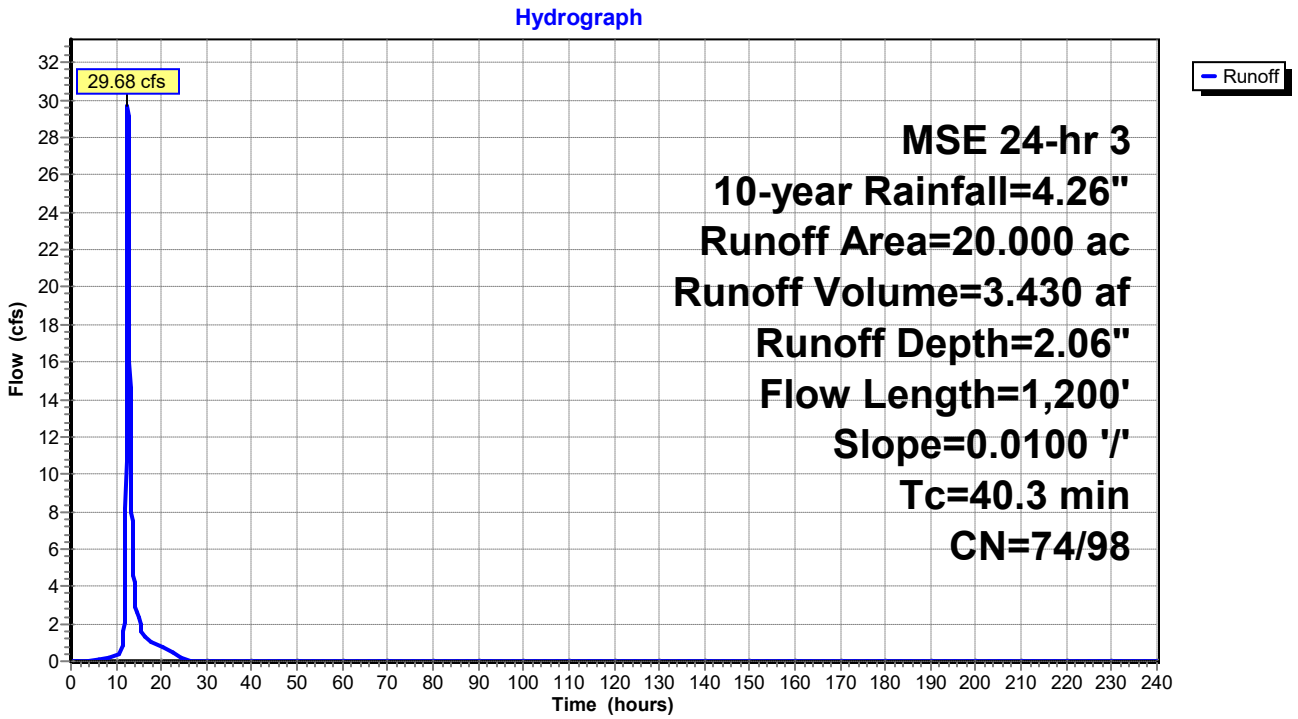
Runoff = 29.68 cfs @ 12.57 hrs, Volume= 3.430 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
20.000	77	2 acre lots, 12% imp, HSG C
17.600	74	88.00% Pervious Area
2.400	98	12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 40S: Direct to Wetland 2B

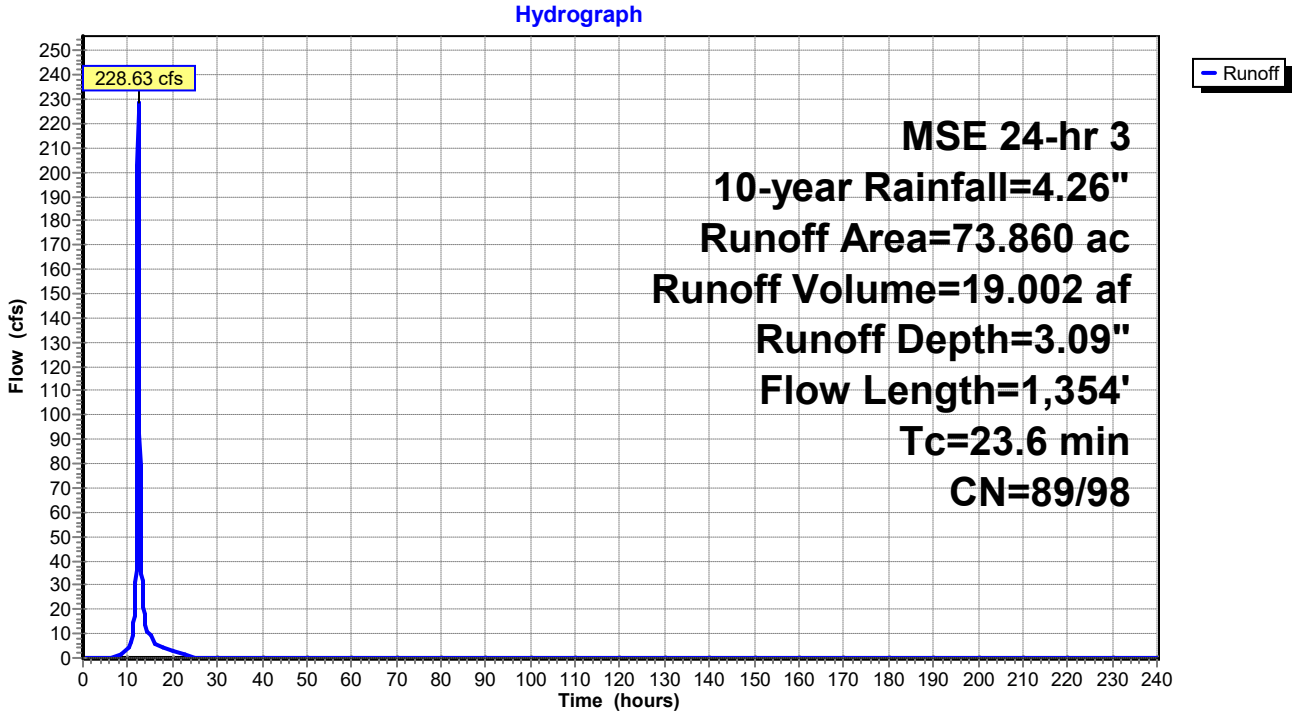
Runoff = 228.63 cfs @ 12.34 hrs, Volume= 19.002 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.965	98	Unconnected pavement, HSG D
0.528	98	Unconnected roofs, HSG D
17.207	98	Water Surface, 0% imp, HSG D
1.249	96	Gravel surface, HSG D
35.493	89	Row crops, straight row, Good, HSG D
0.208	89	Pasture/grassland/range, Poor, HSG D
8.455	80	>75% Grass cover, Good, HSG D
5.449	78	Meadow, non-grazed, HSG D
4.306	77	Woods, Good, HSG D
73.860	89	Weighted Average
72.367	89	97.98% Pervious Area
1.493	98	2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

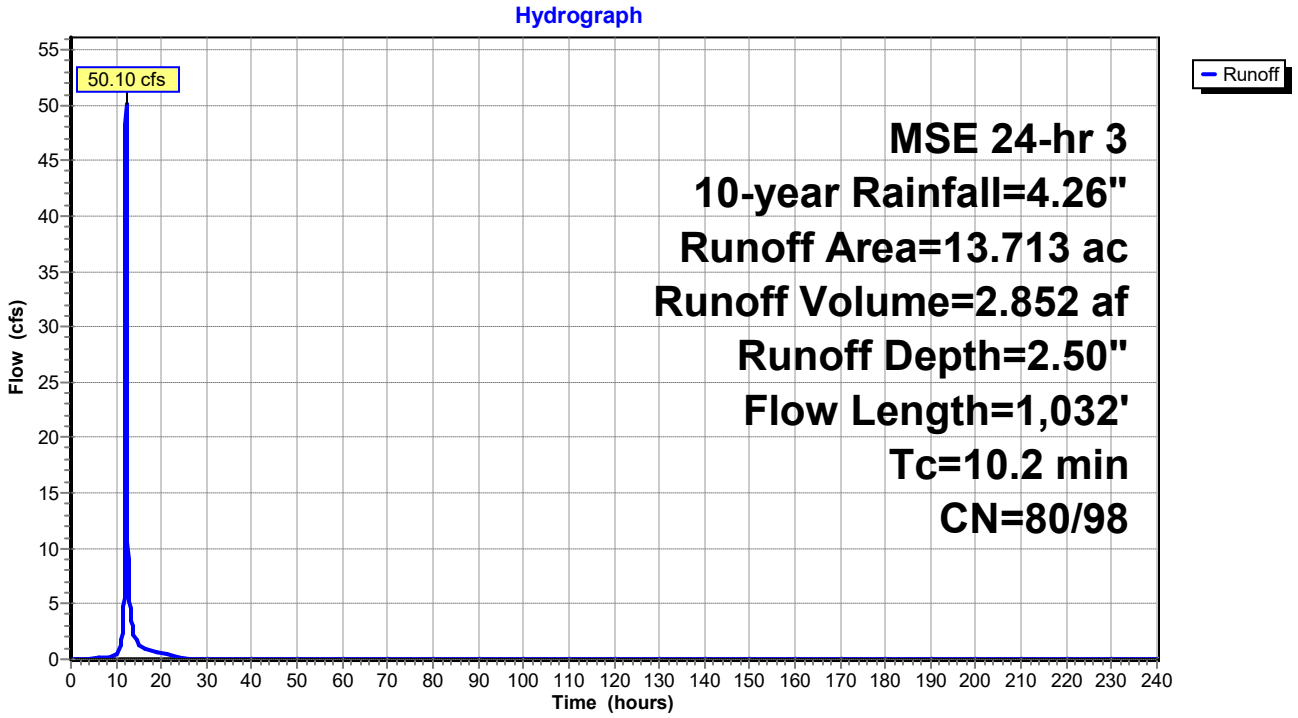
Runoff = 50.10 cfs @ 12.18 hrs, Volume= 2.852 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
1.568	98	Unconnected pavement, HSG D
0.273	98	Unconnected roofs, HSG D
0.107	98	Water Surface, 0% imp, HSG D
0.066	96	Gravel surface, HSG D
10.431	80	>75% Grass cover, Good, HSG D
1.268	78	Meadow, non-grazed, HSG D
13.713	82	Weighted Average
11.872	80	86.57% Pervious Area
1.841	98	13.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

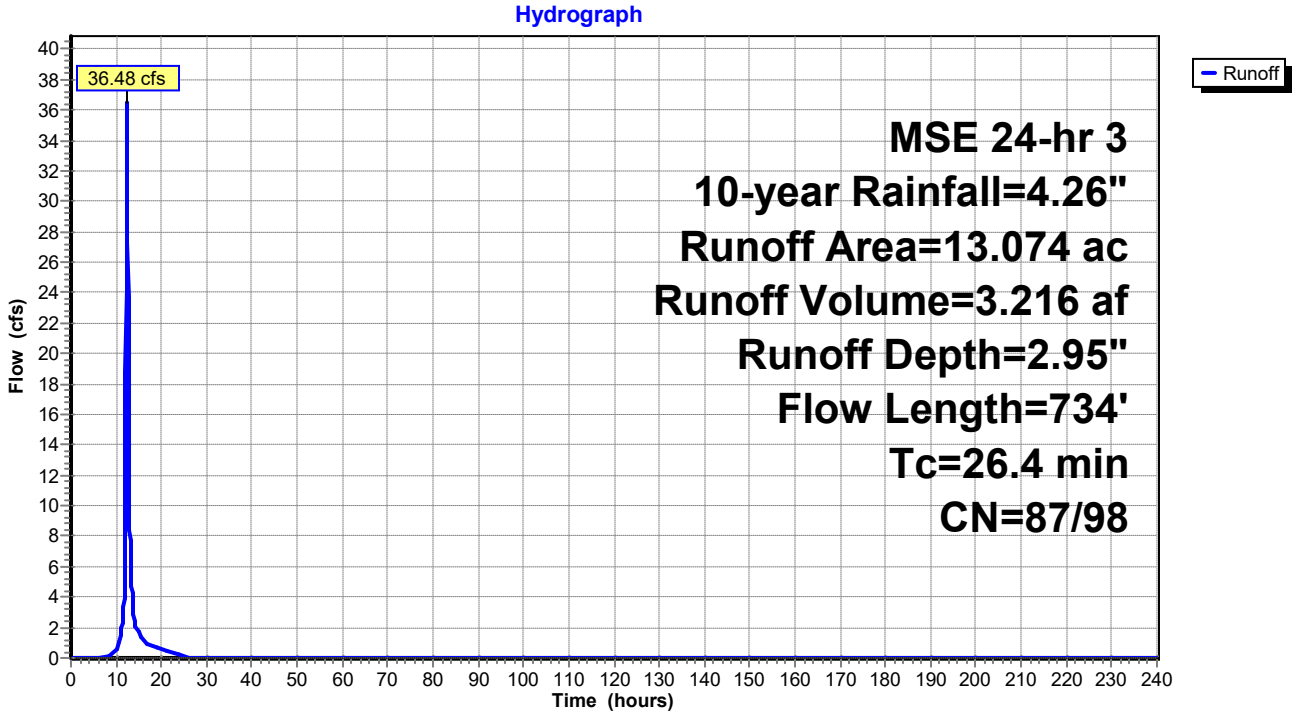
Runoff = 36.48 cfs @ 12.37 hrs, Volume= 3.216 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.523	98	Unconnected pavement, HSG D
0.339	98	Unconnected roofs, HSG D
0.175	98	Water Surface, 0% imp, HSG D
0.233	96	Gravel surface, HSG D
8.346	89	Row crops, straight row, Good, HSG D
0.958	89	Pasture/grassland/range, Poor, HSG D
2.500	80	>75% Grass cover, Good, HSG D
13.074	88	Weighted Average
12.212	87	93.41% Pervious Area
0.862	98	6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

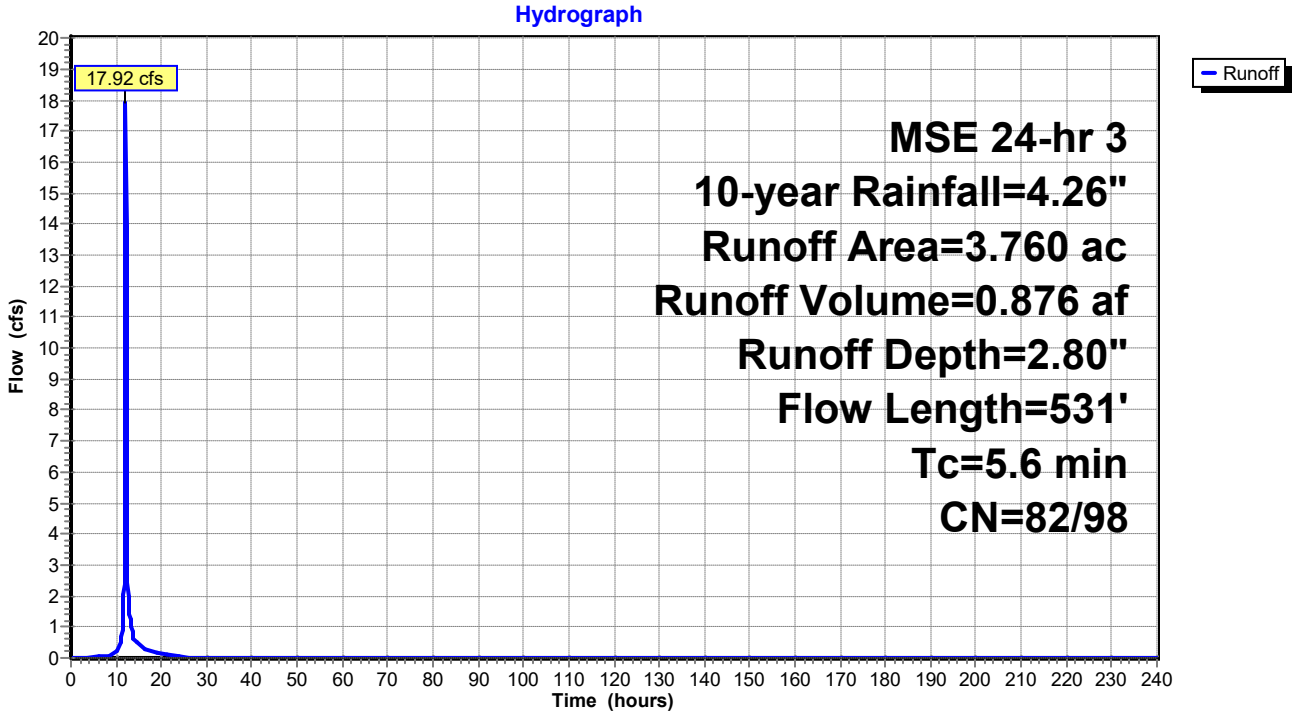
Runoff = 17.92 cfs @ 12.13 hrs, Volume= 0.876 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=4.26"

Area (ac)	CN	Description
0.428	98	Unconnected pavement, HSG D
0.443	98	Unconnected roofs, HSG D
0.064	98	Water Surface, 0% imp, HSG D
0.331	96	Gravel surface, HSG D
2.083	80	>75% Grass cover, Good, HSG D
0.411	77	Woods, Good, HSG D
3.760	86	Weighted Average
2.889	82	76.84% Pervious Area
0.871	98	23.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



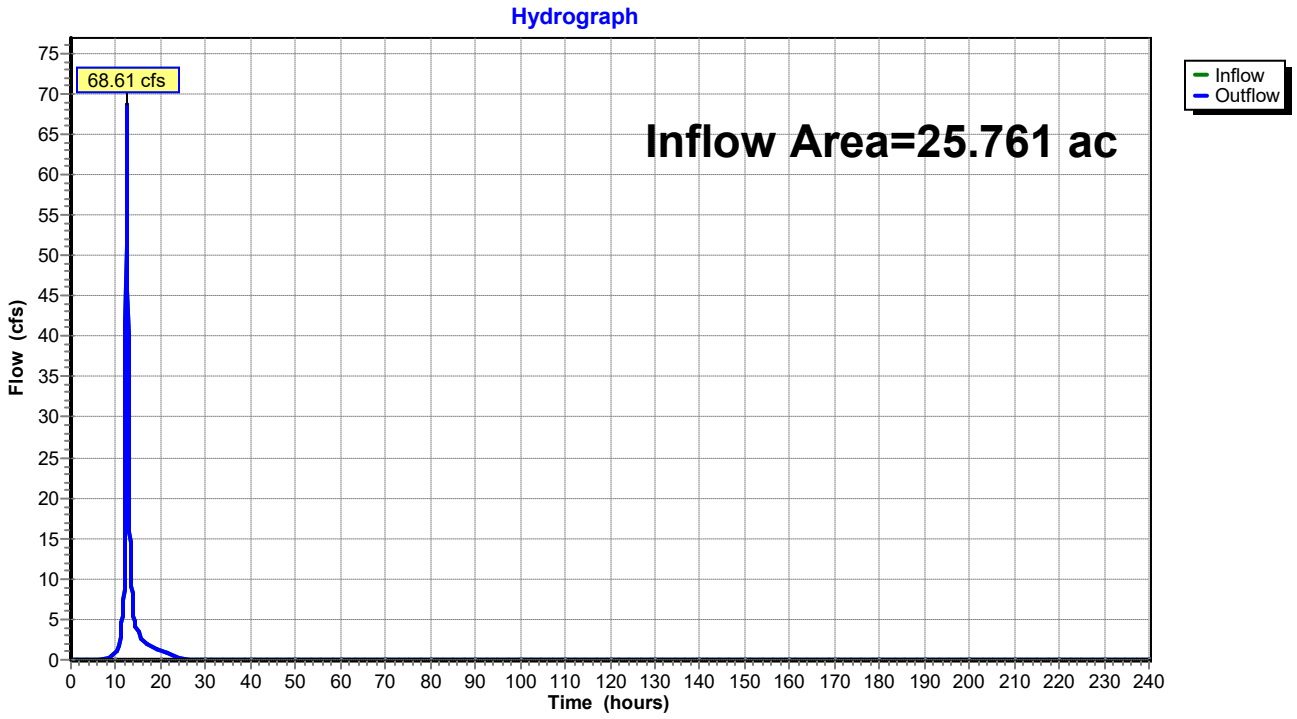
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.761 ac, 0.80% Impervious, Inflow Depth = 2.98" for 10-year event
Inflow = 68.61 cfs @ 12.41 hrs, Volume= 6.396 af
Outflow = 68.61 cfs @ 12.41 hrs, Volume= 6.396 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



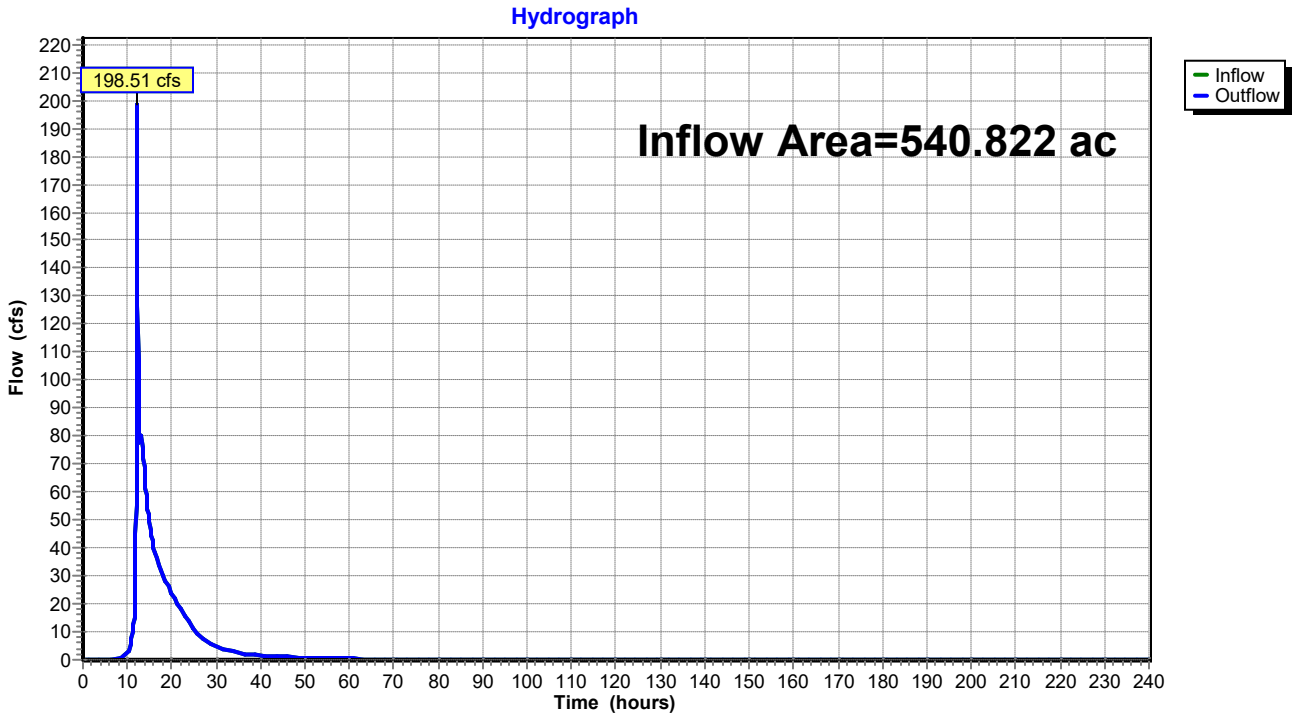
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.822 ac, 2.65% Impervious, Inflow Depth = 1.11" for 10-year event
Inflow = 198.51 cfs @ 12.21 hrs, Volume= 49.934 af
Outflow = 198.51 cfs @ 12.21 hrs, Volume= 49.934 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



Summary for Reach 21R: East Channel

Inflow Area = 131.697 ac, 6.98% Impervious, Inflow Depth = 2.58" for 10-year event
Inflow = 31.62 cfs @ 13.52 hrs, Volume= 28.336 af
Outflow = 31.62 cfs @ 13.54 hrs, Volume= 28.336 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.05 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 6.4 min

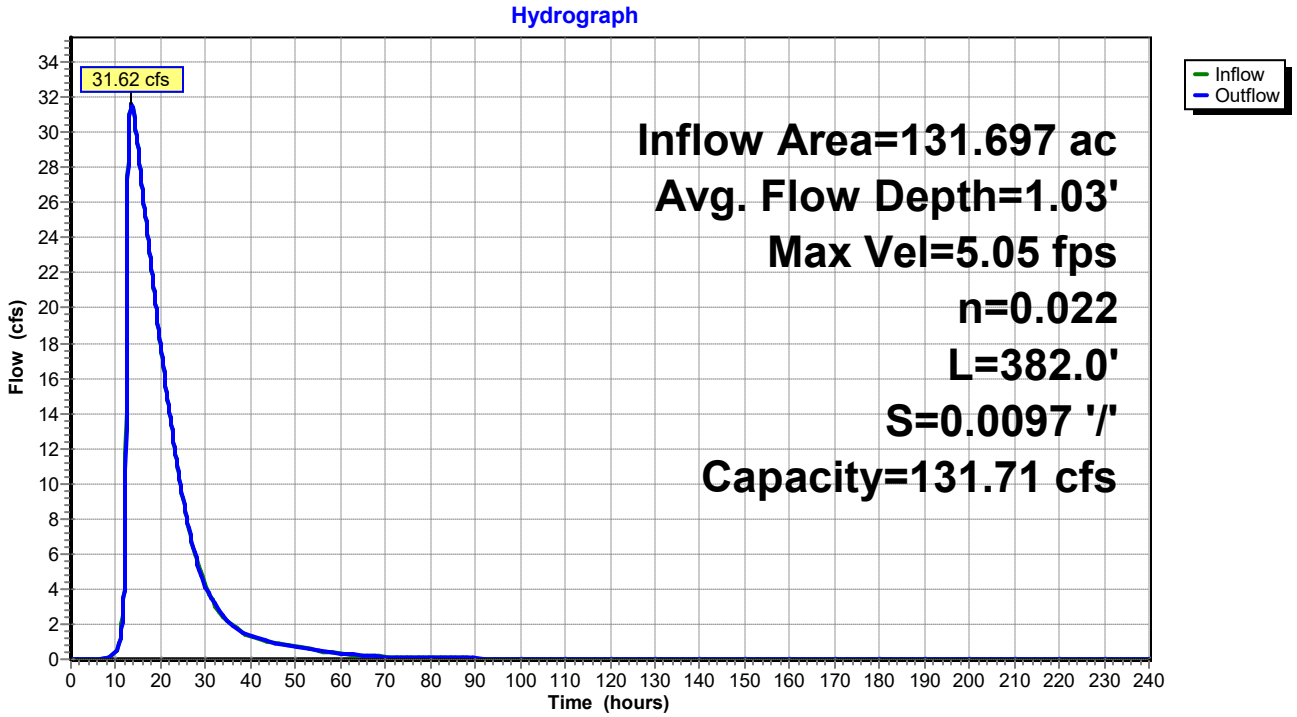
Peak Storage= 2,393 cf @ 13.54 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 131.71 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 382.0' Slope= 0.0097 '/'
Inlet Invert= 923.92', Outlet Invert= 920.20'



‡

Reach 21R: East Channel



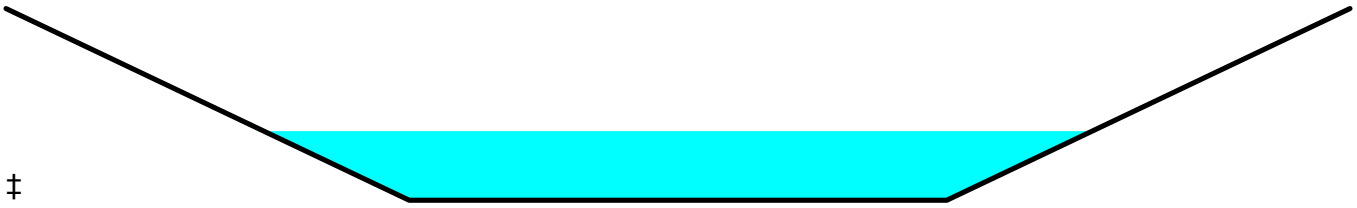
Summary for Reach 23RL: Lower West Channel

Inflow Area = 371.058 ac, 1.30% Impervious, Inflow Depth > 0.40" for 10-year event
Inflow = 41.83 cfs @ 12.17 hrs, Volume= 12.336 af
Outflow = 38.29 cfs @ 12.21 hrs, Volume= 12.336 af, Atten= 8%, Lag= 2.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.33 fps, Min. Travel Time= 3.8 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 27.1 min

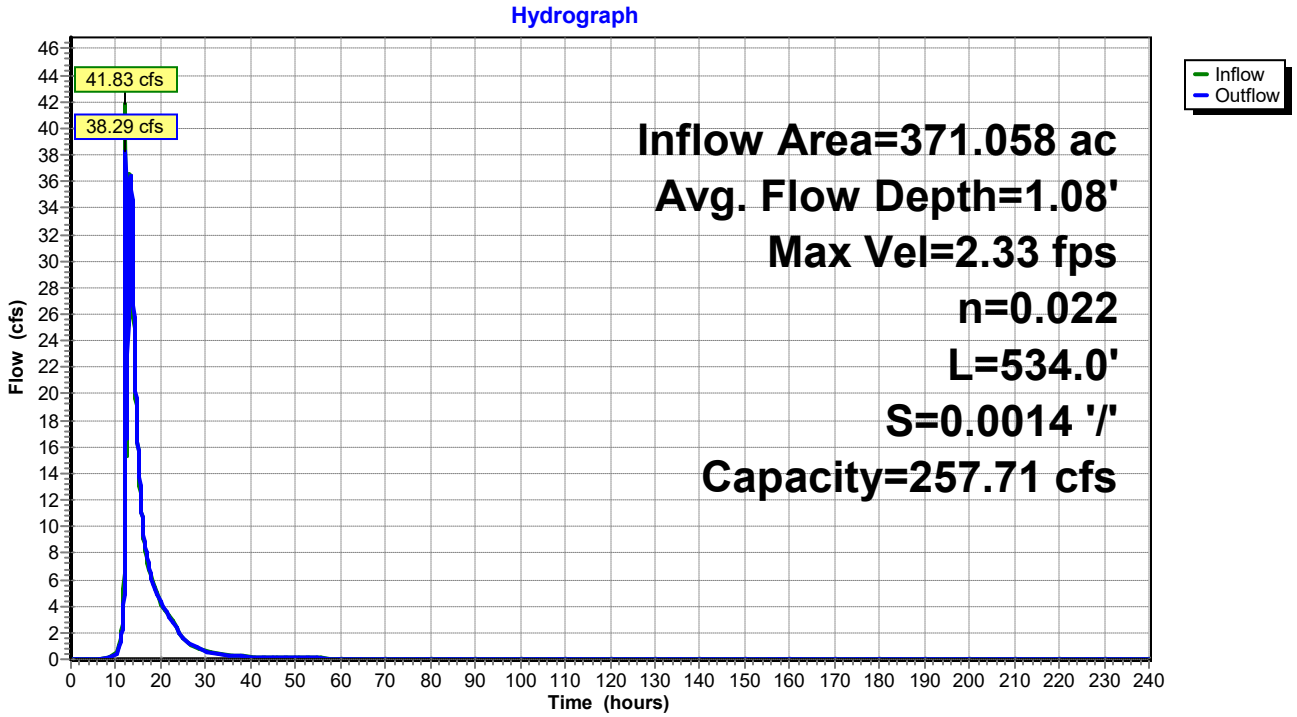
Peak Storage= 8,782 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.08'
Bank-Full Depth= 3.00' Flow Area= 63.0 sf, Capacity= 257.71 cfs

12.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 30.00'
Length= 534.0' Slope= 0.0014 '/'
Inlet Invert= 919.58', Outlet Invert= 918.82'



‡

Reach 23RL: Lower West Channel



Summary for Reach 23RU: Upper West Channel

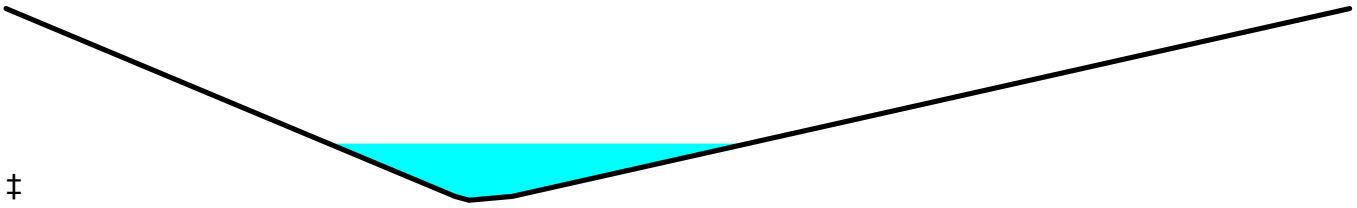
[80] Warning: Exceeded Pond 30P by 0.96' @ 0.00 hrs (0.58 cfs 0.660 af)

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth > 0.33" for 10-year event
Inflow = 33.63 cfs @ 13.23 hrs, Volume= 10.047 af
Outflow = 33.59 cfs @ 13.28 hrs, Volume= 10.047 af, Atten= 0%, Lag= 2.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.39 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 20.6 min

Peak Storage= 6,877 cf @ 13.28 hrs
Average Depth at Peak Storage= 0.60'
Bank-Full Depth= 2.04' Flow Area= 146.2 sf, Capacity= 766.18 cfs

Custom cross-section, Length= 490.0' Slope= 0.0057 '/'
Constant n= 0.022 Earth, clean & straight
Inlet Invert= 925.96', Outlet Invert= 923.17'

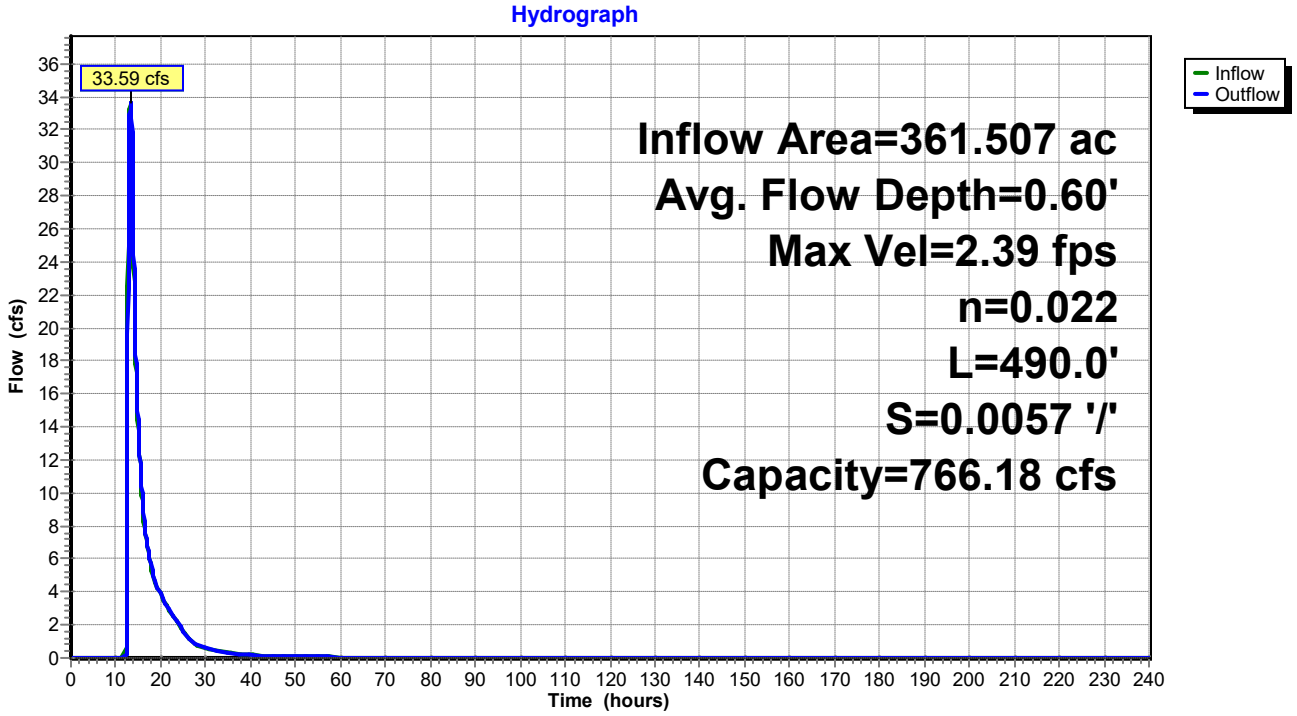


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-48.27	928.00	0.00
-1.47	926.00	2.00
0.00	925.96	2.04
4.51	926.00	2.00
91.79	928.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.1	6.0	59	0.05
2.04	146.2	140.1	71,618	766.18

Reach 23RU: Upper West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth = 1.65" for 10-year event
Inflow = 458.46 cfs @ 12.40 hrs, Volume= 41.126 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 930.67' @ 25.55 hrs Surf.Area= 62.022 ac Storage= 41.126 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

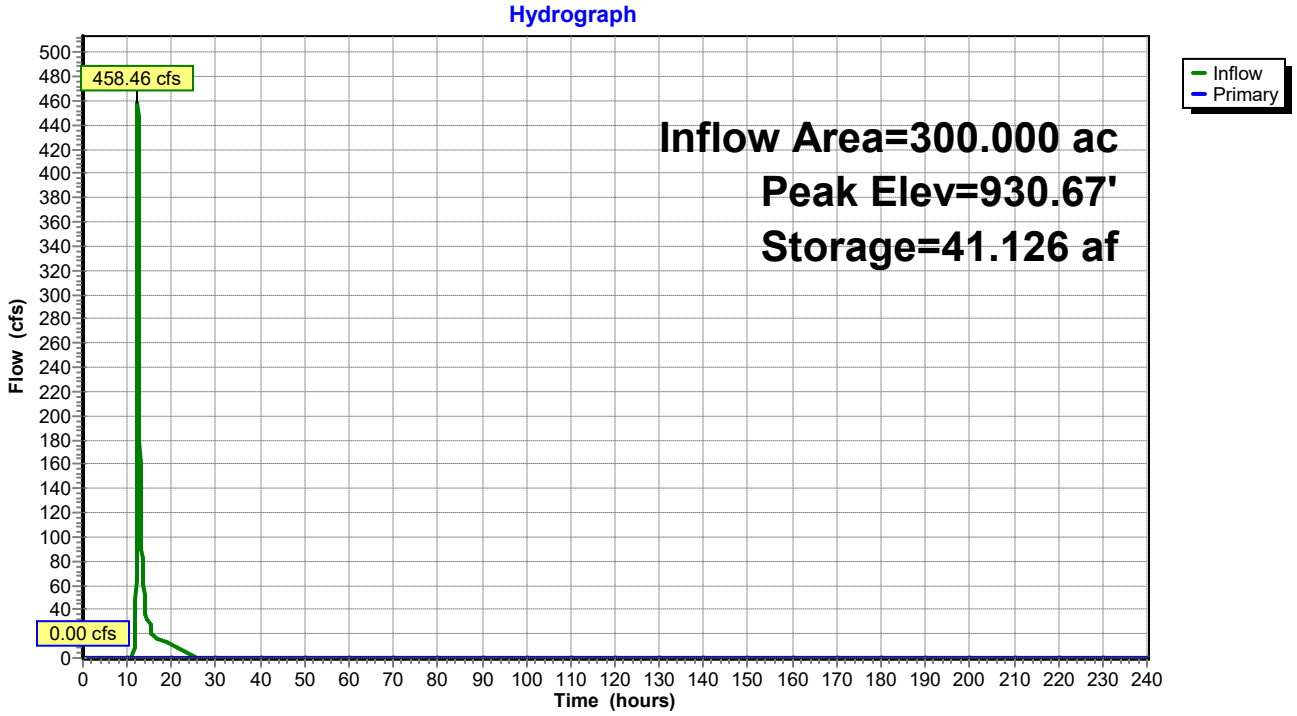
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=930.00' TW=930.22' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 30P: Wetland 4A

[58] Hint: Peaked 0.71' above defined flood level

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth = 0.42" for 10-year event
Inflow = 127.90 cfs @ 12.35 hrs, Volume= 12.716 af
Outflow = 33.63 cfs @ 13.23 hrs, Volume= 10.047 af, Atten= 74%, Lag= 53.2 min
Primary = 33.63 cfs @ 13.23 hrs, Volume= 10.047 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 926.67' @ 13.28 hrs Surf.Area= 6.186 ac Storage= 6.665 af
Flood Elev= 925.96' Surf.Area= 5.112 ac Storage= 2.616 af

Plug-Flow detention time= 372.6 min calculated for 10.045 af (79% of inflow)
Center-of-Mass det. time= 310.3 min (1,126.2 - 815.9)

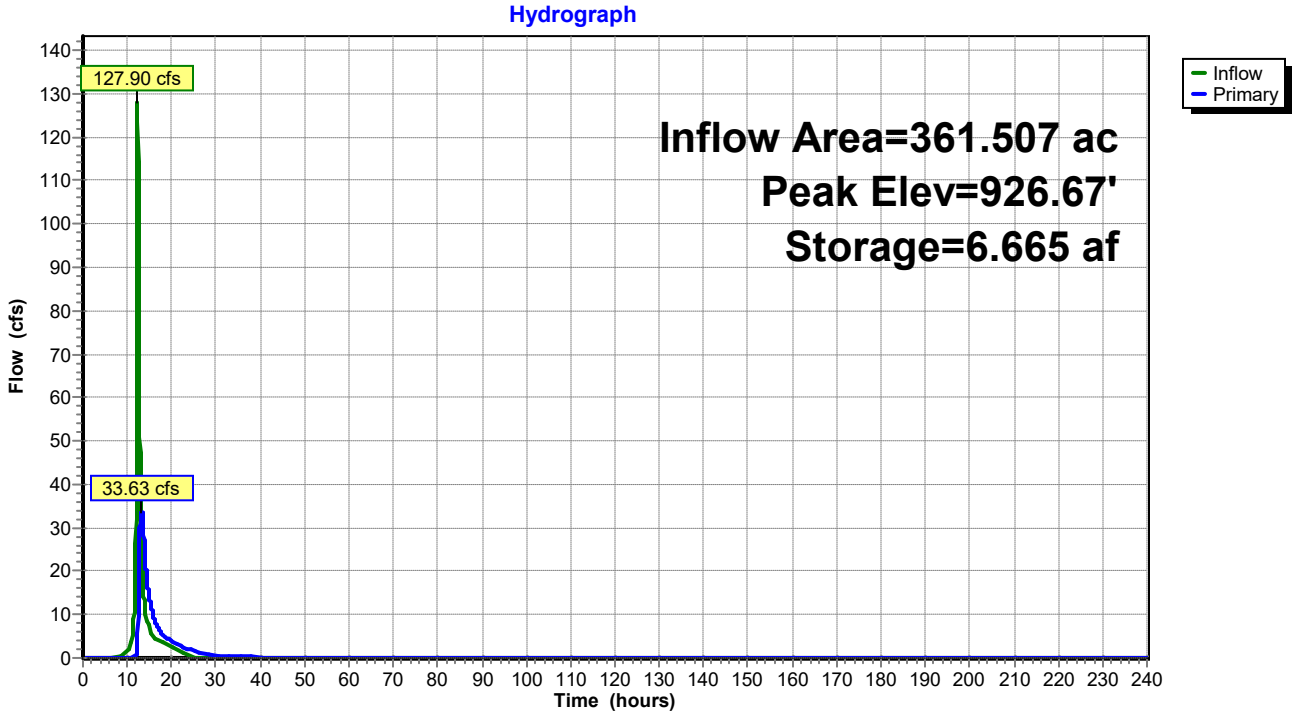
Volume	Invert	Avail.Storage	Storage Description
#1	925.00'	16.212 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
925.00	0.338	0.000	0.000
926.00	5.311	2.824	2.824
927.00	6.620	5.965	8.790
928.00	8.223	7.422	16.212

Device	Routing	Invert	Outlet Devices
#1	Primary	925.96'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.04 1.04 2.04 Width (feet) 0.00 6.00 90.00 140.00
#2	Primary	919.70'	**10.0" Round Culvert** L= 1,310.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.30' / 919.70' S= -0.0003 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#3	Device 2	925.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=33.49 cfs @ 13.23 hrs HW=926.67' TW=926.56' (Dynamic Tailwater)
- **1=Custom Weir/Orifice** (Weir Controls 33.29 cfs @ 1.46 fps)
- **2=Culvert** (Outlet Controls 0.19 cfs @ 0.36 fps)
  - **3=Orifice/Grate** (Passes 0.19 cfs of 0.86 cfs potential flow)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)
[80] Warning: Exceeded Pond 7P by 3.03' @ 12.85 hrs (389.13 cfs 34.431 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth = 0.13" for 10-year event
Inflow = 29.68 cfs @ 12.57 hrs, Volume= 3.430 af
Outflow = 20.21 cfs @ 12.88 hrs, Volume= 3.430 af, Atten= 32%, Lag= 18.3 min
Primary = 20.21 cfs @ 12.88 hrs, Volume= 3.430 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 933.39' @ 12.88 hrs Surf.Area= 0.537 ac Storage= 0.381 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 5.1 min (837.1 - 832.0)

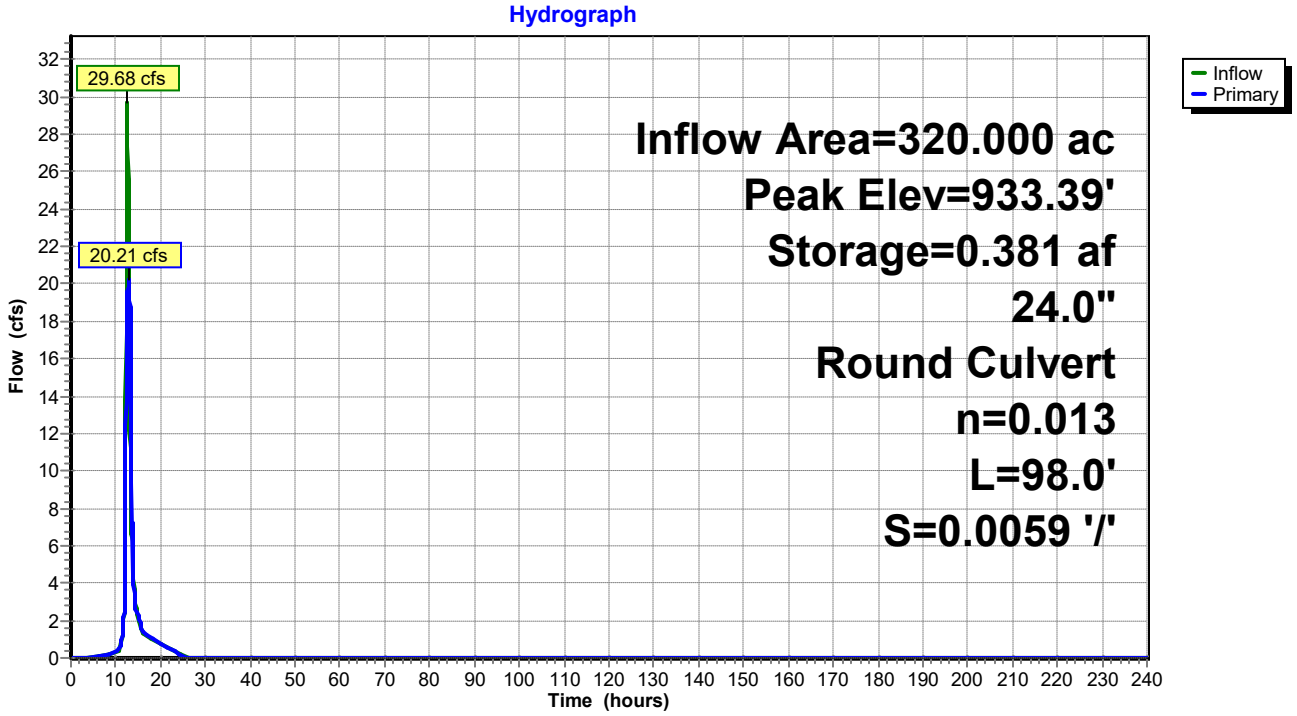
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=20.19 cfs @ 12.88 hrs HW=933.39' TW=926.63' (Dynamic Tailwater)
1=Culvert (Barrel Controls 20.19 cfs @ 6.43 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 40P: Wetland 2B

Inflow Area = 130.797 ac, 7.03% Impervious, Inflow Depth = 2.59" for 10-year event
Inflow = 239.10 cfs @ 12.33 hrs, Volume= 28.177 af
Outflow = 31.39 cfs @ 13.56 hrs, Volume= 28.172 af, Atten= 87%, Lag= 73.9 min
Primary = 31.39 cfs @ 13.56 hrs, Volume= 28.172 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 925.70' @ 13.57 hrs Surf.Area= 12.448 ac Storage= 12.456 af

Plug-Flow detention time= 324.5 min calculated for 28.167 af (100% of inflow)
Center-of-Mass det. time= 322.7 min (1,306.1 - 983.4)

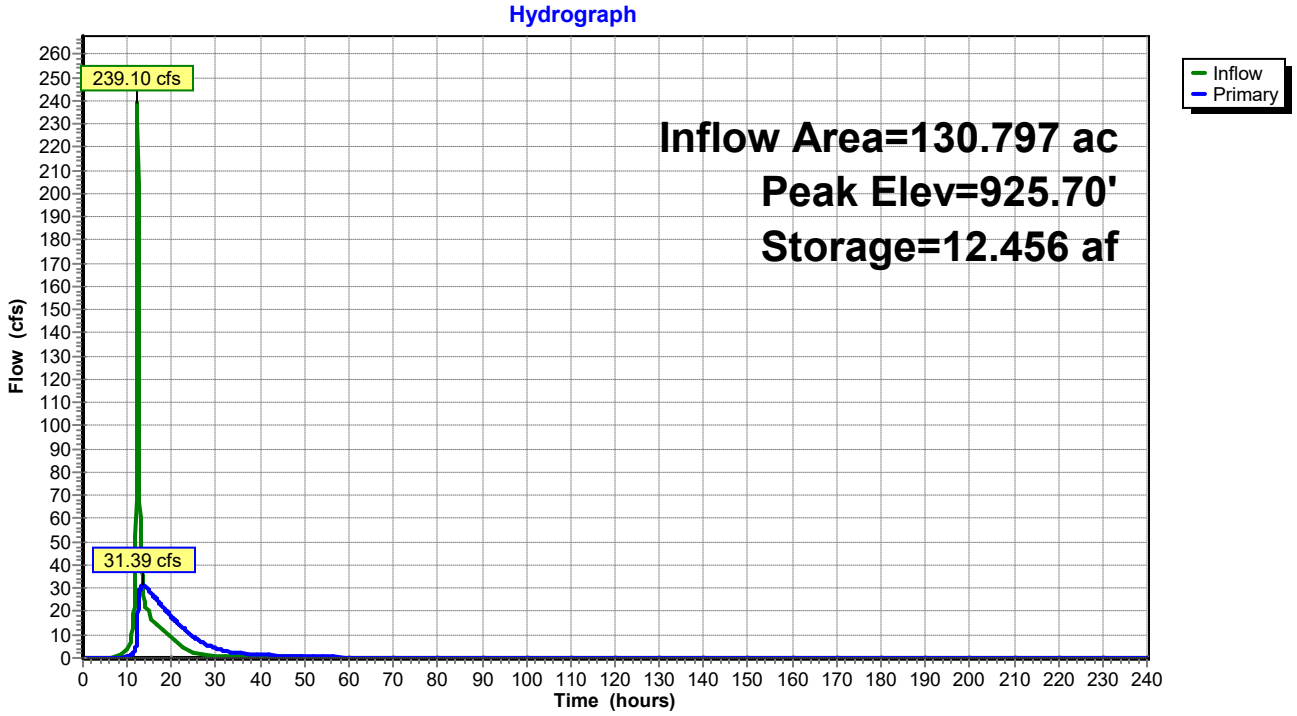
Volume	Invert	Avail.Storage	Storage Description
#1	923.92'	52.726 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.92	0.000	0.000	0.000
924.00	2.123	0.085	0.085
926.00	14.283	16.406	16.491
928.00	21.952	36.235	52.726

Device	Routing	Invert	Outlet Devices
#1	Primary	923.58'	**Asymmetrical Weir, C= 3.27** Offset (feet) -12.19 0.00 7.43 15.99 Height (feet) 3.38 0.00 0.09 3.38
#2	Device 1	923.92'	**Asymmetrical Weir, C= 3.27** Offset (feet) -56.17 -5.92 -1.08 0.00 3.27 6.37 30.87 135.00 Height (feet) 4.08 2.08 1.66 0.00 0.12 1.87 2.08 4.08

Primary OutFlow Max=31.39 cfs @ 13.56 hrs HW=925.70' TW=924.95' (Dynamic Tailwater)
↑**1=Asymmetrical Weir** (Passes 31.39 cfs of 102.36 cfs potential flow)
↑**2=Asymmetrical Weir** (Weir Controls 31.39 cfs @ 2.46 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 2.50" for 10-year event
Inflow = 50.10 cfs @ 12.18 hrs, Volume= 2.852 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 940.11' @ 24.60 hrs Surf.Area= 2.036 ac Storage= 2.852 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

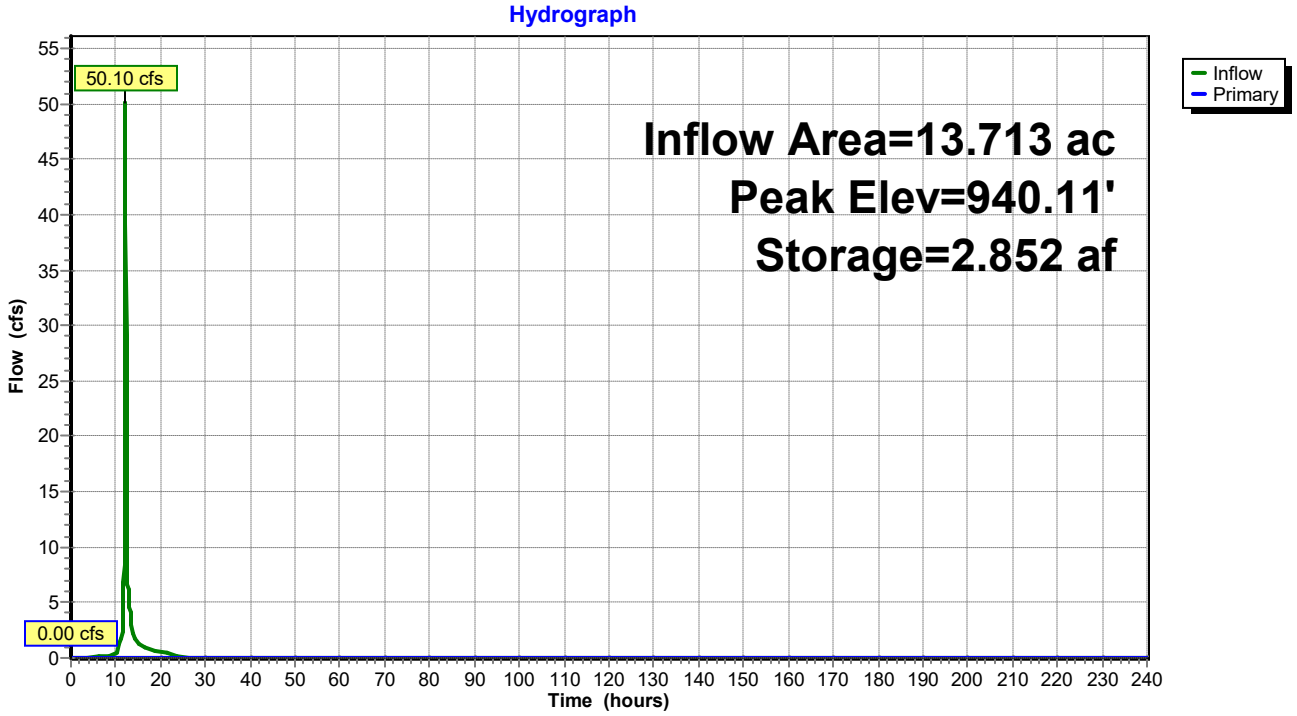
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=936.00' TW=923.92' (Dynamic Tailwater)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 41P: Ex South Off-site Pond



Summary for Pond 50P: Wetland 4B

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth = 1.19" for 10-year event
Inflow = 40.73 cfs @ 12.38 hrs, Volume= 3.922 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 941.05' @ 240.00 hrs Surf.Area= 2.634 ac Storage= 3.922 af
Flood Elev= 941.50' Surf.Area= 3.181 ac Storage= 5.223 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

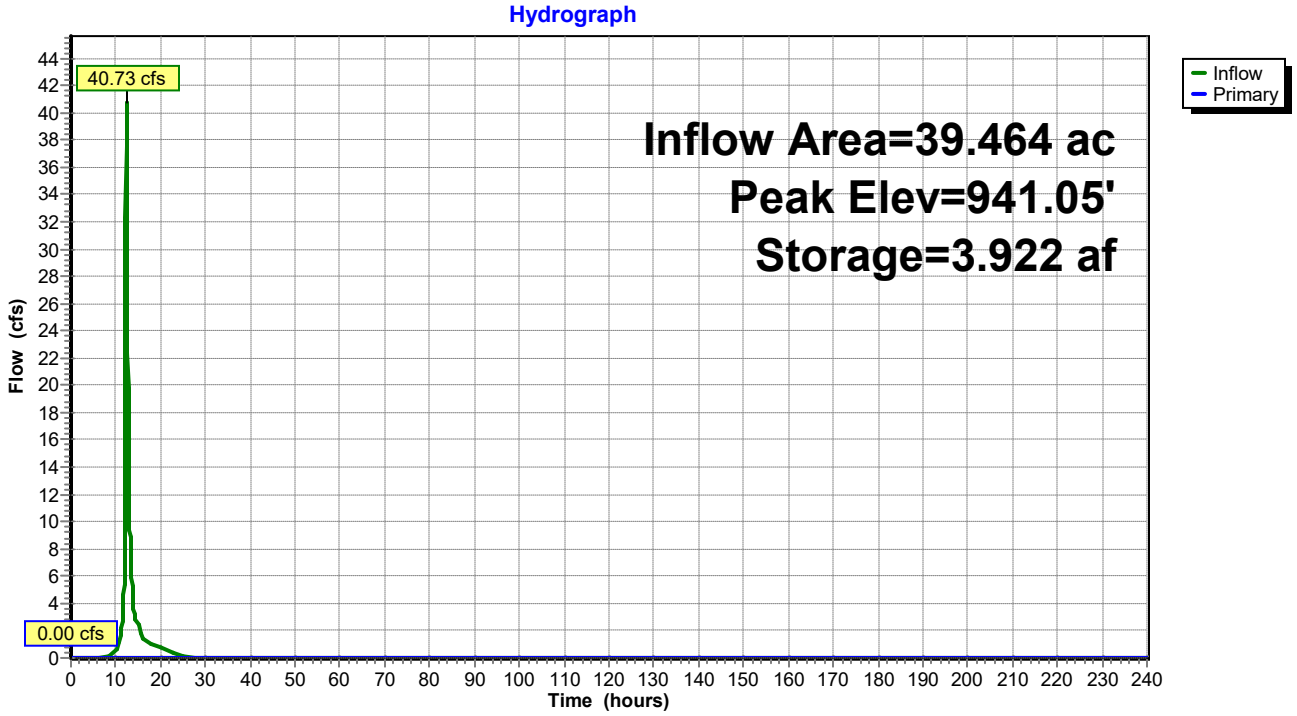
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	6.966 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
938.00	0.102	0.000	0.000
940.00	1.599	1.701	1.701
941.00	2.570	2.085	3.785
942.00	3.792	3.181	6.966

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=938.00' TW=923.92' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

[58] Hint: Peaked 0.31' above defined flood level

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth = 29.97" for 10-year event
Inflow = 21.34 cfs @ 12.13 hrs, Volume= 9.390 af
Outflow = 19.92 cfs @ 12.16 hrs, Volume= 9.176 af, Atten= 7%, Lag= 1.7 min
Primary = 19.92 cfs @ 12.16 hrs, Volume= 9.176 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 938.81' @ 12.16 hrs Surf.Area= 0.288 ac Storage= 0.292 af
Flood Elev= 938.50' Surf.Area= 0.226 ac Storage= 0.214 af

Plug-Flow detention time= 112.5 min calculated for 9.176 af (98% of inflow)
Center-of-Mass det. time= 21.2 min (1,364.0 - 1,342.8)

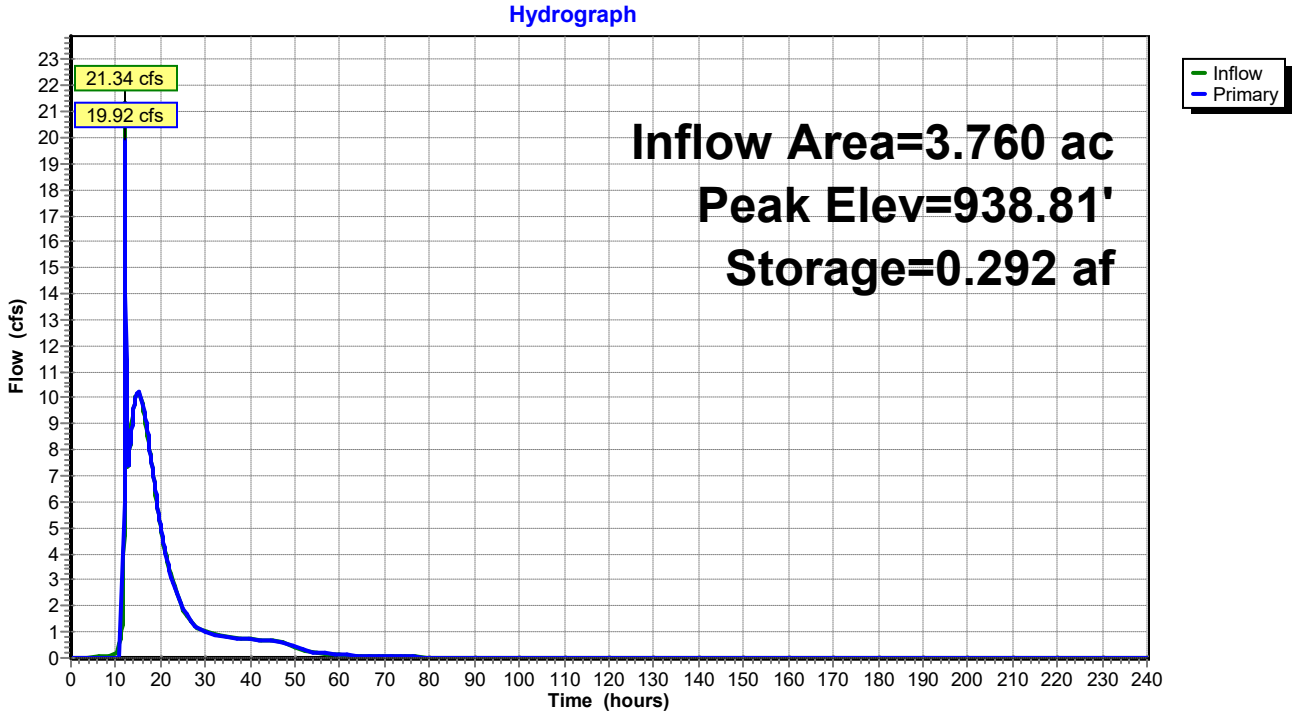
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	0.353 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.004	0.000	0.000
938.00	0.123	0.127	0.127
939.00	0.328	0.226	0.353

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=19.46 cfs @ 12.16 hrs HW=938.80' TW=924.80' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 19.46 cfs @ 1.72 fps)

Pond 60P: Wetland 5B



Summary for Link 1PP: Northwest Wetland (Big Woods)

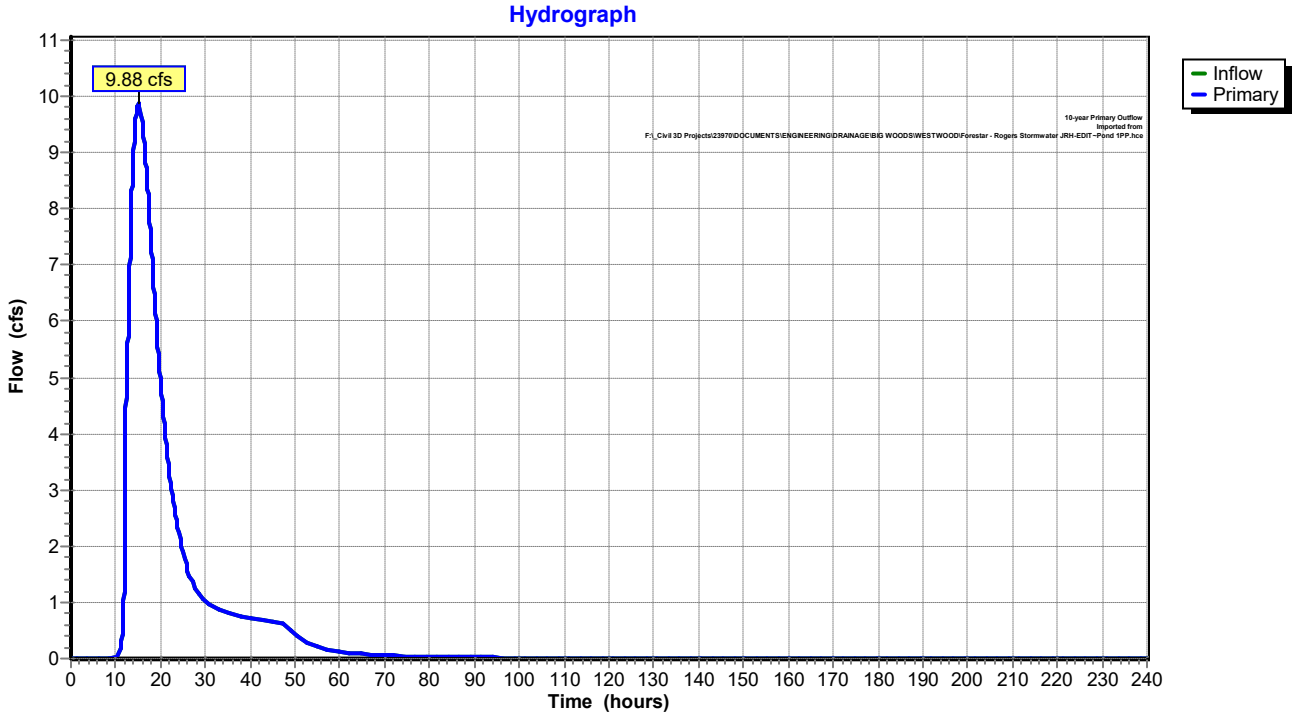
From the Big Woods development drainage model prepared by Westwood.

Inflow	=	9.88 cfs @	15.07 hrs, Volume=	8.513 af
Primary	=	9.88 cfs @	15.07 hrs, Volume=	8.513 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

10-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG W

Link 1PP: Northwest Wetland (Big Woods)



Summary for Link 5PP: Existing Pond (Big Woods)

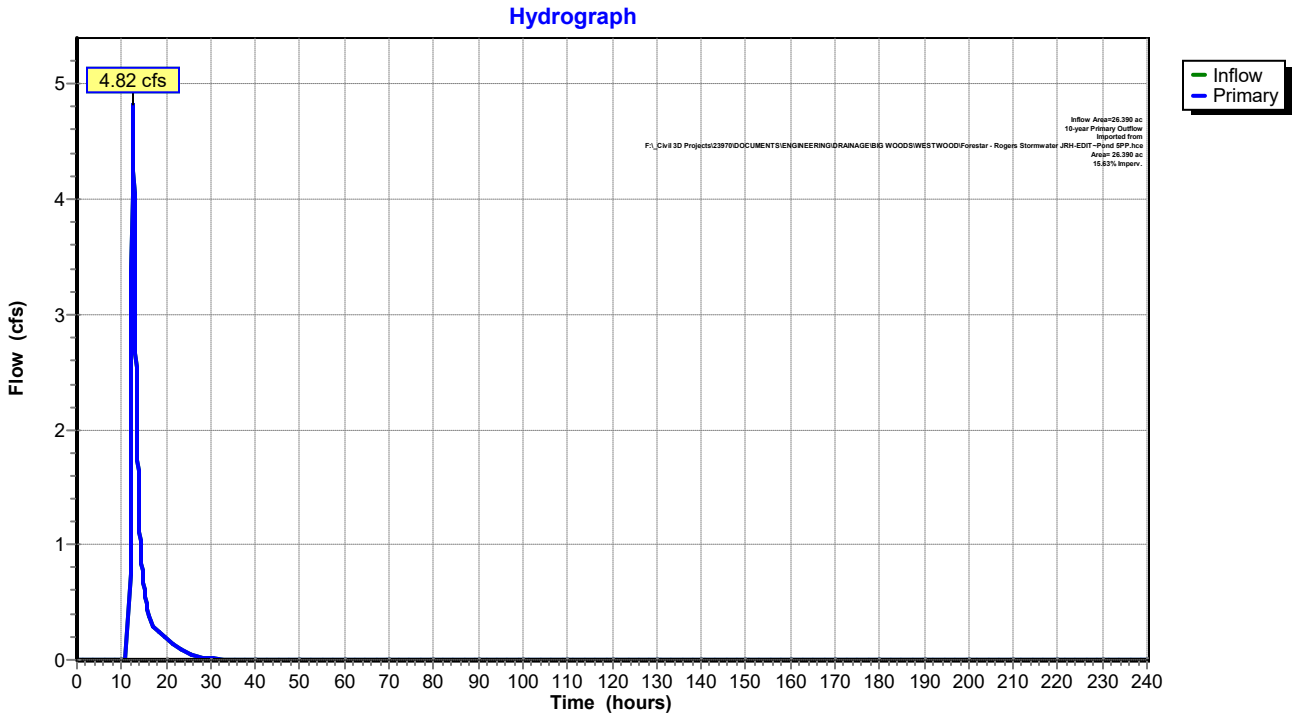
From the Big Woods development drainage model prepared by Westwood.

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth = 0.32" for 10-year event
Inflow = 4.82 cfs @ 12.52 hrs, Volume= 0.706 af
Primary = 4.82 cfs @ 12.52 hrs, Volume= 0.706 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

10-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG W

Link 5PP: Existing Pond (Big Woods)



Time span=0.00-240.00 hrs, dt=0.05 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth=3.93"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min CN=72/0 Runoff=1,123.30 cfs 98.288 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=25.761 ac 0.80% Impervious Runoff Depth=5.72"
Flow Length=2,175' Tc=29.4 min CN=88/98 Runoff=128.35 cfs 12.278 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=6.216 ac 0.00% Impervious Runoff Depth=5.48"
Flow Length=586' Tc=8.9 min CN=86/0 Runoff=51.77 cfs 2.839 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=4.69"
Flow Length=247' Tc=20.0 min CN=79/0 Runoff=4.68 cfs 0.352 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=5.776 ac 0.00% Impervious Runoff Depth=5.48"
Flow Length=737' Tc=11.1 min CN=86/0 Runoff=44.21 cfs 2.638 af

Subcatchment 23S: Direct to Lower West Runoff Area=9.551 ac 0.00% Impervious Runoff Depth=5.60"
Flow Length=391' Tc=9.5 min CN=87/0 Runoff=78.66 cfs 4.453 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=26.075 ac 1.14% Impervious Runoff Depth=5.72"
Flow Length=998' Tc=13.6 min CN=88/98 Runoff=190.34 cfs 12.437 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=41.507 ac 5.85% Impervious Runoff Depth=5.35"
Flow Length=1,249' Tc=23.4 min CN=84/98 Runoff=221.25 cfs 18.502 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth=4.47"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min CN=74/98 Runoff=65.78 cfs 7.458 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=73.860 ac 2.02% Impervious Runoff Depth=5.85"
Flow Length=1,354' Tc=23.6 min CN=89/98 Runoff=420.71 cfs 35.986 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=5.08"
Flow Length=1,032' Tc=10.2 min CN=80/98 Runoff=100.55 cfs 5.810 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth=5.68"
Flow Length=734' Tc=26.4 min CN=87/98 Runoff=68.57 cfs 6.189 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=5.46"
Flow Length=531' Tc=5.6 min CN=82/98 Runoff=33.96 cfs 1.710 af

Reach 1R: Cowley Lake Outlet Channel Inflow=128.35 cfs 12.278 af
Outflow=128.35 cfs 12.278 af

Reach 2R: Cowley Lake Inflow=387.66 cfs 146.220 af
Outflow=387.66 cfs 146.220 af

Reach 21R: East Channel Avg. Flow Depth=1.74' Max Vel=6.77 fps Inflow=97.01 cfs 62.198 af
n=0.022 L=382.0' S=0.0097 '/' Capacity=131.71 cfs Outflow=97.00 cfs 62.198 af

Reach 23RL: Lower West Channel Avg. Flow Depth=2.07' Max Vel=3.34 fps Inflow=126.31 cfs 66.110 af
n=0.022 L=534.0' S=0.0014 '/' Capacity=257.71 cfs Outflow=126.04 cfs 66.107 af

Reach 23RU: Upper West Channel Avg. Flow Depth=0.98' Max Vel=3.27 fps Inflow=116.87 cfs 61.658 af
n=0.022 L=490.0' S=0.0057 '/' Capacity=766.18 cfs Outflow=116.47 cfs 61.657 af

Pond 7P: Whiteford Lake and Peak Elev=931.48' Storage=92.213 af Inflow=1,123.30 cfs 98.288 af
Outflow=34.97 cfs 36.442 af

Pond 30P: Wetland 4A Peak Elev=927.13' Storage=9.664 af Inflow=240.29 cfs 64.505 af
Outflow=116.87 cfs 61.658 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=934.52' Storage=1.969 af Inflow=65.78 cfs 43.901 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=25.92 cfs 46.003 af

Pond 40P: Wetland 2B Peak Elev=926.39' Storage=22.297 af Inflow=440.42 cfs 61.852 af
Outflow=96.31 cfs 61.846 af

Pond 41P: Ex South Off-site Pond Peak Elev=940.67' Storage=4.079 af Inflow=100.55 cfs 5.810 af
Outflow=7.88 cfs 2.123 af

Pond 50P: Wetland 4B Peak Elev=941.66' Storage=5.746 af Inflow=78.67 cfs 10.853 af
Outflow=9.40 cfs 5.629 af

Pond 60P: Wetland 5B Peak Elev=938.96' Storage=0.338 af Inflow=41.22 cfs 18.328 af
Outflow=39.48 cfs 18.114 af

Link DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=17.34 cfs 16.618 af
Primary=17.34 cfs 16.618 af

Link S\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=10.47 cfs 4.665 af
Area= 26.390 ac 15.63% Imperv. Primary=10.47 cfs 4.665 af

Total Runoff Area = 540.193 ac Runoff Volume = 208.941 af Average Runoff Depth = 4.64"
98.07% Pervious = 529.794 ac 1.93% Impervious = 10.399 ac

Summary for Subcatchment 7S: Approx DA to Lake

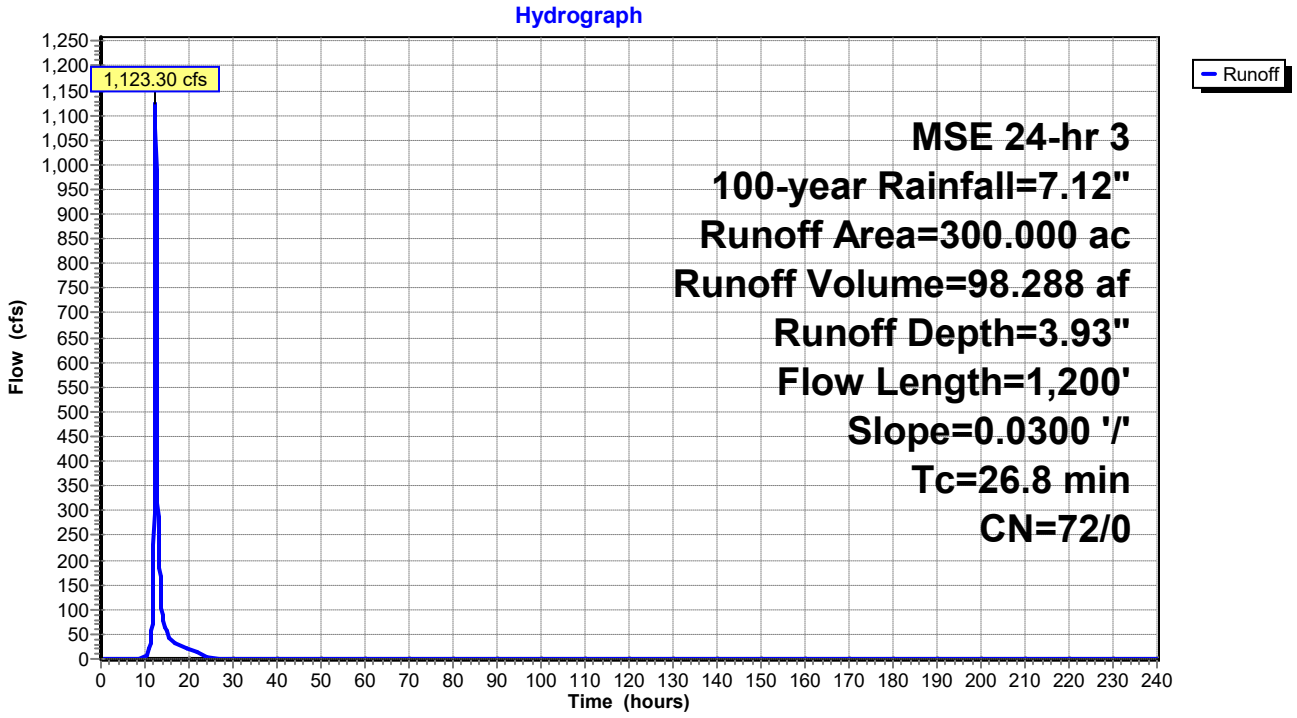
Runoff = 1,123.30 cfs @ 12.39 hrs, Volume= 98.288 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
300.000	72	Woods/grass comb., Good, HSG C
300.000	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

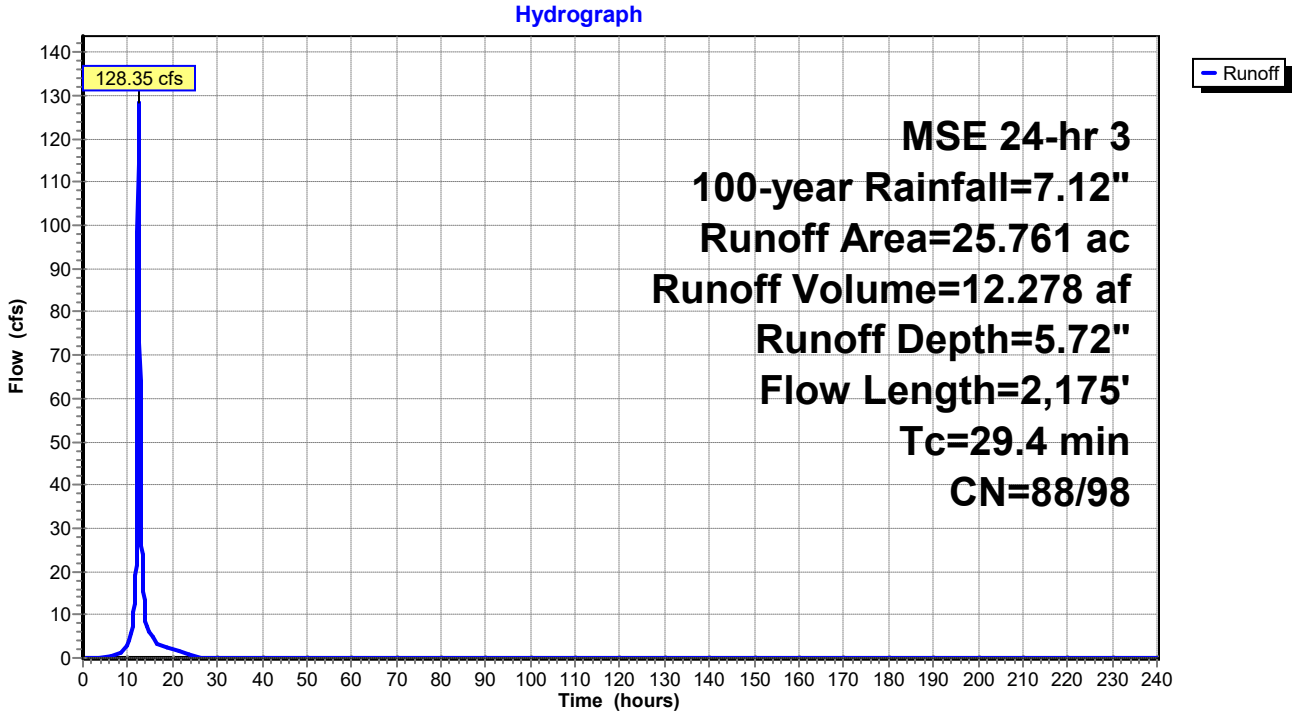
Runoff = 128.35 cfs @ 12.40 hrs, Volume= 12.278 af, Depth= 5.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.136	98	Unconnected pavement, HSG D
0.070	98	Unconnected roofs, HSG D
1.380	98	Water Surface, 0% imp, HSG D
21.395	89	Row crops, straight row, Good, HSG D
1.284	80	>75% Grass cover, Good, HSG D
0.797	78	Meadow, non-grazed, HSG D
0.699	77	Woods, Good, HSG D
25.761	88	Weighted Average
25.555	88	99.20% Pervious Area
0.206	98	0.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
20.2	1,454	0.0177	1.20		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.9	621	0.0020	2.64	68.60	**Channel Flow,** Area= 26.0 sf Perim= 20.0' r= 1.30' n= 0.030 Earth, grassed & winding
29.4	2,175	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 20S: Direct to Cowley Lake

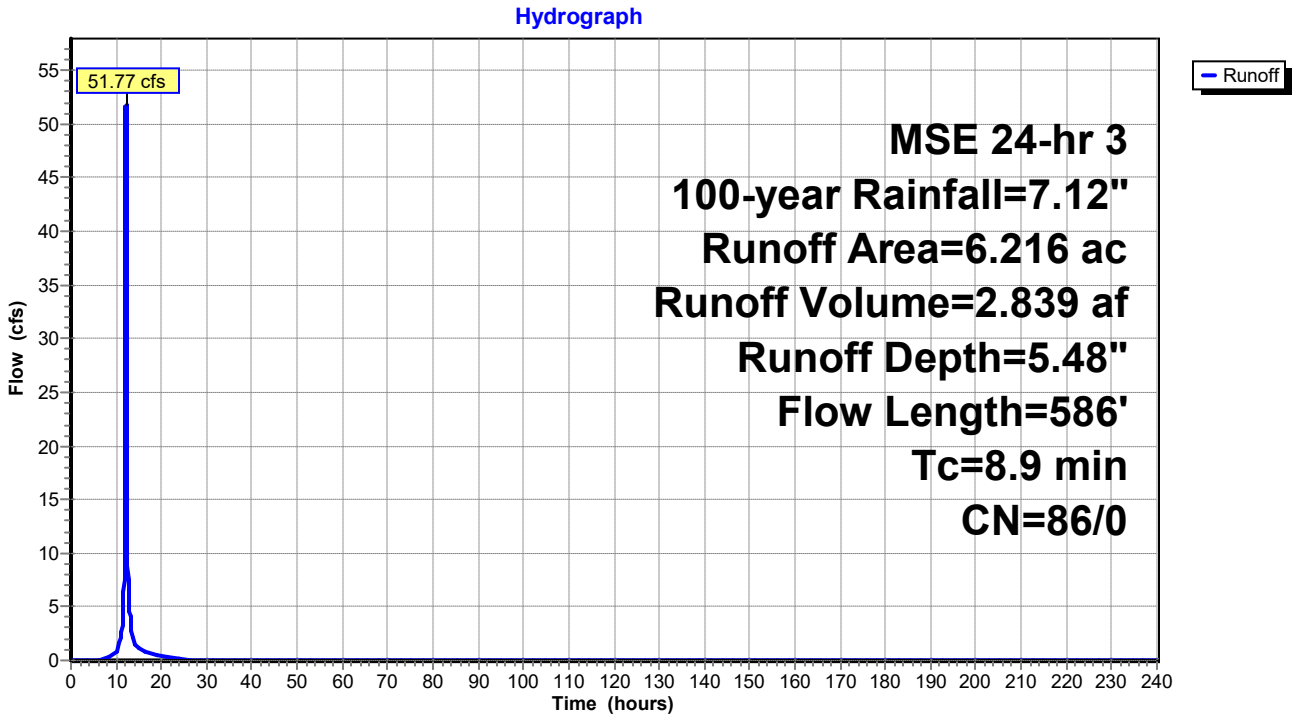
Runoff = 51.77 cfs @ 12.16 hrs, Volume= 2.839 af, Depth= 5.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.123	98	Water Surface, 0% imp, HSG D
4.384	89	Row crops, straight row, Good, HSG D
1.709	77	Woods, Good, HSG D
6.216	86	Weighted Average
6.216	86	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.0240	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
4.3	486	0.0440	1.89		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
8.9	586	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

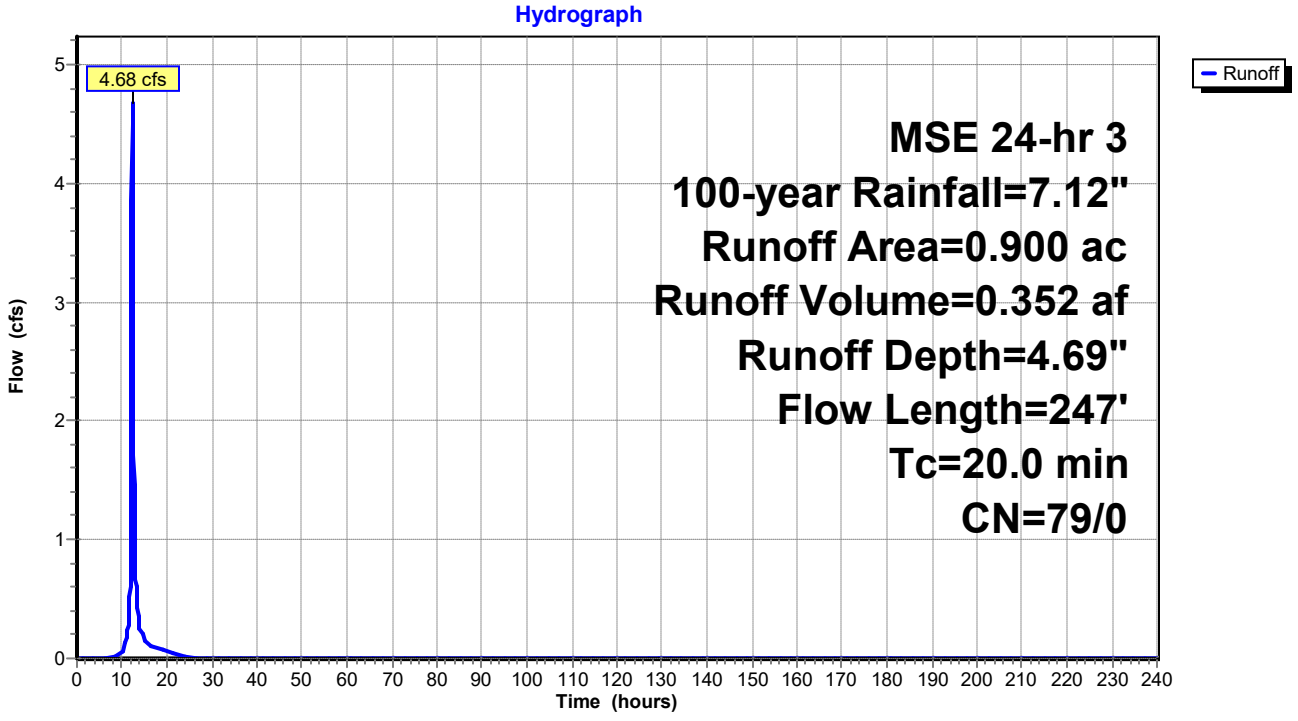
Runoff = 4.68 cfs @ 12.30 hrs, Volume= 0.352 af, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.074	98	Water Surface, 0% imp, HSG D
0.005	89	Row crops, straight row, Good, HSG D
0.821	77	Woods, Good, HSG D
0.900	79	Weighted Average
0.900	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0350	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.8	147	0.0721	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.0	247	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

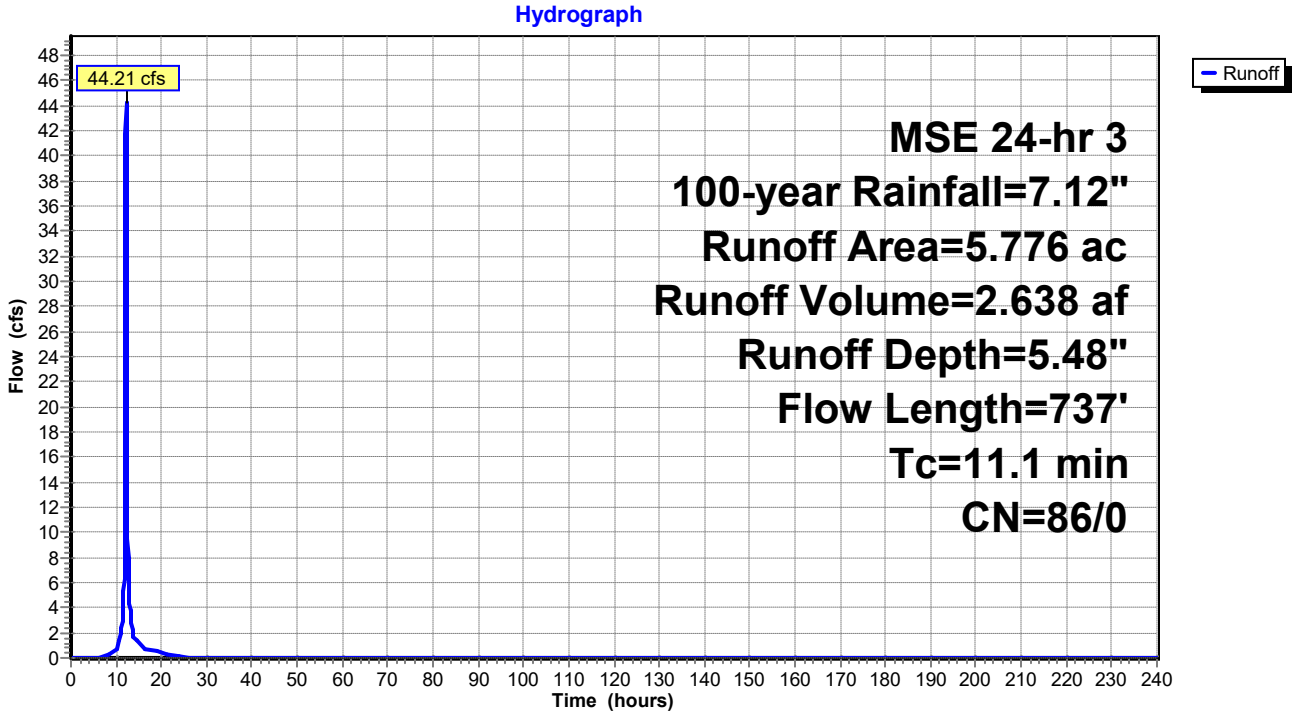
Runoff = 44.21 cfs @ 12.19 hrs, Volume= 2.638 af, Depth= 5.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.031	98	Water Surface, 0% imp, HSG D
4.386	89	Row crops, straight row, Good, HSG D
0.729	78	Meadow, non-grazed, HSG D
0.630	77	Woods, Good, HSG D
5.776	86	Weighted Average
5.776	86	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.0440	0.46		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
7.5	637	0.0248	1.42		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.1	737	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Lower West Channel

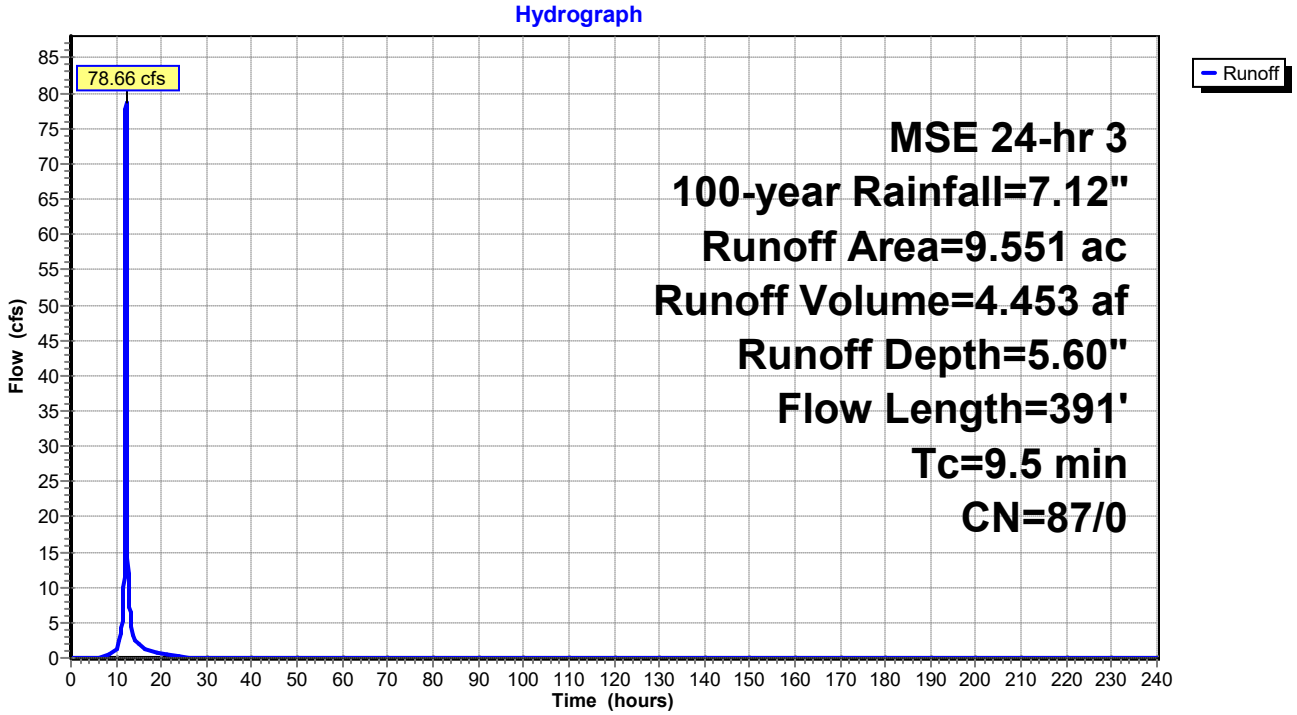
Runoff = 78.66 cfs @ 12.16 hrs, Volume= 4.453 af, Depth= 5.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.467	98	Water Surface, 0% imp, HSG D
7.263	89	Row crops, straight row, Good, HSG D
0.213	78	Meadow, non-grazed, HSG D
1.608	77	Woods, Good, HSG D
9.551	87	Weighted Average
9.551	87	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0090	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
2.6	291	0.0433	1.87		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.5	391	Total			

Subcatchment 23S: Direct to Lower West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

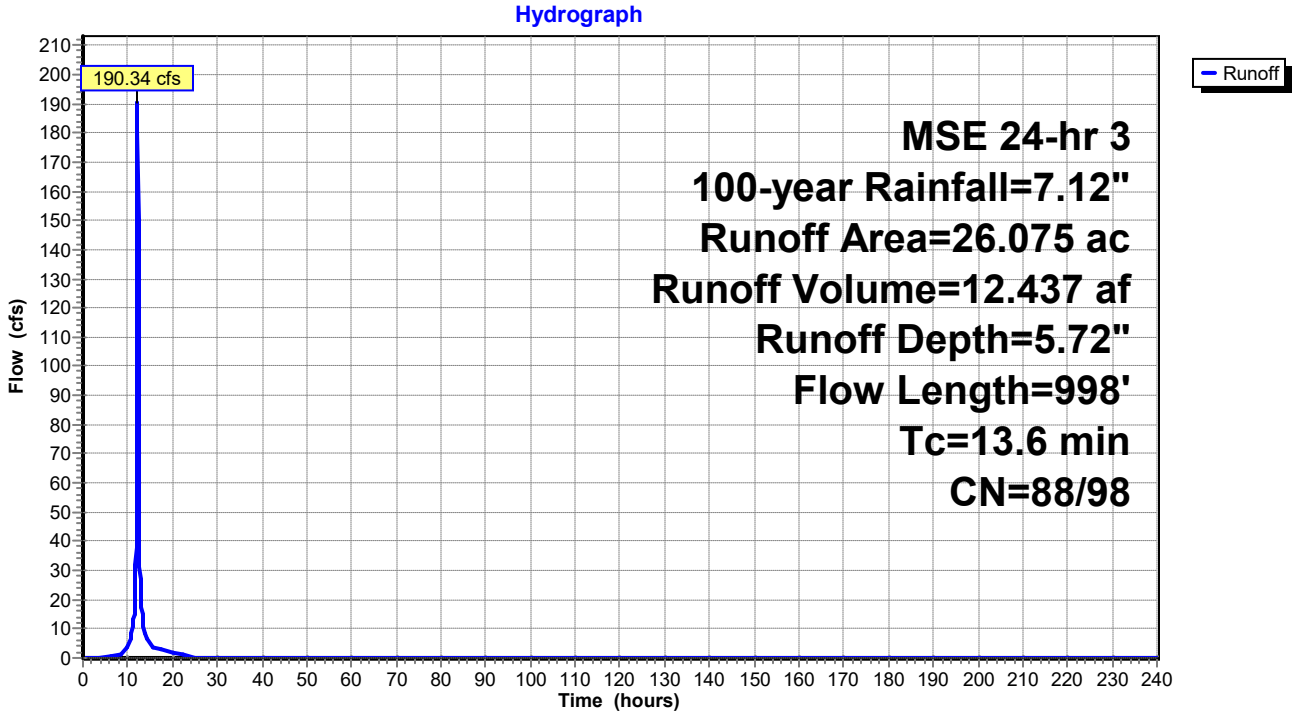
Runoff = 190.34 cfs @ 12.21 hrs, Volume= 12.437 af, Depth= 5.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.298	98	Unconnected pavement, HSG D
0.980	98	Water Surface, 0% imp, HSG D
0.082	96	Gravel surface, HSG D
0.357	80	>75% Grass cover, Good, HSG D
21.863	89	Row crops, straight row, Good, HSG D
0.151	78	Meadow, non-grazed, HSG D
2.344	77	Woods, Good, HSG D
26.075	88	Weighted Average
25.777	88	98.86% Pervious Area
0.298	98	1.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0200	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
10.3	819	0.0217	1.33		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.8	149	0.0315	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.6	998	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 30S: Direct to Wetland 4A

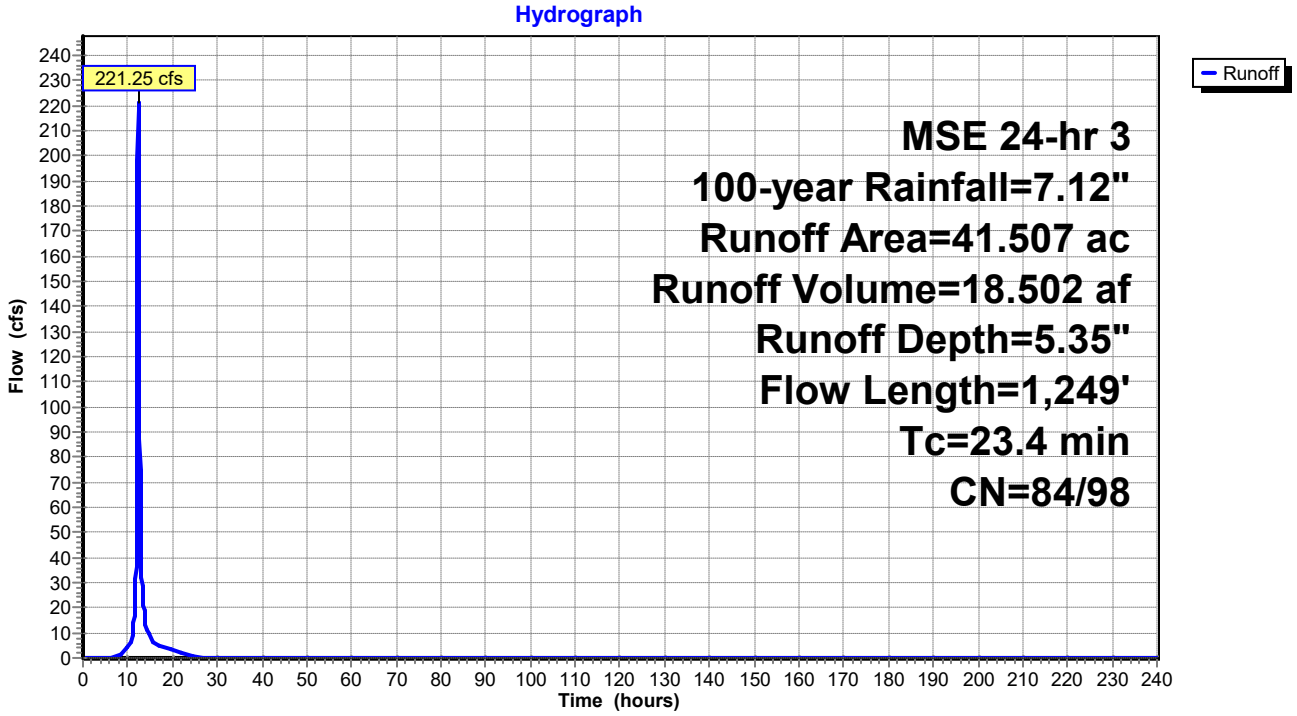
Runoff = 221.25 cfs @ 12.33 hrs, Volume= 18.502 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
1.469	98	Unconnected pavement, HSG D
0.959	98	Unconnected roofs, HSG D
0.947	96	Gravel surface, HSG D
17.469	89	Row crops, straight row, Good, HSG D
1.609	89	Pasture/grassland/range, Poor, HSG D
14.597	80	>75% Grass cover, Good, HSG D
0.684	78	Meadow, non-grazed, HSG D
3.773	77	Woods, Good, HSG D
41.507	85	Weighted Average
39.079	84	94.15% Pervious Area
2.428	98	5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

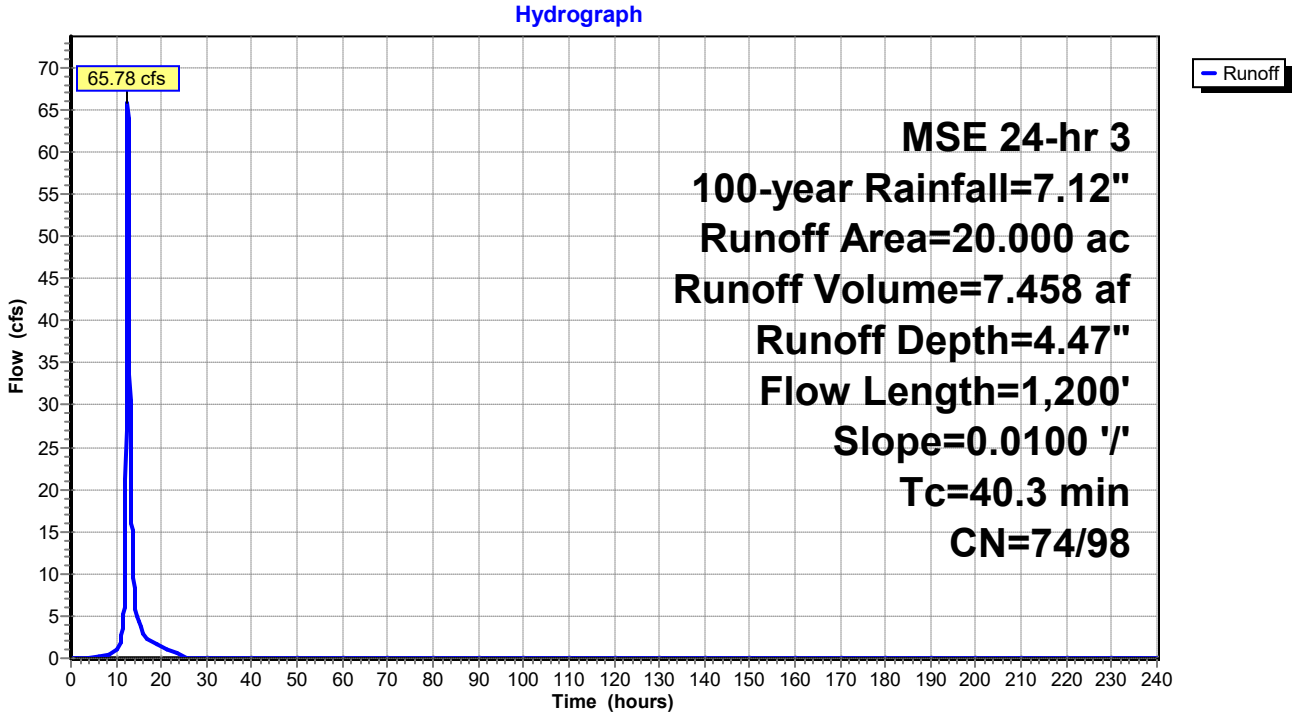
Runoff = 65.78 cfs @ 12.56 hrs, Volume= 7.458 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
20.000	77	2 acre lots, 12% imp, HSG C
17.600	74	88.00% Pervious Area
2.400	98	12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 40S: Direct to Wetland 2B

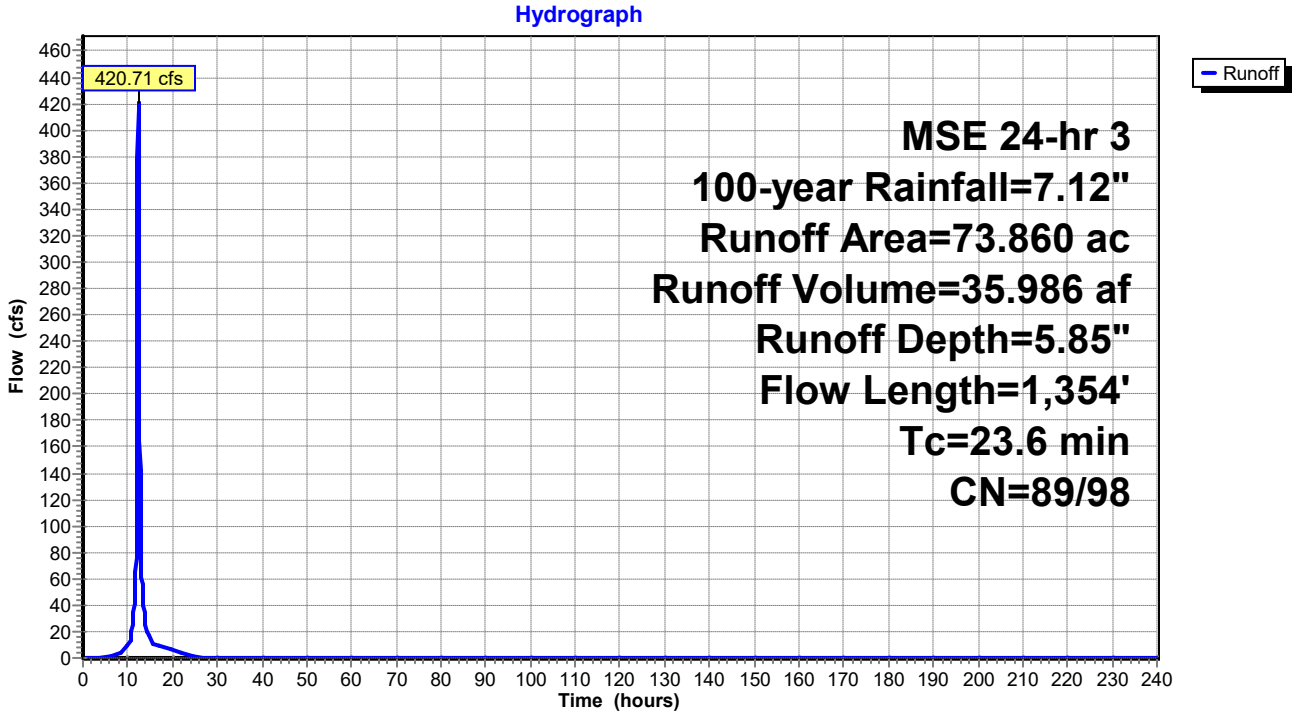
Runoff = 420.71 cfs @ 12.33 hrs, Volume= 35.986 af, Depth= 5.85"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.965	98	Unconnected pavement, HSG D
0.528	98	Unconnected roofs, HSG D
17.207	98	Water Surface, 0% imp, HSG D
1.249	96	Gravel surface, HSG D
35.493	89	Row crops, straight row, Good, HSG D
0.208	89	Pasture/grassland/range, Poor, HSG D
8.455	80	>75% Grass cover, Good, HSG D
5.449	78	Meadow, non-grazed, HSG D
4.306	77	Woods, Good, HSG D
73.860	89	Weighted Average
72.367	89	97.98% Pervious Area
1.493	98	2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

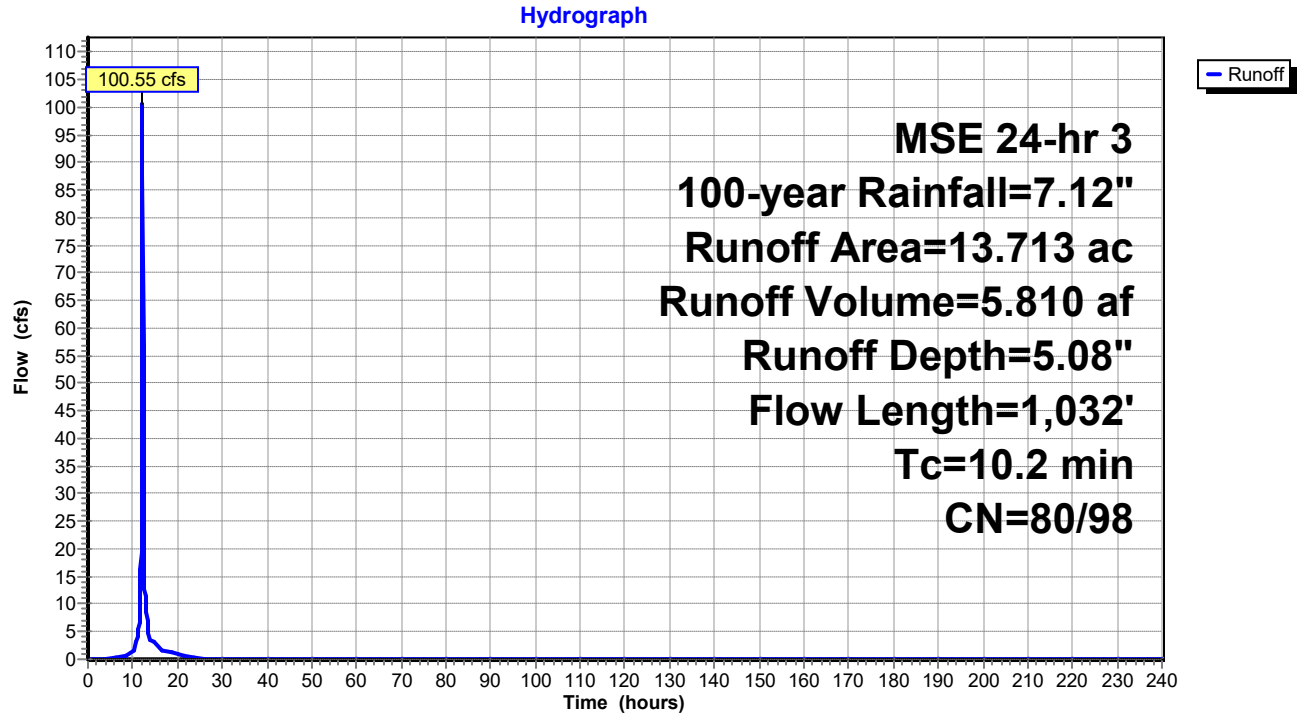
Runoff = 100.55 cfs @ 12.18 hrs, Volume= 5.810 af, Depth= 5.08"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
1.568	98	Unconnected pavement, HSG D
0.273	98	Unconnected roofs, HSG D
0.107	98	Water Surface, 0% imp, HSG D
0.066	96	Gravel surface, HSG D
10.431	80	>75% Grass cover, Good, HSG D
1.268	78	Meadow, non-grazed, HSG D
13.713	82	Weighted Average
11.872	80	86.57% Pervious Area
1.841	98	13.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

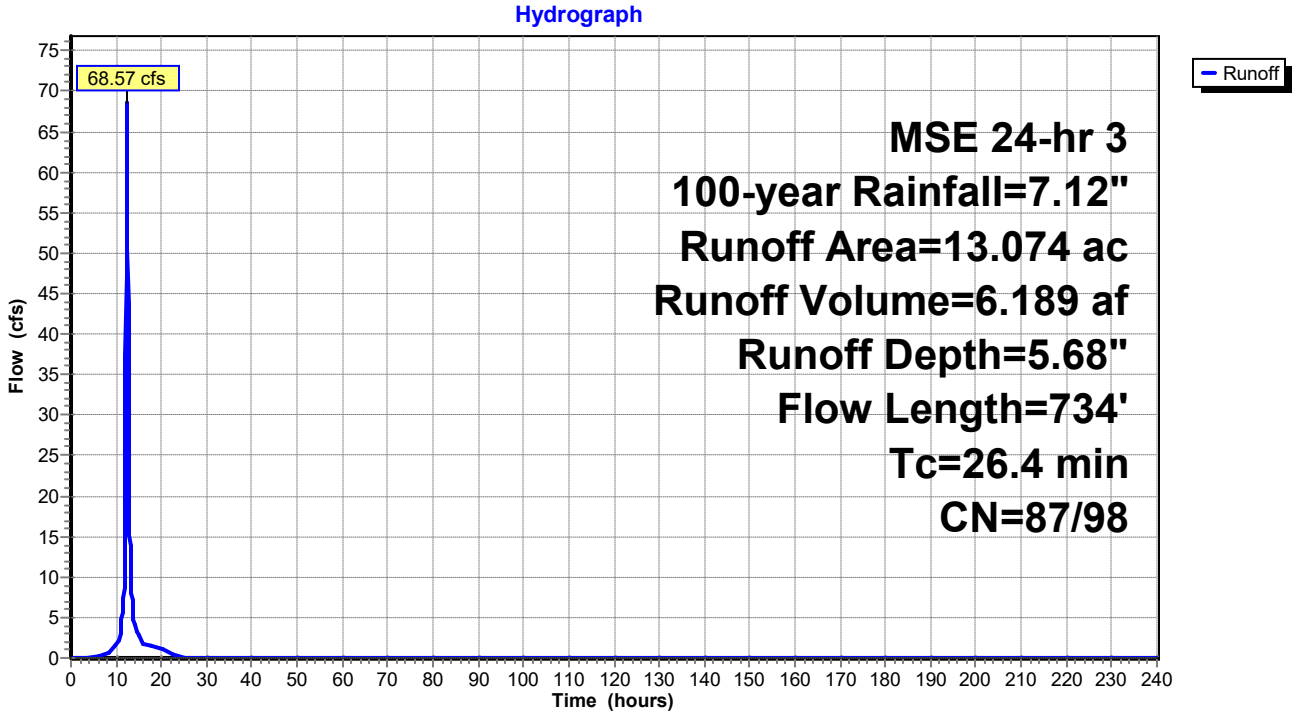
Runoff = 68.57 cfs @ 12.37 hrs, Volume= 6.189 af, Depth= 5.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.523	98	Unconnected pavement, HSG D
0.339	98	Unconnected roofs, HSG D
0.175	98	Water Surface, 0% imp, HSG D
0.233	96	Gravel surface, HSG D
8.346	89	Row crops, straight row, Good, HSG D
0.958	89	Pasture/grassland/range, Poor, HSG D
2.500	80	>75% Grass cover, Good, HSG D
13.074	88	Weighted Average
12.212	87	93.41% Pervious Area
0.862	98	6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

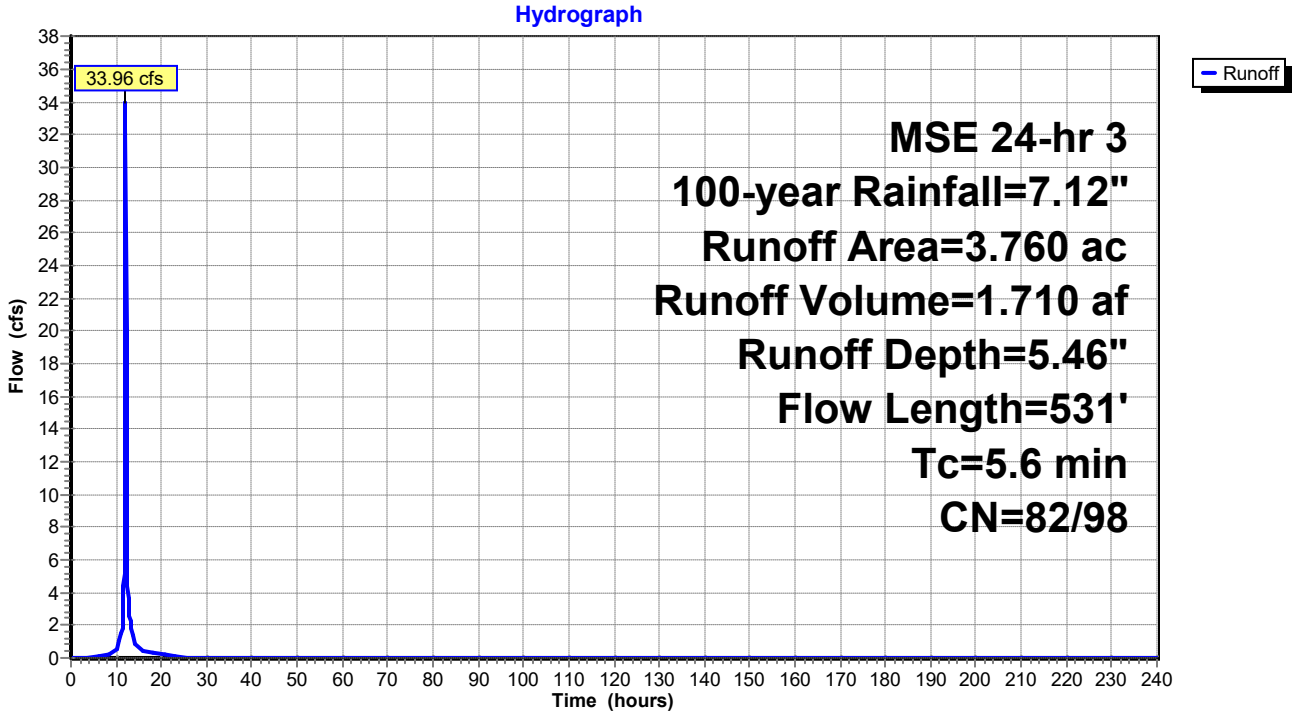
Runoff = 33.96 cfs @ 12.12 hrs, Volume= 1.710 af, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=7.12"

Area (ac)	CN	Description
0.428	98	Unconnected pavement, HSG D
0.443	98	Unconnected roofs, HSG D
0.064	98	Water Surface, 0% imp, HSG D
0.331	96	Gravel surface, HSG D
2.083	80	>75% Grass cover, Good, HSG D
0.411	77	Woods, Good, HSG D
3.760	86	Weighted Average
2.889	82	76.84% Pervious Area
0.871	98	23.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



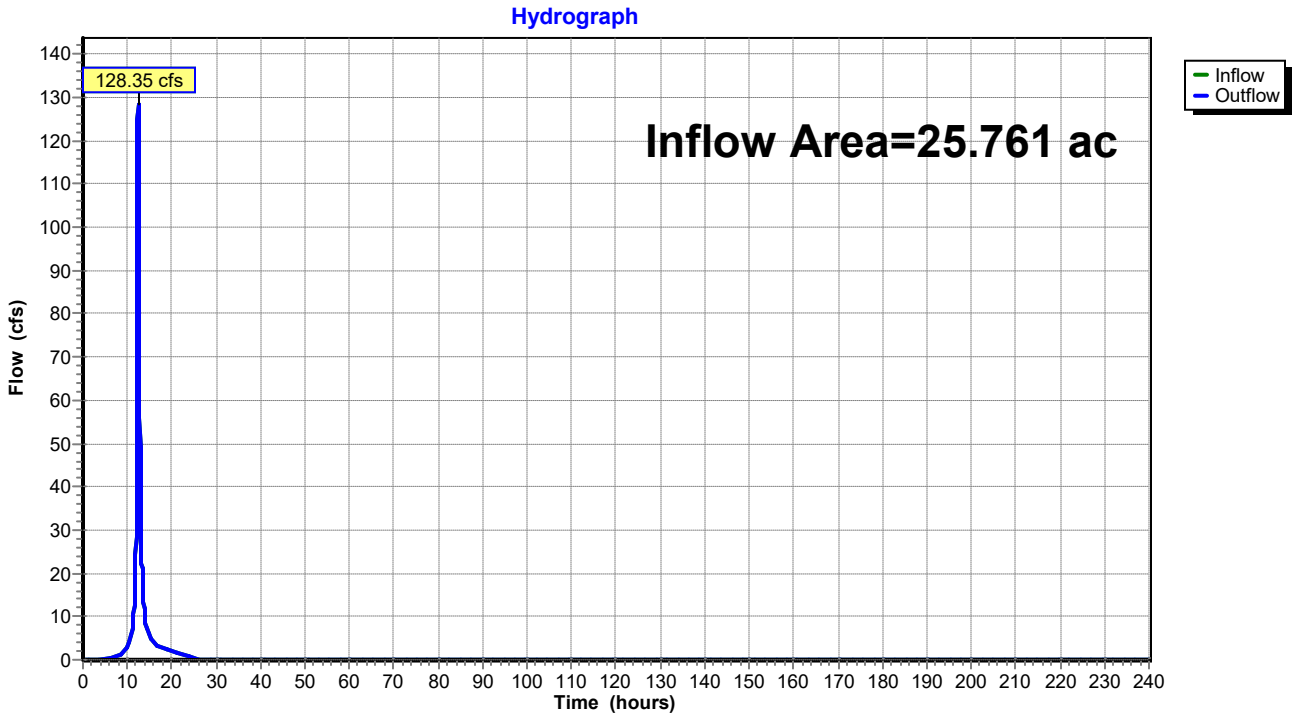
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.761 ac, 0.80% Impervious, Inflow Depth = 5.72" for 100-year event
Inflow = 128.35 cfs @ 12.40 hrs, Volume= 12.278 af
Outflow = 128.35 cfs @ 12.40 hrs, Volume= 12.278 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



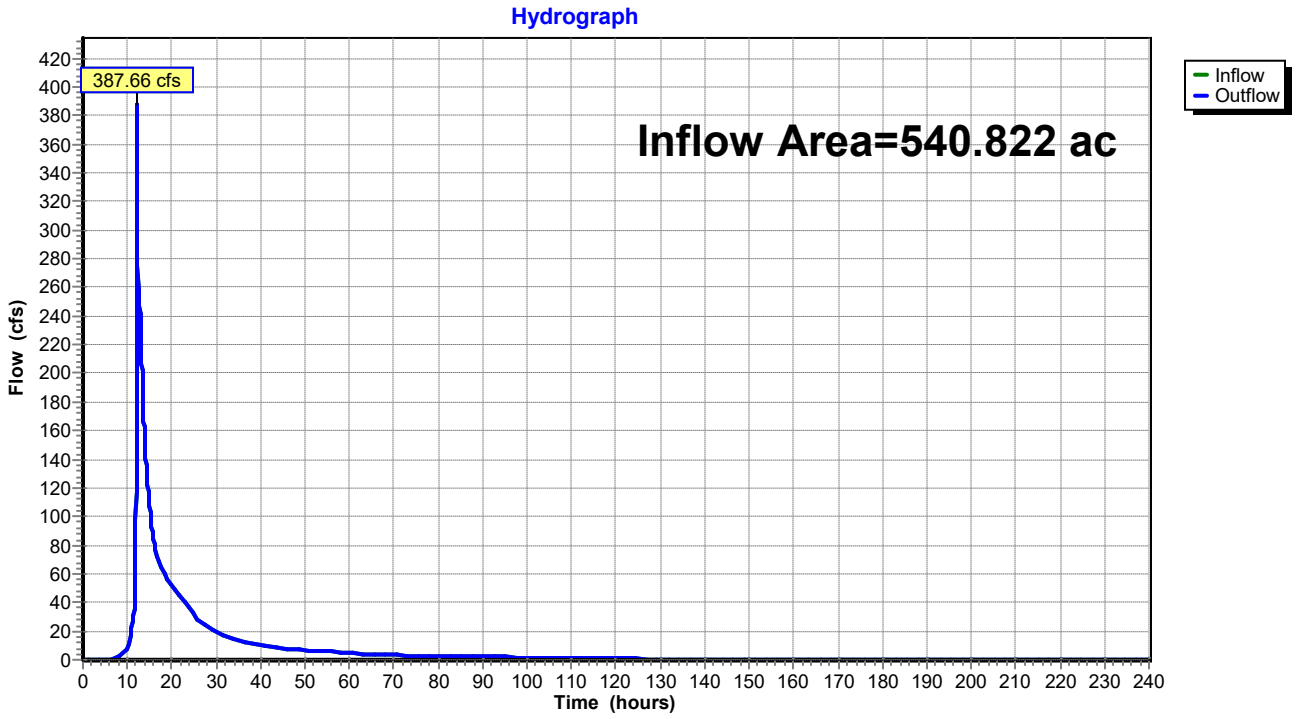
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.822 ac, 2.65% Impervious, Inflow Depth > 3.24" for 100-year event
Inflow = 387.66 cfs @ 12.21 hrs, Volume= 146.220 af
Outflow = 387.66 cfs @ 12.21 hrs, Volume= 146.220 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



Summary for Reach 21R: East Channel

Inflow Area = 131.697 ac, 6.98% Impervious, Inflow Depth = 5.67" for 100-year event
Inflow = 97.01 cfs @ 13.03 hrs, Volume= 62.198 af
Outflow = 97.00 cfs @ 13.04 hrs, Volume= 62.198 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.77 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 5.6 min

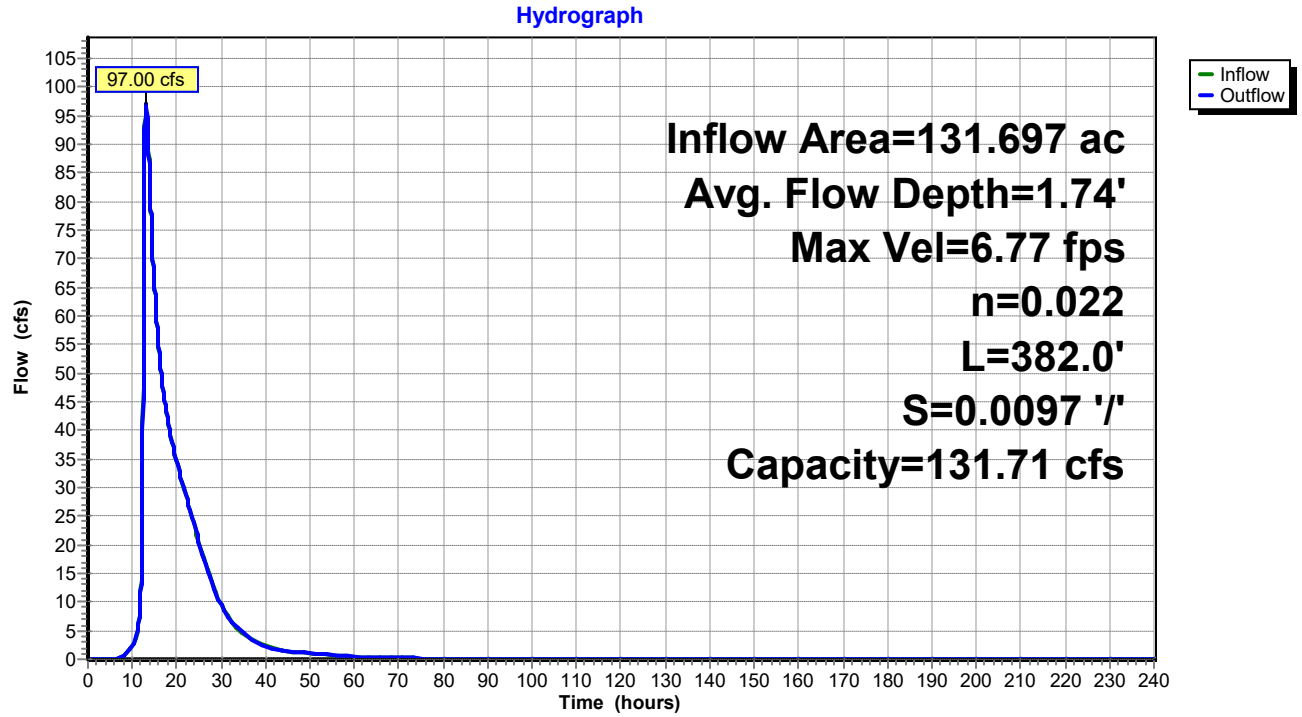
Peak Storage= 5,477 cf @ 13.04 hrs
Average Depth at Peak Storage= 1.74'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 131.71 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 382.0' Slope= 0.0097 '/'
Inlet Invert= 923.92', Outlet Invert= 920.20'



‡

Reach 21R: East Channel



Summary for Reach 23RL: Lower West Channel

Inflow Area = 371.058 ac, 1.30% Impervious, Inflow Depth > 2.14" for 100-year event
Inflow = 126.31 cfs @ 12.64 hrs, Volume= 66.110 af
Outflow = 126.04 cfs @ 12.67 hrs, Volume= 66.107 af, Atten= 0%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.34 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 12.6 min

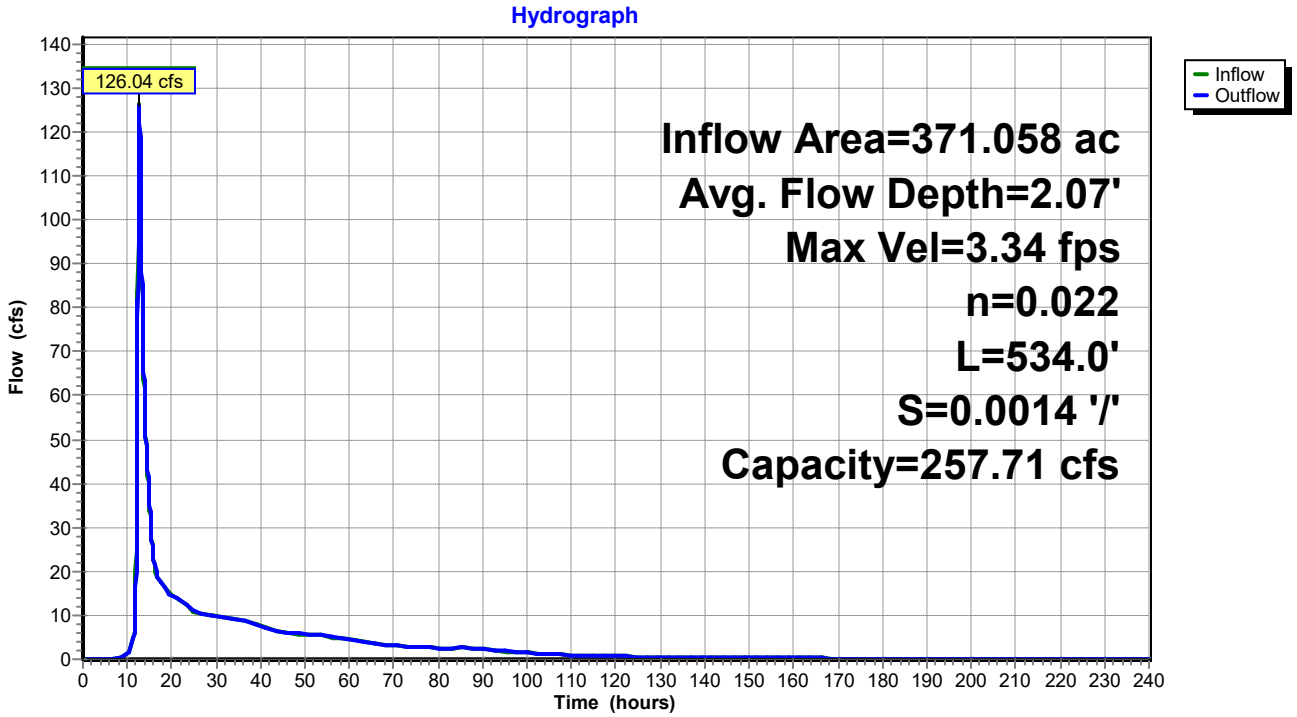
Peak Storage= 20,134 cf @ 12.67 hrs
Average Depth at Peak Storage= 2.07'
Bank-Full Depth= 3.00' Flow Area= 63.0 sf, Capacity= 257.71 cfs

12.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 30.00'
Length= 534.0' Slope= 0.0014 '/'
Inlet Invert= 919.58', Outlet Invert= 918.82'



‡

Reach 23RL: Lower West Channel



Summary for Reach 23RU: Upper West Channel

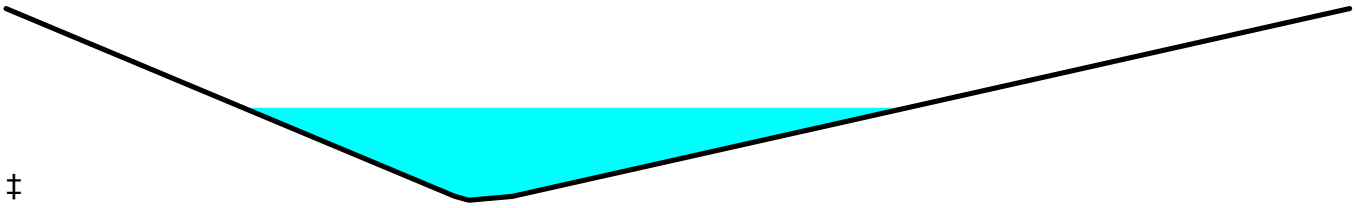
[80] Warning: Exceeded Pond 30P by 0.96' @ 0.00 hrs (0.58 cfs 0.503 af)

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth > 2.05" for 100-year event
Inflow = 116.87 cfs @ 12.65 hrs, Volume= 61.658 af
Outflow = 116.47 cfs @ 12.68 hrs, Volume= 61.657 af, Atten= 0%, Lag= 2.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.27 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 8.3 min

Peak Storage= 17,448 cf @ 12.68 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 2.04' Flow Area= 146.2 sf, Capacity= 766.18 cfs

Custom cross-section, Length= 490.0' Slope= 0.0057 '/'
Constant n= 0.022 Earth, clean & straight
Inlet Invert= 925.96', Outlet Invert= 923.17'

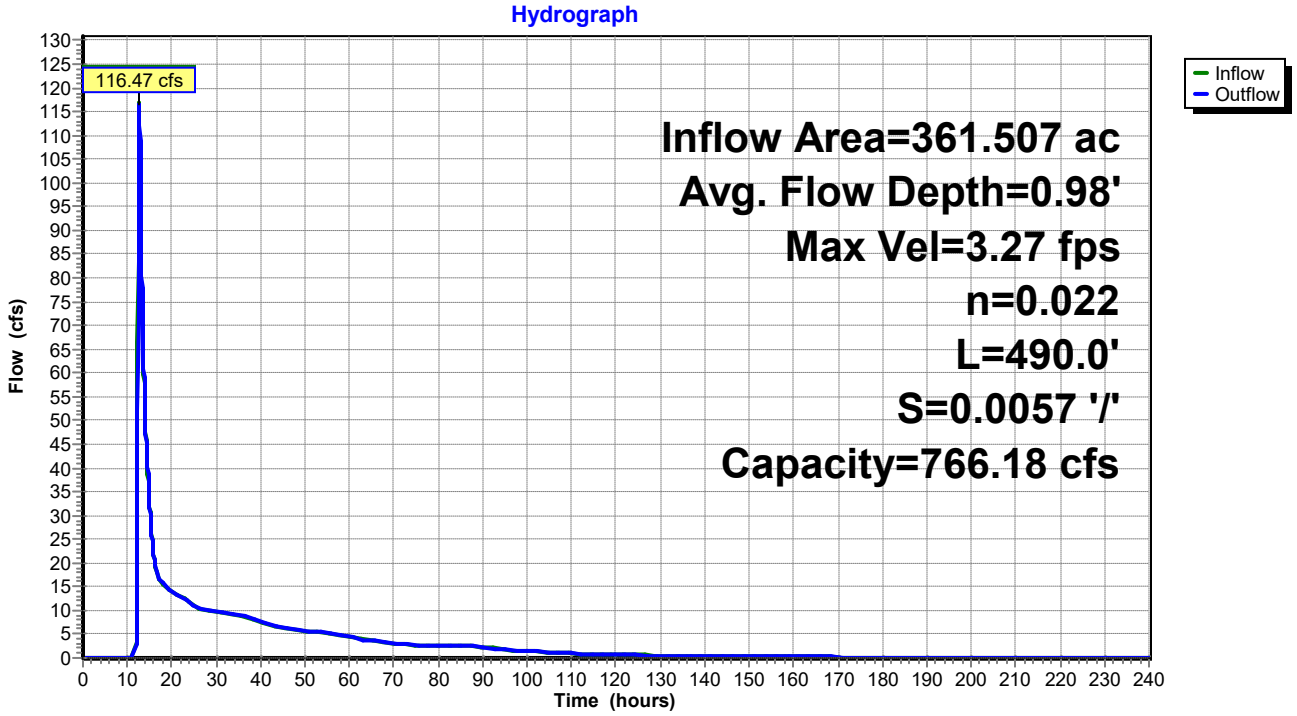


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-48.27	928.00	0.00
-1.47	926.00	2.00
0.00	925.96	2.04
4.51	926.00	2.00
91.79	928.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.1	6.0	59	0.05
2.04	146.2	140.1	71,618	766.18

Reach 23RU: Upper West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=488)

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth = 3.93" for 100-year event
Inflow = 1,123.30 cfs @ 12.39 hrs, Volume= 98.288 af
Outflow = 34.97 cfs @ 23.30 hrs, Volume= 36.442 af, Atten= 97%, Lag= 654.8 min
Primary = 34.97 cfs @ 23.30 hrs, Volume= 36.442 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 931.48' @ 23.25 hrs Surf.Area= 64.446 ac Storage= 92.213 af

Plug-Flow detention time= 2,407.3 min calculated for 36.435 af (37% of inflow)
Center-of-Mass det. time= 2,316.8 min (3,138.3 - 821.5)

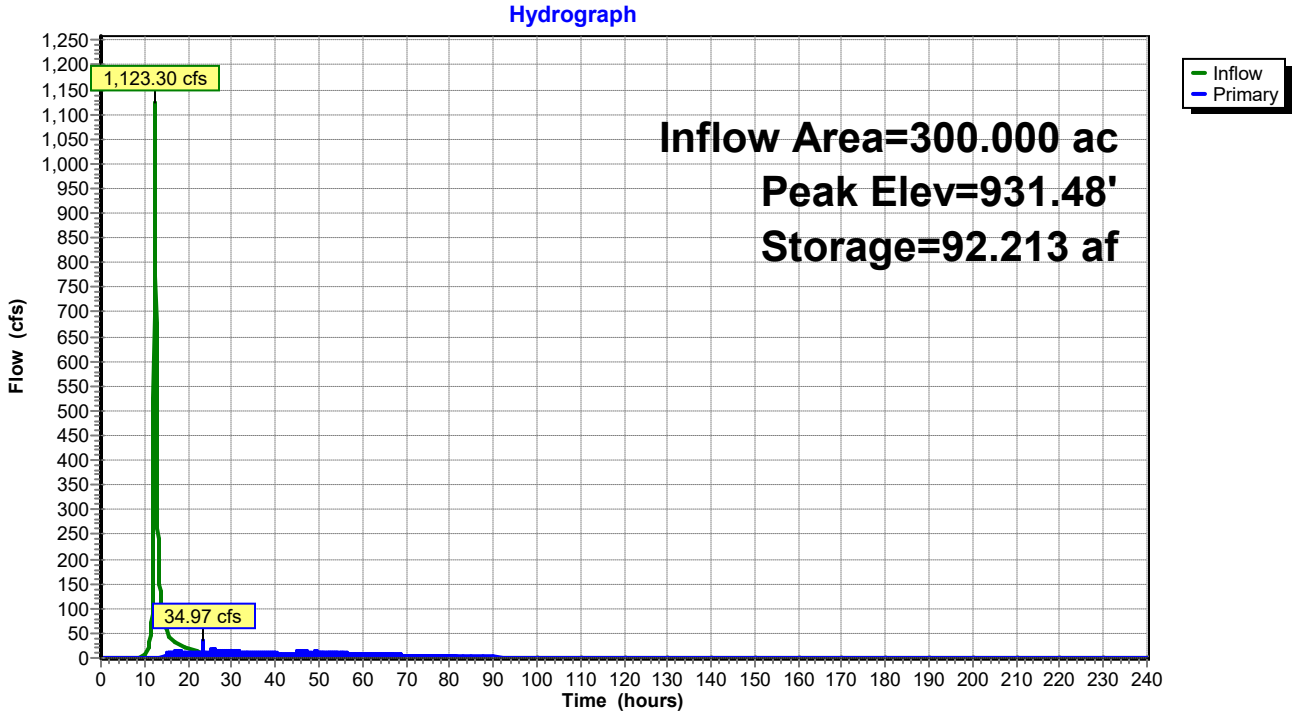
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 23.30 hrs HW=931.48' TW=932.44' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 30P: Wetland 4A

[58] Hint: Peaked 1.17' above defined flood level

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth > 2.14" for 100-year event
Inflow = 240.29 cfs @ 12.34 hrs, Volume= 64.505 af
Outflow = 116.87 cfs @ 12.65 hrs, Volume= 61.658 af, Atten= 51%, Lag= 18.6 min
Primary = 116.87 cfs @ 12.65 hrs, Volume= 61.658 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 927.13' @ 12.69 hrs Surf.Area= 6.828 ac Storage= 9.664 af
Flood Elev= 925.96' Surf.Area= 5.112 ac Storage= 2.616 af

Plug-Flow detention time= 520.8 min calculated for 61.658 af (96% of inflow)
Center-of-Mass det. time= 245.0 min (2,414.3 - 2,169.4)

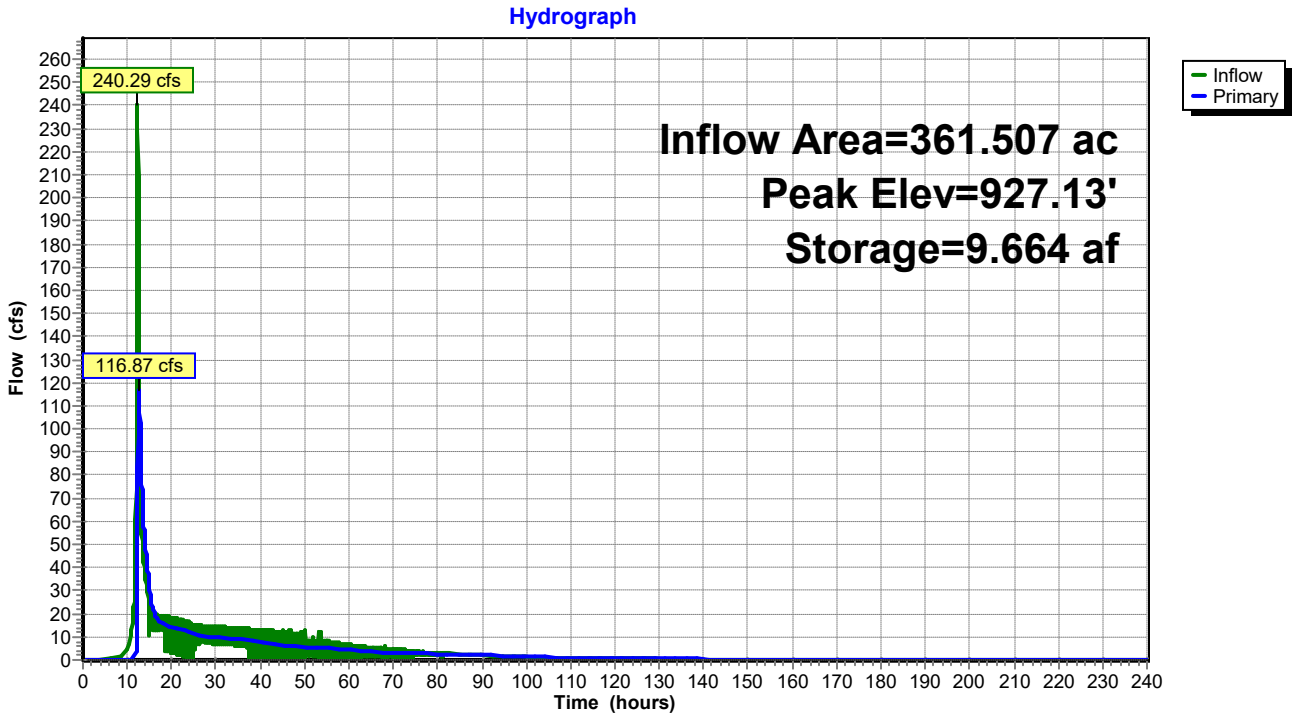
Volume	Invert	Avail.Storage	Storage Description
#1	925.00'	16.212 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
925.00	0.338	0.000	0.000
926.00	5.311	2.824	2.824
927.00	6.620	5.965	8.790
928.00	8.223	7.422	16.212

Device	Routing	Invert	Outlet Devices
#1	Primary	925.96'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.04 1.04 2.04 Width (feet) 0.00 6.00 90.00 140.00
#2	Primary	919.70'	**10.0" Round Culvert** L= 1,310.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.30' / 919.70' S= -0.0003 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#3	Device 2	925.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=114.84 cfs @ 12.65 hrs HW=927.13' TW=926.94' (Dynamic Tailwater)
- **1=Custom Weir/Orifice** (Weir Controls 114.59 cfs @ 1.91 fps)
- **2=Culvert** (Outlet Controls 0.26 cfs @ 0.47 fps)
  - **3=Orifice/Grate** (Passes 0.26 cfs of 1.13 cfs potential flow)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)
[80] Warning: Exceeded Pond 7P by 3.52' @ 12.80 hrs (671.90 cfs 382.412 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth > 1.65" for 100-year event
Inflow = 65.78 cfs @ 12.56 hrs, Volume= 43.901 af
Outflow = 25.92 cfs @ 13.14 hrs, Volume= 46.003 af, Atten= 61%, Lag= 34.9 min
Primary = 25.92 cfs @ 13.14 hrs, Volume= 46.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 934.52' @ 13.14 hrs Surf.Area= 3.819 ac Storage= 1.969 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

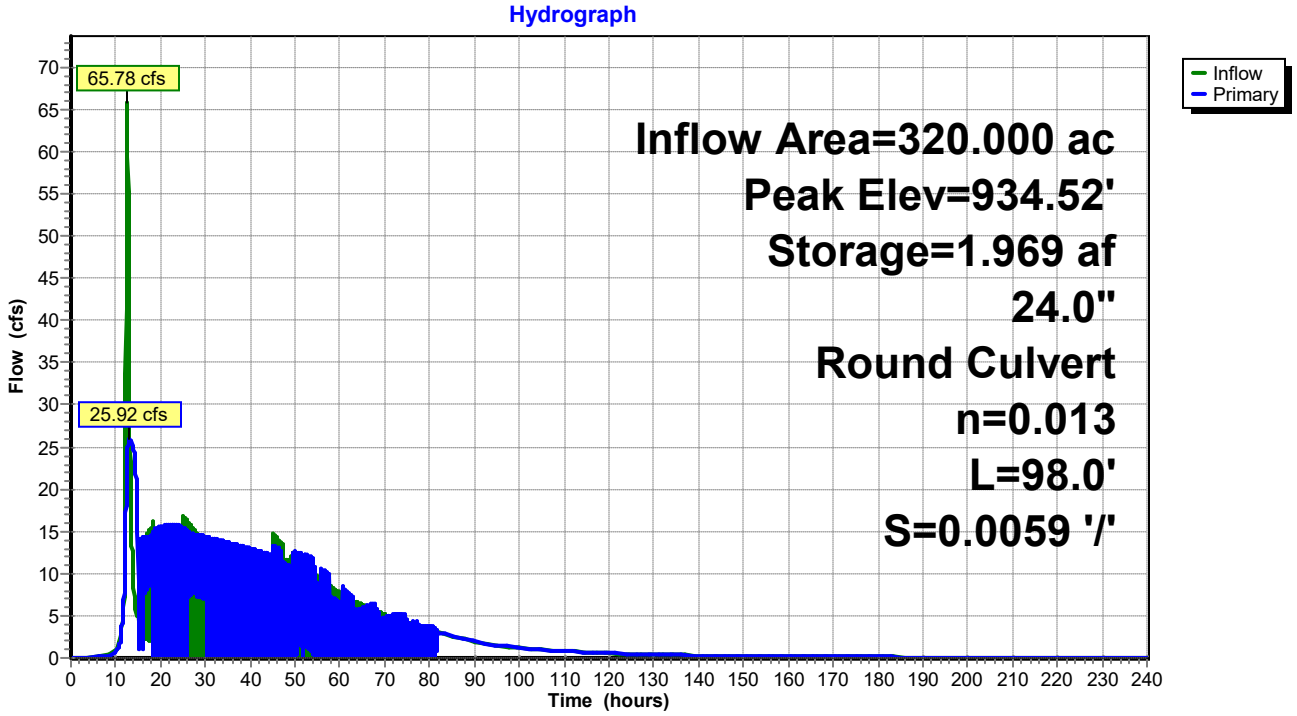
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=25.92 cfs @ 13.14 hrs HW=934.52' TW=927.01' (Dynamic Tailwater)
1=Culvert (Barrel Controls 25.92 cfs @ 8.25 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 40P: Wetland 2B

Inflow Area = 130.797 ac, 7.03% Impervious, Inflow Depth = 5.67" for 100-year event
Inflow = 440.42 cfs @ 12.33 hrs, Volume= 61.852 af
Outflow = 96.31 cfs @ 13.04 hrs, Volume= 61.846 af, Atten= 78%, Lag= 42.6 min
Primary = 96.31 cfs @ 13.04 hrs, Volume= 61.846 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 926.39' @ 13.05 hrs Surf.Area= 15.765 ac Storage= 22.297 af

Plug-Flow detention time= 266.0 min calculated for 61.833 af (100% of inflow)
Center-of-Mass det. time= 265.3 min (1,234.2 - 968.9)

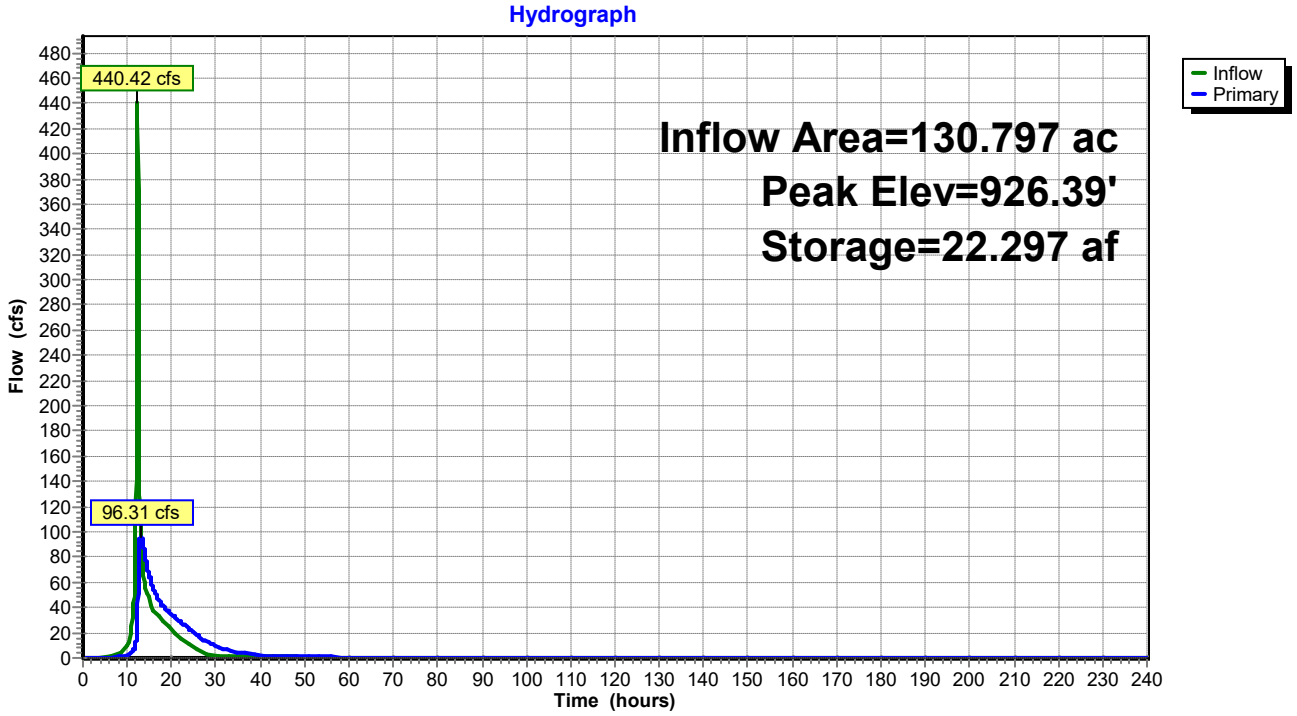
Volume	Invert	Avail.Storage	Storage Description
#1	923.92'	52.726 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.92	0.000	0.000	0.000
924.00	2.123	0.085	0.085
926.00	14.283	16.406	16.491
928.00	21.952	36.235	52.726

Device	Routing	Invert	Outlet Devices
#1	Primary	923.58'	**Asymmetrical Weir, C= 3.27**
			Offset (feet) -12.19 0.00 7.43 15.99
			Height (feet) 3.38 0.00 0.09 3.38
#2	Device 1	923.92'	**Asymmetrical Weir, C= 3.27**
			Offset (feet) -56.17 -5.92 -1.08 0.00 3.27 6.37 30.87 135.00
			Height (feet) 4.08 2.08 1.66 0.00 0.12 1.87 2.08 4.08

Primary OutFlow Max=96.26 cfs @ 13.04 hrs HW=926.39' TW=925.66' (Dynamic Tailwater)
↑**1=Asymmetrical Weir** (Passes 96.26 cfs of 161.51 cfs potential flow)
↑**2=Asymmetrical Weir** (Weir Controls 96.26 cfs @ 2.00 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 5.08" for 100-year event
Inflow = 100.55 cfs @ 12.18 hrs, Volume= 5.810 af
Outflow = 7.88 cfs @ 13.21 hrs, Volume= 2.123 af, Atten= 92%, Lag= 62.0 min
Primary = 7.88 cfs @ 13.21 hrs, Volume= 2.123 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 940.67' @ 13.21 hrs Surf.Area= 2.395 ac Storage= 4.079 af

Plug-Flow detention time= 289.5 min calculated for 2.123 af (37% of inflow)
Center-of-Mass det. time= 192.8 min (977.2 - 784.4)

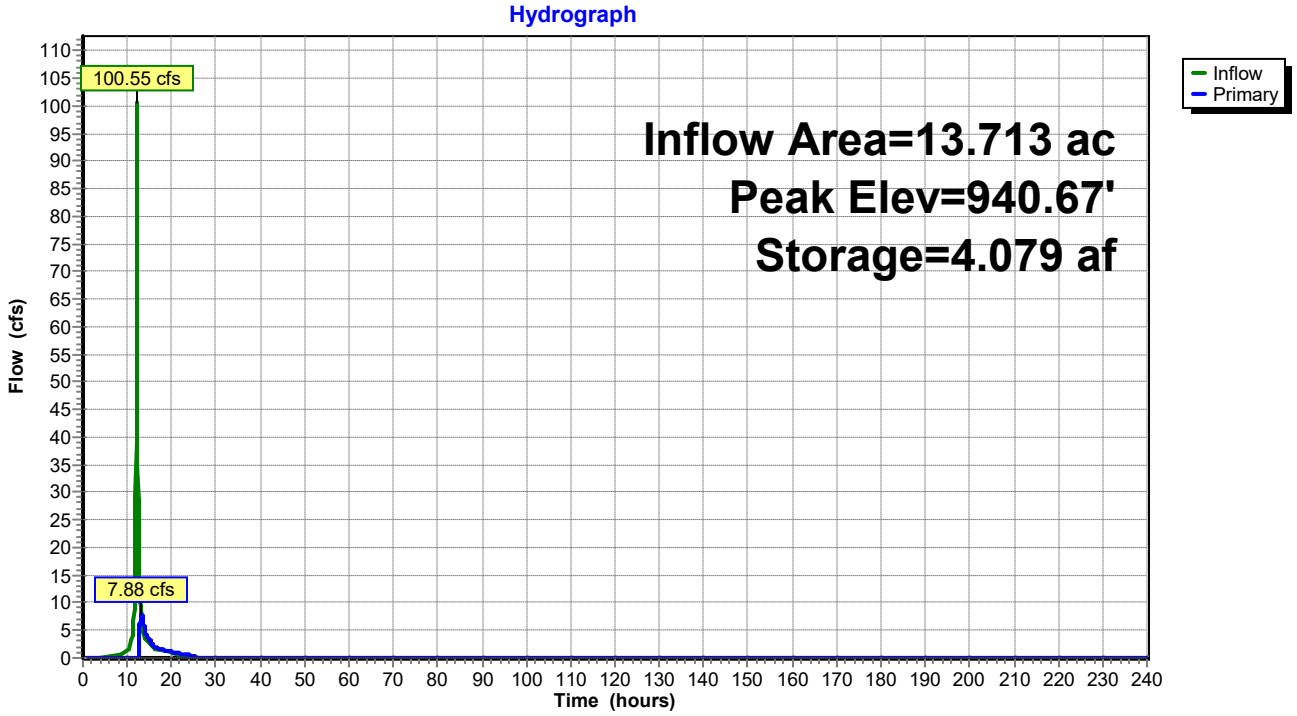
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=7.87 cfs @ 13.21 hrs HW=940.67' TW=926.38' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Weir Controls 7.87 cfs @ 1.25 fps)

Pond 41P: Ex South Off-site Pond



Summary for Pond 50P: Wetland 4B

[58] Hint: Peaked 0.16' above defined flood level

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth = 3.30" for 100-year event
Inflow = 78.67 cfs @ 12.37 hrs, Volume= 10.853 af
Outflow = 9.40 cfs @ 14.02 hrs, Volume= 5.629 af, Atten= 88%, Lag= 98.7 min
Primary = 9.40 cfs @ 14.02 hrs, Volume= 5.629 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 941.66' @ 14.02 hrs Surf.Area= 3.376 ac Storage= 5.746 af
Flood Elev= 941.50' Surf.Area= 3.181 ac Storage= 5.223 af

Plug-Flow detention time= 445.7 min calculated for 5.629 af (52% of inflow)
Center-of-Mass det. time= 247.8 min (1,179.2 - 931.5)

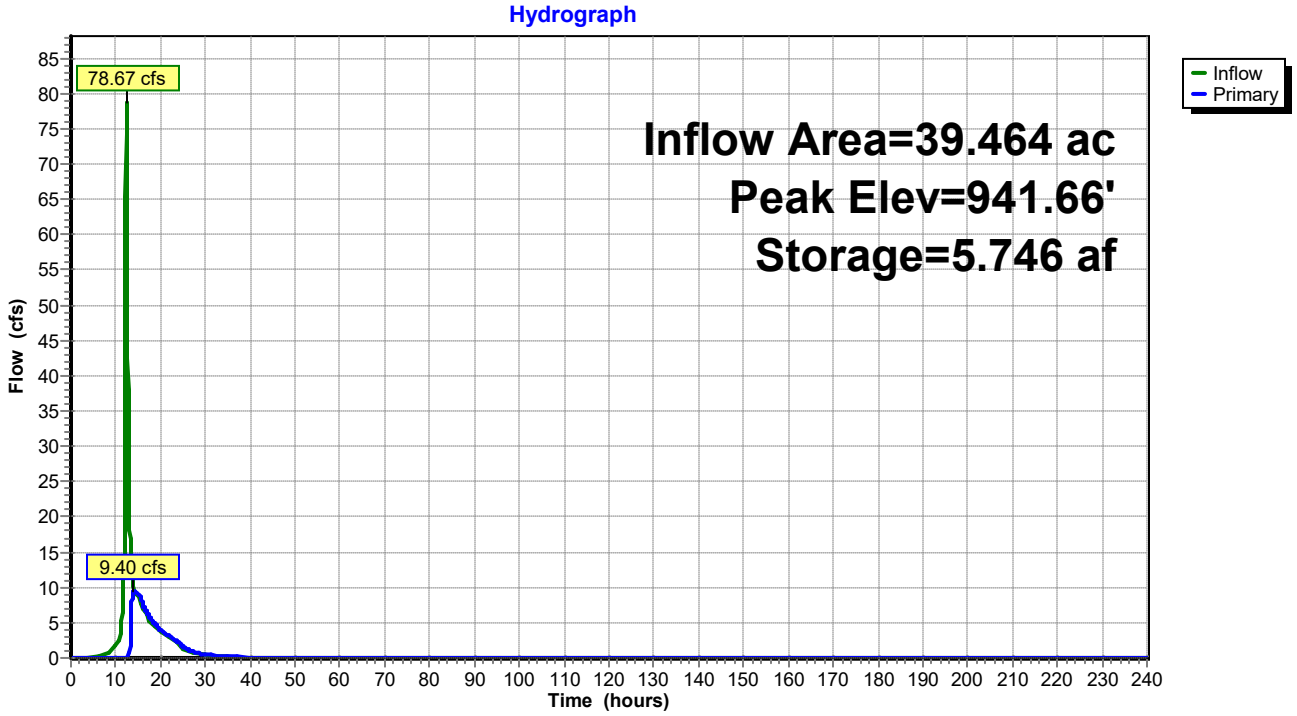
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	6.966 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
938.00	0.102	0.000	0.000
940.00	1.599	1.701	1.701
941.00	2.570	2.085	3.785
942.00	3.792	3.181	6.966

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=9.40 cfs @ 14.02 hrs HW=941.66' TW=926.30' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Weir Controls 9.40 cfs @ 1.27 fps)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

[58] Hint: Peaked 0.46' above defined flood level

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth = 58.49" for 100-year event
Inflow = 41.22 cfs @ 12.13 hrs, Volume= 18.328 af
Outflow = 39.48 cfs @ 12.15 hrs, Volume= 18.114 af, Atten= 4%, Lag= 1.5 min
Primary = 39.48 cfs @ 12.15 hrs, Volume= 18.114 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 938.96' @ 12.15 hrs Surf.Area= 0.319 ac Storage= 0.338 af
Flood Elev= 938.50' Surf.Area= 0.226 ac Storage= 0.214 af

Plug-Flow detention time= 59.8 min calculated for 18.110 af (99% of inflow)
Center-of-Mass det. time= 12.1 min (1,263.5 - 1,251.4)

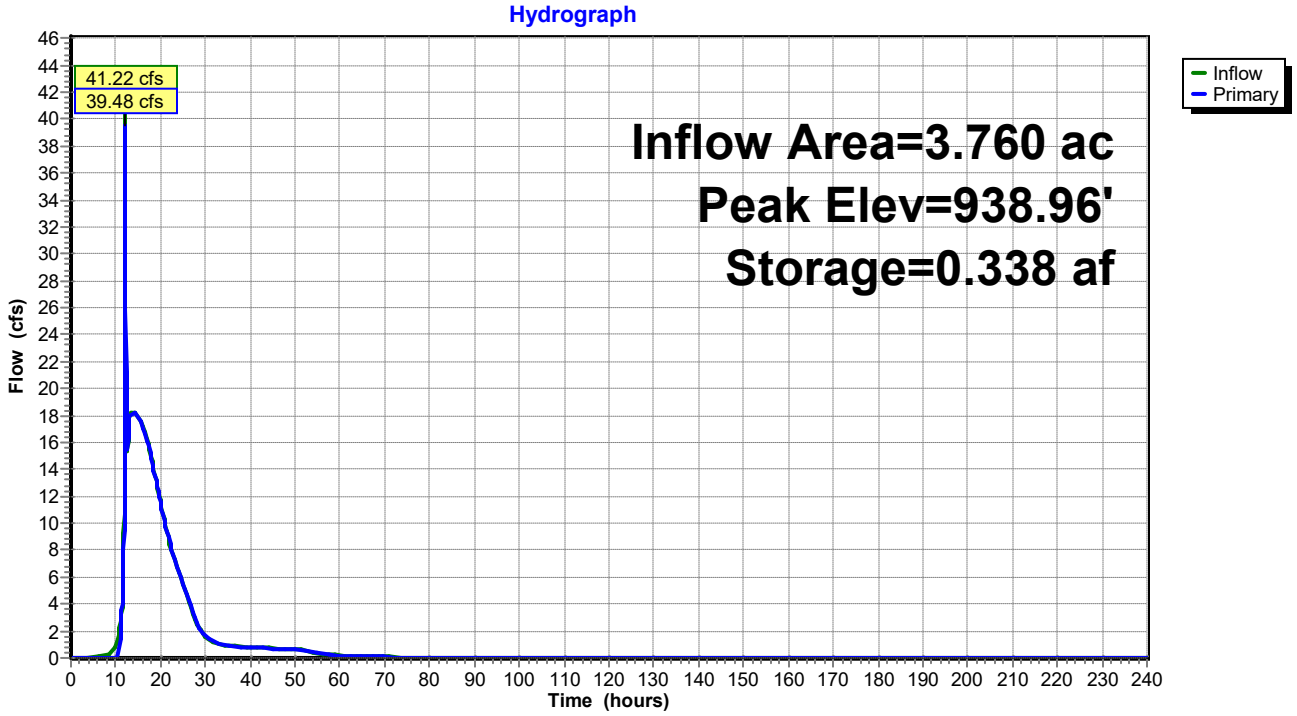
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	0.353 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.004	0.000	0.000
938.00	0.123	0.127	0.127
939.00	0.328	0.226	0.353

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=39.19 cfs @ 12.15 hrs HW=938.95' TW=925.33' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 39.19 cfs @ 2.09 fps)

Pond 60P: Wetland 5B



Summary for Link 1PP: Northwest Wetland (Big Woods)

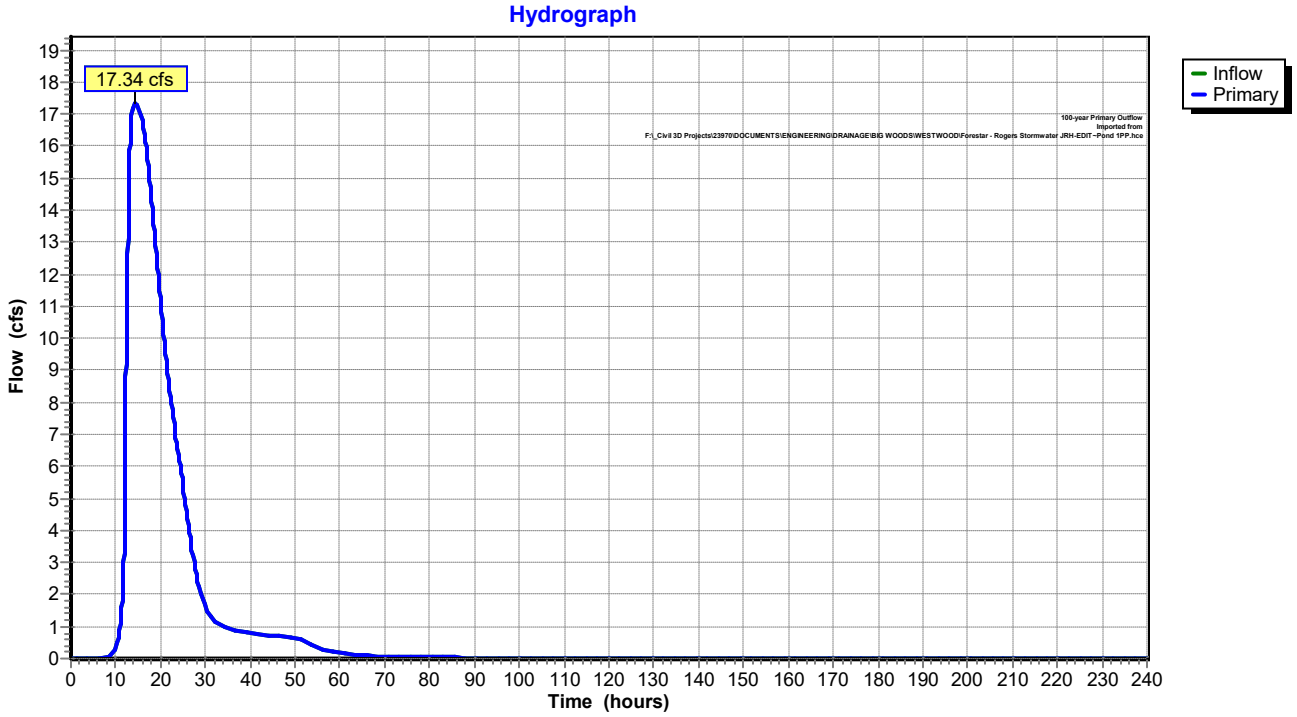
From the Big Woods development drainage model prepared by Westwood.

Inflow	=	17.34 cfs @	14.37 hrs, Volume=	16.618 af
Primary	=	17.34 cfs @	14.37 hrs, Volume=	16.618 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

100-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG W

Link 1PP: Northwest Wetland (Big Woods)



Summary for Link 5PP: Existing Pond (Big Woods)

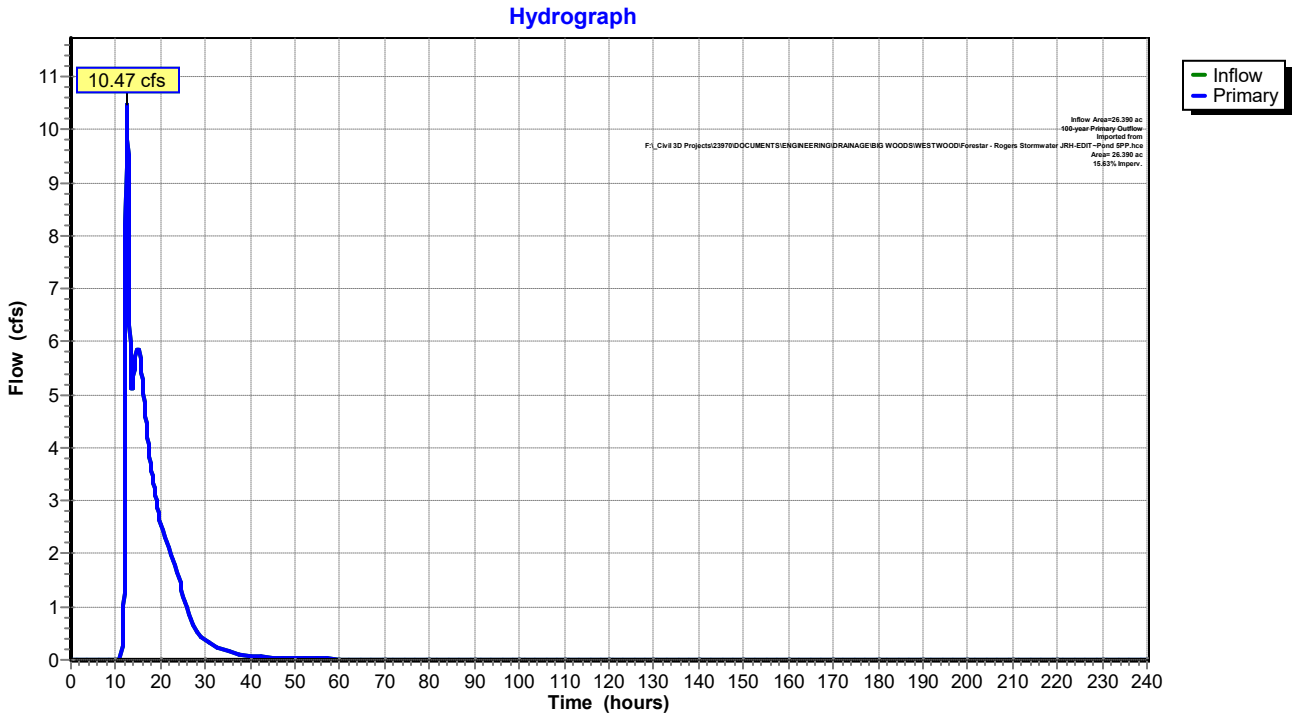
From the Big Woods development drainage model prepared by Westwood.

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth = 2.12" for 100-year event
Inflow = 10.47 cfs @ 12.49 hrs, Volume= 4.665 af
Primary = 10.47 cfs @ 12.49 hrs, Volume= 4.665 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

100-year Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG W

Link 5PP: Existing Pond (Big Woods)



Time span=0.00-240.00 hrs, dt=0.05 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth>6.96"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min AMC Adjusted CN=98/98 Runoff=139.00 cfs 174.019 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=25.761 ac 0.80% Impervious Runoff Depth>6.96"
Flow Length=2,175' Tc=29.4 min AMC Adjusted CN=98/98 Runoff=11.88 cfs 14.943 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=6.216 ac 0.00% Impervious Runoff Depth=6.96"
Flow Length=586' Tc=8.9 min AMC Adjusted CN=98/98 Runoff=2.97 cfs 3.606 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.900 ac 0.00% Impervious Runoff Depth>6.96"
Flow Length=247' Tc=20.0 min AMC Adjusted CN=98/98 Runoff=0.42 cfs 0.522 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=5.776 ac 0.00% Impervious Runoff Depth=6.96"
Flow Length=737' Tc=11.1 min AMC Adjusted CN=98/98 Runoff=2.75 cfs 3.350 af

Subcatchment 23S: Direct to Lower West Runoff Area=9.551 ac 0.00% Impervious Runoff Depth=6.96"
Flow Length=391' Tc=9.5 min AMC Adjusted CN=98/98 Runoff=4.56 cfs 5.540 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=26.075 ac 1.14% Impervious Runoff Depth=6.96"
Flow Length=998' Tc=13.6 min AMC Adjusted CN=98/98 Runoff=12.36 cfs 15.125 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=41.507 ac 5.85% Impervious Runoff Depth>6.96"
Flow Length=1,249' Tc=23.4 min AMC Adjusted CN=98/98 Runoff=19.35 cfs 24.077 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth>6.96"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min AMC Adjusted CN=98/98 Runoff=9.05 cfs 11.601 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=73.860 ac 2.02% Impervious Runoff Depth>6.96"
Flow Length=1,354' Tc=23.6 min AMC Adjusted CN=98/98 Runoff=34.41 cfs 42.843 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=6.96"
Flow Length=1,032' Tc=10.2 min AMC Adjusted CN=98/98 Runoff=6.54 cfs 7.954 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth>6.96"
Flow Length=734' Tc=26.4 min AMC Adjusted CN=98/98 Runoff=6.06 cfs 7.584 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=6.96"
Flow Length=531' Tc=5.6 min AMC Adjusted CN=98/98 Runoff=1.81 cfs 2.181 af

Reach 1R: Cowley Lake Outlet Channel Inflow=11.88 cfs 14.943 af
Outflow=11.88 cfs 14.943 af

Reach 2R: Cowley Lake Inflow=60.66 cfs 241.121 af
Outflow=60.66 cfs 241.121 af

Reach 21R: East Channel Avg. Flow Depth=0.89' Max Vel=4.67 fps Inflow=23.77 cfs 81.123 af
n=0.022 L=382.0' S=0.0097 '/' Capacity=131.71 cfs Outflow=23.77 cfs 81.116 af

Reach 23RL: Lower West Channel Avg. Flow Depth=0.88' Max Vel=2.08 fps Inflow=26.95 cfs 137.984 af
n=0.022 L=534.0' S=0.0014 '/' Capacity=257.71 cfs Outflow=26.94 cfs 137.923 af

Reach 23RU: Upper West Channel Avg. Flow Depth=0.52' Max Vel=2.19 fps Inflow=23.73 cfs 132.489 af
n=0.022 L=490.0' S=0.0057 '/' Capacity=766.18 cfs Outflow=23.58 cfs 132.444 af

Pond 7P: Whiteford Lake and Peak Elev=931.78' Storage=111.745 af Inflow=139.00 cfs 174.019 af
Outflow=74.34 cfs 95.344 af

Pond 30P: Wetland 4A Peak Elev=926.57' Storage=6.081 af Inflow=28.49 cfs 137.053 af
Outflow=23.73 cfs 132.489 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=933.01' Storage=0.206 af Inflow=75.18 cfs 106.945 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=17.90 cfs 112.976 af

Pond 40P: Wetland 2B Peak Elev=925.46' Storage=9.621 af Inflow=43.34 cfs 81.491 af
Outflow=23.65 cfs 80.601 af

Pond 41P: Ex South Off-site Pond Peak Elev=940.62' Storage=3.976 af Inflow=6.54 cfs 7.954 af
Outflow=4.65 cfs 4.254 af

Pond 50P: Wetland 4B Peak Elev=941.60' Storage=5.549 af Inflow=7.65 cfs 15.607 af
Outflow=4.51 cfs 10.335 af

Pond 60P: Wetland 5B Peak Elev=938.67' Storage=0.255 af Inflow=7.53 cfs 24.279 af
Outflow=7.53 cfs 24.059 af

Link 1PL: \DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=6.94 cfs 22.098 af
Primary=6.94 cfs 22.098 af

Link 5PL: G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=2.94 cfs 8.023 af
Area= 26.390 ac 15.63% Imperv. Primary=2.94 cfs 8.023 af

Total Runoff Area = 540.193 ac Runoff Volume = 313.346 af Average Runoff Depth = 6.96"
98.07% Pervious = 529.794 ac 1.93% Impervious = 10.399 ac

Summary for Subcatchment 7S: Approx DA to Lake

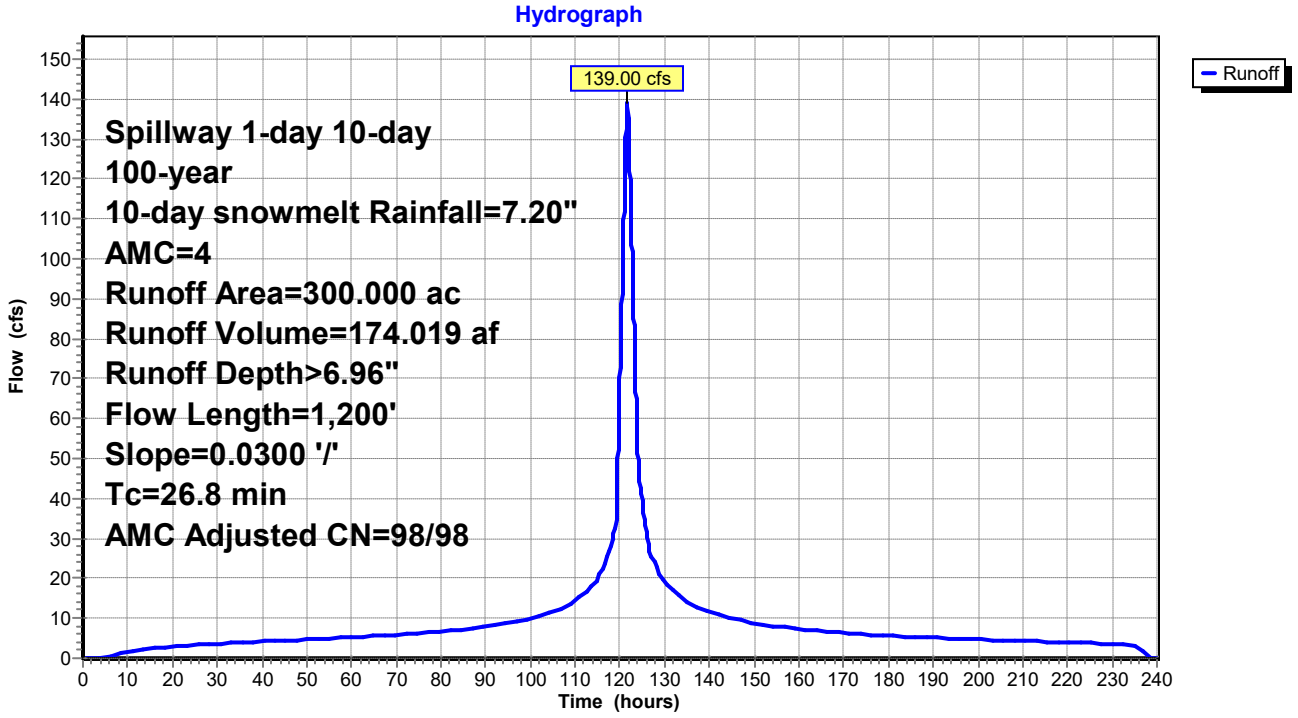
Runoff = 139.00 cfs @ 121.61 hrs, Volume= 174.019 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
300.000	72		Woods/grass comb., Good, HSG C
300.000	72	98	Weighted Average, AMC Adjusted
300.000	72	98	100.00% Pervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

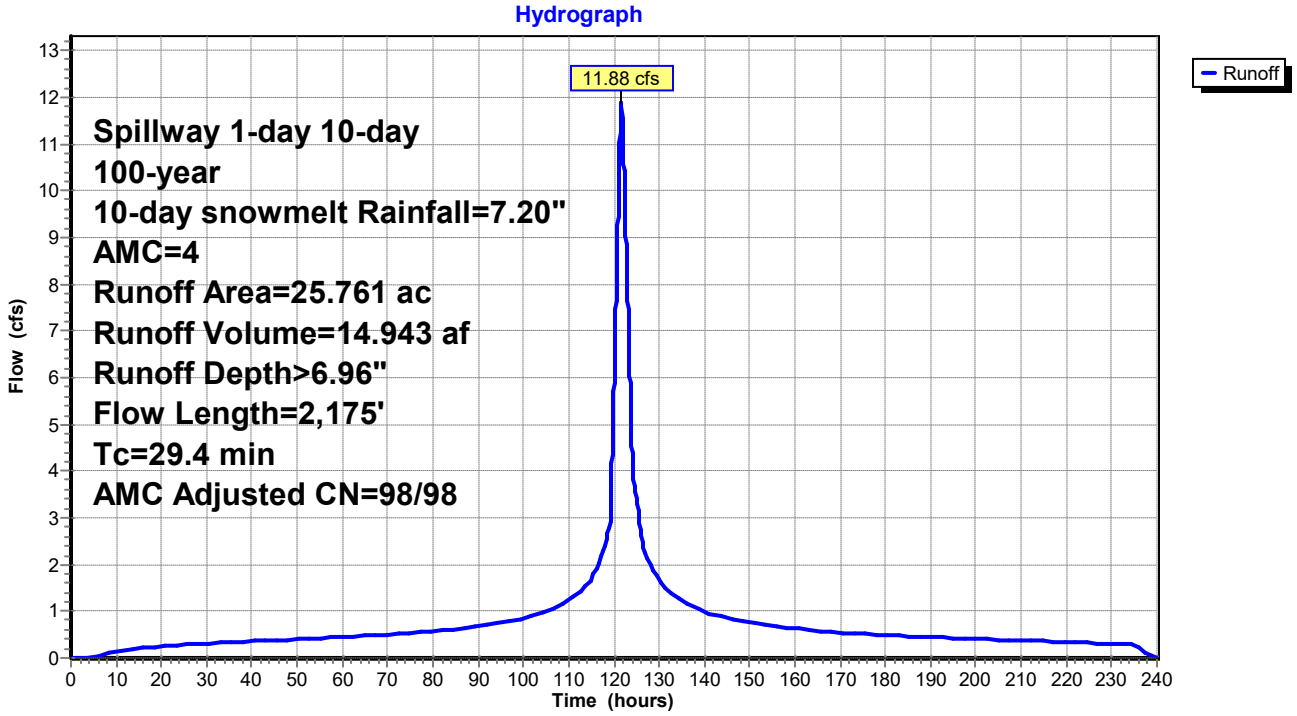
Runoff = 11.88 cfs @ 121.64 hrs, Volume= 14.943 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.136	98		Unconnected pavement, HSG D
0.070	98		Unconnected roofs, HSG D
1.380	98		Water Surface, 0% imp, HSG D
21.395	89		Row crops, straight row, Good, HSG D
1.284	80		>75% Grass cover, Good, HSG D
0.797	78		Meadow, non-grazed, HSG D
0.699	77		Woods, Good, HSG D
25.761	88	98	Weighted Average, AMC Adjusted
25.555	88	98	99.20% Pervious Area, AMC Adjusted
0.206	98	98	0.80% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
20.2	1,454	0.0177	1.20		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.9	621	0.0020	2.64	68.60	**Channel Flow,** Area= 26.0 sf Perim= 20.0' r= 1.30' n= 0.030 Earth, grassed & winding
29.4	2,175	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 20S: Direct to Cowley Lake

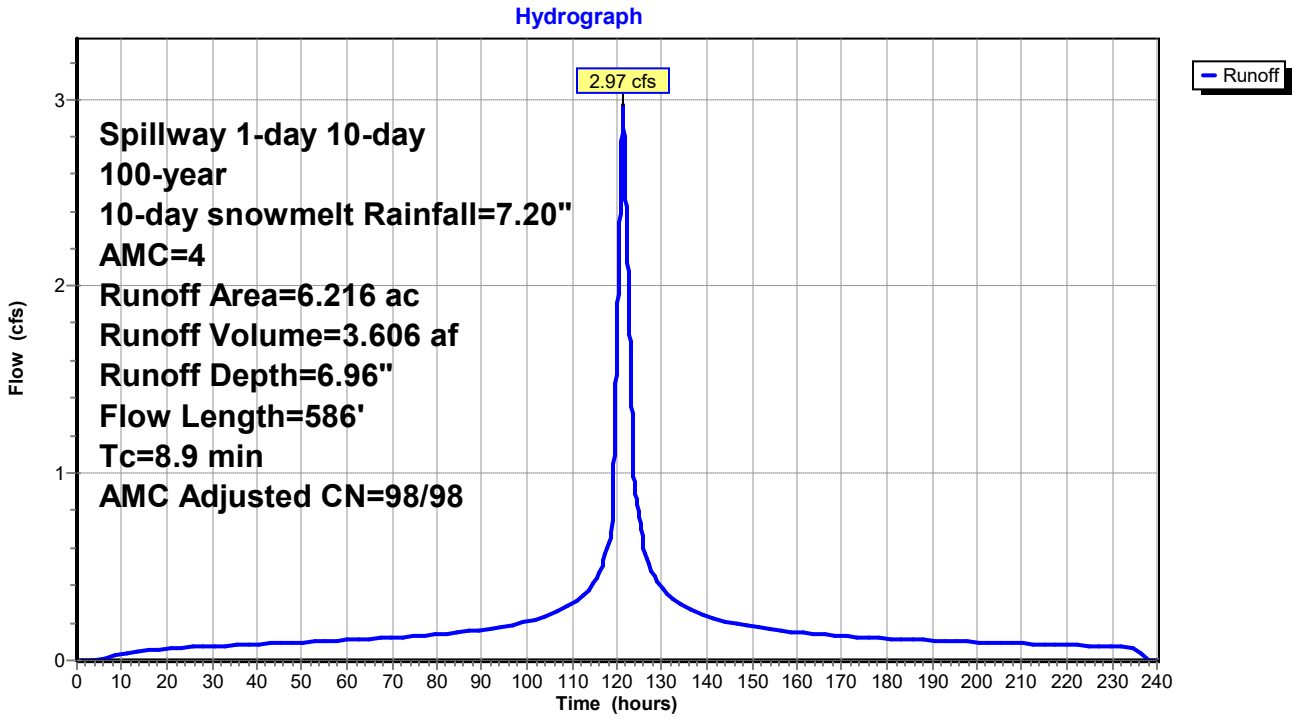
Runoff = 2.97 cfs @ 121.35 hrs, Volume= 3.606 af, Depth= 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.123	98		Water Surface, 0% imp, HSG D
4.384	89		Row crops, straight row, Good, HSG D
1.709	77		Woods, Good, HSG D
6.216	86	98	Weighted Average, AMC Adjusted
6.216	86	98	100.00% Pervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.0240	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
4.3	486	0.0440	1.89		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
8.9	586	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

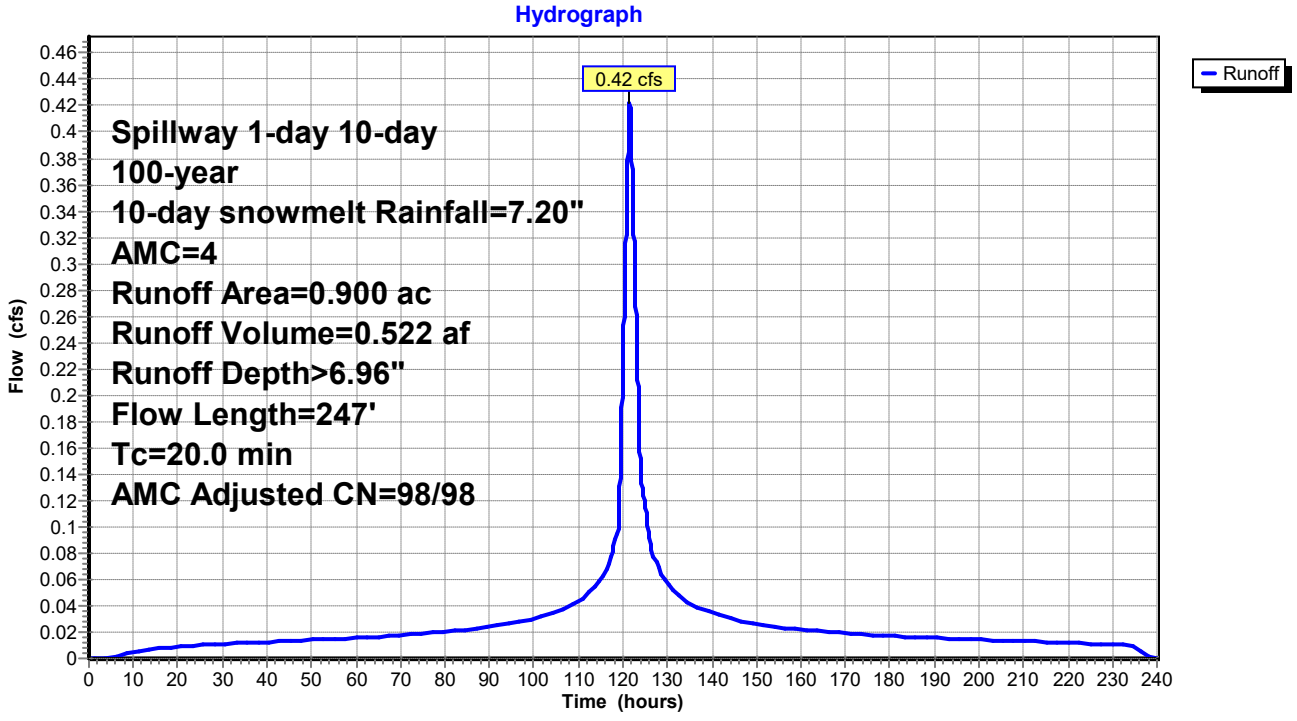
Runoff = 0.42 cfs @ 121.51 hrs, Volume= 0.522 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.074	98		Water Surface, 0% imp, HSG D
0.005	89		Row crops, straight row, Good, HSG D
0.821	77		Woods, Good, HSG D
0.900	79	98	Weighted Average, AMC Adjusted
0.900	79	98	100.00% Pervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0350	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.8	147	0.0721	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.0	247	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

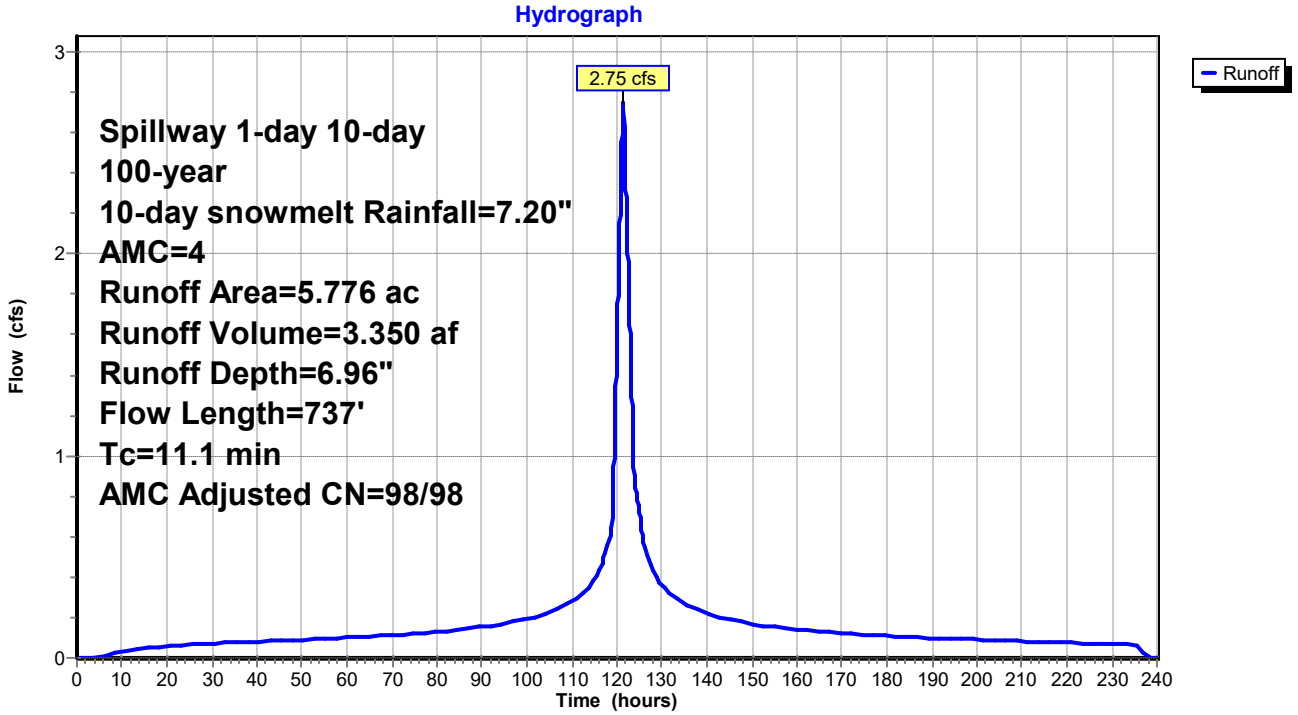
Runoff = 2.75 cfs @ 121.38 hrs, Volume= 3.350 af, Depth= 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.031	98		Water Surface, 0% imp, HSG D
4.386	89		Row crops, straight row, Good, HSG D
0.729	78		Meadow, non-grazed, HSG D
0.630	77		Woods, Good, HSG D
5.776	86	98	Weighted Average, AMC Adjusted
5.776	86	98	100.00% Pervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.0440	0.46		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
7.5	637	0.0248	1.42		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.1	737	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Lower West Channel

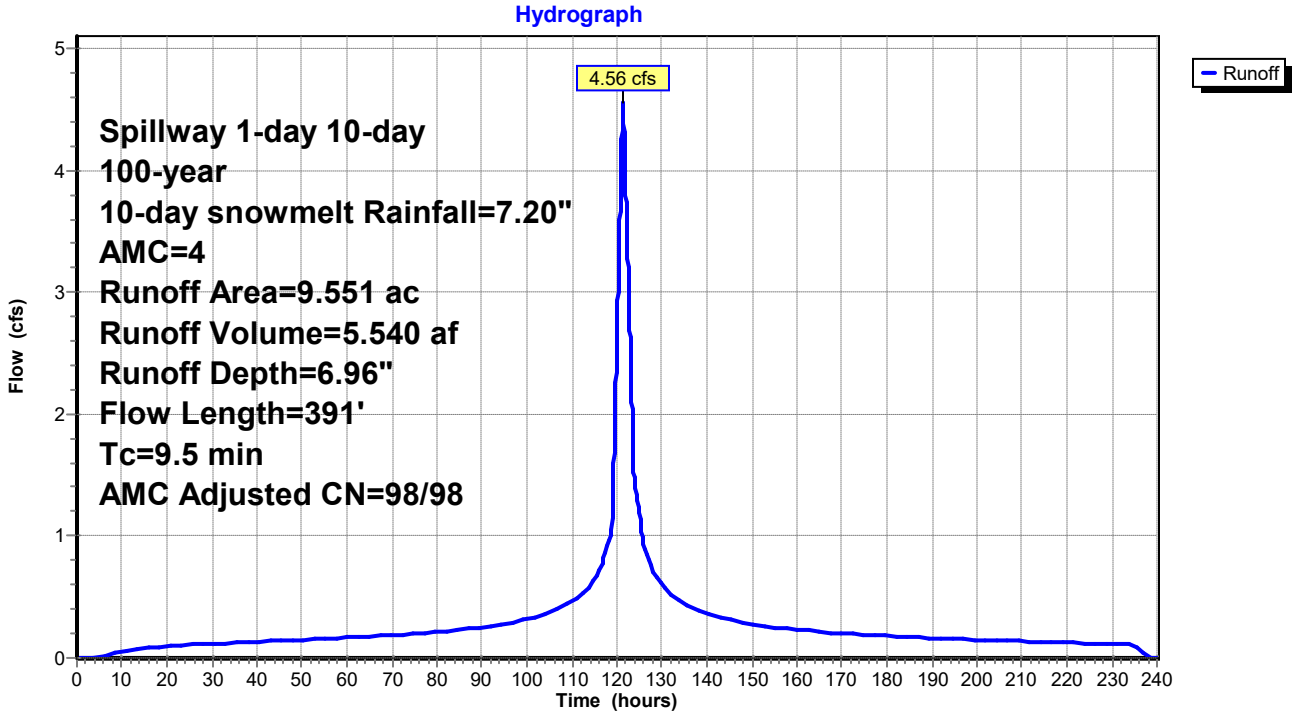
Runoff = 4.56 cfs @ 121.35 hrs, Volume= 5.540 af, Depth= 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.467	98		Water Surface, 0% imp, HSG D
7.263	89		Row crops, straight row, Good, HSG D
0.213	78		Meadow, non-grazed, HSG D
1.608	77		Woods, Good, HSG D
9.551	87	98	Weighted Average, AMC Adjusted
9.551	87	98	100.00% Pervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0090	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
2.6	291	0.0433	1.87		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.5	391	Total			

Subcatchment 23S: Direct to Lower West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

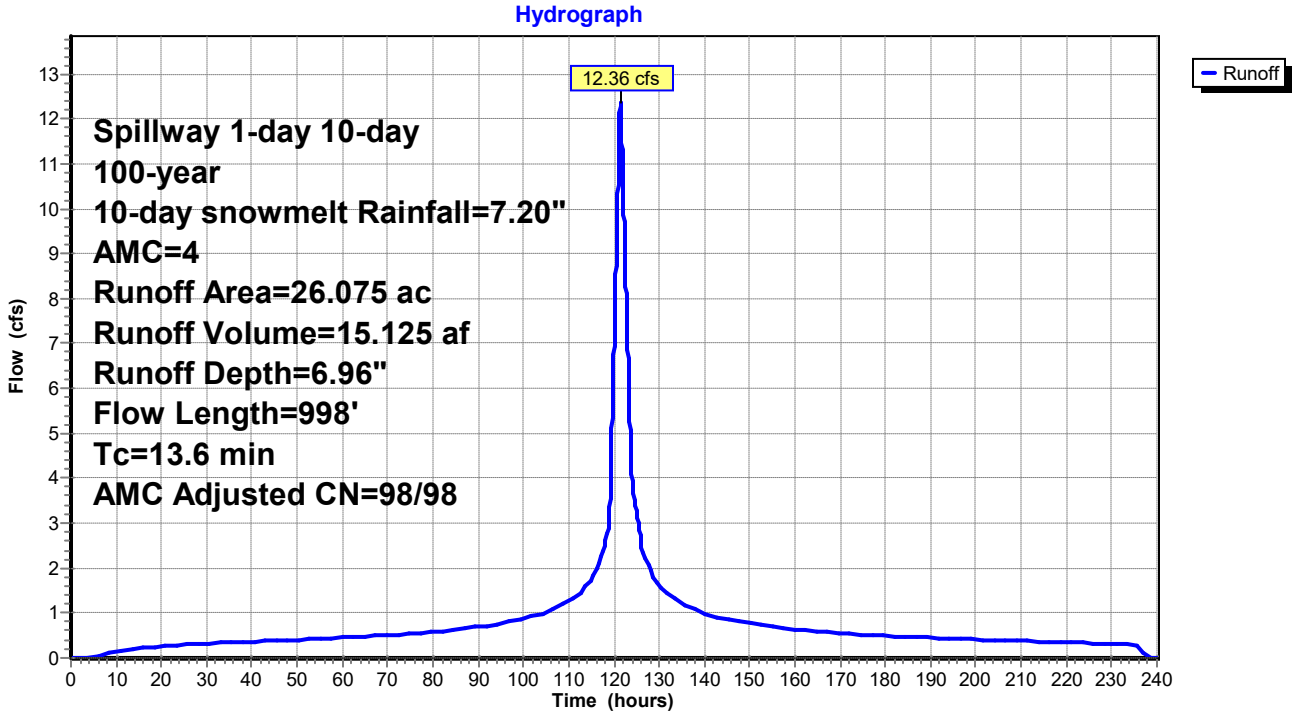
Runoff = 12.36 cfs @ 121.41 hrs, Volume= 15.125 af, Depth= 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.298	98		Unconnected pavement, HSG D
0.980	98		Water Surface, 0% imp, HSG D
0.082	96		Gravel surface, HSG D
0.357	80		>75% Grass cover, Good, HSG D
21.863	89		Row crops, straight row, Good, HSG D
0.151	78		Meadow, non-grazed, HSG D
2.344	77		Woods, Good, HSG D
26.075	88	98	Weighted Average, AMC Adjusted
25.777	88	98	98.86% Pervious Area, AMC Adjusted
0.298	98	98	1.14% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0200	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
10.3	819	0.0217	1.33		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.8	149	0.0315	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.6	998	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 30S: Direct to Wetland 4A

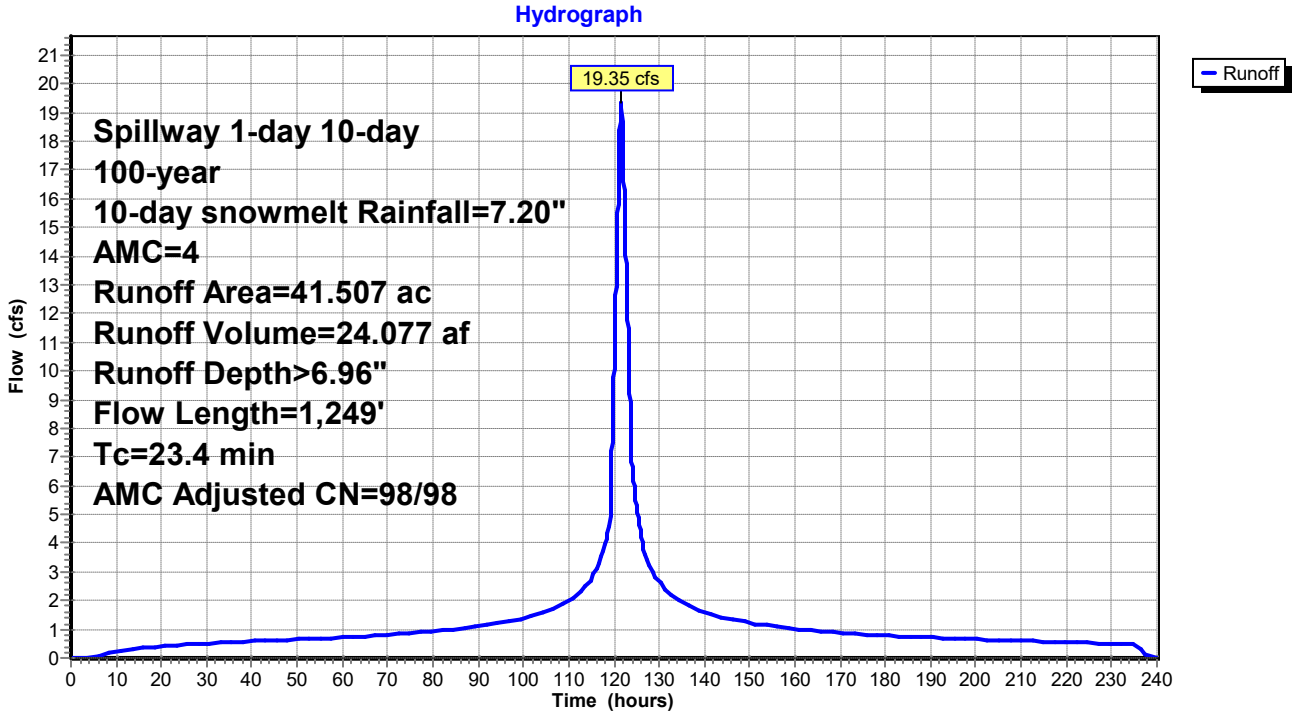
Runoff = 19.35 cfs @ 121.56 hrs, Volume= 24.077 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
1.469	98		Unconnected pavement, HSG D
0.959	98		Unconnected roofs, HSG D
0.947	96		Gravel surface, HSG D
17.469	89		Row crops, straight row, Good, HSG D
1.609	89		Pasture/grassland/range, Poor, HSG D
14.597	80		>75% Grass cover, Good, HSG D
0.684	78		Meadow, non-grazed, HSG D
3.773	77		Woods, Good, HSG D
41.507	85	98	Weighted Average, AMC Adjusted
39.079	84	98	94.15% Pervious Area, AMC Adjusted
2.428	98	98	5.85% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

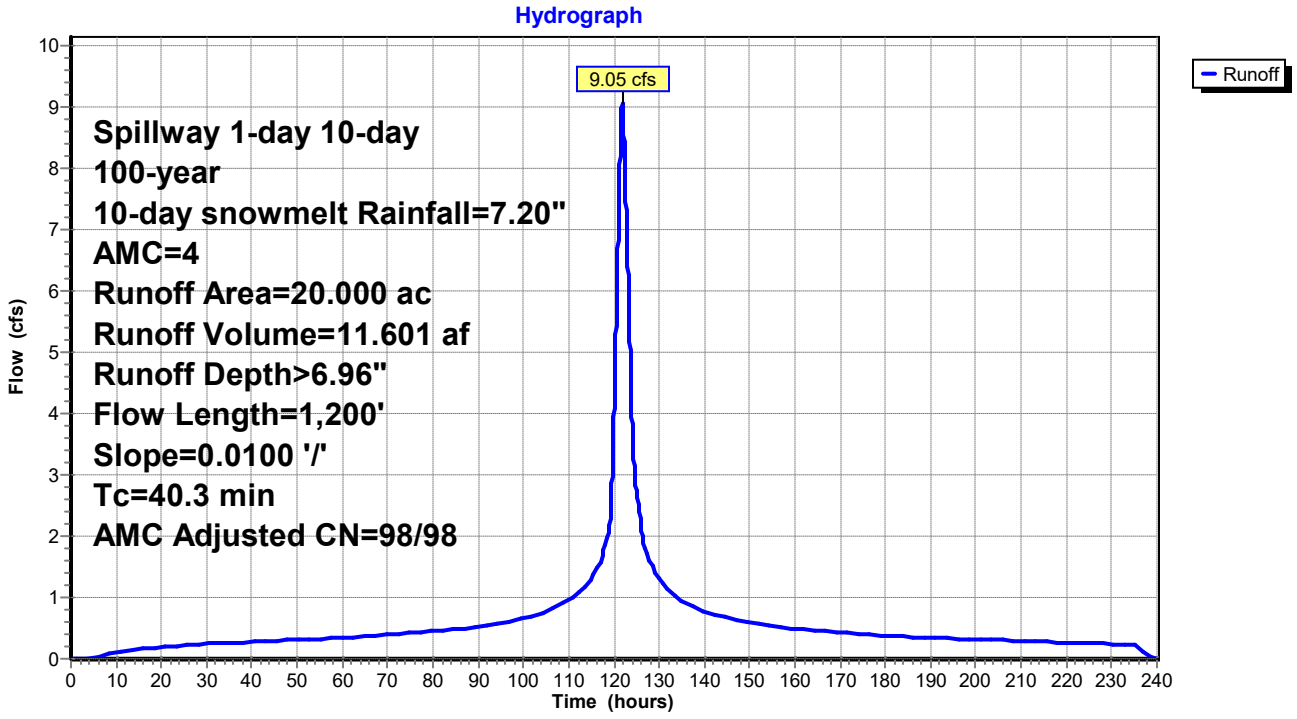
Runoff = 9.05 cfs @ 121.80 hrs, Volume= 11.601 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
20.000	77		2 acre lots, 12% imp, HSG C
20.000	77	98	Weighted Average, AMC Adjusted
17.600	74	98	88.00% Pervious Area, AMC Adjusted
2.400	98	98	12.00% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 40S: Direct to Wetland 2B

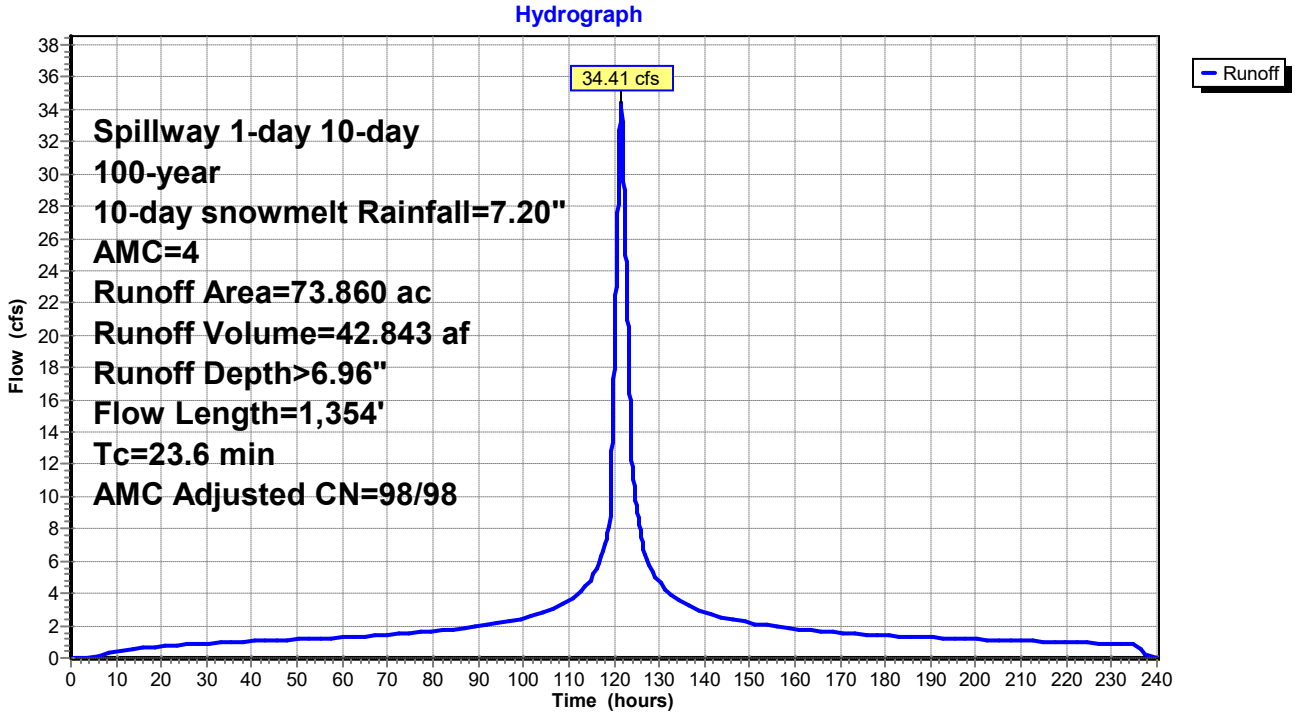
Runoff = 34.41 cfs @ 121.56 hrs, Volume= 42.843 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.965	98		Unconnected pavement, HSG D
0.528	98		Unconnected roofs, HSG D
17.207	98		Water Surface, 0% imp, HSG D
1.249	96		Gravel surface, HSG D
35.493	89		Row crops, straight row, Good, HSG D
0.208	89		Pasture/grassland/range, Poor, HSG D
8.455	80		>75% Grass cover, Good, HSG D
5.449	78		Meadow, non-grazed, HSG D
4.306	77		Woods, Good, HSG D
73.860	89	98	Weighted Average, AMC Adjusted
72.367	89	98	97.98% Pervious Area, AMC Adjusted
1.493	98	98	2.02% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

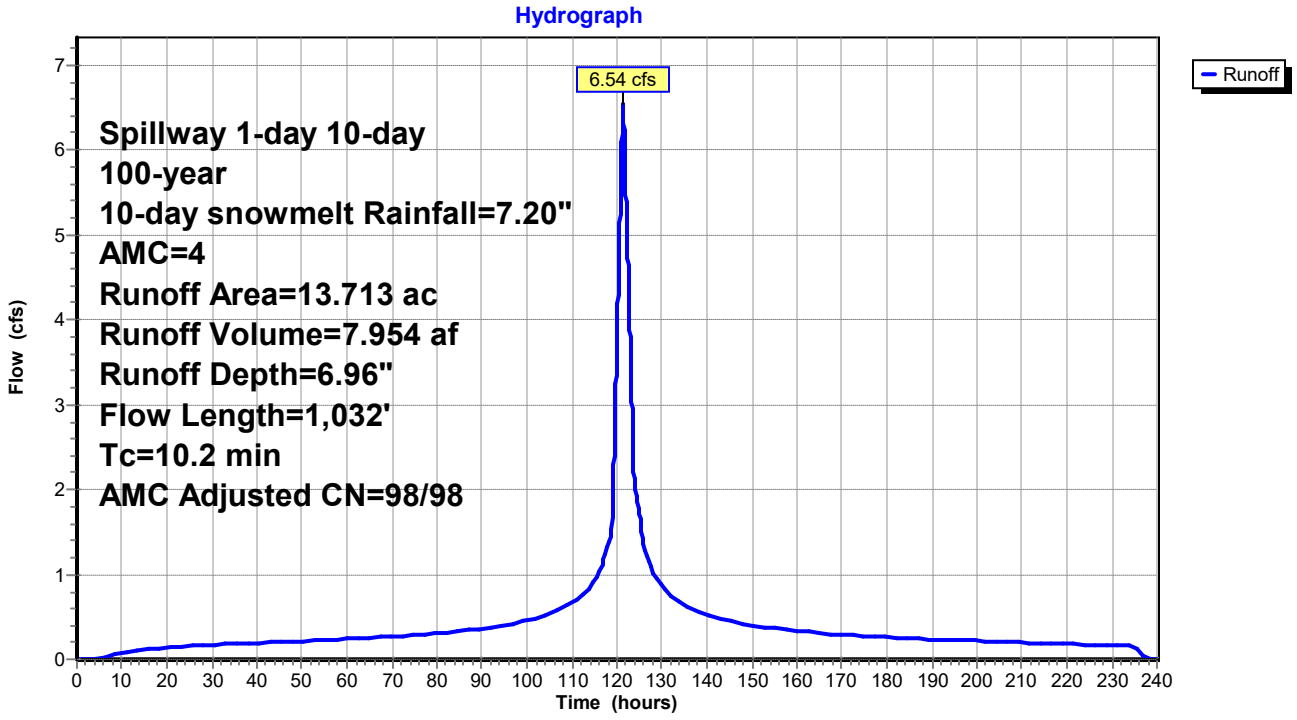
Runoff = 6.54 cfs @ 121.36 hrs, Volume= 7.954 af, Depth= 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
1.568	98		Unconnected pavement, HSG D
0.273	98		Unconnected roofs, HSG D
0.107	98		Water Surface, 0% imp, HSG D
0.066	96		Gravel surface, HSG D
10.431	80		>75% Grass cover, Good, HSG D
1.268	78		Meadow, non-grazed, HSG D
13.713	82	98	Weighted Average, AMC Adjusted
11.872	80	98	86.57% Pervious Area, AMC Adjusted
1.841	98	98	13.43% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

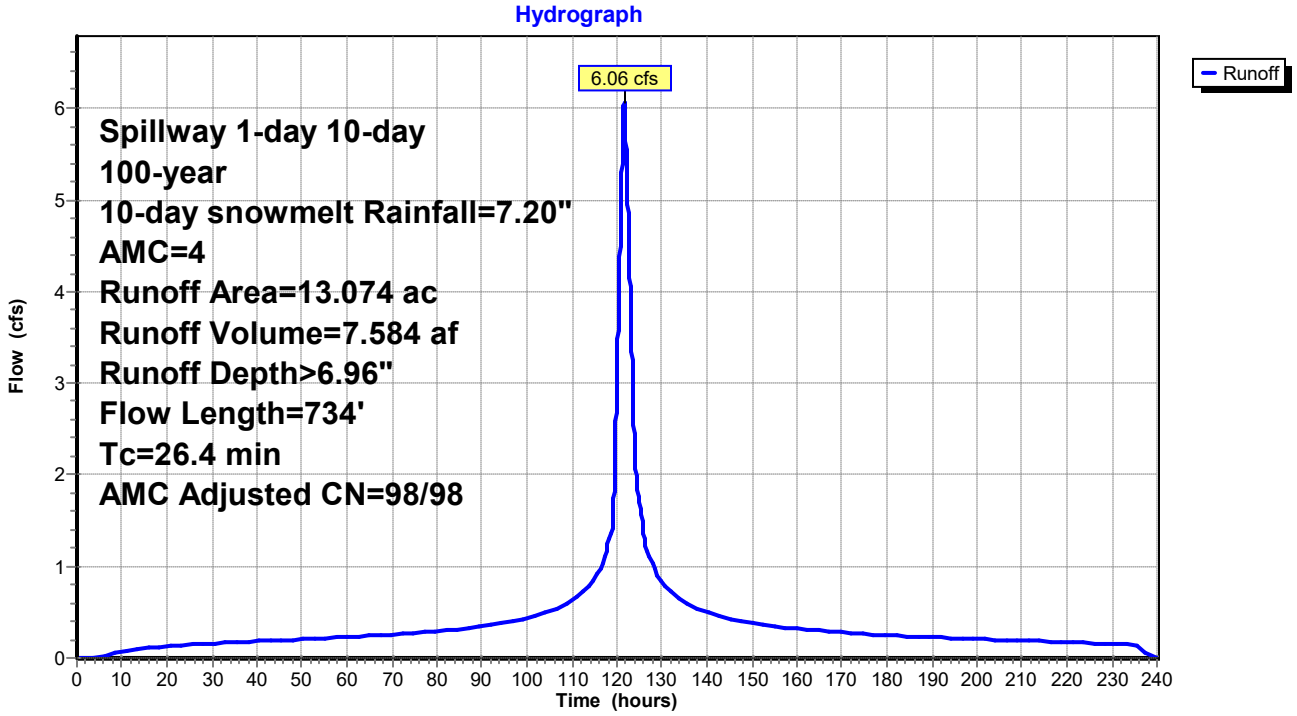
Runoff = 6.06 cfs @ 121.60 hrs, Volume= 7.584 af, Depth> 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.523	98		Unconnected pavement, HSG D
0.339	98		Unconnected roofs, HSG D
0.175	98		Water Surface, 0% imp, HSG D
0.233	96		Gravel surface, HSG D
8.346	89		Row crops, straight row, Good, HSG D
0.958	89		Pasture/grassland/range, Poor, HSG D
2.500	80		>75% Grass cover, Good, HSG D
13.074	88	98	Weighted Average, AMC Adjusted
12.212	87	98	93.41% Pervious Area, AMC Adjusted
0.862	98	98	6.59% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

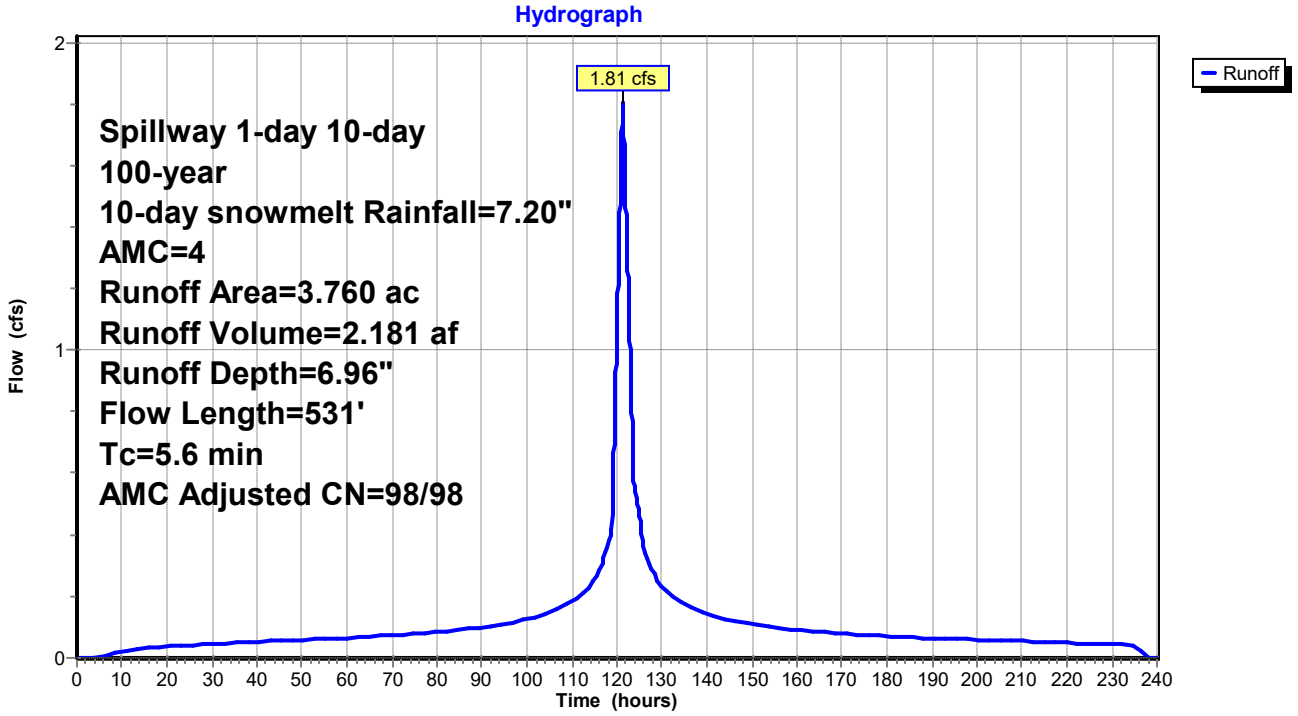
Runoff = 1.81 cfs @ 121.30 hrs, Volume= 2.181 af, Depth= 6.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Spillway 1-day 10-day 100-year, 10-day snowmelt Rainfall=7.20", AMC=4

Area (ac)	CN	Adj	Description
0.428	98		Unconnected pavement, HSG D
0.443	98		Unconnected roofs, HSG D
0.064	98		Water Surface, 0% imp, HSG D
0.331	96		Gravel surface, HSG D
2.083	80		>75% Grass cover, Good, HSG D
0.411	77		Woods, Good, HSG D
3.760	86	98	Weighted Average, AMC Adjusted
2.889	82	98	76.84% Pervious Area, AMC Adjusted
0.871	98	98	23.16% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



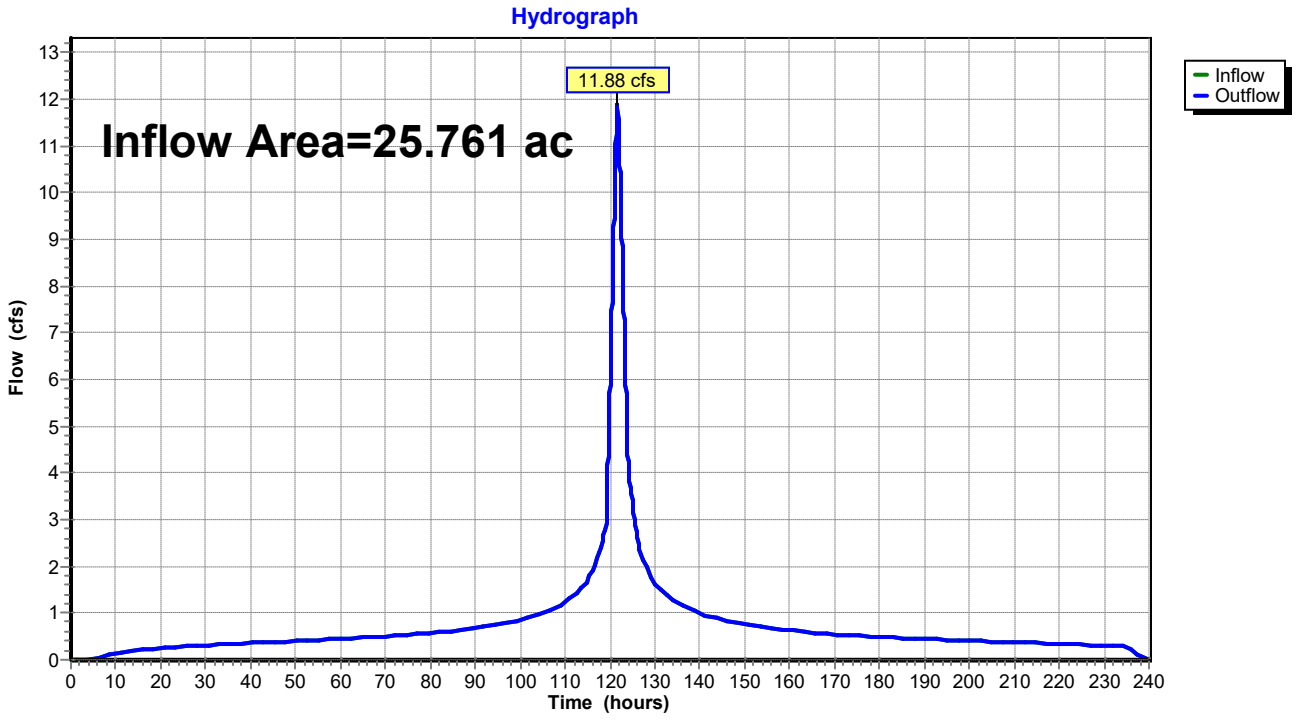
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.761 ac, 0.80% Impervious, Inflow Depth > 6.96" for 100-year, 10-day snowmelt event
Inflow = 11.88 cfs @ 121.64 hrs, Volume= 14.943 af
Outflow = 11.88 cfs @ 121.64 hrs, Volume= 14.943 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



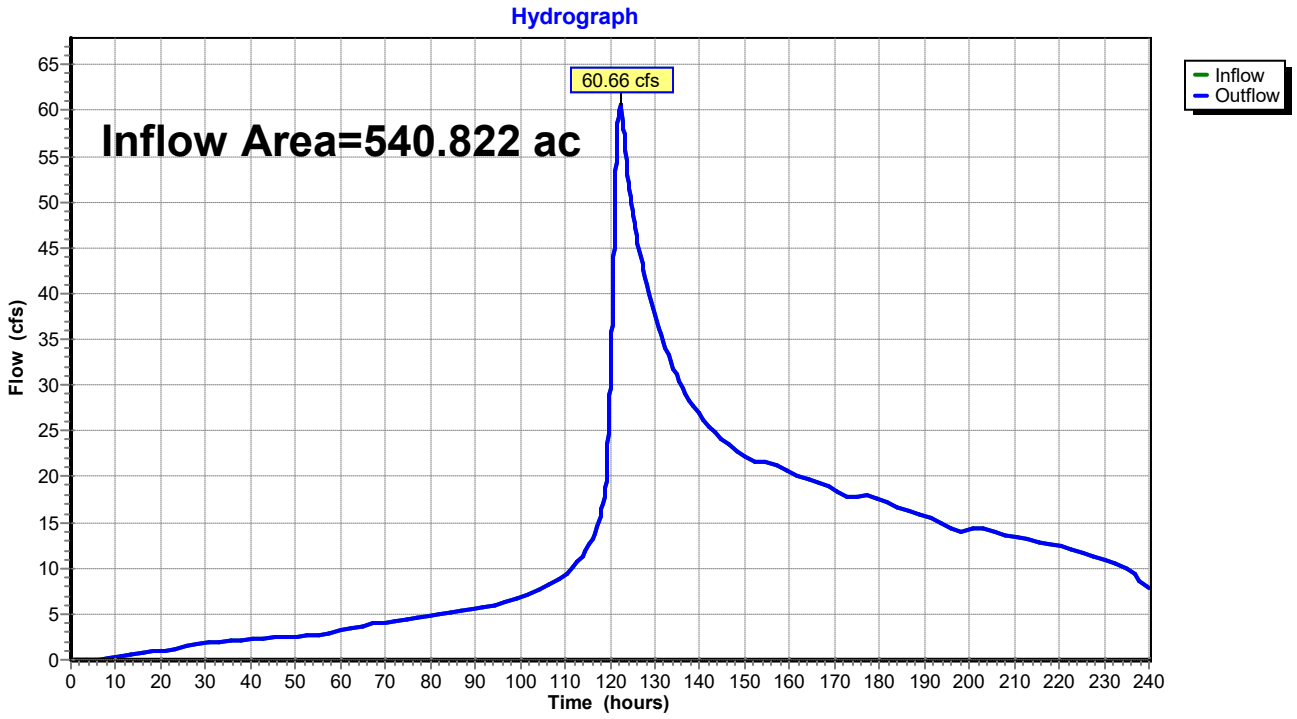
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.822 ac, 2.65% Impervious, Inflow Depth > 5.35" for 100-year, 10-day snowmelt event
Inflow = 60.66 cfs @ 122.26 hrs, Volume= 241.121 af
Outflow = 60.66 cfs @ 122.26 hrs, Volume= 241.121 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



Summary for Reach 21R: East Channel

Inflow Area = 131.697 ac, 6.98% Impervious, Inflow Depth > 7.39" for 100-year, 10-day snowmelt event
Inflow = 23.77 cfs @ 124.75 hrs, Volume= 81.123 af
Outflow = 23.77 cfs @ 124.77 hrs, Volume= 81.116 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.67 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 2.58 fps, Avg. Travel Time= 2.5 min

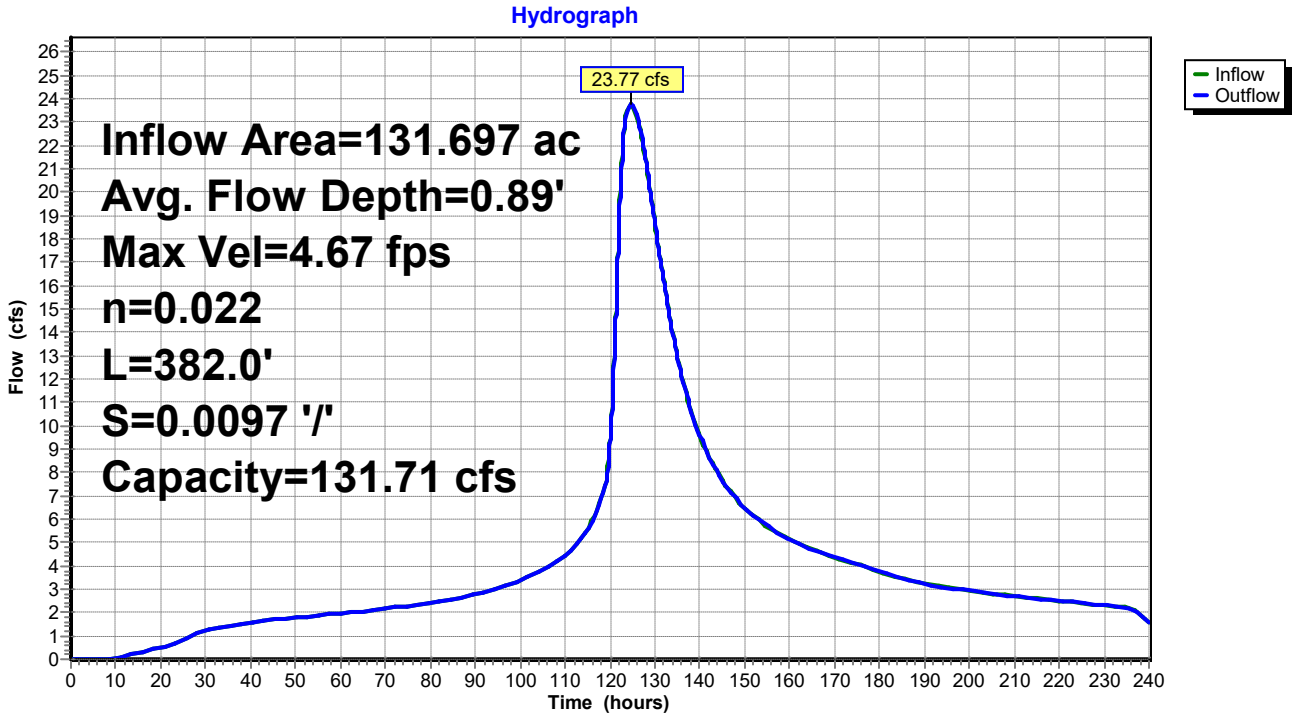
Peak Storage= 1,942 cf @ 124.77 hrs
Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 131.71 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 382.0' Slope= 0.0097 '/'
Inlet Invert= 923.92', Outlet Invert= 920.20'



‡

Reach 21R: East Channel



Summary for Reach 23RL: Lower West Channel

Inflow Area = 371.058 ac, 1.30% Impervious, Inflow Depth > 4.46" for 100-year, 10-day snowmelt event
Inflow = 26.95 cfs @ 122.27 hrs, Volume= 137.984 af
Outflow = 26.94 cfs @ 122.32 hrs, Volume= 137.923 af, Atten= 0%, Lag= 3.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.08 fps, Min. Travel Time= 4.3 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 8.1 min

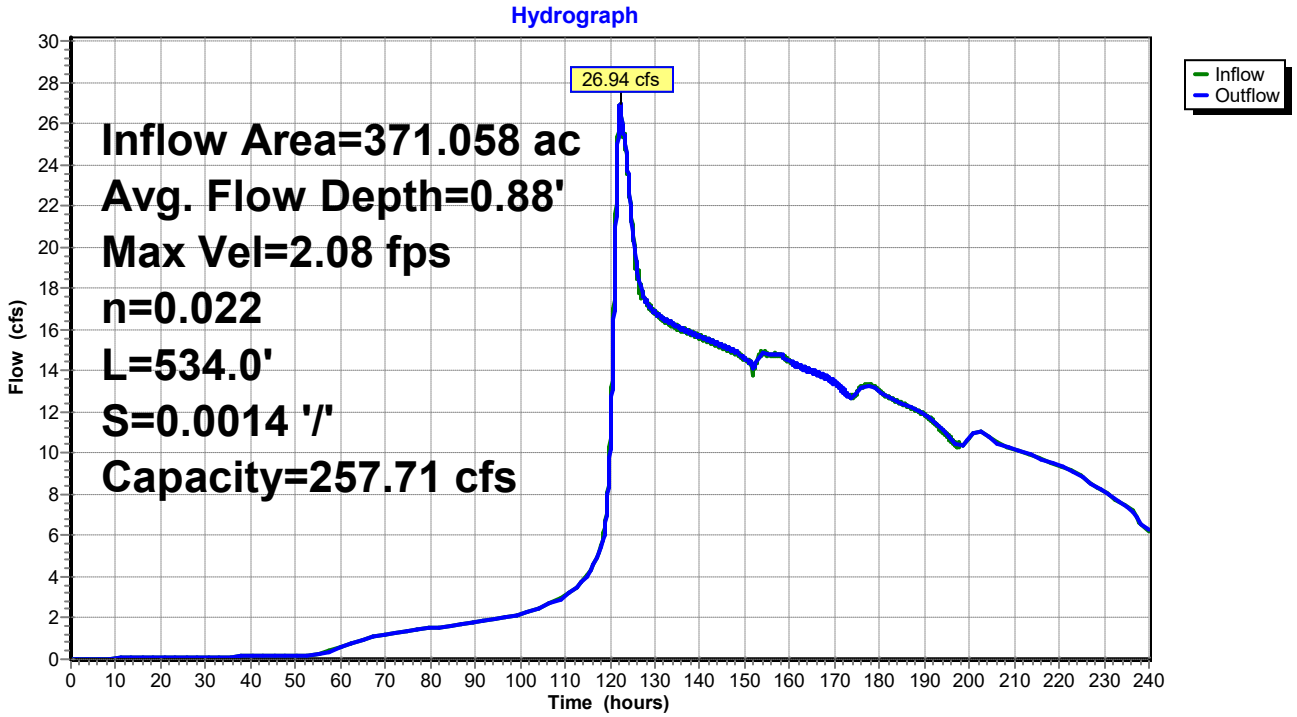
Peak Storage= 6,920 cf @ 122.32 hrs
Average Depth at Peak Storage= 0.88'
Bank-Full Depth= 3.00' Flow Area= 63.0 sf, Capacity= 257.71 cfs

12.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 30.00'
Length= 534.0' Slope= 0.0014 '/'
Inlet Invert= 919.58', Outlet Invert= 918.82'



‡

Reach 23RL: Lower West Channel



Summary for Reach 23RU: Upper West Channel

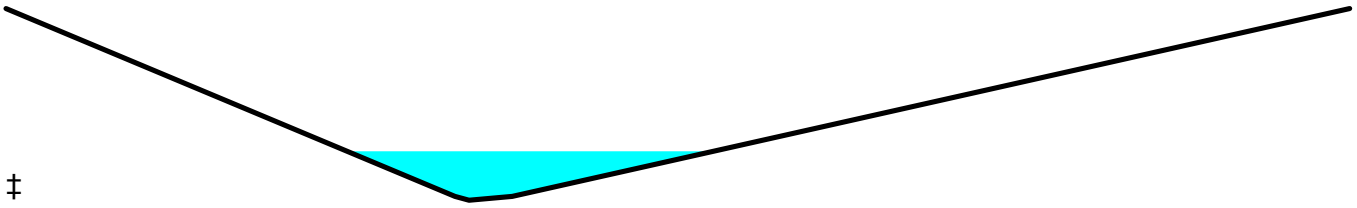
[80] Warning: Exceeded Pond 30P by 0.96' @ 0.00 hrs (0.58 cfs 1.672 af)

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth > 4.40" for 100-year, 10-day snowmelt event
Inflow = 23.73 cfs @ 123.16 hrs, Volume= 132.489 af
Outflow = 23.58 cfs @ 122.40 hrs, Volume= 132.444 af, Atten= 1%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.19 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 5.3 min

Peak Storage= 5,278 cf @ 122.40 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.04' Flow Area= 146.2 sf, Capacity= 766.18 cfs

Custom cross-section, Length= 490.0' Slope= 0.0057 '/'
Constant n= 0.022 Earth, clean & straight
Inlet Invert= 925.96', Outlet Invert= 923.17'

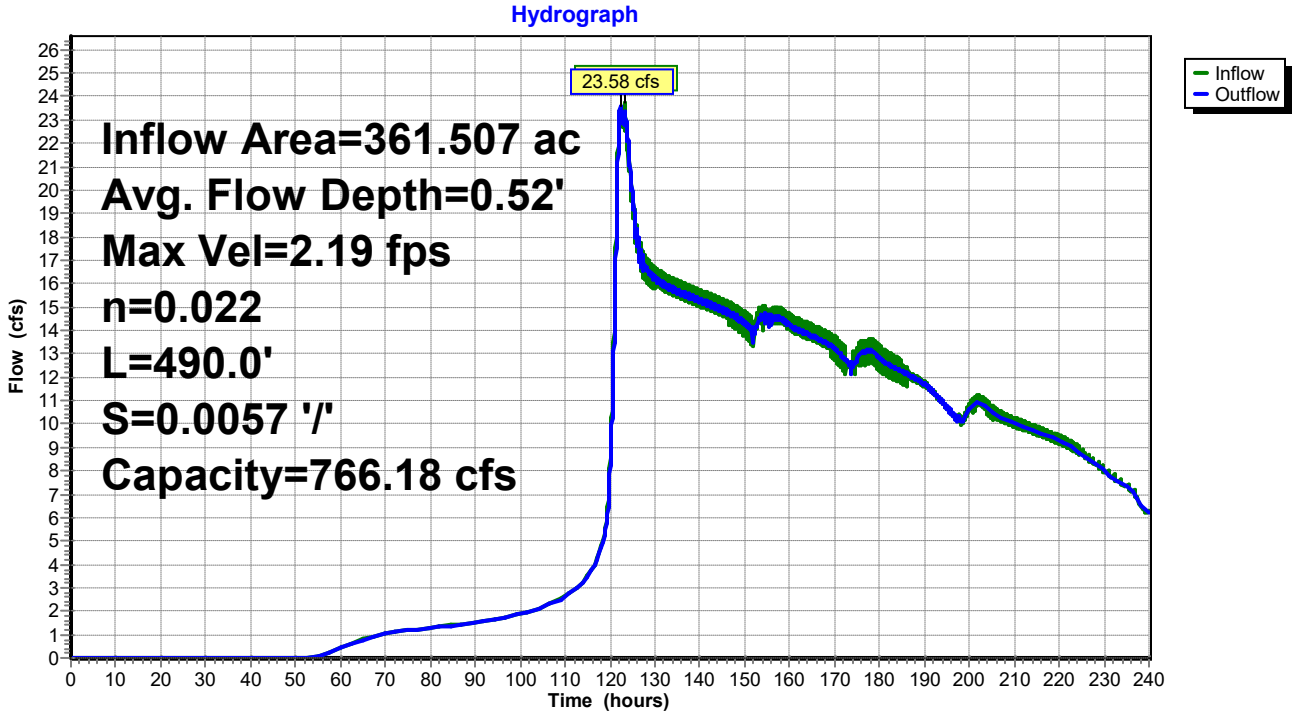


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-48.27	928.00	0.00
-1.47	926.00	2.00
0.00	925.96	2.04
4.51	926.00	2.00
91.79	928.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.1	6.0	59	0.05
2.04	146.2	140.1	71,618	766.18

Reach 23RU: Upper West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=594)

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth > 6.96" for 100-year, 10-day snowmelt event
Inflow = 139.00 cfs @ 121.61 hrs, Volume= 174.019 af
Outflow = 74.34 cfs @ 138.05 hrs, Volume= 95.344 af, Atten= 47%, Lag= 986.6 min
Primary = 74.34 cfs @ 138.05 hrs, Volume= 95.344 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 931.78' @ 137.99 hrs Surf.Area= 65.349 ac Storage= 111.745 af

Plug-Flow detention time= 4,756.8 min calculated for 95.324 af (55% of inflow)
Center-of-Mass det. time= 3,037.4 min (10,466.6 - 7,429.2)

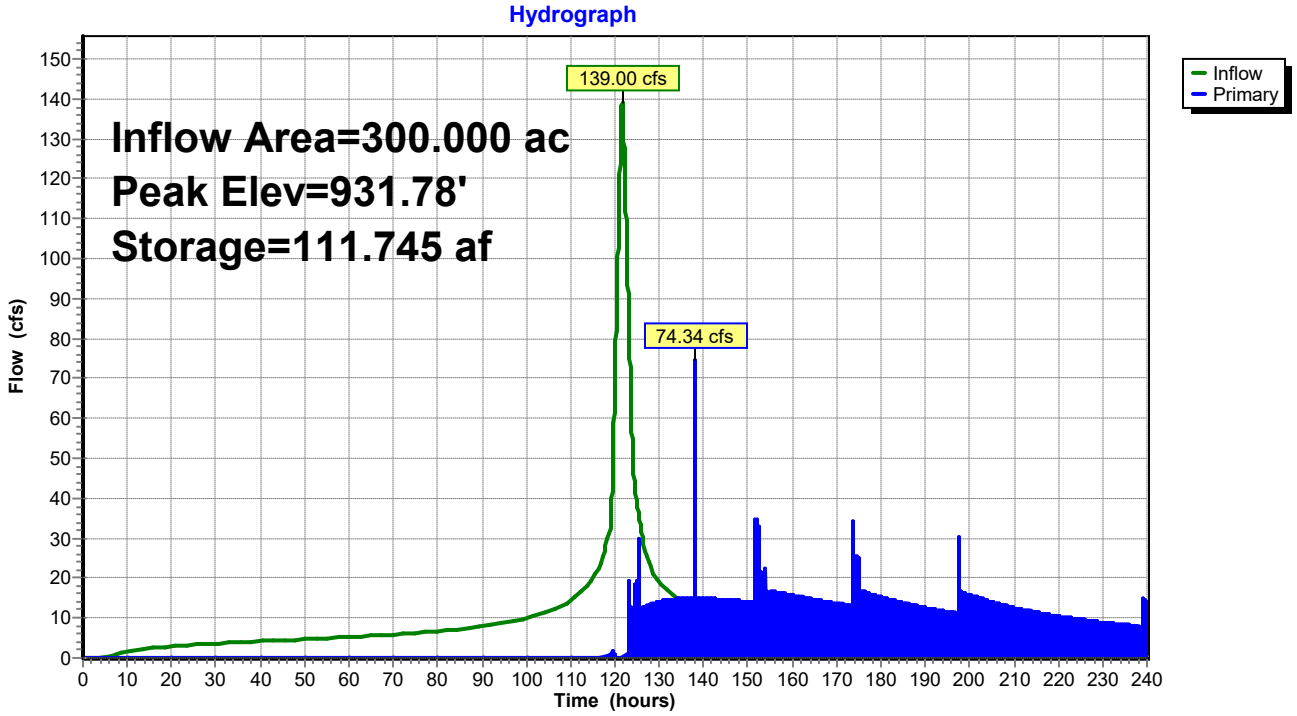
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 138.05 hrs HW=931.78' TW=932.77' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 30P: Wetland 4A

[58] Hint: Peaked 0.61' above defined flood level

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth > 4.55" for 100-year, 10-day snowmelt event
Inflow = 28.49 cfs @ 123.09 hrs, Volume= 137.053 af
Outflow = 23.73 cfs @ 123.16 hrs, Volume= 132.489 af, Atten= 17%, Lag= 4.3 min
Primary = 23.73 cfs @ 123.16 hrs, Volume= 132.489 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 926.57' @ 122.40 hrs Surf.Area= 6.061 ac Storage= 6.081 af
Flood Elev= 925.96' Surf.Area= 5.112 ac Storage= 2.616 af

Plug-Flow detention time= 407.3 min calculated for 132.461 af (97% of inflow)
Center-of-Mass det. time= 255.5 min (9,985.2 - 9,729.7)

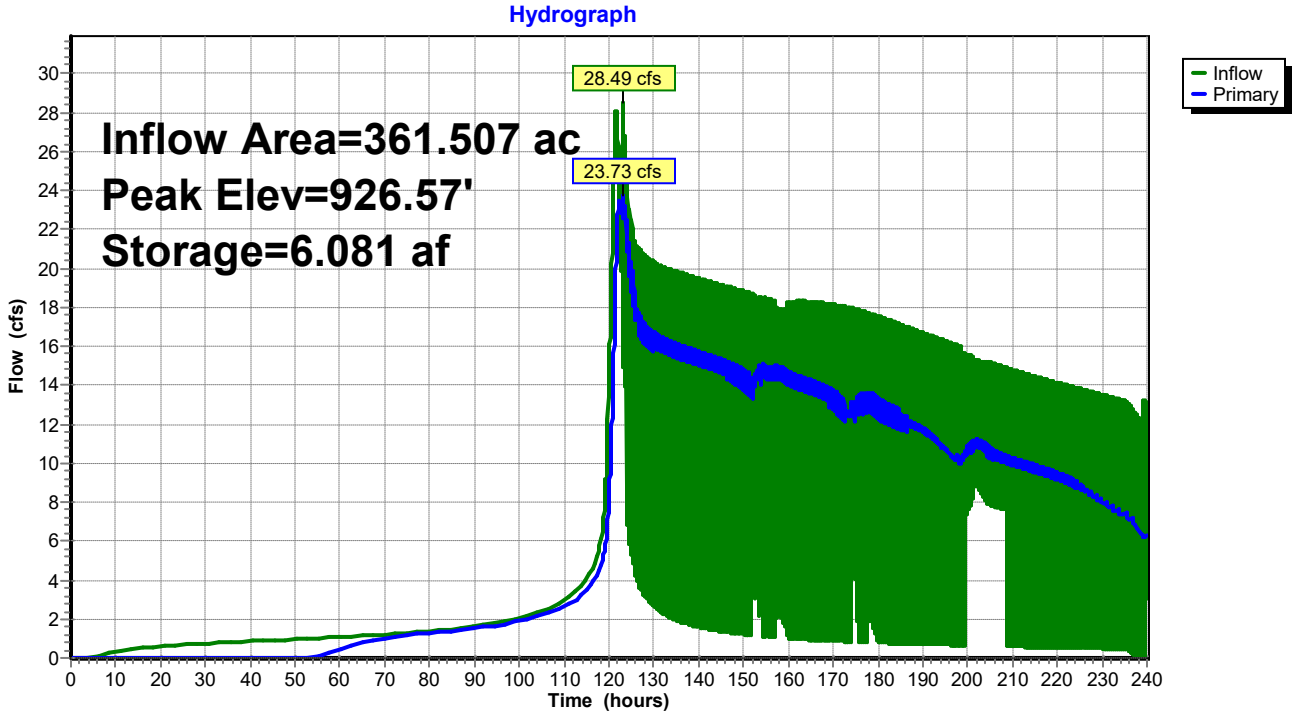
Volume	Invert	Avail.Storage	Storage Description
#1	925.00'	16.212 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
925.00	0.338	0.000	0.000
926.00	5.311	2.824	2.824
927.00	6.620	5.965	8.790
928.00	8.223	7.422	16.212

Device	Routing	Invert	Outlet Devices
#1	Primary	925.96'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.04 1.04 2.04 Width (feet) 0.00 6.00 90.00 140.00
#2	Primary	919.70'	**10.0" Round Culvert** L= 1,310.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.30' / 919.70' S= -0.0003 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#3	Device 2	925.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=23.33 cfs @ 123.16 hrs HW=926.57' TW=926.48' (Dynamic Tailwater)
- **1=Custom Weir/Orifice** (Weir Controls 23.15 cfs @ 1.34 fps)
- **2=Culvert** (Outlet Controls 0.18 cfs @ 0.33 fps)
  - **3=Orifice/Grate** (Passes 0.18 cfs of 0.79 cfs potential flow)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[80] Warning: Exceeded Pond 7P by 1.23' @ 135.40 hrs (270.84 cfs 1,162.955 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth > 4.01" for 100-year, 10-day snowmelt event
Inflow = 75.18 cfs @ 137.75 hrs, Volume= 106.945 af
Outflow = 17.90 cfs @ 137.20 hrs, Volume= 112.976 af, Atten= 76%, Lag= 0.0 min
Primary = 17.90 cfs @ 137.20 hrs, Volume= 112.976 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 933.01' @ 137.20 hrs Surf.Area= 0.394 ac Storage= 0.206 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 82.1 min (10,220.6 - 10,138.5)

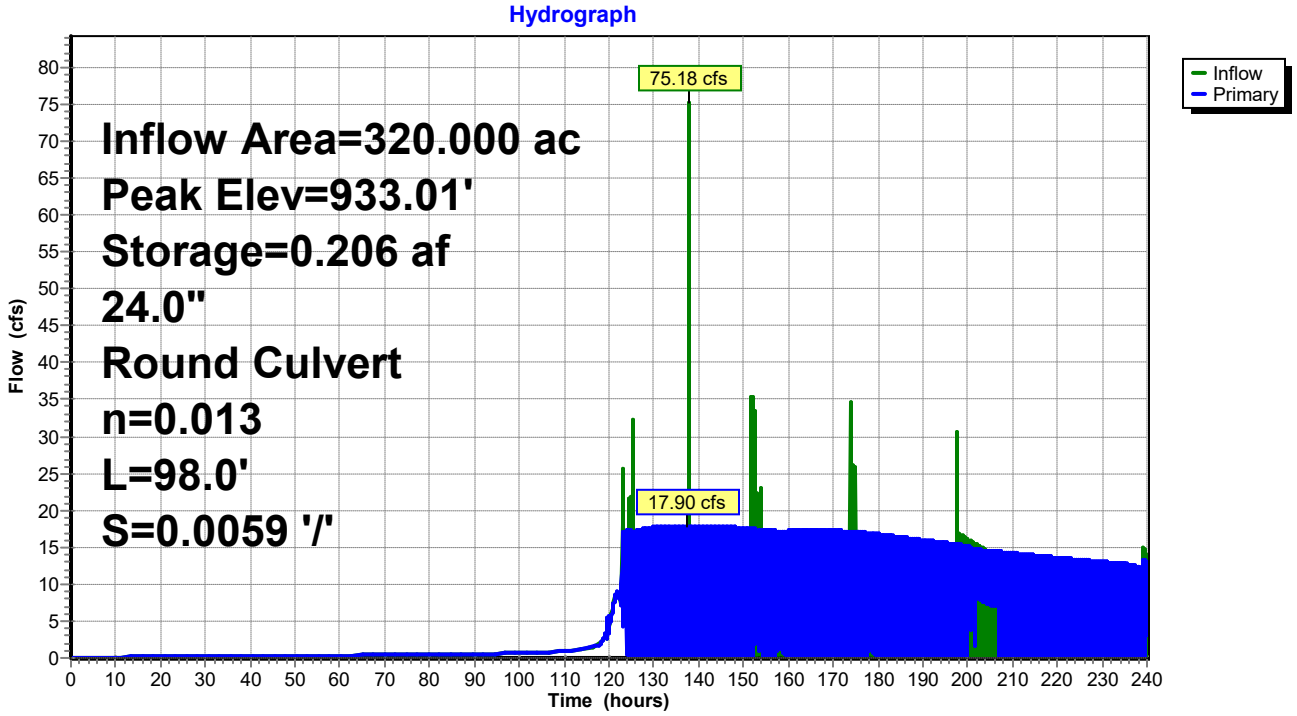
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=17.85 cfs @ 137.20 hrs HW=933.00' TW=926.47' (Dynamic Tailwater)
1=Culvert (Barrel Controls 17.85 cfs @ 5.68 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 40P: Wetland 2B

Inflow Area = 130.797 ac, 7.03% Impervious, Inflow Depth > 7.48" for 100-year, 10-day snowmelt event
Inflow = 43.34 cfs @ 121.73 hrs, Volume= 81.491 af
Outflow = 23.65 cfs @ 124.80 hrs, Volume= 80.601 af, Atten= 45%, Lag= 184.1 min
Primary = 23.65 cfs @ 124.80 hrs, Volume= 80.601 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 925.46' @ 124.80 hrs Surf.Area= 10.976 ac Storage= 9.621 af

Plug-Flow detention time= 338.0 min calculated for 80.601 af (99% of inflow)
Center-of-Mass det. time= 269.3 min (8,195.5 - 7,926.2)

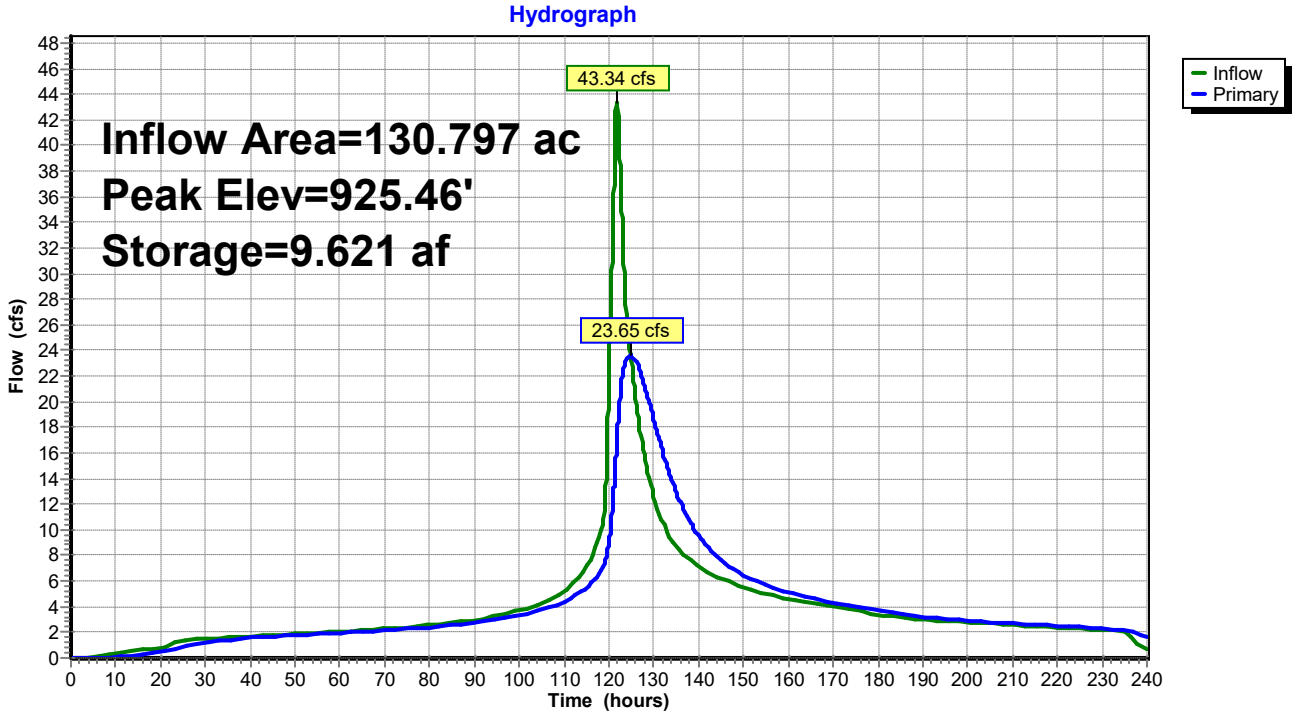
Volume	Invert	Avail.Storage	Storage Description
#1	923.92'	52.726 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.92	0.000	0.000	0.000
924.00	2.123	0.085	0.085
926.00	14.283	16.406	16.491
928.00	21.952	36.235	52.726

Device	Routing	Invert	Outlet Devices
#1	Primary	923.58'	**Asymmetrical Weir, C= 3.27**
			Offset (feet) -12.19 0.00 7.43 15.99
			Height (feet) 3.38 0.00 0.09 3.38
#2	Device 1	923.92'	**Asymmetrical Weir, C= 3.27**
			Offset (feet) -56.17 -5.92 -1.08 0.00 3.27 6.37 30.87 135.00
			Height (feet) 4.08 2.08 1.66 0.00 0.12 1.87 2.08 4.08

Primary OutFlow Max=23.65 cfs @ 124.80 hrs HW=925.46' TW=924.81' (Dynamic Tailwater)
↑**1=Asymmetrical Weir** (Passes 23.65 cfs of 79.85 cfs potential flow)
↑**2=Asymmetrical Weir** (Weir Controls 23.65 cfs @ 2.34 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 6.96" for 100-year, 10-day snowmelt event
Inflow = 6.54 cfs @ 121.36 hrs, Volume= 7.954 af
Outflow = 4.65 cfs @ 122.44 hrs, Volume= 4.254 af, Atten= 29%, Lag= 64.8 min
Primary = 4.65 cfs @ 122.44 hrs, Volume= 4.254 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 940.62' @ 122.44 hrs Surf.Area= 2.367 ac Storage= 3.976 af

Plug-Flow detention time= 3,585.2 min calculated for 4.253 af (53% of inflow)
Center-of-Mass det. time= 1,825.5 min (9,239.4 - 7,413.8)

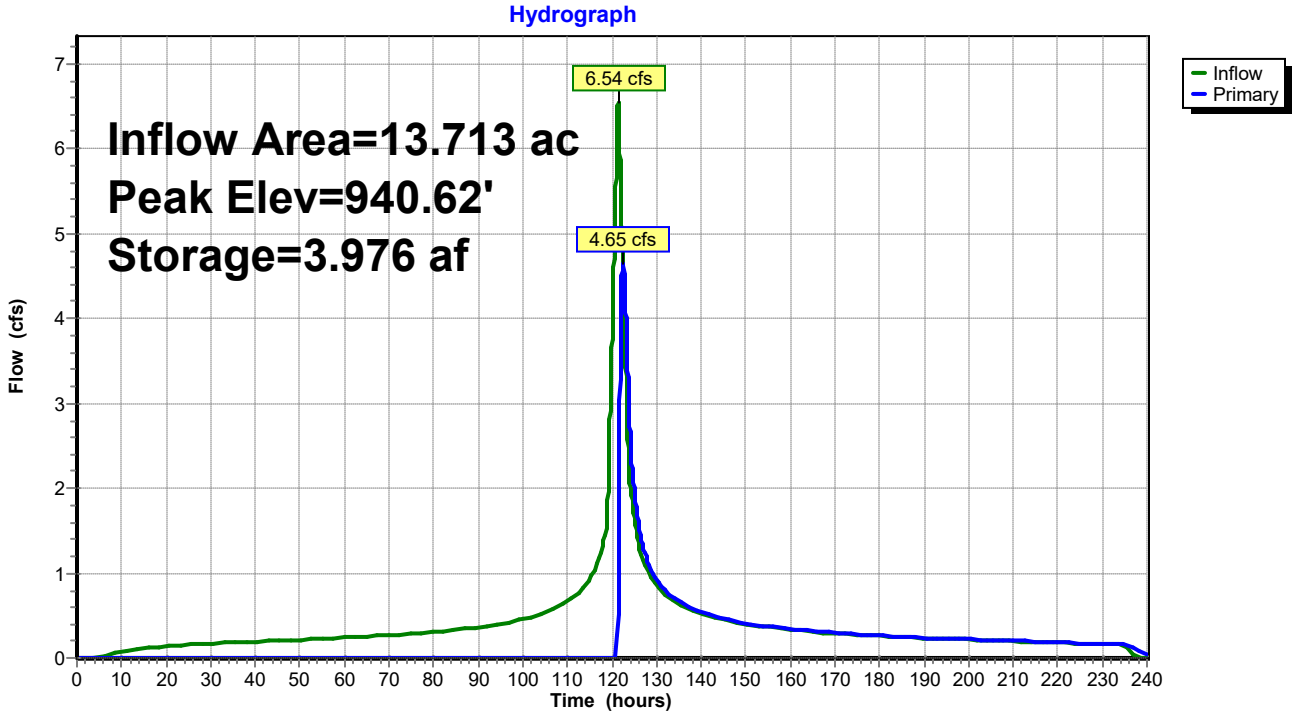
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=4.65 cfs @ 122.44 hrs HW=940.62' TW=925.34' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Weir Controls 4.65 cfs @ 1.09 fps)

Pond 41P: Ex South Off-site Pond



Summary for Pond 50P: Wetland 4B

[58] Hint: Peaked 0.10' above defined flood level

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth > 4.75" for 100-year, 10-day snowmelt event
Inflow = 7.65 cfs @ 121.64 hrs, Volume= 15.607 af
Outflow = 4.51 cfs @ 125.37 hrs, Volume= 10.335 af, Atten= 41%, Lag= 224.1 min
Primary = 4.51 cfs @ 125.37 hrs, Volume= 10.335 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 941.60' @ 125.37 hrs Surf.Area= 3.304 ac Storage= 5.549 af
Flood Elev= 941.50' Surf.Area= 3.181 ac Storage= 5.223 af

Plug-Flow detention time= 2,816.9 min calculated for 10.333 af (66% of inflow)
Center-of-Mass det. time= 1,345.9 min (9,693.0 - 8,347.2)

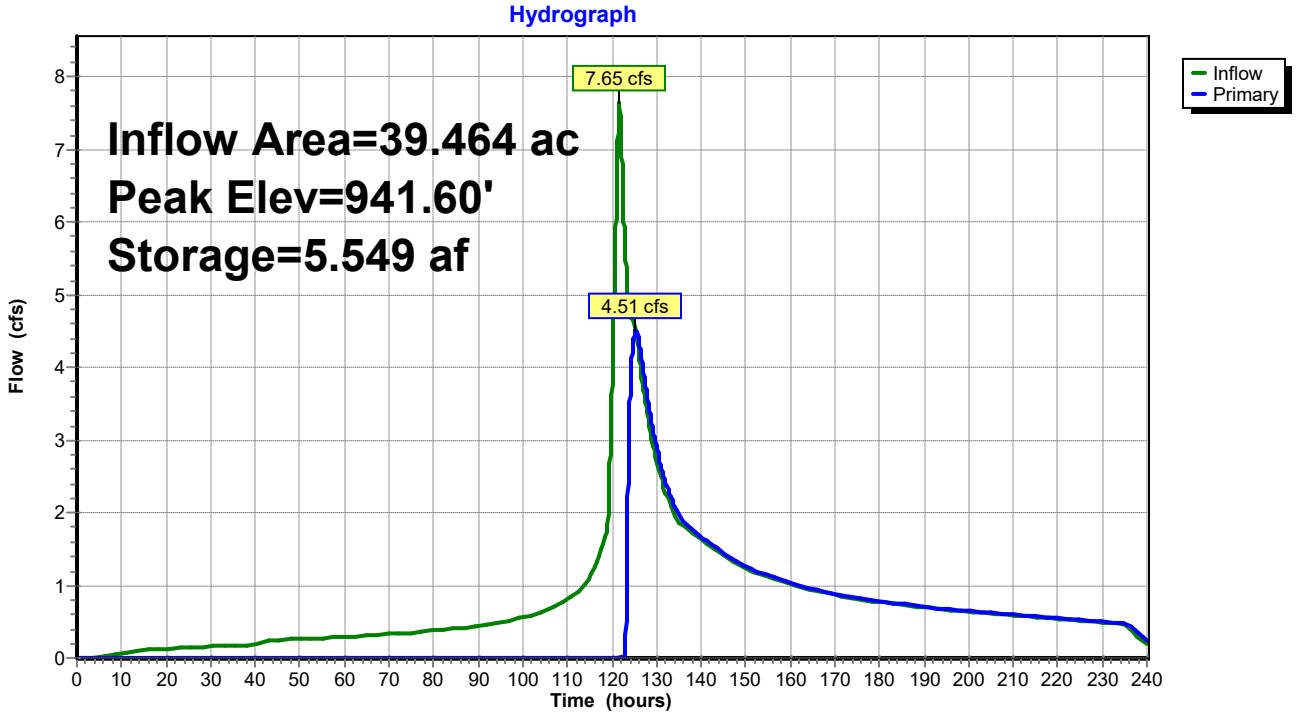
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	6.966 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
938.00	0.102	0.000	0.000
940.00	1.599	1.701	1.701
941.00	2.570	2.085	3.785
942.00	3.792	3.181	6.966

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=4.51 cfs @ 125.37 hrs HW=941.60' TW=925.45' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Weir Controls 4.51 cfs @ 1.02 fps)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

[58] Hint: Peaked 0.17' above defined flood level

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth > 77.49" for 100-year, 10-day snowmelt event
Inflow = 7.53 cfs @ 123.33 hrs, Volume= 24.279 af
Outflow = 7.53 cfs @ 123.37 hrs, Volume= 24.059 af, Atten= 0%, Lag= 2.6 min
Primary = 7.53 cfs @ 123.37 hrs, Volume= 24.059 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 938.67' @ 123.37 hrs Surf.Area= 0.260 ac Storage= 0.255 af
Flood Elev= 938.50' Surf.Area= 0.226 ac Storage= 0.214 af

Plug-Flow detention time= 123.9 min calculated for 24.054 af (99% of inflow)
Center-of-Mass det. time= 64.6 min (7,825.3 - 7,760.7)

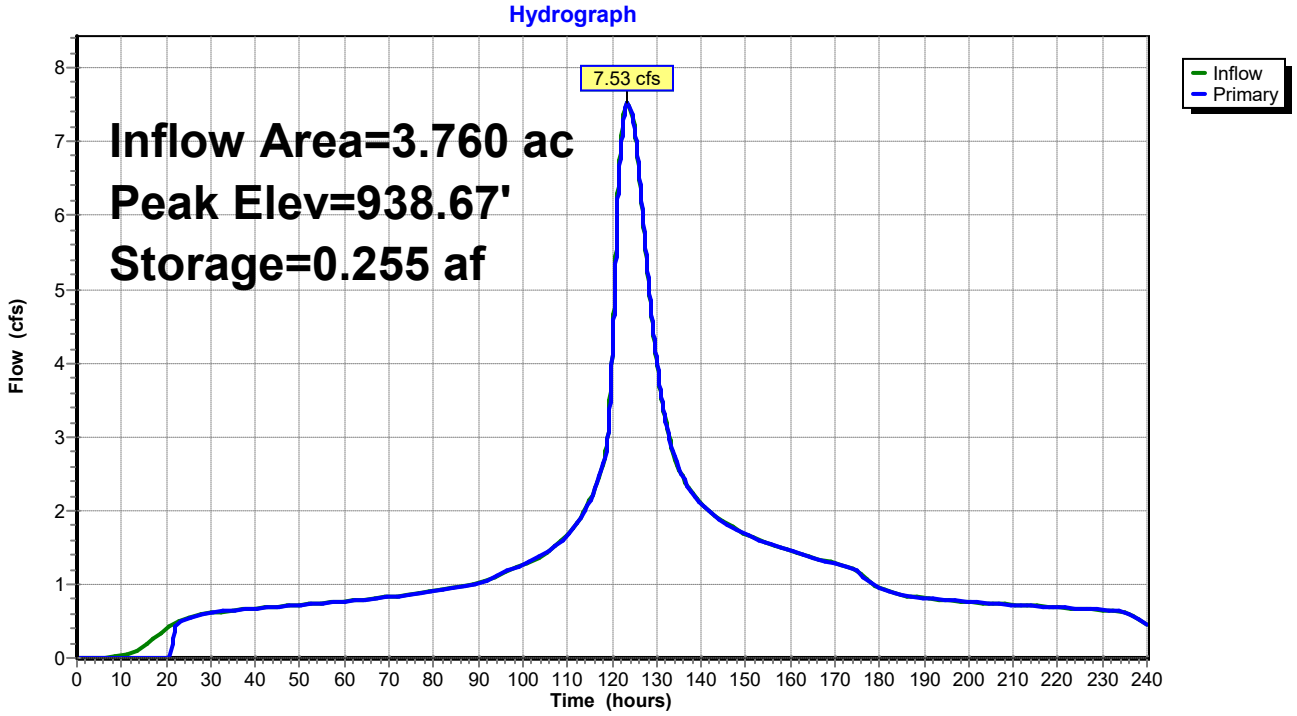
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	0.353 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.004	0.000	0.000
938.00	0.123	0.127	0.127
939.00	0.328	0.226	0.353

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=7.53 cfs @ 123.37 hrs HW=938.67' TW=925.43' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 7.53 cfs @ 1.31 fps)

Pond 60P: Wetland 5B



Summary for Link 1PP: Northwest Wetland (Big Woods)

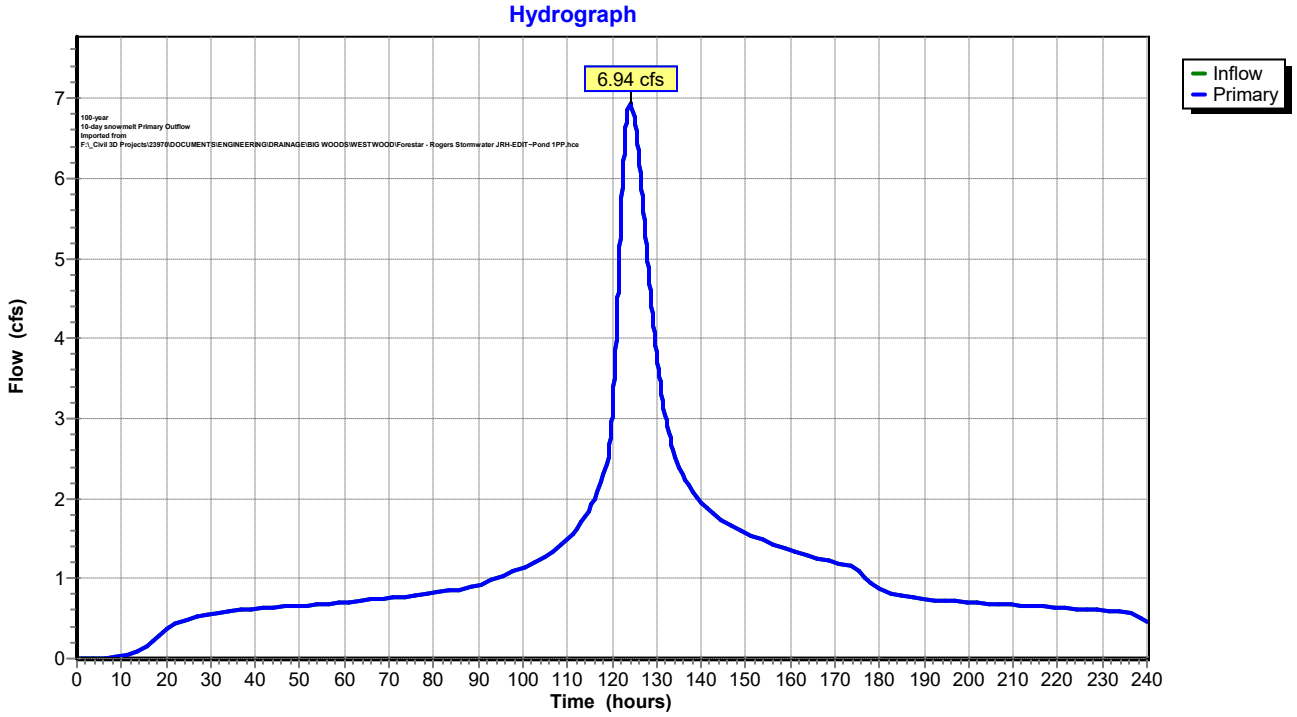
From the Big Woods development drainage model prepared by Westwood.

Inflow	=	6.94 cfs @ 124.13 hrs, Volume=	22.098 af
Primary	=	6.94 cfs @ 124.13 hrs, Volume=	22.098 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

100-year, 10-day snowmelt Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\

Link 1PP: Northwest Wetland (Big Woods)



Summary for Link 5PP: Existing Pond (Big Woods)

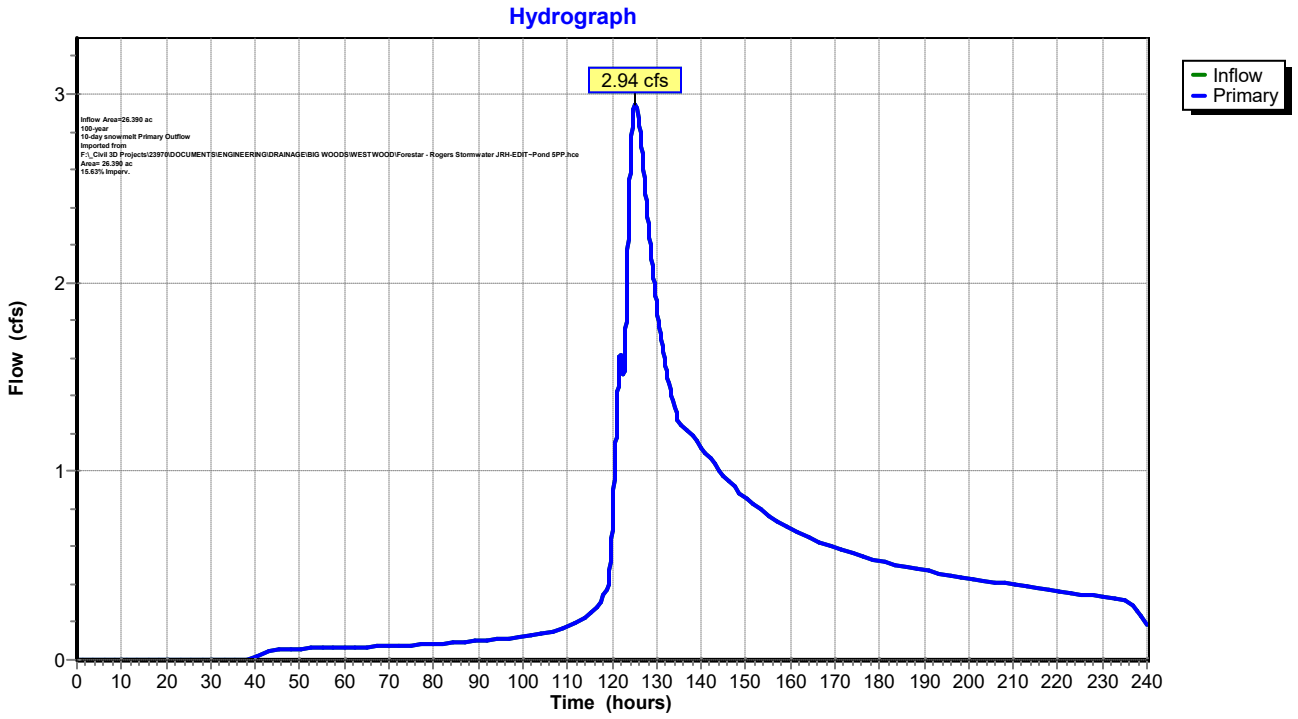
From the Big Woods development drainage model prepared by Westwood.

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth > 3.65" for 100-year, 10-day snowmelt event
Inflow = 2.94 cfs @ 125.27 hrs, Volume= 8.023 af
Primary = 2.94 cfs @ 125.27 hrs, Volume= 8.023 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

100-year, 10-day snowmelt Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\

Link 5PP: Existing Pond (Big Woods)



Time span=0.00-240.00 hrs, dt=0.05 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7S: Approx DA to Lake Runoff Area=300.000 ac 0.00% Impervious Runoff Depth=0.53"
Flow Length=1,200' Slope=0.0300 '/' Tc=26.8 min CN=72/0 Runoff=127.59 cfs 13.215 af

Subcatchment 10S: Direct to Cowley Lake Runoff Area=25.761 ac 0.80% Impervious Runoff Depth=1.39"
Flow Length=2,175' Tc=29.4 min CN=88/98 Runoff=32.31 cfs 2.981 af

Subcatchment 20S: Direct to Cowley Lake Runoff Area=6.216 ac 0.00% Impervious Runoff Depth=1.24"
Flow Length=586' Tc=8.9 min CN=86/0 Runoff=12.35 cfs 0.644 af

Subcatchment 21S: Direct to East Channel Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=0.84"
Flow Length=247' Tc=20.0 min CN=79/0 Runoff=0.81 cfs 0.063 af

Subcatchment 22S: Direct to Cowley Lake Runoff Area=5.776 ac 0.00% Impervious Runoff Depth=1.24"
Flow Length=737' Tc=11.1 min CN=86/0 Runoff=10.53 cfs 0.599 af

Subcatchment 23S: Direct to Lower West Runoff Area=9.551 ac 0.00% Impervious Runoff Depth=1.31"
Flow Length=391' Tc=9.5 min CN=87/0 Runoff=19.45 cfs 1.044 af

Subcatchment 24S: Direct to Cowley Lake Runoff Area=26.075 ac 1.14% Impervious Runoff Depth=1.39"
Flow Length=998' Tc=13.6 min CN=88/98 Runoff=48.72 cfs 3.024 af

Subcatchment 30S: Direct to Wetland 4A Runoff Area=41.507 ac 5.85% Impervious Runoff Depth=1.18"
Flow Length=1,249' Tc=23.4 min CN=84/98 Runoff=49.53 cfs 4.094 af

Subcatchment 31S: Approx DA to Culvert Runoff Area=20.000 ac 12.00% Impervious Runoff Depth=0.81"
Flow Length=1,200' Slope=0.0100 '/' Tc=40.3 min CN=74/98 Runoff=10.74 cfs 1.346 af

Subcatchment 40S: Direct to Wetland 2B Runoff Area=73.860 ac 2.02% Impervious Runoff Depth=1.47"
Flow Length=1,354' Tc=23.6 min CN=89/98 Runoff=110.81 cfs 9.055 af

Subcatchment 41S: Direct to Ex South Runoff Area=13.713 ac 13.43% Impervious Runoff Depth=1.07"
Flow Length=1,032' Tc=10.2 min CN=80/98 Runoff=21.24 cfs 1.228 af

Subcatchment 50S: Direct to Wetland 4B Runoff Area=13.074 ac 6.59% Impervious Runoff Depth=1.37"
Flow Length=734' Tc=26.4 min CN=87/98 Runoff=17.08 cfs 1.497 af

Subcatchment 60S: Direct to Wetland 5B Runoff Area=3.760 ac 23.16% Impervious Runoff Depth=1.29"
Flow Length=531' Tc=5.6 min CN=82/98 Runoff=8.31 cfs 0.405 af

Reach 1R: Cowley Lake Outlet Channel Inflow=32.31 cfs 2.981 af
Outflow=32.31 cfs 2.981 af

Reach 2R: Cowley Lake Inflow=90.39 cfs 21.239 af
Outflow=90.39 cfs 21.239 af

Reach 21R: East Channel Avg. Flow Depth=0.67' Max Vel=4.01 fps Inflow=13.60 cfs 13.158 af
n=0.022 L=382.0' S=0.0097 '/' Capacity=131.71 cfs Outflow=13.60 cfs 13.158 af

Reach 23RL: Lower West Channel Avg. Flow Depth=0.68' Max Vel=1.77 fps Inflow=19.45 cfs 3.814 af
n=0.022 L=534.0' S=0.0014 '/' Capacity=257.71 cfs Outflow=17.05 cfs 3.814 af

Reach 23RU: Upper West Channel Avg. Flow Depth=0.22' Max Vel=1.29 fps Inflow=2.97 cfs 2.771 af
n=0.022 L=490.0' S=0.0057 '/' Capacity=766.18 cfs Outflow=2.97 cfs 2.771 af

Pond 7P: Whiteford Lake and Wetlands Peak Elev=930.22' Storage=13.215 af Inflow=127.59 cfs 13.215 af
Outflow=0.00 cfs 0.000 af

Pond 30P: Wetland 4A Peak Elev=926.22' Storage=4.003 af Inflow=56.56 cfs 5.440 af
Outflow=2.97 cfs 2.771 af

Pond 31P: Ex 24" Culvert Crossing Peak Elev=931.92' Storage=0.004 af Inflow=10.74 cfs 1.346 af
24.0" Round Culvert n=0.013 L=98.0' S=0.0059 '/' Outflow=10.74 cfs 1.346 af

Pond 40P: Wetland 2B Peak Elev=925.06' Storage=5.768 af Inflow=115.05 cfs 13.100 af
Outflow=13.52 cfs 13.096 af

Pond 41P: Ex South Off-site Pond Peak Elev=939.12' Storage=1.228 af Inflow=21.24 cfs 1.228 af
Outflow=0.00 cfs 0.000 af

Pond 50P: Wetland 4B Peak Elev=940.02' Storage=1.737 af Inflow=17.34 cfs 1.737 af
Outflow=0.00 cfs 0.000 af

Pond 60P: Wetland 5B Peak Elev=938.62' Storage=0.242 af Inflow=9.74 cfs 4.259 af
Outflow=4.34 cfs 4.045 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 1PP.hce Inflow=4.11 cfs 3.854 af
Primary=4.11 cfs 3.854 af

Link G\DRAINAGE\BIG WOODS\WESTWOOD\Forestar - Rogers Stormwater JRH-EDIT~Pond 5PP.hce Inflow=0.93 cfs 0.240 af
Area= 26.390 ac 15.63% Imperv. Primary=0.93 cfs 0.240 af

Total Runoff Area = 540.193 ac Runoff Volume = 39.194 af Average Runoff Depth = 0.87"
98.07% Pervious = 529.794 ac 1.93% Impervious = 10.399 ac

Summary for Subcatchment 7S: Approx DA to Lake

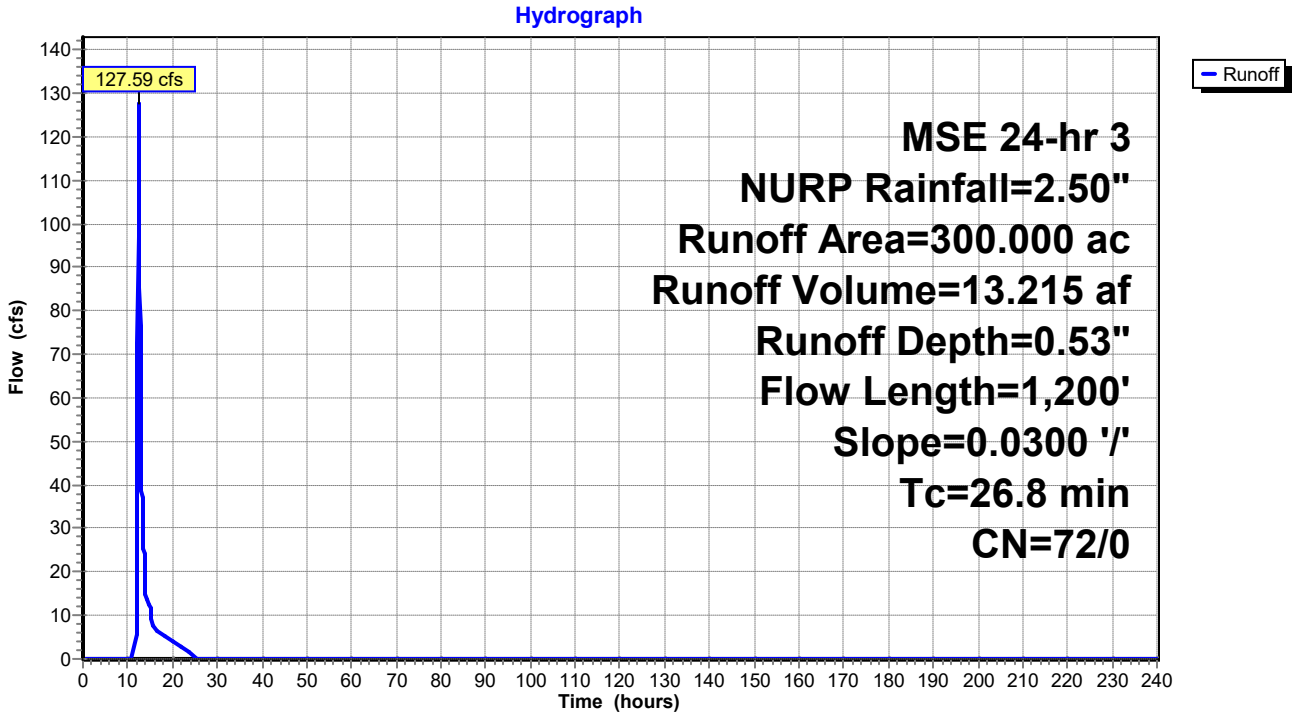
Runoff = 127.59 cfs @ 12.44 hrs, Volume= 13.215 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
300.000	72	Woods/grass comb., Good, HSG C
300.000	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.8	1,200	0.0300	0.75		**Lag/CN Method,**

Subcatchment 7S: Approx DA to Lake



Summary for Subcatchment 10S: Direct to Cowley Lake Outlet Channel

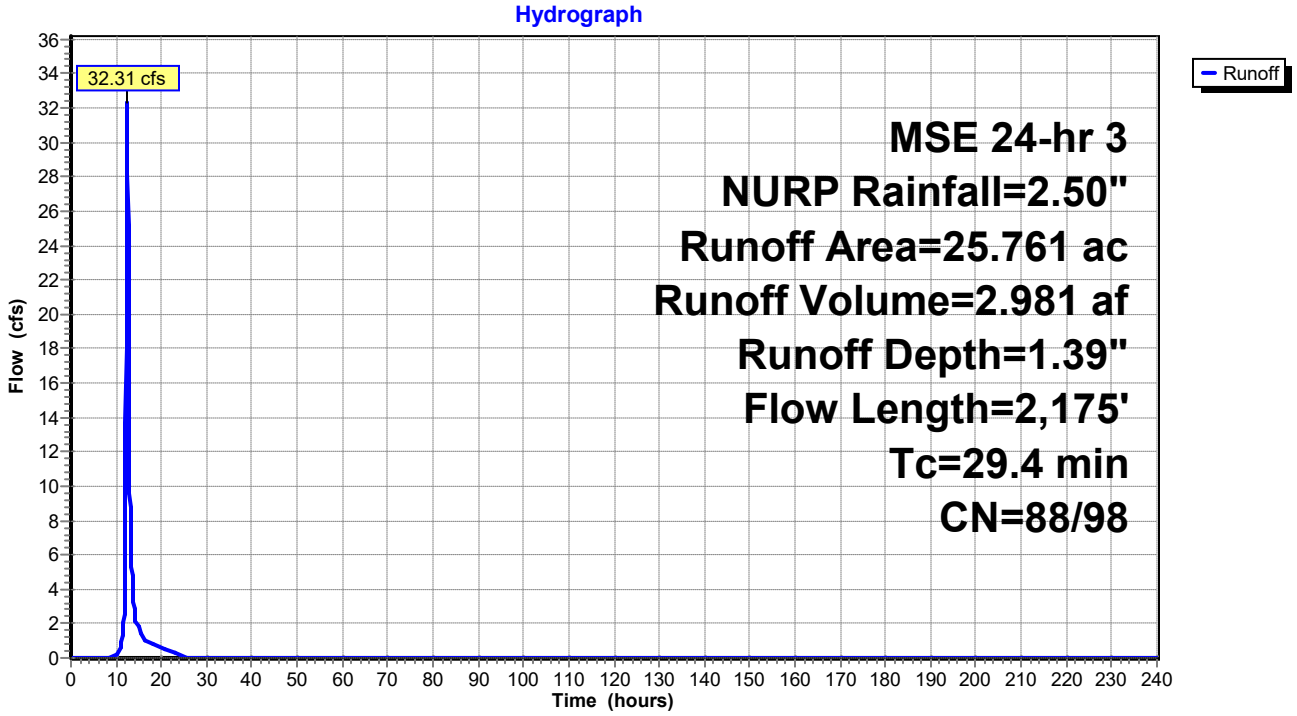
Runoff = 32.31 cfs @ 12.42 hrs, Volume= 2.981 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.136	98	Unconnected pavement, HSG D
0.070	98	Unconnected roofs, HSG D
1.380	98	Water Surface, 0% imp, HSG D
21.395	89	Row crops, straight row, Good, HSG D
1.284	80	>75% Grass cover, Good, HSG D
0.797	78	Meadow, non-grazed, HSG D
0.699	77	Woods, Good, HSG D
25.761	88	Weighted Average
25.555	88	99.20% Pervious Area
0.206	98	0.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0170	0.31		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
20.2	1,454	0.0177	1.20		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.9	621	0.0020	2.64	68.60	**Channel Flow,** Area= 26.0 sf Perim= 20.0' r= 1.30' n= 0.030 Earth, grassed & winding
29.4	2,175	Total			

Subcatchment 10S: Direct to Cowley Lake Outlet Channel



Summary for Subcatchment 20S: Direct to Cowley Lake

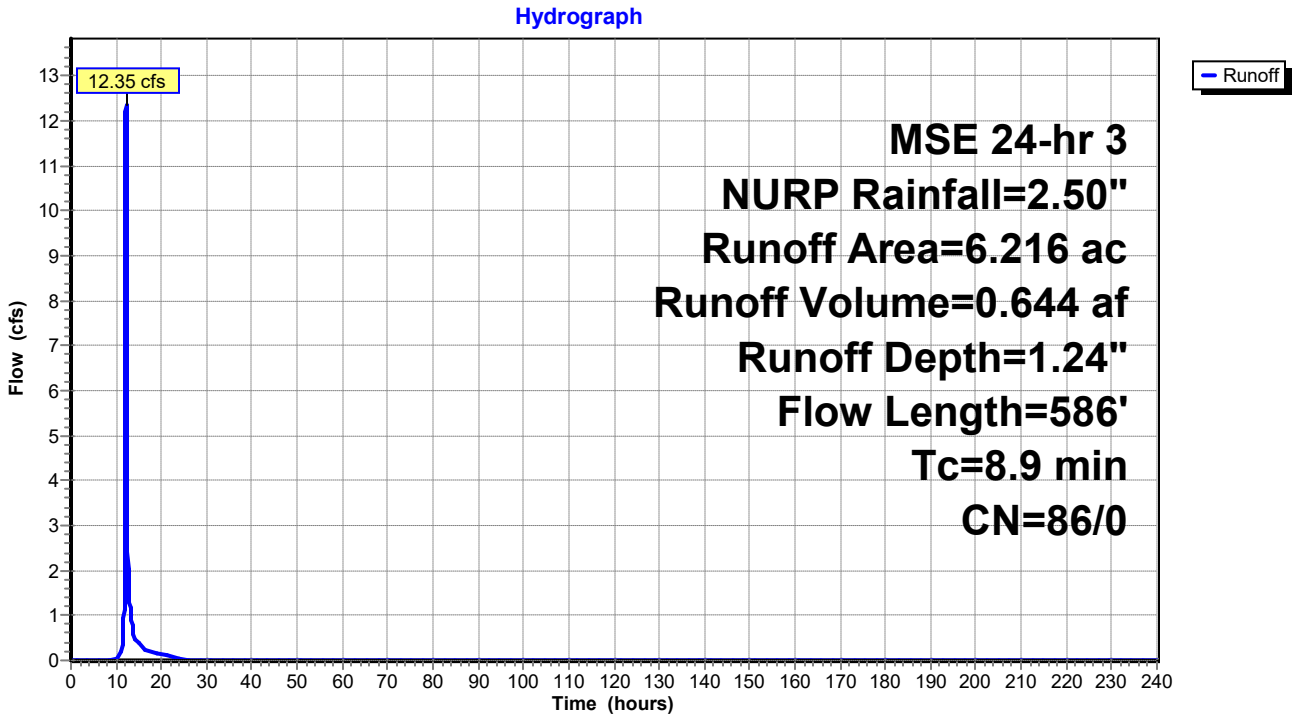
Runoff = 12.35 cfs @ 12.16 hrs, Volume= 0.644 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.123	98	Water Surface, 0% imp, HSG D
4.384	89	Row crops, straight row, Good, HSG D
1.709	77	Woods, Good, HSG D
6.216	86	Weighted Average
6.216	86	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.0240	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
4.3	486	0.0440	1.89		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
8.9	586	Total			

Subcatchment 20S: Direct to Cowley Lake



Summary for Subcatchment 21S: Direct to East Channel

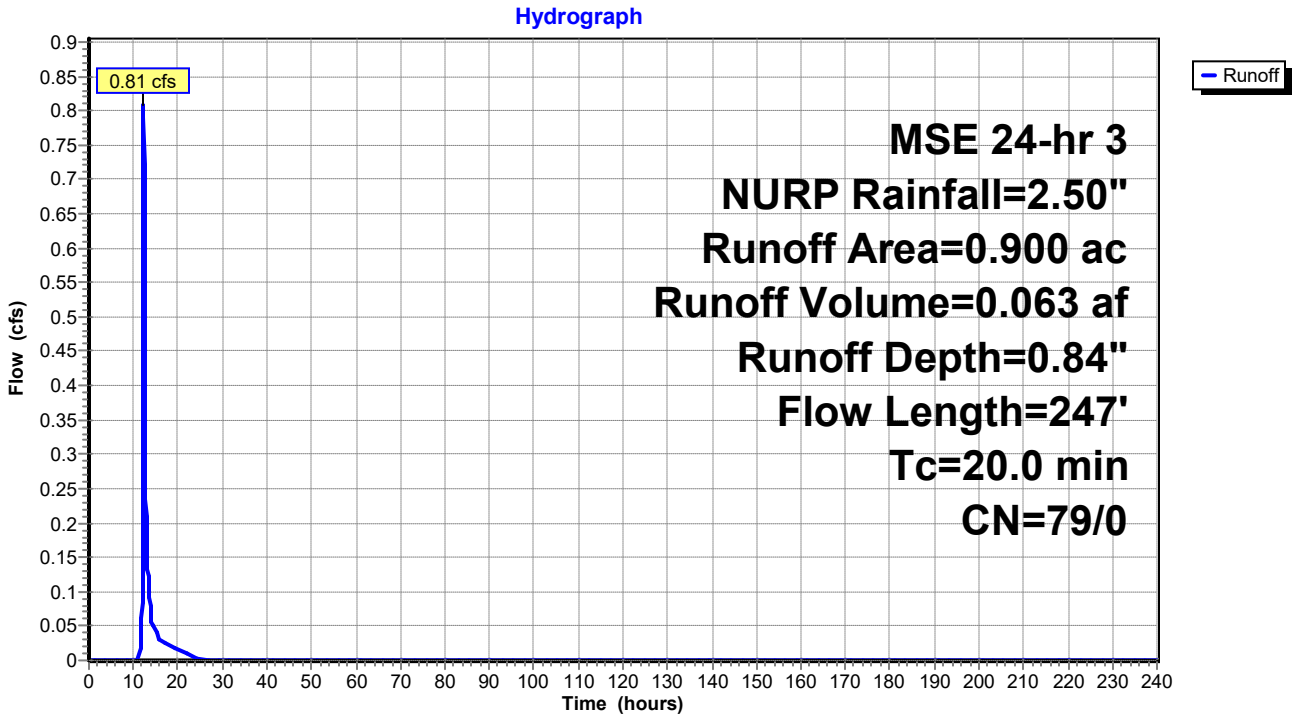
Runoff = 0.81 cfs @ 12.32 hrs, Volume= 0.063 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.074	98	Water Surface, 0% imp, HSG D
0.005	89	Row crops, straight row, Good, HSG D
0.821	77	Woods, Good, HSG D
0.900	79	Weighted Average
0.900	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0350	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.8	147	0.0721	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.0	247	Total			

Subcatchment 21S: Direct to East Channel



Summary for Subcatchment 22S: Direct to Cowley Lake

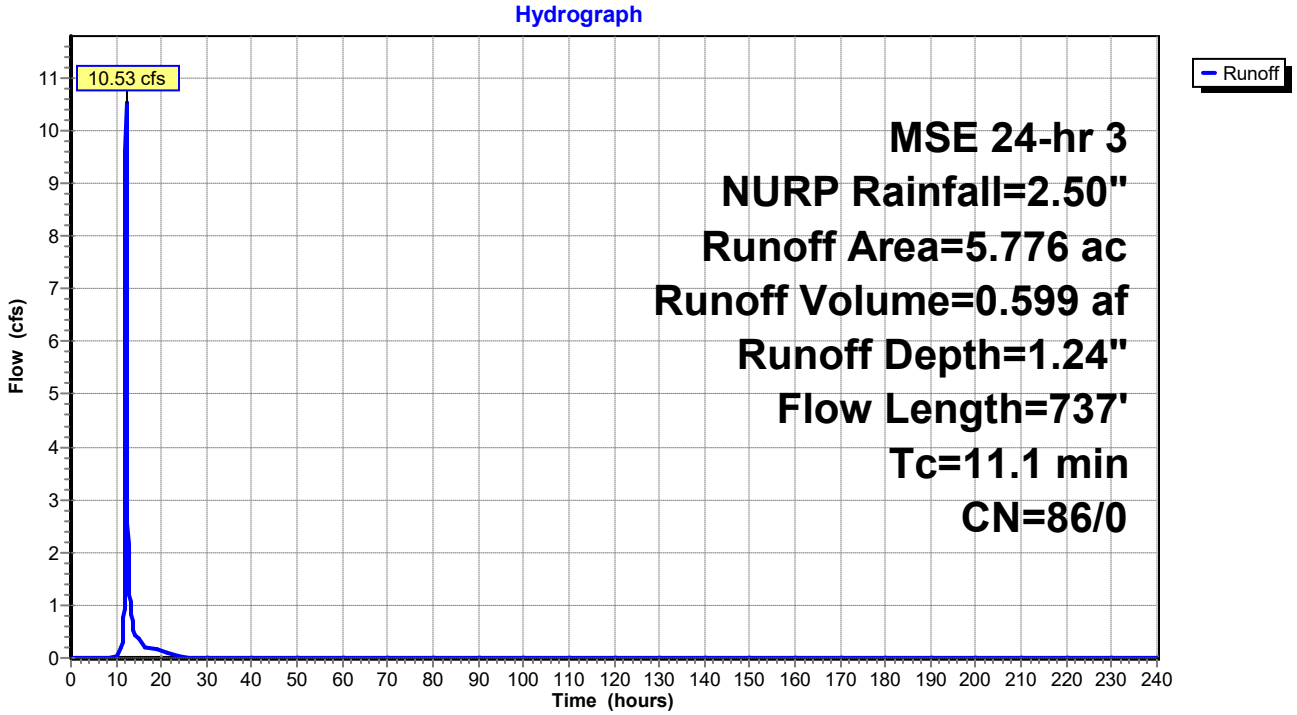
Runoff = 10.53 cfs @ 12.19 hrs, Volume= 0.599 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.031	98	Water Surface, 0% imp, HSG D
4.386	89	Row crops, straight row, Good, HSG D
0.729	78	Meadow, non-grazed, HSG D
0.630	77	Woods, Good, HSG D
5.776	86	Weighted Average
5.776	86	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.0440	0.46		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
7.5	637	0.0248	1.42		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.1	737	Total			

Subcatchment 22S: Direct to Cowley Lake



Summary for Subcatchment 23S: Direct to Lower West Channel

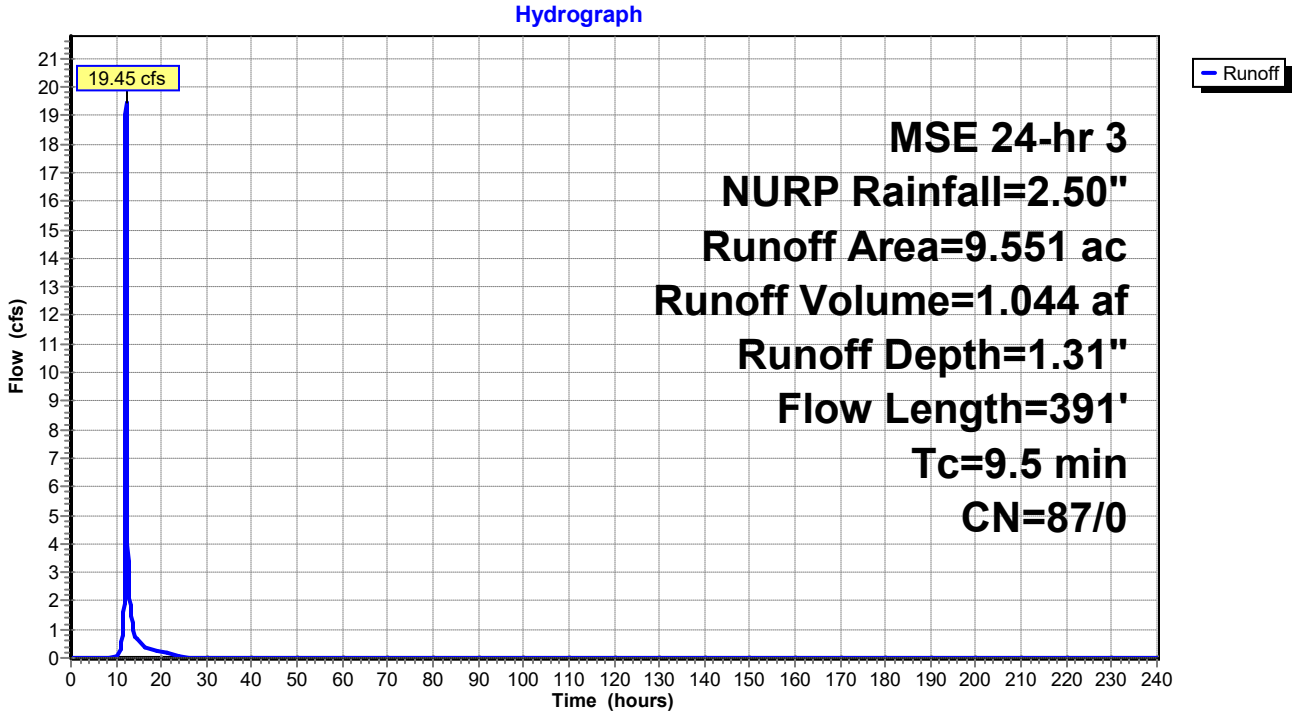
Runoff = 19.45 cfs @ 12.17 hrs, Volume= 1.044 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.467	98	Water Surface, 0% imp, HSG D
7.263	89	Row crops, straight row, Good, HSG D
0.213	78	Meadow, non-grazed, HSG D
1.608	77	Woods, Good, HSG D
9.551	87	Weighted Average
9.551	87	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0090	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
2.6	291	0.0433	1.87		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.5	391	Total			

Subcatchment 23S: Direct to Lower West Channel



Summary for Subcatchment 24S: Direct to Cowley Lake

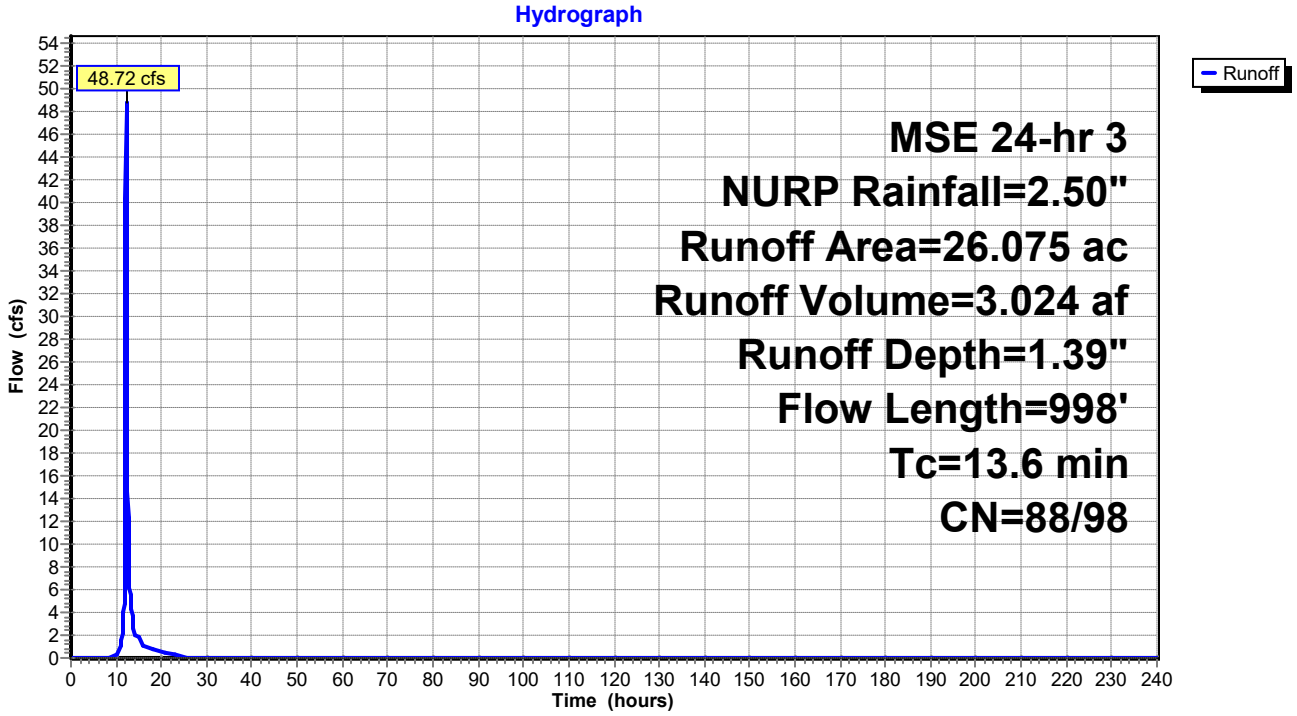
Runoff = 48.72 cfs @ 12.22 hrs, Volume= 3.024 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.298	98	Unconnected pavement, HSG D
0.980	98	Water Surface, 0% imp, HSG D
0.082	96	Gravel surface, HSG D
0.357	80	>75% Grass cover, Good, HSG D
21.863	89	Row crops, straight row, Good, HSG D
0.151	78	Meadow, non-grazed, HSG D
2.344	77	Woods, Good, HSG D
26.075	88	Weighted Average
25.777	88	98.86% Pervious Area
0.298	98	1.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0200	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
10.3	819	0.0217	1.33		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
2.8	149	0.0315	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.6	998	Total			

Subcatchment 24S: Direct to Cowley Lake



Summary for Subcatchment 30S: Direct to Wetland 4A

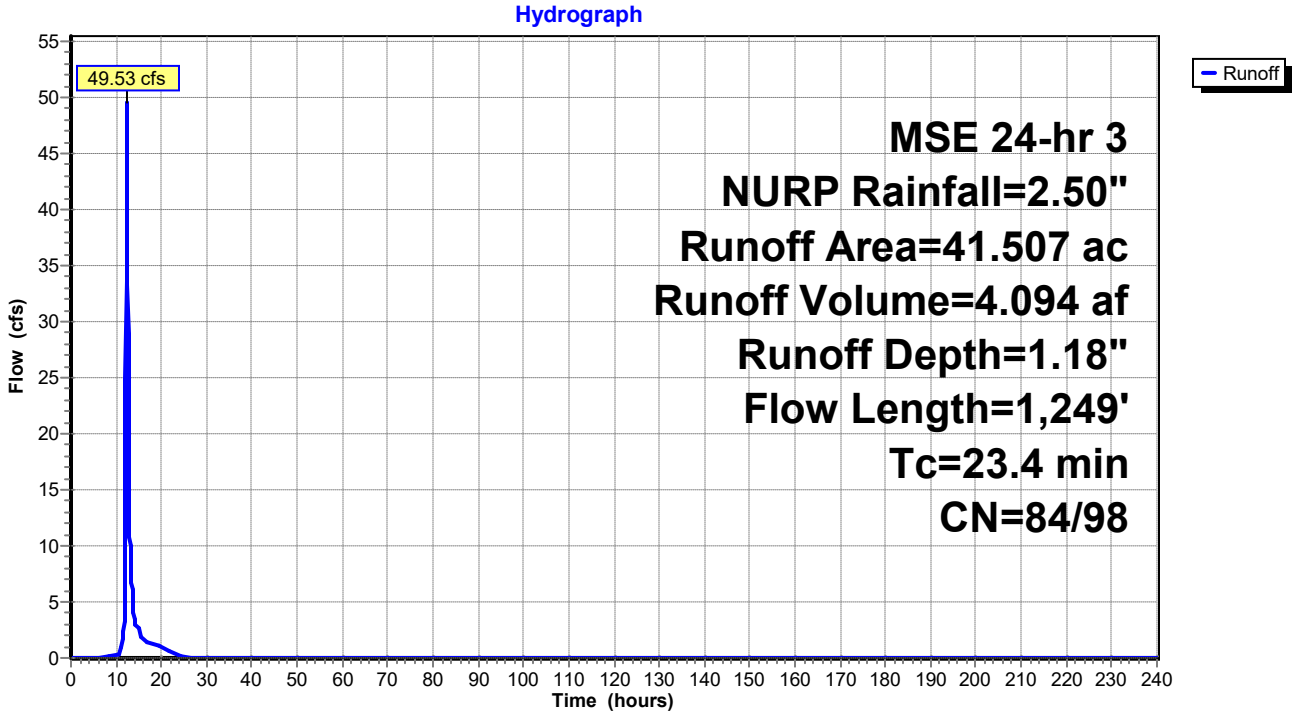
Runoff = 49.53 cfs @ 12.35 hrs, Volume= 4.094 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
1.469	98	Unconnected pavement, HSG D
0.959	98	Unconnected roofs, HSG D
0.947	96	Gravel surface, HSG D
17.469	89	Row crops, straight row, Good, HSG D
1.609	89	Pasture/grassland/range, Poor, HSG D
14.597	80	>75% Grass cover, Good, HSG D
0.684	78	Meadow, non-grazed, HSG D
3.773	77	Woods, Good, HSG D
41.507	85	Weighted Average
39.079	84	94.15% Pervious Area
2.428	98	5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
9.7	1,149	0.0174	1.98		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	1,249	Total			

Subcatchment 30S: Direct to Wetland 4A



Summary for Subcatchment 31S: Approx DA to Culvert

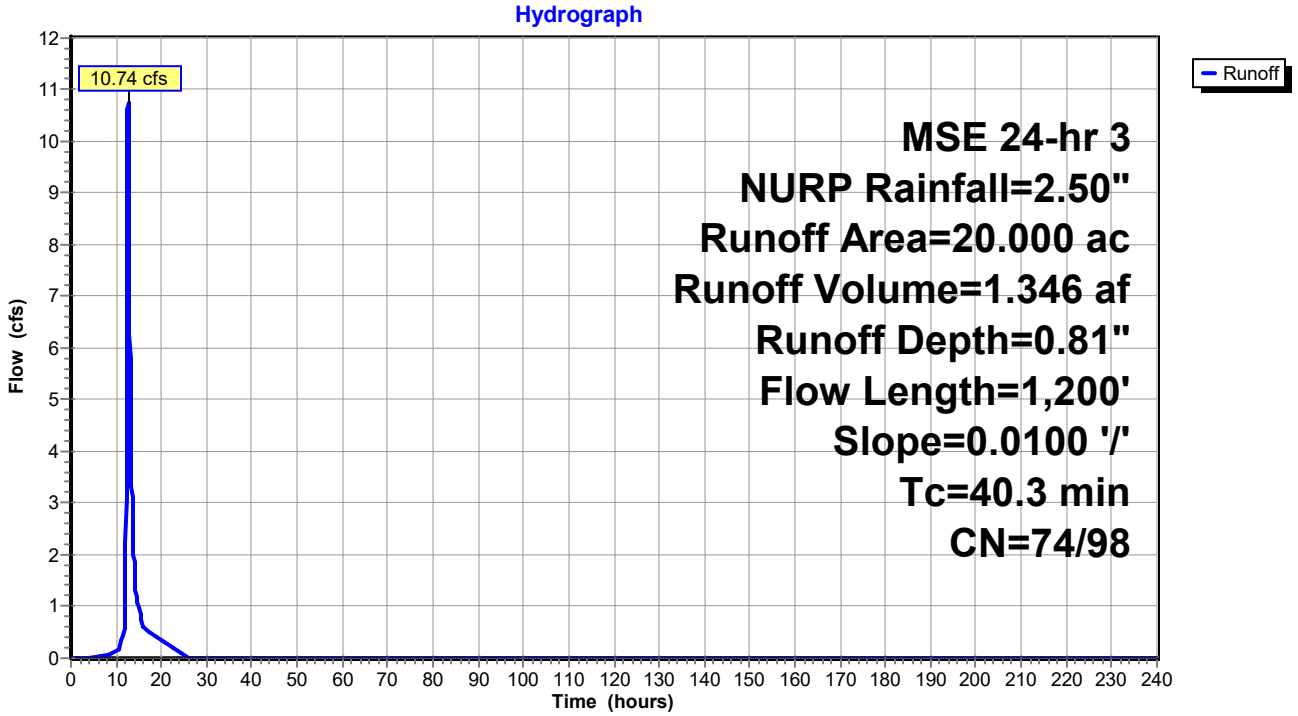
Runoff = 10.74 cfs @ 12.60 hrs, Volume= 1.346 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
20.000	77	2 acre lots, 12% imp, HSG C
17.600	74	88.00% Pervious Area
2.400	98	12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	1,200	0.0100	0.50		**Lag/CN Method,**

Subcatchment 31S: Approx DA to Culvert



Summary for Subcatchment 40S: Direct to Wetland 2B

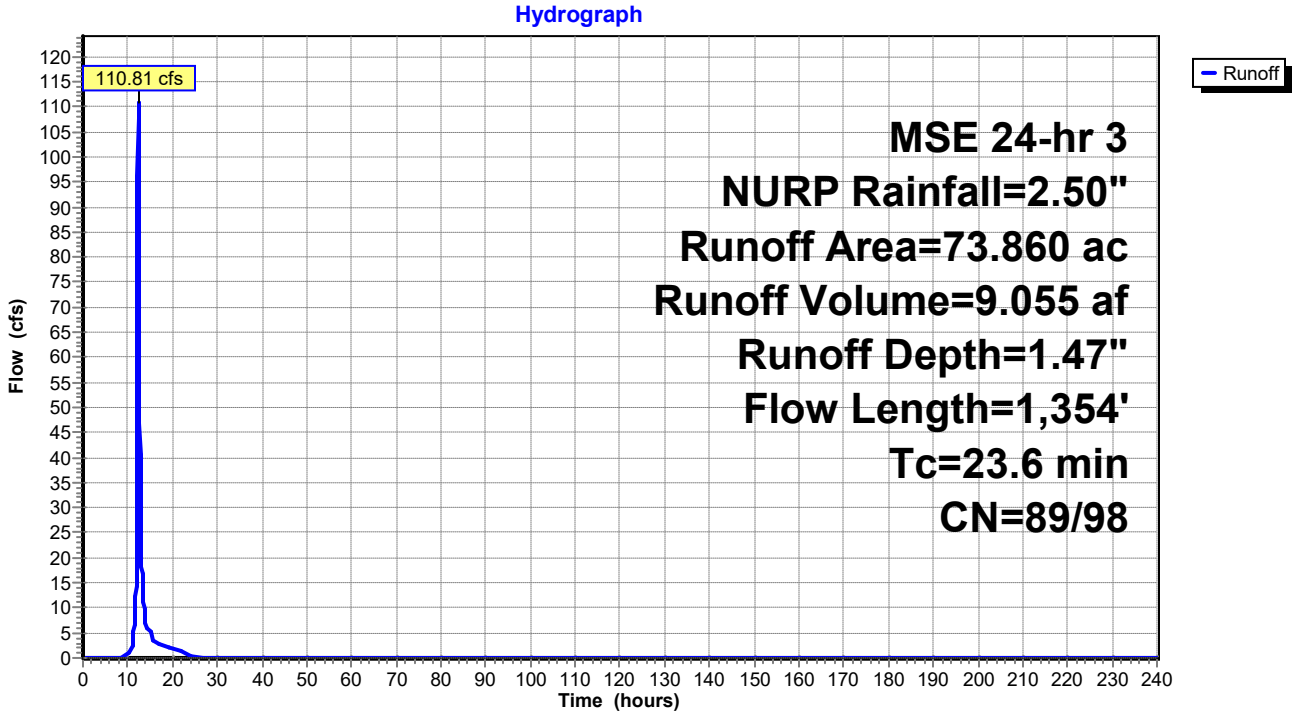
Runoff = 110.81 cfs @ 12.34 hrs, Volume= 9.055 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.965	98	Unconnected pavement, HSG D
0.528	98	Unconnected roofs, HSG D
17.207	98	Water Surface, 0% imp, HSG D
1.249	96	Gravel surface, HSG D
35.493	89	Row crops, straight row, Good, HSG D
0.208	89	Pasture/grassland/range, Poor, HSG D
8.455	80	>75% Grass cover, Good, HSG D
5.449	78	Meadow, non-grazed, HSG D
4.306	77	Woods, Good, HSG D
73.860	89	Weighted Average
72.367	89	97.98% Pervious Area
1.493	98	2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.0300	0.39		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 2.84"
19.4	1,254	0.0143	1.08		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
23.6	1,354	Total			

Subcatchment 40S: Direct to Wetland 2B



Summary for Subcatchment 41S: Direct to Ex South Off-site Pond

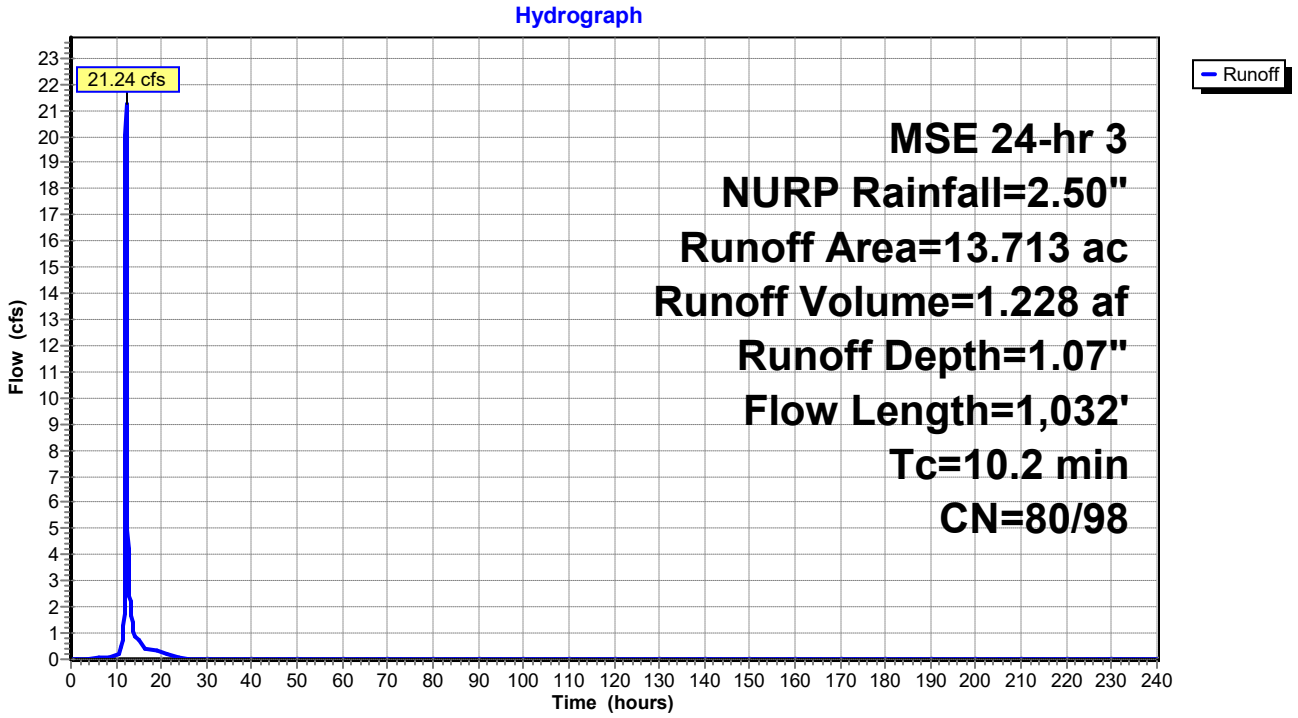
Runoff = 21.24 cfs @ 12.18 hrs, Volume= 1.228 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
1.568	98	Unconnected pavement, HSG D
0.273	98	Unconnected roofs, HSG D
0.107	98	Water Surface, 0% imp, HSG D
0.066	96	Gravel surface, HSG D
10.431	80	>75% Grass cover, Good, HSG D
1.268	78	Meadow, non-grazed, HSG D
13.713	82	Weighted Average
11.872	80	86.57% Pervious Area
1.841	98	13.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	53	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
9.4	979	0.0135	1.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	1,032	Total			

Subcatchment 41S: Direct to Ex South Off-site Pond



Summary for Subcatchment 50S: Direct to Wetland 4B

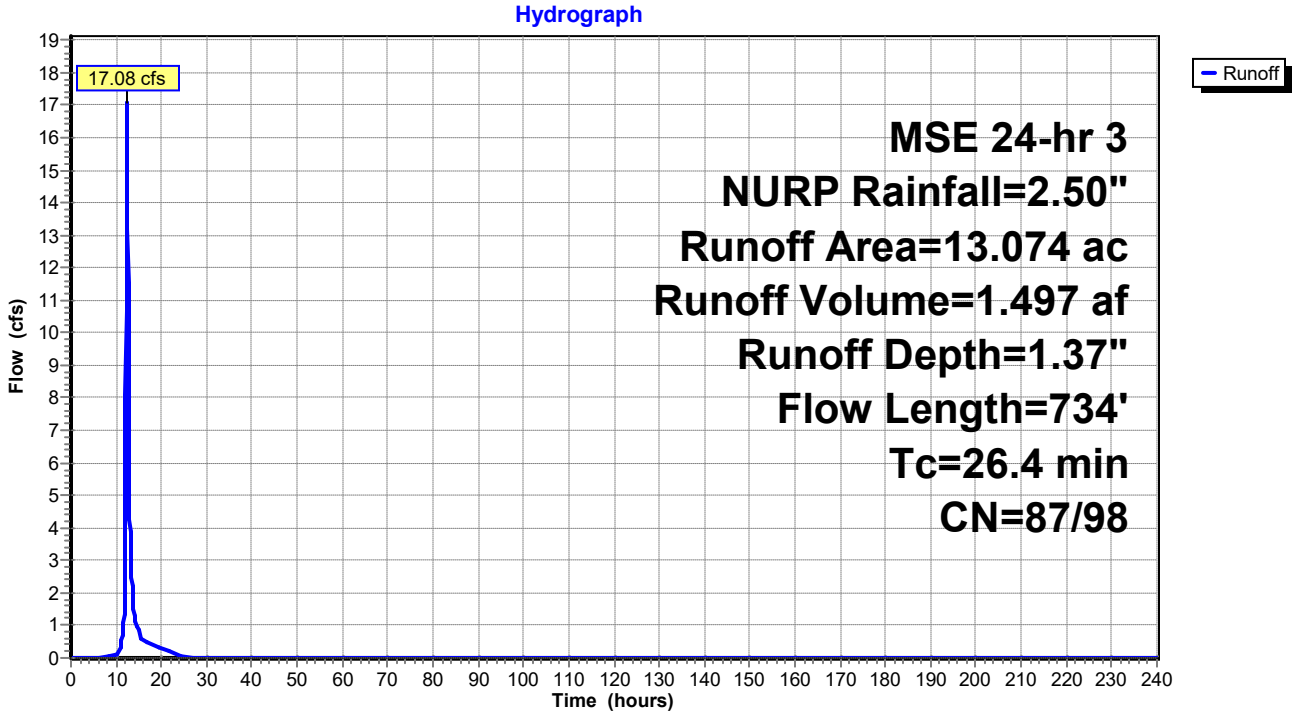
Runoff = 17.08 cfs @ 12.38 hrs, Volume= 1.497 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.523	98	Unconnected pavement, HSG D
0.339	98	Unconnected roofs, HSG D
0.175	98	Water Surface, 0% imp, HSG D
0.233	96	Gravel surface, HSG D
8.346	89	Row crops, straight row, Good, HSG D
0.958	89	Pasture/grassland/range, Poor, HSG D
2.500	80	>75% Grass cover, Good, HSG D
13.074	88	Weighted Average
12.212	87	93.41% Pervious Area
0.862	98	6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0120	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.84"
12.3	634	0.0091	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.4	734	Total			

Subcatchment 50S: Direct to Wetland 4B



Summary for Subcatchment 60S: Direct to Wetland 5B

[49] Hint: Tc<2dt may require smaller dt

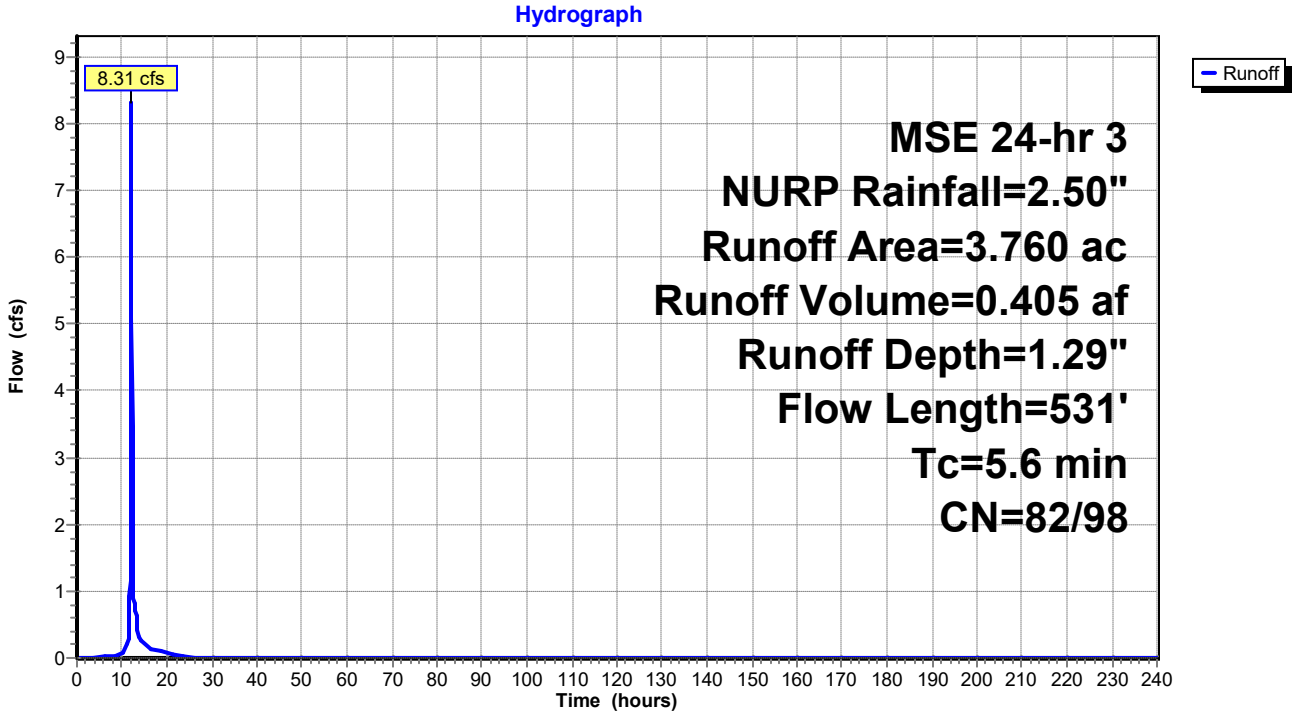
Runoff = 8.31 cfs @ 12.13 hrs, Volume= 0.405 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.428	98	Unconnected pavement, HSG D
0.443	98	Unconnected roofs, HSG D
0.064	98	Water Surface, 0% imp, HSG D
0.331	96	Gravel surface, HSG D
2.083	80	>75% Grass cover, Good, HSG D
0.411	77	Woods, Good, HSG D
3.760	86	Weighted Average
2.889	82	76.84% Pervious Area
0.871	98	23.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0310	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"
4.5	431	0.0111	1.58		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.6	531	Total			

Subcatchment 60S: Direct to Wetland 5B



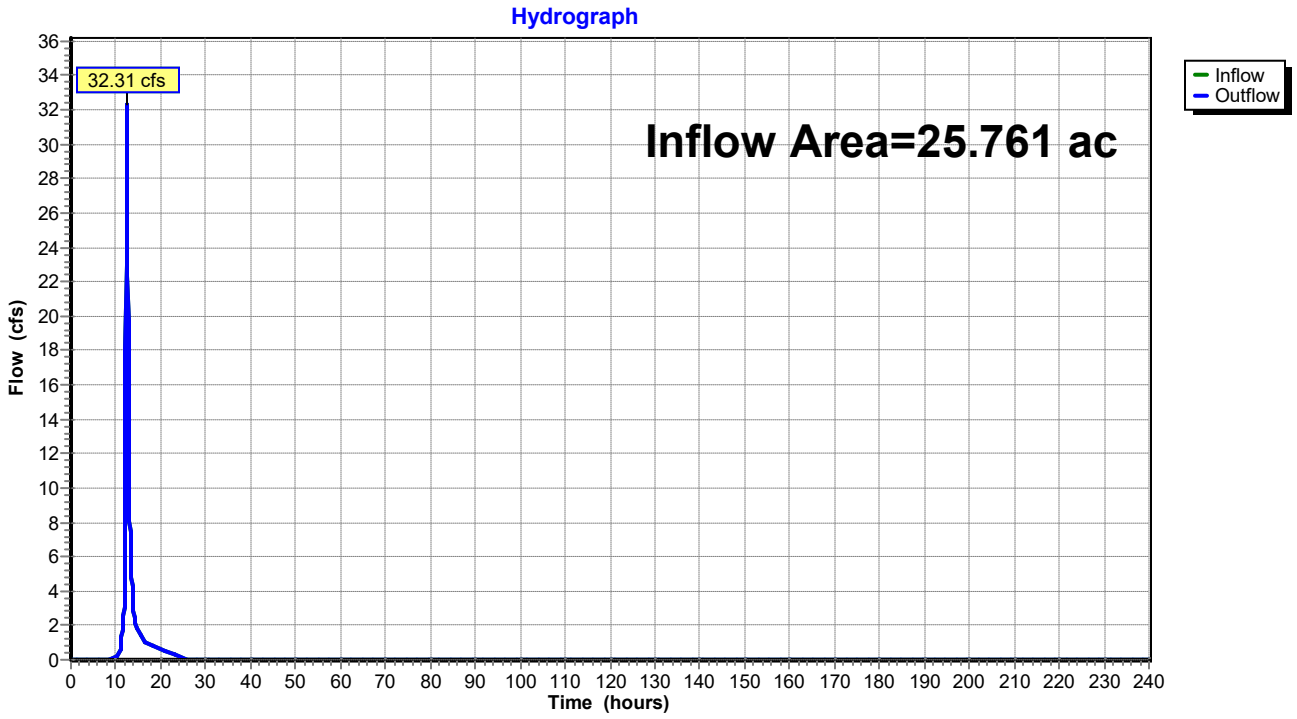
Summary for Reach 1R: Cowley Lake Outlet Channel

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 25.761 ac, 0.80% Impervious, Inflow Depth = 1.39" for NURP event
Inflow = 32.31 cfs @ 12.42 hrs, Volume= 2.981 af
Outflow = 32.31 cfs @ 12.42 hrs, Volume= 2.981 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 1R: Cowley Lake Outlet Channel



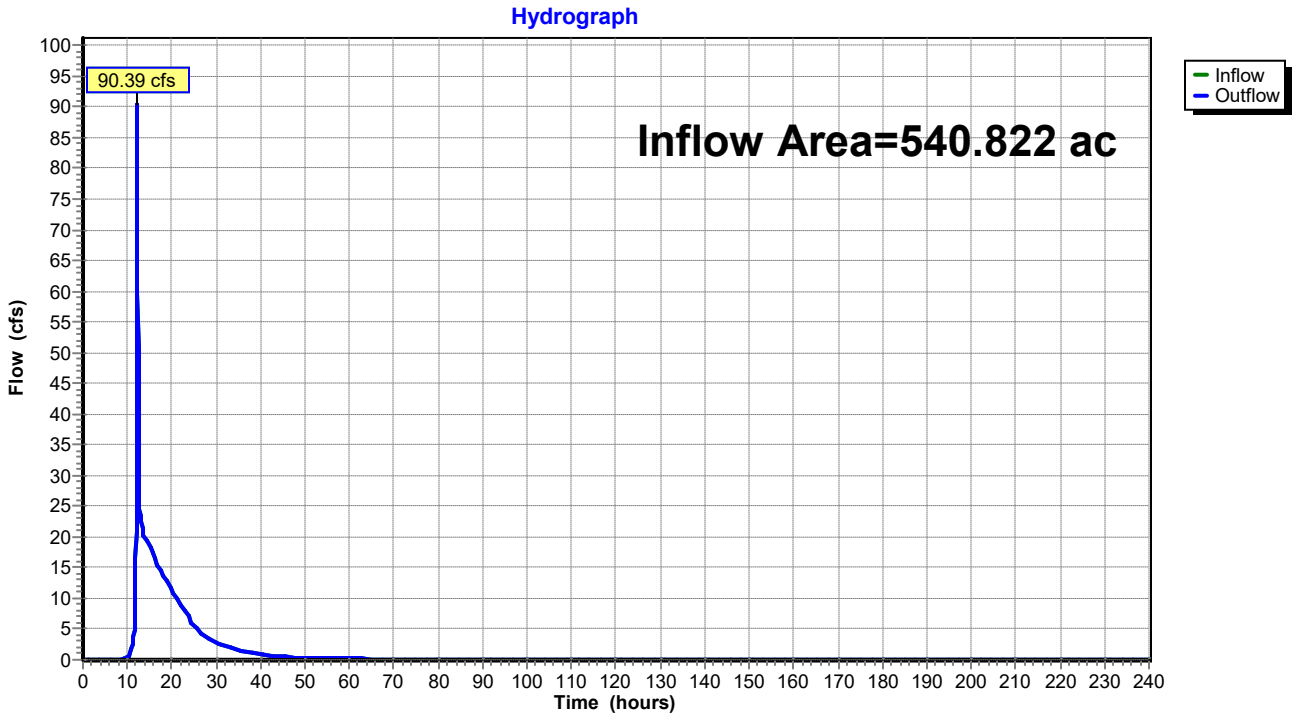
Summary for Reach 2R: Cowley Lake

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 540.822 ac, 2.65% Impervious, Inflow Depth = 0.47" for NURP event
Inflow = 90.39 cfs @ 12.21 hrs, Volume= 21.239 af
Outflow = 90.39 cfs @ 12.21 hrs, Volume= 21.239 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Reach 2R: Cowley Lake



Summary for Reach 21R: East Channel

Inflow Area = 131.697 ac, 6.98% Impervious, Inflow Depth > 1.20" for NURP event
Inflow = 13.60 cfs @ 13.66 hrs, Volume= 13.158 af
Outflow = 13.60 cfs @ 13.68 hrs, Volume= 13.158 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.01 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 7.6 min

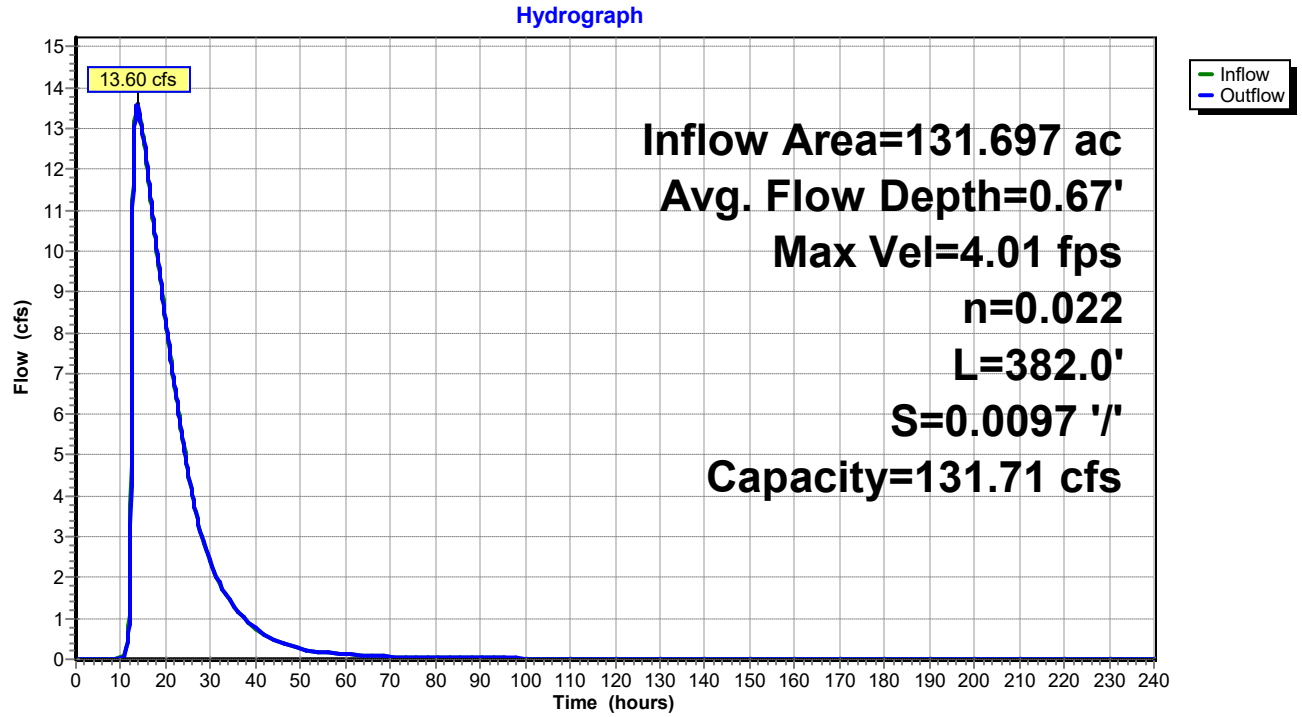
Peak Storage= 1,296 cf @ 13.68 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 131.71 cfs

3.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 382.0' Slope= 0.0097 '/'
Inlet Invert= 923.92', Outlet Invert= 920.20'



‡

Reach 21R: East Channel



Summary for Reach 23RL: Lower West Channel

Inflow Area = 371.058 ac, 1.30% Impervious, Inflow Depth > 0.12" for NURP event
Inflow = 19.45 cfs @ 12.17 hrs, Volume= 3.814 af
Outflow = 17.05 cfs @ 12.22 hrs, Volume= 3.814 af, Atten= 12%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.77 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 0.30 fps, Avg. Travel Time= 30.0 min

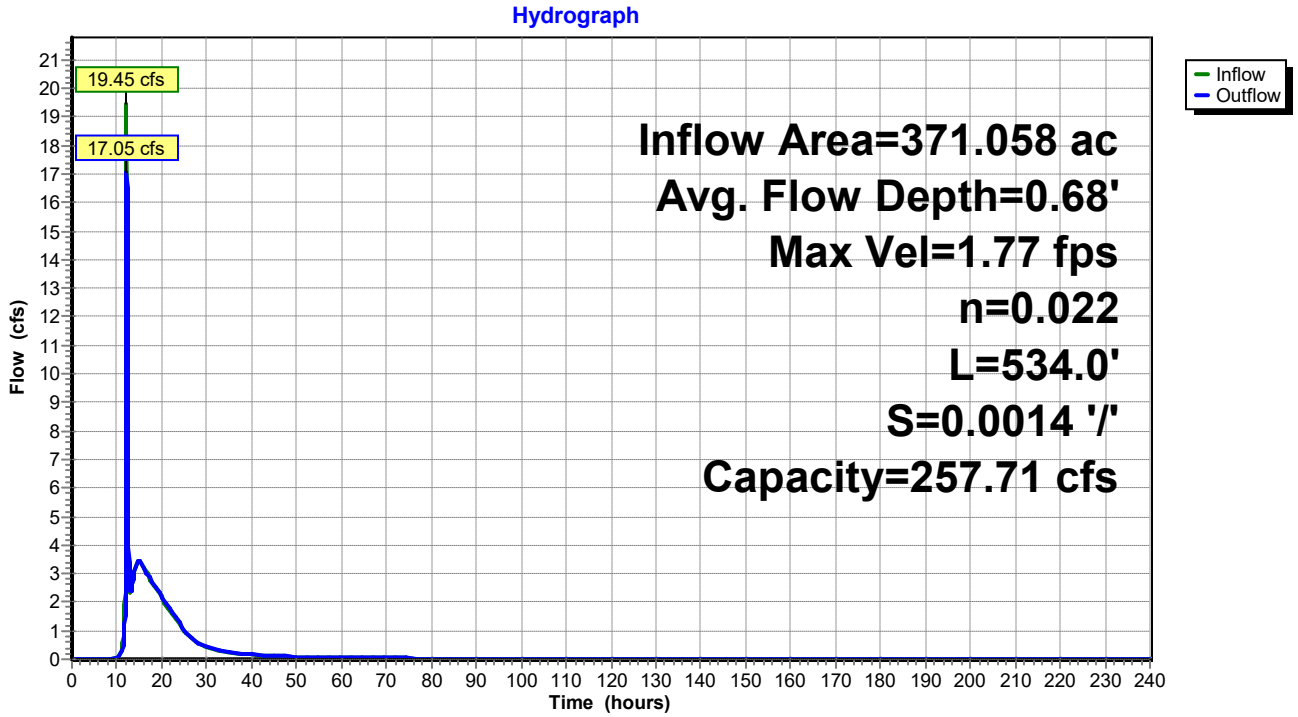
Peak Storage= 5,105 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 3.00' Flow Area= 63.0 sf, Capacity= 257.71 cfs

12.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 30.00'
Length= 534.0' Slope= 0.0014 '/'
Inlet Invert= 919.58', Outlet Invert= 918.82'



‡

Reach 23RL: Lower West Channel



Summary for Reach 23RU: Upper West Channel

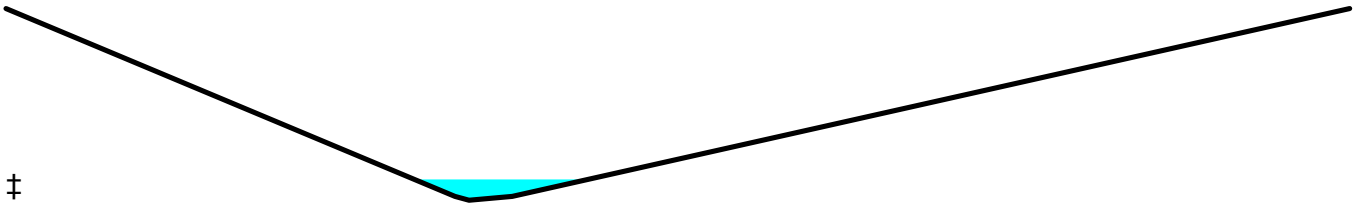
[80] Warning: Exceeded Pond 30P by 0.96' @ 0.00 hrs (0.58 cfs 0.694 af)

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth > 0.09" for NURP event
Inflow = 2.97 cfs @ 15.28 hrs, Volume= 2.771 af
Outflow = 2.97 cfs @ 15.36 hrs, Volume= 2.771 af, Atten= 0%, Lag= 4.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.29 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 22.5 min

Peak Storage= 1,128 cf @ 15.36 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 2.04' Flow Area= 146.2 sf, Capacity= 766.18 cfs

Custom cross-section, Length= 490.0' Slope= 0.0057 '/'
Constant n= 0.022 Earth, clean & straight
Inlet Invert= 925.96', Outlet Invert= 923.17'

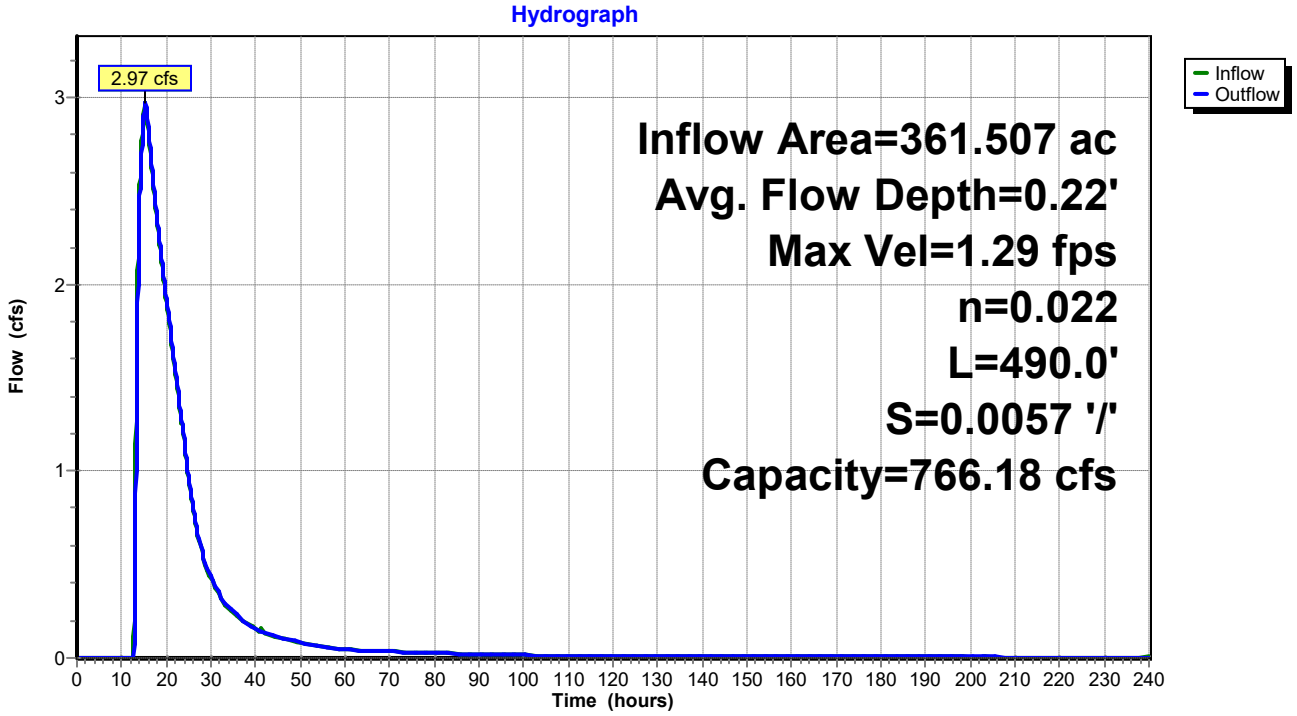


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-48.27	928.00	0.00
-1.47	926.00	2.00
0.00	925.96	2.04
4.51	926.00	2.00
91.79	928.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.1	6.0	59	0.05
2.04	146.2	140.1	71,618	766.18

Reach 23RU: Upper West Channel



Summary for Pond 7P: Whiteford Lake and Wetlands

Inflow Area = 300.000 ac, 0.00% Impervious, Inflow Depth = 0.53" for NURP event
Inflow = 127.59 cfs @ 12.44 hrs, Volume= 13.215 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 930.22' @ 25.55 hrs Surf.Area= 60.657 ac Storage= 13.215 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

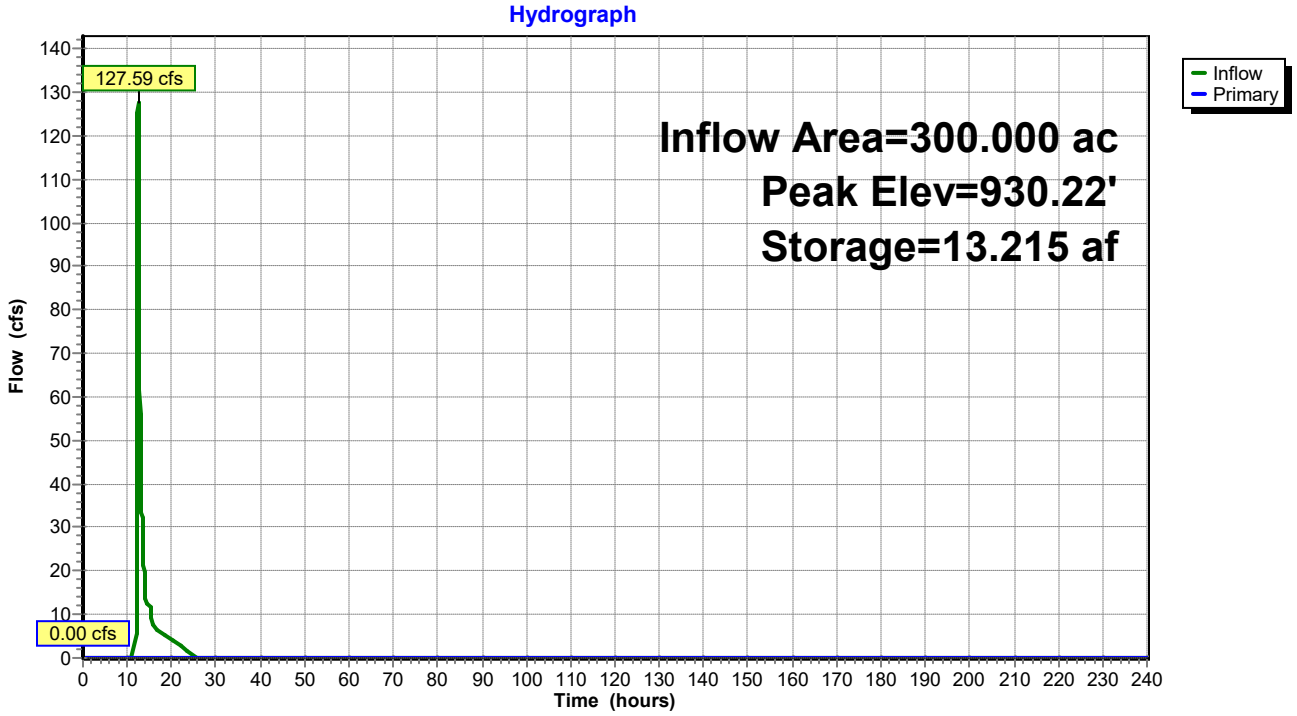
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	259.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.00	60.000	0.000	0.000
932.00	66.000	126.000	126.000
934.00	67.000	133.000	259.000

Device	Routing	Invert	Outlet Devices
#1	Primary	931.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=930.00' TW=930.22' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: Whiteford Lake and Wetlands



Summary for Pond 30P: Wetland 4A

[58] Hint: Peaked 0.26' above defined flood level
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=533)

Inflow Area = 361.507 ac, 1.34% Impervious, Inflow Depth = 0.18" for NURP event
Inflow = 56.56 cfs @ 12.37 hrs, Volume= 5.440 af
Outflow = 2.97 cfs @ 15.28 hrs, Volume= 2.771 af, Atten= 95%, Lag= 174.4 min
Primary = 2.97 cfs @ 15.28 hrs, Volume= 2.771 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 926.22' @ 15.35 hrs Surf.Area= 5.594 ac Storage= 4.003 af
Flood Elev= 925.96' Surf.Area= 5.112 ac Storage= 2.616 af

Plug-Flow detention time= 907.7 min calculated for 2.770 af (51% of inflow)
Center-of-Mass det. time= 815.3 min (1,643.8 - 828.5)

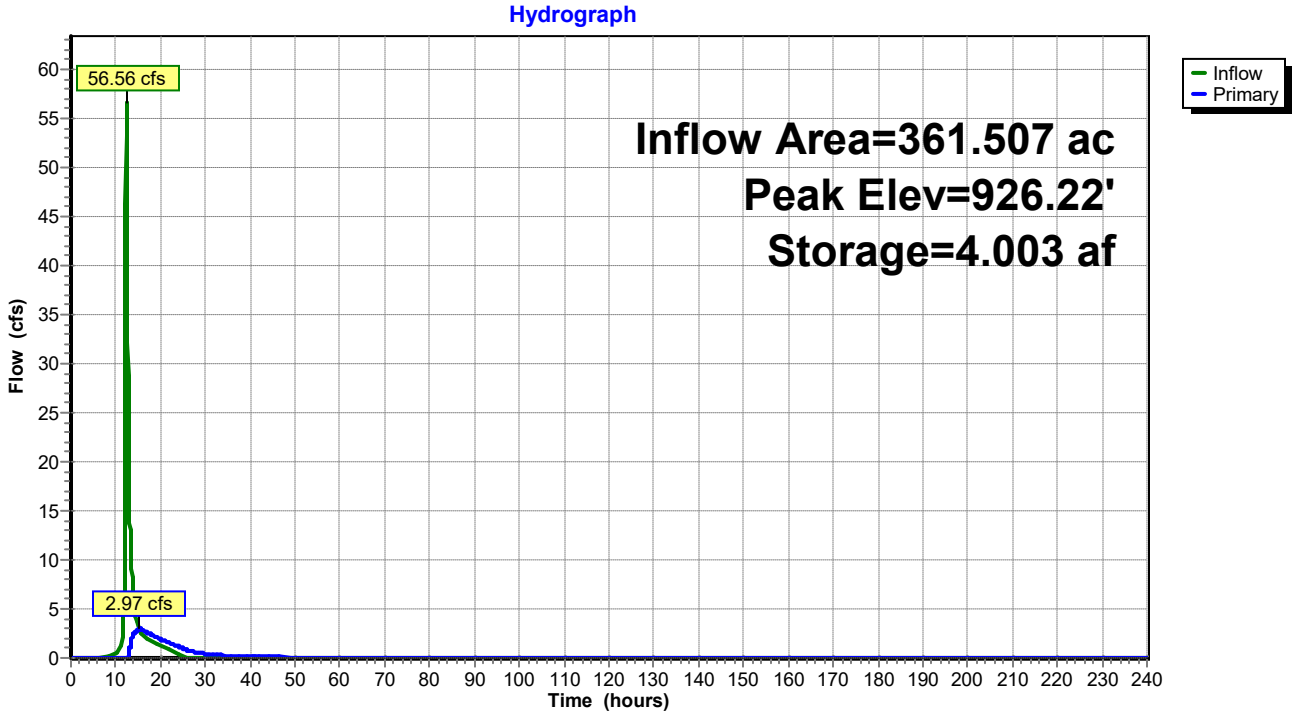
Volume	Invert	Avail.Storage	Storage Description
#1	925.00'	16.212 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
925.00	0.338	0.000	0.000
926.00	5.311	2.824	2.824
927.00	6.620	5.965	8.790
928.00	8.223	7.422	16.212

Device	Routing	Invert	Outlet Devices
#1	Primary	925.96'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.04 1.04 2.04 Width (feet) 0.00 6.00 90.00 140.00
#2	Primary	919.70'	**10.0" Round Culvert** L= 1,310.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 919.30' / 919.70' S= -0.0003 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#3	Device 2	925.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.96 cfs @ 15.28 hrs HW=926.22' TW=926.18' (Dynamic Tailwater)
- **1=Custom Weir/Orifice** (Weir Controls 2.85 cfs @ 0.85 fps)
- **2=Culvert** (Outlet Controls 0.11 cfs @ 0.20 fps)
  - **3=Orifice/Grate** (Passes 0.11 cfs of 0.49 cfs potential flow)

Pond 30P: Wetland 4A



Summary for Pond 31P: Ex 24" Culvert Crossing

[80] Warning: Exceeded Pond 7P by 1.86' @ 12.60 hrs (95.23 cfs 4.382 af)

Inflow Area = 320.000 ac, 0.75% Impervious, Inflow Depth = 0.05" for NURP event
Inflow = 10.74 cfs @ 12.60 hrs, Volume= 1.346 af
Outflow = 10.74 cfs @ 12.60 hrs, Volume= 1.346 af, Atten= 0%, Lag= 0.4 min
Primary = 10.74 cfs @ 12.60 hrs, Volume= 1.346 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 931.92' @ 12.60 hrs Surf.Area= 0.005 ac Storage= 0.004 af

Plug-Flow detention time= 0.2 min calculated for 1.346 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (844.7 - 844.5)

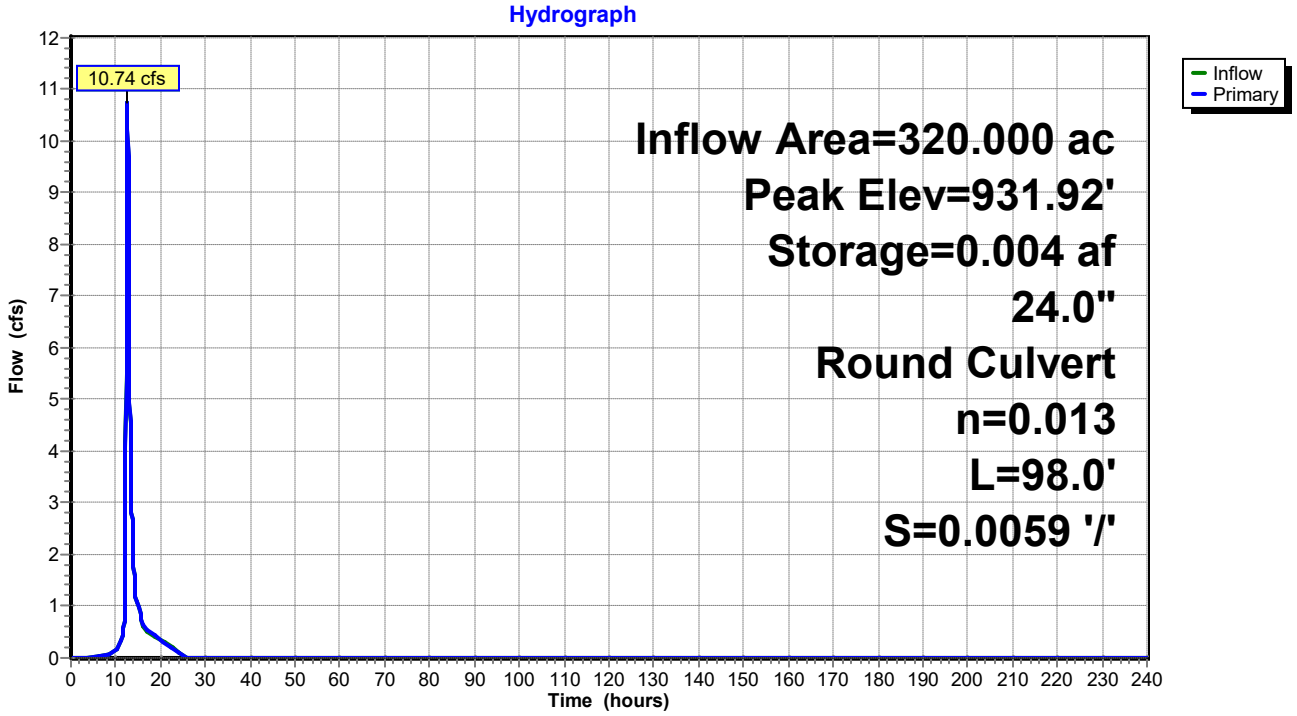
Volume	Invert	Avail.Storage	Storage Description
#1	930.22'	14.106 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
930.22	0.000	0.000	0.000
932.00	0.005	0.004	0.004
934.00	0.772	0.777	0.781
936.00	12.553	13.325	14.106

Device	Routing	Invert	Outlet Devices
#1	Primary	930.22'	**24.0" Round Culvert** L= 98.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 930.22' / 929.64' S= 0.0059 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=10.73 cfs @ 12.60 hrs HW=931.92' TW=925.91' (Dynamic Tailwater)
1=Culvert (Barrel Controls 10.73 cfs @ 5.07 fps)

Pond 31P: Ex 24" Culvert Crossing



Summary for Pond 40P: Wetland 2B

Inflow Area = 130.797 ac, 7.03% Impervious, Inflow Depth = 1.20" for NURP event
Inflow = 115.05 cfs @ 12.35 hrs, Volume= 13.100 af
Outflow = 13.52 cfs @ 13.71 hrs, Volume= 13.096 af, Atten= 88%, Lag= 81.6 min
Primary = 13.52 cfs @ 13.71 hrs, Volume= 13.096 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 925.06' @ 13.71 hrs Surf.Area= 8.580 ac Storage= 5.768 af

Plug-Flow detention time= 357.1 min calculated for 13.093 af (100% of inflow)
Center-of-Mass det. time= 353.4 min (1,350.7 - 997.4)

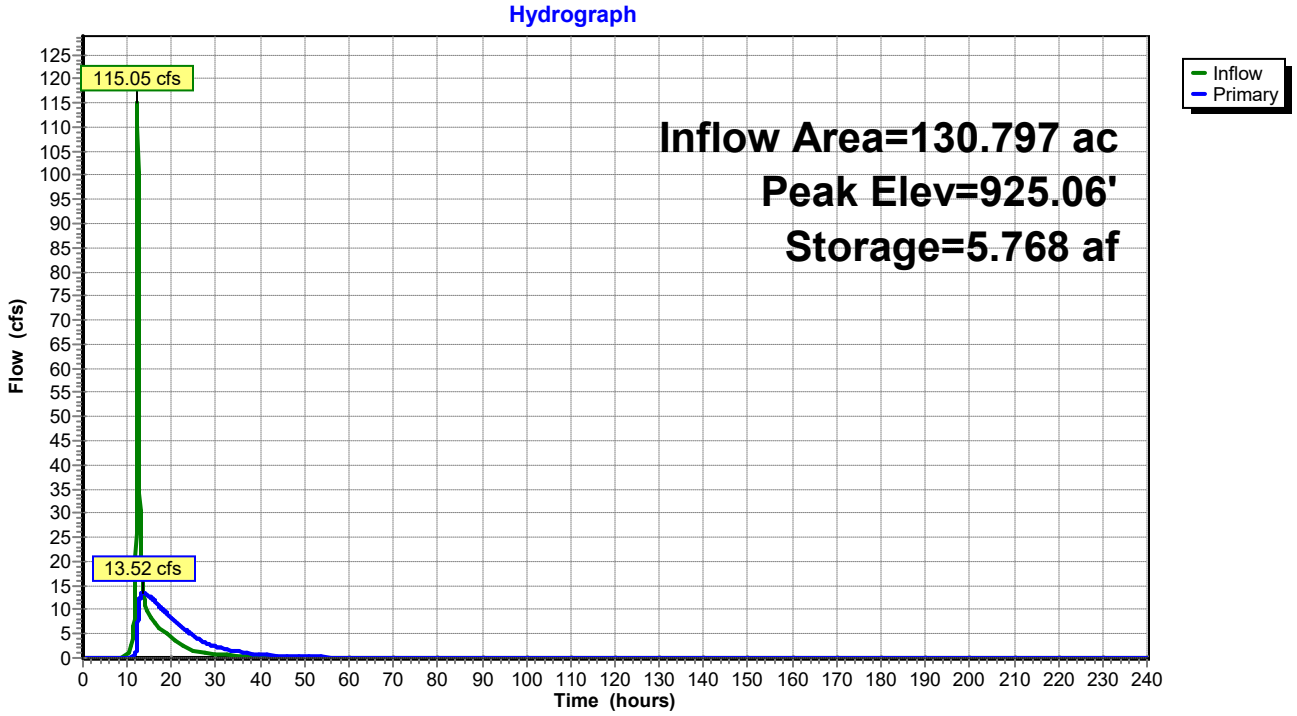
Volume	Invert	Avail.Storage	Storage Description
#1	923.92'	52.726 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
923.92	0.000	0.000	0.000
924.00	2.123	0.085	0.085
926.00	14.283	16.406	16.491
928.00	21.952	36.235	52.726

Device	Routing	Invert	Outlet Devices
#1	Primary	923.58'	**Asymmetrical Weir, C= 3.27**
			Offset (feet) -12.19 0.00 7.43 15.99
			Height (feet) 3.38 0.00 0.09 3.38
#2	Device 1	923.92'	**Asymmetrical Weir, C= 3.27**
			Offset (feet) -56.17 -5.92 -1.08 0.00 3.27 6.37 30.87 135.00
			Height (feet) 4.08 2.08 1.66 0.00 0.12 1.87 2.08 4.08

Primary OutFlow Max=13.52 cfs @ 13.71 hrs HW=925.06' TW=924.59' (Dynamic Tailwater)
↑**1=Asymmetrical Weir** (Passes 13.52 cfs of 49.41 cfs potential flow)
↑**2=Asymmetrical Weir** (Weir Controls 13.52 cfs @ 2.10 fps)

Pond 40P: Wetland 2B



Summary for Pond 41P: Ex South Off-site Pond

Inflow Area = 13.713 ac, 13.43% Impervious, Inflow Depth = 1.07" for NURP event
Inflow = 21.24 cfs @ 12.18 hrs, Volume= 1.228 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 939.12' @ 24.60 hrs Surf.Area= 1.223 ac Storage= 1.228 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

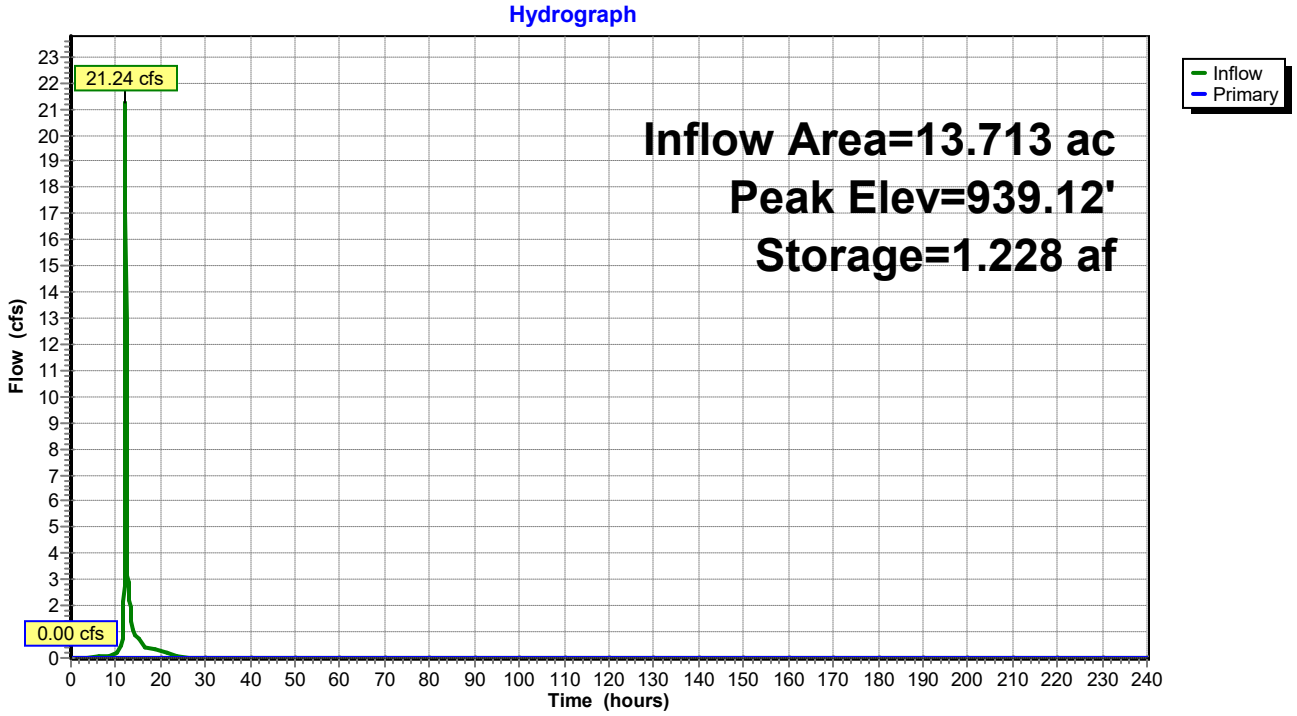
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	4.911 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.107	0.000	0.000
938.00	0.278	0.385	0.385
940.00	1.962	2.240	2.625
941.00	2.611	2.286	4.911

Device	Routing	Invert	Outlet Devices
#1	Primary	940.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 25.00 100.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=936.00' TW=923.92' (Dynamic Tailwater)
↑**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond 41P: Ex South Off-site Pond



Summary for Pond 50P: Wetland 4B

Inflow Area = 39.464 ac, 12.63% Impervious, Inflow Depth = 0.53" for NURP event
Inflow = 17.34 cfs @ 12.39 hrs, Volume= 1.737 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 940.02' @ 240.00 hrs Surf.Area= 1.621 ac Storage= 1.737 af
Flood Elev= 941.50' Surf.Area= 3.181 ac Storage= 5.223 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

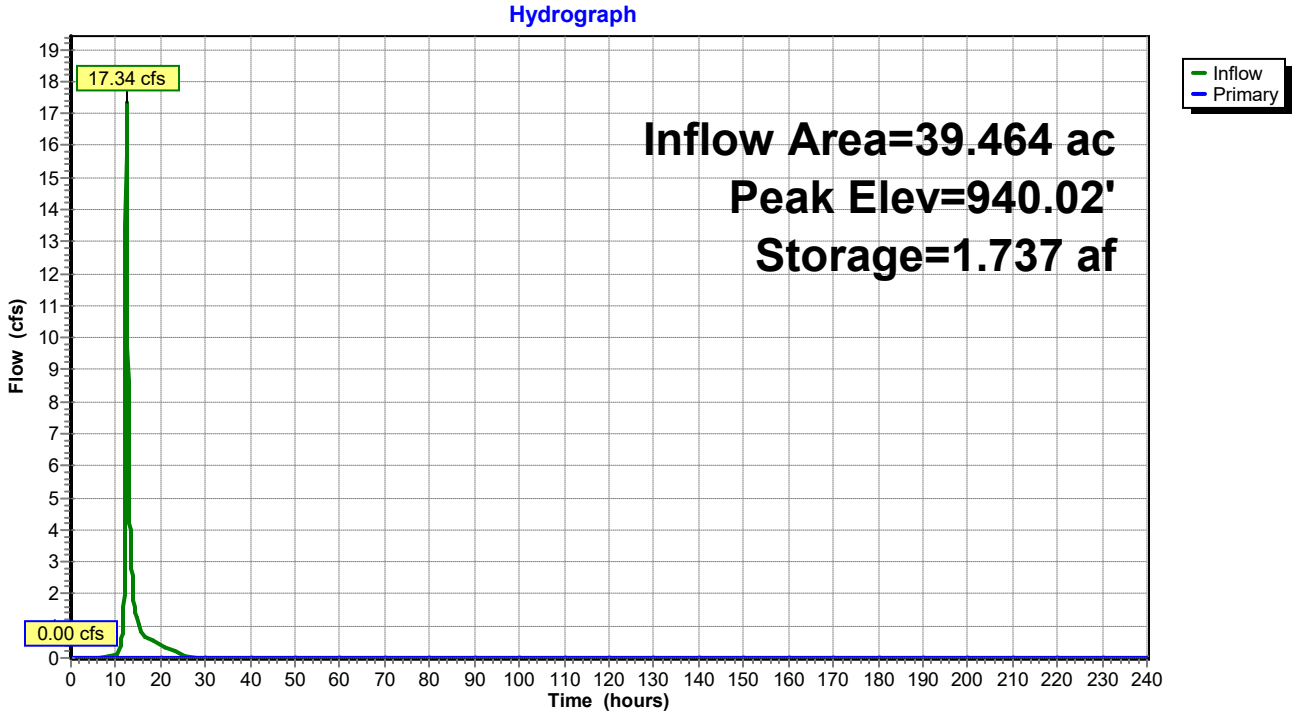
Volume	Invert	Avail.Storage	Storage Description
#1	938.00'	6.966 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
938.00	0.102	0.000	0.000
940.00	1.599	1.701	1.701
941.00	2.570	2.085	3.785
942.00	3.792	3.181	6.966

Device	Routing	Invert	Outlet Devices
#1	Primary	941.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 40.00 80.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=938.00' TW=923.92' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond 50P: Wetland 4B



Summary for Pond 60P: Wetland 5B

[58] Hint: Peaked 0.12' above defined flood level

Inflow Area = 3.760 ac, 23.16% Impervious, Inflow Depth > 13.59" for NURP event
Inflow = 9.74 cfs @ 12.13 hrs, Volume= 4.259 af
Outflow = 4.34 cfs @ 15.02 hrs, Volume= 4.045 af, Atten= 55%, Lag= 173.4 min
Primary = 4.34 cfs @ 15.02 hrs, Volume= 4.045 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 938.62' @ 15.02 hrs Surf.Area= 0.250 ac Storage= 0.242 af
Flood Elev= 938.50' Surf.Area= 0.226 ac Storage= 0.214 af

Plug-Flow detention time= 206.7 min calculated for 4.045 af (95% of inflow)
Center-of-Mass det. time= 42.0 min (1,407.5 - 1,365.5)

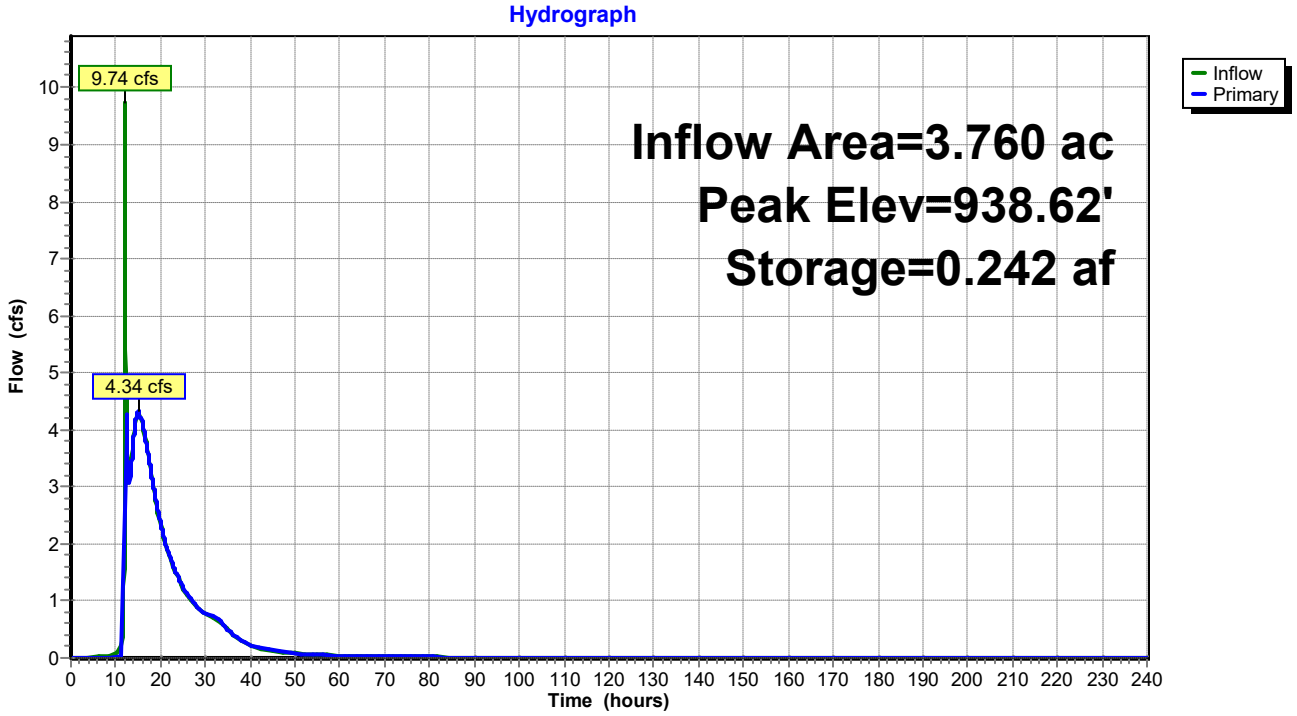
Volume	Invert	Avail.Storage	Storage Description
#1	936.00'	0.353 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
936.00	0.004	0.000	0.000
938.00	0.123	0.127	0.127
939.00	0.328	0.226	0.353

Device	Routing	Invert	Outlet Devices
#1	Primary	938.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 30.00 55.00

Primary OutFlow Max=4.34 cfs @ 15.02 hrs HW=938.62' TW=925.03' (Dynamic Tailwater)
↑—**1=Custom Weir/Orifice** (Weir Controls 4.34 cfs @ 1.11 fps)

Pond 60P: Wetland 5B



Summary for Link 1PP: Northwest Wetland (Big Woods)

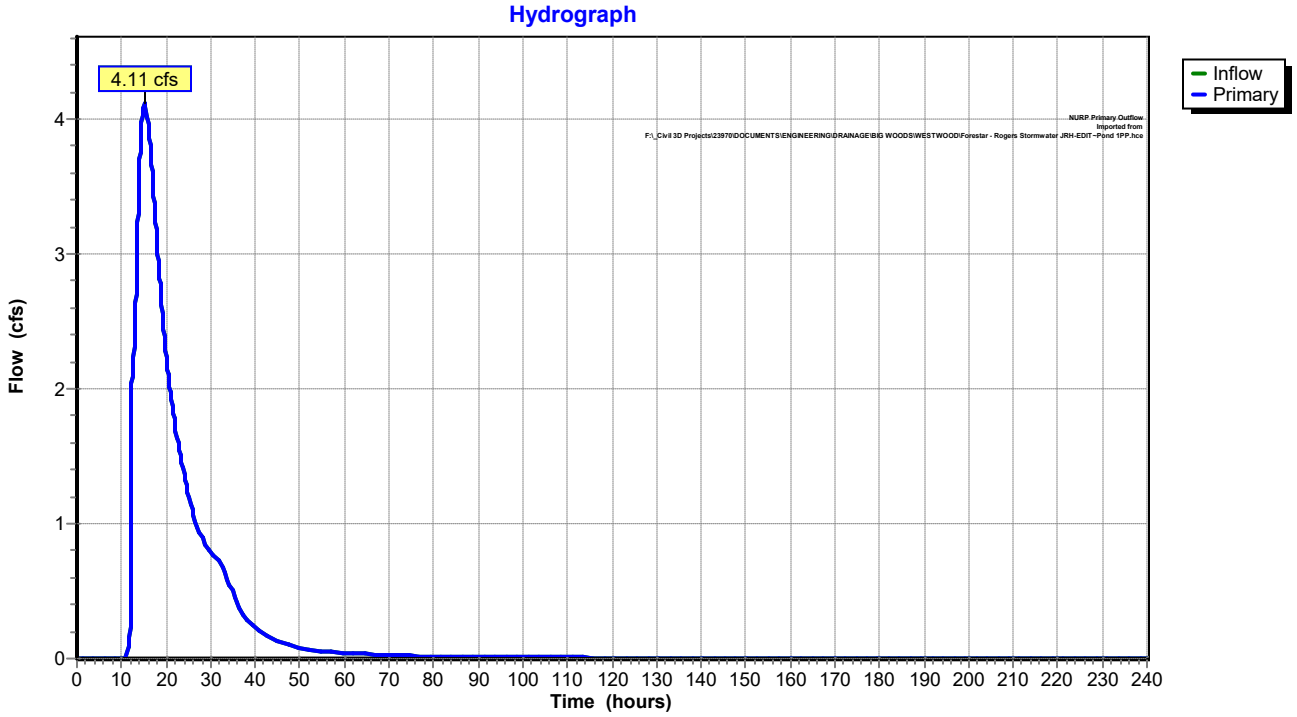
From the Big Woods development drainage model prepared by Westwood.

Inflow	=	4.11 cfs @	15.12 hrs, Volume=	3.854 af
Primary	=	4.11 cfs @	15.12 hrs, Volume=	3.854 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

NURP Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG WC

Link 1PP: Northwest Wetland (Big Woods)



Summary for Link 5PP: Existing Pond (Big Woods)

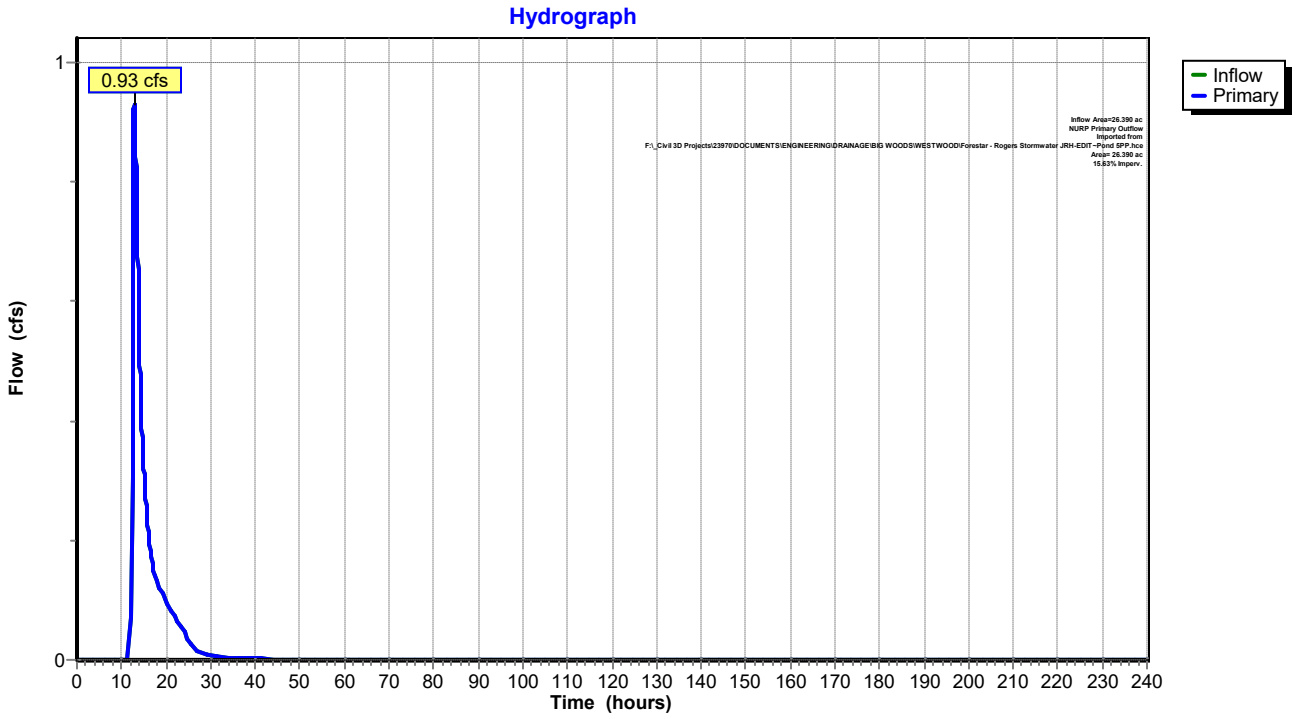
From the Big Woods development drainage model prepared by Westwood.

Inflow Area = 26.390 ac, 15.63% Impervious, Inflow Depth = 0.11" for NURP event
Inflow = 0.93 cfs @ 12.82 hrs, Volume= 0.240 af
Primary = 0.93 cfs @ 12.82 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

NURP Primary Outflow Imported from F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\BIG WC

Link 5PP: Existing Pond (Big Woods)



COWLEY LAKE PRESERVE - DESIGN IMPERVIOUS SURFACE SUMMARY **2/24/2025**

COMPUTATION OF IMPERVIOUS SURFACE AND REQUIRED VOLUME CONTROL

IMPERVIOUS AREA:

STREETS WITHIN PLAT				275,189	SF	6.317 AC
STREETS OUTSIDE PLAT				7,794	SF	0.179 AC
TRAILS/WALKS WITHIN PLAT				67,561	SF	1.551 AC
TRAILS/WALKS OUTSIDE PLAT				2,477	SF	0.057 AC
FUTURE STREETS WITHIN PLAT				4,164	SF	0.096 AC
FUTURE TRAILS/WALKS WITHIN PLAT				752	SF	0.017 AC
LOTS	# LOTS					
ROOFS						
42' CARRIAGE LOTS	36	2,100	SF	75,600	SF	1.736 AC
60' VILLA LOTS	26	2,600	SF	67,600	SF	1.552 AC
60' STANDARD LOTS	48	2,400	SF	115,200	SF	2.645 AC
70' STANDARD LOTS	59	3,000	SF	177,000	SF	4.063 AC
DRIVEWAYS						
CARRIAGE LOTS	36	900	SF	32,400	SF	0.744 AC
STANDARD AND VILLA LOTS	133	1,100	SF	146,300	SF	3.359 AC
TOTAL IMPERVIOUS				**972,037**	**SF**	**22.315 AC**

INDICATES AREA MEASURED IN CAD

INDICATES ASSUMED VALUES

VOLUME CONTROL REQUIRED

REQUIRED VOL = 1.1"/12"/FT X TOTAL IMP =	*2.046*	*AC-FT*
*FILTRATION CREDIT AT 55% = 2.046*1.82 =*	*3.724*	*AC-FT REQUIRED*

VOLUME CONTROL PROVIDED SEE HYDROCAD MODEL

POND 10P NORTHEAST POND/FILTRATION	1.149	AC-FT
POND 25P NORTHWEST POND/FILTRATION	1.846	AC-FT
POND 26P NORTHWEST CENTRAL POND/FILTRATION	1.333	AC-FT
TOTAL VOLUME	**4.328**	**AC-FT PROVIDED**

COWLEY LAKE PRESERVE - FILTRATION COMPUTATIONS **2/24/2025**

	POND 10P	POND 25P	POND 26P
1. RATE (IN/HR)	0.8	0.8	0.8
2. SURFACE AREA (SF)	16,819	29,363	20,260
3. FLOW (CFS)	0.31	0.54	0.38
4. VOLUME (CF)	50,050	80,412	58,065
5. DRAWDOWN (HR)	44.6	41.1	43.0

NOTES:

1. Assumed infiltration rate of the filtration media mix.
2. Proposed surface area of the filtration media mix.
3. Computed infiltration flow (Surface Area times Rate). Used as constant flow in the HydroCAD model.
4. Retainted volume below the primary pond outlet.
5. Computed drawdown time of the retained volume (Volume divided by Flow).

USER INPUT

P8 Urban Catchment Model, Version 3.5

Case	23970-EXISTING.p8c
Title	Cowley Lake Preserve Existing
PrecFile	MSP4918.pcp
PartFile	nurp50.p8p

Case Title	Cowley Lake Preserve Existing
Case Data File	23970-EXISTING.p8c
Path	F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\P8\
Case Notes:	Existing Conditions Cowley Lake Preserve Rogers, MN
Storm Data File	MSP4918.pcp
Particle File	nurp50.p8p
Air Temp File File	MSP4918.tem

Time Steps Per Hour	4
Minimum Inter-Event Time (hrs)	10
Maximum Continuity Error %	2
Rainfall Breakpoint (inches)	0.8
Precipitation Scale Factor	1
Air Temp Offset (deg-F)	0
Loops Thru Storm File	1
Simulation Dates	
Start	1/1/2000
Keep	6/1/2000
Stop	12/31/2018

Max Snowfall Temperature (deg-f)	32.0
SnowMelt Temperature (deg-f)	32.0
Snowmelt Coef (in/degF-Day)	0.06
Soil Freeze Temp (deg-F)	32.0
Snowmelt Abstraction Factor	1.00
Evapo-Trans. Calibration Factor	1.00
Growing Season Start Month	5
Growing Season End Month	10

5-Day Antecedent Rainfall + Runoff (inches)		
CN Antecedent Moisture Condition	AMC-II	AMC-III
Growing Season	1.40	2.10
NonGrowing Season	0.50	1.10

Watershed Data

Watershed Name	10S	20S	21S	22S	23S	24S	30S	40S	41S	50S	60S				
Runoff to Device	1R	2R	21R	2R	23RL	2R	30P	40P	41P	50P	60P				
Infiltration to Device															
Watershed Area	25.761	6.216	0.9	5.776	9.551	26.075	41.507	73.86	13.713	13.074	3.76				
SCS Curve Number (Pervious)	87	85	77	86	86	87	84	84	80	87	81				
Scale Factor for Pervious Runoff Load	1	1	1	1	1	1	1	1	1	1	1				
Indirectly Connected Imperv Fraction	0.008	0	0	0	0	0.0114	0.0585	0.0202	0.1343	0.0659	0.2316				
UnSwept Impervious Fraction	0	0	0	0	0	0	0	0	0	0	0				
UnSwept Depression Storage (inches)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02				
UnSwept Imperv. Runoff Coefficient	1	1	1	1	1	1	1	1	1	1	1				
UnSwept Scale Factor for Particle Loads	1	1	1	1	1	1	1	1	1	1	1				
Swept Impervious Fraction	0	0	0	0	0	0	0	0	0	0	0				
Swept Depression Storage (inches)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02				
Swept Imperv. Runoff Coefficient	1	1	1	1	1	1	1	1	1	1	1				
Swept Scale Factor for Particle Loads	1	1	1	1	1	1	1	1	1	1	1				
Sweeping Frequency	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5				
Sweeping Efficiency	1	1	1	1	1	1	1	1	1	1	1				
Sweeping Start Date (MMDD)	101	101	101	101	101	101	101	101	101	101	101				
Sweeping Stop Date (MMDD)	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231				

Device Data															
Device Name	21R	23RL	23RU	30P	40P	41P	50P	60P	1R	2R					
Device Type	SWALE	SWALE	SWALE	POND	POND	POND	POND	POND	PIPE	PIPE					
Infiltration Outlet															
Normal Outlet	2R	2R	23RL	23RU	21R	40P	40P	40P							
Spillway Outlet	2R	2R	23RL	23RU	21R	40P	40P	40P							
Particle Removal Scale Factor	1	1	1	1	1	1	1	1							
Bottom Elevation (ft)	923.92	919.58	925.96	925	923.92	936	938	936							
Bottom Area (acres)				0.338	2.123	0.107	0.102	0.004							
Permanent Pool Area (acres)				5.112	2.123	0.107	3.181	0.226							
Permanent Pool Volume (ac-ft)				2.616	0	0	5.223	0.214							
Perm Pool Infilt Rate (in/hr)				0	0	0	0	0							
Flood Pool Area (acres)				8.223	15.343	2.395	3.376	0.318							
Flood Pool Volume (ac-ft)				16.212	20.585	4.079	5.746	0.337							
Flood Pool Infilt Rate (in/hr)	0	0	0	0	0	0	0	0							
Infilt Basin Void Fraction (%)															
Detention Pond Outlet Parameters															
Outlet Type				WEIR	WEIR	WEIR	WEIR	WEIR							
Outlet Orifice Diameter (in)															
Orifice Discharge Coef															
Outlet Weir Length (ft)				90	7	25	40	30							
Weir Discharge Coef				2.62	3.27	2.62	2.62	2.62							
Perforated Riser Height (ft)															
Number of Holes in Riser															
Holes Diameter															
Flood Pool Drain Time (hrs)															
Swale Parameters															
Length of Flow Path (ft)	382	534	490												
Slope of Flow Path %	0.97	0.14	0.57												
Bottom Width (ft)	3	12	5.98												
Side Slope (ft-v/ft-h)	3	3	23.4												
Maximum Depth of Flow (ft)	1.58	2.41	1.1												
Mannings n Constant	0.022	0.022	0.022												
Hydraulic Model	0	0	0												
Pipe, Splitter, Aquifer Parameter															
Hydraulic Res. Time (hrs)									0	0					

Particle Data					
Particle File	nurp50.p8p				
Particle Class	P0%	P10%	P30%	P50%	P80%
Filtration Efficiency (%)	90	100	100	100	100
Settling Velocity (ft/hr)	0	0.03	0.3	1.5	15
First Order Decay Rate (1/day)	0	0	0	0	0
2nd Order Decay (1/day-ppm)	0	0	0	0	0
Impervious Runoff Conc (ppm)	1	0	0	0	0
Pervious Runoff Conc (ppm)	1	100	100	100	200
Pervious Conc Exponent	0	1	1	1	1
Accum. Rate (lbs-ac-day)	0	1.75	1.75	1.75	3.5
Particle Removal Rate (1/day)	0	0.25	0.25	0.25	0.25
Washoff Coefficient	0	20	20	20	20
Washoff Exponent	0	2	2	2	2
Sweeper Efficiency	0	0	0	5	15

Water Quality Component Data										
Component Name	TSS	TP	TKN	CU	PB	ZN	HC			
Water Quality Criteria (ppm)										
Level 1	5	0.025	2	2	0.02	5	0.1			
Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5			
Level 3	20	0.1	0.5	0.02	0.15	0.38	1			
Content Scale Factor	1	1	1	1	1	1	1			
Particle Composition (mg/kg)										
P0%	0	99000	600000	13600	2000	64000	250000			
P10%	1000000	3850	15000	340	180	1600	22500			
P30%	1000000	3850	15000	340	180	1600	22500			
P50%	1000000	3850	15000	340	180	1600	22500			
P80%	1000000	0	0	340	180	0	22500			

P8 Urban Catchment Model, Version 3.5				Run Date	02/12/25
Case	23970-PROPOSED.p8c	FirstDate	06/01/00	Precip(in)	545.0
Title	Cowley Lake Preserve Proposed	LastDate	12/31/18	Rain(in)	481.61
PrecFile	MSP4918.pcp	Events	1355	Snow(in)	63.35
PartFile	nurp50.p8p	TotalHrs	162806	TotalYrs	18.57

Case Title	Cowley Lake Preserve Proposed
Case Data File	23970-PROPOSED.p8c
Path	F:_Civil 3D Projects\23970\DOCUMENTS\ENGINEERING\DRAINAGE\P8\
Case Notes:	Proposed Conditions Cowley Lake Preserve Rogers, MN
Storm Data File	MSP4918.pcp
Particle File	nurp50.p8p
Air Temp File File	MSP4918.tem

Time Steps Per Hour	4
Minimum Inter-Event Time (hrs)	10
Maximum Continuity Error %	2
Rainfall Breakpoint (inches)	0.8
Precipitation Scale Factor	1
Air Temp Offset (deg-F)	0
Loops Thru Storm File	1
Simulation Dates	
Start	1/1/2000
Keep	6/1/2000
Stop	12/31/2018

Max Snowfall Temperature (deg-f)	32.0
SnowMelt Temperature (deg-f)	32.0
Snowmelt Coef (in/degF-Day)	0.06
Soil Freeze Temp (deg-F)	32.0
Snowmelt Abstraction Factor	1.00
Evapo-Trans. Calibration Factor	1.00
Growing Season Start Month	5
Growing Season End Month	10

5-Day Antecedent Rainfall + Runoff (inches)		
CN Antecedent Moisture Condition	AMC-II	AMC-III
Growing Season	1.40	2.10
NonGrowing Season	0.50	1.10

Watershed Data

Watershed Name	10S	11S		20S	21S	22S	23S	24S	25S	26S	27S	28S	30S	32S	40S	41S	42S	43S	50S	60S
Runoff to Device	10P	1R		2R	21R	2R	23R	2R	25P	26P	27P	28P	30P	32P	40P	41P	42P	43P	50P	60P
Infiltration to Device																				
Watershed Area	19.438	6.152		3.97	0.782	3.04	3.385	7.873	15.059	4.398	3.12	7.153	34.339	3.686	67.435	13.713	2.409	6.86	13.074	3.76
SCS Curve Number (Pervious)	86	78		78	77	78	78	78	81	81	83	82	82	83	83	80	80	82	87	81
Scale Factor for Pervious Runoff Load	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Indirectly Connected Imperv Fraction	0.0765	0.0335		0.0766	0.0128	0.1033	0.0068	0.0531	0.131	0.128	0.1311	0.1515	0.0687	0.1294	0.0292	0.1343	0.0805	0.1544	0.0659	0.2316
UnSwept Impervious Fraction	0.1346	0		0	0	0	0	0	0.1843	0.2558	0.3391	0.3549	0	0.2358	0	0	0.1972	0.2567	0	0
UnSwept Depression Storage (inches)	0.02	0.02		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
UnSwept Imperv. Runoff Coefficient	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
UnSwept Scale Factor for Particle Loads	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Swept Impervious Fraction	0	0		0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0
Swept Depression Storage (inches)	0.02	0.02		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Swept Imperv. Runoff Coefficient	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Swept Scale Factor for Particle Loads	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sweeping Frequency	0	0		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Sweeping Efficiency	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sweeping Start Date (MMDD)	101	101		101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
Sweeping Stop Date (MMDD)	1231	1231		1231	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231

Device Data																				
Device Name	10P	21R	23R	25P	26P	27P	28P	30P	32P	40P	41P	42P	43P	50P	60P	1R	2R			
Device Type	POND	SWALE	SWALE	POND	POND	POND	POND	POND	POND	POND	POND	POND	POND	POND	POND	PIPE	PIPE			
Infiltration Outlet	1R	2R	2R	2R	23R	26P	23R	23R	30P	21R	40P	40P	40P	40P	40P					
Normal Outlet	1R	2R	2R	2R	23R	26P	23R	23R	30P	21R	40P	40P	40P	40P	40P					
Spillway Outlet	1R	2R	2R	2R	23R	2R	23R	23R	30P	21R	40P	40P	40P	40P	40P					
Particle Removal Scale Factor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
Bottom Elevation (ft)	913	923.5	919.58	917	916	917	914	924.6	920	923.9	936	922.5	918.5	938	936					
Bottom Area (acres)	0.209			0.052	0.009	0.019	0.034	0.002	0.034	2.123	0.107	0.007	0.053	0.102	0.004					
Permanent Pool Area (acres)	0.662			0.322	0.318	0.278	0.38	0.002	0.395	2.123	0.107	0.154	0.401	3.181	0.226					
Permanent Pool Volume (ac-ft)	2.995			1.156	0.894	0.723	1.043	0	1.213	0	0	0.305	1.319	5.223	0.214					
Perm Pool Infilt Rate (in/hr)	0			0	0	0	0	0	0	0	0	0	0	0	0					
Flood Pool Area (acres)	1.553			1.584	1.155	0.543	0.724	8.223	0.638	21.952	2.611	0.372	0.787	3.376	0.318					
Flood Pool Volume (ac-ft)	9.359			5.216	3.855	1.777	2.802	16.279	2.284	36.235	4.911	1.118	3.505	5.746	0.337					
Flood Pool Infilt Rate (in/hr)	0.8	0	0	0.8	0.8	0	0	0	0	0	0	0	0	0	0					
Infilt Basin Void Fraction (%)																				
Detention Pond Outlet Parameters																				
Outlet Type	ORIFICE			ORIFICE	ORIFICE	ORIFICE	ORIFICE	WEIR	ORIFICE	WEIR	WEIR	ORIFICE	ORIFICE	WEIR	WEIR					
Outlet Orifice Diameter (in)	36			21	21	24	24		18			15	18							
Orifice Discharge Coef	0.6			0.6	0.6	0.6	0.6		1			0.6	0.6							
Outlet Weir Length (ft)								8		8	25			40	30					
Weir Discharge Coef								2.62		3.27	2.62			2.62	2.62					
Perforated Riser Height (ft)																				
Number of Holes in Riser																				
Holes Diameter																				
Flood Pool Drain Time (hrs)																				
Swale Parameters																				
Length of Flow Path (ft)		264	251																	
Slope of Flow Path %		0.0125	0.37																	
Bottom Width (ft)		3	6																	
Side Slope (ft-v/ft-h)		3	4																	
Maximum Depth of Flow (ft)		2	3																	
Mannings n Constant		0.022	0.022																	
Hydraulic Model		0	0																	
Pipe, Splitter, Aquifer Parameter																				
Hydraulic Res. Time (hrs)																0	0			

Particle Data					
Particle File	nurp50.p8p				
Particle Class	P0%	P10%	P30%	P50%	P80%
Filtration Efficiency (%)	90	100	100	100	100
Settling Velocity (ft/hr)	0	0.03	0.3	1.5	15
First Order Decay Rate (1/day)	0	0	0	0	0
2nd Order Decay (1/day-ppm)	0	0	0	0	0
Impervious Runoff Conc (ppm)	1	0	0	0	0
Pervious Runoff Conc (ppm)	1	100	100	100	200
Pervious Conc Exponent	0	1	1	1	1
Accum. Rate (lbs-ac-day)	0	1.75	1.75	1.75	3.5
Particle Removal Rate (1/day)	0	0.25	0.25	0.25	0.25
Washoff Coefficient	0	20	20	20	20
Washoff Exponent	0	2	2	2	2
Sweeper Efficiency	0	0	0	5	15

Water Quality Component Data										
Component Name	TSS	TP	TKN	CU	PB	ZN	HC			
Water Quality Criteria (ppm)										
Level 1	5	0.025	2	2	0.02	5	0.1			
Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5			
Level 3	20	0.1	0.5	0.02	0.15	0.38	1			
Content Scale Factor	1	1	1	1	1	1	1			
Particle Composition (mg/kg)										
P0%	0	99000	600000	13600	2000	64000	250000			
P10%	1000000	3850	15000	340	180	1600	22500			
P30%	1000000	3850	15000	340	180	1600	22500			
P50%	1000000	3850	15000	340	180	1600	22500			
P80%	1000000	0	0	340	180	0	22500			

COWLEY LAKE PRESERVE - p8 RESULTS **2/24/2025**

EXISTING

Variable	OVERALL	30P	23RU	23RL	41P	50P	60P	40P	21R	1R	2R
P0%	261.9	47.2	47.2	59.2	13.2	18	4.3	116.9	117.5	35.1	226.8
P10%	4239.4	516.4	509.8	750.2	253.2	75.5	51	1684.3	1691.9	744.2	3495.3
P30%	3124.7	347.8	325.1	541.1	220.3	54.5	39.9	787	786.2	744.2	2380.5
P50%	2315.9	158.3	124.6	296.1	150	28.7	24.9	227.4	222.5	744.2	1571.8
P80%	3788	40.7	11.9	155.2	71.8	7.8	10	43.1	38	1488.4	2299.7
TSS	**13468.1**	1063.2	971.4	1742.6	695.3	166.4	125.8	2741.8	2738.5	**3720.9**	**9747.2**
TP	**63.2**	8.6	8.4	12	3.7	2.4	0.9	22	22	**12.1**	**51.1**
TKN	302.3	43.7	42.7	59.3	17.3	13.2	4.3	110.6	111	54.5	247.8
CU	8.1	1	1	1.4	0.4	0.3	0.1	2.5	2.5	1.7	6.4
PB	2.9	0.3	0.3	0.4	0.2	0.1	0	0.7	0.7	0.7	2.2
ZN	32.2	4.7	4.6	6.3	1.8	1.4	0.5	11.8	11.8	5.8	26.4
HC	368.5	35.7	33.7	54	19	8.2	3.9	90.9	91	92.5	276

PROPOSED

Variable	OVERALL	10P	25P	27P	26P	28P	32P	30P	23R	41P	42P	43P	50P	60P	40P	21R	1R	2R
P0%	311.9	38.9	29.7	9.2	19.4	33.6	8.8	43.5	99	13.2	4.8	17.1	18	4.3	127.4	127.9	43.6	268.3
P10%	3392.7	261	239.5	36.2	78.9	221	27.7	684.1	1023.5	253.2	24.2	82.2	75.5	51	1556	1561.8	347.3	3045.4
P30%	2058.4	187	162.7	22.6	49.4	130.4	18.1	495.9	698	220.8	16.3	52.8	54.5	39.9	706.3	703.7	273.4	1785.1
P50%	1060.9	131.4	97.3	13.4	26.9	72.9	11.2	229.6	333.8	151.2	9.4	30.8	28.7	24.9	197.3	191.5	217.7	843.3
P80%	847.5	65.2	32.6	4.7	7.2	21.4	4.1	64.2	104.9	73	3.1	10	7.8	10	36.1	31	237.8	609.7
TSS	**7359.7**	644.6	532.1	76.9	162.3	445.7	61.1	1473.7	2160.2	698.3	53	175.8	166.4	125.8	2495.6	2488	**1076.2**	**6283.5**
TP	**55.9**	6.1	4.9	1.2	2.5	5	1.1	9.7	17.7	3.7	0.7	2.3	2.4	0.9	22.1	22.1	**7.5**	**48.4**
TKN	284.8	32.1	25.3	6.6	14	26.5	6.1	47.3	90.2	17.3	3.6	12.8	13.2	4.3	113.3	113.6	38.7	246.1
CU	6.7	0.7	0.6	0.2	0.3	0.6	0.1	1.1	2.1	0.4	0.1	0.3	0.3	0.1	2.6	2.6	1	5.8
PB	1.9	0.2	0.2	0	0.1	0.1	0	0.4	0.6	0.2	0	0.1	0.1	0	0.7	0.7	0.3	1.7
ZN	30.4	3.4	2.7	0.7	1.5	2.8	0.7	5	9.6	1.8	0.4	1.4	1.4	0.5	12.1	12.1	4.1	26.3
HC	243.6	24.2	19.4	4	8.5	18.4	3.6	44	73.4	19	2.4	8.2	8.2	3.9	88	88	35.1	208.5

Geotechnical Evaluation Report

Proposed Scherber Property Residential Development
24910 Territorial Road
Rogers, Minnesota

Prepared for

Rachel Development, Inc.

Professional Certification:
I hereby certify that this plan, specification, or report, was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



John T. Carlson, PE
Senior Engineer
License Number: 20663
June 12, 2023

BRAUN INTERTEC
The Science You Build On.

Project B2303953

Braun Intertec Corporation

Braun Intertec Corporation
11001 Hampshire Avenue S
Minneapolis, MN 55438

Phone: 952.995.2000
Fax: 952.995.2020
Web: braunintertec.com

June 12, 2023 Project B2303953

Mr. Steve Wolbeck
Rachel Development, Inc.
4180 Napier Court NE
St. Michael, MN 55376

Re: Geotechnical Evaluation
Proposed Scherber Property Residential Development
24910 Territorial Road
Rogers, Minnesota

Dear Mr. Wolbeck:

We are pleased to present this Geotechnical Evaluation Report for the proposed Scherber Property Residential Development project located north of 24910 Territorial Road in Rogers, Minnesota. Please read the entire attached report for details regarding our findings and recommendations.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact John Carlson at 952.540.7248 (johcarlson@braunintertec.com).

Sincerely,

BRAUN INTERTEC CORPORATION

John T. Carlson, PE
Senior Engineer

Henry Vloo, PE
Senior Engineer

c: Mr. David Stradtman; Rachel Development
Rick Osberg, PE; James R. Hill, Inc.
Joe Westphal, PE: Braun Intertec

AA/EOE

Table of Contents

Description **Page**

A. Introduction....1
A.1. Project Description....1
A.1.a. Structural Loads....1
A.1.b. Pavement Traffic Loads....1
A.2. Site Conditions and History....1
A.3. Purpose....2
A.4. Background Information and Reference Documents....3
A.5. Scope of Services....4
B. Results....5
B.1. Geologic Overview....5
B.2. Boring Results....5
B.3. Groundwater....6
B.4. Laboratory Test Results....6
C. Recommendations....7
C.1. Design and Construction Discussion....7
C.1.a. Building Subgrade Preparation....7
C.1.b. Reuse of On-Site Soils....7
C.1.c. Disturbance of On-Site Soils....7
C.1.d. Effects of Groundwater....8
C.2. Site Grading and Subgrade Preparation....8
C.2.a. Building Subgrade Excavations....8
C.2.b. Excavation Oversizing....9
C.2.c. Excavated Slopes....10
C.2.d. Filling on Slopes....11
C.2.e. Excavation Dewatering....11
C.2.f. Selecting Excavation Backfill and Additional Required Fill....11
C.2.g. Pavement and Exterior Slab Subgrade Preparation....11
C.2.h. Pavement Subgrade Proofroll....12
C.2.i. Engineered Fill Materials and Compaction....12
C.3. Spread Footings....14
C.3.a. Embedment Depth....14
C.3.b. Subgrade Improvement....14
C.3.c. Net Allowable Bearing Pressure....14
C.3.d. Settlement....14
C.4. Below-Grade Walls....15
C.4.a. Drainage Control....15
C.4.b. Selection, Placement, and Compaction of Backfill....16
C.4.c. Configuring and Resisting Lateral Loads....17
C.5. Interior Slabs....18
C.5.a. Moisture Vapor Protection....18
C.5.b. Radon....18
C.6. Frost Protection....18
C.7. Pavements and Exterior Slabs....20
C.7.a. Design Sections....20
C.7.b. Bituminous Pavement Materials....20

Table of Contents (continued)

Description **Page**

C.7.c. Subgrade Drainage 20
C.7.d. Performance and Maintenance 20
C.8. Utilities 21
C.8.a. Subgrade Stabilization 21
C.8.b. Selection, Placement, and Compaction of Backfill 21
C.8.c. Corrosion Potential 21
C.9. Stormwater 21
D. Procedures 22
D.1. Penetration Test Borings 22
D.2. Exploration Logs 22
D.2.a. Log of Boring Sheets 22
D.2.b. Geologic Origins 23
D.3. Material Classification and Testing 23
D.3.a. Visual and Manual Classification 23
D.3.b. Laboratory Testing 23
D.4. Groundwater Measurements 23
E. Qualifications 23
E.1. Variations in Subsurface Conditions 23
E.1.a. Material Strata 23
E.1.b. Groundwater Levels 24
E.2. Continuity of Professional Responsibility 24
E.2.a. Plan Review 24
E.2.b. Construction Observations and Testing 24
E.3. Use of Report 24
E.4. Standard of Care 25

Appendix

Soil Boring Location Sketch
Log of Boring Sheets ST-1 through ST-14
Descriptive Terminology of Soil

A. Introduction

A.1. Project Description

Rachel Development, Inc. is planning to construct a Residential Development project at the Scherber Property located north of 24910 Territorial Road in Rogers, Minnesota. The proposed development will consist of 173 single family house building pads, along with the associated streets, underground utilities, and stormwater ponds.

A.1.a. Structural Loads

We understand the residential construction will consist of one- to two-story wood framed houses with pitched roofs on poured concrete or masonry foundations. The houses will likely be slab-on-grade or have partial- to full-depth basements. Based on the residential construction, we have based our analysis and recommendations on the assumption that footing pressures will not exceed 2,000 pounds per square foot (psf). Please contact us if this information is not correct.

A.1.b. Pavement Traffic Loads

We have assumed that bituminous pavements, typical of residential neighborhoods, will be subjected to normal traffic conditions over a design life of 20 years.

A.2. Site Conditions and History

The site of the Scherber Property located north of 24910 Territorial Road in Rogers, Minnesota. The north portion of the site borders Cowley Lake. The site generally contains open cultivated fields, several wetlands, and brush and mature trees around the fields, Cowley Lake, wetlands, and property lines.

The ground surface on this site is generally flat to rolling with current grades at the boring locations ranging from about elevation 920 to 944 feet Mean Sea Level (MSL).

The following recent aerial Photograph 1 shows the current site conditions, as obtained through Google Earth.

Photograph 1. Aerial Photograph of the Site - 2023



Photograph provided by Google Earth.

A.3. Purpose

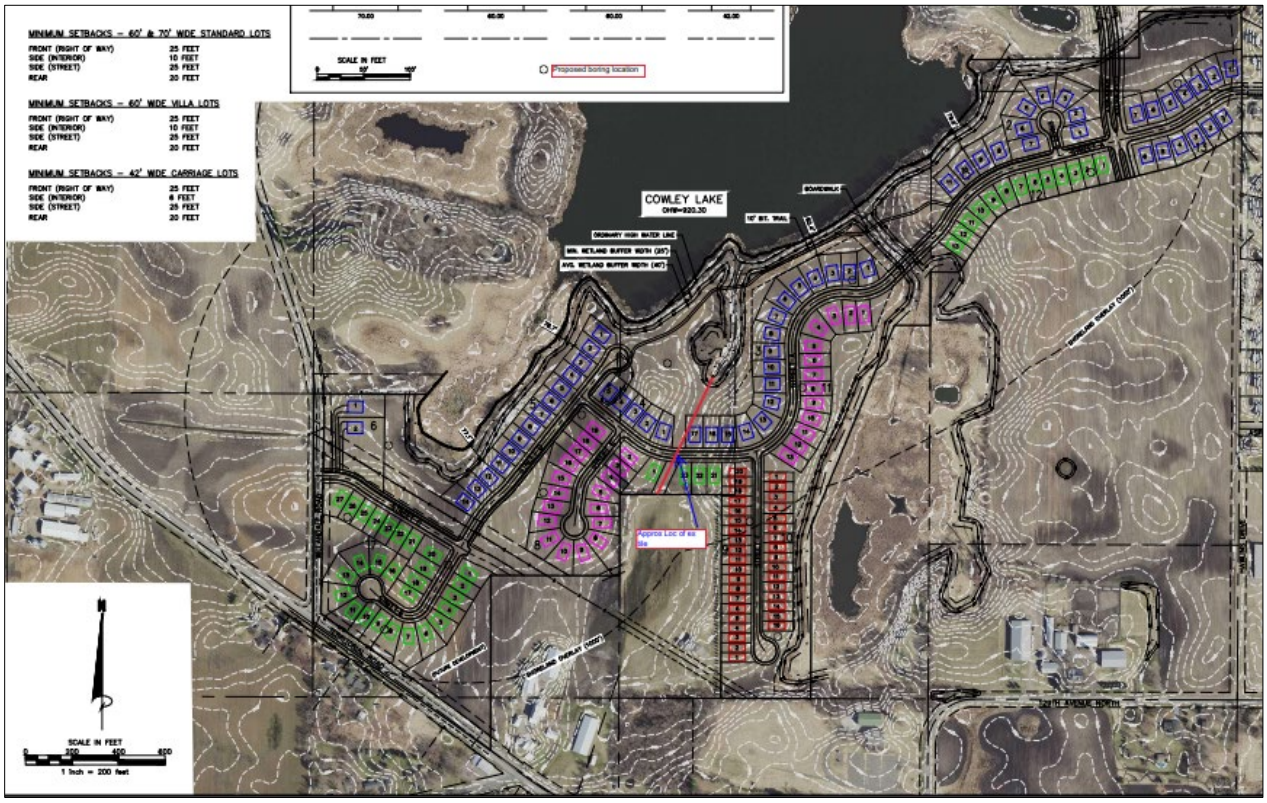
The purpose of our geotechnical evaluation will be to characterize subsurface geologic conditions at selected exploration locations and evaluate their impact on the design and construction of the proposed residential development.

A.4. Background Information and Reference Documents

We reviewed the following information:

- Available public aerial photographs showing the existing site conditions.
- Geologic atlas showing the general soil types present in this area.
- A conceptual site plan dated April 13, 2023 prepared by James R. Hill, Inc. The conceptual site plan is shown on Figure 1 below.

Figure 1. Conceptual Site Plan



We have described our understanding of the proposed construction and site to the extent others reported it to us. Depending on the extent of available information, we may have made assumptions based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, the project team should notify us. New or changed information could require additional evaluation, analyses and/or recommendations.

A.5. Scope of Services

We completed our services based on our Proposal QTB177344 for a Geotechnical Evaluation to Rachel Development, Inc., dated May 2, 2023. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Reviewing the background information and reference documents previously cited.
- Coordinating the clearing of the exploration locations of public underground utilities.
- Performing 14 standard penetration test (SPT) borings, denoted as ST-1 to ST-14, to nominal depths of 14 1/2 to 21 feet below grade across the site.
- We acquired the surface elevations and locations at the boring locations with GPS technology using the State of Minnesota's permanent GPS base station network. The Soil Boring Location sketch included in the Appendix shows the approximate boring locations.
- Performing laboratory testing on select samples to aid in soil classification and engineering analysis.
- Preparing this report containing a boring location sketch, logs of the soil borings, a summary of the soils encountered by the borings, results of laboratory tests, and recommendations for structure and pavement subgrade preparation and the design of foundations, floor slabs, exterior slabs, and utilities.

Our scope included to observe backhoe test pits excavated by Rachel Contracting, Inc. to further evaluate the site soil conditions. As of the date of this report, those test pits have not yet been scheduled.

Our geotechnical scope of services did not include environmental services or testing and our geotechnical personnel performing this evaluation are not trained to provide environmental services or testing.

B. Results

B.1. Geologic Overview

We based the geologic origins used in this report on the soil types, in-situ and laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history, geologic origins can be difficult to ascertain. We did not perform a detailed investigation of the geologic history for the site.

B.2. Boring Results

Table 1 provides a summary of the current soil boring results in the general order we encountered the strata. Please refer to the Log of Boring sheets in the Appendix for additional details. The Descriptive Terminology of Soil sheet in the Appendix includes definitions of abbreviations used in Table 1.

Table 1. Subsurface Profile Summary*

Strata	Soil Type - ASTM Classification	Range of Penetration Resistances	Commentary and Details
Topsoil	CL, SC	N/A	▪ Encountered at the surface of all 14 borings and consisted of lean clay, sandy lean clay or clayey sand. ▪ Approximately 1/2 to 2 1/2 feet thick. ▪ Dark brown and black in color with varying organic content. ▪ Moisture content generally moist.
Alluvium	CL, SC, SC-SM	2 to 6 BPF	▪ Encountered in Borings ST-1, ST-2, ST-4, ST-5, ST-7, ST-9, ST-11, ST-13, and ST-14 below the topsoil and consisted of a mixture of lean clay, clayey sand and silty clayey sand. ▪ Ranges from about 2 to 8 1/2 feet thick. Generally 2 to 3 feet thick. ▪ Contained seams of Silty Sand. ▪ Brown, dark brown and light gray in color. ▪ Moisture condition generally moist.
Glacial Till	CL-S, CL, SM, SP	3 to 65 BPF	▪ Encountered below the topsoil and/or alluvial soils at all 14 borings. ▪ Consisted of a mixture of clayey and sandy soil. ▪ Contained variable amounts of gravel. ▪ Contained lenses and seams of Sand, Silty Sand, Clayey Sand. ▪ Brown and gray in color. ▪ Moisture condition generally moist to wet.

*Abbreviations defined in the attached Descriptive Terminology of Soil sheet.

B.3. Groundwater

Table 2 summarizes the depths where we observed groundwater; the attached Log of Boring sheets in the Appendix also include this information and additional details. We have only included the borings at which water was observed in the bore holes.

Table 2. Groundwater Summary

Location	Measured Surface Elevation (feet MSL)	Measured Depth to Groundwater (feet)	Corresponding Groundwater Elevation (feet MSL)
ST-4	929.9	18	912
ST-5	935.5	20	915 1/2
ST-6	930.8	12	919

The MN DNR indicates the Ordinary High-Water level of Cowley Lake to be 920.3 feet.

Groundwater may take days or longer to reach equilibrium in the boreholes, and we immediately backfilled the boreholes, in accordance with our scope of work. The groundwater levels at the site are likely related to the water level of Cowley Lake. Seasonal and annual fluctuations of groundwater should be anticipated.

B.4. Laboratory Test Results

The boring logs show the results of the moisture content and percent passing a #200 sieve laboratory testing we performed, next to the tested sample depth. The laboratory tests were all completed in general conformance with the applicable ASTM standards. The Log of Boring sheets are included in the Appendix of this report.

The moisture content tests (ASTM D2218) of the selected clayey soil samples tested ranged from 18 to 30 percent, indicating the clayey soils were near to above the soils' estimated optimum moisture content.

One soil sample from the 5-foot depth in Boring ST-3 was washed through a number 200 sieve (ASTM C117) to assist in classifying the soil. The result was 14 percent passing the number 200 sieve, classifying this soil as silty sand. The moisture content of this soil sample was 33 percent.

A number of pocket penetrometer tests were performed on selected clayey soil samples to assist in determining the unconfined compressive strengths of these soils. The results indicated penetrometer tests ranging from about 1/4 to 2 tons per square foot (tsf).

C. Recommendations

C.1. Design and Construction Discussion

C.1.a. Building Subgrade Preparation

Based on the results of our subsurface exploration and evaluation, spread footing foundations bearing on engineered fill and/or native soils can support the proposed houses, after performing typical subgrade preparation. Typical subgrade preparation includes removal of the vegetation, topsoil, existing fill, soft clays, and any other unsuitable soils, along with proper compaction of the required fill soils. Also any relic buried structures – such as old pavements, wells, tile lines, cisterns or foundations, etc., should be removed from building pads and paved areas.

Although preliminary grading plans were not available, we anticipate cuts and fills within the development could range from 1 to 10 feet from existing grades. Any soil correction work could add or subtract to the cut and fill depths.

C.1.b. Reuse of On-Site Soils

The on-site native soils, free of organic materials and debris, appear suitable for reuse as engineered fill. Some of the on-site soils will likely require moisture conditioning (drying or wetting) prior to reuse and compaction.

However, we caution that the alluvial clays encountered on the site are moisture sensitive and will likely be difficult for reuse as engineered fill in building or roadway areas. Additional moisture conditioning (drying) will likely be required prior to reuse for structural fill. Any materials to be used as engineered fill should be tested and approved by the geotechnical engineer prior to placement.

C.1.c. Disturbance of On-Site Soils

We caution that the silty or clayey nature of some of the site soils makes them susceptible to disturbance from construction. Care should be taken not to disturb these soils during construction as once stable subgrades can be destabilized and require additional moisture conditioning and compacting or excavation and replacement of the disturbed or unstable soils.

We recommend any loose or disturbed sandy soils be moisture conditioned, if necessary, and surface compacted prior to engineered fill and/or footing placement.

C.1.d. Effects of Groundwater

Groundwater is anticipated to be encountered during the site grading and utility construction in deeper excavation areas at this site. Despite the groundwater levels observed in the soil borings, we anticipate water will be at or slightly above the Ordinary High Water (OHW) level of Cowley Lake near 920.3 feet MSL, although perched water could be present at higher elevations.

The contractor should immediately remove any collected water within the excavations to facilitate construction and proper backfilling. Project planning should include temporary sumps and pumps for excavations in low-permeability soils, such as clays and silts. Dewatering of high-permeability soils (e.g., sands) from within the excavation with conventional pumps has the potential to loosen the soils, due to upward flow, and we recommend that well points or dewatering wells be used in these areas.

The low floor of the proposed house sites should include a vertical separation from the OHW level of the lake. The amount of separation required varies by city and county building code. Foundation drain tile and sump pumps are highly recommended for each unit, regardless of vertical separation amounts.

C.2. Site Grading and Subgrade Preparation

C.2.a. Building Subgrade Excavations

Based on the soil boring information, we have estimated the depths of soil corrections for building pads. We recommend removing unsuitable materials from beneath house pads and oversize areas. We define unsuitable materials as vegetation, topsoil, organic soils, existing fill, soft clays and any other unsuitable soils. Table 3 shows the anticipated excavation depths and bottom of excavation elevations at each of the current soil boring.

Table 3. Recommended Excavation Depths for Building Pads

Location	Measured Surface Elevation (feet MSL)	Anticipated Excavation Depth (feet)	Anticipated Bottom Elevation (feet MSL)
ST-1	924.7	Pond	---
ST-2	939.0	1 ½ – 4*	937 ½-935*
ST-3	944.2	1	943
ST-4	929.9	2 ½ – 4*	927 ½-926*
ST-5	935.5	1	934 ½
ST-6	930.8	1 ½	929
ST-7	928.9	Pond	---
ST-8	934.9	½	934 ½

Location	Measured Surface Elevation (feet MSL)	Anticipated Excavation Depth (feet)	Anticipated Bottom Elevation (feet MSL)
ST-9	934.5	2	932 ½
ST-10	937.3	1 ½	935 ½
ST-11	931.1	2	929
ST-12	933.7	4	929 ½
ST-13	930.6	4	926 ½
ST-14	920.4	Pond	---

*Provided Range, final correct depth to be determined in the field during site grading.

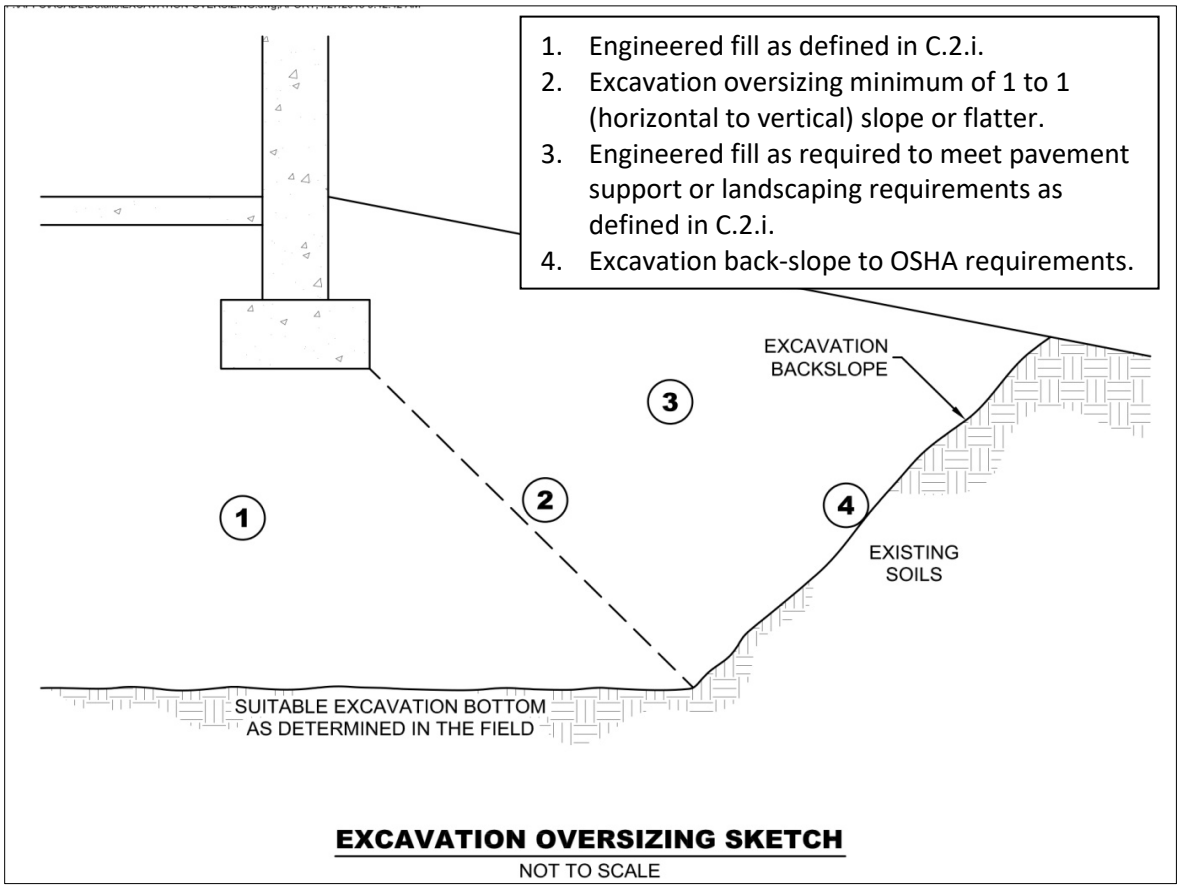
Excavation depths will vary between the borings. Portions of the excavations may also extend deeper than indicated by the borings. A geotechnical representative should observe the excavations to make the necessary field judgments regarding the suitability of the exposed soils. Any loose or disturbed areas should be recompacted.

Several borings encountered layers of softer alluvial clays. These soils can be moisture sensitive and easily disturbed. The contractor should use equipment and techniques to minimize soil disturbance. If soils become disturbed or are wet, we recommend excavation and replacement of the disturbed or unstable soils.

C.2.b. Excavation Oversizing

When removing unsuitable materials below structures or pavements, we recommend the excavation extend outward and downward at a slope of 1H:1V (horizontal:vertical) or flatter. See Figure 2 for an illustration of excavation oversizing.

Figure 2. Generalized Illustration of Oversizing



C.2.c. Excavated Slopes

Based on the borings, we anticipate on-site soils in excavations will consist of mostly clayey soils. The clayey soils are typically considered Type B Soil under OSHA (Occupational Safety and Health Administration) guidelines. OSHA guidelines indicate unsupported excavations in Type B soils should have a gradient no steeper than 1H:1V. Slopes constructed in this manner may still exhibit surface sloughing. OSHA requires an engineer to evaluate slopes or excavations over 20 feet in depth.

An OSHA-approved qualified person should review the soil classification in the field. Excavations must comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, “Excavations and Trenches.” This document states excavation safety is the responsibility of the contractor. The project specifications should reference these OSHA requirements.

C.2.d. Filling on Slopes

Where existing grades or soil correction excavation grades are steeper than 5H:1V, we recommend placing fill from low to high elevations on horizontal benches cut into the native soils so that successive lifts are spread and compacted on level surfaces, and a potential failure surface is not created along the fill's lower boundary. Depending on fill requirements, the contractor can construct benches by cutting into existing grades while placing fill (the composition of the exposed soils thus being in compliance with fill specifications), or by cutting the benches in advance of filling (to prevent mixing with soils not in compliance with fill specifications). The height of a given bench may vary but the width should consistently be great enough to accommodate compaction equipment.

C.2.e. Excavation Dewatering

At the time of the soil borings, groundwater was encountered in 3 of the 14 borings between depths of about 12 to 20 feet below the ground surface. If encountered during site grading or utility construction, groundwater should be removed from the excavations. Project planning should include temporary sumps and pumps for excavations in low-permeability soils, such as clays and silts, and well points or dewatering wells in high-permeability soils, such as sands.

C.2.f. Selecting Excavation Backfill and Additional Required Fill

On-site soils free of organic soil and debris can be considered for reuse as backfill and fill. However, the topsoil and the organic soils should not be reused as engineered fill under building pads or below streets. Also, the alluvial clay soils exhibit a high sensitivity to moisture and if it is necessary to use these soil types in building pad areas, the moisture contents will need to comply with the requirements of those listed in Table 5. These soils will then need to be placed in thin lifts and should have close supervision and testing.

Unless a drainage composite is placed against the backs of the exterior perimeter basement walls, we recommend that backfill placed within 2 horizontal feet of those walls consist of sand having less than 50 percent of the particles, by weight, passing a #40 sieve and less than 10 percent of the particles, by weight, passing a #200 sieve. We recommend that the balance of the backfill placed against exterior perimeter walls also consist of sand; although it is our opinion that the sand may contain up to 20 percent of the particles, by weight, passing a #200 sieve.

C.2.g. Pavement and Exterior Slab Subgrade Preparation

We recommend the following steps for pavement and exterior slab subgrade preparation. Note that project planning may need to require additional subcuts to limit frost heave.

1. Strip unsuitable soils consisting of topsoil, organic soils, vegetation, and soft clays from the area, down to suitable native soils.

2. Have a geotechnical representative observe the excavated subgrade to evaluate if additional subgrade improvements are necessary.

3. Slope subgrade soils to areas of sand or drain tile to allow the removal of accumulating water.

4. Place pavement fill to grade and compact in accordance with Section C.2.i. to bottom of pavement and/or exterior slab section.

5. Proofroll the pavement or exterior slab subgrade as described in Section C.2.h.

C.2.h. Pavement Subgrade Proofroll

After preparing the subgrade as described above and prior to the placement of the aggregate base, we recommend proofrolling the subgrade soils with a fully loaded tandem-axle truck. We also recommend having a geotechnical representative observe the proofroll. Areas that fail the proofroll likely indicate soft or weak areas that will require additional soil correction work to support pavements or slabs.

The contractor should correct areas that display excessive yielding or rutting during the proofroll, as determined by the geotechnical representative. Possible options for subgrade correction include moisture conditioning and re-compaction, subcutting and replacement with soil or crushed aggregate, chemical stabilization and/or geotextiles. We recommend performing a second proofroll after the aggregate base material is in place, and prior to placing bituminous or concrete pavement/slabs.

C.2.i. Engineered Fill Materials and Compaction

Table 4 that follows contains our recommendations for engineered fill materials.

Table 4. Engineered Fill Materials*

Locations To Be Used	Engineered Fill Classification	Possible Soil Type Descriptions	Gradation	Additional Requirements
▪ Below foundations ▪ Below interior slabs	Structural fill	SP, SP-SM, SM, SC, CL	100% passing 2-inch sieve	< 2% Organic Content (OC) Plasticity Index (PI) < 20%
▪ Drainage layer ▪ Non-frost-susceptible	▪ Free-draining ▪ Non-frost-susceptible fill	GP, GW, SP, SP-SM, SW	100% passing 1-inch sieve < 50% passing #40 sieve < 10% passing #200 sieve	< 2% OC

Locations To Be Used	Engineered Fill Classification	Possible Soil Type Descriptions	Gradation	Additional Requirements
Behind below-grade walls, beyond drainage layer	Retained fill	SP, SP-SM, SM	100% passing 3-inch sieve < 20% passing #200 sieve	< 2% OC PI < 4%
Pavements	Pavement fill	SP, SP-SM, SM, SC, CL	100% passing 3-inch sieve	< 2% OC PI < 20%
Below landscaped surfaces, where subsidence is not a concern	Non-structural fill	SP, SP-SM, SM, SC, ML, CL, CH, OL	100% passing 6-inch sieve	< 10% OC

*More select soils comprised of coarse sands with < 5 percent passing #200 sieve may be needed to accommodate work occurring in periods of wet or freezing weather.

We recommend spreading fill in loose lifts of approximately 8 inches thick. We recommend compacting each lift of fill with a full size vibratory or sheepsfoot compactor in accordance with the criteria presented in Table 5. The project documents should specify relative compaction of fill, based on the structure located above the fill, and vertical proximity to that structure.

Table 5. Compaction Recommendations Summary

Reference	Relative Compaction, percent (ASTM D698 – Standard Proctor)	Moisture Content Variance from Optimum, percentage points
Below foundations, less than 10 feet of fill	95	-1 to +3 for clayey soils ±3 for sandy soils
Below foundations, greater than 10 feet of fill	98	-1 to +2 for clayey soils ±3 for sandy soils
Below slabs	95	-1 to +3 for clayey soils ±3 for sandy soils
Below pavements, within 3 feet of top of subgrade elevations	100	-2 to +1 for clayey soils ±3 for sandy soils
Below pavements, more than 3 feet below subgrade elevations	95	-1 to +3 for clayey soils ±3 for sandy soils
Below landscaped surfaces	90	-1 to +5 for clayey soils ±6 for sandy soils

The project documents should not allow the contractor to use frozen material as fill or to place fill on frozen material. Frost should not penetrate under foundations during construction.

We recommend performing density tests in fill to evaluate if the contractors are effectively compacting the soil and meeting project requirements.

Based on the need for some deeper soil correction work, it is likely that some of the house pads will require more than 10 feet of compacted fill. If only clay fill is used to fill those house pads where more

than 10 feet of fill is needed, a construction delay ranging from 6 to 12 months may be needed, depending on the final depths of clay fill used. As an alternative, on lots where deep fills are needed, clean sand fill (less than 12 percent passing the number 200 sieve) could be used to initially fill the excavations below these house pads. The clean sand fill should be placed in thin compacted lifts up to an elevation of 10 feet or less from finished basement floor grades. On-site clay fill can then be used to complete construction of the building pads. If the alternative method of filling the house pads partially with sand is used, a construction delay would not be needed.

C.3. Spread Footings

C.3.a. Embedment Depth

For frost protection, we recommend embedding perimeter footings of the structures, including attached garages, a minimum of 42 inches below the lowest exterior grade. Interior footings may be placed directly below floor slabs unless they will be subjected to freezing. We recommend embedding building footings not heated during winter construction, and other unheated footings associated with decks, porches, stoops, or sidewalks 60 inches below the lowest exterior grade.

C.3.b. Subgrade Improvement

If a small amount of groundwater is present within the footing excavation, or if the footing subgrade soils become disturbed prior to placing forms or reinforcement, we recommend subcutting any soft or wet soil and placing a 6- to 12-inch layer of clear rock. The clear rock will provide a stable working surface and will allow for the flow of water to a drain tile or sump pump.

C.3.c. Net Allowable Bearing Pressure

We recommend sizing spread footings to exert a net allowable bearing pressure of up to 2,000 pounds per square foot (psf). This value includes a safety factor of at least 3.0 with regard to bearing capacity failure.

C.3.d. Settlement

We estimate that total and differential settlements among the footings will amount to less than 1 and 1/2 inch, respectively, under the assumed loads. If there are areas where more than 10 feet of fill is required, higher settlements could occur, unless the deeper fill areas are only filled with poorly graded sand (SP) or poorly graded sand with silt (SP-SM) fill.

Please contact us prior to construction if there will be areas of fill placement in excess of 10 feet thick in building pad areas. If deep fill areas are completed using clay soil, a construction delay may also be needed to allow the fill soils to consolidate under its own weight. Construction delays could range from 6 to 12 months, depending on the type of fill used, the compaction level obtained in the fill and the

thickness of the fill. The construction delays should be evaluated after grading is completed by using settlement plates to monitor the consolidation of the fill.

C.4. Below-Grade Walls

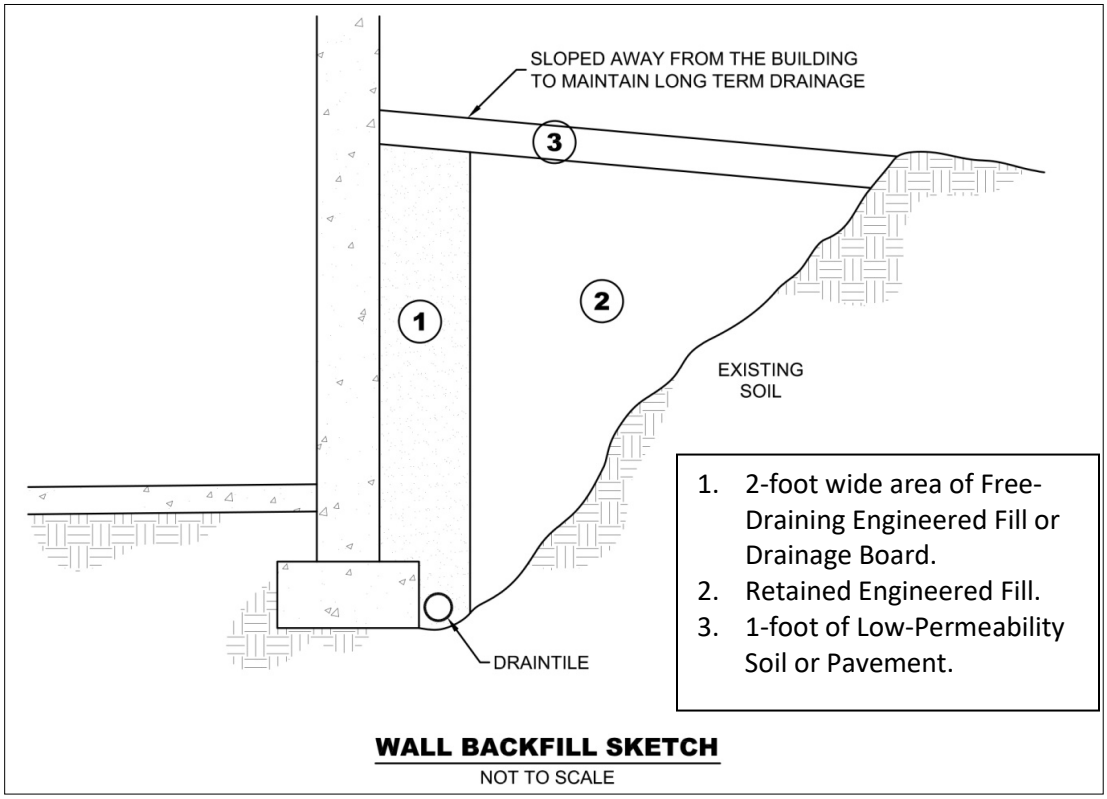
The following sections address soil parameters for basement wall design. Although construction of retaining walls has not been specified for this project to date, the following recommendations can also be used for preliminary retaining wall design. Depending on the location and height of potential walls, we recommend that additional soil borings may be completed for final retaining wall design.

C.4.a. Drainage Control

We recommend installing drain tile to remove water behind the below-grade walls at the location shown in Figure 3. The below-grade wall drainage system should also incorporate free-draining, engineered fill or a drainage board placed against the wall and connected to the drain tile.

Even with the use of free-draining, engineered fill, we recommend general waterproofing of below-grade walls that surround occupied or potentially occupied areas because of the potential cost impacts related to seepage after construction is complete.

Figure 3. Generalized Illustration of Wall Engineered Fill



The materials listed in the sketch should meet the definitions in Section C.2.i. Low-permeability material is capable of directing water away from the wall, like clay, topsoil, or pavement. The project documents should indicate if the contractor should brace the walls prior to filling, and the allowable unbalanced fill heights.

As shown in Figure 2, we recommend Zone 2 consist of retained, engineered fill, and this material will control lateral pressures on the wall. However, we are also providing design parameters for using other engineered fill material. If final design uses non-sand material for engineered fill, project planning should account for the following items:

- Other engineered fill material may result in higher lateral pressure on the wall.
- Other engineered fill material may be more difficult to compact.
- Post-construction consolidation of other engineered fill material may result in settlement-related damage to the structures or slabs supported on the engineered fill. Post-construction settlement of other engineered fill material may also cause drainage towards the structure. The magnitude of consolidation could be up to about 3 percent of the wall fill thickness.

C.4.b. Selection, Placement, and Compaction of Backfill

Unless a drainage composite is placed against the backs of the exterior perimeter basement walls, we recommend that backfill placed within 2 horizontal feet of those walls consist of sand having less than 50 percent of the particles, by weight, passing a #40 sieve and less than 10 percent of the particles, by weight, passing a #200 sieve. Sand meeting this gradation will likely be present on parts of the site. We recommend that the balance of the backfill placed against exterior perimeter walls also consist of sand, though it is our opinion that the sand may contain up to 20 percent of the particles, by weight, passing a #200 sieve.

If clay or silt must be considered for use to make up the balance of the below-grade wall backfill (assuming a drainage composite or sand is placed against the backs of the walls), post-compaction consolidation of the clay occurring under its own weight can be expected to continue beyond the end of construction. The magnitude of consolidation could typically amount to between 1 and 3 percent of the backfill thickness, or wall height, and if not accommodated, could cause slabs or pavements to settle unfavorably or be damaged.

Should clay or silt still be considered for use as backfill, however, we further recommend that:

- The bottoms of the excavations required for basement wall construction are wide enough to accommodate compaction equipment.
- Backfill is placed at moisture contents at least equal to, but not more than, 3 percentage points above its optimum moisture content.
- Backfill is placed in loose lifts no thicker than 6 inches prior to compaction.
- The relative compaction of the backfill is measured through density testing at intervals not exceeding one test per 50 horizontal feet for each 2 vertical feet of backfill placed.

We recommend using a walk behind compactor to compact the backfill placed within about 5 feet of the basement walls. Further away than that, a self-propelled compactor can be used. Compaction criteria for basement walls should be determined based on the compaction recommendations provided above in Section C.2.i.

Exterior backfill not capped with slabs or pavement should be capped with a low-permeability soil to limit the infiltration of surface drainage into the backfill. The finished surface should also be sloped to divert water away from the walls.

C.4.c. Configuring and Resisting Lateral Loads

Below-grade wall design can use active earth pressure conditions, if the walls can rotate slightly. If the wall design cannot tolerate rotation, then design should use at-rest earth pressure conditions. Rotation up to 0.002 times the wall height is generally required for walls supporting sand. Rotation up to 0.02 times the wall height is required when wall supports clay.

Table 6 presents our recommended lateral coefficients and equivalent fluid pressures for wall design of active, at-rest, and passive earth pressure conditions. The table also provides recommended wet unit weights and internal friction angles. Designs should also consider the slope of any engineered fill and dead or live loads placed behind the walls within a horizontal distance that is equal to the height of the walls. Our recommended values assume the wall design provides drainage so water cannot accumulate behind the walls. The construction documents should clearly identify what soils the contractor should use for engineered fill of walls.

Table 6. Recommended Below-Grade Wall Design Parameters – Drained Conditions

Retained Soil	Wet Unit Weight (pcf)	Friction Angle (degrees)	Equivalent Active Fluid Pressure* (pcf)	Equivalent At-Rest Fluid Pressure* (pcf)	Equivalent Passive Fluid Pressure* (pcf)
Sand (SP, SP-SM)	120	33	35	55	405
Silty sand (SM)	130	30	42	62	390
Clayey sand, clay, silt (SC, CL, ML)	125	26	50	70	320

*Based on Rankine model for soils in a region behind the wall extending at least 2 horizontal feet beyond the bottom outer edges of the wall footings and then rising up and away from the wall at an angle no steeper than 60 degrees from horizontal.

Sliding resistance between the bottom of the footing and the soil can also resist lateral pressures. We recommend assuming a sliding coefficient equal to 0.30 between the concrete and clay or silt soil and a coefficient equal to 0.40 between concrete and sand soils.

The values presented in this section are un-factored.

C.5. Interior Slabs

C.5.a. Moisture Vapor Protection

Excess transmission of water vapor could cause floor dampness, certain types of floor bonding agents to separate, or mold to form under floor coverings. If project planning includes using floor coverings or coatings, we recommend placing a vapor retarder or vapor barrier immediately beneath the slab. We also recommend consulting with floor covering manufacturers regarding the appropriate type, use, and installation of the vapor retarder or barrier to preserve warranty assurances.

C.5.b. Radon

We recommend installing a radon mitigation system in occupied spaces in accordance with local building code. Our certified and licensed radon mitigation professionals can assist in this design, at your request.

C.6. Frost Protection

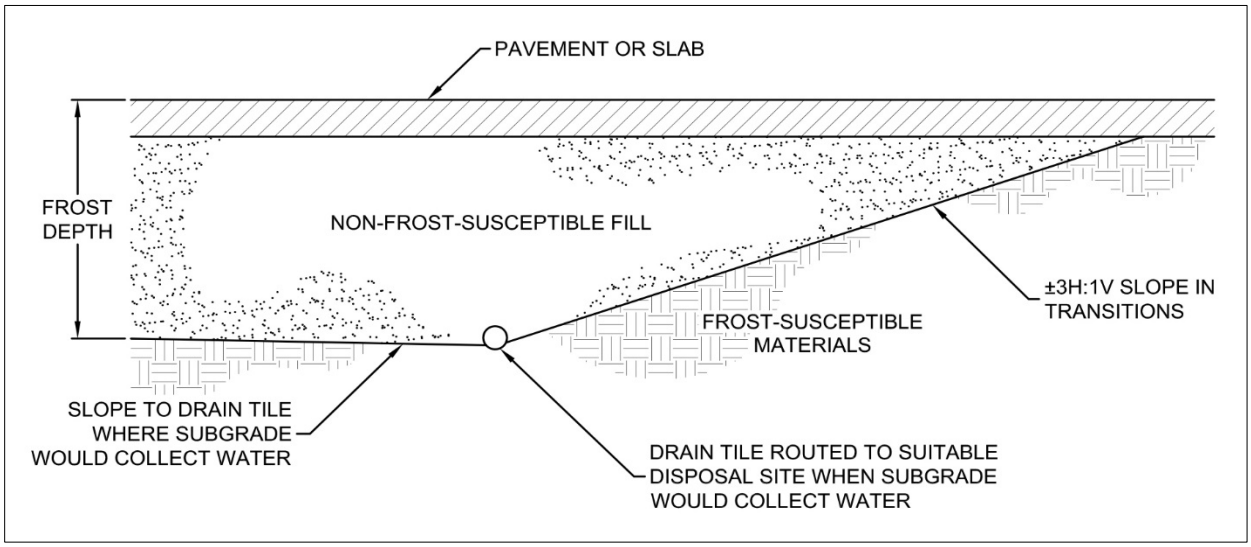
We consider the on-site clayey and silty sand soil to be moderately to highly frost susceptible. While the proposed construction will remove some of these soils, unfavorable amounts of heaving could occur if these soils become saturated and freeze. Grading to direct surface drainage away from buildings helps

limit the potential for saturation and subsequent heaving to occur. Still, even limited amounts of movement can create tripping hazards.

One method to help limit the potential for heaving to occur is to remove frost-susceptible soils present below the overlying slab or pavement area down to bottom-of-footing grades and replace the excavated material with non-frost-susceptible, engineered fill. We recommend providing drainage at the base of the subcut, as well as gradual transitions from this subcut (3H:1V or flatter gradient).

Figure 4 shows an illustration summarizing some of the recommendations above.

Figure 4. Frost Protection Geometry Illustration



An alternative method to reduce the risk of heaving is to support the slabs on frost-depth footings and suspend the slabs at least 4 inches above the underlying subgrade soils. With this alternative, we recommend making accommodations for differential frost heave at transition areas.

Over the life of the pavement or slab, cracks may develop, and joints may open up, which will expose the subgrade and allow water to enter the subgrade. This water entering the subgrade increases the likelihood of heave. It will be critical that the owner develop a detailed maintenance program to repair any cracks and joints that may develop during the useful life of the various surface features. The maintenance program should pay special attention to areas where dissimilar materials abut one another, where construction joints occur and where shrinkage cracks develop.

C.7. Pavements and Exterior Slabs

C.7.a. Design Sections

Our scope of services for this project did not include laboratory tests on subgrade soils to determine an R-value for pavement design. Since most of the soils present on this site consist of sandy lean clays, we recommend pavement design assume an R-value of 12. We assumed that pavements for the residential development will be subject to a maximum of 50,000 ESAL's over a 20-year design life.

We assume that the pavements will be constructed in accordance with the City of Rogers standard section, which includes a sand subbase.

C.7.b. Bituminous Pavement Materials

Appropriate mix designs are critical to the performance of flexible pavements. We can provide recommendations for pavement material selection during final pavement design.

C.7.c. Subgrade Drainage

We recommend installing perforated drainpipes throughout pavement areas at low points, around catch basins, and behind curb in landscaped areas. We also recommend installing drainpipes along pavement and exterior slab edges where exterior grades promote drainage toward those edge areas. The contractor should place drainpipes at the bottom of the sand subbase material.

C.7.d. Performance and Maintenance

The pavement designs are typically based on a 20-year performance life for bituminous. This is the amount of time before we anticipate the pavement will require reconstruction. This performance life assumes routine maintenance, such as seal coating and crack sealing. The actual pavement life will vary depending on variations in weather, traffic conditions, and maintenance.

It is common to place the non-wear course of bituminous and then delay placement of wear course. For this situation, we recommend evaluating if the reduced pavement section will have sufficient structure to support construction traffic.

Many conditions affect the overall performance of the exterior slabs and pavements. Some of these conditions include the environment, loading conditions and the level of ongoing maintenance. With regard to bituminous pavements in particular, it is common to have thermal cracking develop within the first few years of placement and continue throughout the life of the pavement. We recommend developing a regular maintenance plan for filling cracks in exterior slabs and pavements to lessen the

potential impacts for cold weather distress due to frost heave or warm weather distress due to wetting and softening of the subgrade.

C.8. Utilities

C.8.a. Subgrade Stabilization

Earthwork activities associated with utility installations located inside the building area should adhere to the recommendations in Section C.2.

For exterior utilities, we anticipate the soils at typical invert elevations will be suitable for utility support. However, if construction encounters unfavorable conditions such as soft clay, organic soils, or perched water at invert grades, the unsuitable soils may require some additional subcutting and replacement with sand or crushed rock to prepare a proper subgrade for pipe support. Project design and construction should not place utilities within the 1H:1V oversizing of foundations.

C.8.b. Selection, Placement, and Compaction of Backfill

We recommend selecting, placing, and compacting utility trench backfill in accordance with the recommendations provided above in Section C.2.i.

C.8.c. Corrosion Potential

Based on our experience, the clayey soils generally encountered by the borings are moderately corrosive to metallic conduits. We recommend specifying non-corrosive materials or providing corrosion protection, unless project planning chooses to perform additional tests to demonstrate the soils are not corrosive.

C.9. Stormwater

Based on the abundance of clayey, fine grained soils encountered within the soil borings, we do not recommend infiltration of stormwater at this site. The site soils are judged to be in the Hydrologic Soil Group D according to the Minnesota Stormwater manual. However, if a design is requested, we offer the following.

If Infiltration basins are proposed, we recommend field-testing of in-situ soils, such as double-ring infiltrometer tests (ASTM D3385), to determine infiltration rates. Alternatively, preliminary infiltration rates can be found in the Minnesota Stormwater Manual based on soil types.

Fine-grained soils (silts and clays), topsoil, or organic matter that mixes into or washes onto the soil will lower the permeability of an infiltration/filtration basin. The contractor should maintain and protect infiltration areas during construction. Furthermore, organic matter and silt washed into the system after construction can fill the soil pores and reduce permeability over time. Proper maintenance is important for long-term performance of infiltration/filtration systems.

This geotechnical evaluation does not constitute a review of site suitability for stormwater infiltration or evaluate the potential impacts, if any, from infiltration of large amounts of stormwater.

D. Procedures

D.1. Penetration Test Borings

We drilled the penetration test borings on May 12 and 15, 2023, with an off-road-mounted core and auger drill equipped with hollow-stem auger. We performed the borings in general accordance with ASTM D6151 taking penetration test samples at 2 1/2- or 5-foot intervals in general accordance to ASTM D1586. The boring logs show the actual sample intervals and corresponding depths.

We sealed the penetration test boreholes meeting the Minnesota Department of Health (MDH) Environmental Borehole criteria with an MDH-approved grout. A sealing record was submitted to MDH, as required.

D.2. Exploration Logs

D.2.a. Log of Boring Sheets

The Appendix includes Log of Boring sheets for our penetration test borings. The logs identify and describe the penetrated geologic materials and present the results of penetration resistance and other in-situ tests performed. The logs also present the results of laboratory tests performed on penetration test samples, and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

D.2.b. Geologic Origins

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance in-situ testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

D.3. Material Classification and Testing

D.3.a. Visual and Manual Classification

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

D.3.b. Laboratory Testing

The exploration logs in the Appendix note the results of the laboratory tests performed on geologic material samples. We performed the tests in general accordance with ASTM procedures.

D.4. Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test borings, and again after auger withdrawal. We then filled the boreholes, as noted on the boring logs.

E. Qualifications

E.1. Variations in Subsurface Conditions

E.1.a. Material Strata

We developed our evaluation, analyses, and recommendations from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses to some extent. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation, and thickness, away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work or starting construction. If future activity for this project reveals any such variations, you should notify us so that we may reevaluate our recommendations. Such variations could increase construction costs, and we recommend including a contingency to accommodate them.

E.1.b. Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs and interpreted in the text of this report. Note that the observation periods were relatively short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications, and other seasonal and annual factors.

E.2. Continuity of Professional Responsibility

E.2.a. Plan Review

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. Braun Intertec should be retained to review the geotechnical aspects of the designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations. Braun Intertec should also be retained to complete the soil observations and testing as the site is being graded.

E.2.b. Construction Observations and Testing

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those encountered by the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.

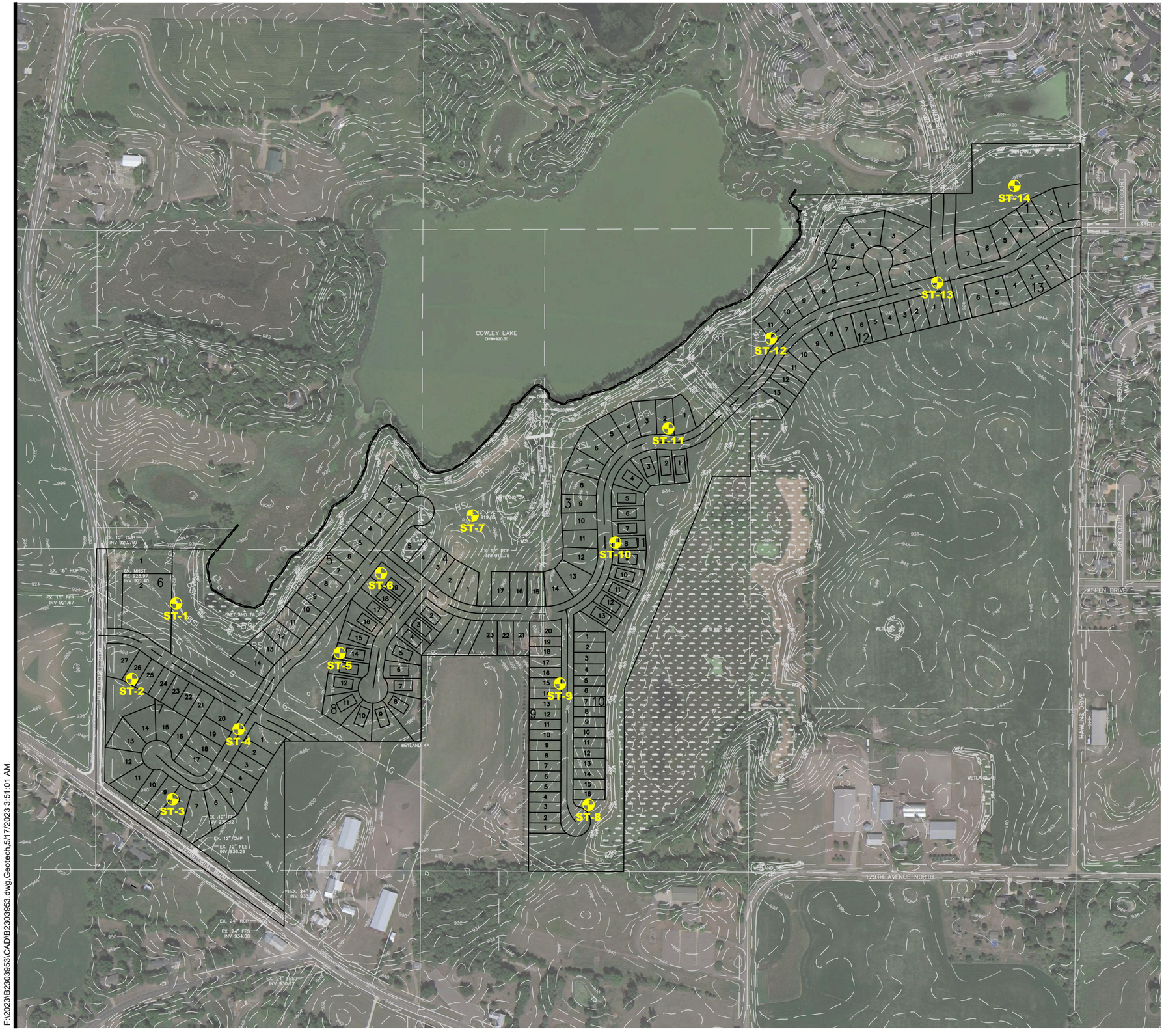
E.3. Use of Report

This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses, and recommendations may not be appropriate for other parties or projects.

E.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix



DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

200' 0 400'

SCALE: 1"= 400'

F:\2023\B2303953\CAD\B2303953.dwg,Geotech,5/17/2023 3:51:01 AM

BRAUN INTERTEC
The Science You Build On.

11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Drawing Information

Project No:	B2303953
Drawing No:	B2303953
Drawn By:	JAG
Date Drawn:	5/3/23
Checked By:	JLW
Last Modified:	5/17/23

Project Information

Scherber Property

North of
24910 Territorial Road

Rogers, Minnesota

Soil Boring Location Sketch

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-1**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 246215 EASTING: 444782
DRILLER: S. Hull LOGGED BY: H. Vloo START DATE: 05/11/23 END DATE: 05/11/23
SURFACE ELEVATION: 924.7 ft RIG: 75011 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
923.7		LEAN CLAY (CL), organic, dark brown, moist (TOPSOIL)					
1.0		LEAN CLAY (CL), grayish brown, moist, soft (ALLUVIUM)		1-2-2 (4) 8"	0.25	30	
920.7							
4.0		SANDY LEAN CLAY (CL), trace Gravel, with lens of Silty Sand, brown, moist, medium (GLACIAL TILL)	5	2-3-3 (6) 18"	0.75		
917.7							
7.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		2-4-4 (8) 18"	1.5	21	
			10	3-5-6 (11) 18"			
				3-4-6-6 (10) 24"			
910.2							
14.5		END OF BORING Boring immediately backfilled	15				Water not observed while drilling.
			20				
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-2**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 245909 EASTING: 444603
DRILLER: S. Hull LOGGED BY: H. Vloo START DATE: 05/11/23 END DATE: 05/11/23
SURFACE ELEVATION: 939.0 ft RIG: 75011 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
937.5		LEAN CLAY (CL), organic, dark brown, moist (TOPSOIL)					
1.5 935.0		CLAYEY SAND (SC), trace Gravel, contains seams of Silty Sand, brown, moist, medium (ALLUVIUM)		1-2-3 (5) 12"	0.25	23	
4.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to very stiff (GLACIAL TILL)		1-3-4 (7) 10"	1.25	21	
				3-5-6 (11) 18"			
				4-6-9 (15) 18"			
924.5				4-8-9-11 (17) 24"			
14.5		END OF BORING Boring immediately backfilled					Water not observed while drilling.

5 10 15 20 25 30

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-3**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 245421 EASTING: 444767
DRILLER: S. Hull LOGGED BY: H. Vloo START DATE: 05/11/23 END DATE: 05/11/23
SURFACE ELEVATION: 944.2 ft RIG: 75011 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
943.2		LEAN CLAY (CL), organic, dark brown, moist (TOPSOIL)					
1.0		SANDY LEAN CLAY (CL), contains seams of Silty Sand, brown, moist, medium (GLACIAL TILL)		1-3-4 (7) 14"	0.5	26	
940.2							
4.0		SILTY SAND (SM), fine to medium-grained, brown, moist, loose (GLACIAL TILL)		3-4-5 (9) 12"		33	P200=14%
937.2							
7.0		LEAN CLAY (CL), brown, moist, medium (GLACIAL TILL)		2-3-5 (8) 16"	1.25		
935.2							
9.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		2-3-5 (8) 18"			
				3-4-6-6 (10) 24"			
929.7							
14.5		END OF BORING Boring immediately backfilled					Water not observed while drilling.

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-4**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 245705 EASTING: 445035
DRILLER: S. Hull LOGGED BY: H. Vloo START DATE: 05/11/23 END DATE: 05/11/23
SURFACE ELEVATION: 929.9 ft RIG: 75011 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
927.4		LEAN CLAY (CL), organic, black, moist (TOPSOIL)					
2.5		SILTY, CLAYEY SAND (SC-SM), fine to medium-grained, light gray, moist, very loose to loose (ALLUVIUM)		2-2-2 (4) 6"			
923.9			5	2-2-4 (6) 10"		30	
6.0		SANDY LEAN CLAY (CL), grayish brown to gray, moist, stiff to medium (GLACIAL TILL)		2-4-6 (10) 16"		18	
			10	3-4-5 (9) 14"	1.25		
				3-3-4 (7) 16"	1.5		
			15	2-3-4 (7) 18"			
911.9	▽						
18.0		POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, gray, wet, very loose (GLACIAL OUTWASH)					
			20	1-0-4 (4) 18"			
908.9							
21.0		END OF BORING					Water observed at 18.0 feet while drilling.
		Boring immediately backfilled with bentonite grout					
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-5**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 246014 EASTING: 445446
DRILLER: J. Tatro LOGGED BY: H. Vloo START DATE: 05/12/23 END DATE: 05/12/23
SURFACE ELEVATION: 935.5 ft RIG: 75011 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
934.5		LEAN CLAY (CL), organic, dark brown, moist (TOPSOIL)					
1.0		LEAN CLAY with SAND (CL), brown, moist, medium (ALLUVIUM)		2-2-3 (5) 10"	0.75	28	
931.5							
4.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)	5	2-3-3 (6) 12"	1	21	
				3-4-6 (10) 18"	2		
			10	3-4-5 (9) 16"	2		
923.5							
12.0		SANDY LEAN CLAY (CL), trace Gravel, gray, moist, stiff to very stiff (GLACIAL TILL)		4-6-9 (15) 18"			
			15	6-7-10 (17) 18"			
917.5							
18.0	▽	SILTY SAND (SM), fine-grained, brown, moist to wet, dense (GLACIAL TILL)	20	16-17-19 (36) 18"			
914.5							
21.0		END OF BORING					Water observed at 20.0 feet while drilling.
		Boring immediately backfilled with bentonite grout					
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-6**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 246338 EASTING: 445613
DRILLER: J. Tatro LOGGED BY: H. Vloo
START DATE: 05/12/23 END DATE: 05/12/23
SURFACE ELEVATION: 930.8 ft RIG: 75011 METHOD: 3 1/4" HSA
SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
929.3		LEAN CLAY (CL), organic, black, moist (TOPSOIL)					
1.5		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		2-2-3 (5) 10"	0.5	21	
				2-2-3 (5) 12"	1	21	
				3-5-7 (12) 16"			
				4-6-7 (13) 16"			
918.8	▽						
12.0		SILTY SAND (SM), contains seams of Clayey Sand, brown, wet, dense (GLACIAL TILL)		13-15-16-17 (31) 24"			
916.3							
14.5		END OF BORING Boring immediately backfilled					Water observed at 12.0 feet while drilling.

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-7**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 246572 EASTING: 445984
DRILLER: J. Tatro LOGGED BY: H. Vloo
START DATE: 05/12/23 END DATE: 05/12/23
SURFACE ELEVATION: 928.9 ft RIG: 75011 METHOD: 3 1/4" HSA
SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
926.9		LEAN CLAY (CL), organic, black, moist (TOPSOIL)					
2.0 / 924.9		LEAN CLAY (CL), dark brown, moist, soft (ALLUVIUM)		2-2-2 (4) 12"	1	24	
4.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)	5	3-3-4 (7) 12"	1.5		
		Lens of coarse Sand at 8 feet		2-2-3 (5) 14"	1	24	
			10	2-3-5 (8) 16"	1		
914.4				5-5-8-10 (13) 24"			
14.5		END OF BORING Boring immediately backfilled	15				Water not observed while drilling.
			20				
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-8**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 245399 EASTING: 446455
DRILLER: J. Tatro LOGGED BY: H. Vloo
START DATE: 05/12/23 END DATE: 05/12/23
SURFACE ELEVATION: 934.9 ft RIG: 75011 METHOD: 3 1/4" HSA
SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
934.4							
0.5		LEAN CLAY (CL), organic, dark brown, moist (TOPSOIL)					
		LEAN CLAY (CL), with Sand, brown, moist, medium (GLACIAL TILL)		1-3-3 (6) 12"	1.25	26	
930.9							
4.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, stiff (GLACIAL TILL)		2-4-5 (9) 14"	1		
			5	3-4-5 (9) 16"	1	21	
			10	4-4-5 (9) 14"			
				3-4-9-8 (13) 24"			
920.4							
14.5		END OF BORING	15				Water not observed while drilling.
		Boring immediately backfilled					
			20				
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-9**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 245890 EASTING: 446339
DRILLER: J. Tatro LOGGED BY: H. Vloo
START DATE: 05/12/23 END DATE: 05/12/23
SURFACE ELEVATION: 934.5 ft RIG: 75011 METHOD: 3 1/4" HSA
SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
932.5		CLAYEY SAND (SC), organic, black, moist (TOPSOIL)					
2.0		LEAN CLAY (CL), with Sand, brown, moist, medium (ALLUVIUM)		1-2-3 (5) 10"	1	24	
930.5							
4.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		2-3-3 (6) 14"	0.75	21	
			5	3-3-4 (7) 18"	1		
				3-6-8 (14) 18"			
			10				
				3-4-9-10 (13) 24"			
920.0		*With lens of Poorly Graded Sand at 14 feet*					
14.5		END OF BORING	15				Water not observed while drilling.
		Boring immediately backfilled					
			20				
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-10**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 246462 EASTING: 446564
DRILLER: J. Tatro LOGGED BY: H. Vloo START DATE: 05/12/23 END DATE: 05/12/23
SURFACE ELEVATION: 937.3 ft RIG: 75011 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
935.8		LEAN CLAY (CL), organic, dark brown, moist (TOPSOIL)					
1.5		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		1-3-4 (7) 10"	1	19	
			5	3-4-6 (10) 14"	1.25		
				3-5-5 (10) 18"	1.5	19	
			10	3-4-5 (9) 18"			
		With seams of Silty Sand at 12 feet		10-6-9 (15) 14"			
			15	5-4-6 (10) 16"			
919.3							
18.0		SANDY LEAN CLAY (CL), trace Gravel, with layer of POORLY GRADED SAND, brown, moist, hard (GLACIAL TILL)	20	13-25-29 (54) 18"			
916.3							
21.0		END OF BORING					Water not observed while drilling.
		Boring immediately backfilled with bentonite grout					
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-11**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 246925 EASTING: 446779
DRILLER: J. Tatro LOGGED BY: H. Vloo START DATE: 05/12/23 END DATE: 05/12/23
SURFACE ELEVATION: 931.1 ft RIG: 75011 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
929.1		CLAYEY SAND (SC), organic, dark brown, moist (TOPSOIL)					
2.0		LEAN CLAY (CL), brown, moist, medium (ALLUVIUM)		1-2-4 (6) 12"	1	27	
927.1							
4.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to very stiff (GLACIAL TILL)		2-3-5 (8) 12"	1		
			5	3-3-4 (7) 16"	0.75	21	
			10	3-4-5 (9) 14"	1.25		
				5-7-10-17 (17) 24"			
916.6							
14.5		END OF BORING Boring immediately backfilled	15				Water not observed while drilling.
			20				
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-12**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 247290 EASTING: 447194
DRILLER: M. Barber LOGGED BY: H. Vloo START DATE: 05/15/23 END DATE: 05/15/23
SURFACE ELEVATION: 933.7 ft RIG: GP-1 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
932.7		LEAN CLAY (CL), organic, dark brown, moist (TOPSOIL)					
1.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, soft to stiff (GLACIAL TILL)		1-1-2 (3) 18"	0.5	20	
			5	1-2-4 (6) 18"	1.25		
				2-3-6 (9) 18"	1.25	20	
924.7							
9.0		SILTY SAND (SM), fine-grained, brown, moist, medium dense (GLACIAL TILL)	10	3-6-10 (16) 18"			
921.7							
12.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, very stiff (GLACIAL TILL)		11-11-13-16 (24) 18"			
919.2							
14.5		END OF BORING	15				Water not observed while drilling.
		Boring immediately backfilled					
			20				
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-13**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 247517 EASTING: 447870
DRILLER: M. Barber LOGGED BY: H. Vloo START DATE: 05/15/23 END DATE: 05/15/23
SURFACE ELEVATION: 930.6 ft RIG: GP-1 METHOD: 3 1/4" HSA SURFACING: Soil WEATHER:

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
930.1		CLAYEY SAND (SC), organic, dark brown, moist (TOPSOIL)					
0.5		LEAN CLAY (CL), contains seams of Silty Sand, brown, moist, soft (ALLUVIUM)		1-1-2 (3) 11"			
926.6							
4.0		LEAN CLAY with SAND (CL), brown and dark brown, moist, medium to soft (ALLUVIUM)	5	1-4-4 (8) 18"	0.25	27	
				1-1-3 (4) 18"	0.25		
921.6		*With layer of SILTY SAND at 8 feet*					
9.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, very stiff to hard (GLACIAL TILL)	10	4-8-13 (21) 18"		19	
				11-28-37 (65) 18"			
915.6			15	14-15-26 (41) 18"			
15.0		POORLY GRADED SAND (SP), fine to medium-grained, trace Gravel, light brown, moist, dense (GLACIAL OUTWASH)					
			20	25-16-20 (36) 14"			
909.6							
21.0		END OF BORING					Water not observed while drilling.
		Boring immediately backfilled with bentonite grout					
			25				
			30				

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2303953
Geotechnical Evaluation
Scherber Property
North of 24910 Territorial Road
Rogers, Minnesota

BORING: **ST-14**
LOCATION: See attached sketch
DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)
NORTHING: 247909 EASTING: 448183
START DATE: 05/15/23 END DATE: 05/15/23
SURFACE ELEVATION: 920.4 ft
RIG: GP-1
METHOD: 3 1/4" HSA
SURFACING: Soil
WEATHER:
DRILLER: M. Barber
LOGGED BY: H. Vloo

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
919.6		CLAYEY SAND (SC), organic, dark brown, moist (TOPSOIL)					
0.8		SANDY LEAN CLAY (CL), grayish brown, moist, soft (ALLUVIUM)		1-1-1 (2) 14"	0.25	29	
916.4							
4.0		LEAN CLAY (CL), brown to gray, moist, stiff (GLACIAL TILL)	5	2-5-5 (10) 14"	1.5	23	
		With layer of SILTY SAND at 8 feet		2-5-9 (14) 11"			
911.4							
9.0		SANDY LEAN CLAY (CL), trace Gravel, gray, moist, stiff to very stiff (GLACIAL TILL)	10	2-4-5 (9) 18"			
				6-8-9-8 (17) 18"			
905.9							
14.5		END OF BORING Boring immediately backfilled	15				Water not observed while drilling.
			20				
			25				
			30				

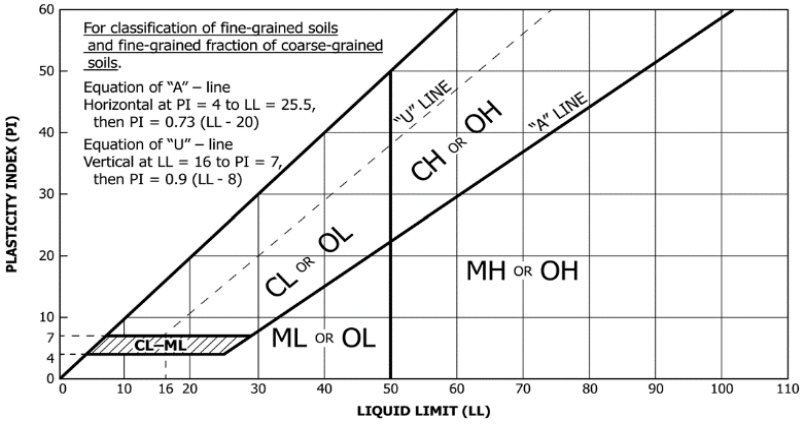
BRAUN INTERTEC
The Science You Build On.

Descriptive Terminology of Soil

Based on Standards ASTM D2487/2488
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	$C_u \geq 4$ and $1 \leq C_c \leq 3^D$	GW	Well-graded gravel[E]
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$)[D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty gravel[E F G]
			Fines Classify as CL or CH	GC	Clayey gravel[E F G]
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	$C_u \geq 6$ and $1 \leq C_c \leq 3^D$	SW	Well-graded sand[I]
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$)[D]	SP	Poorly graded sand[I]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty sand[F G I]
			Fines classify as CL or CH	SC	Clayey sand[F G I]
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K L M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OL	Organic clay[K L M N] / Organic silt[K L M O]
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay[K L M]
			PI plots below "A" line	MH	Elastic silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OH	Organic clay[K L M P] / Organic silt[K L M Q]
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. Gravels with 5 to 12% fines require dual symbols:
   GW-GM well-graded gravel with silt
   GW-GC well-graded gravel with clay
   GP-GM poorly graded gravel with silt
   GP-GC poorly graded gravel with clay
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains ≥ 15% sand, add "with sand" to group name.
F. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
G. If fines are organic, add "with organic fines" to group name.
H. Sands with 5 to 12% fines require dual symbols:
   SW-SM well-graded sand with silt
   SW-SC well-graded sand with clay
   SP-SM poorly graded sand with silt
   SP-SC poorly graded sand with clay
I. If soil contains ≥ 15% gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
L. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
N. PI ≥ 4 and plots on or above "A" line.
O. PI < 4 or plots below "A" line.
P. PI plots on or above "A" line.
Q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	**q_p**	Pocket penetrometer strength, tsf
WD	Wet density, pcf	**q_U**	Unconfined compression test, tsf
P200	% Passing #200 sieve	**LL**	Liquid limit
MC	Moisture content, %	**PL**	Plastic limit
OC	Organic content, %	**PI**	Plasticity index

Particle Size Identification

Boulders..... over 12"
Cobbles..... 3" to 12"
Gravel
  Coarse..... 3/4" to 3" (19.00 mm to 75.00 mm)
  Fine..... No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand
  Coarse..... No. 10 to No. 4 (2.00 mm to 4.75 mm)
  Medium..... No. 40 to No. 10 (0.425 mm to 2.00 mm)
  Fine..... No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt..... No. 200 (0.075 mm) to .005 mm
Clay..... < .005 mm

Relative Proportions[L, M]

trace..... 0 to 5%
little..... 6 to 14%
with..... ≥ 15%

Inclusion Thicknesses

lens..... 0 to 1/8"
seam..... 1/8" to 1"
layer..... over 1"

Apparent Relative Density of Cohesionless Soils

Very loose ..... 0 to 4 BPF
Loose ..... 5 to 10 BPF
Medium dense..... 11 to 30 BPF
Dense..... 31 to 50 BPF
Very dense..... over 50 BPF

Consistency of Cohesive Soils	Blows Per Foot	Approximate Unconfined Compressive Strength
Very soft	0 to 1 BPF	< 0.25 tsf
Soft	2 to 4 BPF	0.25 to 0.5 tsf
Medium	5 to 8 BPF	0.5 to 1 tsf
Stiff	9 to 15 BPF	1 to 2 tsf
Very Stiff	16 to 30 BPF	2 to 4 tsf
Hard	over 30 BPF	> 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:

Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WOR: Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

Water Level: Indicates the water level measured by the drillers either while drilling (▽), at the end of drilling (▼), or at some time after drilling (▼).

Sample Symbols

Standard Penetration Test
Modified California (MC)
Auger
Grab Sample
Rock Core
Thinwall (TW)/Shelby Tube (SH)
Texas Cone Penetrometer
Dynamic Cone Penetrometer

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hennepin County, Minnesota



January 22, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map.....9
Legend.....10
Map Unit Legend.....11
Map Unit Descriptions.....11
Hennepin County, Minnesota.....14
L16A—Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes.....14
L22C2—Lester loam, 6 to 10 percent slopes, moderately eroded.....16
L22D2—Lester loam, 10 to 16 percent slopes, moderately eroded.....18
L23A—Cordova loam, 0 to 2 percent slopes.....19
L24A—Glencoe clay loam, 0 to 1 percent slopes.....21
L25A—Le Sueur loam, 1 to 3 percent slopes.....22
L36A—Hamel, overwash-Hamel complex, 0 to 3 percent slopes.....24
L37B—Angus loam, 2 to 6 percent slopes.....26
L44A—Nessel loam, 1 to 3 percent slopes.....28
L45A—Dundas-Cordova complex, 0 to 3 percent slopes.....29
Soil Information for All Uses.....32
Soil Properties and Qualities.....32
Soil Qualities and Features.....32
Hydrologic Soil Group (Cowley Lake Preserve).....32
References.....37

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


93° 36' 9" W
93° 34' 46" W
45° 11' 53" N
45° 11' 14" N
452700
452800
452900
453000
453100
453200
453300
453400
453500
453600
453700
453800
453900
454000
454100
454200
454300
454400
5005100
5005000
5004900
5004800
5004700
5004600
5004500
5004400
5004300
5004200
5004100
5004000
Willandale Rd
Hawkins Rd
129th Ave N
L24A
L16A
L23A
L22C2
L37B
L22C2
L37B
L23A
L16A
L22C2
L36A
L37B
L24A
L16A
L16A
L23A
L37B
L25A
L22C2
L37B
L36A
L22D2
L22C2
L36A
L37B
L37B
L45A
L37B
L36A
L36A
L37B
L44A
L22C2
L36A
L22C2
L36A
L37B
L24A
L44A
L25A
L36A
L45A
Map Scale: 1:8,280 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
100
200
400
600
Feet
0
400
800
1600
2400
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:12,000.

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: Hennepin County, Minnesota
Survey Area Data: Version 20, Sep 7, 2024

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

Date(s) aerial images were photographed: Jun 29, 2023—Sep 13, 2023

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
L16A	Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes	0.8	0.9%
L22C2	Lester loam, 6 to 10 percent slopes, moderately eroded	19.6	22.1%
L22D2	Lester loam, 10 to 16 percent slopes, moderately eroded	2.0	2.3%
L23A	Cordova loam, 0 to 2 percent slopes	6.9	7.8%
L24A	Glencoe clay loam, 0 to 1 percent slopes	3.1	3.5%
L25A	Le Sueur loam, 1 to 3 percent slopes	2.3	2.6%
L36A	Hamel, overwash-Hamel complex, 0 to 3 percent slopes	4.7	5.3%
L37B	Angus loam, 2 to 6 percent slopes	31.0	34.9%
L44A	Nessel loam, 1 to 3 percent slopes	4.1	4.6%
L45A	Dundas-Cordova complex, 0 to 3 percent slopes	14.2	16.0%
Totals for Area of Interest		**88.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a

particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hennepin County, Minnesota

L16A—Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: h4xy
Elevation: 800 to 1,020 feet
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 124 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Muskego, ponded, and similar soils: 35 percent
Blue earth, ponded, and similar soils: 30 percent
Houghton, ponded, and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Muskego, Ponded

Setting

Landform: Marshes on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material over coprogenous earth

Typical profile

Oa1 - 0 to 9 inches: muck
Oa2 - 9 to 36 inches: muck
Lco - 36 to 60 inches: coprogenous earth

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 80 percent
Available water supply, 0 to 60 inches: Very high (about 19.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: C/D
Ecological site: R103XY016MN - Organic Marsh
Forage suitability group: Not Suited (G103XS024MN)
Other vegetative classification: Not Suited (G103XS024MN)
Hydric soil rating: Yes

Description of Blue Earth, Ponded

Setting

Landform: Marshes on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coprogenous earth

Typical profile

A - 0 to 50 inches: silt loam
Cg - 50 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: R103XY018MN - Shallow Lakes
Forage suitability group: Not Suited (G103XS024MN)
Other vegetative classification: Not Suited (G103XS024MN)
Hydric soil rating: Yes

Description of Houghton, Ponded

Setting

Landform: Marshes on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material

Typical profile

Oa - 0 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: R103XY016MN - Organic Marsh
Forage suitability group: Not Suited (G103XS024MN)
Other vegetative classification: Not Suited (G103XS024MN)
Hydric soil rating: Yes

Minor Components

Klossner, ponded
Percent of map unit: 10 percent
Landform: Marshes on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R103XY016MN - Organic Marsh
Other vegetative classification: Not Suited (G103XS024MN)
Hydric soil rating: Yes

L22C2—Lester loam, 6 to 10 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: 2ttc4
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Lester, moderately eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lester, Moderately Eroded

Setting
Landform: Hillslopes, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Fine-loamy till

Typical profile
Ap - 0 to 6 inches: loam
Bt - 6 to 38 inches: clay loam
C - 38 to 79 inches: loam

Properties and qualities

Slope: 6 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 47 to 63 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R103XY020MN - Loamy Upland Savannas
Forage suitability group: Sloping Upland, Acid (G103XS006MN)
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Minor Components

Storden, moderately eroded

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Calcareous (G103XS010MN)
Hydric soil rating: No

Le sueur

Percent of map unit: 3 percent
Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Hamel

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Ecological site: F103XY030MN - Wet Footslope/Drainageway Forests
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

L22D2—Lester loam, 10 to 16 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2ttc8
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lester, moderately eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lester, Moderately Eroded

Setting

Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 38 inches: clay loam
C - 38 to 79 inches: loam

Properties and qualities

Slope: 10 to 16 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 55 to 71 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R103XY020MN - Loamy Upland Savannas
Forage suitability group: Sloping Upland, Acid (G103XS006MN)
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)

Hydric soil rating: No

Minor Components

Storden, moderately eroded

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Calcareous (G103XS010MN)
Hydric soil rating: No

Lester, moderately eroded

Percent of map unit: 3 percent
Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Le sueur

Percent of map unit: 2 percent
Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

L23A—Cordova loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: h4xf
Elevation: 800 to 1,080 feet
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 124 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Cordova and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cordova

Setting

Landform: Drainageways on moraines
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap,AB - 0 to 13 inches: loam
Btg - 13 to 33 inches: clay loam
Cg - 33 to 80 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 1 percent
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F103XY027MN - Loamy Wet Forests
Forage suitability group: Level Swale, Neutral (G103XS001MN)
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Minor Components

Glencoe, depressional

Percent of map unit: 10 percent
Landform: Depressions on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R103XY015MN - Depressional Marsh
Other vegetative classification: Ponded If Not Drained (G103XS013MN)
Hydric soil rating: Yes

Nessel

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F103XY025MN - Loamy Upland Forests
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

L24A—Glencoe clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tsjr
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Glencoe and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glencoe

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Local alluvium over till

Typical profile

Ap - 0 to 9 inches: clay loam
A - 9 to 39 inches: clay loam
Bg - 39 to 50 inches: clay loam
Cg - 50 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R103XY015MN - Depressional Marsh
Forage suitability group: Ponded If Not Drained (G103XS013MN)
Other vegetative classification: Ponded If Not Drained (G103XS013MN)
Hydric soil rating: Yes

Minor Components

Okoboji

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R103XY015MN - Depressional Marsh
Other vegetative classification: Ponded If Not Drained (G103XS013MN)
Hydric soil rating: Yes

Webster

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R103XY001MN - Loamy Wet Prairies
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Canisteo

Percent of map unit: 5 percent
Landform: Ground moraines, rims on depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: R103XY001MN - Loamy Wet Prairies
Other vegetative classification: Level Swale, Calcareous (G103XS009MN)
Hydric soil rating: Yes

L25A—Le Sueur loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2vvdg
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Le sueur and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Le Sueur

Setting

Landform: Ground moraines, hillslopes

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 8 inches: loam
A - 8 to 14 inches: loam
Btg - 14 to 52 inches: clay loam
Cg - 52 to 79 inches: loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C/D
Ecological site: R103XY020MN - Loamy Upland Savannas
Forage suitability group: Sloping Upland, Acid (G103XS006MN)
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Minor Components

Cordova

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F103XY027MN - Loamy Wet Forests
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Lester

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Webster

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R103XY001MN - Loamy Wet Prairies
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

L36A—Hamel, overwash-Hamel complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tsjx
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hamel, overwash, and similar soils: 50 percent
Hamel and similar soils: 43 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hamel, Overwash

Setting

Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Colluvium over till

Typical profile

Ap - 0 to 12 inches: loam
A - 12 to 26 inches: loam
Btg - 26 to 48 inches: clay loam
Cg - 48 to 79 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F103XY029MN - Footslope/Drainageway Forests
Forage suitability group: Level Swale, Neutral (G103XS001MN)
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: No

Description of Hamel

Setting

Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Colluvium over till

Typical profile

Ap - 0 to 10 inches: loam
A - 10 to 24 inches: loam
Btg - 24 to 46 inches: clay loam
Cg - 46 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 to 8 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F103XY030MN - Wet Footslope/Drainageway Forests
Forage suitability group: Level Swale, Neutral (G103XS001MN)
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Minor Components

Terril

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Dip

Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R103XY011MN - Footslope/Drainageway Prairies
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: No

Glencoe

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R103XY015MN - Depressional Marsh
Other vegetative classification: Ponded If Not Drained (G103XS013MN)
Hydric soil rating: Yes

L37B—Angus loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2syrq
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Angus and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Angus

Setting

Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 37 inches: clay loam
BC - 37 to 50 inches: clay loam
C - 50 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 39 to 51 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R103XY020MN - Loamy Upland Savannas
Forage suitability group: Sloping Upland, Acid (G103XS006MN)
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Minor Components

Angus, moderately eroded

Percent of map unit: 10 percent
Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Cordova

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F103XY027MN - Loamy Wet Forests
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Le sueur

Percent of map unit: 5 percent
Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

L44A—Nessel loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: h657
Elevation: 820 to 1,080 feet
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 124 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Nessel and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nessel

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 38 inches: clay loam
C - 38 to 80 inches: loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 1 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F103XY025MN - Loamy Upland Forests
Forage suitability group: Sloping Upland, Acid (G103XS006MN)
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Minor Components

Cordova

Percent of map unit: 10 percent
Landform: Drainageways on moraines
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F103XY027MN - Loamy Wet Forests
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Angus

Percent of map unit: 5 percent
Landform: Hills on moraines
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R103XY020MN - Loamy Upland Savannas
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

L45A—Dundas-Cordova complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: h660
Elevation: 820 to 1,070 feet
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 124 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Dundas and similar soils: 65 percent
Cordova and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dundas

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 9 inches: silt loam
E - 9 to 15 inches: loam
Btg - 15 to 40 inches: clay loam
Cg - 40 to 80 inches: loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 1 percent
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R103XY020MN - Loamy Upland Savannas
Forage suitability group: Level Swale, Neutral (G103XS001MN)
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: No

Description of Cordova

Setting

Landform: Drainageways on moraines
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap,AB - 0 to 13 inches: loam
Btg - 13 to 33 inches: clay loam
Cg - 33 to 80 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 1 percent
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F103XY027MN - Loamy Wet Forests
Forage suitability group: Level Swale, Neutral (G103XS001MN)
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Minor Components

Nessel

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F103XY025MN - Loamy Upland Forests
Other vegetative classification: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Glencoe

Percent of map unit: 5 percent
Landform: Depressions on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R103XY015MN - Depressional Marsh
Other vegetative classification: Ponded If Not Drained (G103XS013MN)
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Cowley Lake Preserve)

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.

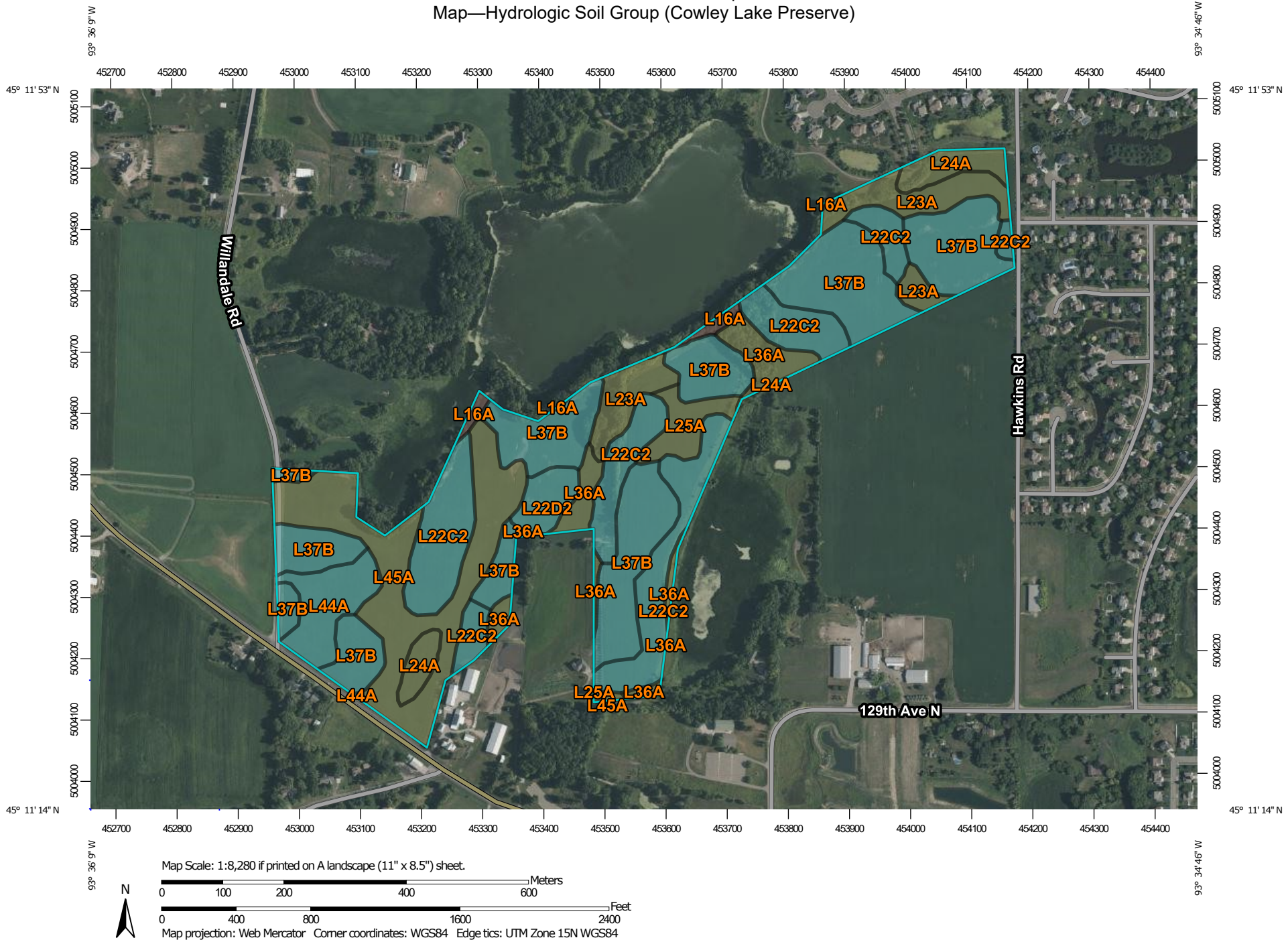
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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.

Map—Hydrologic Soil Group (Cowley Lake Preserve)



Map Scale: 1:8,280 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

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

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 1:12,000.

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: Hennepin County, Minnesota
Survey Area Data: Version 20, Sep 7, 2024

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

Date(s) aerial images were photographed: Jun 29, 2023—Sep 13, 2023

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.

Table—Hydrologic Soil Group (Cowley Lake Preserve)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
L16A	Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes	B/D	0.8	0.9%
L22C2	Lester loam, 6 to 10 percent slopes, moderately eroded	C	19.6	22.1%
L22D2	Lester loam, 10 to 16 percent slopes, moderately eroded	C	2.0	2.3%
L23A	Cordova loam, 0 to 2 percent slopes	C/D	6.9	7.8%
L24A	Glencoe clay loam, 0 to 1 percent slopes	C/D	3.1	3.5%
L25A	Le Sueur loam, 1 to 3 percent slopes	C/D	2.3	2.6%
L36A	Hamel, overwash-Hamel complex, 0 to 3 percent slopes	C/D	4.7	5.3%
L37B	Angus loam, 2 to 6 percent slopes	C	31.0	34.9%
L44A	Nessel loam, 1 to 3 percent slopes	C	4.1	4.6%
L45A	Dundas-Cordova complex, 0 to 3 percent slopes	C/D	14.2	16.0%
Totals for Area of Interest			**88.8**	**100.0%**

Rating Options—Hydrologic Soil Group (Cowley Lake Preserve)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

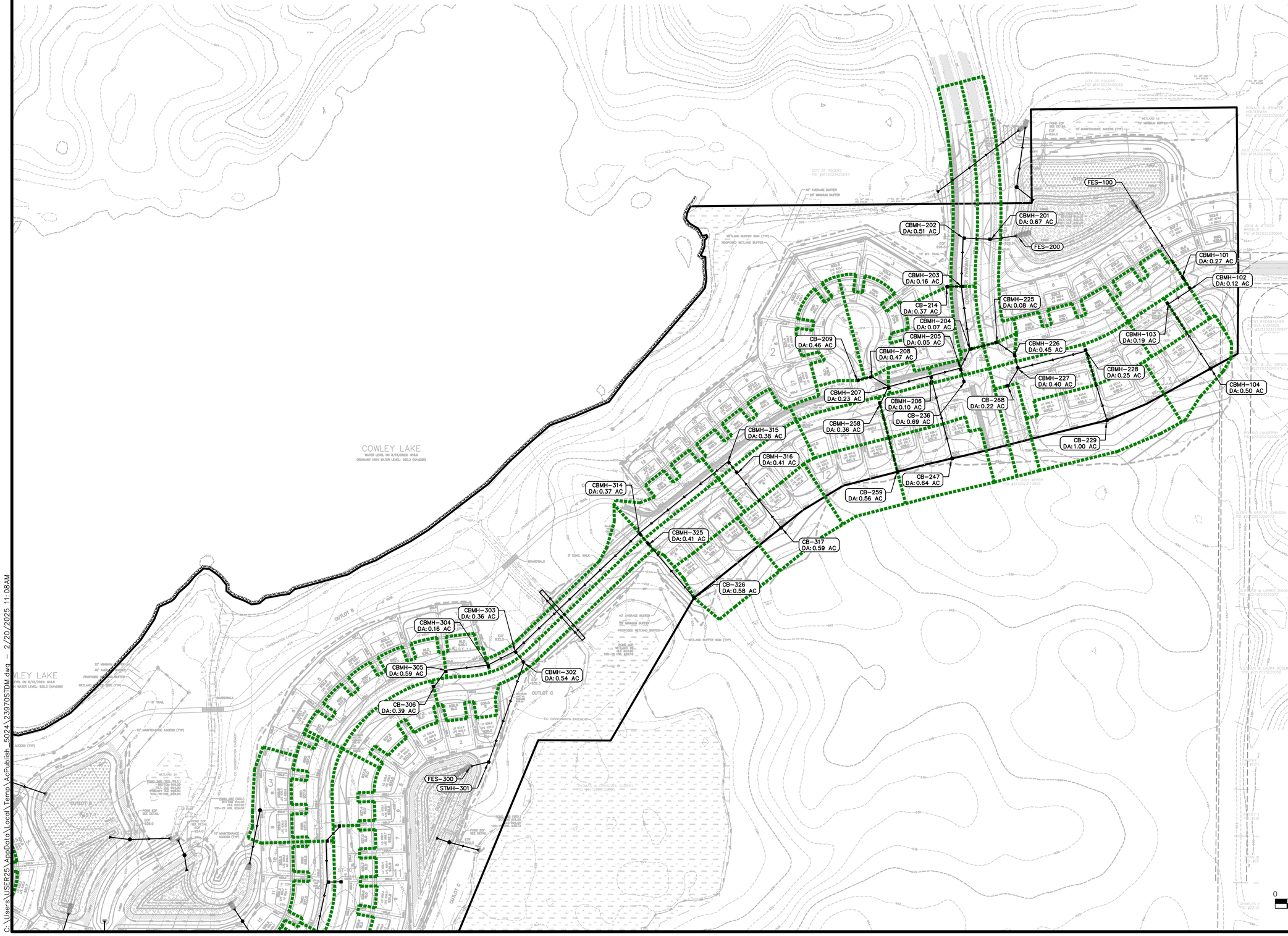
United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

STORM SEWER 100s, 200s & 300s

LEGEND

PROPOSED STORM SEWER

CATCH BASIN SUBCATCHMENT BOUNDARY



James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Reg.No.

Date:

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
STORM SEWER DRAINAGE MAP
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	JSO
DATE	02/24/2024
REVISIONS	
CAD FILE	23970STDM
PROJECT NO.	23970
SHEET	1 OF 2

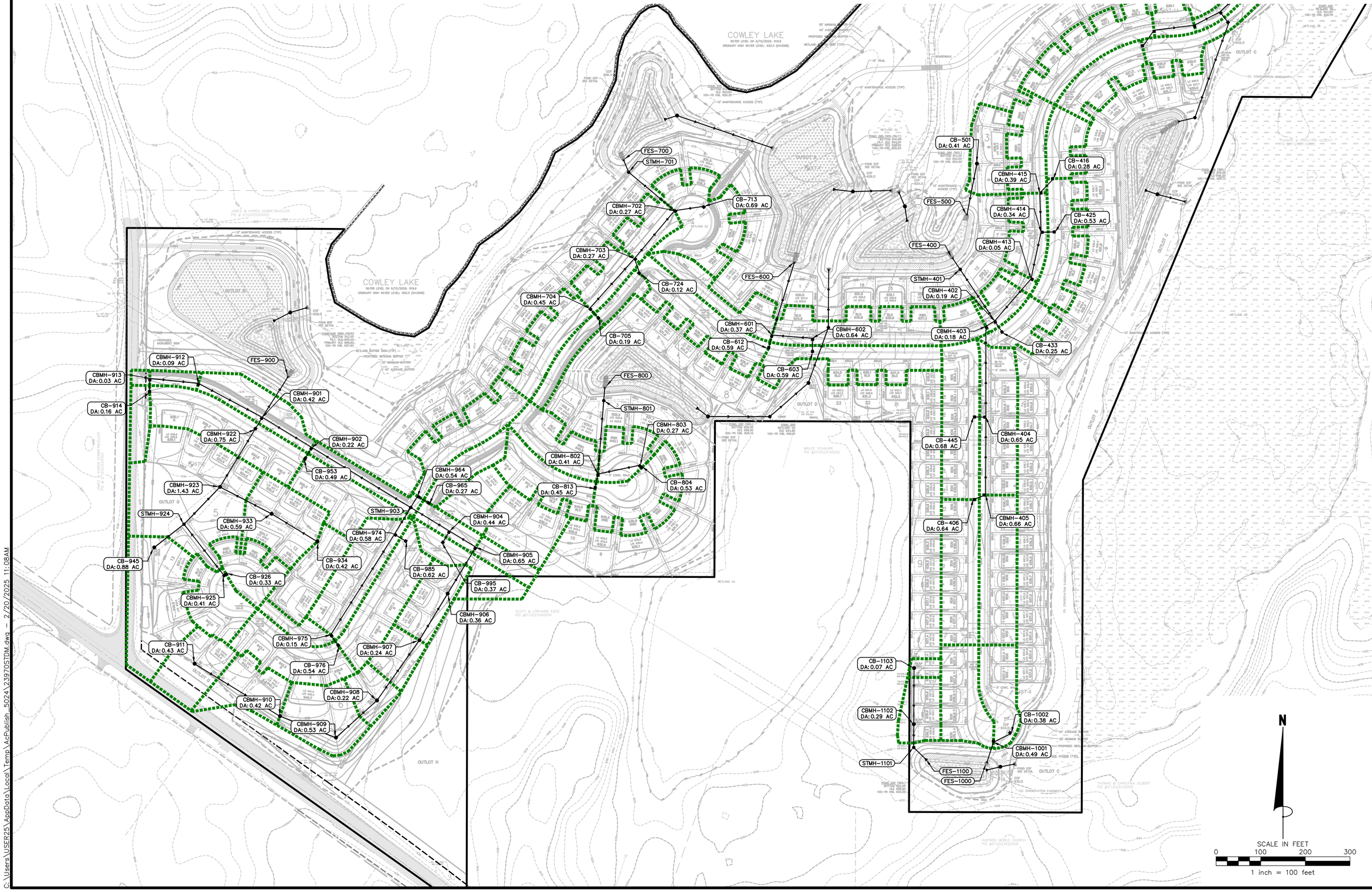
C:\Users\USER25\AppData\Local\Temp\AcPublish_5024\23970STDM.dwg - 2/20/2025, 11:08AM

STORM SEWER 400s, 500s, 600s, 700s, 800s, 900s, 1000s & 1100s

LEGEND

PROPOSED STORM SEWER

CATCH BASIN SUBCATCHMENT BOUNDARY



James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: _____ Reg.No. _____

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
STORM SEWER DRAINAGE MAP
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY	JSO
DATE	02/24/2024
REVISIONS	
CAD FILE	23970STDM
PROJECT NO.	23970
SHEET	2 OF 2

C:\Users\USER25\AppData\Local\Temp\AcPublish_5024\23970STDM.dwg - 2/20/2025 11:08AM

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 West County Road 42, Suite 100
Burnsville, MN 55306
Phone: 952-890-6044

STORM SEWER DESIGN COMPUTATION SHEET

Project: Cowley Lake Preserve
Location: Rogers, MN
Desc: Storm Sewer Comps
Design Return Period: 10 yr
Pipe Type: RCP/HDPE 15" Min Req'd? yes
Manning's n : 0.013

Job No.: 23970
Prepared by: Josh O.
Date: 2/24/2025

	Up-stream Str	Dn-stream Str	A	C	C x A	Σ	Tc_Da	Tc_Str	i	Qd	UPSTREAM			DOWNSTREAM			Length	Slope	Min. Dia.	Q-full	Vel.-full	T_trav			Qds
	From	To	acres	coef.		C x A	min.	min.	intens.	c.f.s.	Rim	Inv.	Depth	Rim	Inv.	Depth	ft.	ft./ft.	in.	c.f.s.	ft./sec.	min.	Remarks		c.f.s.
	STORM SEWER 100s																								
1	CB-104	CBMH-103	0.50	0.40	0.20	0.20	10.00	10.00	6.13	1.23	931.84	928.84	3.00	932.65	928.02	4.63	164	0.50%	15	4.58	3.72	0.73	OK	1	1.23
2	CBMH-103	CBMH-102	0.19	0.70	0.13	0.33	10.00	10.73	5.92	1.97	932.65	928.02	4.63	930.35	926.35	4.00	58	2.88%	15	10.99	8.94	0.11	OK	2	0.79
3	CBMH-102	CBMH-101	0.12	0.70	0.08	0.42	10.00	10.84	5.89	2.45	930.35	926.35	4.00	930.35	926.19	4.16	32	0.50%	15	4.58	3.72	0.14	OK	3	0.49
4	CBMH-101	FES-100	0.27	0.70	0.19	0.61	10.00	10.99	5.85	3.54	930.35	924.00	6.35	923.25	922.00	1.25	168	1.19%	15	7.07	5.75	0.49	OK	4	1.10
	STORM SEWER 200s																								
1	CB-209	CBMH-208	0.46	0.70	0.32	0.32	10.00	10.00	6.13	1.97	936.96	932.96	4.00	936.96	932.80	4.16	32	0.50%	15	4.58	3.72	0.14	OK	1	1.97
2	CBMH-208	CBMH-207	0.47	0.70	0.33	0.65	10.00	10.14	6.09	3.96	936.96	932.80	4.16	935.95	931.95	4.00	42	2.02%	15	9.21	7.49	0.09	OK	2	2.00
3	CB-259	CBMH-258	0.56	0.40	0.22	0.22	10.00	10.00	6.13	1.37	936.07	933.07	3.00	936.45	932.33	4.12	149	0.50%	15	4.56	3.71	0.67	OK	3	1.37
4	CBMH-258	CBMH-207	0.36	0.70	0.25	0.48	10.00	10.67	5.94	2.83	936.45	932.33	4.12	935.95	931.95	4.00	42	0.90%	15	6.16	5.01	0.14	OK	4	1.50
5	CBMH-207	CBMH-206	0.23	0.70	0.16	1.29	10.00	10.81	5.90	7.59	935.95	931.95	4.00	934.21	929.76	4.45	93	2.35%	15	9.94	8.08	0.19	OK	5	0.95
6	CB-247	CBMH-206	0.64	0.40	0.26	0.26	10.00	10.00	6.13	1.57	933.67	930.67	3.00	934.21	929.76	4.45	182	0.50%	15	4.58	3.72	0.81	OK	6	1.57
7	CBMH-206	CBMH-205	0.10	0.70	0.07	1.61	10.00	11.00	5.84	9.43	934.21	929.56	4.65	932.99	928.63	4.36	66	1.41%	18	12.50	7.06	0.16	OK	7	0.41
8	CB-236	CBMH-205	0.69	0.70	0.48	0.48	10.00	10.00	6.13	2.96	932.99	928.99	4.00	932.99	928.83	4.16	32	0.50%	15	4.58	3.72	0.14	OK	8	2.96
9	CBMH-205	CBMH-204	0.05	0.70	0.04	2.13	10.00	11.16	5.80	12.37	932.99	928.63	4.36	931.20	927.20	4.00	45	3.18%	18	18.78	10.60	0.07	OK	9	0.20
10	CB-229	CBMH-228	1.00	0.40	0.40	0.40	10.00	10.00	6.13	2.45	931.41	928.41	3.00	933.85	927.64	6.21	154	0.50%	15	4.58	3.72	0.69	OK	10	2.45
11	CBMH-228	CBMH-227	0.25	0.70	0.18	0.58	10.00	10.69	5.93	3.41	933.85	927.64	6.21	932.65	926.89	5.76	150	0.50%	15	4.58	3.72	0.67	OK	11	1.04
12	CB-268	CBMH-227	0.22	0.70	0.15	0.15	10.00	10.00	6.13	0.94	933.92	929.92	4.00	932.65	928.65	4.00	42	3.02%	15	11.26	9.16	0.08	OK	12	0.94
13	CBMH-227	CBMH-226	0.40	0.70	0.28	1.01	10.00	11.36	5.75	5.80	932.65	926.89	5.76	932.65	926.63	6.02	32	0.81%	15	5.84	4.75	0.11	OK	13	1.61
14	CBMH-226	CBMH-225	0.45	0.70	0.32	1.32	10.00	11.47	5.72	7.58	932.65	926.43	6.22	931.16	926.11	5.05	45	0.71%	18	8.88	5.02	0.15	OK	14	1.80
15	CBMH-225	CBMH-204	0.08	0.70	0.06	1.38	10.00	11.62	5.68	7.84	931.16	926.11	5.05	931.20	925.63	5.57	60	0.80%	18	9.42	5.32	0.19	OK	15	0.32
16	CBMH-204	CBMH-203	0.07	0.70	0.05	3.56	10.00	11.81	5.64	20.07	931.20	925.23	5.97	927.08	923.08	4.00	136	1.58%	24	28.52	9.06	0.25	OK	16	0.28
17	CB-214	CBMH-203	0.37	0.40	0.15	0.15	10.00	10.00	6.13	0.91	927.24	924.24	3.00	927.08	923.68	3.40	30	1.87%	15	8.85	7.20	0.07	OK	17	0.91
18	CBMH-203	CBMH-202	0.16	0.70	0.11	3.82	10.00	12.06	5.57	21.30	927.08	923.08	4.00	925.62	921.80	3.82	103	1.24%	24	25.29	8.03	0.21	OK	18	0.62
19	CBMH-202	CBMH-201	0.51	0.70	0.36	4.18	10.00	12.27	5.53	23.09	925.62	921.40	4.22	925.62	921.20	4.42	60	0.33%	30	23.75	4.83	0.21	OK	19	1.97
20	CBMH-201	FES-200	0.67	0.70	0.47	4.65	10.00	12.48	5.48	25.47	925.62	921.20	4.42	922.00	921.00	1.00	55	0.36%	36	40.33	5.69	0.16	OK	20	2.57
	STORM SEWER 300s																								
1	CB-317	CBMH-316	0.59	0.40	0.24	0.24	10.00	10.00	6.13	1.45	936.90	933.90	3.00	938.19	933.15	5.04	149	0.50%	15	4.60	3.74	0.66	OK	1	1.45
2	CBMH-316	CBMH-315	0.41	0.70	0.29	0.52	10.00	10.66	5.94	3.11	938.19	933.15	5.04	938.19	932.99	5.20	32	0.50%	15	4.58	3.72	0.14	OK	2	1.70
3	CBMH-315	CBMH-314	0.38	0.70	0.27	0.79	10.00	10.81	5.90	4.65	938.19	932.99	5.20	934.15	929.99	4.16	244	1.23%	15	7.18	5.84	0.70	OK	3	1.57

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 West County Road 42, Suite 100
Burnsville, MN 55306
Phone: 952-890-6044

STORM SEWER DESIGN COMPUTATION SHEET

Project: Cowley Lake Preserve
Location: Rogers, MN
Desc: Storm Sewer Comps
Design Return Period: 10 yr
Pipe Type: RCP/HDPE 15" Min Req'd? yes
Manning's n : 0.013

Job No.: 23970
Prepared by: Josh O.
Date: 2/24/2025

	Up-stream Str	Dn-stream Str	A	C	C x A	Σ	Tc_Da	Tc_Str	i	Qd	UPSTREAM			DOWNSTREAM			Length	Slope	Min. Dia.	Q-full	Vel.-full	T_trav			Qds
	From	To	acres	coef.		C x A	min.	min.	intens.	c.f.s.	Rim	Inv.	Depth	Rim	Inv.	Depth	ft.	ft./ft.	in.	c.f.s.	ft./sec.	min.	Remarks		c.f.s.
4	CB-326	CBMH-325	0.58	0.40	0.23	0.23	10.00	10.00	6.13	1.42	934.53	931.53	3.00	934.15	930.15	4.00	149	0.93%	15	6.23	5.07	0.49	OK	4	1.42
5	CBMH-325	CBMH-314	0.41	0.70	0.29	0.52	10.00	10.49	5.99	3.11	934.15	930.15	4.00	934.15	929.99	4.16	32	0.50%	15	4.58	3.72	0.14	OK	5	1.72
6	CBMH-314	CBMH-303	0.37	0.70	0.26	1.57	10.00	11.50	5.71	8.95	934.10	929.59	4.51	931.13	927.88	3.25	359	0.48%	21	10.97	4.55	1.32	OK	6	1.48
7	CB-306	CBMH-305	0.39	0.70	0.27	0.27	10.00	10.00	6.13	1.67	934.42	930.42	4.00	934.01	930.01	4.00	45	0.91%	15	6.18	5.03	0.15	OK	7	1.67
8	CBMH-305	CBMH-304	0.59	0.70	0.41	0.69	10.00	10.15	6.09	4.18	934.01	930.01	4.00	932.18	928.58	3.60	91	1.57%	15	8.12	6.60	0.23	OK	8	2.51
9	CBMH-304	CBMH-303	0.16	0.70	0.11	0.80	10.00	10.38	6.02	4.81	932.18	928.18	4.00	931.13	927.88	3.25	72	0.42%	18	6.80	3.84	0.31	OK	9	0.67
10	CBMH-303	CBMH-302	0.36	0.80	0.29	2.65	10.00	12.82	5.41	14.34	931.13	927.68	3.45	931.13	927.52	3.61	32	0.50%	24	16.04	5.09	0.10	OK	10	1.56
11	CBMH-302	STMH-301	0.54	0.70	0.38	3.03	10.00	12.92	5.38	16.31	931.13	927.32	3.81	930.47	926.62	3.85	232	0.30%	27	17.06	4.28	0.90	OK	11	2.03
12	STMH-301	FES-300	0.00	0.40	0.00	3.03	10.00	13.83	5.20	15.76	930.47	926.62	3.85	928.75	926.50	2.25	38	0.32%	27	17.45	4.38	0.14	OK	12	0.00
	STORM SEWER 400s																								
1	CB-416	CBMH-415	0.28	0.70	0.20	0.20	10.00	10.00	6.13	1.20	934.95	930.95	4.00	934.76	930.73	4.03	45	0.49%	15	4.53	3.68	0.20	OK	1	1.20
2	CBMH-415	CBMH-414	0.39	0.70	0.27	0.47	10.00	10.20	6.07	2.85	934.76	930.73	4.03	934.38	930.22	4.16	88	0.58%	15	4.93	4.01	0.37	OK	2	1.66
3	CB-425	CBMH-414	0.53	0.70	0.37	0.37	10.00	10.00	6.13	2.27	934.38	930.38	4.00	934.38	930.22	4.16	32	0.50%	15	4.58	3.72	0.14	OK	3	2.27
4	CBMH-414	CBMH-413	0.34	0.70	0.24	1.08	10.00	10.57	5.97	6.43	934.38	930.02	4.36	934.91	929.49	5.42	107	0.50%	18	7.41	4.19	0.43	OK	4	1.42
5	CBMH-413	CBMH-402	0.05	0.70	0.04	1.11	10.00	11.00	5.84	6.50	934.91	929.49	5.42	934.68	928.87	5.81	125	0.50%	18	7.42	4.19	0.50	OK	5	0.20
6	CB-433	CBMH-402	0.25	0.70	0.18	0.18	10.00	10.00	6.13	1.07	934.68	930.68	4.00	934.68	930.52	4.16	32	0.50%	15	4.58	3.72	0.14	OK	6	1.07
7	CB-406	CBMH-405	0.64	0.70	0.45	0.45	10.00	10.00	6.13	2.75	933.07	929.07	4.00	933.01	928.92	4.09	30	0.50%	15	4.58	3.72	0.13	OK	7	2.75
8	CBMH-405	CBMH-404	0.66	0.70	0.46	0.91	10.00	10.13	6.09	5.54	933.01	928.72	4.29	932.03	927.69	4.34	175	0.59%	18	8.08	4.56	0.64	OK	8	2.81
9	CB-445	CBMH-404	0.68	0.70	0.48	0.48	10.00	10.00	6.13	2.92	932.03	928.03	4.00	932.03	927.89	4.14	28	0.50%	15	4.58	3.72	0.13	OK	9	2.92
10	CBMH-404	CBMH-403	0.65	0.70	0.46	1.84	10.00	10.77	5.91	10.87	932.03	927.49	4.54	934.72	926.47	8.25	203	0.50%	21	11.26	4.67	0.72	OK	10	2.69
11	CBMH-403	CBMH-402	0.18	0.70	0.13	1.97	10.00	11.50	5.72	11.24	934.72	926.47	8.25	934.68	926.35	8.33	23	0.52%	21	11.48	4.76	0.08	OK	11	0.72
12	CBMH-402	STMH-401	0.19	0.70	0.13	3.39	10.00	11.58	5.69	19.29	934.68	926.35	8.33	927.61	924.21	3.40	139	1.54%	21	19.71	8.18	0.28	OK	12	0.76
13	STMH-401	FES-400	0.00	0.70	0.00	3.39	10.00	11.86	5.62	19.05	927.61	922.16	5.45	924.25	922.00	2.25	32	0.50%	27	21.96	5.51	0.10	OK	13	0.00
	STORM SEWER 500s																								
1	CB-501	FES-500	0.41	0.40	0.16	0.16	10.00	10.00	6.13	1.01	925.78	922.78	3.00	923.25	922.00	1.25	117	0.67%	15	5.29	4.30	0.45	OK	1	1.01
	STORM SEWER 600s																								
1	CB-603	CBMH-602	0.59	0.70	0.41	0.41	10.00	10.00	6.13	2.53	931.41	927.41	4.00	931.41	927.25	4.16	32	0.50%	15	4.58	3.72	0.14	OK	1	2.53
2	CBMH-602	CBMH-601	0.64	0.70	0.45	0.86	10.00	10.14	6.09	5.24	931.41	927.05	4.36	932.59	926.59	6.00	91	0.51%	18	7.49	4.23	0.36	OK	2	2.73
3	CB-612	CBMH-601	0.59	0.70	0.41	0.41	10.00	10.00	6.13	2.53	932.59	928.59	4.00	932.59	928.43	4.16	32	0.50%	15	4.58	3.72	0.14	OK	3	2.53

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 West County Road 42, Suite 100
Burnsville, MN 55306
Phone: 952-890-6044

STORM SEWER DESIGN COMPUTATION SHEET

Project: Cowley Lake Preserve
Location: Rogers, MN
Desc: Storm Sewer Comps
Design Return Period: 10 yr
Pipe Type: RCP/HDPE 15" Min Req'd? yes
Manning's n : 0.013

Job No.: 23970
Prepared by: Josh O.
Date: 2/24/2025

	Up-stream Str	Dn-stream Str	A	C	C x A	Σ	Tc_Da	Tc_Str	i	Qd	UPSTREAM			DOWNSTREAM			Length	Slope	Min. Dia.	Q-full	Vel.-full	T_trav			Qds
	From	To	acres	coef.		C x A	min.	min.	intens.	c.f.s.	Rim	Inv.	Depth	Rim	Inv.	Depth	ft.	ft./ft.	in.	c.f.s.	ft./sec.	min.	Remarks		c.f.s.
4	CBMH-601	FES-600	0.37	0.70	0.26	1.53	10.00	10.50	5.99	9.18	932.59	925.71	6.88		924.00	-924.00	171	1.00%	18	10.53	5.95	0.48	OK	4	1.55
	STORM SEWER 700s																								
1	CB-705	CBMH-704	0.19	0.80	0.15	0.15	10.00	10.00	6.13	0.93	939.23	935.23	4.00	939.23	935.07	4.16	32	0.50%	15	4.58	3.72	0.14	OK	1	0.93
2	CBMH-704	CBMH-703	0.45	0.70	0.32	0.47	10.00	10.14	6.09	2.84	939.23	935.07	4.16	938.55	934.32	4.23	150	0.50%	15	4.58	3.72	0.67	OK	2	1.92
3	CB-724	CBMH-703	0.12	0.80	0.10	0.10	10.00	10.00	6.13	0.59	938.43	934.43	4.00	938.45	934.24	4.21	37	0.51%	15	4.64	3.77	0.16	OK	3	0.59
4	CBMH-703	CBMH-702	0.27	0.70	0.19	0.75	10.00	10.81	5.89	4.43	938.45	934.24	4.21	937.23	932.62	4.61	140	1.16%	15	6.97	5.67	0.41	OK	4	1.11
5	CB-713	CBMH-702	0.69	0.70	0.48	0.48	10.00	10.00	6.13	2.96	936.96	932.96	4.00	937.23	932.62	4.61	68	0.50%	15	4.58	3.72	0.30	OK	5	2.96
6	CBMH-702	STMH-701	0.27	0.70	0.19	1.42	10.00	11.23	5.78	8.24	937.51	932.62	4.89	928.56	925.06	3.50	134	5.64%	15	15.38	12.51	0.18	OK	6	1.09
7	STMH-701	FES-700	0.00	0.70	0.00	1.42	10.00	11.40	5.74	8.17	928.56	924.25	4.31	925.50	924.00	1.50	31	0.81%	18	9.46	5.34	0.10	OK	7	0.00
	STORM SEWER 800s																								
1	CB-804	CBMH-803	0.53	0.70	0.37	0.37	10.00	10.00	6.13	2.27	937.09	933.09	4.00	937.05	933.05	4.00	6	0.67%	15	5.29	4.30	0.02	OK	1	2.27
2	CBMH-803	CBMH-802	0.27	0.70	0.19	0.56	10.00	10.02	6.13	3.43	937.05	933.05	4.00	938.10	932.56	5.54	98	0.50%	15	4.58	3.72	0.44	OK	2	1.16
3	CB-813	CBMH-802	0.45	0.70	0.32	0.32	10.00	10.00	6.13	1.93	938.18	934.18	4.00	938.10	934.01	4.09	34	0.50%	15	4.58	3.72	0.15	OK	3	1.93
4	CBMH-802	STMH-801	0.41	0.40	0.16	1.04	11.00	11.00	5.84	6.07	938.10	932.56	5.54	930.97	928.35	2.62	165	2.55%	15	10.35	8.41	0.33	OK	4	0.96
5	STMH-801	FES-800	0.00	0.70	0.00	1.04	10.00	11.33	5.76	5.98	938.10	928.15	9.95	930.97	928.00	2.97	30	0.50%	18	7.45	4.21	0.12	OK	5	0.00
	STORM SEWER 900s																								
1	CB-911	CBMH-910	0.43	0.40	0.17	0.17	10.00	10.00	6.13	1.05	940.16	937.16	3.00	938.11	935.11	3.00	225	0.91%	15	6.18	5.03	0.75	OK	1	1.05
2	CBMH-910	CBMH-909	0.42	0.40	0.17	0.34	10.00	10.75	5.91	2.01	938.11	935.11	3.00	935.42	932.42	3.00	134	2.01%	15	9.18	7.46	0.30	OK	2	0.99
3	CBMH-909	CBMH-908	0.53	0.40	0.21	0.55	10.00	11.05	5.83	3.22	935.42	932.42	3.00	935.80	931.80	4.00	124	0.50%	15	4.58	3.72	0.55	OK	3	1.24
4	CBMH-908	CBMH-907	0.22	0.40	0.09	0.64	10.00	11.60	5.69	3.64	935.80	931.80	4.00	934.93	930.98	3.95	165	0.50%	15	4.57	3.71	0.74	OK	4	0.50
5	CBMH-907	CBMH-906	0.24	0.40	0.10	0.74	10.00	12.34	5.51	4.06	934.93	930.98	3.95	932.49	929.49	3.00	122	1.22%	15	7.16	5.82	0.35	OK	5	0.53
6	CBMH-906	CBMH-905	0.36	0.40	0.14	0.88	10.00	12.69	5.43	4.78	932.49	929.29	3.20	933.55	928.92	4.63	122	0.30%	18	5.80	3.28	0.62	OK	6	0.78
7	CBMH-905	CBMH-904	0.65	0.50	0.33	1.21	10.00	13.31	5.30	6.39	933.55	928.92	4.63	933.20	928.64	4.56	69	0.41%	18	6.71	3.79	0.30	OK	7	1.72
8	CB-995	CBMH-904	0.37	0.60	0.22	0.22	10.00	10.00	6.13	1.36	933.20	929.20	4.00	933.20	929.04	4.16	32	0.50%	15	4.58	3.72	0.14	OK	8	1.36
9	CBMH-904	STMH-903	0.44	0.50	0.22	1.65	10.00	13.61	5.24	8.63	933.20	928.64	4.56	934.64	927.93	6.71	102	0.70%	18	8.79	4.96	0.34	OK	9	1.15
10	CB-976	CBMH-975	0.54	0.70	0.38	0.38	10.00	10.00	6.13	2.32	936.30	932.30	4.00	936.30	932.14	4.16	32	0.50%	15	4.58	3.72	0.14	OK	10	2.32
11	CBMH-975	CBMH-974	0.15	0.70	0.11	0.48	10.00	10.14	6.09	2.94	936.30	932.14	4.16	933.89	929.73	4.16	267	0.90%	15	6.15	5.00	0.89	OK	11	0.64
12	CB-985	CBMH-974	0.62	0.70	0.43	0.43	10.00	10.00	6.13	2.66	933.89	929.89	4.00	933.89	929.73	4.16	32	0.50%	15	4.58	3.72	0.14	OK	12	2.66
13	CBMH-974	STMH-903	0.58	0.70	0.41	1.32	10.00	11.03	5.83	7.72	933.89	929.73	4.16	934.64	928.13	6.51	70	2.29%	15	9.79	7.96	0.15	OK	13	2.37

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 West County Road 42, Suite 100
Burnsville, MN 55306
Phone: 952-890-6044

STORM SEWER DESIGN COMPUTATION SHEET

Project: Cowley Lake Preserve
Location: Rogers, MN
Desc: Storm Sewer Comps
Design Return Period: 10 yr
Pipe Type: RCP/HDPE 15" Min Req'd? yes
Manning's n : 0.013

Job No.: 23970
Prepared by: Josh O.
Date: 2/24/2025

	Up-stream Str	Dn-stream Str	A	C	C x A	Σ	Tc_Da	Tc_Str	i	Qd	UPSTREAM			DOWNSTREAM			Length	Slope	Min. Dia.	Q-full	Vel.-full	T_trav			Qds
	From	To	acres	coef.		C x A	min.	min.	intens.	c.f.s.	Rim	Inv.	Depth	Rim	Inv.	Depth	ft.	ft./ft.	in.	c.f.s.	ft./sec.	min.	Remarks		c.f.s.
14	CB-965	CBMH-964	0.27	0.70	0.19	0.19	10.00	10.00	6.13	1.16	934.78	930.78	4.00	934.76	930.62	4.14	32	0.50%	15	4.58	3.72	0.14	OK	14	1.16
15	CBMH-964	STMH-903	0.54	0.70	0.38	0.57	10.00	10.14	6.09	3.45	934.76	930.62	4.14	934.40	930.40	4.00	29	0.76%	15	5.64	4.59	0.11	OK	15	2.30
16	STMH-903	CBMH-902	0.00	0.80	0.00	3.54	10.00	13.96	5.17	18.30	934.64	927.33	7.31	932.50	926.42	6.08	259	0.35%	27	18.41	4.62	0.93	OK	16	0.00
17	CB-953	CBMH-902	0.49	0.70	0.34	0.34	10.00	10.00	6.13	2.10	932.50	928.50	4.00	932.50	928.34	4.16	32	0.50%	15	4.58	3.72	0.14	OK	17	2.10
25	CBMH-902	CBMH-901	0.22	0.80	0.18	4.06	10.00	14.89	5.01	20.31	932.50	926.22	6.28	931.85	925.72	6.13	130	0.38%	30	25.51	5.18	0.42	OK	25	0.88
18	CB-926	CBMH-925	0.33	0.70	0.23	0.23	10.00	10.00	6.13	1.42	939.96	935.96	4.00	939.92	935.92	4.00	6	0.67%	15	5.29	4.30	0.02	OK	18	1.42
19	CBMH-925	STMH-924	0.41	0.70	0.29	0.52	10.00	10.02	6.13	3.17	939.92	935.92	4.00	934.39	930.94	3.45	144	3.46%	15	12.05	9.79	0.25	OK	19	1.76
20	CB-945	STMH-924	0.88	0.40	0.35	0.35	10.00	10.00	6.13	2.16	934.36	931.36	3.00	934.39	930.94	3.45	85	0.49%	15	4.55	3.70	0.38	OK	20	2.16
21	STMH-924	CBMH-923	0.00	0.35	0.00	0.87	10.00	10.38	6.02	5.24	934.39	930.94	3.45	930.84	927.19	3.65	130	2.88%	15	11.00	8.94	0.24	OK	21	0.00
22	CB-934	CBMH-933	0.42	0.40	0.17	0.17	10.00	10.00	6.13	1.03	933.24	930.24	3.00	930.84	927.84	3.00	120	2.00%	15	9.16	7.45	0.27	OK	22	1.03
23	CBMH-933	CBMH-923	0.59	0.40	0.24	0.40	10.00	10.27	6.05	2.45	930.84	927.84	3.00	930.84	927.38	3.46	130	0.35%	15	3.85	3.13	0.69	OK	23	1.43
24	CBMH-923	CBMH-922	1.43	0.35	0.50	1.77	10.00	10.96	5.85	10.39	930.84	926.59	4.25	931.85	926.25	5.60	151	0.23%	24	10.76	3.42	0.74	OK	24	2.93
25	CBMH-922	CBMH-901	0.75	0.70	0.53	2.30	10.00	11.70	5.66	13.03	931.85	926.25	5.60	931.85	926.12	5.73	32	0.41%	24	14.46	4.59	0.12	OK	25	2.97
27	CB-914	CBMH-913	0.16	0.70	0.11	0.11	10.00	10.00	6.13	0.69	933.72	929.72	4.00	933.72	929.56	4.16	32	0.50%	15	4.58	3.72	0.14	OK	27	0.69
28	CBMH-913	CBMH-912	0.03	0.80	0.02	0.14	10.00	10.14	6.09	0.83	933.72	929.56	4.16	932.88	928.88	4.00	110	0.62%	15	5.09	4.14	0.44	OK	28	0.15
29	CBMH-912	CBMH-901	0.09	0.80	0.07	0.21	10.00	10.59	5.96	1.24	932.88	928.88	4.00	931.85	927.85	4.00	165	0.62%	15	5.12	4.16	0.66	OK	29	0.43
30	CBMH-901	FES-900	0.42	0.80	0.34	6.90	10.00	15.31	4.94	34.06	931.74	925.32	6.42	928.00	925.00	3.00	109	0.29%	36	36.24	5.12	0.36	OK	30	1.66
	STORM SEWER 1000s																								
1	CB-1002	CBMH-1001	0.38	0.70	0.27	0.27	10.00	10.00	6.13	1.63	932.83	928.83	4.00	933.14	928.69	4.45	44	0.32%	15	3.69	3.00	0.24	OK	1	1.63
2	CBMH-1001	FES-1000	0.49	0.70	0.34	0.61	10.00	10.24	6.06	3.69	933.14	928.69	4.45	929.75	928.50	1.25	49	0.39%	15	4.03	3.28	0.25	OK	2	2.08
	STORM SEWER 1100s																								
1	CB-1103	CBMH-1102	0.07	0.50	0.04	0.04	10.00	10.00	6.13	0.21	935.10	932.10	3.00	933.42	930.42	3.00	126	1.33%	15	7.48	6.08	0.35	OK	1	0.21
2	CBMH-1102	STMH-1101	0.29	0.50	0.15	0.18	10.00	10.35	6.03	1.09	933.42	930.42	3.00	935.15	930.16	4.99	52	0.50%	15	4.58	3.72	0.23	OK	2	0.87
3	STMH-1101	FES-1100	0.00	0.40	0.00	0.18	10.00	10.58	5.96	1.07	935.15	929.00	6.15	929.75	928.50	1.25	40	1.25%	15	7.24	5.89	0.11	OK	3	0.00

SURVEYED PROPERTY

Scherber Parcel:

Parcel 1:
Beginning at a point on the East line of Government Three (3) distant 525 feet North 0 degrees 14 minutes 28 seconds West from the Southeast corner thereof; thence South 89 degrees 44 minutes 7 seconds West parallel with the South line thereof distant 553.53 feet; thence South 0 degrees 21 minutes East to center line of county road; thence Northwesterly along said center line to the West line thereof; thence Northerly to the Northwest corner thereof; thence along the Northerly line thereof to the Northeast corner thereof; thence Southerly to the point of beginning. Also that part of the West 30 rods of Government Lot 2 lying North of the South 53 rods thereof, except roads, in Section Twenty-one (21), Township One Hundred Twenty (120), Range Twenty-three (23), Hennepin County, State of Minnesota.

Casco Parcel:

That part of Government Lot 2 in Section 21, Township 120, Range 23, described as commencing at the Southwest corner thereof, thence South 89 degrees 48 minutes 24 seconds East, assumed bearing along the South line of Government Lot 2, a distance of 438.00 feet to the point of beginning; thence North 00 degrees 13 minutes 06 seconds East parallel to the West line of Government Lot 2, a distance of 874.50 feet; thence South 89 degrees 48 minutes 24 seconds East a distance of 57.00 feet; thence North 0 degrees 13 minutes 06 seconds East a distance of 891.00 feet, more or less, to the shore of Crowley Lake; thence Northeasterly along said shoreline a distance of 1043.00 feet, more or less, to the East line of Government Lot 2; thence South 00 degrees 20 minutes 20 seconds West along said East line to a point which is 1604.32 feet North of the Southeast corner of Government Lot 2; thence North 89 degrees 39 minutes 40 seconds West a distance of 154.63 feet; thence South 22 degrees 32 minutes 57 seconds West a distance of 930.19 feet; thence South 00 degrees 13 minutes 06 seconds West distance 744.43 feet to the South line of Government Lot 2; thence North 89 degrees 48 minutes 24 seconds West along said South line a distance of 387.00 feet to the point of beginning, Hennepin County, Minnesota.

Weber Parcel:

That part of Government Lot 1, Section 16, Township 120 North, Range 23 West, Hennepin County, Minnesota, which lies southerly of a line, and its westerly extension, described as commencing at the southeast comer of said Government Lot 1; thence northerly along the east line of said Government Lot 1, a distance of 343.00 feet to the point of beginning of the line to be described; thence westerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 440.00 feet; thence southerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 200 feet; thence westerly deflecting to the right, 90 degrees 00 minutes 00 seconds to the west line of said Government Lot 1 and said line there terminating; AND

That part of Government Lot 1, Section 21, Township 120, Range 23, Hennepin County, Minnesota , which lies northerly of a line described as commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South 00 degrees 27 minutes 31 seconds West, along the east line of said Government Lot 1, a distance of 182.88 feet to the point of beginning of the line to be described; thence South 61 degrees 03 minutes 26 seconds West a distance of 222.02 feet; thence South 67 degrees 30 minutes 11 seconds West a distance of 91.95 feet; thence South 76 degrees 13 minutes 23 seconds West a distance of 165.87 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 100.00 feet; thence South 76 degrees 59 minutes 00 seconds West a distance of 124.04 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 191.00 feet; thence South 58 degrees 41 minutes 05 seconds West a distance of 100.13 feet; thence South 51 degrees 12 minutes 52 seconds West a distance of 298.78 feet; thence South 30 degrees 17 minutes 17 seconds West a distance of 353.33 feet to a point in the west line of said Government Lot 1 which is 1604.32 feet north of the southwest corner of the Southeast Quarter of the Northeast Quarter of said Section 21, and said line there terminating.

EXISTING ZONING IS R2
PROPOSED ZONING IS PUD

TOTAL SITE AREA	±88.99 AC.
LOT AREA	35.64 AC.
–(70' WIDE LOTS)	(14.41 AC.)
–(60' WIDE LOTS)	(10.60 AC.)
–(60' WIDE VILLA LOTS)	(6.01 AC.)
–(42' WIDE CARRIAGE LOT)	(4.62 AC.)
OUTLOT AREA	±39.16 AC.
–(OPEN SPACE – OUTLOTS A–G)	(±36.98 AC.)
–(FUTURE DEVELOPMENT – OUTLOTS H–I)	(2.18 AC.)
RIGHT OF WAY AREA	14.19 AC.
–(EXISTING ROADS – WILLANDALE & TERRITORIAL)	(2.44 AC.)
–(SUBDIVISION ROADS)	(11.75 AC.)

SITE DATA

70' WIDE LOTS – 59 LOTS
(BLOCKS 1–4 & 13)
MINIMUM LOT AREA – 8,750 S.F. (70'x125')

60' WIDE LOTS – 48 LOTS
(BLOCKS 5, 6, 8, & 12 & LOTS 21–23, BLOCK 9)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

60' WIDE VILLA LOTS – 26 LOTS
(BLOCK 7 & 11)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

42' WIDE CARRIAGE LOT – 36 LOTS
(BLOCK 10, & LOTS 1–20, BLOCK 9)
MINIMUM LOT AREA – 5,460 S.F. (42'x130')

TOTAL LOT COUNT – 169 LOTS

MAXIMUM IMPERVIOUS (ALL LOTS) = 50%

MINIMUM SETBACKS – 60' & 70' WIDE STANDARD LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET

MINIMUM SETBACKS – 60' WIDE VILLA LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET

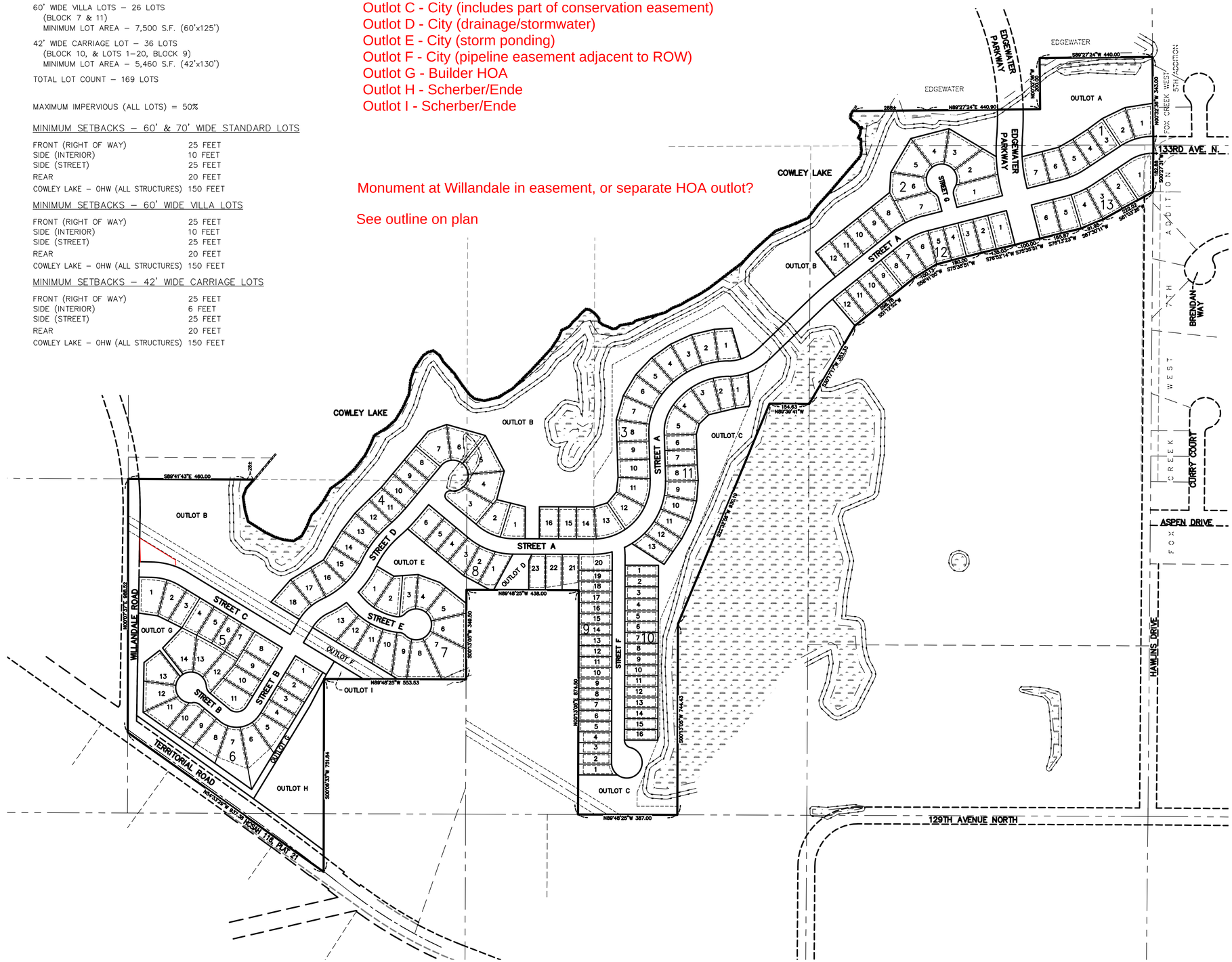
MINIMUM SETBACKS – 42' WIDE CARRIAGE LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	6 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET

OUTLOT OWNERSHIP
Outlot A - City (storm ponding)
Outlot B - City (shoreland req'd)
Outlot C - City (includes part of conservation easement)
Outlot D - City (drainage/stormwater)
Outlot E - City (storm ponding)
Outlot F - City (pipeline easement adjacent to ROW)
Outlot G - Builder HOA
Outlot H - Scherber/Ende
Outlot I - Scherber/Ende

Monument at Willandale in easement, or separate HOA outlot?

See outline on plan



N

SCALE IN FEET
0 200' 400'

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY PLAT
FOR
RACHEL DEVELOPMENT
4180 NAPPER COURT, ST. MICHAEL, MN 55376

DRAWN BY
PLM
DATE
2/24/2025
REVISIONS

CAD FILE
23970pp.dwg
PROJECT NO.
23970-00
2.0

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp.dwg – 2/21/2025 10:51AM

DRAFT REPORT

To: David Stradtman, VP of Development
Rachel Development

From: Matt Pacyna, PE, Principal
Transportation Collaborative & Consultants, LLC

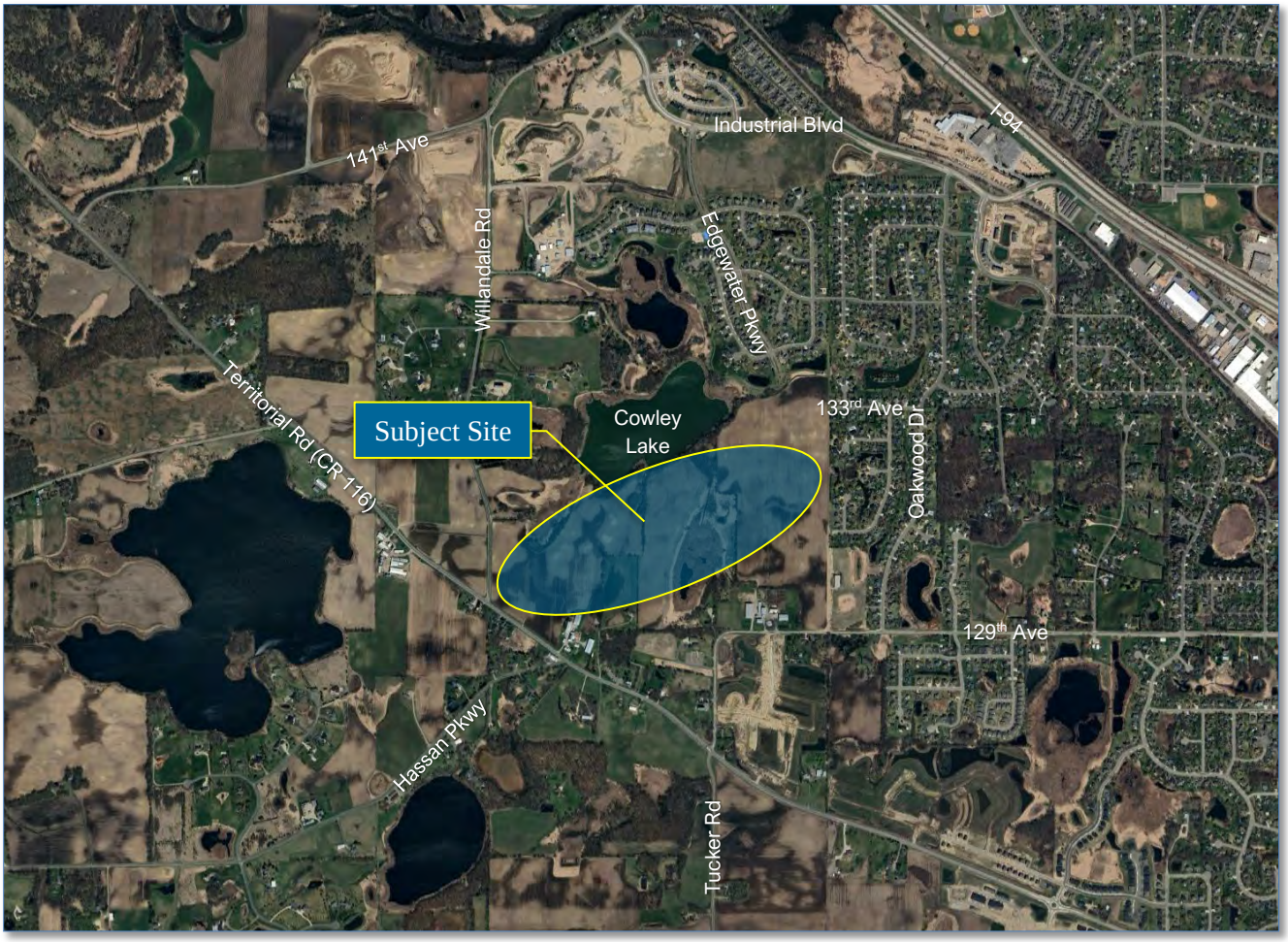
Date: March 19, 2025

Subject: Scherber Property Development Traffic Study, Rogers, MN

INTRODUCTION

TC2 completed a traffic study for the proposed Scherber Property Residential Development in Rogers, MN. The site under consideration, shown in Figure 1, is generally bound by Territorial Road (CR 116) to the south, Willandale Road to the west, Cowley Lake to the north, and Hawkins Drive to the east. The main objectives of the study are to quantify existing traffic operations within the study area, evaluate potential impacts of the proposed development, and recommend improvements, if necessary, to ensure safe and efficient operations for all users. The following study assumptions, methodology, and findings are offered for consideration.

Figure 1 Subject Site



EXISTING CONDITIONS

Existing conditions were reviewed within the study area to establish current traffic conditions to help determine impacts associated with the proposed development. The evaluation of existing conditions included collecting traffic volumes, observing transportation characteristics, and analyzing crash history and intersection capacity, which are described in the following sections.

Traffic Volumes

Vehicular intersection turning movement counts were collected at the following locations on Tuesday, February 4, 2025. The counts were collected from 6 a.m. to 7 p.m. at each study intersection.

- Territorial Road (CR 116) and Willandale Road
- Edgewater Parkway and Industrial Boulevard
- Oakwood Drive and 133rd Avenue

The a.m. and p.m. peak hours represent 7 to 8 a.m. and 4:15 to 5:15 p.m., respectively. Average daily traffic (ADT) volumes were provided by MnDOT or estimated based on the data collected.

Transportation Characteristics

Observations were conducted within the study area to identify various transportation characteristics such as roadway geometry, traffic controls, speed limits, and multimodal facilities. A general overview of key roadways within the study area is as follows:

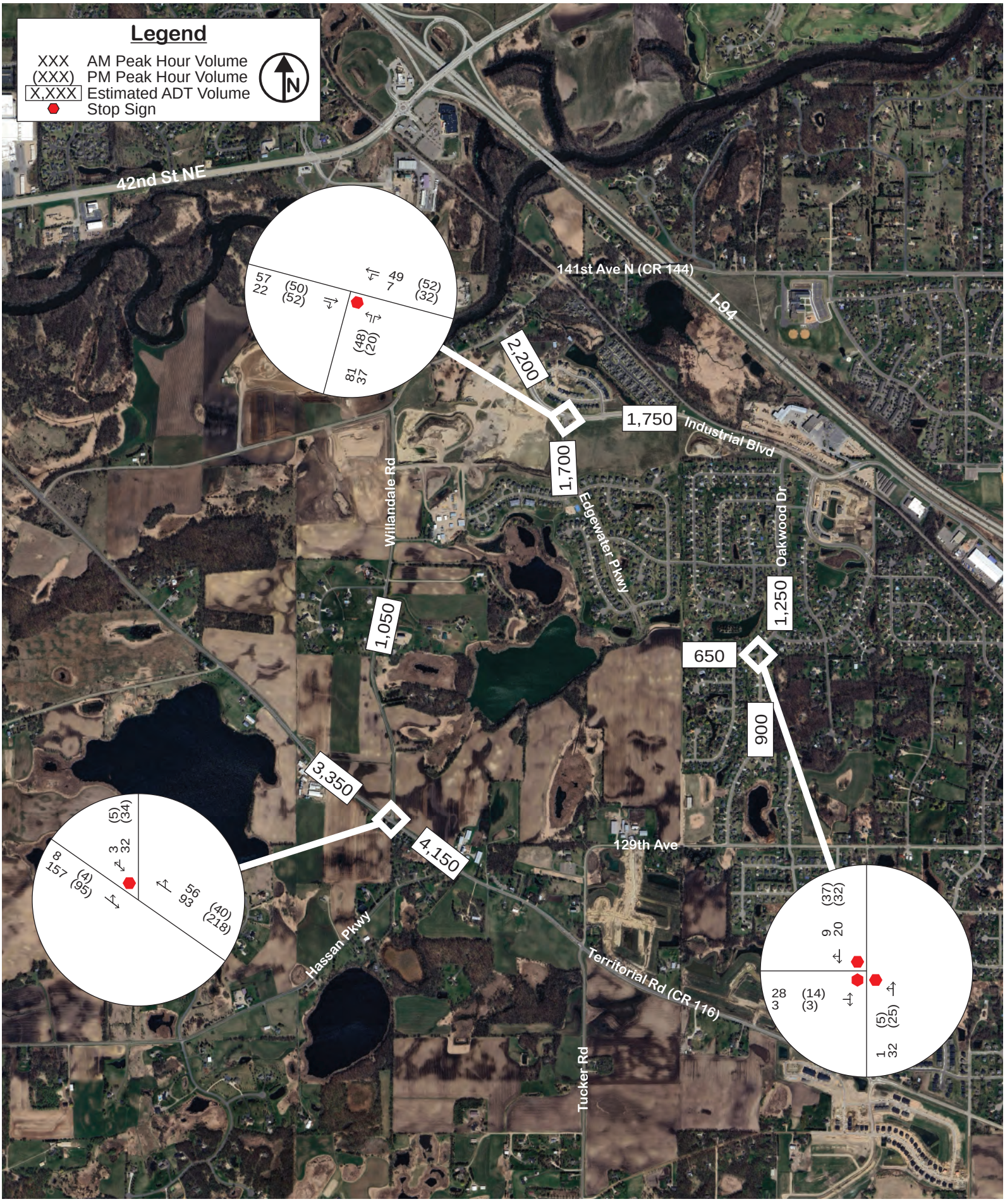
- ***Territorial Road (CR 116)*** – a 2-lane undivided minor arterial roadway with no turn lanes at Willandale Road. There are no multimodal facilities and the speed limit is 50-mph.
- ***Willandale Road*** – a 2-lane undivided local roadway with no turn lanes at Territorial Road (CR 166). There are no multimodal facilities and the speed limit is 45-mph.
- ***Industrial Boulevard*** – a 2-lane divided major collector roadway with periodic left and right turn lanes at key intersections. There is sidewalk along north side of the roadway, as well as the south side to the east of Edgewater Parkway; the speed limit is 30 mph.
- ***Edgewater Parkway*** – a 2-lane divided local roadway with no turn lanes. There is a multiuse trail along the west side and a sidewalk along the east side of the roadway; the speed limit is 20 mph.
- ***133rd Avenue*** – a 2-lane undivided local roadway with no turn lanes. There is sidewalk along the south side of the roadway; the speed limit is 25 mph.
- ***Oakwood Drive*** – a 2-lane undivided minor collector roadway with no turn lanes. There is sidewalk along the west side of the roadway; the speed limit is 25 mph.

The Oakwood Drive and 133rd Avenue intersection has all-way stop control, while all other study intersections have side-street stop control. Existing conditions are illustrated in Figure 2.

Crash History

Five years of crash history within the study area (January 2020 through December 2024) was reviewed using data from *MnDOT's Crash Mapping Analysis Tool* (MnCMAT). There were two (2) non-animal reported crashes within the study area; one (1) at both the Territorial Road (CR 116) / Willandale Road and Industrial Boulevard / Edgewater Parkway intersections. Both reported crashes were property damage only. Therefore, there are no existing safety issues within the study area from a crash frequency or severity perspective

DRAFT


Legend
XXX AM Peak Hour Volume
(XXX) PM Peak Hour Volume
X,XXX Estimated ADT Volume
Stop Sign
N
42nd St NE
141st Ave N (CR 144)
I-94
Industrial Blvd
Willandale Rd
Edgewater Pkwy
Oakwood Dr
129th Ave
Hassan Pkwy
Territorial Rd (CR 116)
Tucker Rd
2,200
1,750
1,700
1,050
1,250
650
900
3,350
4,150
57
22
(50)
(52)
49
7
(52)
(32)
(48)
(20)
81
37
(5)
(34)
3
32
8
157
(4)
(95)
56
93
(40)
(218)
(37)
(32)
9
20
28
3
(14)
(3)
(5)
(25)
1
32

Intersection Capacity

Intersection capacity was evaluated using Synchro / SimTraffic Software (version 11), which uses methods outlined in the *Highway Capacity Manual, 6th Edition*. The software is used to develop calibrated models that simulate observed traffic operations and identify key metrics such as intersection Level of Service (LOS) and queues. These models incorporate collected traffic, pedestrian, and bicyclist volumes, traffic controls, peaking characteristics, and driver behavior factors. Level of Service (LOS) quantifies how an intersection is operating. Intersections are graded from LOS A to LOS F, which corresponds to the average delay per vehicle values shown. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity. An overall intersection LOS A though LOS D is generally considered acceptable in the study area.

Level of Service	Average Delay / Vehicles	
	Stop, Yield, and Roundabout	Signalized
A	< 10 seconds	< 10 seconds
B	10 to 15 seconds	10 to 20 seconds
C	15 to 25 seconds	20 to 35 seconds
D	25 to 35 seconds	35 to 55 seconds
E	35 to 50 seconds	55 to 80 seconds
F	> 50 seconds	> 80 seconds

For side-street stop-controlled intersections, special emphasis is given to providing an estimate for the level of service of the side-street approach. Traffic operations at an unsignalized intersection with side-street stop control can be described in two ways. First, consideration is given to the overall intersection level of service, which takes into account the total number of vehicles entering the intersection and the capability of the intersection to support the volumes. Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, most delay is attributed to the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high-levels of delay (i.e., poor levels of service) on the side-street approaches, but an acceptable overall intersection level of service during peak hour conditions.

The existing intersection capacity analysis results, summarized in Table 2, indicate that all study intersections and approaches currently operate at an acceptable LOS B or better during the typical weekday a.m. and p.m. peak hours. Peak queues for all approaches are generally 50 feet or less (i.e., 2 to 3 vehicles). Thus, there are currently no significant issues within the study area from an intersection capacity perspective.

Table 1 Existing Intersection Capacity

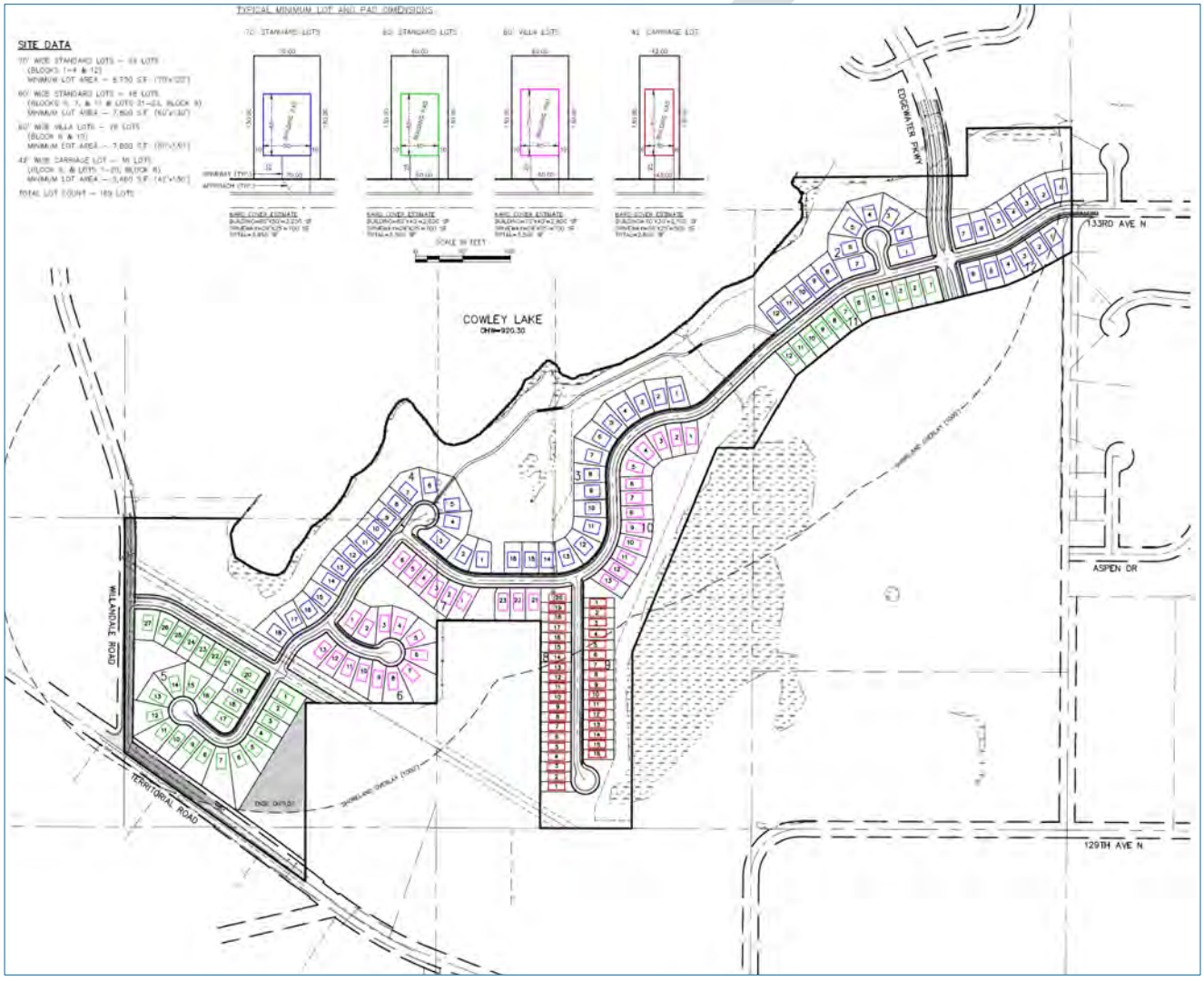
Intersection	Traffic Control	Level of Service (Delay)	
		AM Peak Hour	PM Peak Hour
Willandale Road and Territorial Road (CR 116)	SSS	A / B (11 sec)	A / B (12 sec)
Edgewater Parkway and Industrial Boulevard	SSS	A / B (10 sec)	A / B (10 sec)
Oakwood Drive and 133rd Avenue	AWSC	A (7 sec)	A (7 sec)

AWSC – All Way Stop Control *SSS – Side-Street-Stop*

PROPOSED DEVELOPMENT

The proposed development, shown in Figure 3, is generally bound by Territorial Road (CR 116) to the south, Willandale Road to the west, Cowley Lake to the north, and Hawkins Drive to the east. As proposed, the project would include a total of 169 single-family residential homes and complete a roadway connection between Willandale Road and both Edgewater Parkway and 133rd Avenue. The development would also provide for future roadway extensions of Edgewater Parkway and 129th Avenue. Sidewalk is proposed throughout the site along one side of each roadway and includes connections to adjacent facilities. Construction was assumed to be fully completed by 2030.

Figure 3 Proposed Site Plan



TRAFFIC FORECASTS

Traffic forecasts were developed for year 2030 conditions and account for general background growth, travel pattern changes associated with the new roadway connections, and trip generation from the proposed development. The following information summarizes the traffic forecast development process.

Background Growth

To account for general background growth in the study area, an annual growth rate of three (3) percent was applied to the existing traffic volumes to develop year 2030 background traffic forecasts. This growth rate is consistent with historical ADT volumes over the last 20-years, as well as future year 2040 traffic forecasts within the *Hennepin County Mobility 2040 Plan*.

Roadway Network Travel Pattern Changes

The proposed development would complete a roadway connection between Willandale Road and both Edgewater Parkway and 133rd Avenue. This roadway connection would provide existing area residents to the north and east additional route options to / from their residences. With this roadway connection, approximately 150 to 250 daily motorists could be expected to change current travel patterns and utilize the new roadway connections. A corresponding reduction in motorists along portions of Edgewater Parkway and / or Oakwood Drive could also be expected. At this level of travel pattern change, no significant impacts would be expected and therefore existing travel patterns were not modified as part of this study to better understand traffic volume impacts associated with the proposed development. Note that travel pattern changes associated with the future extension of Edgewater Parkway and 129th Avenue were also not evaluated as part of this study.

Proposed Development Trip Generation

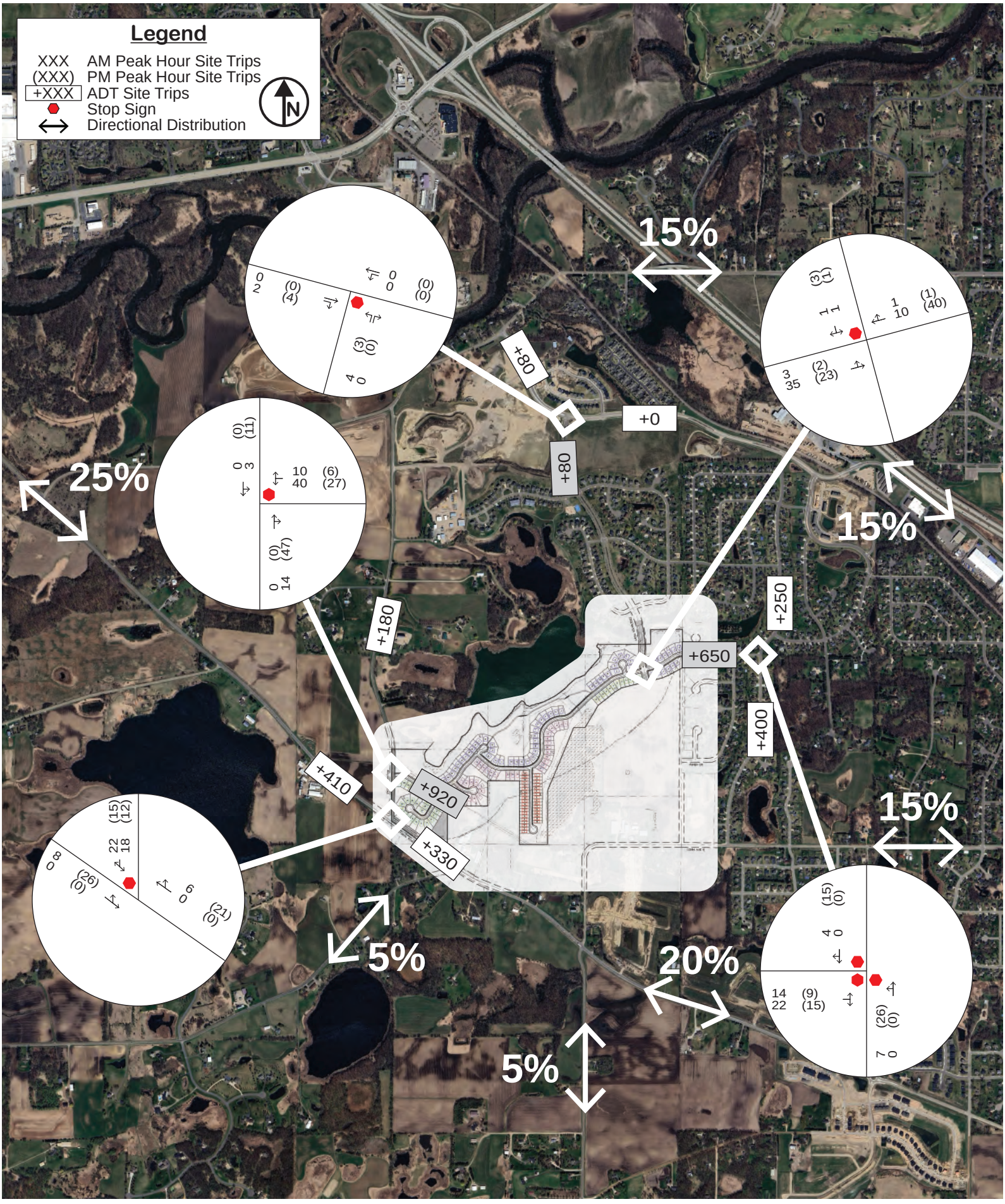
The trip generation estimate for the proposed development was created using the *ITE Trip Generation Manual, 11th Edition* and includes trips for typical weekday a.m. and p.m. peak hours, as well as daily. The proposed development, shown in Table 2, is estimated to generate 120 a.m. peak hour (30 in / 90 out), 163 p.m. peak hour (103 in / 60 out), and 1,636 daily trips. No modal reductions were applied to provide a more conservative estimate.

Table 2 Trip Generation Summary

Land Use Type *(ITE Code)*	**Size**	**AM Peak Hour**		**PM Peak Hour**		**Daily**
		In	**Out**	**In**	**Out**	
Single-Family Residential *(210)*	169 homes	30	90	103	60	1,636

Site generated trips were distributed throughout the study area using the directional distribution shown in Figure 4, which is based on a combination of existing area travel patterns and engineering judgment. The resultant year 2030 build condition traffic forecasts are illustrated in Figure 5.

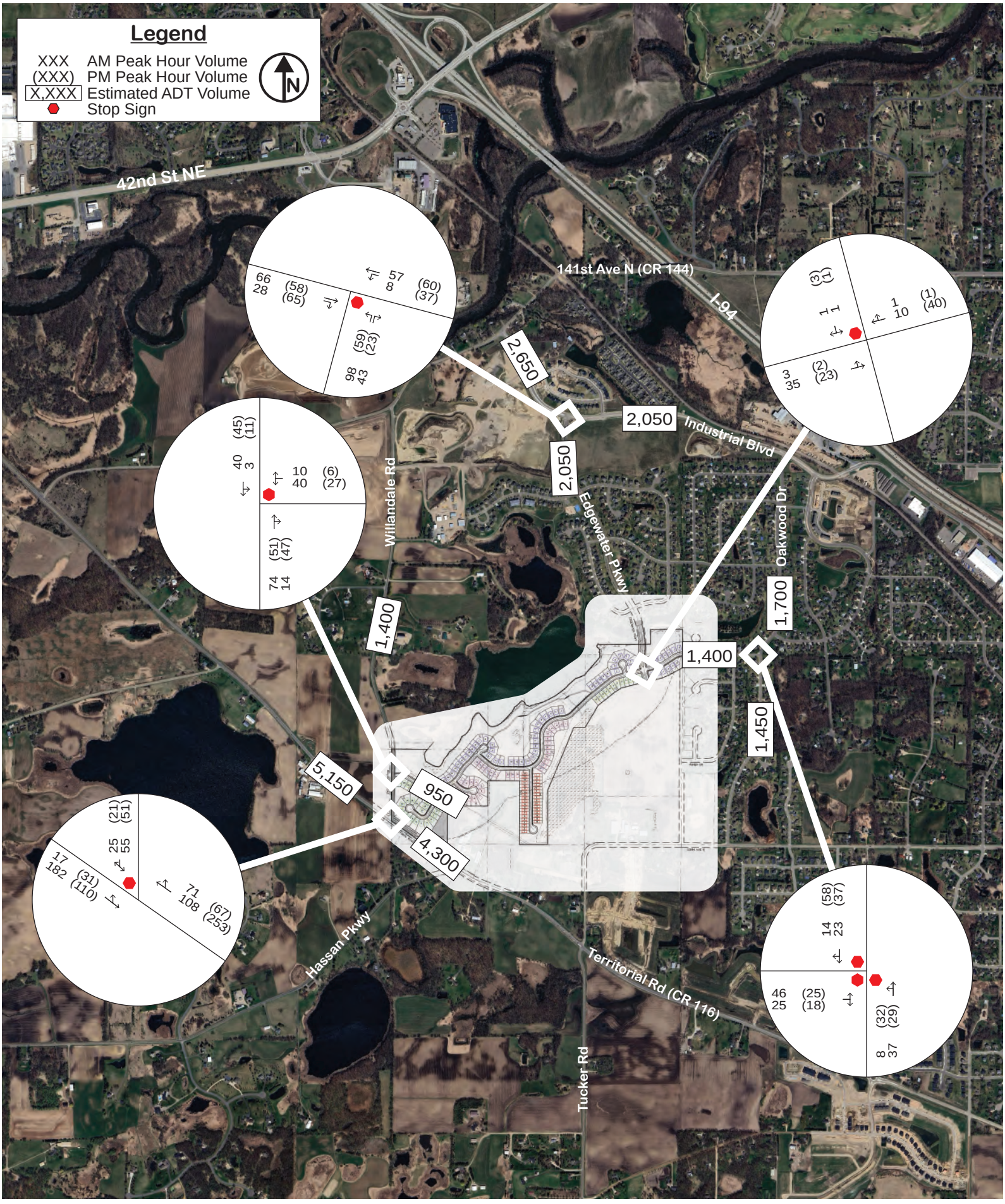
DRAFT



Site Generated Trips

Scherber Property Development Traffic Study

Figure 4



Year 2030 Build Conditions

Scherber Property Development Traffic Study

Figure 5

YEAR 2030 CONDITIONS

To understand impacts associated with the proposed development, a year 2030 build condition intersection capacity analysis was conducted. Results of the future analysis shown Table 3 indicate that all study intersections and approaches will continue to operate at an acceptable LOS B or better during the typical weekday a.m. and p.m. peak hours. In addition, peak queues for all approaches will also continue to be generally 50 feet or less (i.e., 2 to 3 vehicles). Thus, the overall change in operations as a result of the proposed development from an intersection capacity perspective is relatively minimal and within acceptable industry standards. No additional infrastructure is needed to support the proposed development from a roadway capacity perspective.

Table 3 Year 2030 Build Intersection Capacity

Intersection	Traffic Control	Level of Service (Delay)	
		AM Peak Hour	PM Peak Hour
Willandale Road and West Site Access	SSS	A / B (10 sec)	A / B (10 sec)
Willandale Road and Territorial Road (CR 116)	SSS	A / B (12 sec)	A / B (13 sec)
Edgewater Parkway and Industrial Boulevard	SSS	A / B (10 sec)	A / B (10 sec)
Edgewater Parkway and 133rd Avenue	SSS	A / A (9 sec)	A / A (9 sec)
Oakwood Drive and 133rd Avenue	AWSC	A (8 sec)	A (8 sec)

AWSC – All Way Stop Control *SSS – Side-Street-Stop*

TURN LANE REVIEW

Although not needed from an intersection capacity perspective, turn lanes can provide safety benefits by limiting conflicts between thru and turning vehicles. To determine if turn lanes are warranted within the study area, specifically along Willandale Avenue at both the West Site Access and Territorial Road (CR 116) intersections, a turn lane analysis was conducted. Guidance from *MnDOT's Access Management Manual*, *AASHTO's Geometric Design of Highways and Streets*, and the *NCHRP Report on Evaluating Intersection Improvements: An Engineering Study Guide* were reviewed. Each of these guidelines consider traffic volumes along the roadways, including hourly directional, left- / right-turning, and ADT volumes.

Results of the turn lane review indicate that the traffic volumes at the Territorial Road (CR 116) and Willandale Road intersection will meet the guidance to warrant a westbound right-turn lane. However, the eastbound left-turn and opposing volumes do not meet the guidance to warrant an eastbound left-turn lane. In addition, the anticipated traffic volumes along Willandale Road at the West Site Access do not meet the guidance for either a northbound right-turn lane or a southbound left-turn lane. Therefore, further coordination with area agencies, including Hennepin County, should occur to discuss the turn lane needs. Detailed information used for the turn lane analysis is included in the Appendix.

DRAFT

SITE PLAN / OTHER CONSIDERATIONS

A review of the proposed site plan does not indicate any major issues. However, the following items are offered for further consideration between the City, County, and / or project team.

- Locate signage and landscaping to avoid creating any sight distance issues.
- Increase the curve radius near the internal cul-de-sac intersection or reorientate the roadway so the roadway / cul-de-sac are the continue roadway and the east approach intersects at 90 degrees.
- Add internal traffic controls (i.e., stop signs) per direction from the City Engineer; traffic controls should be reviewed further upon the future extension of Edgewater Parkway and / or 129th Avenue.
- Review truck maneuverability to limit potential circulation conflicts.

CONCLUSIONS

Based on the findings of the study, the following conclusions are offered for consideration.

1) There does not appear to be any significant safety issues within the study area from a crash history perspective.
2) All study intersections and approaches currently operate at an acceptable overall LOS B or better during the typical weekday a.m. and p.m. peak hours and there are no significant existing intersection capacity issues within the study area.
3) The proposed development includes 169 single-family residential homes with construction anticipated to be fully completed by the year 2030.
4) Traffic forecasts were developed for year 2030 build conditions, which included a three (3) percent annual background growth and trip generation from the proposed development; the proposed development is estimated to generate 120 a.m. peak hour (30 in / 90 out), 163 p.m. peak hour (103 in / 60 out), and 1,636 daily trips.
5) Key takeaways from the future year 2030 build capacity analysis, include:
    a. All study intersections and approaches are expected to continue to operate at an acceptable LOS B or better during typical weekday a.m. and p.m. peak hours.
    b. The overall change in operations as a result of the proposed development is relatively minimal and within acceptable industry standards and no additional infrastructure is needed to support the proposed development from an intersection capacity perspective.
6) Traffic volumes at the Territorial Road (CR 116) and Willandale Road intersection are expected to meet the guidance to warrant a westbound right-turn lane; no other locations will meet the guidance to warrant any additional turn lanes. Thus, further coordination with area agencies, including Hennepin County, should occur to discuss the turn lane needs.
7) A review of the proposed site plan does not indicate any major issues although the site plan items noted above are offered for further consideration between the City, County, and / or project team.

DRAFT

APPENDIX

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

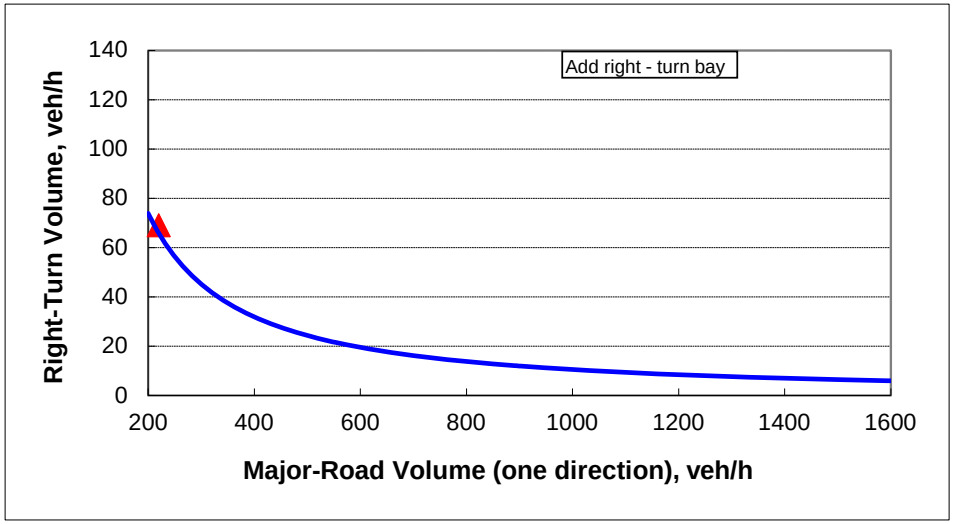
INPUT

Roadway geometry:	2-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	220
Right-turn volume, veh/h:	69

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	66
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



	Territorial Road (CR 116) / Willandale Road Intersection Year 2030 Build Traffic Volumes			
	EBLT	EBT	WBT	WBR
6:00 AM	5	89	48	25
7:00 AM	17	182	108	71
8:00 AM	21	110	75	43
9:00 AM	17	74	68	32
10:00 AM	22	65	58	28
11:00 AM	23	58	75	29
12:00 PM	31	58	79	34
1:00 PM	26	77	104	37
2:00 PM	34	71	147	58
3:00 PM	34	102	169	74
4:00 PM	31	89	255	69
5:00 PM	36	107	190	58
6:00 PM	26	68	85	50

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

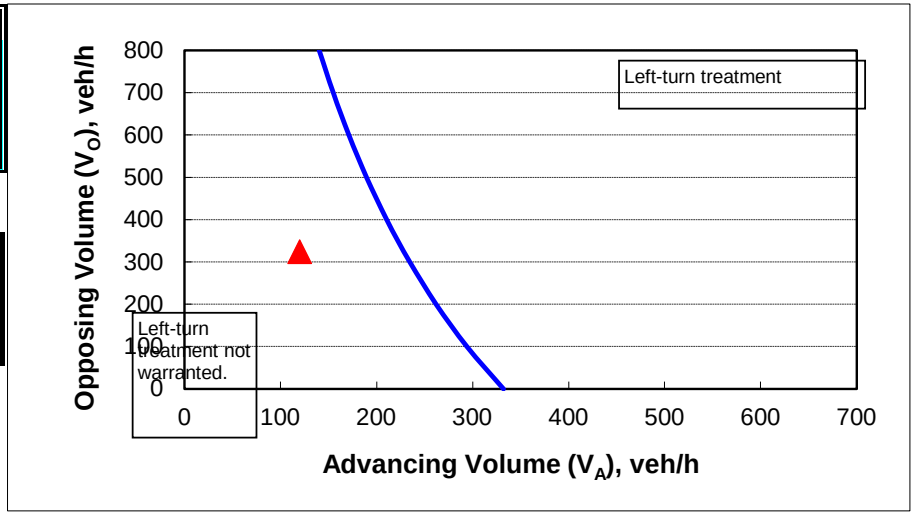
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	55
Percent of left-turns in advancing volume (V_A), %:	22%
Advancing volume (V_A), veh/h:	120
Opposing volume (V_O), veh/h:	324

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	228
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane , s:	1.9

Territorial Road (CR 116) / Willandale Road Intersection
Year 2030 Build Traffic Volumes

	EBLT	EBT	WBT	WBR
6:00 AM	5	89	48	25
7:00 AM	17	182	108	71
8:00 AM	21	110	75	43
9:00 AM	17	74	68	32
10:00 AM	22	65	58	28
11:00 AM	23	58	75	29
12:00 PM	31	58	79	34
1:00 PM	26	77	104	37
2:00 PM	34	71	147	58
3:00 PM	34	102	169	74
4:00 PM	31	89	255	69
5:00 PM	36	107	190	58
6:00 PM	26	68	85	50

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

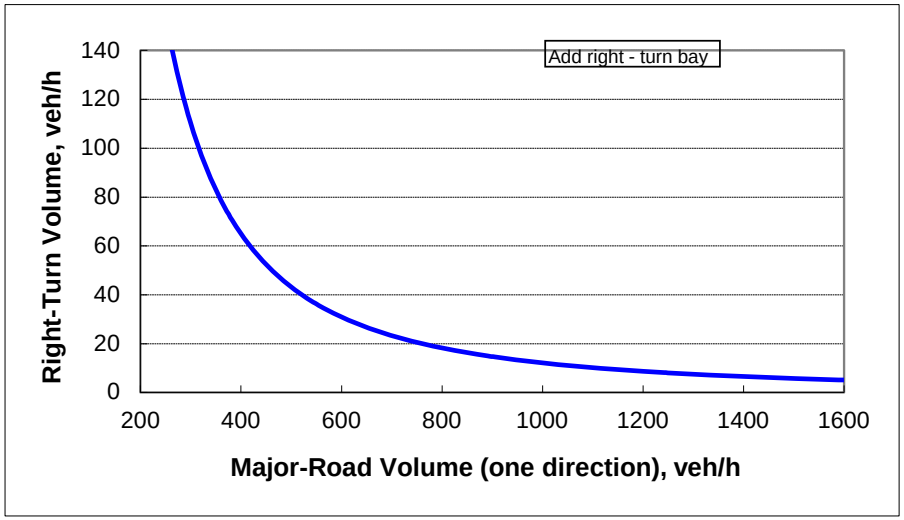
INPUT

Roadway geometry:	2-lane roadway

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	100
Right-turn volume, veh/h:	47

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	824
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



	Willandale Road / West Site Access Intersection Year 2030 Build Traffic Volumes			
	SBL	SBT	NBT	NBR
6:00 AM	2	22	23	7
7:00 AM	3	41	74	14
8:00 AM	7	37	35	29
9:00 AM	7	24	20	29
10:00 AM	8	9	14	37
11:00 AM	8	14	16	37
12:00 PM	10	16	20	44
1:00 PM	10	22	19	44
2:00 PM	12	34	39	51
3:00 PM	12	60	56	51
4:00 PM	11	57	52	47
5:00 PM	12	45	42	51
6:00 PM	10	29	31	44

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

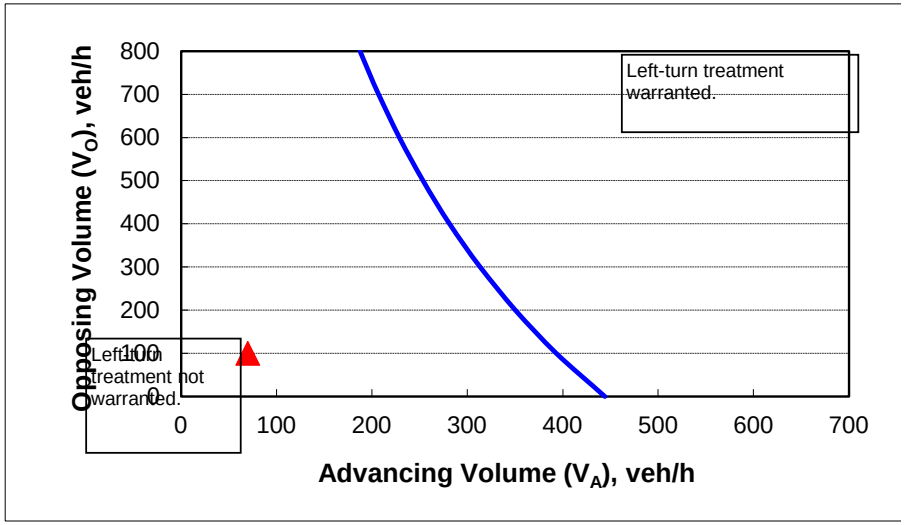
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	16%
Advancing volume (V_A), veh/h:	70
Opposing volume (V_O), veh/h:	100

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	393
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane , s:	1.9

	Willandale Road / West Site Access Intersection Year 2030 Build Traffic Volumes			
	SBL	SBT	NBT	NBR
6:00 AM	2	22	23	7
7:00 AM	3	41	74	14
8:00 AM	7	37	35	29
9:00 AM	7	24	20	29
10:00 AM	8	9	14	37
11:00 AM	8	14	16	37
12:00 PM	10	16	20	44
1:00 PM	10	22	19	44
2:00 PM	12	34	39	51
3:00 PM	12	60	56	51
4:00 PM	11	57	52	47
5:00 PM	12	45	42	51
6:00 PM	10	29	31	44

HENNEPIN COUNTY
MINNESOTA

May 2, 2025

Alec Henderson, Senior Planner
22350 South Diamond Lake Road
Rogers, MN 55374

Re: Preliminary Plat Review – Cowley Lake Preserve (Received 4/2/2025)
County State Aid Highway (CSAH) 159 (Territorial Road)
Hennepin County Plat Review ID #4029 (Reviewed 4/8/2025)

Mr. Henderson:

Please consider the following comments for the preliminary plat of the proposed Cowley Lake Preserve development (PIDs 2112023240005, 2112023130004 and 2112023110003).

Access: County staff support development access on Willandale Road. We also support the inclusion of a westbound right-turn lane at Territorial Road/Willandale Road. Given the intersection skew, consideration to incorporate traffic calming into the turn lane design is recommended to promote safety. We also appreciate the city adding lighting at this intersection. Please coordinate with our Design Division for review and approval of the turn lane design and the closure/regrading of the existing field access to facilitate drainage. For a new field access, please work with county Permits on the location and culvert size needed.

Right-of-way: We appreciate the inclusion of a 65-foot half right-of-way in the plat.

Storm Water/Drainage: The existing drainage patterns shall not be altered unless approved by Hennepin County. Watershed District approval and drainage calculations are required if the work alters existing drainage patterns. Post-construction flow rates entering Hennepin County's drainage system, overland or through pipes, shall not exceed pre-construction rates for the two, 10 and 100-year events.

Permits: Please inform the developer that all construction within county right of way requires an approved Hennepin County permit prior to beginning construction. This includes, but is not limited to, driveway and street access, drainage and utility construction, trail development, and landscaping.
Contact: Doug Heidemann, Permits Coordinator at 612-596-0336 or douglas.heidemann@hennepin.us

Please contact Chad Ellos at chad.ellos@hennepin.us or 612-596-0395 for any further discussion.

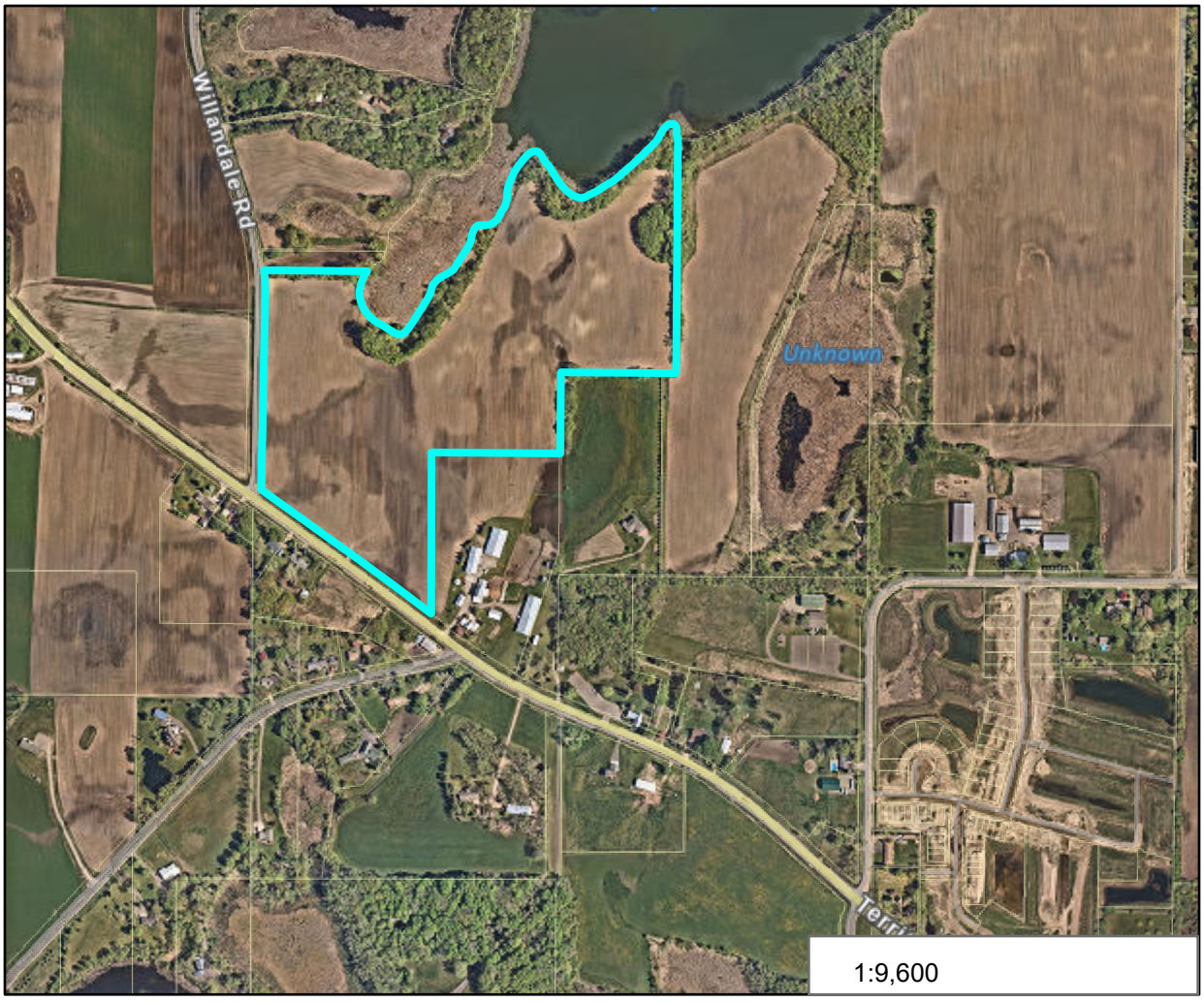
Sincerely,

Carla Stueve, PE
County Highway Engineer

Hennepin County Transportation Project Delivery
Public Works Facility, 1600 Prairie Drive, Medina, MN 55340
612-596-0300 | hennepin.us

Hennepin County Property Map

Date: 5/2/2025



PARCEL ID: 2112023240005

OWNER NAME: Scherber Disclaimer Trust

PARCEL ADDRESS: 92 Address Unassigned,Rogers MN 00000

PARCEL AREA: 41.84 acres, 1,822,614 sq ft

A-T-B: Abstract

SALE PRICE:

SALE DATE:

SALE CODE:

ASSESSED 2024, PAYABLE 2025
PROPERTY TYPE: Farm
HOMESTEAD: Homestead
MARKET VALUE: $372,900
TAX TOTAL: $1,346.18

ASSESSED 2025, PAYABLE 2026
PROPERTY TYPE: Farm
HOMESTEAD: Homestead
MARKET VALUE: $369,200

Comments:

This data (i) is furnished 'AS IS' with no representation as to completeness or accuracy; (ii) is furnished with no warranty of any kind; and (iii) is not suitable for legal, engineering or surveying purposes. Hennepin County shall not be liable for any damage, injury or loss resulting from this data.

COPYRIGHT © HENNEPIN COUNTY 2025

SURVEYED PROPERTY

Scherber Parcel:

Parcel 1:
Beginning at a point on the East line of Government Three (3) distant 525 feet North 0 degrees 14 minutes 28 seconds West from the Southeast corner thereof; thence South 89 degrees 44 minutes 7 seconds West parallel with the South line thereof distant 553.53 feet; thence South 0 degrees 21 minutes East to center line of county road; thence Northwesterly along said center line to the West line thereof; thence Northerly to the Northwest corner thereof; thence along the Northerly line thereof to the Northeast corner thereof; thence Southerly to the point of beginning. Also that part of the West 30 rods of Government Lot 2 lying North of the South 53 rods thereof, except roads, in Section Twenty-one (21), Township One Hundred Twenty (120), Range Twenty-three (23), Hennepin County, State of Minnesota.

Casco Parcel:

That part of Government Lot 2 in Section 21, Township 120, Range 23, described as commencing at the Southwest corner thereof, thence South 89 degrees 48 minutes 24 seconds East, assumed bearing along the South line of Government Lot 2, a distance of 438.00 feet to the point of beginning; thence North 00 degrees 13 minutes 06 seconds East parallel to the West line of Government Lot 2, a distance of 874.50 feet; thence South 89 degrees 48 minutes 24 seconds East a distance of 57.00 feet; thence North 0 degrees 13 minutes 06 seconds East a distance of 891.00 feet, more or less, to the shore of Crowley Lake; thence Northeasterly along said shoreline a distance of 1043.00 feet, more or less, to the East line of Government Lot 2; thence South 00 degrees 20 minutes 20 seconds West along said East line to a point which is 1604.32 feet North of the Southeast corner of Government Lot 2; thence North 89 degrees 39 minutes 40 seconds West a distance of 154.63 feet; thence South 22 degrees 32 minutes 57 seconds West a distance of 930.19 feet; thence South 00 degrees 13 minutes 06 seconds West distance 744.43 feet to the South line of Government Lot 2; thence North 89 degrees 48 minutes 24 seconds West along said South line a distance of 387.00 feet to the point of beginning, Hennepin County, Minnesota.

Weber Parcel:

That part of Government Lot 1, Section 16, Township 120 North, Range 23 West, Hennepin County, Minnesota, which lies southerly of a line, and its westerly extension, described as commencing at the southeast comer of said Government Lot 1; thence northerly along the east line of said Government Lot 1, a distance of 343.00 feet to the point of beginning of the line to be described; thence westerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 440.00 feet; thence southerly, deflecting to the left, 90 degrees 00 minutes 00 seconds a distance of 200 feet; thence westerly deflecting to the right, 90 degrees 00 minutes 00 seconds to the west line of said Government Lot 1 and said line there terminating; AND

That part of Government Lot 1, Section 21, Township 120, Range 23, Hennepin County, Minnesota , which lies northerly of a line described as commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South 00 degrees 27 minutes 31 seconds West, along the east line of said Government Lot 1, a distance of 182.88 feet to the point of beginning of the line to be described; thence South 61 degrees 03 minutes 26 seconds West a distance of 222.02 feet; thence South 67 degrees 30 minutes 11 seconds West a distance of 91.95 feet; thence South 76 degrees 13 minutes 23 seconds West a distance of 165.87 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 100.00 feet; thence South 76 degrees 59 minutes 00 seconds West a distance of 124.04 feet; thence South 75 degrees 35 minutes 51 seconds West a distance of 191.00 feet; thence South 58 degrees 41 minutes 05 seconds West a distance of 100.13 feet; thence South 51 degrees 12 minutes 52 seconds West a distance of 298.78 feet; thence South 30 degrees 17 minutes 17 seconds West a distance of 353.33 feet to a point in the west line of said Government Lot 1 which is 1604.32 feet north of the southwest corner of the Southeast Quarter of the Northeast Quarter of said Section 21, and said line there terminating.

EXISTING ZONING IS R2
PROPOSED ZONING IS PUD

TOTAL SITE AREA	±88.99 AC.
LOT AREA	35.64 AC.
–(70' WIDE LOTS)	(14.41 AC.)
–(60' WIDE LOTS)	(10.60 AC.)
–(60' WIDE VILLA LOTS)	(6.01 AC.)
–(42' WIDE CARRIAGE LOT)	(4.62 AC.)
OUTLOT AREA	±39.16 AC.
–(OPEN SPACE – OUTLOTS A–G)	(±36.98 AC.)
–(FUTURE DEVELOPMENT – OUTLOTS H–I)	(2.18 AC.)
RIGHT OF WAY AREA	14.19 AC.
–(EXISTING ROADS – WILLANDALE & TERRITORIAL)	(2.44 AC.)
–(SUBDIVISION ROADS)	(11.75 AC.)

SITE DATA

70' WIDE LOTS – 59 LOTS
(BLOCKS 1–4 & 13)
MINIMUM LOT AREA – 8,750 S.F. (70'x125')

60' WIDE LOTS – 48 LOTS
(BLOCKS 5, 6, 8, & 12 & LOTS 21–23, BLOCK 9)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

60' WIDE VILLA LOTS – 26 LOTS
(BLOCK 7 & 11)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

42' WIDE CARRIAGE LOT – 36 LOTS
(BLOCK 10, & LOTS 1–20, BLOCK 9)
MINIMUM LOT AREA – 5,460 S.F. (42'x130')

TOTAL LOT COUNT – 169 LOTS

MAXIMUM IMPERVIOUS (ALL LOTS) = 50%

MINIMUM SETBACKS – 60' & 70' WIDE STANDARD LOTS

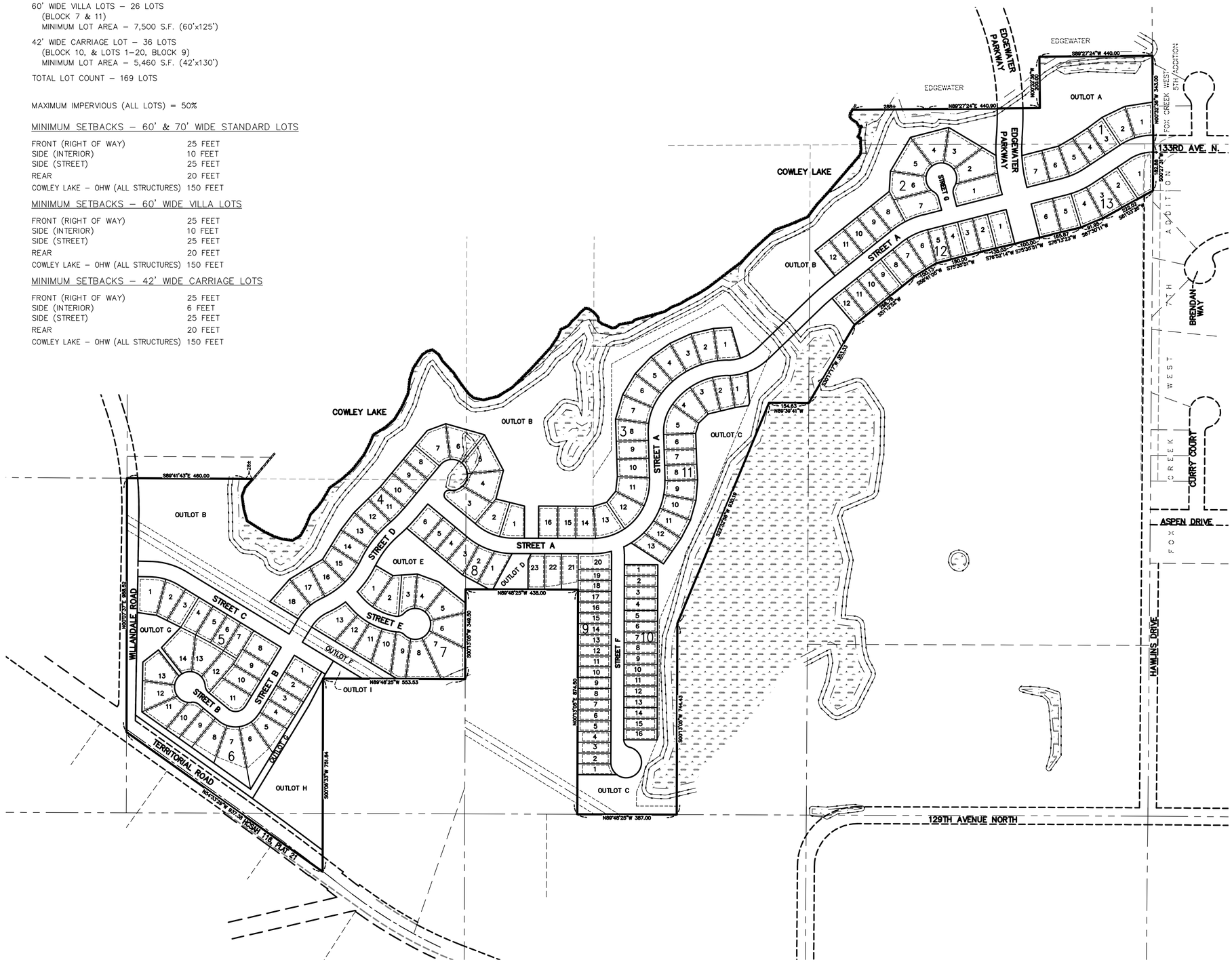
FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET

MINIMUM SETBACKS – 60' WIDE VILLA LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET

MINIMUM SETBACKS – 42' WIDE CARRIAGE LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	6 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STRUCTURES)	150 FEET



N

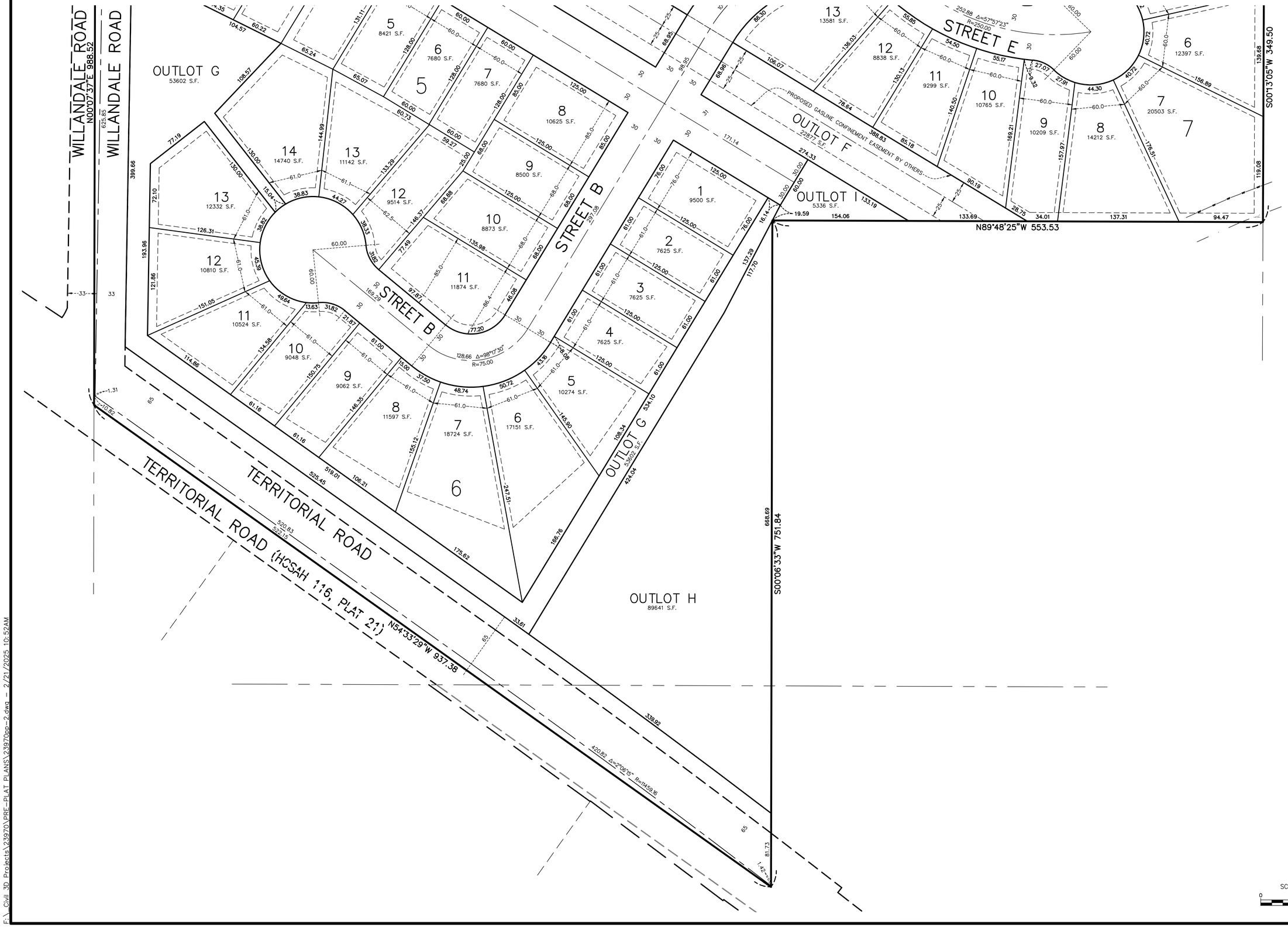
SCALE IN FEET
0 200' 400'

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
PRELIMINARY PLAT
FOR
RACHEL DEVELOPMENT
4180 NAPPER COURT, ST. MICHAEL, MN 55376

DRAWN BY
PLM
DATE
2/24/2025
REVISIONS
CAD FILE
23970pp.dwg
PROJECT NO.
23970-00
2.0

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp.dwg – 2/21/2025 10:51AM



James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
PHONE: 952.890.6044 mhampton@jrhinc.com
www.jrhinc.com

COWLEY LAKE PRESERVE

ROGERS, MINNESOTA

PRELIMINARY PLAT

FOR

RACHEL DEVELOPMENT

4180 NAPIER COURT, ST. MICHAEL, MN 55376

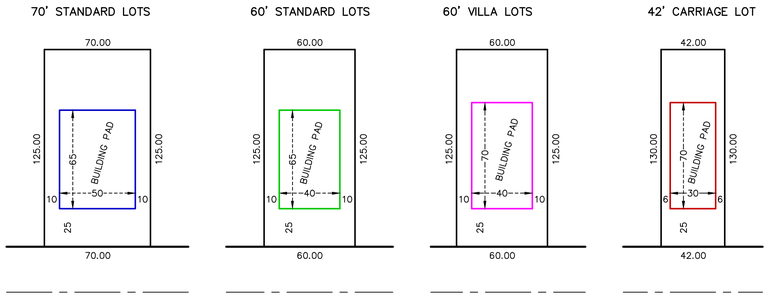
DRAWN BY
PLM
DATE
2/24/2025
REVISIONS
CAD FILE
23970pp-2.dwg
PROJECT NO.
23970-00
2.6

N

SCALE IN FEET
0 50' 100'

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970pp-2.dwg - 2/21/2025 10:52AM

TYPICAL MINIMUM LOT AND PAD DIMENSIONS



SCALE IN FEET
0 50' 100'

COWLEY LAKE
OHW=920.30

BOARDWALK
10' UNPAVED TRAIL

SUPERIOR DRIVE
133RD COURT
133RD AVE. N.
FIRE WATER PARKWAY
STREET E
STREET A
BRENDAN WAY
CURRY COURT
ASPEN DRIVE
STREET D
STREET C
STREET E
STREET F
WILLANDALE ROAD
STREET B
TERRITORIAL ROAD
(FUTURE DEVELOPMENT)
HAWKINS DRIVE
129TH AVENUE NORTH

LEGEND

- 70' LOTS – STANDARD
- 60' LOTS – STANDARD
- 60' LOTS – VILLA
- 42' LOTS – CARRIAGE

SITE DATA

70' WIDE LOTS – 59 LOTS
(BLOCKS 1–4 & 13)
MINIMUM LOT AREA – 8,750 S.F. (70'x125')

60' WIDE LOTS – 48 LOTS
(BLOCKS 5, 6, 8, & 12 & LOTS 21–23, BLOCK 9)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

60' WIDE VILLA LOTS – 26 LOTS
(BLOCK 7 & 11)
MINIMUM LOT AREA – 7,500 S.F. (60'x125')

42' WIDE CARRIAGE LOT – 36 LOTS
(BLOCK 10, & LOTS 1–20, BLOCK 9)
MINIMUM LOT AREA – 5,460 S.F. (42'x130')

TOTAL LOT COUNT – 169 LOTS

MAXIMUM IMPERVIOUS (ALL LOTS) = 50%

MINIMUM SETBACKS – 60' & 70' WIDE STANDARD LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STURCTURES)	150 FEET

MINIMUM SETBACKS – 60' WIDE VILLA LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	10 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STURCTURES)	150 FEET

MINIMUM SETBACKS – 42' WIDE CARRIAGE LOTS

FRONT (RIGHT OF WAY)	25 FEET
SIDE (INTERIOR)	6 FEET
SIDE (STREET)	25 FEET
REAR	20 FEET
COWLEY LAKE – OHW (ALL STURCTURES)	150 FEET

N

SCALE IN FEET
0 200 400 600
1 inch = 200 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: Reg.No.

COWLEY LAKE PRESERVE
ROGERS, MINNESOTA
OVERALL SITE PLAN
FOR
RACHEL DEVELOPMENT
4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
VUN/EPF

DATE
02/24/2024

REVISIONS

CAD FILE
23970SITE

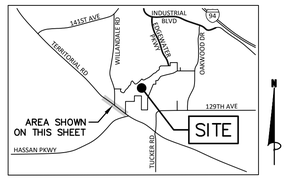
PROJECT NO.
23970

1.2

F:\Civil 3D Projects\23970\PRE-PLAT PLANS\23970SITE.dwg - 2/21/2025 10:51AM

VICINITY MAP

NOT TO SCALE



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING ELECTRIC OUTLET POST
- EXISTING GUY WIRE
- EXISTING LIGHT POLE
- EXISTING MANHOLE (WATER)
- EXISTING SIGN
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
- EXISTING VAULT
- EXISTING CURB & GUTTER
- EXISTING MAILBOX
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED CURB & GUTTER

SCALE IN FEET

0 50 100 150

1 inch = 50 feet

James R. Hill, Inc.

PLANNERS / ENGINEERS / SURVEYORS

2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306

PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

PRELIMINARY

Date: Reg.No.

COWLEY LAKE PRESERVE

ROGERS, MINNESOTA

PRELIMINARY TURN LANES

FOR

RACHEL DEVELOPMENT

4180 NAPIER COURT, ST. MICHAEL, MN 55376

DRAWN BY
JSO

DATE
02/24/2024

REVISIONS

CAD FILE
23970TURN

PROJECT NO.
23970

SHEET 1 OF 1

F:_Civil 3D Projects\23970\PRE-PLAT PLANS\23970TURN.dwg - 2/21/2025 09:40AM