SITE PLAN AND TRAFFIC ADVISORY REVIEW COMMITTEE
Internal Staff Meeting
Minnesota Valley Room, First Floor, Intergovernmental Center
****

1. **SITE PLAN ITEMS**

1. CY30-26

Request of Samantha Grems, with permission of the property owner, Daniel Dinsmore, for a conditional use permit to allow for a play café in the CBD-F, Central Business District Fringe, zoning district. The subject property is described as one-third of Lot 2, Block 17, Map of Mankato (321 N. Riverfront Drive).

2. CY31-26

Request of ISG, on behalf of Mankato Surgery Center, for a preliminary and final plat review of Mankato Clinic Fifth Addition; for an amended planned unit development, PUD, to allow for a structure expansion and replatting of the existing planned unit development; and for a certificate of design compliance for a property located in the Highway Gateway Overlay District for an approximately 8,000 square foot addition to an existing structure. The subject property is described as Lot 1, Block 1, Mankato Clinic Third Addition, and Lot 1, Block 1, Mankato Clinic Fourth Addition, City of Mankato, Blue Earth County (1411 Premier Drive).

3. CY32-26

Request of Southwest Minnesota Housing Partnership for an amendment to the previously approved planned unit development, PUD, to allow for the usage of Scheid Hall and to allow for parking lot and related infrastructure improvements at the property. The subject property is described as Outlot B, School Sisters of Notre Dame Subdivision, according to the plat thereof on file at the County Recorder's Office, Blue Earth County, Minnesota, to be described as Lot 1, Block 1, Good Counsel Hill subdivision (170 Good Counsel Drive, BE County PID's R010905379005, R010908201007).

4. CY33-26

Request of ERM on behalf of CenterPoint Energy, the property owner, for a final plat review of Centerpoint Energy Mankato First Addition, and for a conditional use permit to allow for a hydrogen facility that uses energy from a 1 megawatt on-site solar panel array on a property zoned M-2, Heavy Industrial. The subject property is described as part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, a tract of land located in the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of a parcel lying within the Southeast Quarter of the Northwest Quarter, Section 5, Township 108 North, Range 26 West, all located in the City of Mankato, Blue Earth County (2400 N. Riverfront Drive, BE County PID's R010905176004, R010905176003, R010905176002, R010905176001).

5. CY34-26

Request of Rice Companies, on behalf of the owner Kohlmeyer Hagen Law, for a certificate of design compliance for a new, approximately 9,360 square foot structure to be located in the Highway Gateway Overlay District. The subject property is described as Lot 1, Block 1, Alexia Subdivision (Blue Earth County PID R010909126033).

6. CYV05-26

Request of Brian and Tricia Sarff for a variance from Chapter 10, Article II, Division 3, Sec.10-97 of the Mankato City Code to decrease the front yard setback from thirty feet (30') to zero feet (0') in the R-1, one-family dwelling, zoning district. The variance is being requested in order to allow for the construction of an accessory structure. The property is described as the east 120' of Ridgewood Street lying north of Lot 28, Sunset View Addition, and lying south of Lot 97 and Vacated Alley, Oak Knoll, according to the plats on files and record with the Blue Earth County Recorder (405 Ridgewood Street).

7. CYV06-26

Request of Web Construction, on behalf of the property owner, Dustin Lee, for a variance from Chapter 10, Article V, Division 6, Sec. 10-584 of the Mankato City Code to decrease the front yard setback from the code required fifteen feet (15') to twelve feet (12') and to decrease the corner side yard from the code required seven feet, six inches (7'6") to zero feet (0') in the B-1, Community Business, zoning district. The variance is being requested in order to allow for an updated façade with new finishes and a new exit door and related foundation. The property is described as Lots 1-A and 1-B, Block 1, Elks Subdivision, Mankato, Blue Earth County (1028 N Riverfront Drive).

8. *****SITE PLAN AND TRAFFIC ADVISORY COMMITTEE REVIEW ONLY. Request of Web Construction for the review of an addition to the existing truck and rail car wash facility.**

2. **TRAFFIC ITEMS**

Meeting Date: 07/07/2026

Title

CY30-26

Request of Samantha Grems, with permission of the property owner, Daniel Dinsmore, for a conditional use permit to allow for a play café in the CBD-F, Central Business District Fringe, zoning district. The subject property is described as one-third of Lot 2, Block 17, Map of Mankato (321 N. Riverfront Drive).

Applicant

Samantha Grems, with permission of the property owner, is the applicant.

Request

The applicant is seeking a conditional use permit to allow for the operation of a play café.

Location

The subject property is located at 321 N. Riverfront Drive and is legally described as one-third of Lot 2, Block 17, Map of Mankato.

Existing Land Use

The property is the location of an existing structure that was most recently the location of Artifact.

Zoning

The property is zoned CBD-F, Central Business District Fringe.

Environmentally Sensitive Areas

There are no known environmentally sensitive areas on the site.

Public Utilities

The property is, and will continue to be, served by public utilities.

Review

Samantha Grems, with permission of the property owner, Daniel Dinsmore, is requesting a conditional use permit to allow for a play café in the CBD-F, Central Business District Fringe, zoning district. The subject property is located at 321 N Riverfront Drive and is described as one-third of Lot 2, Block 17, Map of Mankato.

The applicant's narrative states, the Play Café was created with one simple mission: to provide a welcoming space where children can learn through play while parents find connection, community, and a moment to recharge. The narrative continues to say, "The café will comfortably seat approximately 14 guests, creating an intimate and welcoming atmosphere that encourages conversation, connection, and repeat visits. Parents can enjoy specialty coffee while keeping a close eye on their children in the play area, creating a stress-free environment unlike traditional coffee shops."

The café will serve coffee and various non-alcoholic beverages.

Plans show a play area for young children, and a multipurpose therapy and party room in the back of the space.

Attachments

General Location Map
Aerial Plan
Plans
Narrative

General Location Map



Date: June 2026

Author:

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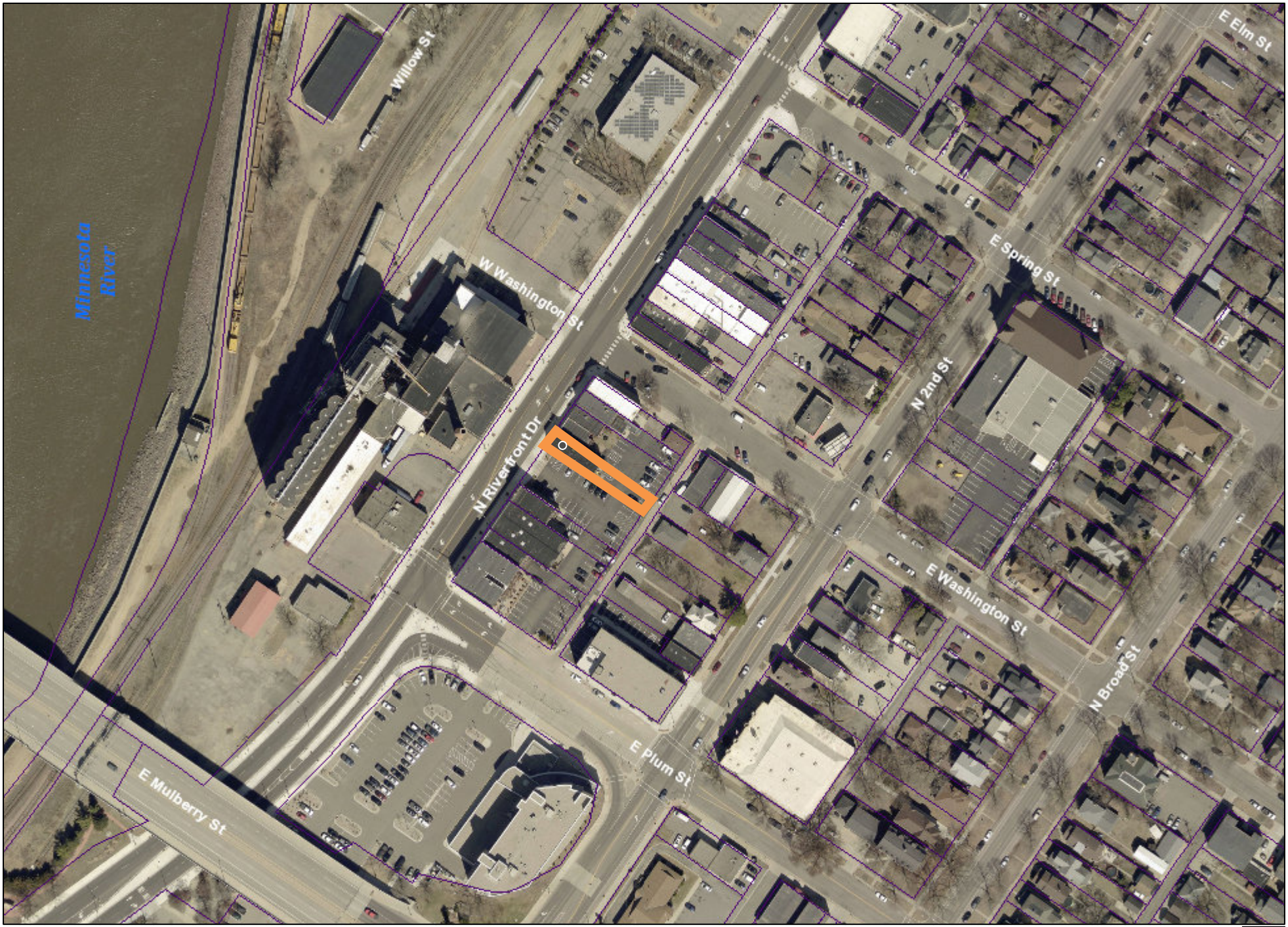
N

Aerial Map



Date: June 2026

Author:

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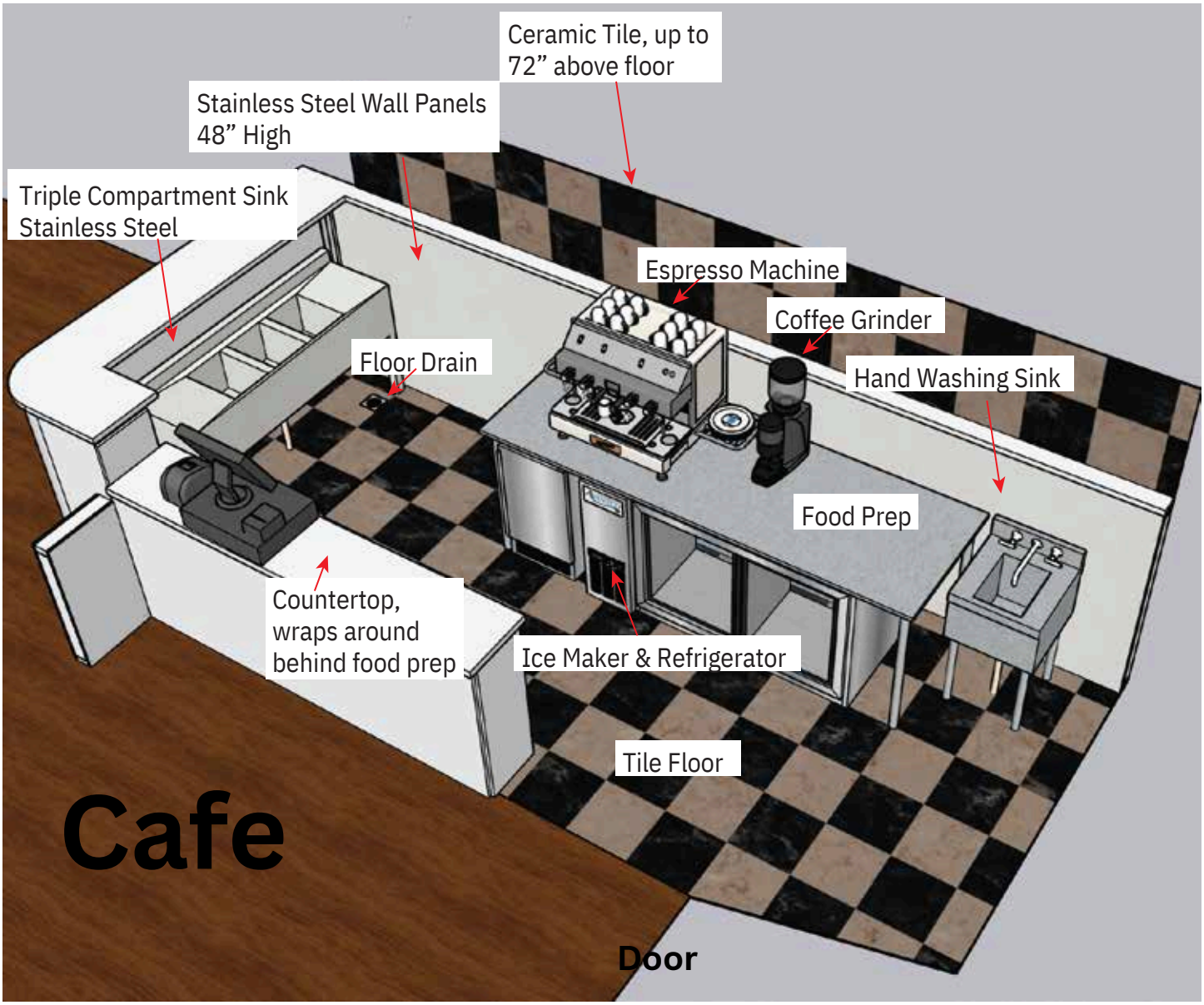
N

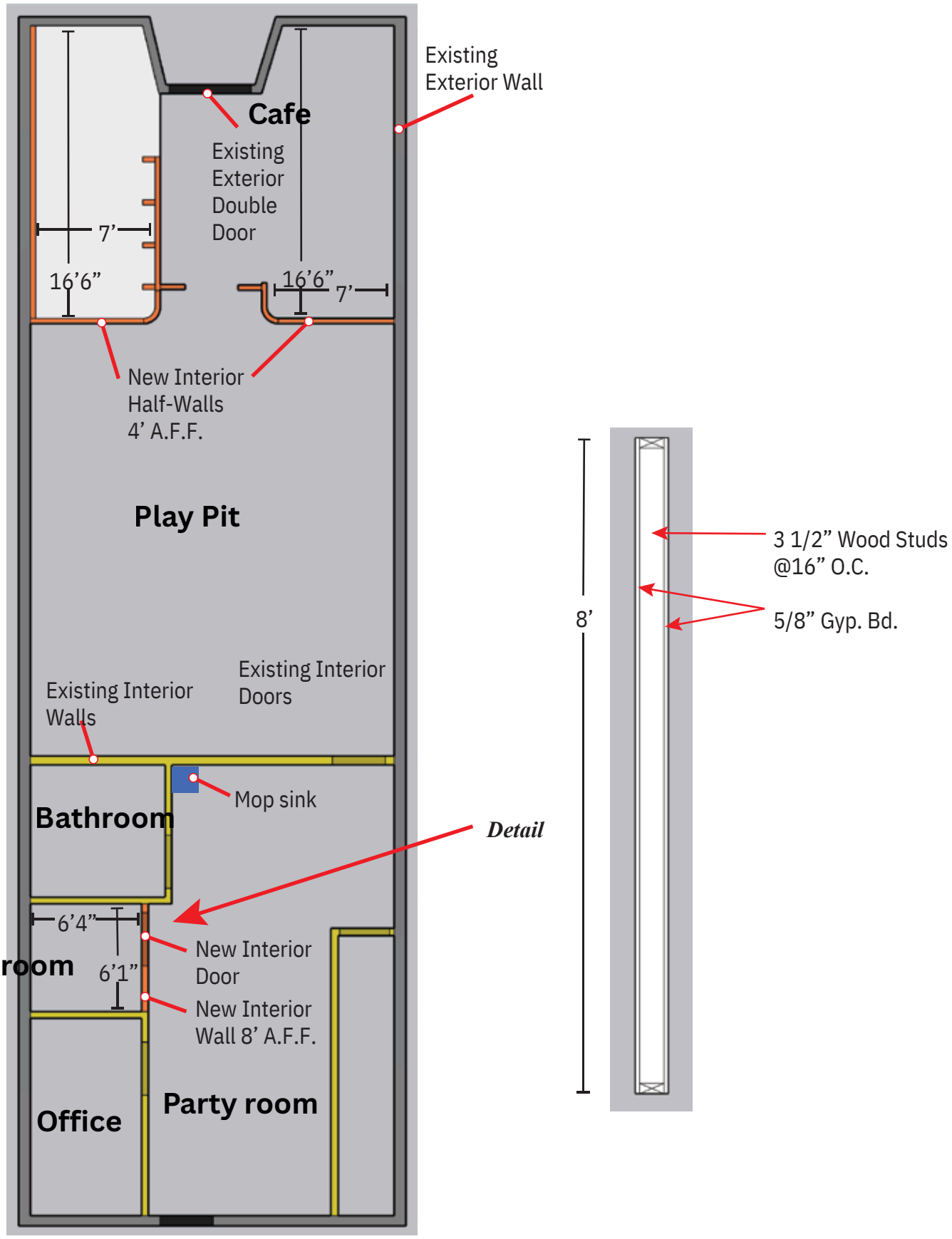


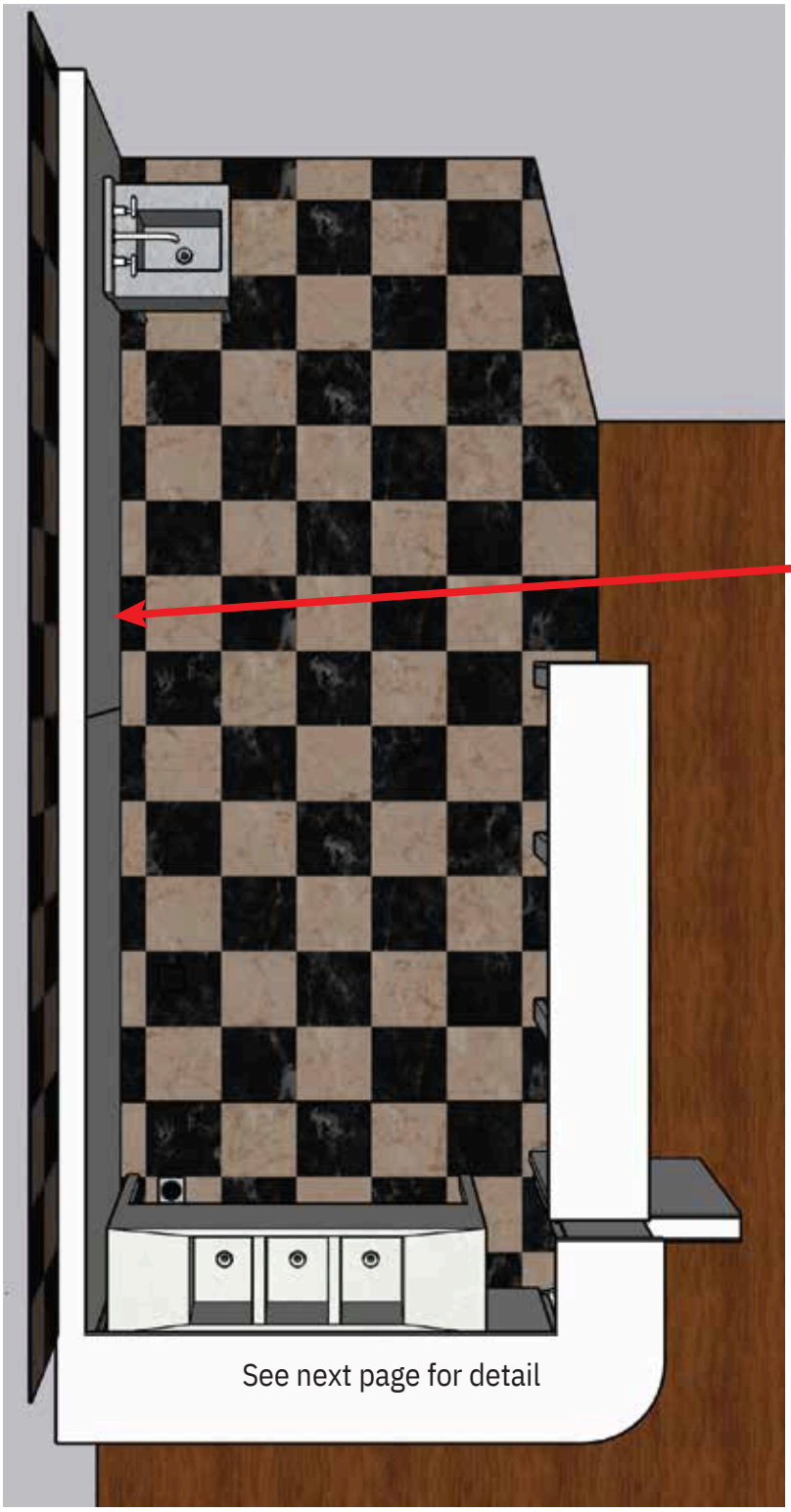


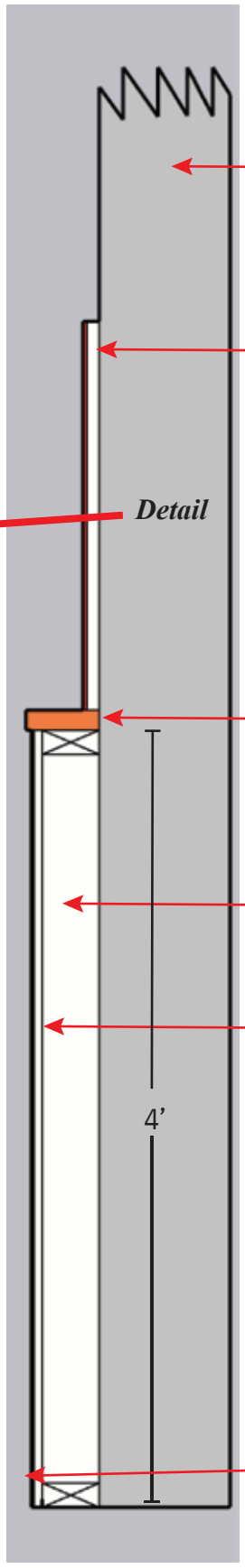
Seating:

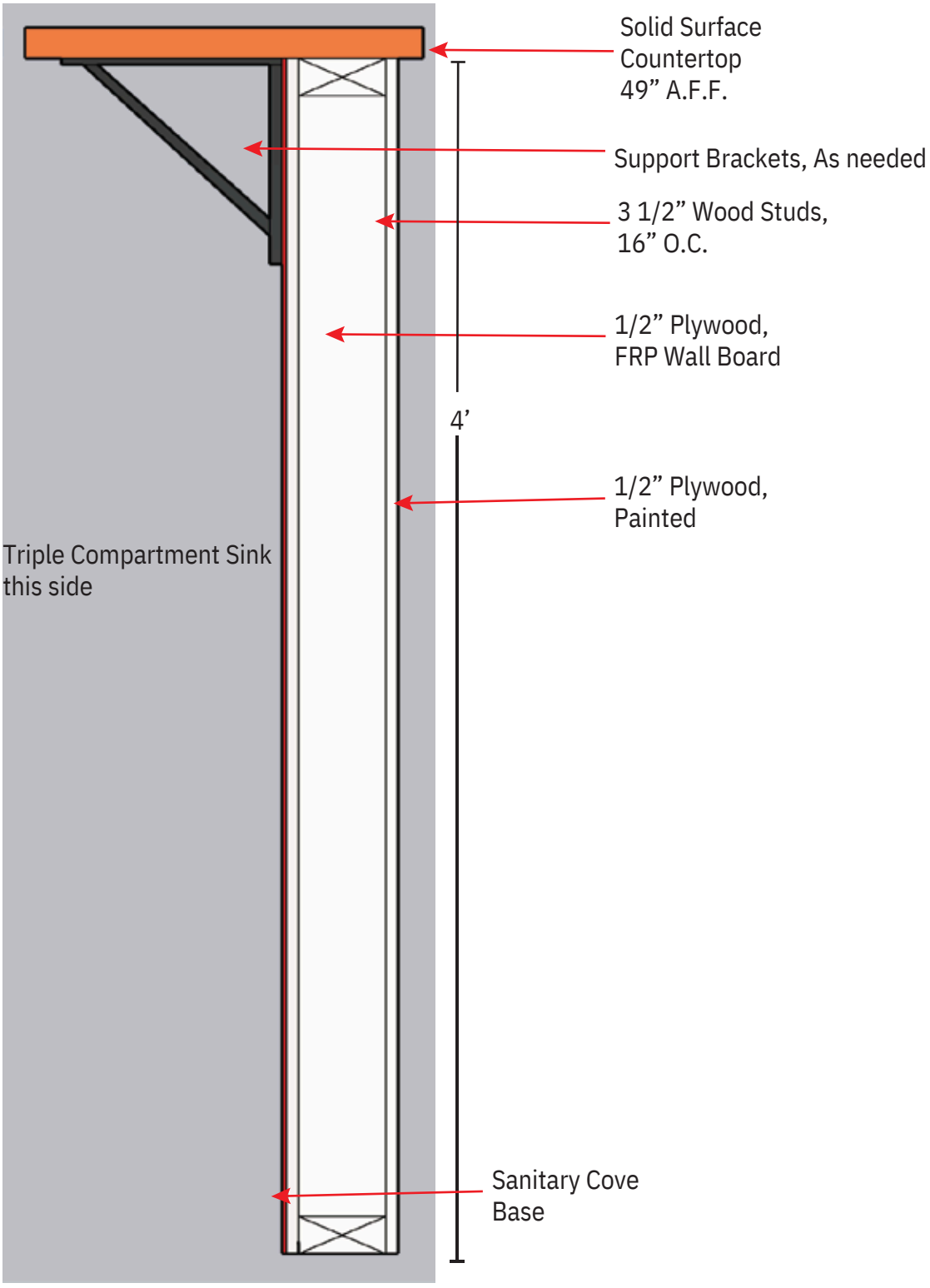
The cafe will have three tables with bench and chair seating to fit 6 people, in addition we will have 4 stools at the counter to over the play area and bench seating the play pit to sit an additional 4 people. Meaning we will have seating for 14 people up front.


Ceramic Tile, up to 72” above floor
Stainless Steel Wall Panels 48” High
Triple Compartment Sink Stainless Steel
Espresso Machine
Coffee Grinder
Floor Drain
Hand Washing Sink
Food Prep
Countertop, wraps around behind food prep
Ice Maker & Refrigerator
Tile Floor
Cafe
Door

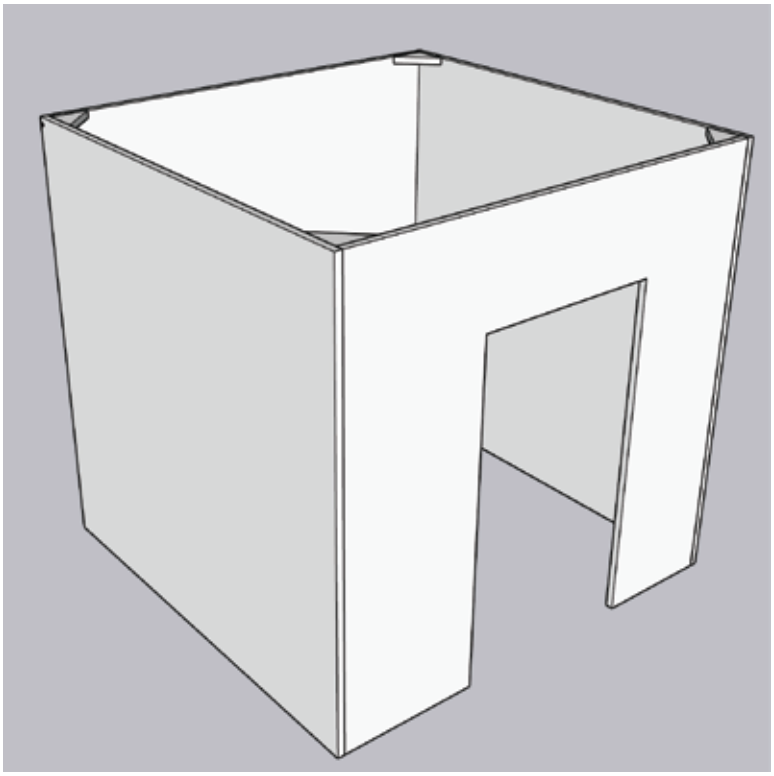

Existing
Exterior Wall
Cafe
Existing
Exterior
Double
Door
7’
16’6”
16’6”
7’
New Interior
Half-Walls
4’ A.F.F.
Play Pit
Existing Interior
Walls
Existing Interior
Doors
Bathroom
Mop sink
Detail
6’4”
6’1”
New Interior
Door
New Interior
Wall 8’ A.F.F.
Nursing room
Office
Party room
8’
3 1/2” Wood Studs
@16” O.C.
5/8” Gyp. Bd.


See next page for detail


Detail
Exterior Wall
3/4” Plywood,
Waterproof Membrane
Tile, 75” A.F.F.
Solid Surface
Countertop
49” A.F.F.
3 1/2” Wood Studs,
16” O.C.
1/2” Plywood,
Stainless Steel
Wall Panel
4’
Sanitary Cove
Base


Solid Surface
Countertop
49” A.F.F.
Support Brackets, As needed
3 1/2” Wood Studs,
16” O.C.
1/2” Plywood,
FRP Wall Board
4’
1/2” Plywood,
Painted
Triple Compartment Sink
this side
Sanitary Cove
Base





Build Principles:

3/4” Plywood with excellent
screw holding capability for all walls.
All units have large openings cut in walls for entry and exit.
Units stand-alone, but anchored to walls.
No moving parts.
Gussets for stabilization of joints.
Glue & screws in joints.
Most open at the top for light.
All surfaces painted.

Business Overview: The Village Play Café

Our Story

Our Play Café was created with one simple mission: to provide a welcoming space where children can learn through play while parents find connection, community, and a moment to recharge.

As parents ourselves, we understand that finding a place designed for both children and adults can be difficult. Coffee shops often aren't child-friendly, while indoor playgrounds rarely provide a relaxing environment for caregivers. Our Play Café bridges that gap by offering a thoughtfully designed space where children can safely explore and families can gather in comfort.

More than just a café, we envision becoming a cornerstone of our community—a place where friendships are built, milestones are celebrated, and families feel supported throughout every stage of childhood.

The Café Experience

Our café will comfortably seat approximately **14 guests**, creating an intimate and welcoming atmosphere that encourages conversation, connection, and repeat visits. Parents can enjoy specialty coffee while keeping a close eye on their children in the play area, creating a stress-free environment unlike traditional coffee shops.

Our business will operate **Monday through Saturday from 7:30 AM to 5:30 PM**, serving early morning parents, stay-at-home families, remote workers, and afternoon visitors.

Coffee & Beverage Menu

Our beverage program will feature locally crafted coffee alongside a wide selection of handcrafted drinks designed to appeal to all ages.

Our menu will include:

- Fresh brewed coffee
- Espresso beverages
- Lattes
- Cappuccinos
- Americanos
- Cold Brew
- Seasonal signature lattes
- Chai Tea Lattes
- Matcha Lattes
- Hot Chocolate

- Italian Sodas
- Lotus Energy Drinks in a variety of flavors
- Refreshers
- Herbal Teas
- Black Teas
- Green Teas
- Fruit Teas

We will also offer pastries, light snacks, and kid-friendly beverages to create a complete café experience for families. These will be provided from an outside licensed company NOT made in house.

Play Space

The play area will be carefully designed for young children, encouraging imaginative play, creativity, movement, and social interaction in a clean, safe, and engaging environment.

Parents can enjoy their beverages while maintaining clear visibility of their children, creating peace of mind and allowing families to spend quality time together.

Multi-Purpose Therapy & Party Room

A unique feature of our business is a dedicated **private back room** designed to serve multiple purposes throughout the week.

During business hours, this flexible space can be used by licensed professionals for:

- Play Therapy
- Child Counseling
- Family Therapy
- Small Group Therapy
- Parenting Workshops
- Developmental Classes
- Support Groups

During evenings and weekends, the room can easily transform into a **private birthday party space**, allowing families to celebrate special occasions in a fun and memorable setting without disrupting the main café.

This dual-purpose design maximizes the use of the space while expanding our services and creating additional revenue opportunities.

Staffing

To provide exceptional customer service and maintain a clean, safe environment, our business will employ:

- **1 Full-Time Manager**
- **6 Part-Time Team Members**

Our staff will be cross-trained in café operations, customer service, food preparation, cleaning procedures, and play area supervision to ensure every guest has a positive experience.

Revenue Streams

Our business will generate income through multiple channels, including:

- Coffee and beverage sales
- Food and snack sales
- Play admission
- Memberships
- Birthday party packages
- Private room rentals
- Play therapy and group therapy room rentals
- Special events and workshops
- Seasonal programming

Diversifying our revenue allows us to build a stable and sustainable business while serving the evolving needs of our community.

Our Vision

Our goal is to become much more than a coffee shop or indoor playground. We strive to create a community gathering place where families feel welcomed, supported, and connected.

Whether a parent stops in for a morning latte, a toddler spends the afternoon exploring, a therapist helps a child grow through play, or a family celebrates a birthday with loved ones, every visit will contribute to building lasting relationships and strengthening our community.

By combining high-quality café offerings with meaningful family experiences, we believe our Play Café will become a destination where both children and adults can thrive together.

Parking

We are part of the old town paring association agreement.

Site Plan and Traffic Advisory Review Committee **1. 2.**

Meeting Date: 07/07/2026

Title

CY31-26

Request of ISG, on behalf of Mankato Surgery Center, for a preliminary and final plat review of Mankato Clinic Fifth Addition; for an amended planned unit development, PUD, to allow for a structure expansion and replatting of the existing planned unit development; and for a certificate of design compliance for a property located in the Highway Gateway Overlay District for an approximately 8,000 square foot addition to an existing structure. The subject property is described as Lot 1, Block 1, Mankato Clinic Third Addition, and Lot 1, Block 1, Mankato Clinic Fourth Addition, City of Mankato, Blue Earth County (1411 Premier Drive).

Applicant

The applicant is ISG on behalf of Mankato Surgery Center.

Request

The applicant is requesting a preliminary and final plat review of Mankato Clinic Fifth Addition; an amended planned unit development (PUD), to allow for a structure expansion and replatting of the existing planned unit development; and a certificate of design compliance for a property located in the Highway Gateway Overlay District to allow for an approximately 8,000 square foot addition to an existing structure.

Location

The subject property is located at 1411 Premier Drive and is legally described as Lot 1, Block 1, Mankato Clinic Third Addition, and Lot 1, Block 1, Mankato Clinic Fourth Addition, City of Mankato, Blue Earth County.

Existing Land Use

The property is currently in use as the Mankato Surgery Center, a medical clinic.

Zoning

The property is zoned O, Office District.

Environmentally Sensitive Areas

There are no known environmentally sensitive areas on the current Mankato Surgery Center site, but multiple wetlands were delineated within boundary of the plat and approved for wetland replacement in 2023. These wetlands were/are located to the south of the Wickersham campus.

Public Utilities

The property is currently served by public utilities.

Review

The applicant is seeking a preliminary and final plat review of Mankato Clinic Fifth Addition; an amended planned unit development, to allow for a structure expansion and replatting of the existing planned unit development; and a certificate of design compliance for a property located in the Highway Gateway Overlay District, to allow for an approximately 8,000 square foot addition to an existing structure.

Preliminary & Final Plat:

The applicant is seeking a preliminary and final plat review of Mankato Clinic Fifth Addition, a one-block, two-lot subdivision. Lot One contains approximately 4.37 acres and is currently home to the Mankato Surgery Center. Lot Two contains approximately 17.38 acres and is home to the Mankato Clinic Children's Health Center.

The subject property is currently platted as part of Mankato Clinic Third Addition and Mankato Clinic Fourth Addition. The proposed replatting is being requested in order to properly illustrate the proposed interrelationship of the existing Mankato Clinic properties within the greater Wickersham Campus site. In simplified terms, the proposed plat realigns the southern lot boundary of lot 1, block 1, to better match the realistic use of the site and allow for the proposed expansion. As more than two lot lines would need to be modified to meet this goal, the property must be replatted.

The applicant does not intend for any additional easements or restrictive covenants to be dedicated alongside the plat.

Note that the Mankato Surgery Center property, the location of the proposed improvements, would be platted as Lot 1, Block 1, of Mankato Clinic Fifth Addition.

Amendment to Planned Unit Development (PUD):
The applicant is seeking an amendment to the current Planned Unit Development (PUD) to allow for an expansion to the Mankato Surgery Center.

The current Mankato Surgery Center is a freestanding outpatient surgical facility within the Wickersham Health Campus that specializes in same-day surgical and procedural services. The Center currently operates on a 6:00am - 4:30pm, Monday through Friday schedule and employs 51 staff. The applicant states that the proposed expansion to the facility is expected to support an increase to approximately 70 employees.

The proposed project consists of five primary parts. The first is an 8,000 Sq. Ft. structural expansion, which is being sought to accommodate two new operating rooms, enhanced prep and recovery spaces, and additional clinic support spaces. The addition will occur in two segments, a smaller 932 Sq. Ft. off the NE corner of the building, and a larger 13,453 Sq. Ft. expansion to the west. The second is a 10,000 Sq. Ft. interior remodel of the existing Mankato Surgery Center to modernize existing areas to improve overall patient experience and functionality, as well as bring the facility in line with the currently understood best practices. The third aspect is the redirection of the existing frontage road from the northernmost Premier Drive Wickersham Campus entrance to the Mankato Surgery Center parking lot. The existing frontage road, which runs along the west side of the property parallel to Premier Drive, was constructed prior to that portion of Premier Drive and thusly served as the primary access to Mankato Clinic. With the extension of Premier Drive, the applicant feels that the frontage road is no longer needed to serve in such a capacity. Additionally, the applicant attests that rerouting the roadway would improve safety of the northern Premier Drive entrance by eliminating traffic conflict points and simplifying site circulation. The fourth part is the expansion of the parking lot westward to create 24 additional parking stalls within the north side of the old frontage road. The applicant further specifies that there is an easement recorded on the Mankato Surgery Center Property that allowed for future expansion of parking along the duration of the frontage road. The applicant intends to construct this area of parking as well. The fifth and final aspect is the installation of a 1,000-liter above-ground Permacyl bulk oxygen tank installed along the NE side of the building to serve the facilities' medical oxygen needs. The applicant hates that the tank will be enclosed by a security fence and protective bollards and will be supplied by a microbulk delivery truck on a regular basis. The material of the security fence/enclosure is stated as chain-link within the narrative and as a gray-colored bok modern screen panel in the material board. The applicant shall clarify the material with the understanding that the screen panels would better reflect the Highway Gateway Overlay Standards.

Note that bulk oxygen stored in liquid (LOX) form is hazardous but is not considered a flammable or combustible liquid and thus would not be enforced under Sec.10-1503 of the Mankato City Code.

The applicant states that, in total, the proposed project will result in less than one acre of new and fully reconstructed impervious surfaces, and therefore, no permanent stormwater management facilities will be constructed on site.

The applicant has provided a partial site circulation plan that reflects turning movements for Mankato's largest fire engine.

The applicant attests that all improvements that impact shared aspects of the Wickersham Campus have been agreed upon by all campus entities, i.e. the frontage road and parking modifications.

Certificate of Design Compliance (CDC):
The applicant is requesting a Certificate of Design Compliance (CDC) to allow for expansion of an existing structure located within the Highway Gateway Overlay District.

The applicant has provided exterior elevations, a floor plan, exterior renderings, and a digital material board. The proposed exterior materials appear to largely reflect the existing Wickersham Campus buildings. The proposed design shifts vertically in a few locations to allow for expanded window spaces, as the applicant seeks to increase natural light penetration into interior spaces in line with their desired best healthcare facility practices.

Exterior materials include a combination of utility brick and EIFS to best match the existing facility, as well as glazing/glass, and aluminum composite metal paneling. The brick is proposed to differ in design from the existing brick of the campus, as they intend the brick to be banded in order to create a corbeling effect, which will increase the visual interest of the facade. The proposed design is punctuated with multiple areas of steel and glass canopies.

Of note, the applicant shows a large rooftop mechanical area with ribbed metal panels to provide screening. The ribbed metal panels largely reflect the look of a typical corrugated metal panel.

As noted above, the applicant intends to reroute the existing frontage road and incorporate it into the parking lot. The applicant proposes to construct 24 new parking stalls north and west of the existing parking areas, as well as potentially construct an unspecified number of parking stalls along the frontage road, which would act as shared stalls with the Mankato Clinic facility to the SE. Note that the shared parking area was not included in the applicant's parking calculations, as a parking easement is already in place for this area. Additionally, the applicant shows the installation of seven bicycle parking stalls west of the building.

The applicant proposes to install multiple areas of clustered landscaping on the Mankato Surgery Center property. In particular, the applicant proposes to install a line of trees and shrubs along the newly constructed parking area and to keep the existing trees along Premier Drive in place. The Mankato City Code requires that wherever a surface parking area faces a street frontage, like Premier Drive, the parking area must be screened from the street with a wall, fence, or hedge, to a minimum of four feet, not more than eight feet in height, nor less than 80 percent opaque. Proposed landscaping primarily includes commercial cultivars and non-native botanicals.

Multiple utility pads are shown along the SW extent of the building. The proposed plans show a small band of landscaping encompassing the public-facing elevations of the utility pads.

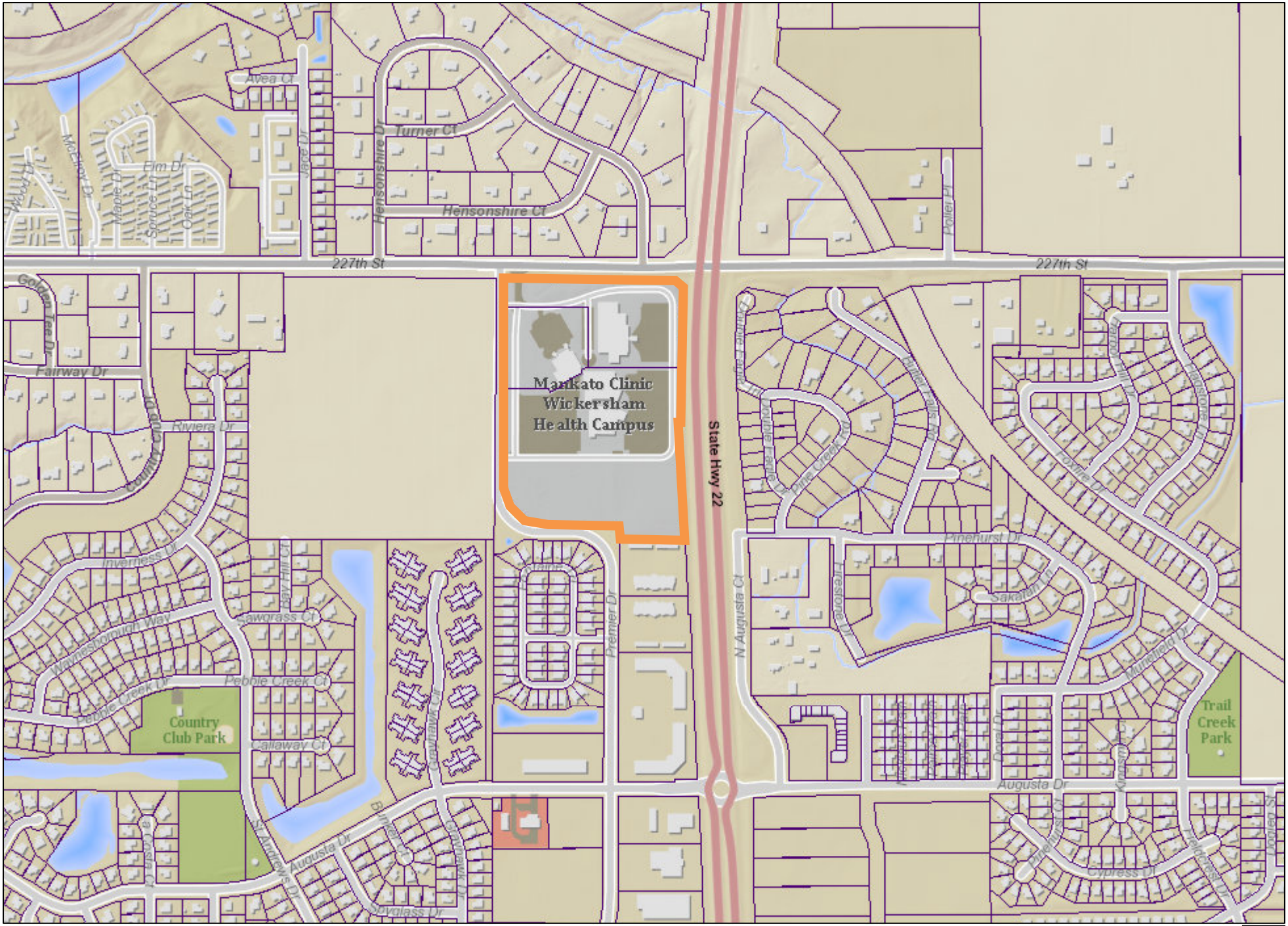
The applicant has provided a photometric plan and lighting fixture cutsheets, both of which appear to reflect conforming lighting levels/fixtures.

Attachments

General Location Map
Aerial
Site Plan
Preliminary Plat
Final Plat
Exterior Elevations
Exterior Renderings

Floor Plan
Grading Plan
Landscaping Plan
Narrative
Material Board
Emergency Vehicle Turning Movements
Existing Conditions
Detail Plans
Wall Section
Photometric Plan
Lighting Cut Sheets

General Location Map



Date: June 2026

Author:

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Aerial Map



Date: June 2026

Author:

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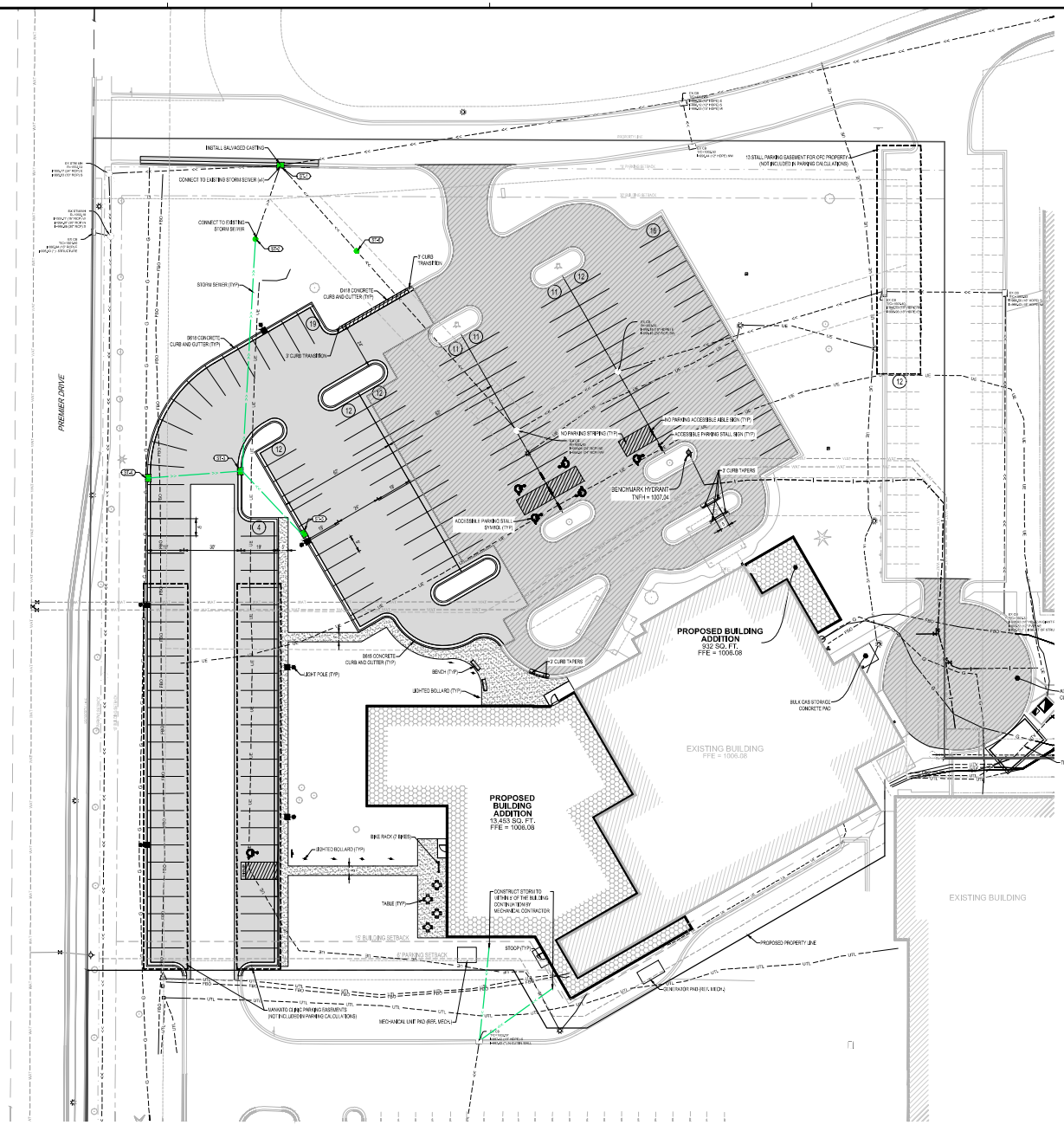

PAVEMENT LEGEND	
SYMBOL	DESCRIPTION
	BITUMINOUS PAVEMENT
	OVERLAY BITUMINOUS PAVEMENT
	CONCRETE WALK
	B4 STYLE CONCRETE CURB AND GUTTER

N

0 20 40

SCALE IN FEET

ISG

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.

BRYAN M. PETZEL

DATE _____ LIC. NO. 53191

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.

MITCHELL COOKAS

DATE _____ LIC. NO. 59522

SHEET NOT VALID UNLESS THIS TEXT IS COLOR.

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122_C3-01.DWG
DRAWN BY	AAD
DESIGNED BY	AAD/BMP
REVIEWED BY	BMP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE

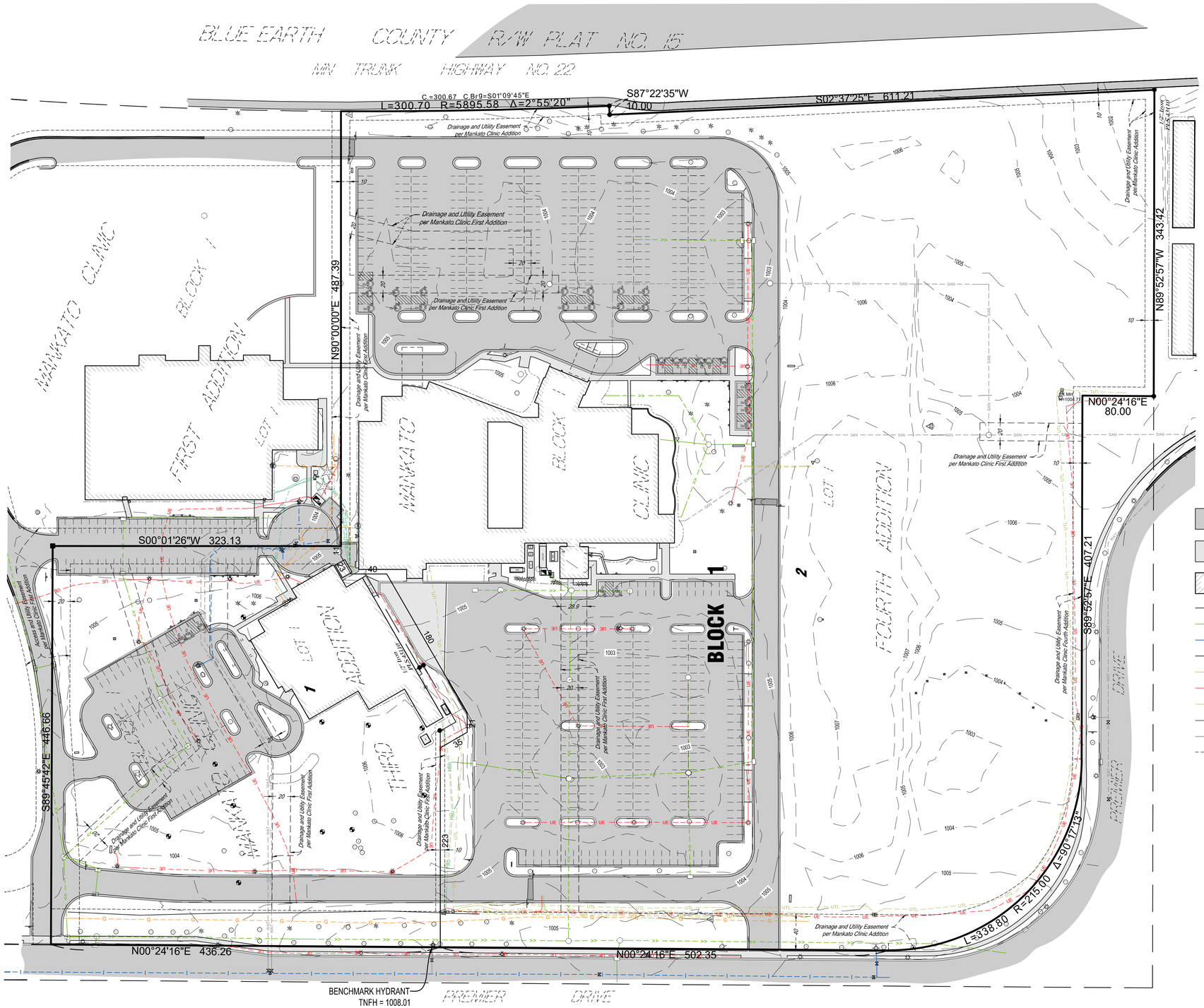
SITE AND UTILITY PLAN

SHEET

C3-10

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION

MANKATO CLINIC FIFTH ADDITION



EXISTING LEGAL DESCRIPTION:
(per client)

Lot 1, Block 1, Mankato Clinic Third Addition, City of Mankato, Blue Earth County, Minnesota.

AND

Lot 1, Block 1, Mankato Clinic Fourth Addition, City of Mankato, Blue Earth County, Minnesota.

OWNERS / DEVELOPERS:
Mankato Surgical Center LLC
1411 Premier Drive
Mankato, MN 56001

SURVEYOR:
ISG
115 E. Hickory Street Suite 300
Mankato, MN 56001

AREA TABLE:
Lot 1 Block 1 = 190,297 sq. ft. - 4.37 acres
Lot 2 Block 1 = 757,057 sq. ft. - 17.38 acres
Total = 947,354 sq. ft. - 21.75 acres

EXISTING PROPERTY:
ZONED: O (Office)

FLOOD ZONE:
The surveyed premises shown on this survey map is in Flood Zone X, according to Flood Insurance Rate Map Community Panel No. 27013C0105F, published by the Federal Emergency Management Agency, effective date February 22, 2024.

NOTES:

1. Orientation of this bearing system is based upon the plat of Mankato Clinic Third Addition.
2. The fieldwork was completed on April 6, 2026.
3. Benchmark is top nut fire hydrant located along the East side of Premier Drive, approximately 425 feet south of the northwest corner of Lot 1, Mankato Clinic Third Addition.

LEGEND

- Bituminous Surface
- Concrete Surface
- Existing Building
- Sanitary Sewer Line
- Storm Sewer Line
- Water Line
- Water Line per GIS
- Underground Gas Line
- Underground Electric Line
- Underground Utility Line
- Underground Fiber Optic Line
- Landscaping Edge
- Building Canopy
- Iron Monument Found
- Indicates Mag Nail Found
- Air Conditioner
- Electric Meter
- Utility Vault
- Gas Meter
- Ground Light
- Light Pole
- Transformer
- Utility Pedestal
- Curb Stop
- Hydrant
- Fire Department Connection
- Water Valve
- Cleanout
- Manhole/Catch Basin
- Roof Drain
- Downspout
- Handicapped Parking Stall
- Flag Pole
- Lawn Sprinkler Box
- Lawn Sprinkler Head
- Mailbox
- Post
- Guard Post
- Sign
- Bush
- Coniferous Tree
- Deciduous Tree
- Utility Hand Hole
- Soil Boring

N

0 60 100
SCALE IN FEET

ISG

DRAFT

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PROJECT

MANKATO SURGERY CENTER

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122 PPLAT
DRAWN BY	JW
DESIGNED BY	---
REVIEWED BY	REK
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE

PRELIMINARY PLAT

SHEET

1

OF 1

MANKATO CLINIC FIFTH ADDITION

INSTRUMENT OF DEDICATION

KNOW ALL PERSONS BY THESE PRESENTS: That Mankato Surgical Center, a limited liability company, owner of the following described property:

Lot 1, Block 1, Mankato Clinic Third Addition, according to the recorded plat thereof, City of Mankato, Blue Earth County, Minnesota

KNOW ALL PERSONS BY THESE PRESENTS: That Mankato Clinic, LTD, a Minnesota corporation, owner of the following described property:

Lot 1, Block 1, Mankato Clinic Fourth Addition, according to the recorded plat thereof, City of Mankato, Blue Earth County, Minnesota

Have caused the same to be surveyed and platted as **MANKATO CLINIC FIFTH ADDITION** and does hereby dedicate to the public, for public use, the public way(s) and/or the drainage and utility easement(s) as created by this plat.

In witness whereof said Mankato Surgical Center, a limited liability company, has caused these presents to be signed by its proper officer this _____ day of _____, 20_____.

Signed: Julie Morgan

_____
Chief Executive Officer

State of _____
County of _____

This instrument was acknowledged before me on _____, 20_____ by

Julie Morgan, Chief Executive Officer, of Mankato Surgical Center, a limited liability company.

_____(sign)

_____(print)

Notary Public _____
My Commission Expires _____

In witness whereof said Mankato Clinic, LTD, has caused these presents to be signed by its proper officer this _____ day of _____, 20_____.

Signed: Aaron Johnson

_____
Chief Executive Officer

State of _____
County of _____

This instrument was acknowledged before me on _____, 20_____ by

Aaron Johnson, Chief Executive Officer, of Mankato Clinic, LTD.

_____(sign)

_____(print)

Notary Public _____
My Commission Expires _____

SURVEYOR'S CERTIFICATE

I, Ryan E. Kotthoff, 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_____.

_____
Ryan E. Kotthoff, Licensed Land Surveyor
Minnesota License No. 61565

State of Minnesota
County of Blue Earth

This instrument was acknowledged before me on _____, 20_____ by Ryan E. Kotthoff, Licensed Land Surveyor.

_____
Kent A. Hays
Notary Public, Minnesota
My Commission Expires Jan. 31, 2030

MANKATO PLANNING COMMISSION

Be it known that on this _____ day of _____, 20_____, the Planning Commission of the City of Mankato did duly review this plat of **MANKATO CLINIC FIFTH ADDITION**.

_____ _____
Chair Person Secretary

CITY COUNCIL, CITY OF MANKATO, MINNESOTA

This plat of **MANKATO CLINIC FIFTH ADDITION**, was approved and accepted by the City Council of the City of Mankato, 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.

_____ _____
Mayor Clerk

TITLE OPINION

I, Jared M. Koch, Licensed Attorney, State of Minnesota, do hereby certify that the owners as indicated hereon represent all ownership interest in the land encompassed by this plat.

_____
Jared M. Koch, Licensed Attorney

BLUE EARTH COUNTY PROPERTY AND ENVIRONMENTAL RESOURCES

I hereby certify that there are no delinquent taxes and/or delinquent special assessments, that the current taxes have ben paid and that the transfer has been entered on the land described herein on the _____ day of _____, 20_____.

_____
Blue Earth County Property and Environmental Resources Director

COUNTY RECORDER, BLUE EARTH COUNTY, MINNESOTA

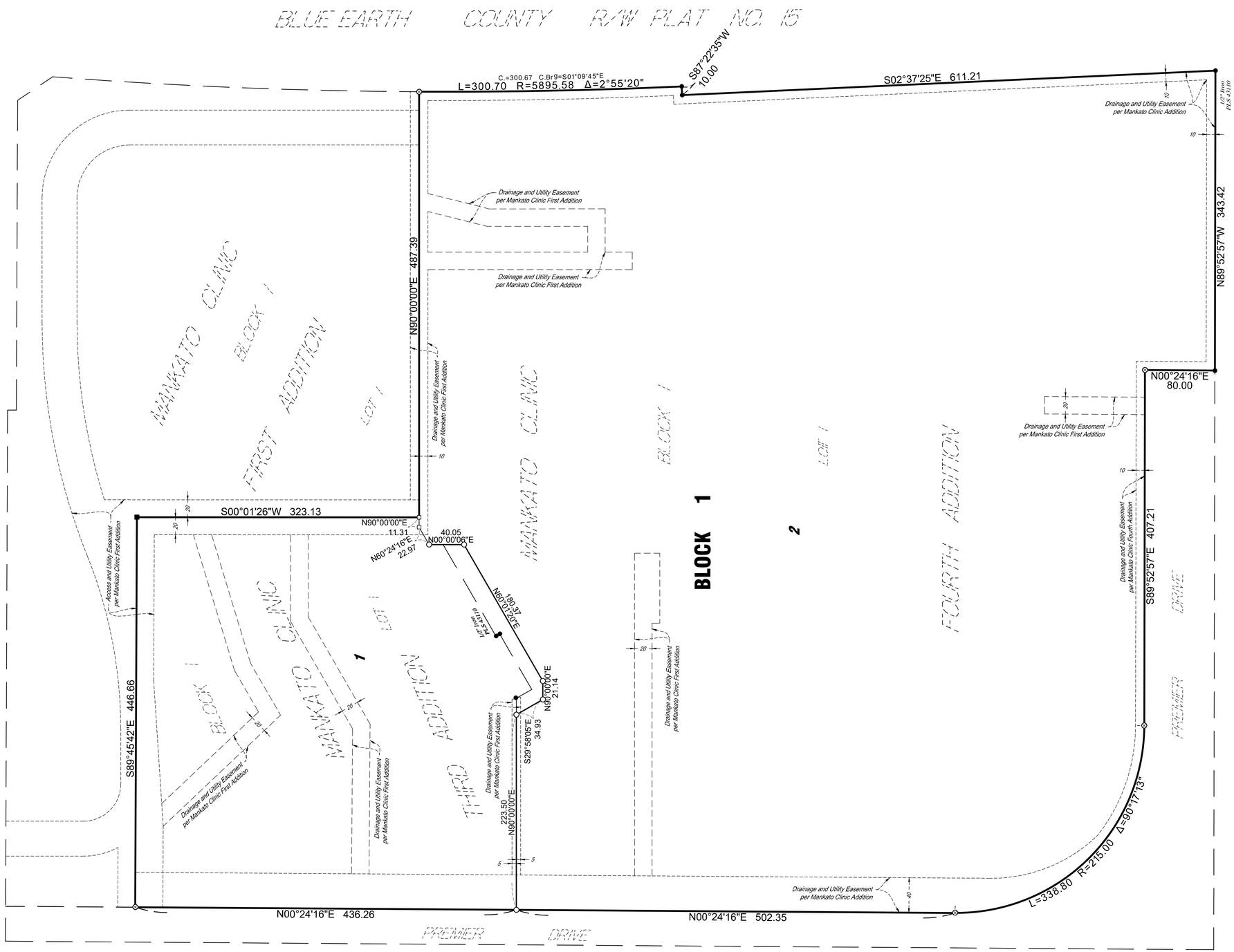
I hereby certify that this plat of **MANKATO CLINIC FIFTH ADDITION** was filed in the office of the County Recorder for public record on this _____ day of _____, 20_____, at _____ o'clock _____.M. and was duly filed in Book _____ of Plats, page _____, as Document No. _____.

_____
Blue Earth County, County Recorder

ISG

JOB # 32122 DATE: June 2026

MANKATO CLINIC FIFTH ADDITION



LEGEND

- ● Iron Monument Found
- ■ Indicates Mag Nail Found
- ※ Indicates Chiseled "X" Found
- ⊗ Indicates 1/2" Dia. Iron Monument Set With Plastic Cap Marked By ISG, PLS No. 61565 to be set before time of recording
- ○ Indicates 1/2" Dia. Iron Monument Set With Plastic Cap Marked By ISG, PLS No. 61565
- □ Indicates Mag Nail Set

BEARING NOTE:
The orientation of this bearing system is based on the plat of Mankato Clinic Third Addition.

N

0 60 120
SCALE IN FEET

ISG

JOB # 32122 DATE: June 2026

EXTERIOR FINISH SCHEDULE

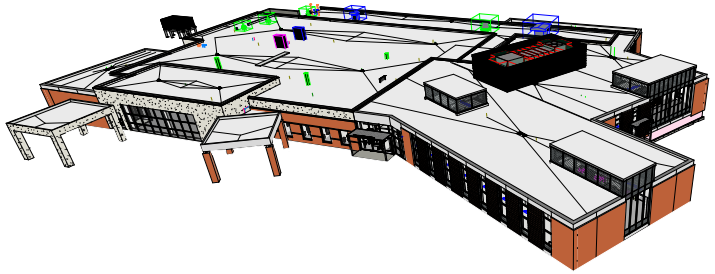
MARK	MATERIAL TYPE	MANUFACTURER	MODEL / SIZE	COLOR	ADDITIONAL INFORMATION	COMMENTS
EF-1	UTILITY BRICK	TBD	1/3 RUNNING	TO MATCH EXISTING	--	REFER TO ELEVATIONS/DETAILS FOR CORBELING
EF-3	ACM PANELS	ALUCOBOND	DRY REVEAL	CLEAR ANODIZED	--	
EF-4	CURTAIN WALL MULLION	KAWNEER	1600 UT SYSTEM 1	CLEAR ANODIZED	--	
EF-4A	PREFINISHED FLASHING	PAC-CLAD	COIL	CLEAR ANODIZED	--	
EF-5	BOX RIB WALL PANEL	PAC-CLAD	BOX RIB 1	SLATE GRAY	--	ROOF SCREEN
EF-6	MECHANICAL SCREEN	SOK MODERN	52LT REVEAL PATTERN - 50% OPEN	SLATE GRAY	--	--
EF-7	EIFS	DRYVIT	OUTSULATION PLUS MD	TO MATCH EXISTING		TO MATCH EXISTING
EF-8	TRANSLUCENT CANOPY	KINGSPAN	BIRDSWAY CANOPY SYSTEM	WHITE	--	--
EF-9	PAINT	SHERWIN WILLIAMS	ACRELIC PAINT	SNOWBOUND	--	--
EF-10	CLEAR GLAZING		SOLARBAN 70 ON #2			
EF-11	FROSTED/FRITTED GLASS	TBD	SOLARBAN 70 ON #2 WITH FRITFROST ON #3			

EXTERIOR ELEV. SHEET NOTES

- THROUGH-WALL FLASHING TO BE LOCATED ABOVE GRADE.
- SEALANT COLORS TO MATCH ADJACENT FINISHED SURFACES.

KEYNOTE LEGEND

11	EXTERIOR ILLUMINATED SIGNAGE - 2' TALL
13	PREFABRICATED CANOPY WITH LINEAR LIGHT
22	BRICK CORBELING AT INDICATED WALL PANEL



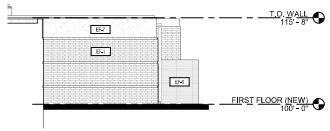
4 BIRD'S EYE VIEW



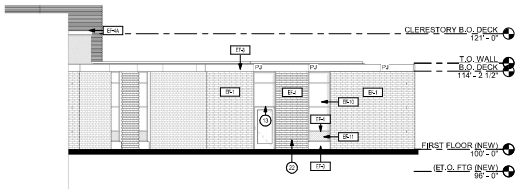
5 ENTRY PERSPECTIVE

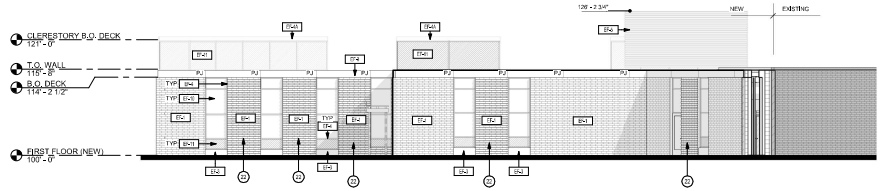


8 NORTH ELEVATION
1/8" = 1'-0"



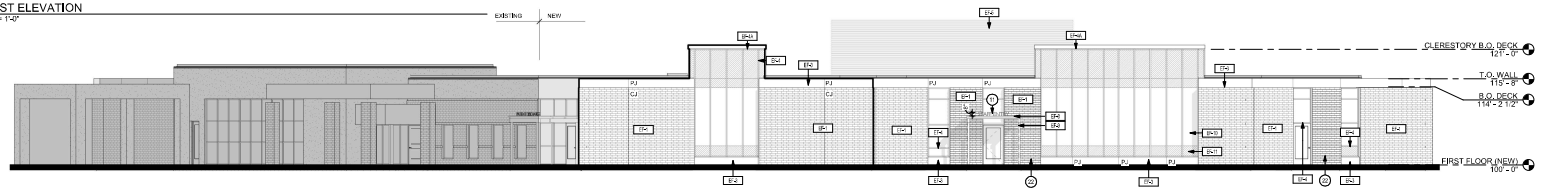
9 STOREAGE ELEVATION - SOUTH
1/8" = 1'-0"



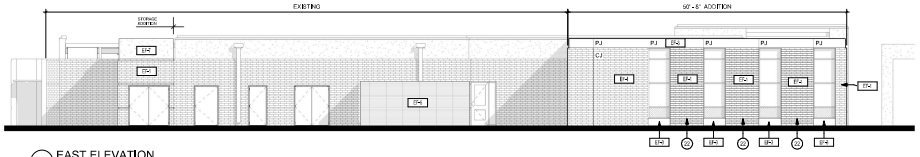


3 ELEVATION (SOUTH)
1/8" = 1'-0"

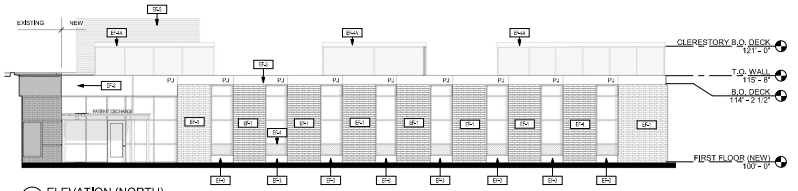
7 WEST ELEVATION
1/8" = 1'-0"



2 ELEVATION (WEST)
1/8" = 1'-0"



6 EAST ELEVATION
1/8" = 1'-0"



1 ELEVATION (NORTH)
1/8" = 1'-0"

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
TILE NAME	
DRAWN BY	CJH
DESIGNED BY	TLR/CJH
ACHIEVED BY	TLR/JLW
ORIGINAL ISSUE DATE	07/07/2025
CLIENT PROJECT NO.	

TITLE

EXTERIOR ELEVATIONS

SHEET

A2-11

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION

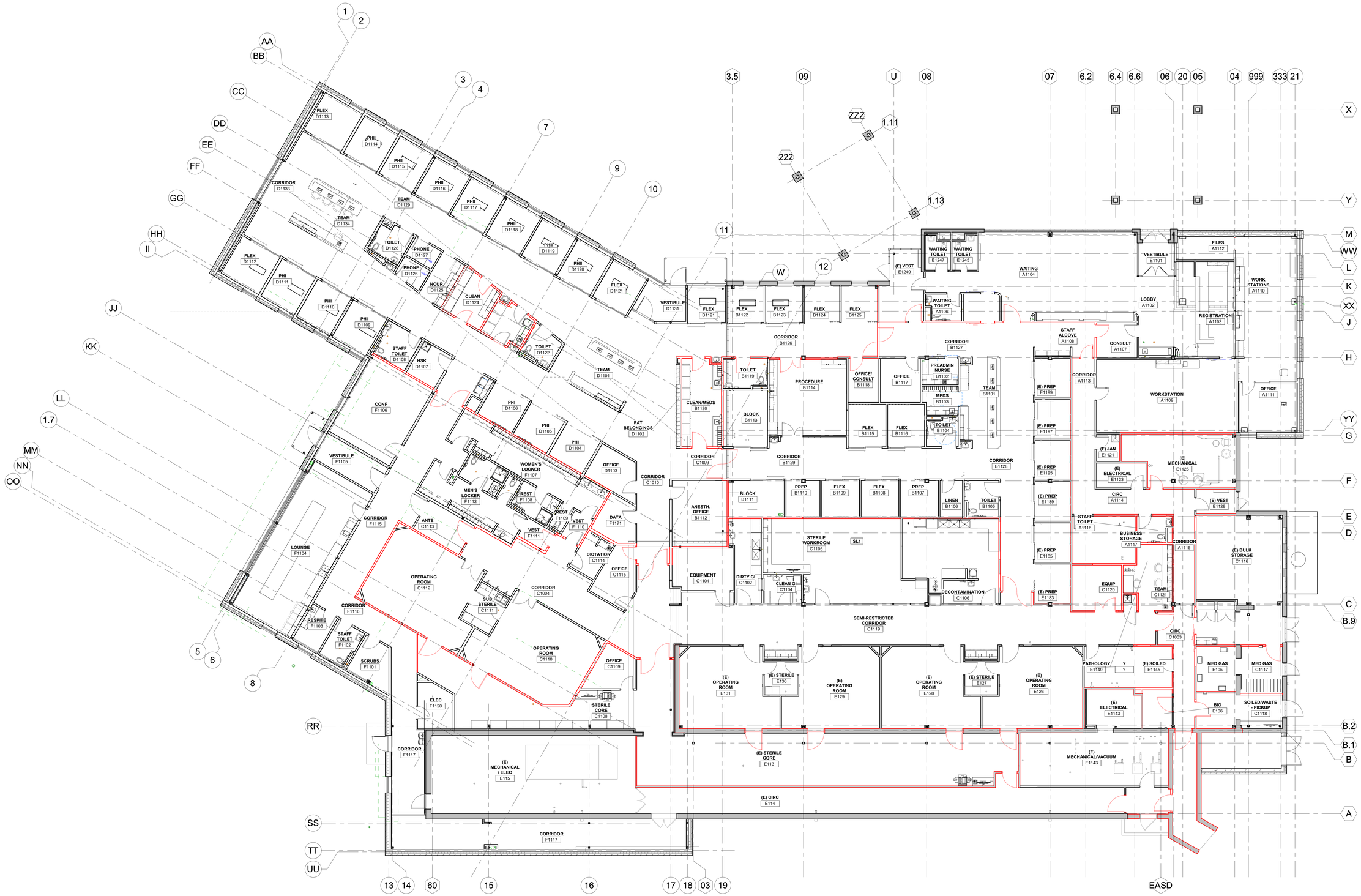
6/22/2026 12:22:30 PM



EXTERIOR CONCEPT



EXTERIOR CONCEPT



1 FIRST FLOOR PLAN
1/8" = 1'-0"

REFERENCE SCALE
1" = 1'
0 1/4" 1/2" 1"

6/22/2026 12:22:47 PM

ISG

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

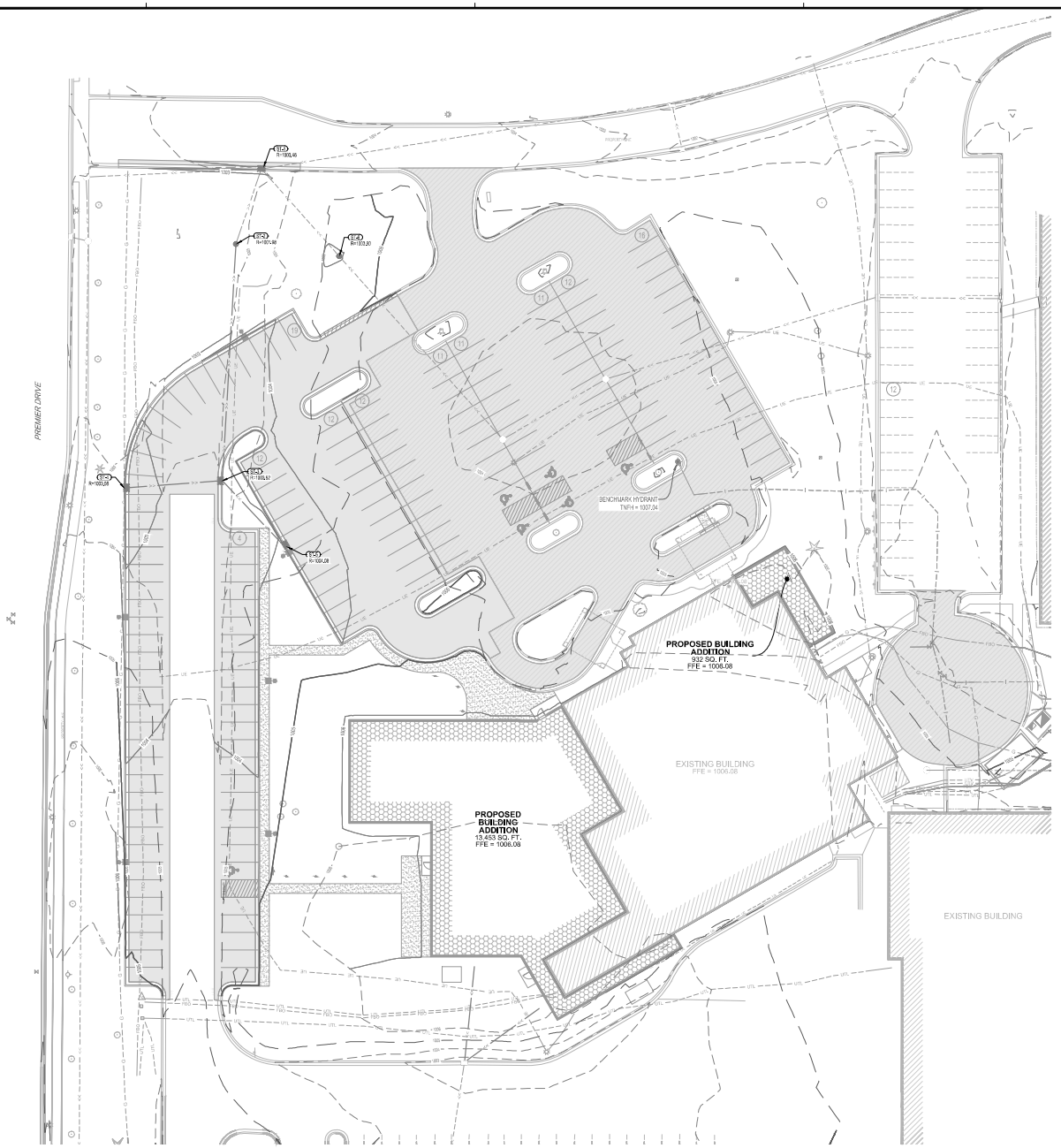
PROJECT NO.	25-32122
FILE NAME	
DRAWN BY	Author
DESIGNED BY	Designer
REVIEWED BY	Checker
ORIGINAL ISSUE DATE	06/19/26
CLIENT PROJECT NO.	

TITLE

FIRST FLOOR PLAN

SHEET

A1-22



GRADING LEGEND

	EXISTING CONTOUR (MINOR INTERVAL)
	EXISTING CONTOUR (MAJOR INTERVAL)
	PROPOSED CONTOUR (MINOR INTERVAL)
	PROPOSED CONTOUR (MAJOR INTERVAL)
	PROPOSED SPOT ELEVATION
	PROPOSED TOP BACK OF CURB SPOT ELEVATION
	PROPOSED TOP OF RETAINING WALL (TW) AND FINISHED GRADE (FG) AT BOTTOM OF RETAINING WALL
	SURFACE GRADE / DIRECTION

GENERAL GRADING NOTES

PROPOSED CONTOURS SHOW FINISHED GRADE ELEVATIONS. BUILDING PAD AND PAVEMENT SUBGRADING ARE NOT INCLUDED. WHEN CONSTRUCTING BUILDING PADS WITH A ROAD DOWN, GRADE AREAS TO ENSURE POSITIVE BUILDING PAD DRAINAGE.

N

0 20 40
SCALE IN FEET

ISG

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.

BRYAN M. PETZEL

DATE _____ LIC. NO. 53191

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.

MITCHELL COOKAS

DATE _____ LIC. NO. 59522

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122-C4-GRADE
DRAWN BY	AAD
DESIGNED BY	AAD/WP
REVIEWED BY	BMP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

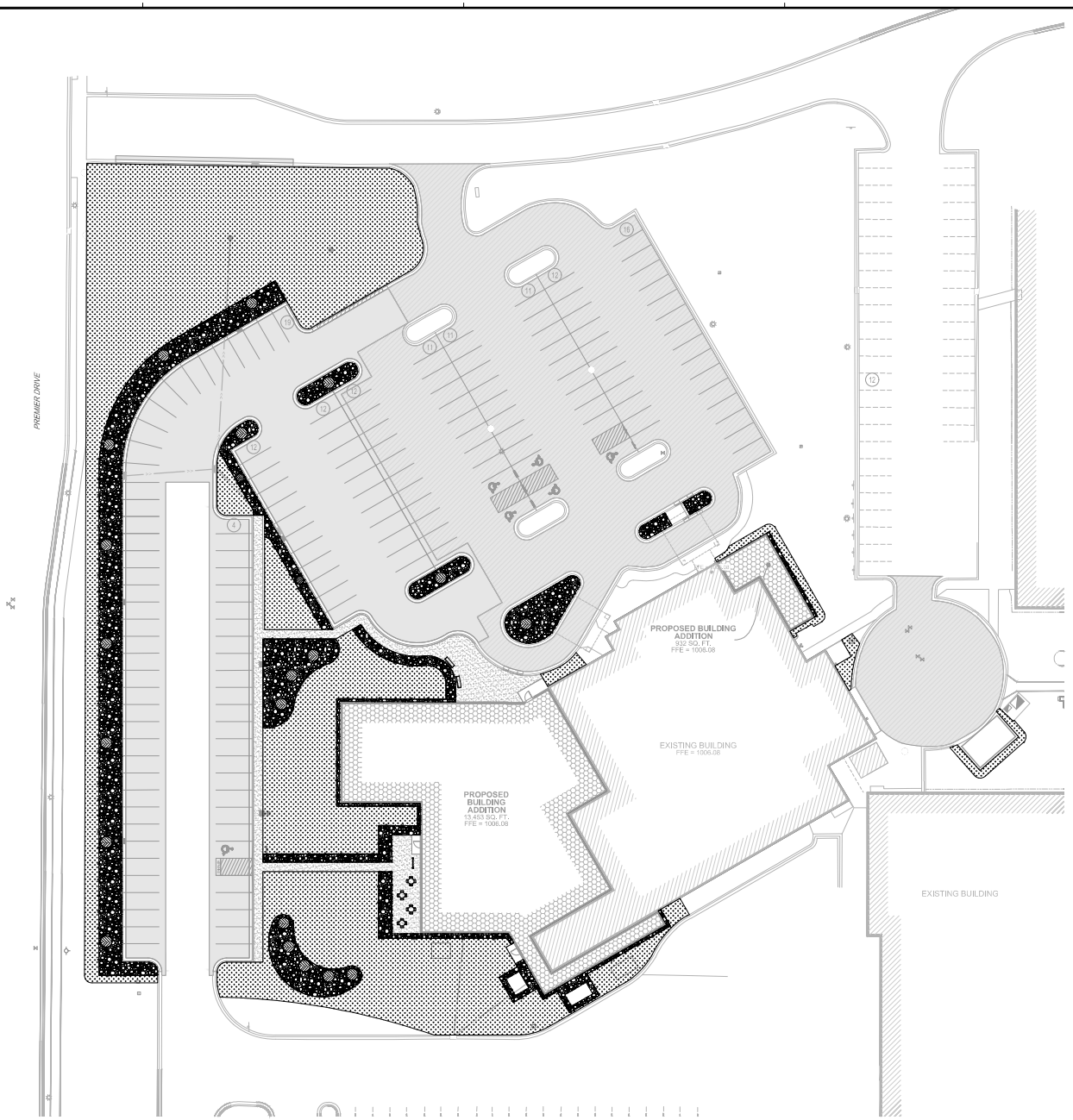
TITLE

GRADING PLAN

SHEET

C4-10

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION



MATERIAL SCHEDULE

SYMBOL	DESCRIPTION
	ROCK MULCH @ 3" DEPTH - OWNER TO CONFIRM TYPE SEE SPECIFICATION 32 9300
	DOUBLE SHREDDED HARDWOOD MULCH @ 3" DEPTH MIN
	LANDSCAPE EDGING SEE SPECIFICATION 32 9300

RESTORATION SCHEDULE

SYMBOL	DESCRIPTION
	SOUTHERN MIX(LAWN) (50) SEED MIX MnDOT 2575/B

SEEDING LIMITS ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR SEEDING ALL DISTURBED AREAS AS A RESULT OF CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. TEMPORARY EROSION CONTROL MEASURES INCLUDING PERIMETER CONTROL AND INLET PROTECTION MUST BE MAINTAINED UNTIL FINAL STABILIZATION MEASURES ARE IN PLACE AND APPROVED BY THE OWNERS REPRESENTATIVE. REFER TO THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR ADDITIONAL INFORMATION.

N

0 20 40
SCALE IN FEET

ISG

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BRYAN M. PETZEL

DATE _____ LIC. NO. 53191

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MITCHELL COOKAS

DATE _____ LIC. NO. 59522

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122-C5-LAND
DRAWN BY	AAD
DESIGNED BY	AAD/BMP
REVIEWED BY	BMP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

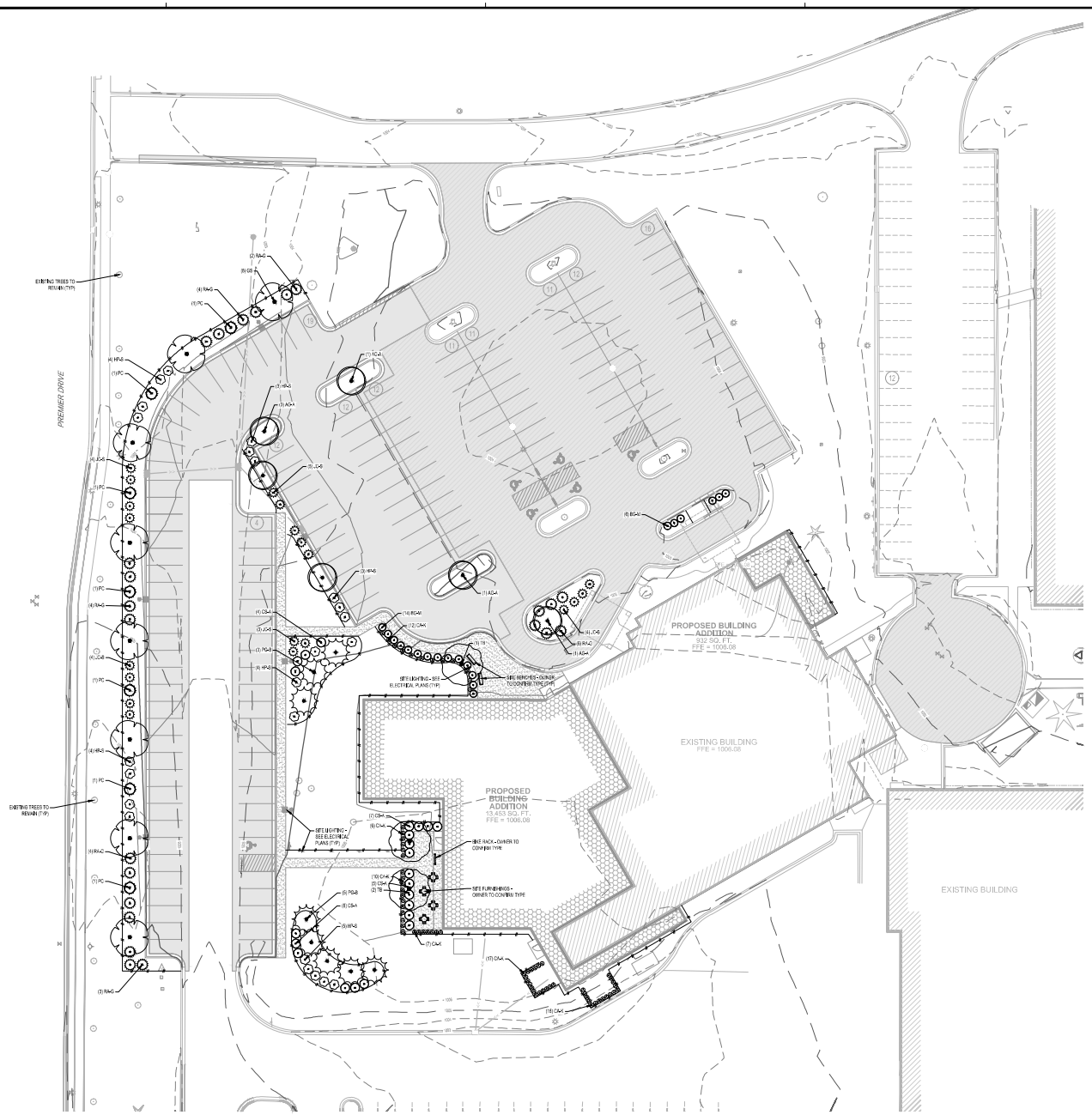
TITLE

SITE RESTORATION

SHEET

C5-10

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION



PLANT SCHEDULE

CODE	QTY	BOTANICAL / COMMON NAME	SIZE	ROOT	NOTE
DECIDUOUS TREES					
GS	6	GLEDITSIA TRICANTHOS SKYLINE SKYLINE HONEYLOCUST	3" CAL	B & B	
TB	3	TILIA AMERICANA 'BOULEVARD' BOULEVARD AMERICAN LINDEN	3" CAL	B & B	
EVERGREEN TREES					
PGH	6	PICEA GLAUCA DENSATA BLACK HILLS SPRUCE	6' HT MIN	B & B	
PC	7	PINUS STROBUS 'CHEBUT' CHEBUT WHITE STONE PINE	6' HT MIN	B & B	
UNDERSTORY TREES					
AG-4	10	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE' AUTUMN BRILLIANCE SERVICEBERRY (MULTISTEM)	6' HT MIN	B & B	MULTI-TRUNK
DECIDUOUS SHRUBS					
CS-4	23	CORNUS SERICEA 'ALLEMANS COMPACT' COMPACT RED OSIER DOGWOOD	5 GAL	CONT	
HP-6	23	HYDRANGEA PANICULATA 'SUNNY' SUNNYBERRY SMOOTH PANICLE HYDRANGEA	5 GAL	CONT	
RA-C	23	RHUS AROMATICA 'GRO-LOW' GRO-LOW FRAGRANT SUMAC	5 GAL	CONT	
EVERGREEN SHRUBS					
BOX	30	BUXUS x 'GREEN GEM NH' GREEN MOUNTAIN BOXWOOD	5 GAL	CONT	
JC-S	35	JUNIPERUS CHINENSIS 'SEA GREEN' SEA GREEN JUNIPER	5 GAL	CONT	
PERENNIALS					
CA-K	56	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' FEATHER REED GRASS	3 GAL	CONT	

LANDSCAPE REQUIREMENTS

PERIMETER LANDSCAPING:

EVERY OFF-STREET PARKING LOT CONTAINING FOUR (4) OR MORE PARKING STALLS SHALL BE BUFFERED AND SCREENED BY PERIMETER LANDSCAPING CONSISTING OF AN AREA AT LEAST THREE (3) FEET OR GREATER IN HEIGHT AS REQUIRED IN THE YARD AND SETBACK STANDARDS OF EACH ZONING DISTRICT. SHADE TREES SHALL BE PROVIDED AT A RATE OF ONE (1) TREE FOR EVERY FIFTY (50) LINEAR FEET OF PERIMETER LENGTH OR FRACTION THEREOF. EVERGREEN TREES SHALL BE PROVIDED AT A RATE OF ONE (1) TREE AND SHRUB FOR EVERY TWENTY-FIVE (25) LINEAR FEET OF PERIMETER LENGTH OR FRACTION THEREOF. EVERGREEN TREES SHALL BE MAINTAINED AT A HEIGHT OF NOT LESS THAN THREE (3) FEET.

PERIMETER LENGTH = 460 FT
REQUIRED SHADE TREES = 8 REQUIRED EVERGREEN TREES = 10 REQUIRED SHRUBS = 16
PROVIDED SHADE TREES = 8 PROVIDED EVERGREEN TREES = 16 PROVIDED SHRUBS = 21

N

0 20 40
SCALE IN FEET

ISG

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DATE _____ LIC. NO. 53191

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MITCHELL COOKAS

DATE _____ LIC. NO. 59522

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122-C5-LAND
DRAWN BY	AAD
DESIGNED BY	AAD/BMP
REVIEWED BY	BMP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

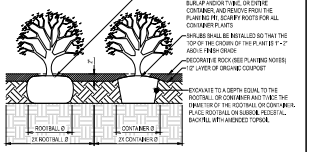
TITLE

PLANTING PLAN

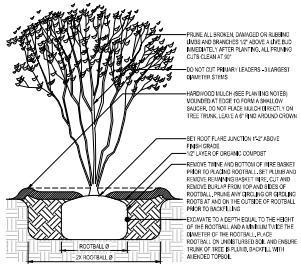
SHEET

C5-20

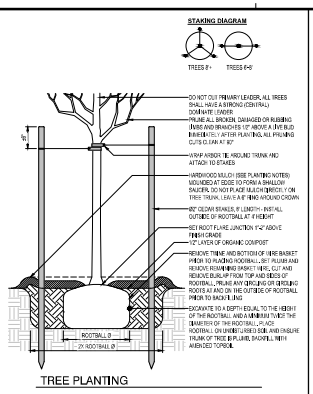
PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION



SHRUB PLANTING
NTS



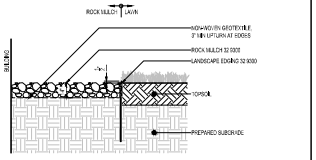
MULTI-STEM TREE PLANTING
NTS



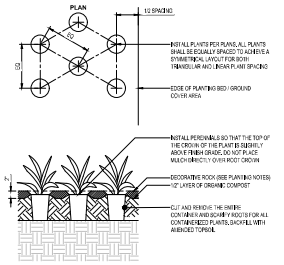
TREE PLANTING

PLANTING NOTES

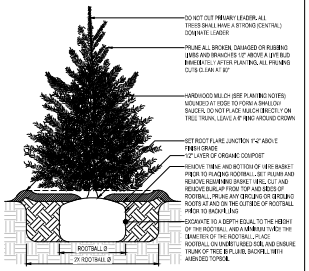
1. COORDINATE LOCATION OF ALL PUBLIC AND PRIVATE UTILITIES (LINES, DUCTS, CONDUITS, SLEEVES, FOOTINGS, ETC.) WITH LOCATIONS OF PROPOSED LANDSCAPE ELEMENTS (HEDGE, FOOTINGS, TREE ROOTBALLS, ETC.). CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO OWNER'S REPRESENTATIVE PRIOR TO CONTINUING WORK.
2. SAVE AND PROTECT ALL EXISTING TREES NOT NOTED TO BE REMOVED.
3. PROVIDE ALL CONSTRUCTION BARRIERS AND MAINTENANCE NECESSARY TO PLANT GROWTH FROM PLANTING PITS AND BEDS PRIOR TO BACKFILLING WITH PLANTING MIX.
4. REFER TO PLANTING DETAILS FOR AMENDED SOIL DEPTH IN PLANTING BEDS AND SURROUNDING TREES.
5. FIELD STAKE PLANTING ACCORDING TO PLAN. OWNER'S REPRESENTATIVE SHALL APPROVE ALL PLANT LOCATIONS PRIOR TO INSTALLATION. OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO REVISE PLANTING LAYOUT AT TIME OF INSTALLATION.
6. ALL PLANT MATERIALS SHALL BE TRUE TO THEIR SCIENTIFIC NAME AND SIZE AS INDICATED IN THE PLANT SCHEDULE. ANY PROPOSED SUBSTITUTIONS OF PLANT SPECIES SHALL BE MADE WITH PLANTS OF EQUIVALENT OVERALL FORM, HEIGHT, BRANCHING HABIT, FLOWER, LEAF, COLOR, FRUIT AND CULTURE, AND ONLY AFTER WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
7. IF DISCREPANCIES EXIST BETWEEN THE NUMBER OF PLANTS SHOWN ON THE PLANTING PLAN AND THE NUMBER OF PLANTS IN THE SCHEDULE, THE PLANTING PLAN SHALL GOVERN.
8. ALL PLANT MATERIALS MUST CONFORM TO AMERICAN STANDARDS FOR NURSERY STOCK (ANSI Z60.1, LATEST EDITION PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, WASHINGTON D.C.). LARGER SIZED PLANT MATERIALS OF THE SPECIES LISTED MAY BE USED IF THE STOCK CONFORMS TO ANSI Z60.1 AT NO ADDITIONAL COST TO THE OWNER.
9. ALL PLANT MATERIAL SHALL BE GUARANTEED BY THE CONTRACTOR TO BE IN A LIVE AND HEALTHY GROWING CONDITION FOR ONE FULL GROWING SEASON (ONE YEAR) AFTER FINAL PROJECT ACCEPTANCE. PLANTS DEFINED UNHEALTHY OR DEAD BY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE SHALL BE REPLACED BY THE CONTRACTOR FREE OF CHARGE WITH THE SAME GRADE AND SPECIES.
10. ALL TREES SHALL HAVE A STRONG CENTRAL LEADER. ANY TREES DEEMED NOT TO HAVE A STRONG CENTRAL LEADER SHALL BE REJECTED.
11. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE DUE TO CONSTRUCTION OPERATIONS. IN AREAS THAT ARE DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
12. DO NOT USE AN UNDERLAYMENT SUCH AS PLASTIC SHEET OR LANDSCAPE FABRIC. APPLY PRE-EMERGENT AND ORGANIC COMPOST TO ALL PLANTING BEDS PRIOR TO MULCHING. REFER TO STORMWATER DETAILS FOR RAIN GARDEN CONSTRUCTION AND MULCH APPLICATION.
13. INDICATED QUANTITIES ARE ESTIMATES AND SHALL BE CONFIRMED BY THE CONTRACTOR.
14. ADJUST SPACING OF PLANT MATERIAL AROUND EXISTING UTILITY STRUCTURES, NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY IF DEVIATION FROM PLAN IS MORE THAN 18" AND REQUEST DIRECTION.
15. ADJUST SPACING OF PLANT MATERIAL AROUND EXISTING TREES TO AVOID UNNECESSARY REMOVAL OF ROOTS WITHIN CRITICAL ROOT ZONE OF EXISTING TREES. STAND FROM RIGHT END TREE ROOTS UNLESS DIRECTED BY THE LANDSCAPE ARCHITECT.
16. HARDWOOD MULCH SHALL BE DOUBLE SHREDDED, NATURAL IN COLOR, AND BE RANGING FROM ½" TO 4 INCHES. CONTRACTOR SHALL PROVIDE SAMPLES OF MULCH AND COMPOST TO BE APPROVED BY THE LANDSCAPE ARCHITECT.
17. DECORATIVE ROCK MULCH TO BE 1.5" DIAMETER B-612 AND INSTALLED AT A MINIMUM 3" DEPTH OVER GEOTEXTILE FABRIC. OWNER TO CONFIRM ROCK MULCH TYPE.
18. REFER TO SPECIFICATION SECTION 32 9000 - PLANTS FOR MORE INFORMATION ON SPECIFIED PRODUCTS AND REQUIRED SUBMITTALS.
19. CONTRACTOR TO PROVIDE IRRIGATION SYSTEM PLAN AND DETAILS FOR REVIEW BY LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION. IRRIGATION SYSTEM SHALL INCLUDE DRIP AND SPRAY IRRIGATION AREAS ALONG WITH A RAIN SENSOR AND SMART CONTROLLER.



ROCK MULCH
NTS



PERENNIAL PLANTING
NTS



EVERGREEN TREE PLANTING
NTS

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BRYAN M. PETZEL

DATE _____ LIC. NO. 53191

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MITCHELL COOKAS

DATE _____ LIC. NO. 59522

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122-C5-LAND
DRAWN BY	AAD
DESIGNED BY	AAD/BWP
REVIEWED BY	BWP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE

LANDSCAPE DETAILS

SHEET

C5-30

PRELIMINARY NOT FOR CONSTRUCTION

PRELIMINARY NOT FOR CONSTRUCTION

June 23, 2026

Molly Westman
Planning & Zoning Administrator
City of Mankato
10 Civic Center Plaza
P.O. Box 3368
Mankato, MN 56002-3368
mwestman@mankatomn.gov

ISG

RE: Operational Narrative + CDC, PUD Amendment, & Prelim/Final Plat Applications Mankato Surgery Center –1411 Premier Drive, Mankato, MN 56001

Molly,

On behalf of Mankato Surgery Center, we respectfully request review and approval of this Certificate of Design Compliance Review, Planned Unit Development Amendment, and Preliminary and Final Plat Review. Mankato Surgery Center looks forward to enhancing their site to continue providing caring and compassionate outpatient surgical experiences to residents of Mankato and surrounding communities.

OPERATIONAL NARRATIVE

Mankato Surgery Center is a freestanding outpatient surgical facility located at the Wickersham Health Campus, dedicated to providing high-quality, cost-effective surgical care in a convenient and patient-centered environment. The facility specializes in same-day surgical and procedural services, allowing patients to return home the day of their procedure without requiring an overnight hospital stay. Mankato Surgery Center currently employs 61 staff members and operates Monday through Friday from 6:00 a.m. to 4:30 p.m. The proposed expansion is expected to support an increase in staffing to approximately 70 employees upon project completion. Through its commitment to quality care, Mankato Surgery Center serves as a valuable healthcare resource for the greater Mankato region.

The proposed project includes an 8,000 SF addition and a 10,000 SF interior remodel to the existing Mankato Surgery Center. The expansion will accommodate two new operating rooms, enhanced prep and recovery areas, and additional clinical support spaces. Interior updates will modernize existing areas to improve overall function and patient experience and bring the facility up to currently adopted best standards. The interior design of the facility is focused on infection prevention and leveraging biophilic design elements to enhance patient outcomes. Studies indicate healthcare facilities that leverage biophilic design elements and drive natural light deep into core spaces reduce stress, lower patient mortality, reduce recovery times, and provide access to natural elements for both patients and staff. A combination of brick to match the existing facility as closely as possible, glass, and metal panel is proposed as the exterior finish material for the expansion.

The existing campus frontage road paralleling Premier Drive along the west side of the property will be redirected from the north Premier Drive campus entrance to the Mankato Surgery Center parking lot. Prior to the construction of Premier Drive, the frontage road served as a primary access to Mankato Clinic. With the construction of Premier Drive and the southern Premier Drive access, the frontage road is no longer needed to serve in this capacity. The frontage road redirection will improve the safety of the northern Premier Drive entrance by eliminating potential traffic conflicts due to close proximity of the existing frontage road outlet to the north Premier Drive entrance.

To accommodate the expansion, the existing parking lot will be expanded to the west to create 24 new parking stalls. Additional parking stalls will be added along the redirected frontage road to meet city parking requirements. Mankato Clinic has an existing easement on the Mankato Surgery Center property to construct parking stalls along the frontage road to meet future needs. Those stalls will also be constructed as part of this project. The project will result in less than one acre of new and fully reconstructed impervious surfaces, and, therefore, no permanent stormwater management facilities are required. This has been confirmed in previous correspondence with the City Engineer.

Additionally, the proposed project includes installation of a single 1,000-liter Permacyl bulk oxygen tank with a microbulk oxygen supply system to serve the facility's medical oxygen needs. The tank will be supplied and serviced by a microbulk delivery truck and will be located on-site in a designated area that allows safe access for deliveries and maintenance. The installation includes a chain-link security fence surrounding the tank to restrict unauthorized access, as well as protective bollards positioned adjacent to the tank to prevent accidental vehicle damage.

CERTIFICATE OF DESIGN COMPLIANCE

The following items are included within this submittal in support of Certificate of Design Compliance approval:

- Colored Rendering
- Materials Sample Board
- Preliminary Floor Plans
- Exterior Elevations
- Site Plan
- Landscape Plan
- Photometric Plan
- Exterior Light Fixture Cutsheets

The proposed project seeks to aesthetically meet the project vision following the intent of the relevant design guidelines within the underlying O – Office Zoning District and the Highway Gateway Overlay District design standards identified by the City of Mankato.

PLANNED UNIT DEVELOPMENT AMENDMENT

The proposed project will meet the PUD criteria of Sec. 10-1913. 3. D. (1-6).

1. ***A certificate of disclosure of ownership interest.***

   Please see the attached title work documentation included with this submittal.

2. ***When the proposed planned unit development includes provisions for common open space or recreational facilities, a statement describing the provision that is to be made for the care and maintenance of such open space or recreational facilities. If it is proposed that such open space be owned or maintained by an entity other than a government authority, copies of the proposed articles of incorporation and bylaws of such entity shall be submitted.***

   The proposed project includes realignment of the ring road into the parking lot. The campus was developed prior to the Premier Drive being constructed. Since Premier Drive was constructed, the ring road is no longer needed to function in its original capacity as a main entrance drive for the clinic property. All campus entities have agreed to this change.

3. ***Copies of any restrictive covenants that are to be recorded with respect to property in the proposed planned unit development.***

   No additional restrictive covenants to be recorded. All others will remain the same.

4. *When the planned unit development is to be constructed in stages, a schedule for the development of such stages shall be submitted stating the approximate beginning and completion time for each stage. When the development provides for common open space, the total area of common open space provided at any stage of development shall, at a minimum, bear the same relationship to the total open space to be provided in the entire development as the stages completed or under development bear to the entire development.*

   The proposed project is not a phased project, not applicable.

5. *A statement showing the relationship of the proposed planned unit development to any adopted general plan of the city.*

   The City's Land Use Plan designates this area as Office Residential. The continued Mankato Surgery Center use is congruent with the City's Land Use Plan and will continue to meet all city design guidelines.

6. *6. A statement showing why the proposed planned unit development is compatible with other property in the neighborhood.*

   The proposed project is consistent with the existing property use, enhancing clinical operations and is compatible with the O, Office Zoning District and Highway Gateway Overlay District design standards.

PRELIMINARY & FINAL PLAT

Preliminary and Final Plats are being submitted as part of this review package to illustrate the proposed interrelationship of the existing properties as part of the comprehensive site redevelopment. Platting is required to accommodate the scale and vision of the proposed project.

Thank you again for reviewing the attached materials for this proposed project. Please contact us at 507.387.6651 or via email with any questions or if there is any additional information we can provide in support of this project.

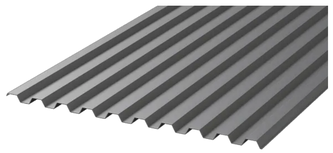
Sincerely,

Emily Nepp
Development Services Coordinator
Emily.Nepp@ISGInc.com

Sincerely,

Joey Wendinger
Senior Project Manager
Joey.Wendinger@ISGInc.com







MECHANICAL /AIR GAS SCREEN

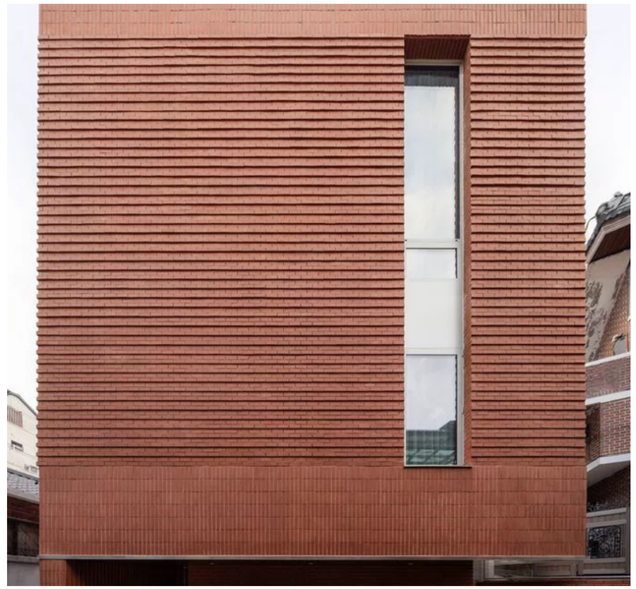
The roof mechanical screen will feature box rib profile metal panel in a gray color to mask the newly planned mechanical unit.

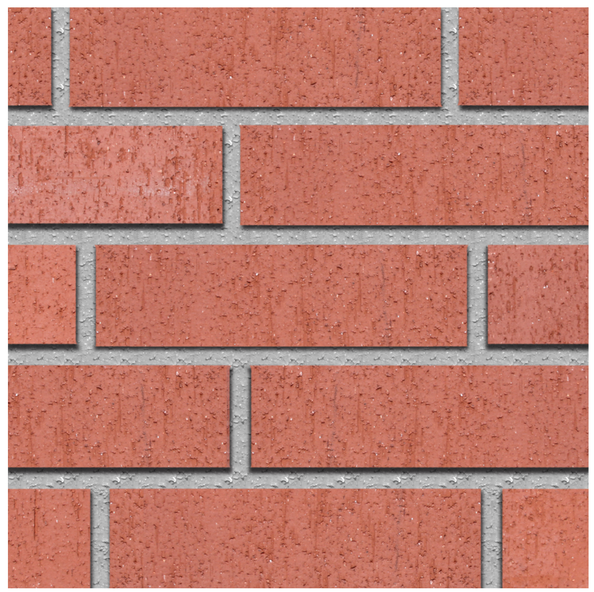
The new bulk oxygen tank located in the cul-de-sac turn around will feature Bok Modern screen panels in a gray color.

ENTRY CANOPY

The patient discharge canopy will feature structural steel framing painted white with translucent polycarbonate covering









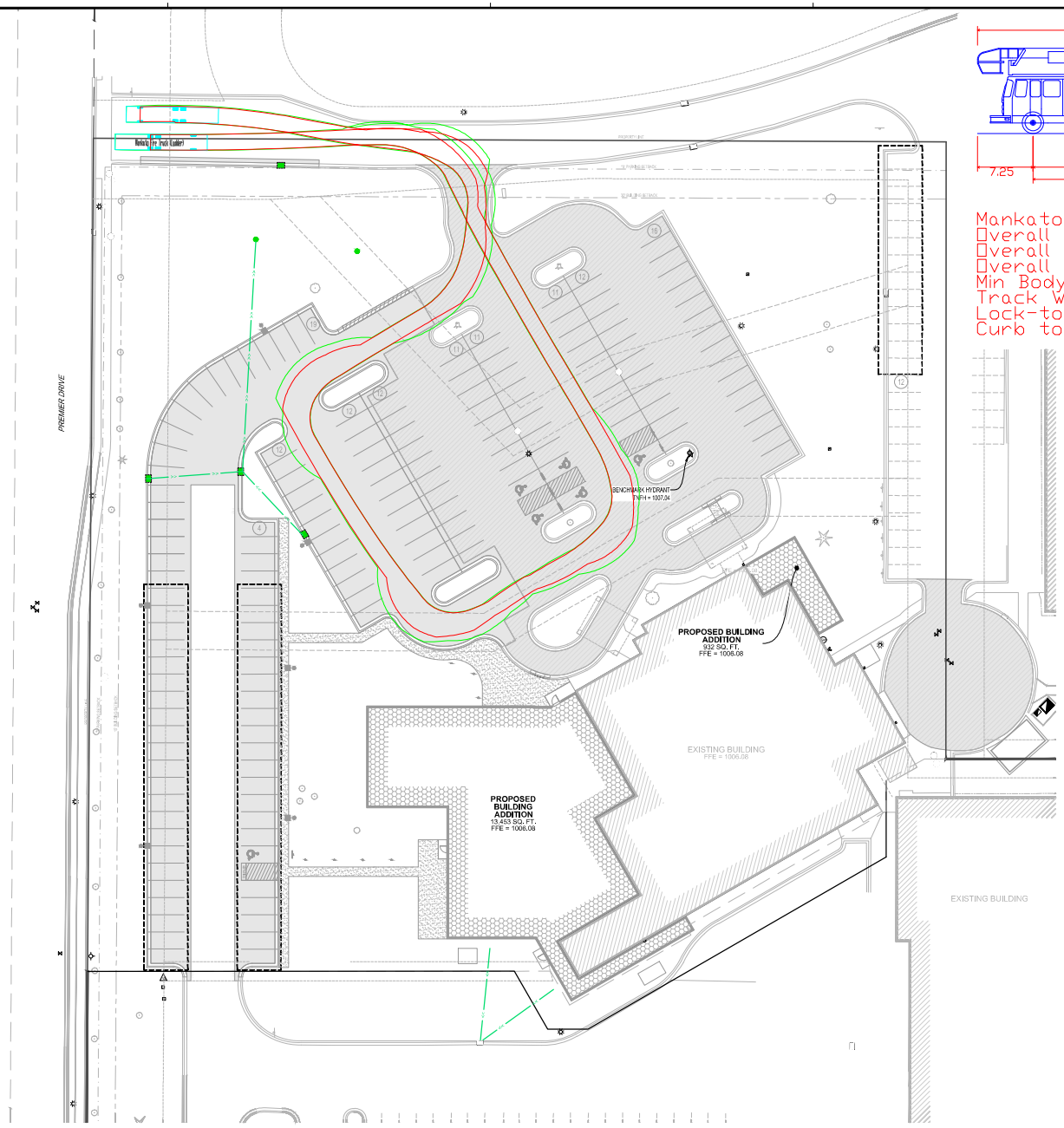
BRICK

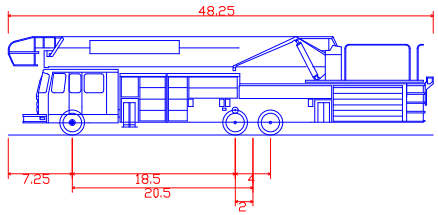
The existing Mankato Surgery Building, and Wickersham campus is clad with mixed red/orange clay masonry brick. The design intent for the project is to match the existing blend of masonry as closely as possible with available blends from major masonry suppliers (Hebron or Endicott). The existing facility features utility sized brick units with 1/3 running bond and features two bands of reveals - for the new construction the design team is proposing a corbeled feature similar to the image above with every other course recessed approximately 1" to provide additional visual interest to the facade. Mortar color will be matched as closely as possible to the existing facility.

ALUMINUM COMPOSITE METAL

Aluminum composite metal panels are the gold standard for large format metal panels. Allowing designers creative freedom in panel size, depth and reveals the material can be expertly crafted to fit the design intent for the project and is a precedent material on the existing Mankato Surgery Center. Available in a warm anodized aluminum finish, the panels will compliment the existing EIFS crown.

EXTERIOR MATERIAL PALETTE





Mankato Fire Truck (Ladder)	
Overall Length	48.250ft
Overall Width	8.200ft
Overall Body Height	11.151ft
Min Body Ground Clearance	0.902ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	35.170ft

N

0 20 40
SCALE IN FEET

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BRYAN M. PETZEL
DATE _____ LIC. NO. 53191

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MITCHELL COOKAS
DATE _____ LIC. NO. 59522
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PROJECT
MANKATO SURGERY CENTER EXPANSION
MANKATO MINNESOTA

REVISION SCHEDULE

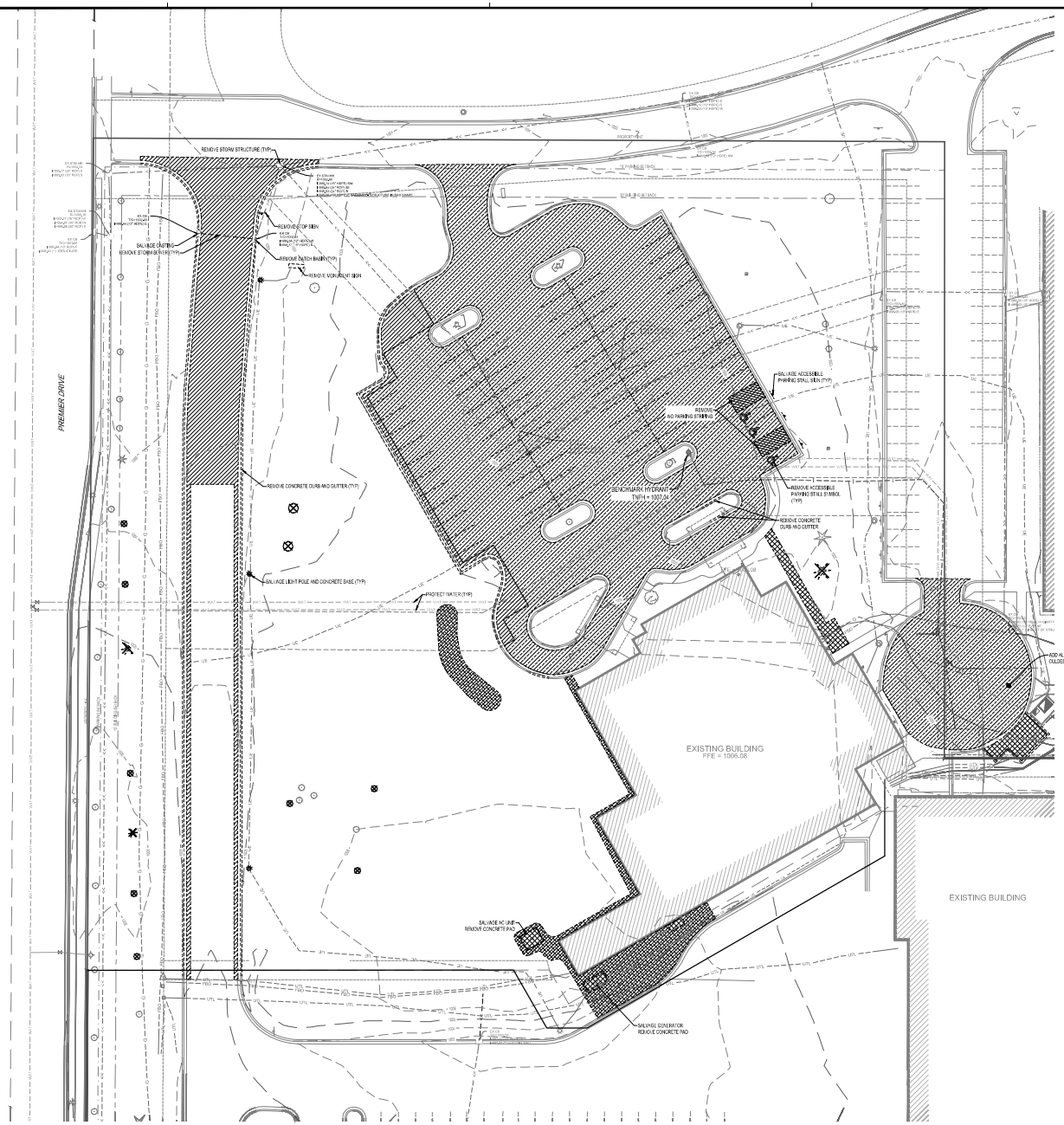
DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	3212-C3-SITE-CIRCULATION
DRAWN BY	AAD
DESIGNED BY	AAD/BMP
REVIEWED BY	BMP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE
SITE CIRCULATION

SHEET
C3-11

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION



REMOVAL LEGEND

SYMBOL	DESCRIPTION
	REMOVE BITUMINOUS PAVEMENT
	REMOVE CONCRETE PAVEMENT
	REMOVE LANDSCAPING
	MILL BITUMINOUS PAVEMENT
	REMOVE DECIDUOUS TREE (CLEAR AND GRUB)
	REMOVE CONIFEROUS TREE (CLEAR AND GRUB)

CONTRACTOR SHALL VERIFY EXISTING PAVEMENT SECTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

PAVEMENT REMOVALS SHALL INCLUDE FULL DEPTH SAWCUT AND SECTION REMOVAL.

N

0 20 40

SCALE IN FEET

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122-C2-EXIST
DRAWN BY	AAD
DESIGNED BY	AAD/BMP
REVIEWED BY	BMP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE

EXISTING SITE AND REMOVAL PLAN

SHEET

C2-10

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION

SYMBOL LEGEND

EXISTING		PROPOSED
EX STM MH	STORM MANHOLE	
EX CB	STORM CATCH BASIN	
EX CO	STORM CLEANOUT	
	STORM CULVERT	
	DOWNSPOUT	
	ROOF DRAIN	
EX SAN MH	SANITARY MANHOLE	
EX CO	SANITARY CLEANOUT	
EX LIFT STATION	LIFT STATION	
	WATER REDUCER	
	WATER VALVE	
	WATER VALVE MAHOLE	
	WATER CURB STOP	
	WATER SHUT-OFF	
EX POST INDICATOR VALVE	POST INDICATOR VALVE	
	FIRE DEPARTMENT CONNECTION	
	WELL	
EX MW	MONITORING WELL	
	LAWN SPRINKLER BOX	
	LAWN SPRINKLER HEAD	
	HYDRANT	
EX YARD HYD	YARD HYDRANT	
	UTILITY POLE	
	LIGHT POLE	
	GROUND LIGHT	
	GUY WIRE	
	TRANSFORMER	
EX HH	HANDHOLE	
EX ELEC MH	ELECTRIC MANHOLE	
	ELECTRIC METER	
	UTILITY VAULT	
	AIR CONDITIONER	
	GAS METER	
GGV	GAS VALVE	
SB-1	SOIL BORING	
	FLAG POLE	
	MAILBOX	
EX SIGNAL	TRAFFIC SIGNAL	
	SIGN	
	STREET SIGN	
	WHEEL STOP	
RR	RAILROAD CROSSING SIGN	
	POST	
	DECIDUOUS TREE	
	CONIFEROUS TREE	
	BUSH	
	TREE STUMP	
	WETLAND / MARSH	
	ROCK / BOULDER	

NOTE:
CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

LINETYPE LEGEND

EXISTING		PROPOSED
>>	STORM DRAIN	>>
>	SANITARY SEWER	>
II>	SANITARY SEWER FORCEMAIN	II>
I	WATER MAIN	I
G	GAS	G
OE	OVERHEAD ELECTRIC	OE
UE	UNDERGROUND ELECTRIC	UE
UT	UNDERGROUND TELEPHONE	UT
UTV	UNDERGROUND TV	UTV
OHL	OVERHEAD UTILITY	OHL
UTL	UNDERGROUND UTILITY	UTL
FO	FIBER OPTIC	FO
WET	WETLAND	WET
W	WATER EDGE	
	DITCH / SWALE	
x	FENCE LINE	x
	TREE LINE	
	PROPERTY / LOT LINE	
	RIGHT OF WAY LINE	
Δ	ACCESS CONTROL	
	EASEMENT LINE	

NOTE:
CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT
ADD	ADDENDUM
AFF	ABOVE FINISHED FLOOR
AGG	AGGREGATE
APPROX	APPROXIMATE
ARCH	ARCHITECT, ARCHITECTURAL
BFE	BASEMENT FLOOR ELEVATION
BIT	BITUMINOUS
BLDG	BUILDING
BM	BENCHMARK
CAD	COMPUTER-AIDED DESIGN
CB	CATCH BASIN
CFS	CUBIC FEET PER SECOND
CF	CUBIC FOOT
CI	CAST IRON
CIP	CAST IRON PIPE
CIPC	CAST IN PLACE CONCRETE
CJ	CONTROL JOINT
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CR	COUNTY ROAD
CY	CUBIC YARD
C&G	CURB AND GUTTER
DEMO	DEMOLITION
DI	DROP INTAKE
DIA	DIAMETER
DIM	DIMENSION
DS	DOWNSPOUT
EA	EACH
EG	EXISTING GROUND
ELEC	ELECTRICAL
ELEV	ELEVATION
EOF	EMERGENCY OVERFLOW
EQ	EQUAL
EX	EXISTING
FG	FINISHED GROUND
F/G	FORM GRADE
FDC	FIRE DEPARTMENT CONNECTION
FDN	FOUNDATION
FES	FLARED END SECTION
FFE	FINISHED FLOOR ELEVATION
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FOOT, FEET
FTG	FOOTING
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GD	GROUND
GFE	GARAGE FLOOR ELEVATION
GL	GUTTERLINE
GPM	GALLONS PER MINUTE
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE
HD	HEAVY DUTY
HH	HANDHOLE
HMA	HOT MIX ASPHALT
HORIZ	HORIZONTAL
HR	HOUR
HWL	HIGH WATER LEVEL
HWY	HIGHWAY
HYD	HYDRANT
I	INVERT
ID	INSIDE DIAMETER
IN	INCH
INV	INVERT
IP	IRON PIPE
IPS	IRON PIPE SIZE
J-BOX	JUNCTION BOX
JT	JOINT
LF	LINEAR FEET
LIN	LINEAR
LPS	LOW PRESSURE STEAM
LS	LUMP SUM
LSO	LOWEST STRUCTURAL OPENING
MAX	MAXIMUM
MB	MAIL BOX
MECH	MECHANICAL
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
NO	NUMBER
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OH	OVERHEAD
OHWL	ORDINARY HIGH WATER LEVEL
OHD	OVERHEAD DOOR
OZ	OUNCE
PCC	PORTLAND CEMENT CONCRETE
PED	PEDESTAL, PEDESTRIAN
PERF	PERFORATED
PL	PROPERTY LINE
PP	POLYPROPYLENE
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
QTY	QUANTITY
R	RIM
RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
REBAR	REINFORCING BAR
REM	REMOVE
ROW	RIGHT OF WAY
R/W	RIGHT OF WAY
SAN	SANITARY
SCH	SCHEDULE
SF	SQUARE FOOT
SPEC	SPECIFICATION
SQ	SQUARE
STA	STATION
STM	STORM
SY	SQUARE YARD
T/C	TOP OF CURB
TEL	TELEPHONE
TEMP	TEMPORARY
THRU	THROUGH
TNFH	TOP NUT OF FIRE HYDRANT
TRANS	TRANSFORMER
TV	TELEVISION
T/W	TOP OF WALL
TYP	TYPICAL
UT	UTILITY, UNDERGROUND TELEPHONE
VCP	VITRIFIED CLAY PIPE
W/O	WITHOUT
W/	WITH
YD	YARD
YR	YEAR



LOCATION MAP

0 500 1,000
SCALE IN FEET

SITE SUMMARY

PROJECT ADDRESS/LOCATION:	1411 PREMIER DRIVE MANKATO, MINNESOTA 56001	
ZONING:	M-1 LIGHT INDUSTRIAL	
SITE/LOT AREA:	94,610 SF	(2.2 AC)
EXISTING IMPERVIOUS:	69,444 SF	(1.6 AC)
PROPOSED IMPERVIOUS:	47,252 SF	(1.1 AC)
REMOVED IMPERVIOUS NOT BEING RECONSTRUCTED:	3,804 SF	(0.1 AC)
NET NEW AND RECONSTRUCTED IMPERVIOUS:	43,448 SF	(1.0 AC)

REQUIRED SETBACKS

	PARKING	BUILDING
FRONT YARD	15'	30'
SIDE YARD	6'	15'
REAR YARD	0'	0'

INTERIOR LANDSCAPE REQUIREMENTS

PARKING AREA	24,692 SF
REQUIRED LANDSCAPE AREA (5% OF PARKING AREA)	1,235 SF
PROVIDED LANDSCAPE AREA	2,486 SF

PARKING DATA

LAND USE CLASSIFICATION	CLINIC
PARKING SPACES REQUIRED (CODE)	ONE SPACE PER EACH 250 SQ. FT. OF FLOOR AREA, PLUS ONE SPACE PER STAFF MEMBER
GOVERNING INFORMATION	MANKATO CITY CODE OF ORDINANCES
PARKING SPACES REQUIRED	15,480 SQ. FT. USABLE FLOOR AREA / 250 SQ. FT. = 62 SPACES + 70 STAFF MEMBERS = 132 SPACES
PARKING STALLS PROVIDED	
STANDARD (EXISTING)	80
ACCESSIBLE (EXISTING)	3
STANDARD (PROPOSED)	47
ACCESSIBLE (PROPOSED)	2
TOTAL	132
BICYCLE PARKING REQUIREMENTS	
PARKING SPACES REQUIRED (CODE)	NONRESIDENTIAL USES HAVING AN OFF-STREET PARKING REQUIREMENT OF 40 OR MORE AUTOMOBILE SPACES SHALL PROVIDE OFF-STREET BICYCLE PARKING SPACES EQUAL TO FIVE PERCENT OF THE TOTAL NUMBER OF AUTOMOBILE OFF-STREET PARKING SPACES PROVIDED
BICYCLE PARKING SPACES PROVIDED	5% OF 132 AUTOMOBILE PARKING SPACES = 7 BICYCLE PARKING SPACES
BICYCLE PARKING SPACES PROVIDED	
TOTAL	7

CIVIL SHEET INDEX

C0-10 SITE DATA
C0-20 DETAILS
C2-10 EXISTING SITE AND REMOVAL PLAN
C3-10 SITE AND UTILITY PLAN
C3-11 SITE CIRCULATION
C4-10 GRADING PLAN
C5-10 SITE RESTORATION
C5-20 PLANTING PLAN
C5-30 LANDSCAPE DETAILS
E2-03 SITE PHOTOMETRIC
E2-04 LIGHT FIXTURE SCHEDULE AND DETAIL

PROJECT GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE CONTRACT DOCUMENTS, WHICH INCLUDE, BUT ARE NOT LIMITED TO, THE OWNER - CONTRACTOR AGREEMENT, THE PROJECT MANUAL (WHICH INCLUDES GENERAL SUPPLEMENTARY CONDITIONS AND SPECIFICATIONS), DRAWINGS OF ALL DISCIPLINES AND ALL ADDENDA, MODIFICATIONS, AND CLARIFICATIONS ISSUED BY ARCHITECT/ENGINEER.
2. CONTRACT DOCUMENTS SHALL BE ISSUED TO ALL SUBCONTRACTORS BY THE GENERAL CONTRACTOR IN COMPLETE SETS IN ORDER TO ACHIEVE THE FULL EXTENT AND COMPLETE COORDINATION OF ALL WORK.
3. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
4. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
5. DETAILS SHOWN ARE INTENDED TO BE INDICATIVE OF THE PROFILES AND TYPE OF DETAILING REQUIRED THROUGHOUT THE WORK. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO DETAILS SHOWN. WHERE SPECIFIC DIMENSIONS, DETAILS, OR DESIGN INTENT CANNOT BE DETERMINED, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
6. ALL MANUFACTURED ARTICLES, MATERIALS, AND EQUIPMENT SHALL BE APPLIED, INSTALLED, CONNECTED, ERECTED, CLEANED, AND CONDITIONED ACCORDING TO MANUFACTURERS' INSTRUCTIONS. IN CASE OF DISCREPANCIES BETWEEN MANUFACTURERS' INSTRUCTIONS AND THE CONTRACT DOCUMENTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
7. ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FROM EACH OTHER TO AVOID GALVANIC CORROSION.
8. THE LOCATION AND TYPE OF ALL EXISTING UTILITIES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY AND ARE ACCURATE AND COMPLETE TO THE BEST OF THE KNOWLEDGE OF I & S GROUP, INC. (ISG). NO WARRANTY OR GUARANTEE IS IMPLIED. THE CONTRACTOR SHALL VERIFY THE SIZES, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
9. THE CONTRACTOR IS TO CONTACT "GOPHER STATE ONE CALL" FOR UTILITY LOCATIONS A MINIMUM OF 2 BUSINESS DAYS PRIOR TO ANY EXCAVATION / CONSTRUCTION (1-800-252-1166).

SPECIFICATIONS REFERENCE

ALL CONSTRUCTION SHALL COMPLY WITH THE CITY OF MANKATO REQUIREMENTS AND MnDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2025 EDITION, THE STANDARD SPECIFICATIONS FOR SANITARY SEWER, STORM DRAIN AND WATERMAIN AS PROPOSED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA, 2025 EDITION, AND THE CURRENT VERSION OF THE MINNESOTA STATE PLUMBING CODE UNLESS DIRECTED OTHERWISE.

PROJECT DATUM

HORIZONTAL COORDINATES HAVE BEEN REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 1996 ADJUSTMENT (NAD83(1996)) ON THE BLUE EARTH COUNTY COORDINATE SYSTEM, IN U.S. SURVEY FEET.
ELEVATIONS HAVE BEEN REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
RTK GPS METHODS WERE USED TO ESTABLISH HORIZONTAL AND VERTICAL COORDINATES FOR THIS PROJECT.

TOPOGRAPHIC SURVEY

THIS PROJECT'S TOPOGRAPHIC SURVEY CONSISTS OF DATA COLLECTED IN FEBRUARY, MARCH, AND APRIL 2026 BY ISG.

ISG

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.
BRYAN M. PETZEL
DATE______ LIC. NO. 53191

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.
MITCHELL COOKAS
DATE______ LIC. NO. 56522

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122-C0-SITE-DATA
DRAWN BY	AAQ
DESIGNED BY	AAQ/BMP
REVIEWED BY	BMP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

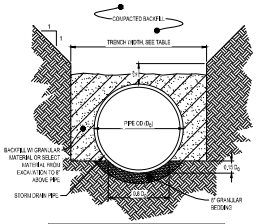
TITLE

SITE DATA

SHEET

C0-10

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION

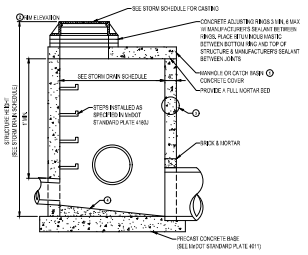


TRENCH WIDTH	
PIPE Ø	TRENCH WIDTH
36" OR LESS	D_E + 24"
42" TO 84"	1.5 D_E
90" OR OVER	D_E + 36"

NOTES:

1. GRANULAR BEDDING AND BACKFILL FOR STORM DRAIN PIPES SHALL BE INCIDENTAL TO STORM DRAIN CONSTRUCTION

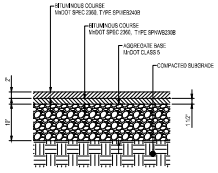
NON-CONCRETE
STORM DRAIN PIPE BEDDING
NTS



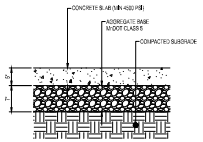
KEY NOTES:

1. WHEN USED AS A CATCH BASIN AND REQUIRING A RECTANGULAR OPENING, USE 4022 CONCRETE COVER.
2. WHEN REFERRING TO A CURB CATCH BASIN, USE TOP SACK OF CURB ELEVATION.
3. WALL CONSTRUCTION MAY BE CLASS II PRECAST PIPE (MNDOT STANDARD PLATE 3006), CAST IN PLACE CONCRETE MEETING THE REQUIREMENTS OF CLASS III PIPE, OR MASONRY CONSTRUCTION, BRICK OR BLOCK (MNDOT STANDARD PLATE 4006).
4. PROVIDE MORTAR FILLETS TO FIT BOTTOM PORTIONS OF PIPE TO DIRECT FLOW TO OUTLET.

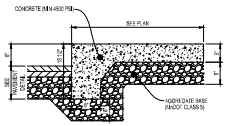
4020
MANHOLE OR CATCH BASIN
NTS



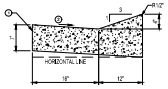
STANDARD
BITUMINOUS PAVEMENT
NTS



STANDARD
CONCRETE PAVEMENT
NTS



TURN DOWN
CONCRETE WALK
NTS



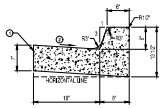
KEY NOTES:

1. LONGITUDINAL JOINT WHEN ADJACENT TO RIGID PAVEMENT OR BASE.
2. SLOPE GUTTER NORMAL, UNLESS OTHERWISE SPECIFIED. IF A DIFFERENT GUTTER SLOPE IS PERMITTED, THE FORM MAY BE TILTED.

NOTE:

1. CURB AND GUTTER FOUNDATION SHALL CONSIST OF MINIMUM 6" THICK MNDOT CLASS 5 AGGREGATE BASE, EXTENDED A MINIMUM OF 12" BEHIND THE BACK OF CURB.

D418
CONCRETE CURB & GUTTER
NTS



KEY NOTES:

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NOTE:

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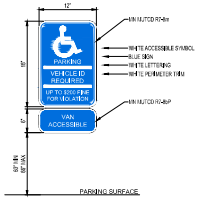
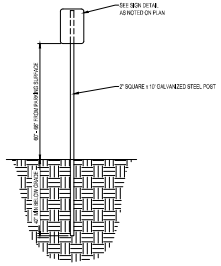
B618
CONCRETE CURB & GUTTER
NTS



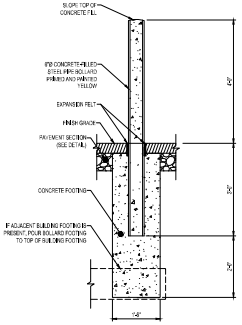
NOTES:

1. ACCESSIBLE PARKING STALL SIGN TO BE MOUNTED AT THE HEIGHT SHOWN, SIGN SHALL COMPLY WITH MINNESOTA STATUTES, SECTION 169.346, SUBDIVISION 2, PARAGRAPH (a). SIGN TO BE CONTAINED ON PARKING STALL.

ACCESSIBLE PARKING SIGN (VAN ACCESSIBLE)
NTS



SIGN POST
NTS



PIPE BOLLARD - PAINTED
NTS

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DATE _____ LIC. NO. 53191

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MITCHELL COOKAS

DATE _____ LIC. NO. 59522

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	32122-00-DETAILS
DRAWN BY	AAD
DESIGNED BY	AAD/BMP
REVIEWED BY	BMP
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

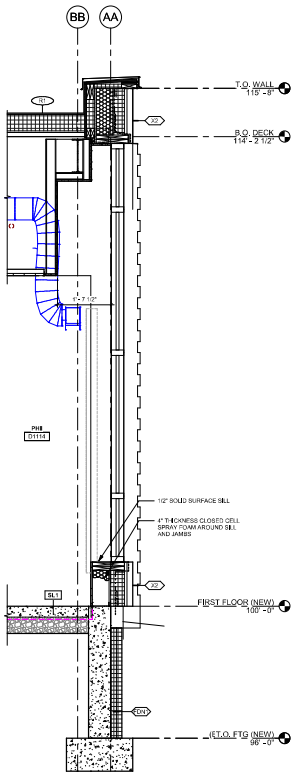
TITLE

DETAILS

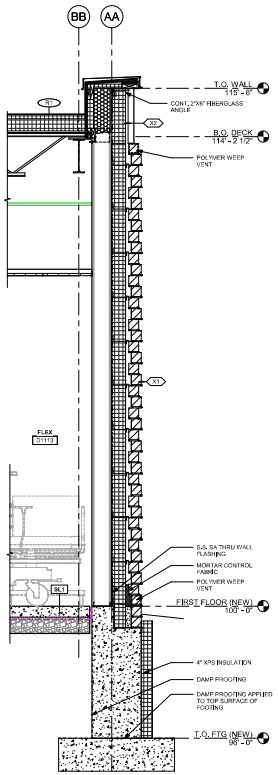
SHEET

C0-20

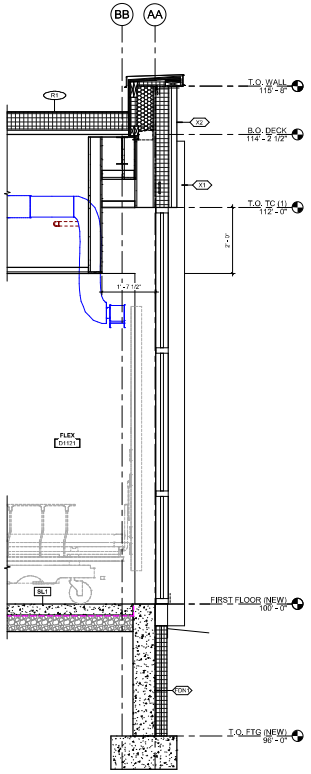
PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION



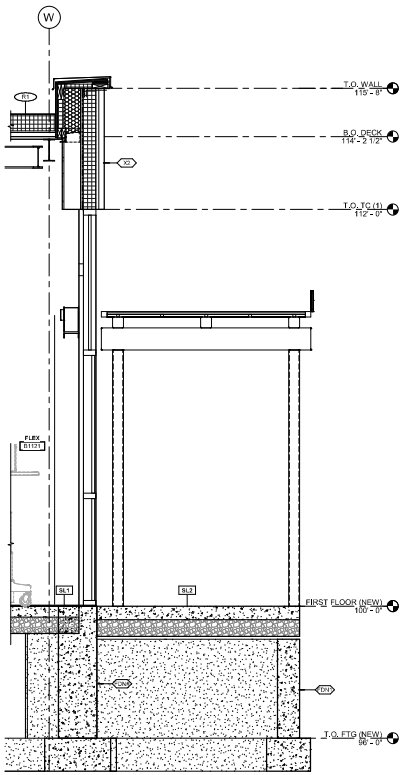
2 TYPICAL WALL SECTION AT PATIENT WINDOW
3/4" = 1'-0"



1 TYPICAL WALL SECTION
3/4" = 1'-0"



3 Section 42
3/4" = 1'-0"



4 WALL SECTION AT ENTRY CANOPY
3/4" = 1'-0"

ISG

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PROJECT

MANKATO SURGERY

CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
FILE NAME	
DRAWN BY	Author
DESIGNED BY	Designer
REVIEWED BY	Checker
ORIGINAL ISSUE DATE	MM/DD/YY
CLIENT PROJECT NO.	

TITLE

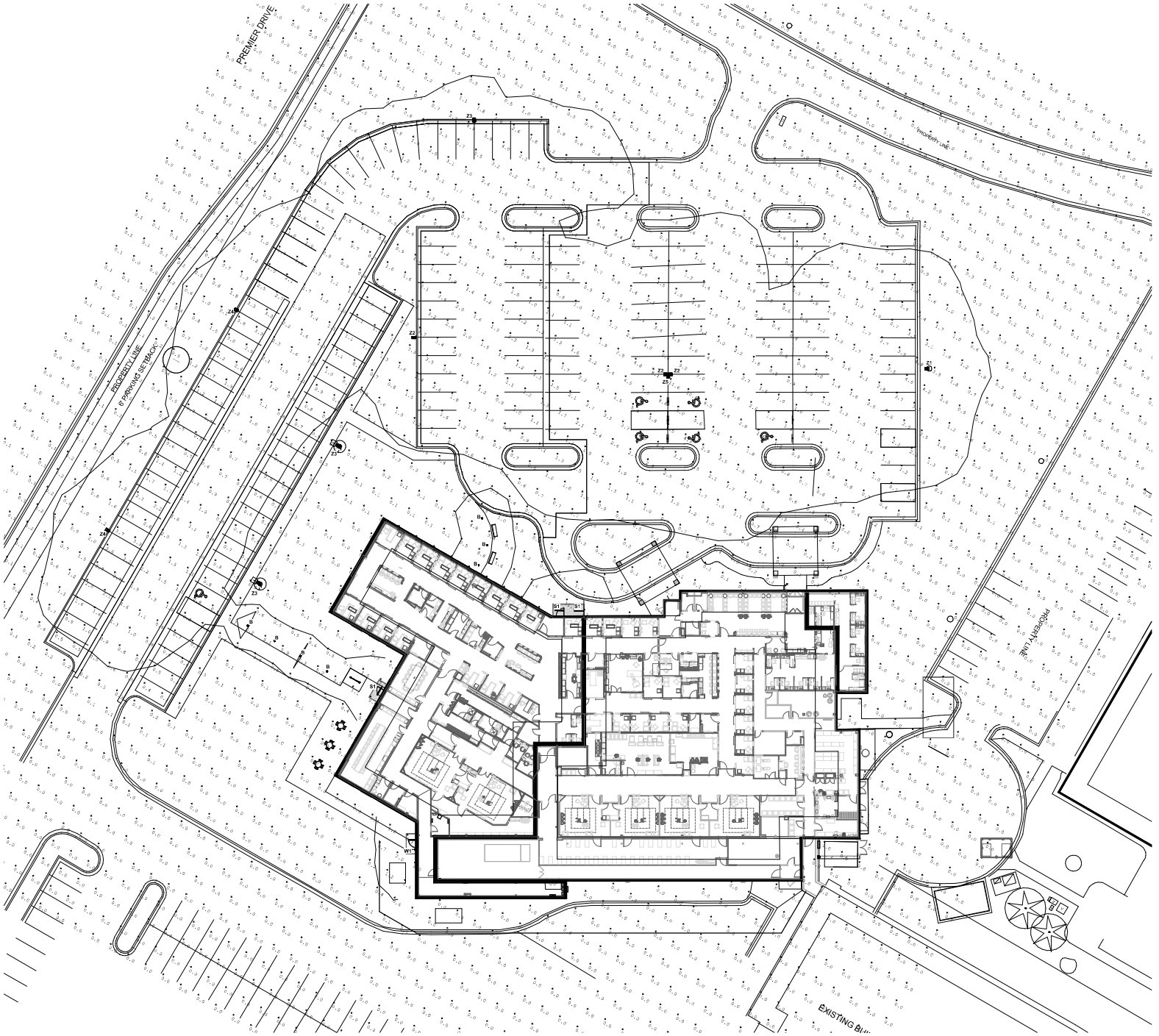
WALL SECTIONS

SHEET

A3-21

REFERENCE SCALE

3/11/2026 4:32:28 PM



1 SITE PHOTOMETRIC
1/16" = 1'-0"

N

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
TILE NAME	32122 ELEC R24.rvt
DRAWN BY	RLS
DESIGNED BY	RLS
REVIEWED BY	RDS
ORIGINAL ISSUE DATE	MM/DD/YY
CLIENT PROJECT NO.	

TITLE

SITE PHOTOMETRIC

SHEET

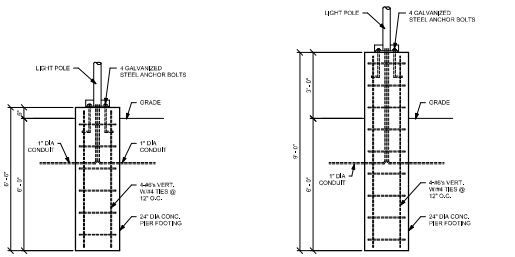
E2-03

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION

NO SCALE

SITE LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	MODEL	LAMP	WATTS	TYPE COMMENTS
B	BOLLARD	NLS LIGHTING	SST-4-WHPR-HLE-ES-3000-DA-SHSB-PC	2002 LM, 3000K CCT, 80 CRI	26 W	
B1	1FX SURFACE MOUNT LINEAR	NLS LIGHTING	NSTBRK24-WH-SHLED-HO-PASTSBHR-SC-UV-WHM-WAL-<LIGHT-WHS>-EMC	2000 LM, 3000K CCT, 80 CRI	9 W	
W1	WALL PACK	LITHONIA	WDGE2 LED-P2-40K-WR-TRA-MVOLTDRIVER-NLTAIRENG PENDELKD	7964 LM, 3000K CCT, 80 CRI	56 W	
Z1	25' POLE LIGHT	NLS LIGHTING	VSS-LT-48L-<3000>-UV-DPSB-BRZ-SP40-HSS	28910 LM, 3000K CCT, 80 CRI	205 W	
Z2	25' POLE LIGHT	NLS LIGHTING	VSS-LT-48L-<3000>-UV-ADPSB-BRZ-SP40	19912 LM, 3000K CCT, 80 CRI	156 W	
Z3	25' POLE LIGHT	NLS LIGHTING	VSS-LT-48L-<3000>-UV-DPSB-BRZ-SP40-HSS	19736 LM, 3000K CCT, 80 CRI	156 W	
Z4	25' POLE LIGHT	NLS LIGHTING	VSS-LT-48L-<3000>-UV-ADPSB-BRZ-SP40-HSS	19912 LM, 3000K CCT, 80 CRI	156 W	
Z5	25' POLE LIGHT	NLS LIGHTING	VSS-LT-48L-<3000>-UV-DPSB-BRZ-SP40	19736 LM, 3000K CCT, 80 CRI	156 W	



1 SITE POLE MOUNTING BASE
NOT TO SCALE

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION

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PROJECT

MANKATO SURGERY CENTER EXPANSION

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-32122
TILE NAME	32122 ELEC R24.vwt
DRAWN BY	RLS
DESIGNED BY	RLS
REVIEWED BY	RDS
ORIGINAL ISSUE DATE	MM/DD/YY
CLIENT PROJECT NO.	

TITLE

LIGHT FIXTURE SCHEDULE AND DETAIL

SHEET

E2-04

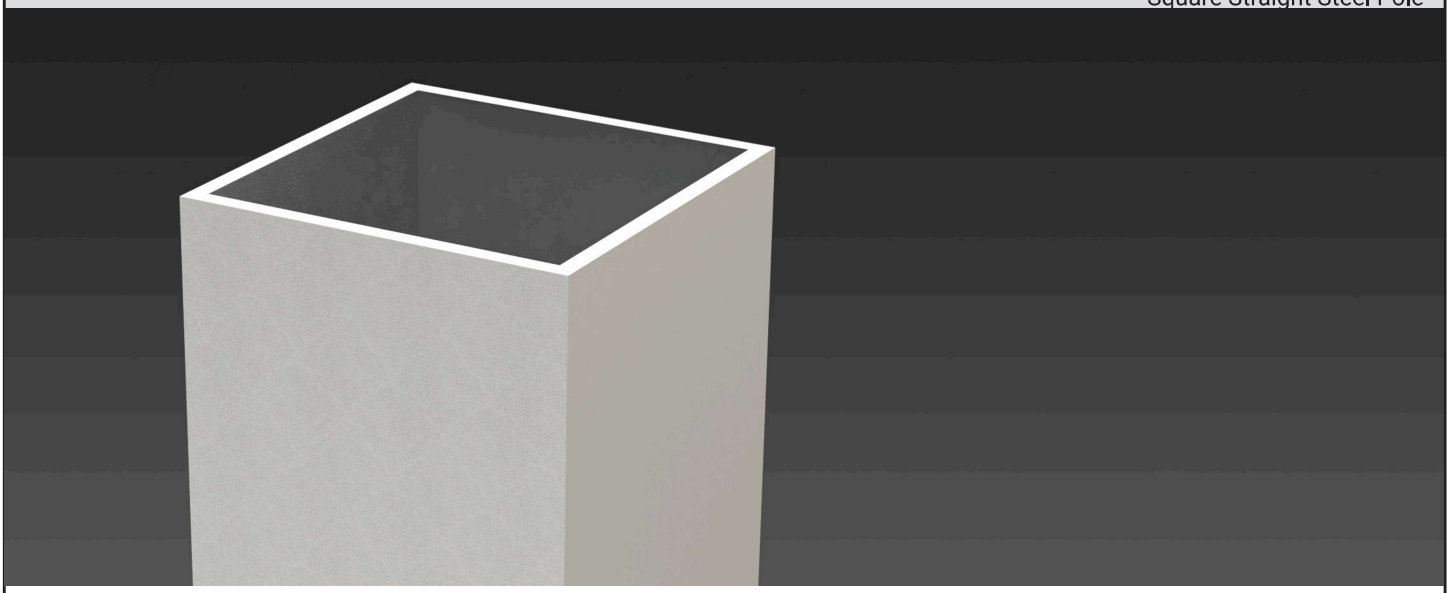
RECOMMENDED SCALE
1" = 1'-0"
0" 1" 2"

6/23/2026 10:24:13 AM

NLS LIGHTING

SSSP

Square Straight Steel Pole



4” 5” 6”

Height
10’ - 35’

Pole Shaft
The pole shaft material is a weldable grade hot rolled commercial quality carbon steel tubing with a minimum yield of 46,000 psi. Conforms to ASTM A500 Grade B Standards. Poles have ground lug welded inside hand-hole opposite side of the hand-hole. Pole shaft is welded to base plate on top and bottom of base plate.

Base Plate
The Base Plate is manufactured from structural hot rolled steel that meets or exceeds a minimum yield strength of 36,000 psi, conforms the ASTM–A36 standards. Base Plate vary in size from 1” thick for poles 21 feet and over, 3/4” thick for poles 10 to 20 feet.

Anchor Bolts
All anchor bolts are hot dipped galvanized steel and come with two galvanized nuts and washers per bolt. Minimum yield strength 55,000 psi. Anchor bolts are not included for Custom Bolt Circle.

Base Cover
All base covers are fabricated two-piece 6063 aluminum and powder coated to match the pole.

Hand-Hole
A reinforced hand-hole is 12” on center from the base plate and is constructed of 3”x 5” rectangular steel tubing which is welded to pole shaft for added strength. The hand-hole covers are provided with internal bridge support and powder coated to match pole finish.

Pole Cap
All poles come with a removable polymer pole cap installed. All pole caps are black finish. Aluminum Pole Cap option is painted to match pole.

Finish
All poles are treated with shot blast media for a near white finish, power blasted with 100 psi prior to powder coat application. Electrostatically applied polyester powder coat with a 3 to 5 mil thickness for maximum adherence.

Marine Grade Finish
All poles are washed through a 5-stage cleaning system with a deionized rinse, a 3 to 5 mils zinc rich durable polyester primer powder coat, followed by a 3 to 5 mils super durable polyester powder coat finish.

Galvanized Finish
All poles are Hot Dipped Galvanized in a multi stage process. Galvanizing Specification, Zinc (Hot Dipped Galvanized) per ASTM A 123/A 123M – 02

Zinc coatings on threaded materials shall conform to specification A 153 /A 153M. The coating shall be continuous and reasonably smooth and uniform in thickness and in weight.

Galvanizing Adherence - The Zinc coating shall withstand handling consistent with the nature and thickness of the coating and normal use of the article without peeling or flaking.

Galvanized Under Powder
Galvanized Under Powder (GUP) adheres to above galvanized specification, and the second stage is a light sand blast on the outside of the pole, third stage is a 3-5 mils polyester powder coat finish for maximum adherence.

Vibration Dampener
The Vibration Dampener is factory installed. The Vibration Dampener consists of a rugged galvanized chain coated with heavy duty polyester tubing that is factory secured at the bottom 2-3rds of the pole and field secured by contractor at the base during installation.

Buy American
To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).

Project Name:	Type:

SSSP ORDERING GUIDE

Cat#

Square
Straight
Steel Pole
(SSSP)

Height

10' **(10)**
12' **(12)**
14' **(14)**
15' **(15)**
16' **(16)**
18' **(18)**
20' **(20)**
22' **(22)**
24' **(24)**
25' **(25)**
28' **(28)**
30' **(30)**
32' **(32)**
35' **(35)**

Pole Dimension

4" Square
(4S)

5" Square
(5S)

6" Square
(6S)❸

Gauge

.120
Wall Thickness
(11G)

.180
Wall Thickness
(7G)

Base Pattern

(10'-20')
8.187" – 10.187"
Bolt Circle
(9BC)

(22'-35')
10" – 14"
Bolt Circle
(12BC)

Custom
Bolt Circle
(CBC)
** Consult Factory*

Mounting

Single
(SGL)

Double
(D-90)
(D-180)

Triple
(T-90)

Quad
(QD)

No Drill
(ND)
**Tenon Option*

Tenon

2 3/8" Round **(T2R)**
3" Round **(T3R)**
3 1/2" Round **(T312R)**
4 1/2" Round **(T412R)**
3 1/2" Square **(T312S)**
4 1/2" Square **(T412S)**
5 1/2" Square **(T512S)**

Color

Bronze Textured
(BRZ)

White Textured
(WHT)

Smooth White
Gloss
(SWT)

Silver
(SVR)

Green Textured
(GRN)

Hunter Green Textured
(HGN)

Black Textured
(BLK)

Smooth Black
Gloss
(SBK)

Graphite Textured
(GPH)

Grey Textured
(GRY)

Custom
(CS)

Bolts

3/4" x 30"
(3430)

1" x 36"
(136)

Less Anchor
Bolts
(LAB)

Options

GFI Kit
(GFI20A)❹
20 Amp
Weather Proof Receptacle

GFI
Provision Only
(PROV)

Galvanized
(GLV)

Galvanized
Under Powder
(GUP)

1/2" Coupling
(COUP)
** Specify Location*

Vibration Dampener
(VD)

Extra Hand Hole
(XHH)
** Specify Location*

Marine Grade Finish
(MGF)

UL Certified with label
(UL)❶

Aluminum Pole Cap
(APC)❷

Buy American
(BAA)❷

Trade American
(TAA)❷

Build America Buy American
(BABA)❷

Notes:
❶ Aluminum Pole Cap must be selected for UL Certified Pole Option
❷ Consult Factory
❸ For 6S Pole, minimum bolt circle 10.19"
❹ Standard weatherproof cover comes standard with option.
For lockable cover requests, please contact factory

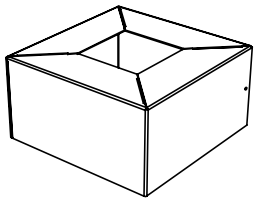
NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
Call Us Today (310) 341-2037
nlslighting.com

Max. allowable EPA - SSSP poles (per AASHTO LRFDLTS-1)																															
Catalog Number	Shaft Length, ft	Wall thick-ness, in.	Shaft dia., in.	Base Plate, in.	Bolt Circle, in.	Bolts	80 mph	Max. wt. (lb)	90 mph	Max. wt. (lb)	100 mph	Max. wt. (lb)	110 mph	Max. wt. (lb)	115 mph	Max. wt., lb	120 mph	Max. wt., lb	130 mph	Max. wt., lb	140 mph	Max. wt., lb	150 mph	Max. wt., lb	160 mph	Max. wt., lb	170 mph	Max. wt., lb	180 mph	Max. wt., lb
SSSP-10-4S-11G-9BC-3430	10	0.120	4	9" sq.	9	3/4"x30"	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	17.8	250	15.6	250	13.2	250	11.4	250
SSSP-12-4S-11G-9BC-3430	12	0.120	4	9" sq.	9	3/4"x30"	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	19.5	250	16.3	250	13.7	250	11.9	250	10.1	250	8.7	218
SSSP-14-4S-11G-9BC-3430	14	0.120	4	9" sq.	9	3/4"x30"	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	19.3	250	15.9	250	13.1	250	10.9	250	9.1	227	7.3	183	6.3	158
SSSP-15-4S-7G-9BC-3430	15	0.188	4	9" sq.	9	3/4"x30"	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	17.7	250	14.7	250	11.9	250	9.9	248	8.3	208	6.9	173
SSSP-16-4S-11G-9BC-3430	16	0.120	4	9" sq.	9	3/4"x30"	20.0	250	20.0	250	20.0	250	18.1	250	16.1	250	14.7	250	11.9	250	9.7	242	7.9	198	6.1	153	5.1	128	4.1	103
SSSP-18-4S-11G-9BC-3430	18	0.120	4	9" sq.	9	3/4"x30"	20.0	250	20.0	250	19.2	250	15.2	250	13.2	250	12.0	250	9.2	230	7.2	180	5.6	140	4.6	115	3.2	80	2.2	60
SSSP-20-4S-11G-9BC-3430	20	0.120	4	9" sq.	9	3/4"x30"	20.0	250	20.0	250	16.1	250	12.3	250	10.7	250	9.7	242	7.1	178	5.3	133	3.9	98	2.7	68	1.7	60	0.9	60
SSSP-20-4S-7G-9BC-3430	20	0.188	4	9" sq.	9	3/4"x30"	20.0	250	20.0	250	20.0	250	15.7	250	14.1	250	12.5	250	9.5	238	7.7	193	5.7	143	4.3	108	3.1	78	2.1	60
SSSP-20-5S-11G-9BC-3430	20	0.120	5	9" sq.	9	3/4"x30"	20.0	250	20.0	250	20.0	250	19.3	250	16.9	250	15.0	250	11.6	250	9.0	226	6.9	172	5.1	128	3.7	92	2.5	63
SSSP-20-5S-7G-9BC-3430	20	0.188	5	9" sq.	9	3/4"x30"	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	17.9	250	14.4	250	11.6	250	9.3	232	7.4	184	5.8	144
SSSP-22-4S-11G-12BC-136	22	0.120	4	12" sq.	12	1"x36"	20.0	250	16.7	250	12.4	250	9.2	231	7.9	198	6.8	169	4.9	123	3.4	85	2.2	60	1.2	60	0.4	60	0.0	-
SSSP-22-4S-7G-12BC-136	22	0.188	4	12" sq.	12	1"x36"	20.0	250	20.0	250	19.2	250	14.8	250	13.0	250	11.5	250	8.9	223	6.8	171	5.2	130	3.8	96	2.7	68	1.8	60
SSSP-22-5S-11G-12BC-136	22	0.120	5	12" sq.	12	1"x36"	20.0	250	20.0	250	19.3	250	14.6	250	12.7	250	11.0	250	8.2	206	6.0	151	4.2	106	2.8	71	1.6	60	0.6	60
SSSP-22-5S-7G-12BC-136	22	0.188	5	12" sq.	12	1"x36"	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	20.0	250	15.9	250	12.6	250	10.0	250	7.9	197	6.1	152	4.6	116
SSSP-24-4S-11G-12BC-136	24	0.120	4	12" sq.	12	1"x36"	19.6	250	14.0	250	10.4	250	7.2	180	6.0	150	5.2	130	3.2	80	1.8	60	1.0	60	0.0	-	0.0	-	0.0	-
SSSP-24-4S-7G-12BC-136	24	0.188	4	12" sq.	12	1"x36"	20.0	250	20.0	250	16.4	250	12.4	250	10.8	250	9.4	234	7.0	175	5.1	128	3.6	90	2.4	60	1.4	60	0.5	60
SSSP-24-5S-11G-12BC-136	24	0.120	5	12" sq.	12	1"x36"	20.0	250	20.0	250	16.2	250	11.9	250	10.1	250	8.6	215	6.1	152	4.1	101	2.4	61	1.1	60	0.0	-	0.0	-
SSSP-24-5S-7G-12BC-136	24	0.188	5	12" sq.	12	1"x36"	20.0	250	20.0	250	20.0	250	20.0	250	19.1	250	16.9	250	13.1	250	10.1	250	7.7	192	5.8	144	4.1	103	2.7	68
SSSP-25-4S-11G-12BC-136	25	0.120	4	12" sq.	12	1"x36"	18.2	250	13.2	250	9.4	235	6.6	165	5.4	135	4.4	110	2.8	70	1.2	60	0.4	60	0.0	-	0.0	-	0.0	-
SSSP-25-4S-7G-12BC-136	25	0.188	4	12" sq.	12	1"x36"	20.0	250	20.0	250	15.1	250	11.3	250	9.8	244	8.4	210	6.1	153	4.3	108	2.9	71	1.7	60	0.7	60	0.0	-
SSSP-25-5S-11G-12BC-136	25	0.120	5	12" sq.	12	1"x36"	20.0	250	20.0	250	14.7	250	10.6	250	9.0	224	7.5	188	5.1	127	3.1	78	1.6	60	0.3	60	0.0	-	0.0	-
SSSP-25-5S-7G-12BC-136	25	0.188	5	12" sq.	12	1"x36"	20.0	250	20.0	250	20.0	250	20.0	250	17.6	250	15.4	250	11.8	250	8.9	223	6.7	166	4.7	118	3.2	80	1.9	60
SSSP-26-4S-11G-12BC-136	26	0.120	4	12" sq.	12	1"x36"	17.2	250	11.8	250	8.4	210	5.4	135	4.6	115	3.4	85	1.8	60	0.8	60	0.0	-	0.0	-	0.0	-	0.0	-
SSSP-26-4S-7G-12BC-136	26	0.188	4	12" sq.	12	1"x36"	20.0	250	19.0	250	14.0	250	10.3	250	8.8	220	7.5	187	5.3	133	3.6	89	2.2	60	1.0	60	0.1	60	0.0	-
SSSP-26-5S-11G-12BC-136	26	0.120	5	12" sq.	12	1"x36"	20.0	250	18.8	250	13.4	250	9.5	237	7.8	196	6.5	161	4.1	103	2.3	60	0.8	60	0.0	-	0.0	-	0.0	-
SSSP-26-5S-7G-12BC-136	26	0.188	5	12" sq.	12	1"x36"	20.0	250	20.0	250	20.0	250	18.6	250	16.2	250	14.1	250	10.6	250	7.9	196	5.6	141	3.8	95	2.3	60	1.0	60
SSSP-28-4S-7G-12BC-136	28	0.188	4	12" sq.	12	1"x36"	20.0	250	16.4	250	11.8	250	8.4	210	7.0	175	5.8	144	3.8	94	2.2	60	0.9	60	0.0	-	0.0	-	0.0	-
SSSP-28-5S-11G-12BC-136	28	0.120	5	12" sq.	12	1"x36"	20.0	250	16.0	250	11.0	250	7.3	182	5.8	144	4.5	112	2.3	60	0.6	60	0.0	-	0.0	-	0.0	-	0.0	-
SSSP-28-5S-7G-12BC-136	28	0.188	5	12" sq.	12	1"x36"	20.0	250	20.0	250	20.0	250	15.7	250	13.5	250	11.6	250	8.4	209	5.8	145	3.7	93	2.0	60	0.6	60	0.0	-
SSSP-28-6S-7G-12BC-136	28	0.188	6	12" sq.	12	1"x36"	20.0	250	20.0	250	20.0	250	19.8	250	17.0	250	14.6	250	10.6	250	7.4	185	4.9	121	2.7	68	1.0	60	0.0	-
SSSP-30-5S-11G-12BC-136	30	0.120	5	12" sq.	12	1"x36"	19.9	250	13.4	250	8.7	218	5.3	132	3.9	98	2.7	67	0.6	60	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-
SSSP-30-5S-7G-12BC-136	30	0.188	5	12" sq.	12	1"x36"	20.0	250	20.0	250	18.2	250	13.2	250	11.1	250	9.3	233	6.3	157	3.9	98	2.0	60	0.4	60	0.0	-	0.0	-
SSSP-30-6S-7G-12BC-136	30	0.188	6	12" sq.	12	1"x36"	20.0	250	20.0	250	20.0	250	16.6	250	14.0	250	11.8	250	8.0	201	5.1	126	2.7	66	0.7	60	0.0	-	0.0	-
SSSP-32-5S-7G-12BC-136	32	0.188	5	12" sq.	12	1"x36"	20.0	250	20.0	250	17.5	250	13.0	250	11.2	250	9.6	239	6.9	173	4.8	119	3.1	77	1.7	60	0.6	60	0.0	-
SSSP-32-6S-7G-12BC-136	32	0.188	6	12" sq.	12	1"x36"	20.0	250	20.0	250	20.0	250	16.4	250	14.1	250	12.1	250	8.8	219	6.2	154	4.0	101	2.3	60	0.9	60	0.0	-
SSSP-35-5S-7G-12BC-136	35	0.188	5	12" sq.	12	1"x36"	20.0	250	19.3	250	13.8	250	9.6	240	8.0	199	6.5	162	4.1	102	2.1	60	0.6	60	0.0	-	0.0	-	0.0	-
SSSP-35-6S-7G-12BC-136	35	0.188	6	12" sq.	12	1"x36"	20.0	250	20.0	250	17.3	250	12.2	250	10.1	250	8.3	207	5.3	132	2.9	72	1.0	60	0.0	-	0.0	-	0.0	-
SSSP-40-5S-7G-12BC-136	40	0.188	5	12" sq.	12	1"x36"	20.0	250	13.2	250	8.4	210	4.8	120	3.3	83	2.0	60	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-
SSSP-40-6S-7G-12BC-136	40	0.188	6	12" sq.	12	1"x36"	20.0	250	16.7	250	10.7	250	6.2	155	4.4	110	2.8	70	0.1	60	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-
*Pole Assemblies With EPA>9.0 Require Specific Review																														

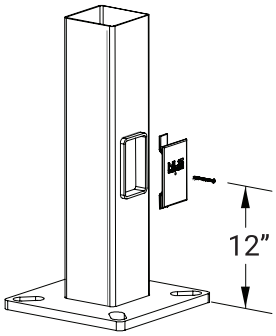
CAUTION: Installation of poles without luminaire(s) will compromise pole strength. Any accessories attached to the pole, or other modifications done in the field, will compromise the pole strength and may result in pole failure. Wind load evaluations and provisions for appendages such as banner arms, signage, cameras, etc., must be evaluated and approved by the factory prior to placing an order. Additional evaluation and approval should be performed by the customer's local structural engineer on the project.

***Anchor Bolts are NOT included with Custom Bolt Circle.**
Do NOT pour concrete referencing this drawing. Consult Factory.

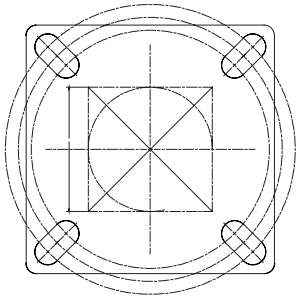
All wind loading calculations are based on sustained wind force plus an additional 1.3 gust.



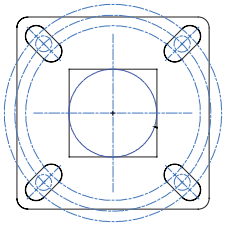
Base Cover



Base Detail



12” Base Detail



9” Base Detail

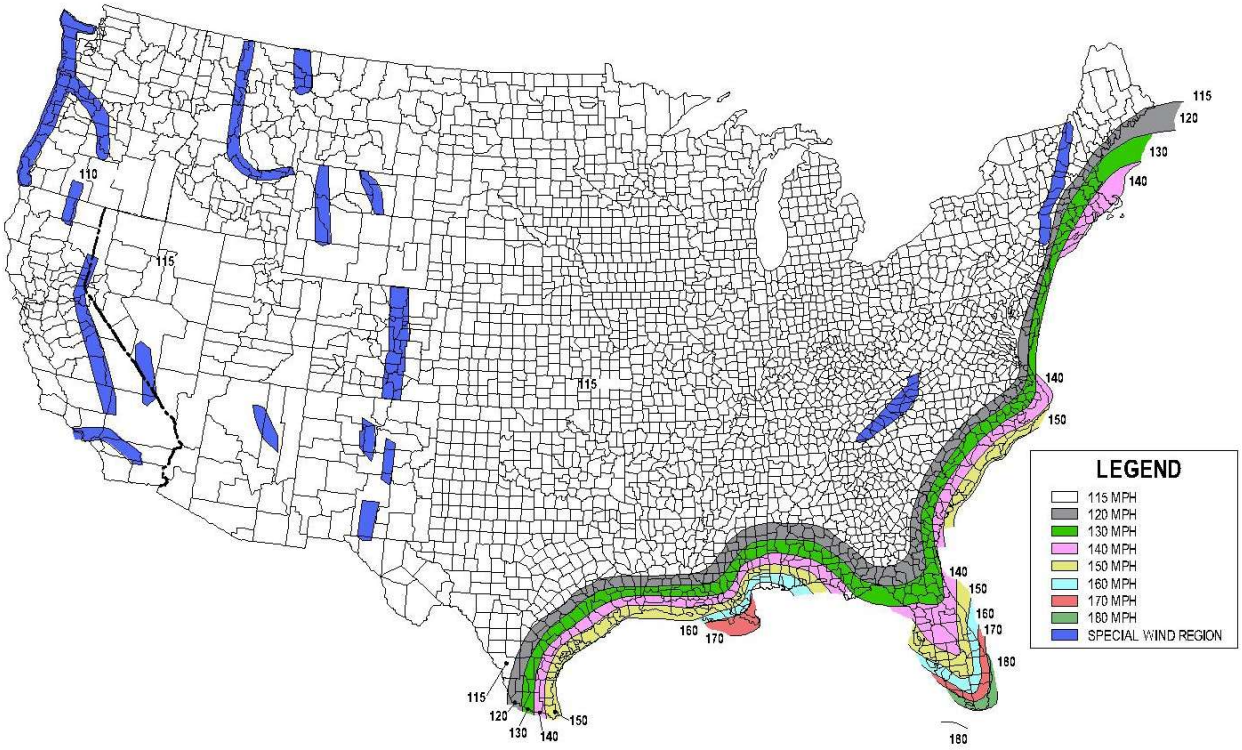


FIG. 3.8-1b - 700-Year MRI Basic Wind Speed, mph (AASHTO LRFDLTS-1)

1) All wind load calculations are based on sustained wind force plus and additional 1.3 gust
2) Wind Map is to be used as a reference only. Please coordinate with local agencies for further review.
3) Wind Map values are based on a 50 year mean recurrence. These values do not account for severe conditions, such as hurricanes, tornadoes, etc...
4) For review of poles with additional configurations (arms, banners, shorter/longer pole lengths, etc...), please contact factory.

BUY AMERICAN OPTION

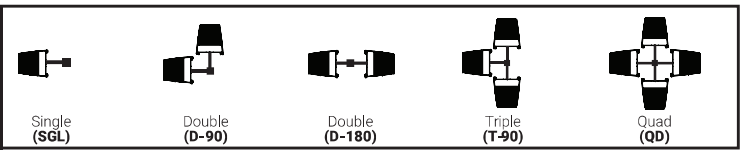
While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/wp-content/uploads/cs/NLS_BuyAmerica(n).pdf

MOUNTING CONFIGURATION



NLS LIGHTING

SEA SIDE BOLLARD

BOLLARD + LANDSCAPE LIGHTING



LED WATTAGE CHART	
	16L
400 milliamps	21w
530 milliamps	26w
700 milliamps	35w

The Sea Side Bollard is a combination of security, style and Vandal resistance that blends beautifully into any pathway environment.

This luminaire tower can disperse light in 45° angle with the cast Cutoff Grill (COG45). Paracline Reflector (PR) or Stacked Louver (SL) are also optional light distributions.

The Sea Side Bollard uses the patented Star Power™ reflector system. The Dome Top selection offers either Dome or Flat and are available in either 8” or 6" Round or 8” Square. Kelvin temperature offering of Amber, 2700K, 3000K, 3500K, 4000K and 5000K.

Conforms to the strictest Made in America standards designed, tooled, fabricated and assembled in the USA.

BUY AMERICAN

To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).

PROUDLY MADE IN THE USA

STAR POWER OPTICAL SYSTEM

STAR POWER™ OPTICAL SYSTEM

The Star Power™ reflector is an excellent system which provides great value and performance. Star Power Patent number: 10168023

Project Name:	Type:

SEA SIDE BOLLARD ORDERING GUIDE

Cat#	Height	Shaft Dim.	Light Dist.	# of LEDs	Miliamps
Sea Side Flat Top **(SSF)**	26" **(2)**	6" Round **(6R)** [3]	Cut Off Grill **(COG45)**	16 **(16L)**	400 **(40)**
Sea Side Dome Top **(SSD)** [3]	36" **(3)**	8" Round **(8R)** [3]	Stacked Louver **(SL)**		530 **(53)**
	42" **(4)**	8" Square **(8S)**	Paracline Reflector **(PR)**		700 **(7)**

Kelvin	Volts	Mounting	Color	Options
Amber 585-600nM **(AMBER)** [5, 7, 8]	120-277 **(UNV)**	Anchor Base **(AB)**	Bronze Textured **(BRZ)**	Button Photocell **(PC)** [2]
Amber LED Phosphor Converted **(AMBER/PC)** [7, 8]	347-480 **(HV)**		White Textured **(WHT)**	Vandal Resistant Base **(VRB)**
2700K, 70 CRI **(27K7)**			Smooth White Gloss **(SWT)**	Marine Grade Finish **(MGF)**
2700K, 80 CRI **(27K8)** [1]			Silver Metallic **(SVR)**	House Side Shield **(HSS)**
3000K, 70 CRI **(30K7)**			Black Textured **(BLK)**	Surge Protector **(20K)**
3000K, 80 CRI **(30K8)** [1]			Smooth Black Gloss **(SBK)**	Buy American Act **(BAA)** [6]
3500K, 80 CRI **(35K8)** [1]			Graphite Textured **(GPH)**	Trade Agreement Act **(TAA)** [6]
4000K, 70 CRI **(40K7)**			Grey Textured **(GRY)**	Build America Buy American **(BABA)** [6]
4000K, 80 CRI **(40K8)** [1]			Green Textured **(GRN)**	Custom Controls Integration **(CCI)** [4]
5000K, 70 CRI **(50K7)**			Hunter Green Textured **(HGN)**	Integral GFCI Outlet **(GFCI)** [9, 10]
5000K, 80 CRI **(50K8)** [1]			Custom **(CS)**	USB Charging Outlet **(USB)** [9, 11]

NOTES:

1. Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
2. Universal Voltage 120-277
3. (SSD) Dome Top only available on Round shaft
4. Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
5. Turtle Safe
6. Consult factory for all BAA/TAA/BABA requests
7. Consult Factory for Lead Time
8. Not Available above 530mA
9. 120V Only
10. GFCI installed 12" from base, street side. Contact Factory for custom height
11. USB - Specify location.

NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
Call Us Today (310) 341-2037
nlslighting.com

PRODUCT SPECIFICATIONS

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- CRI 70, 80 or 90
- Color temperatures: Amber, 2700, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20kA supplied as standard.

CONSTRUCTION

- Extruded Aluminum. Cast Aluminum. Spun Aluminum

OPTIONS

- MARINE GRADE FINISH (MGF) - A multi-step process creating protective finishing coat against harsh environments. Chemically washed in a 5 stage cleaning system. Pre-baked, Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked. Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- VANDAL RESISTANT BASE (VRB) - Includes an internal shaft welded to base plate with a mounting plate on top of the shaft to provide additonal support for the bollard shaft.
- House Side Shield (HSS)
- 20ka Surge Protector (20K)
- Integral GFCI Outlet (GFCI)
- USB Charging Outlet (USB)

CONTROL OPTIONS

- PHOTOCELL (PC) - Button Type
- Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

OPTICS

Recessed Star Power Optical System is 95% reflective material. Utilizes a linear diffused pattern, softening the light distribution and eliminating any dark shadows or striations.

FINISH

- 3-5 mils electrostatic powder coat.
- NLS Lighting standard high-quality finishes prevent corrosion and protects against extreme environmental conditions
- 10 Standard Finishes, Custom Finish and Marine Grade Finish Available

WARRANTY

Five-year limited warranty for drivers and LEDs.

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/buy-american/









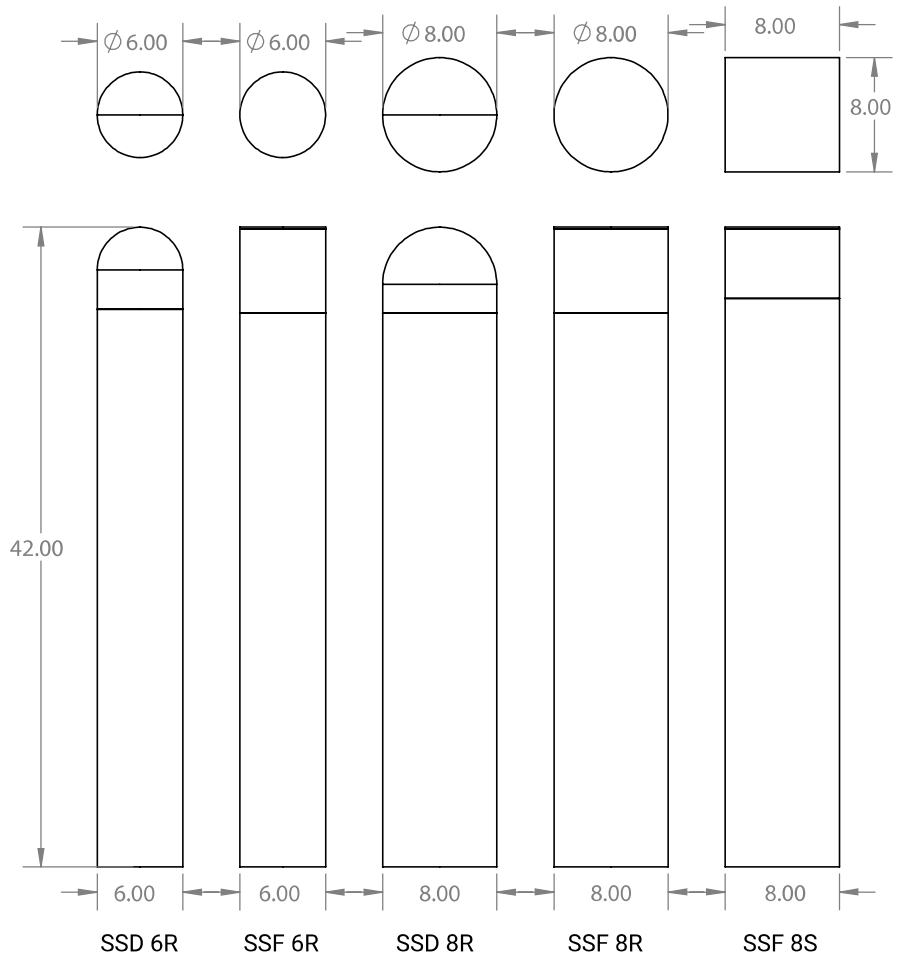







The information and specifications on this document are subject to change without any notification. All values are design, nominal, or typical or prorated values when measured under internal and external laboratory conditions.

DIMENSIONS


∅6.00
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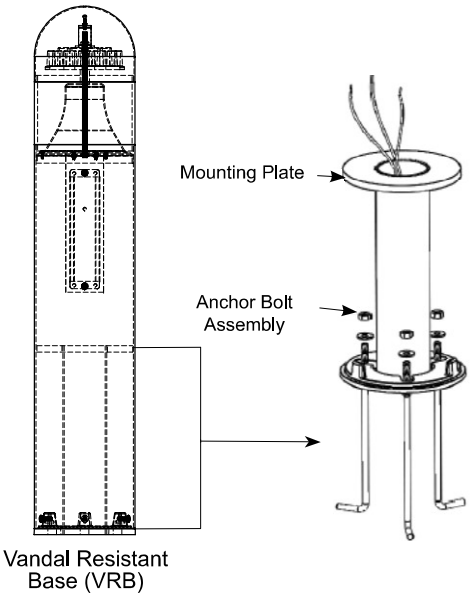
8.00
SSD 6R
SSF 6R
SSD 8R
SSF 8R
SSF 8S

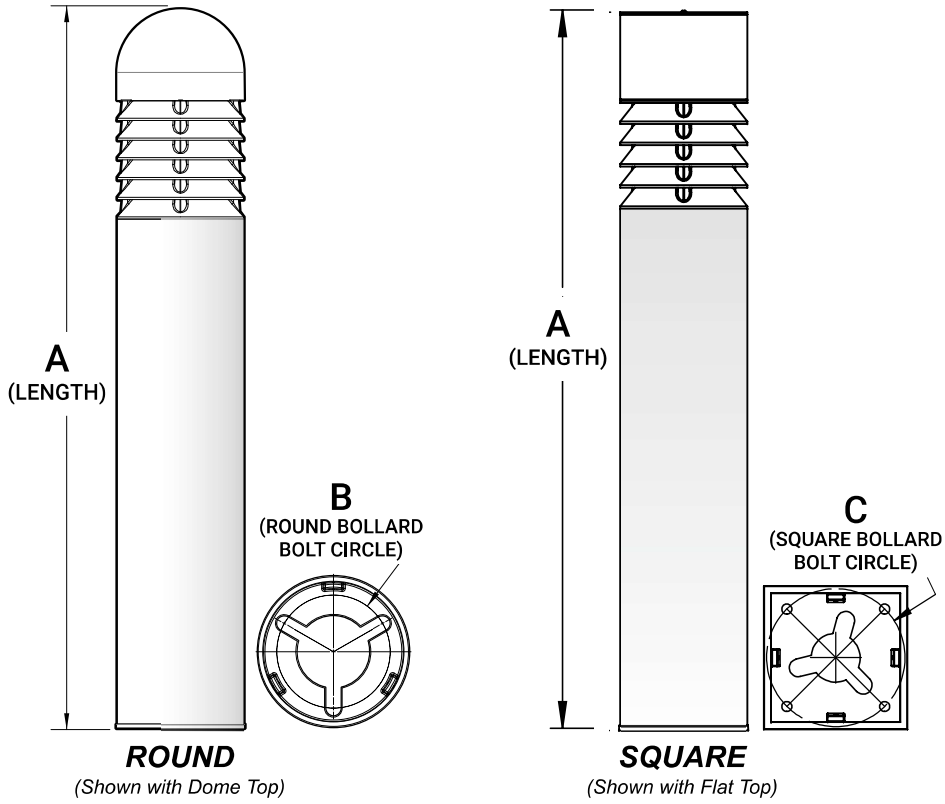

Flat Top
Dome Top
Stacked Louver (SL)
Paracline Reflector (PR)
Cutoff Grill (COG)


Mounting Plate
Anchor Bolt Assembly
Vandal Resistant Base (VRB)

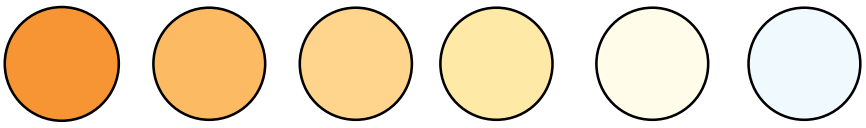
PRODUCT SPECIFICATIONS

DIMENSION	6" ROUND	8" ROUND
A	26", 36", or 42"	26", 36", or 42"
B	3-5/8"	6"

DIMENSION	8" SQUARE
A	26", 36", or 42"
C	7.75"



LED KELVIN RANGE



Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

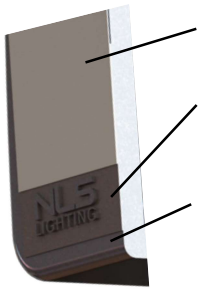
LUMEN MAINTENANCE DATA							
Ambient Temperature	Drive Current	L90 Hours*	L70 Hours**	30,000 Hours*	50,000 Hours*	60,00 Hours*	100,000 Hours**
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
*Reported extrapolations per IESNA TM-21			**Projected extrapolations per IESNA TM-21				

PRODUCT SPECIFICATIONS

SEA SIDE BOLLARD - LUMEN DATA CHART			
PART NUMBER	T5 LUMENS	T5 Lm/W	WATTS
SEA SIDE-COG45-16L-40-27K7	987	47	21
SEA SIDE-COG45-16L-40-27K8	924	44	21
SEA SIDE-COG45-16L-40-30K8	991	47	21
SEA SIDE-COG45-16L-40-30K7	1067	51	21
SEA SIDE-COG45-16L-40-35K8	991	47	21
SEA SIDE-COG45-16L-40-40K8	1067	51	21
SEA SIDE-COG45-16L-40-40K7	1153	55	21
SEA SIDE-COG45-16L-40-50K8	1067	51	21
SEA SIDE-COG45-16L-40-50K7	1153	55	21
SEA SIDE-COG45-16L-53-30K	1429	55	26
SEA SIDE-COG45-16L-53-40K	1502	58	26
SEA SIDE-COG45-16L-53-50K	1502	58	26
SEA SIDE-COG45-16L-7-30K	1906	53	36
SEA SIDE-COG45-16L-7-40K	2003	56	36
SEA SIDE-COG45-16L-7-50K	2003	56	36
SEA SIDE-SL-16L-40-27K7	1081	51	21
SEA SIDE-SL-16L-40-27K8	1012	48	21
SEA SIDE-SL-16L-40-30K8	1085	52	21
SEA SIDE-SL-16L-40-30K7	1169	56	21
SEA SIDE-SL-16L-40-35K8	1085	52	21
SEA SIDE-SL-16L-40-40K8	1169	56	21
SEA SIDE-SL-16L-40-40K7	1263	60	21
SEA SIDE-SL-16L-40-50K8	1169	56	21
SEA SIDE-SL-16L-40-50K7	1263	60	21
SEA SIDE-SL-16L-53-30K	1508	58	26
SEA SIDE-SL-16L-53-40K	1612	62	26
SEA SIDE-SL-16L-53-50K	1690	65	26
SEA SIDE-SL-16L-7-30K	2030	58	35
SEA SIDE-SL-16L-7-40K	2170	62	35
SEA SIDE-SL-16L-7-50K	2275	65	35
SEA SIDE-PR-16L-40-27K7	1397	67	21
SEA SIDE-PR-16L-40-27K8	1308	62	21
SEA SIDE-PR-16L-40-30K8	1402	67	21
SEA SIDE-PR-16L-40-30K7	1510	72	21
SEA SIDE-PR-16L-40-35K8	1402	67	21
SEA SIDE-PR-16L-40-40K8	1510	72	21
SEA SIDE-PR-16L-40-40K7	1632	78	21
SEA SIDE-PR-16L-40-50K8	1510	72	21
SEA SIDE-PR-16L-40-50K7	1632	78	21
SEA SIDE-PR-16L-53-30K	2002	77	26
SEA SIDE-PR-16L-53-40K	2106	81	26
SEA SIDE-PR-16L-53-50K	2184	84	26
SEA SIDE-PR-16L-7-30K	2695	77	35
SEA SIDE-PR-16L-7-40K	2835	81	35
SEA SIDE-PR-16L-7-50K	2975	85	35

MARINE GRADE FINISH (MGF)

The **(MGF)** is a multi step process.
Chemically washed in a 5 stage cleaning system. Pre-baked. Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked.
Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.



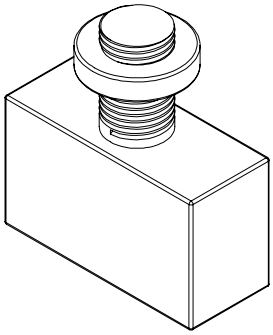
Powder Coat Finish
3-5 mil Powder Coat

Primer Layer
3-5 mil Zinc Rich Super Durable Polyester Primer

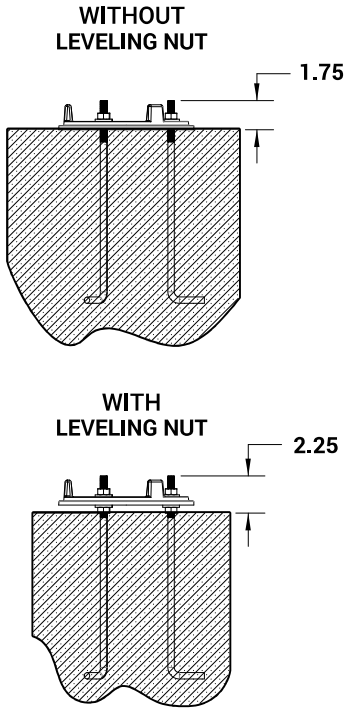
Prepared Casting
Chemically washed in multi Step 5 stage cleaning process

BUTTON TYPE PHOTOCELL (PC)

Photocell for dusk to dawn operation.
Consult Factory.



LEVELING NUT DIAGRAM



Wet BionicPro3 | Linear

PRUDENTIAL LTG.

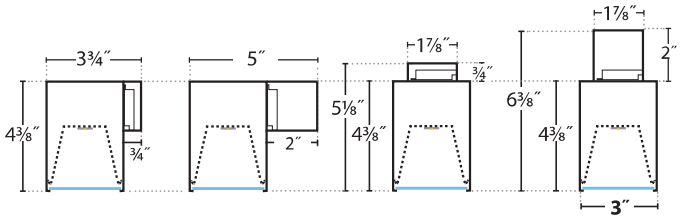
PRULITE.COM 213.746.0360



SEAMLESS

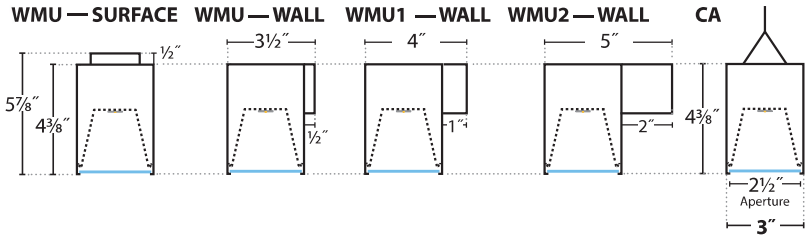
CHANNELS:

WMC — WALL | WMC2 — WALL | WMC — SURFACE | WMC2 — SURFACE



BRACKETS:

WMU — SURFACE | WMU — WALL | WMU1 — WALL | WMU2 — WALL | CA



BionicPro delivers again. You're welcome!

Continuous lines of clean, seamless light with an IP65 & 66 wet listed rating. No door frames or broken lines of light. Gasketed lens for fully protected fixture (not just LED array). Indoor aesthetics taken outdoors for a consistent look.

Batwing, Wall Wash, Graze, Room Fill Distributions with just a lens change. Wash walkways with light from the perimeter, wash or graze a building facade, with seamless lines of light.

Lumen output may vary +/– 5%

Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20% 90 CRI -15%
(3K, 3500K, 4K & 5K)

LUMEN CHART:

		LO	MO	SO	HO
SAL	Lm/Ft	475	700	975	1225
BTW	Lm/Ft	475	700	975	1225
WWG	Lm/Ft	475	700	975	1225
PFL	Lm/Ft	475	700	975	1225
WGZ	Lm/Ft	475	700	975	1225
	W	3.8	5.6	7.8	10.5

SMART SPECS

-30° TO 50°C

IK08 IMPACT PROTECTION

IP65 DUST +WATER PROOF (ROWS)

IP66 DUST +WATER PROOF (INDIVIDUALS)

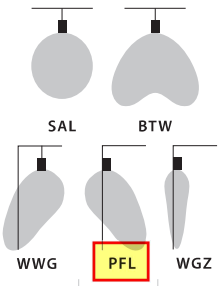
BABAA BUILD AMERICA BUY AMERICA ACT

Declare.

5 YEAR LED WARRANTY

Made in the USA

SERIES	LENS POS.	LED COLOR	OUT-PUT	LENGTH	FINISH COLOR	DISTRI-BUTION	CIRCU-ITING	VOLT-AGE	MOUNTING	CEILING TYPE	DRIVERS & CONTROLS	OPTIONS
WETBPRO3-LIN	FLSH						SC					
BionicPro 3″ Linear • **IP66** Wet Listed for Individual fixtures • **IP65** Wet Listed for Rows	FLSH Flush Lens	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) **PRUHUES:** BLU3S Static BLU3D* Dynamic BLU35S BLU35D* BLU4S BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2 TuHue 2200-5000K Tunable White AMB AmberHue Warm Dim 2200K-5000K CHR ChromaHue RGBW (DMX at HO only)	LO Low MO Medium SO Standard HO High PROG Programmable Light Output (Specify desired lm/ft or w/ft)	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length, 1″ increments) SRL Symmetric Row Length **NOTE:** Individual fixtures are NOT intended for row mounting • **IP66** Wet Listed for Individual fixtures • **IP65** Wet Listed for Rows	WetTMW Wet Textured White Semi-gloss WetYBB Wet Black Semi-gloss WetYPE Wet Pewter Matte WetYBR Wet Bronze Semi-gloss	SAL Satin Lens BTW Batwing PFL Perimeter Room Fill WWG Focal Glow Wall Wash WGZ Wide Wall Graze	SC Single Circuit	UNV (120-277) 347 (Emergency battery requires remote driver box)	**SPECIFY CEILING TYPE IN NEXT COLUMN ➡)** CA96″ Aircraft Cable (NOT for outside installs where wind can swing fixtures) RSC Rigid Stem Center SSC Swivel Stem Center (~30° of rotation) **(SPECIFY MOUNTING LOCATION IN NEXT COLUMN ➡)** WMC (Channel) .75″ Tall Continuous Channel WMC2 (Channel) 2″ Tall Continuous Channel WMU (Bracket) .5″ Tall Bracket WMU1 (Bracket) 1″ Tall Bracket WMU2 (Bracket) 2″ Tall Bracket	**CEILING TYPE:** X3 Hard Ceiling **MOUNTING LOCATION:** WALL (For Wall or Mullion Mount) SUR Ceiling	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dimming std) ECDA 1% DALI, EldoLED (Logarithmic dimming std) nLight-Wired Acuity nLight Drivers SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dimming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Logarithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/Forward/Reverse Phase Driver **PRUHUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX ChromaHue or Static White	EMHE CA T20 Emergency Battery (4′ or <Remote) EMC Emergency Circuiting EF Power End Feed (NA: CA Aircraft Cable) COS Custom On-Center Spacing for Wall/Surface Brackets (See pages 7+8)



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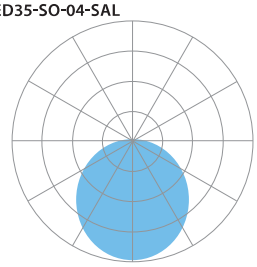
FLSH:

SATIN LENS

STANDARD OUTPUT:

WETBIOPRO3-LIN-FLSH-LED35-SO-04-SAL

3859 Delivered Lumens
32 Watts
122 lm/w
3500 CCT



Zonal Lumen Summary:
0-90 = 100%

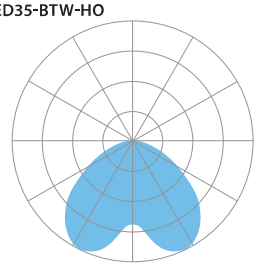
Vertical Angle	0°	25°	45°	65°	90°
0°	1619	1619	1619	1619	1619
5°	1614	1607	1600	1607	1610
15°	1538	1523	1502	1495	1493
25°	1393	1367	1326	1302	1294
35°	1192	1160	1103	1070	1059
45°	960	922	869	838	827
55°	715	685	644	618	609
65°	478	445	420	402	397
75°	247	224	212	205	203
85°	53	50	51	49	48
90°	0	0	0	0	0

BATWING

HIGH OUTPUT:

WETBIOPRO3-LIN-FLSH-LED35-BTW-HO

4931 Delivered Lumens
42 Watts
117 lm/w
3500 CCT



Zonal Lumen Summary:
0-90 = 100%

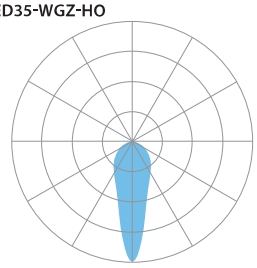
Vertical Angle	0°	22.5°	45°	67.5°	90°
0°	1327	1327	1327	1327	1327
5°	1323	1332	1360	1377	1399
15°	1212	1320	1535	1690	1759
25°	1030	1264	1651	1847	1894
35°	837	1152	1605	1767	1781
45°	674	982	1417	1500	1459
55°	536	771	729	673	615
65°	391	536	420	402	397
75°	222	293	368	330	298
85°	60	79	83	77	58
90°	0	0	0	0	0

WIDE WALL GRAZE

HIGH OUTPUT:

WETBIOPRO3-LIN-FLSH-LED35-WGZ-HO

4983 Delivered Lumens
42 Watts
119 lm/w
3500 CCT



Zonal Lumen Summary:
0-90 = 100%

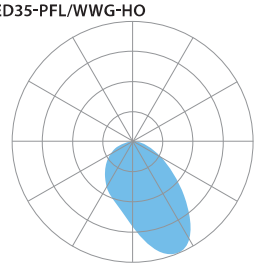
Vertical Angle	0°	25°	45°	65°	90°
0°	1907	1907	1907	1907	1907
5°	2107	2099	2035	1962	1811
15°	2429	2385	2221	1998	1723
25°	2442	2408	2254	1915	1553
35°	1192	1160	1103	1070	1059
45°	1339	1409	1595	1381	1051
55°	832	887	1082	989	767
65°	479	506	639	609	495
75°	221	233	297	297	257
85°	38	40	61	49	51
90°	0	0	0	0	0

ROOM FILL / FOCAL GLOW WALL WASH

HIGH OUTPUT:

WETBIOPRO3-LIN-FLSH-LED35-PFL/WWG-HO

4983 Delivered Lumens
42 Watts
119 lm/w
3500 CCT



Zonal Lumen Summary:
0-90 = 100%

Vertical Angle	0°	25°	45°	65°	90°
0°	1907	1907	1907	1907	1907
5°	2107	2099	2035	1962	1811
15°	2429	2385	2221	1998	1723
25°	2442	2408	2254	1915	1553
35°	1192	1160	1103	1070	1059
45°	1339	1409	1595	1381	1051
55°	832	887	1082	989	767
65°	479	506	639	609	495
75°	221	233	297	297	257
85°	38	40	61	49	51
90°	0	0	0	0	0

LUMEN MAINTENANCE

L70 — 200,000+ Hours
L90 — 100,000+ Hours (LO, MO & SO)
L90 — 60,000+ Hours (HO)

LED SYSTEM LED modules and drivers are field replaceable.

PROG (OPTIONAL) Programmable light output. Specify desired lumens or watts per linear foot.

LABELS CSA and ETL wet labeled (downlight only), IP65 for continuous rows, IP66 for individual fixtures (up to 8´), and I.B.E.W. manufactured. Impact rating of IK08. Extended temperature range -30˚ to 50˚ C.

ELECTRICAL Must specify LED dimming controls. LED fixtures have constant current driver(s) with less than 20% THD when loaded to a minimum of 60%. Drivers sink a maximum of 6mA per driver. DM01 LED drivers are 0-10V dimmable and are compatible with most 0-10V wall slide dimmers and direct 0-10V analog signal dimmers. Max driver size 1.65˝ w x 1.25˝ h.

CONSTRUCTION

Housing — Extruded aluminum housing and side wall >25% PC recycled, 100% recyclable.

Lens — Seamless lens up to 200´. Consult factory for longer lengths. Polymer, 100% recyclable.

Weight — 3.5 lbs/ft

MOUNTING Surface standoff mounted to walls or ceilings (downlight only) via channel or mullion, suspended by cable.

WARRANTY Single-source, 5 year limited warranty covers standard components and construction.

FINISH COLORS

WetTMW – White (Semi Gloss)

WetYBB – Black (Semi Gloss)

WetYPE – Pewter (Matte)

WetYBR – Bronze (Semi Gloss)

For paint chip samples, please email: **info@prulite.com**

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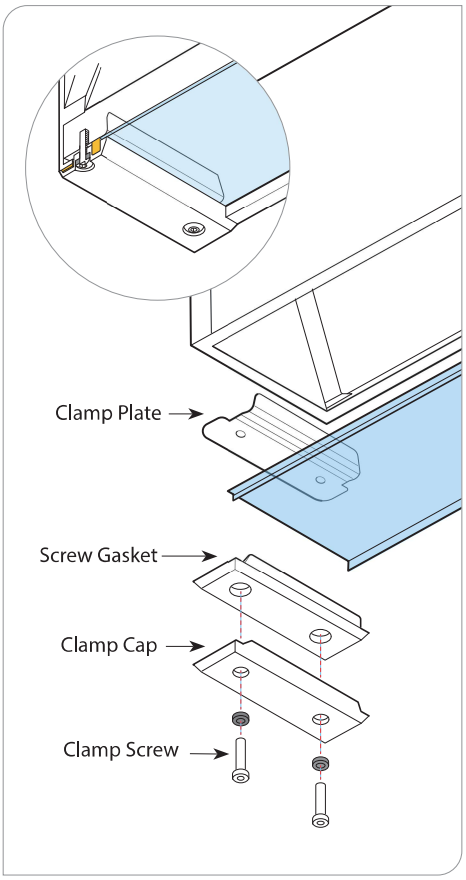
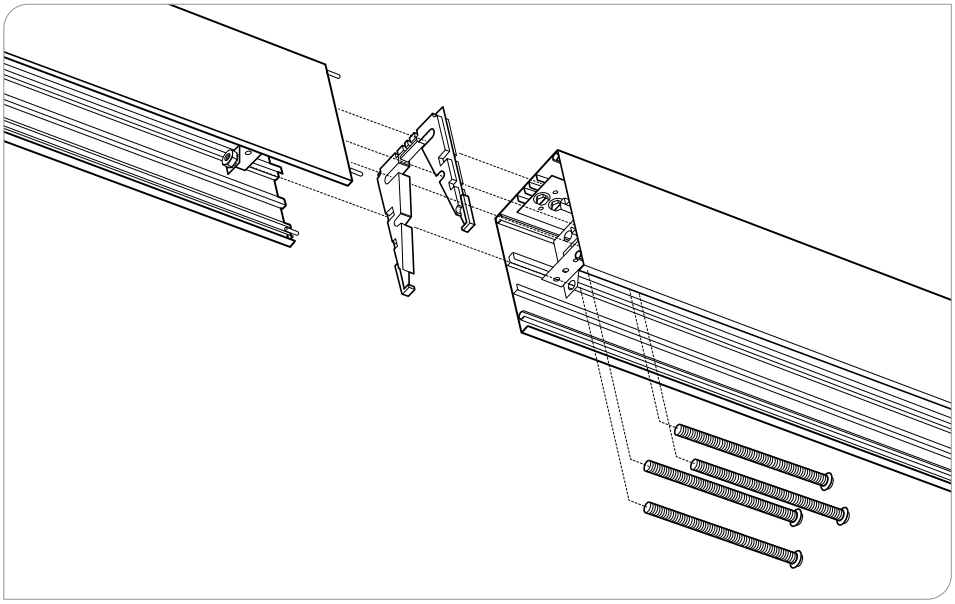
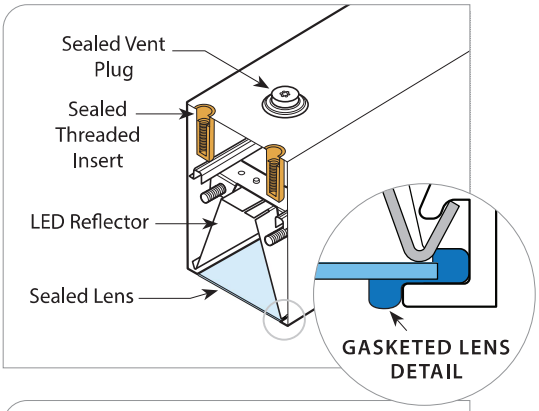
RUGGED DURABILITY

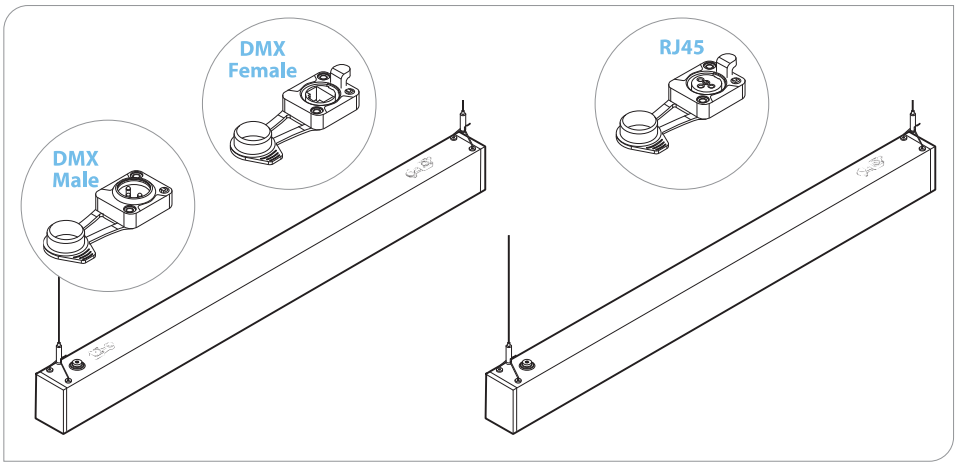


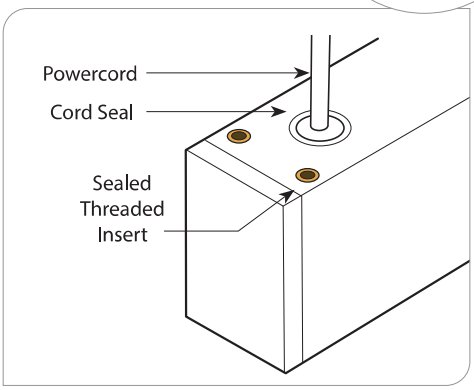
ADJOINING DETAIL





DMX / CAT5 CONNECTORS





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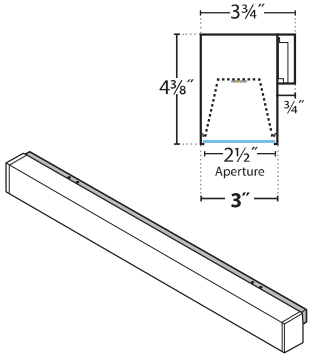
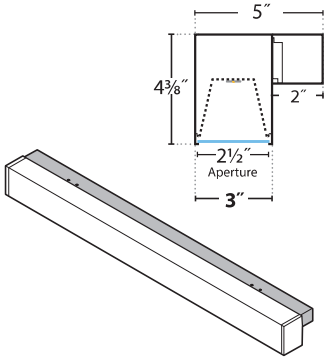
Why Channels?

Channels provide maximum flexibility in mounting points on the ceiling/wall (drilled in the field into structure).
2 mounting points per channel required, all channels are the length of the fixture. .75″ Channel accommodates Wet SOOW cord (8 foot, 6 conductor cord), 2″ Channel accommodates liquitite Flex with sealed connectors (6′ long 6′ conductor cord).

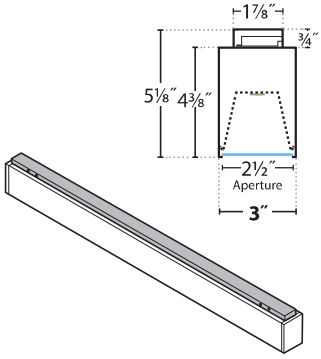
WMC — WALL



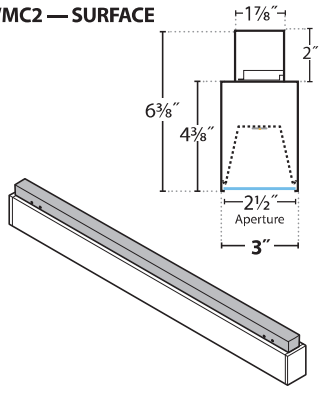
WMC2 — WALL



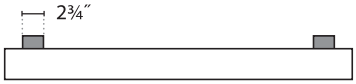
WMC — SURFACE



WMC2 — SURFACE



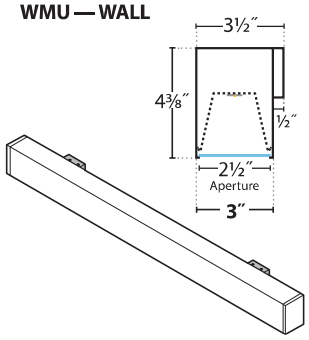
Why Brackets?



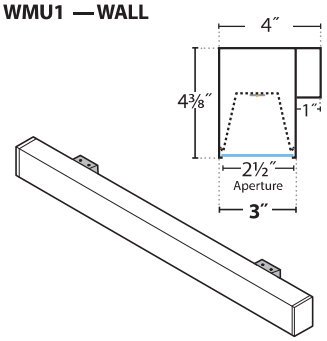
Clean look. Two options.

1. Installed at our standard dimensions (see page 8).
2. COS (Custom on-center spacing) —
   Provide dimensions and our factory will install bracket cleats at provided dimensions.

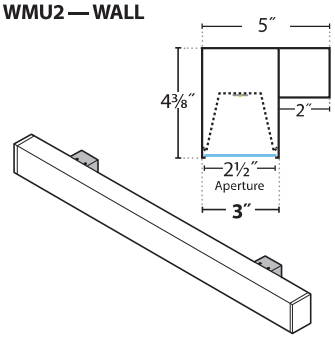
WMU — WALL



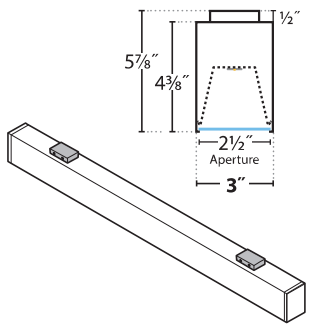
WMU1 — WALL



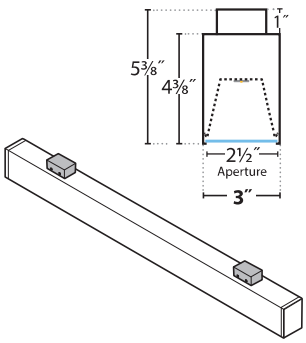
WMU2 — WALL



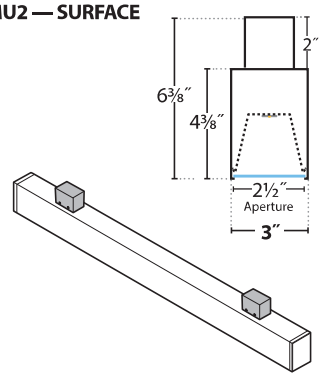
WMU — SURFACE



WMU1 — SURFACE

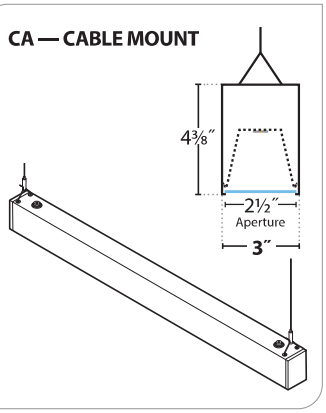


WMU2 — SURFACE



See page 9 for mounting dimensions.

CA — CABLE MOUNT



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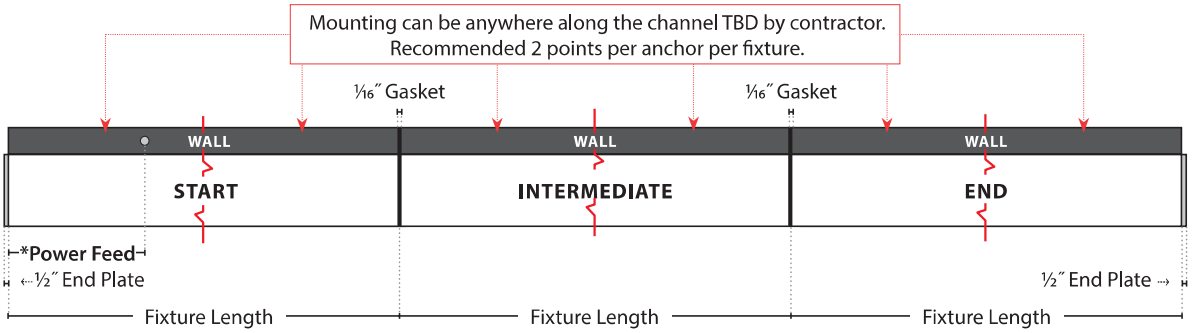
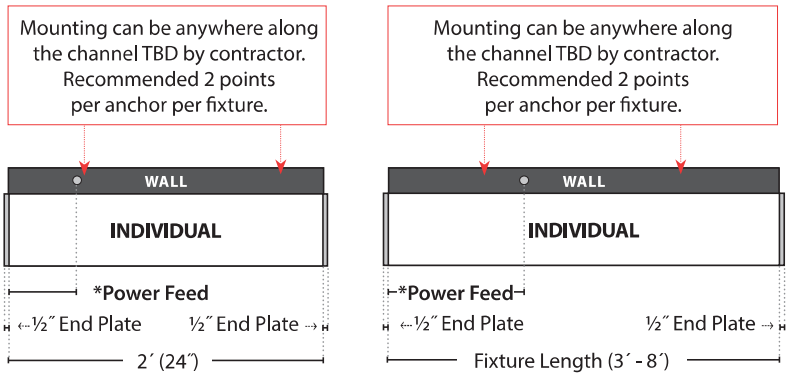
WMC/WMC2 (CHANNELS): WALL — MOUNTING

NOTE: 2′ ROW FIXTURES NOT AVAILABLE

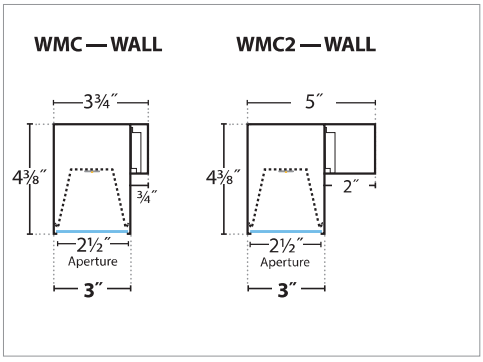
POWER FEED



INDIVIDUAL (2′):



	FIXTURE LENGTHS	
	*Power Feed	All
2′	4″	24″
3′	10″	36″
4′	10″	48″
5′	10″	60″
6′	36″	72″
7′	42″	84″
8′	48″	96″



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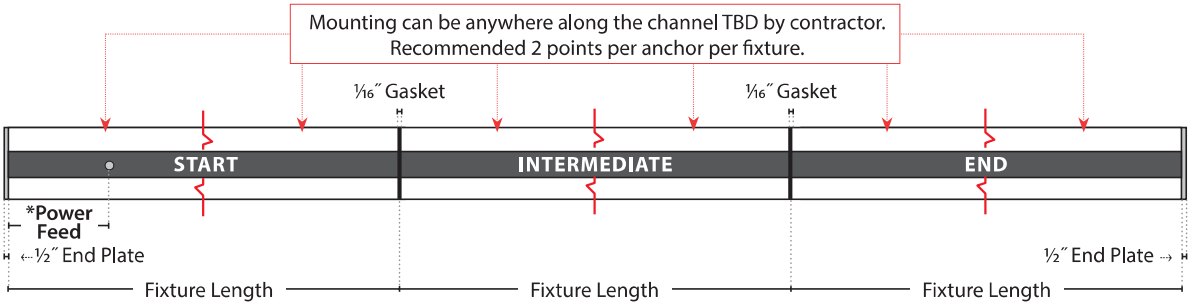
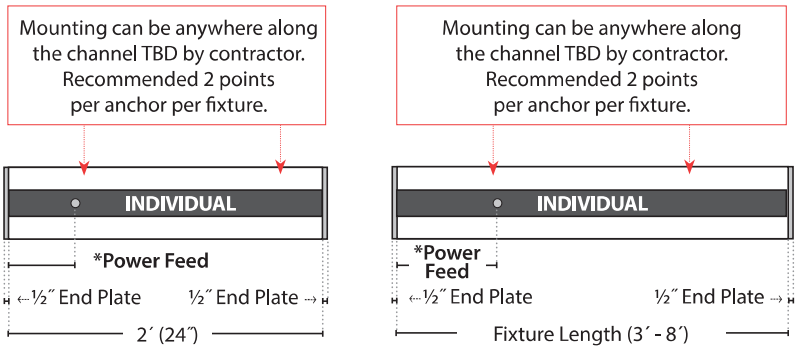
WMC/WMC2 (CHANNELS): SURFACE — MOUNTING

NOTE: 2′ ROW FIXTURES NOT AVAILABLE

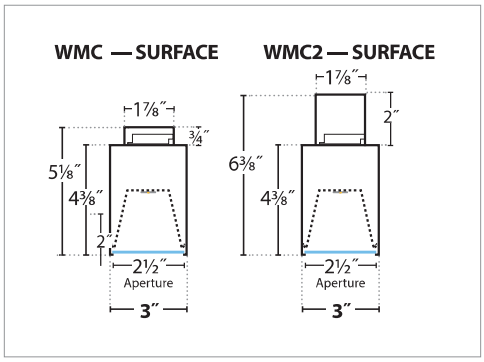
POWER FEED



INDIVIDUAL (2′):



	FIXTURE LENGTHS	
	*Power Feed	All
2′	4″	24″
3′	6″	36″
4′	6″	48″
5′	6″	60″
6′	36″	72″
7′	42″	84″
8′	48″	96″



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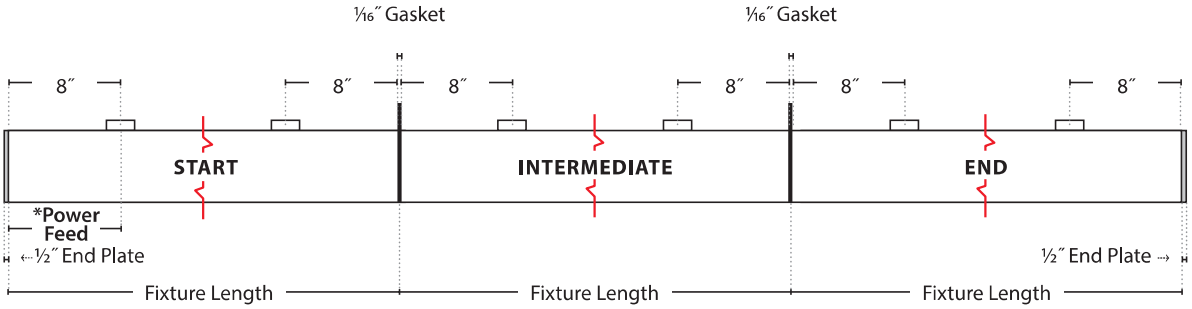
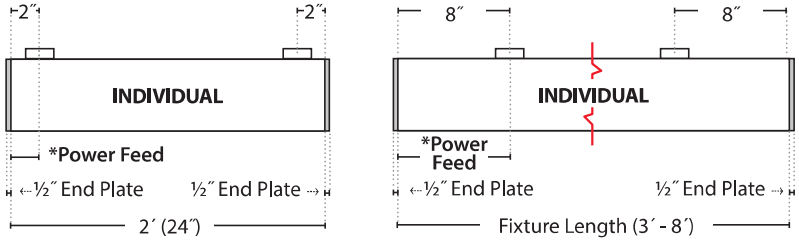
WMU/WMU1/WMU2 (BRACKETS): WALL — MOUNTING

NOTE: 2′ ROW FIXTURES NOT AVAILABLE

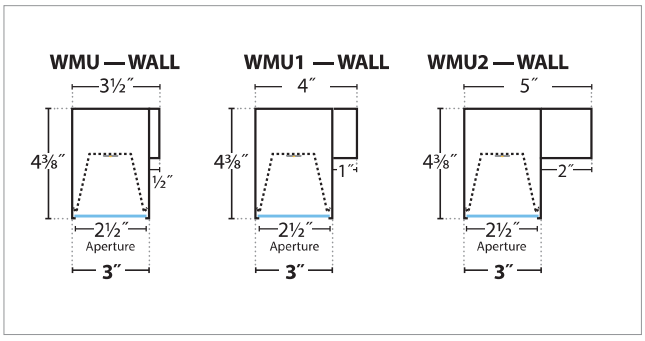


INDIVIDUAL (2′):





	FIXTURE LENGTHS	MOUNTING LOCATIONS		
	*Power Feed	All	Start / Intermediate / End	Individual	COS (Custom On-Center Spacing)
2′	2″	24″	—	20″	Customer to provide on-center mounting dimensions, PRU will pre-drill and mount Brackets
3′	8″	36″	20″	20″	
4′	8″	48″	32″	32″	
5′	8″	60″	44″	44″	
6′	8″	72″	56″	56″	
7′	8″	84″	68″	68″	
8′	8″	96″	80″	80″	



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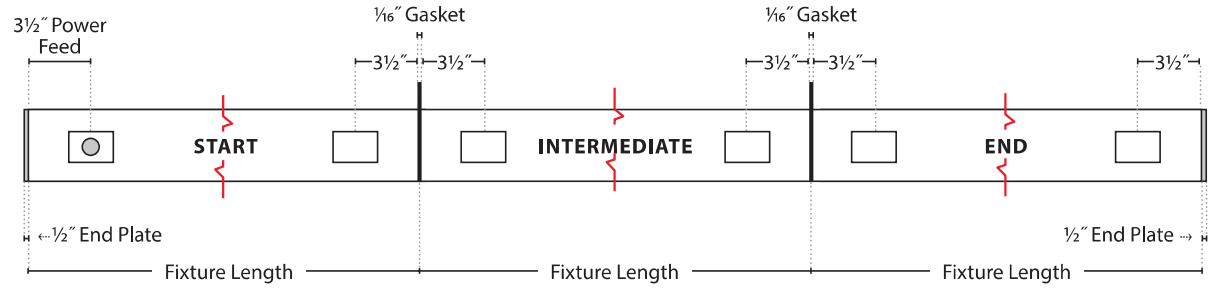
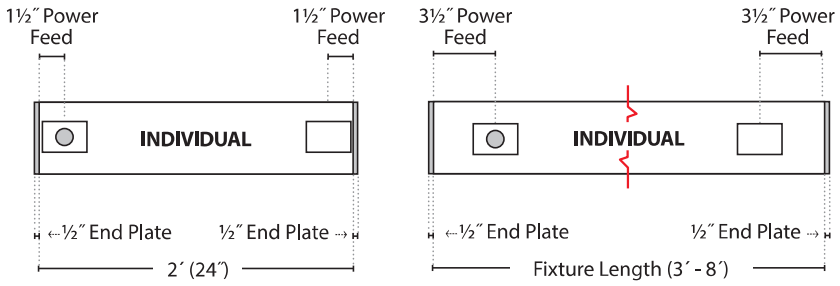
WMU/WMU1/WMU2 (BRACKETS): SURFACE — MOUNTING

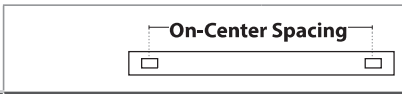
NOTE: 2′ ROW FIXTURES NOT AVAILABLE

POWER FEED



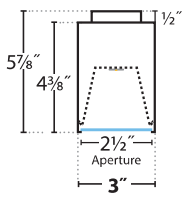
INDIVIDUAL (2′):



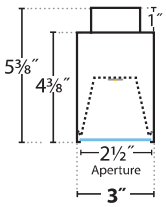


FIXTURE LENGTHS	MOUNTING LOCATIONS			
	All	Start / Intermediate / End	Individual	COS (Custom On-Center Spacing)
2′	24″	—	21″	Customer to provide on-center mounting dimensions, PRU will pre-drill and mount Brackets
3′	36″	29″	29″	
4′	48″	41″	41″	
5′	60″	53″	53″	
6′	72″	65″	65″	
7′	84″	77″	77″	
8′	96″	89″	89″	

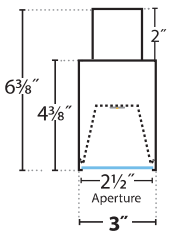
WMU — SURFACE



WMU1 — SURFACE



WMU2 — SURFACE



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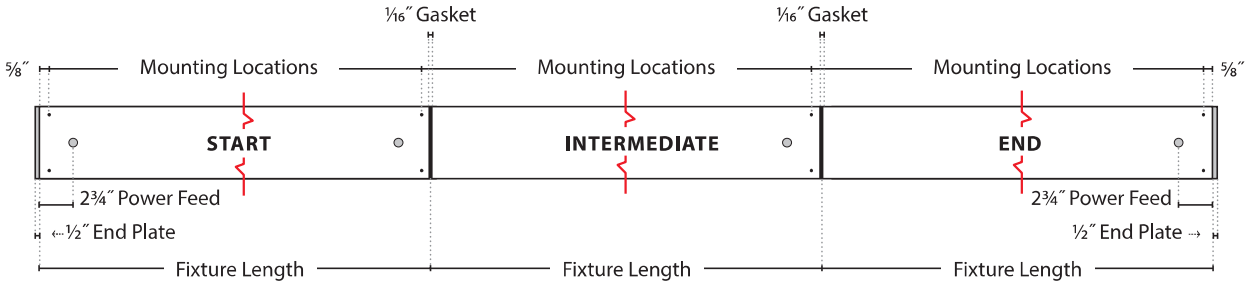
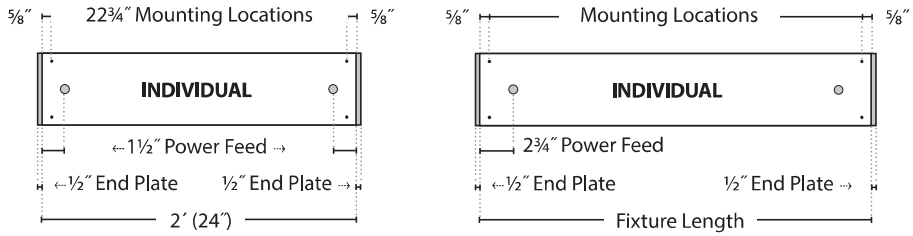
CABLE (CA) — MOUNTING

NOTE: 2′ ROW FIXTURES NOT AVAILABLE

POWER FEED

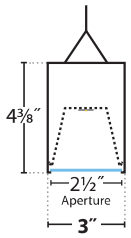


INDIVIDUAL (2′)



	FIXTURE LENGTHS	MOUNTING LOCATIONS		
	All	Start	Intermediate / End	Individual
2′	24″	—	—	22¾″
3′	36″	34¾″	36 1/16″	34¾″
4′	48″	46¾″	48 1/16″	46¾″
5′	60″	58¾″	60 1/16″	58¾″
6′	72″	70¾″	72 1/16″	70¾″
7′	84″	82¾″	84 1/16″	82¾″
8′	96″	94¾″	96 1/16″	94¾″

CA — CABLE MOUNT



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Wet BionicPro3 | Linear

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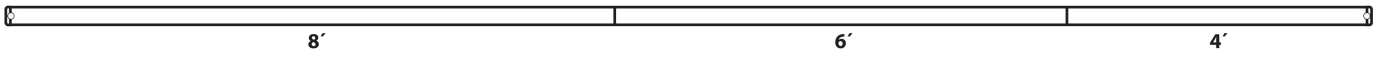
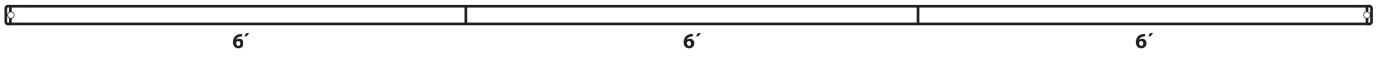
ROW BUILDER

18´ STANDARD ROW LENGTH:



18´ SYMMETRIC ROW LENGTH (SRL):



STANDARD

ROW LENGTH		
9´	5+4	5FT STR + 4FT END
10´	6+4	6FT STR + 4FT END
11´	7+4	7FT STR + 4FT END
12´	8+4	8FT STR + 4FT END
13´	8+5	8FT STR + 5FT END
14´	8+6	8FT STR + 6FT END
15´	8+7	8FT STR + 7FT END
16´	8+8	8FT STR + 8FT END
17´	8+5+4	8FT STR + 5FT INT + 4FT END
18´	8+6+4	8FT STR + 6FT INT + 4FT END
19´	8+7+4	8FT STR + 7FT INT + 4FT END
20´	8+8+4	8FT STR + 8FT INT + 4FT END
21´	8+8+5	8FT STR + 8FT INT + 5FT END
22´	8+8+6	8FT STR + 8FT INT + 6FT END
23´	8+8+7	8FT STR + 8FT INT + 7FT END
24´	8+8+8	8FT STR + 8FT INT + 8FT END
25´	8+8+5+4	8FT STR + 8FT INT + 5FT INT + 4FT END
26´	8+8+6+4	8FT STR + 8FT INT + 6FT INT + 4FT END
27´	8+8+7+4	8FT STR + 8FT INT + 7FT INT + 4FT END
28´	8+8+8+4	8FT STR + (2) 8FT INT + 4FT END
29´	8+8+8+5	8FT STR + (2) 8FT INT + 5FT END
30´	8+8+8+6	8FT STR + (2) 8FT INT + 6FT END
31´	8+8+8+7	8FT STR + (2) 8FT INT + 7FT END
32´	8+8+8+8	8FT STR + (2) 8FT INT + 8FT END
33´	8+8+8+5+4	8FT STR + (2) 8FT INT + 5FT INT + 4FT END
34´	8+8+8+6+4	8FT STR + (2) 8FT INT + 6FT INT + 4FT END
35´	8+8+8+7+4	8FT STR + (2) 8FT INT + 7FT INT + 4FT END
36´	8+8+8+8+4	8FT STR + (3) 8FT INT + 4FT END
37´	8+8+8+8+5	8FT STR + (3) 8FT INT + 5FT END
38´	8+8+8+8+6	8FT STR + (3) 8FT INT + 6FT END
39´	8+8+8+8+7	8FT STR + (3) 8FT INT + 7FT END
40´	8+8+8+8+8	8FT STR + (3) 8FT INT + 8FT END
41´	8+8+8+8+5+4	8FT STR + (3) 8FT INT + 5FT INT + 4FT END
42´	8+8+8+8+6+4	8FT STR + (3) 8FT INT + 6FT INT + 4FT END
43´	8+8+8+8+7+4	8FT STR + (3) 8FT INT + 7FT INT + 4FT END
44´	8+8+8+8+8+4	8FT STR + (4) 8FT INT + 4FT END
45´	8+8+8+8+8+5	8FT STR + (4) 8FT INT + 5FT END
46´	8+8+8+8+8+6	8FT STR + (4) 8FT INT + 6FT END
47´	8+8+8+8+8+7	8FT STR + (4) 8FT INT + 7FT END
48	8+8+8+8+8+8	8FT STR + (4) 8FT INT + 8FT END
49´	8+8+8+8+8+5+4	8FT STR + (4) 8FT INT + 5FT INT + 4FT END
50´	8+8+8+8+8+6+4	8FT STR + (4) 8FT INT + 6FT INT + 4FT END

SYMMETRICAL

ROW LENGTH		
9´	3+3+3	3FT STR + 3FT INT + 3FT END
10´	5+5	5FT STR + 5FT END
11´	4+3+4	4FT STR + 3FT INT + 4FT END
12´	6+6	6FT STR + 6FT END
13´	4+5+4	4FT STR + 5FT INT + 4FT END
14´	7+7	7FT STR + 7FT END
15´	5+5+5	5FT STR + 5FT INT + 5FT END
16´	8+8	8FT STR + 8FT END
17´	6+5+6	6FT STR + 5FT INT + 6FT END
18´	6+6+6	6FT STR + 6FT INT + 6FT END
19´	6+7+6	6FT STR + 7FT INT + 6FT END
20´	8+4+8	8FT STR + 4FT INT + 8FT END
21´	8+5+8	8FT STR + 5FT INT + 8FT END
22´	8+6+8	8FT STR + 6FT INT + 8FT END
23´	8+7+8	8FT STR + 7FT INT + 8FT END
24´	8+8+8	8FT STR + 8FT INT + 8FT END
25´	6+4+5+4+6	6FT STR + 4FT INT + 5FT INT + 4FT INT + 6FT END
26´	8+5+5+8	8FT STR + (2) 5FT INT + 8FT END
27´	6+5+5+5+6	6FT STR + (3) 5FT INT + 6FT END
28´	8+6+6+8	8FT STR + (2) 6FT INT + 8FT END
29´	8+4+5+4+8	8FT STR + 4FT INT + 5FT INT + 4FT INT + 8FT END
30´	8+7+7+8	8FT STR + (2) 7FT INT + 8FT END
31´	8+5+5+5+8	8FT STR + (3) 5FT INT + 8FT END
32´	8+8+8+8	8FT STR + (2) 8FT INT + 8FT END
33´	8+6+5+6+8	8FT STR + 6FT INT + 5FT INT + 6FT INT + 8FT END
34´	8+6+6+6+8	8FT STR + 6FT INT + 6FT INT + 6FT INT + 8FT END
35´	8+6+7+6+8	8FT STR + 6FT INT + 7FT INT + 6FT INT + 8FT END
36´	8+8+4+8+8	8FT STR + 8FT INT + 4FT INT + 8FT INT + 8FT END
37´	8+8+5+8+8	8FT STR + 8FT INT + 5FT INT + 8FT INT + 8FT END
38´	8+8+6+8+8	8FT STR + 8FT INT + 6FT INT + 8FT INT + 8FT END
39´	8+8+7+8+8	8FT STR + 8FT INT + 7FT INT + 8FT INT + 8FT END
40´	8+8+8+8+8	8FT STR + (3) 8FT INT + 8FT END
41´	8+6+4+5+4+6+8	8FT STR + 6FT INT + 4FT INT + 5FT INT + 4FT INT + 6FT INT + 8FT END
42´	8+8+5+5+8+8	8FT STR + 8FT INT + (2) 5FT INT + 8FT INT + 8FT END
43´	8+6+5+5+5+6+8	8FT STR + 6FT INT + (3) 5FT INT + 6FT INT + 8FT END
44´	8+8+6+6+8+8	8FT STR + 8FT INT + (2) 6FT INT + 8FT INT + 8FT END
45´	8+8+4+5+4+8+8	8FT STR + 8FT INT + 4FT INT + 5FT INT + 4FT INT + 8FT INT + 8FT END
46´	8+8+7+7+8+8	8FT STR + 8FT INT + (2) 7FT INT + 8FT INT + 8FT END
47´	8+8+5+5+5+8+8	8FT STR + 8FT INT + (3) 5FT INT + 8FT INT + 8FT END
48	8+8+8+8+8+8	8FT STR + (4) 8FT INT + 8FT END
49´	8+8+6+5+6+8+8	8FT STR + 8FT INT + 6FT INT + 5FT INT + 6FT INT + 8FT INT + 8FT END
50´	8+8+6+6+6+8+8	8FT STR + 8FT INT + (3) 6FT INT + 8FT INT + 8FT END

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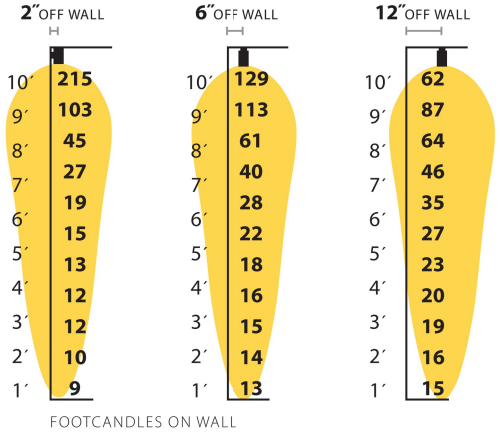
DISTRIBUTIONS

ALL FIXTURES AT SO OUTPUT, 10´ MOUNTING HEIGHT

Wide Wall Graze (WWG)

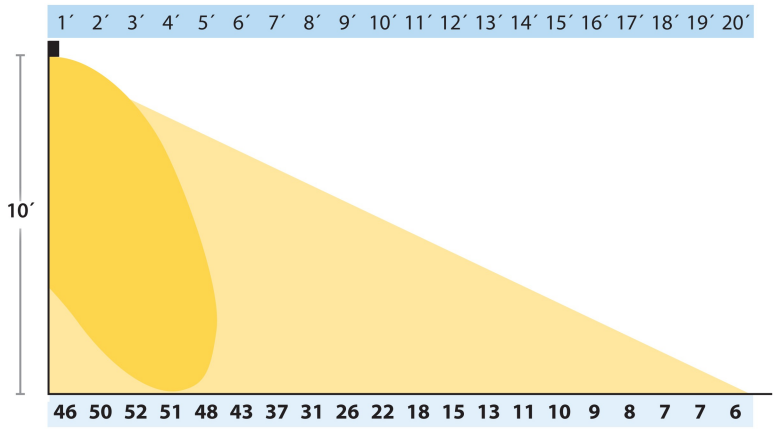
Wall grazing performance often better just off a wall.



FOOTCANDLES ON WALL

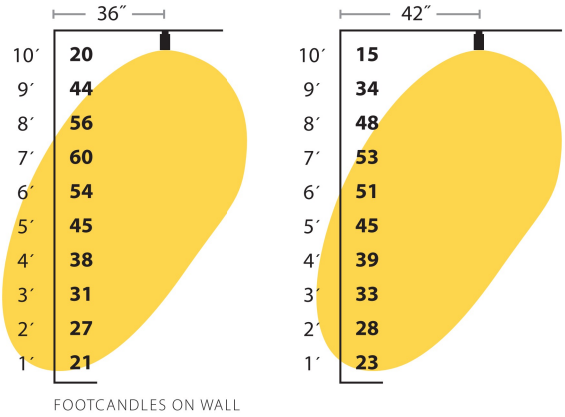
Perimeter Fill (PFL)

Wash a space in light from one side of the perimeter.



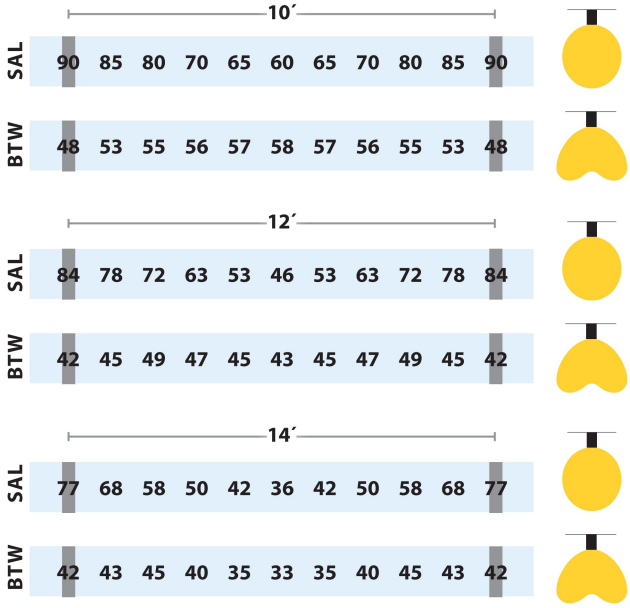
Focal Glow Wall Wash (WWG)

Pique interest by giving works of art 'pop' — more light at eye level.



FOOTCANDLES ON WALL

Satin (SAL) Vs. Batwing (BTW)



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Wet BionicPro3 | Linear

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Lumen Outputs:

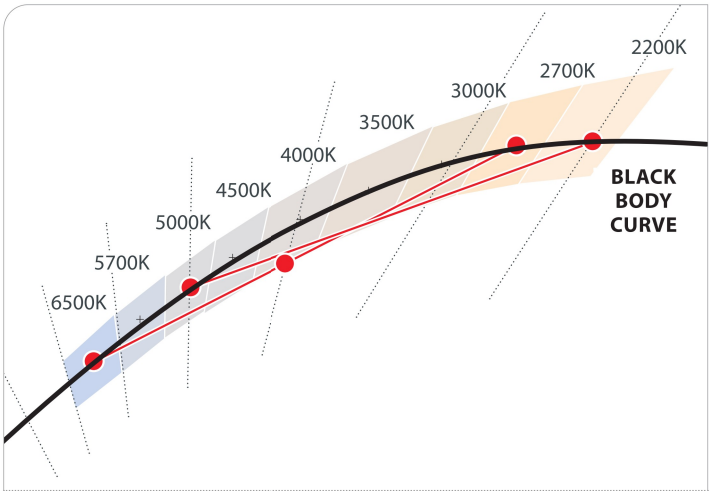
DIRECT:		BLUHUE, TUHUE, TUHUE2, AMBERHUE			
		LO	MO	SO	HO*
SAL	Lm/Ft	200	375	500	715
	W/Ft	3.8	5.6	7.8	10.5

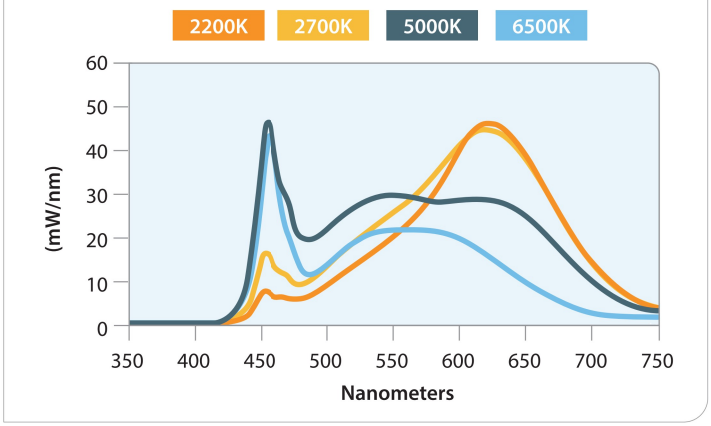
* TU2 + AMB NOT AVAILABLE HO / CHROMAHUE ONLY AVAILABLE ON HO

Tū Hue

Prudential Lighting's **TuHue** Tunable White provides warm to cool white light simulating sunlight. Controlling the light source color temperature offers differing design aesthetics with potential benefits via circadian rhythm support. Blue light for alertness while warm light conveys tranquility.

— 2700K-6500K or 2200K-5000K.
— Adjust the color temperate and brightness separately.
— Simulates warm to cool to warm transition of sunlight.



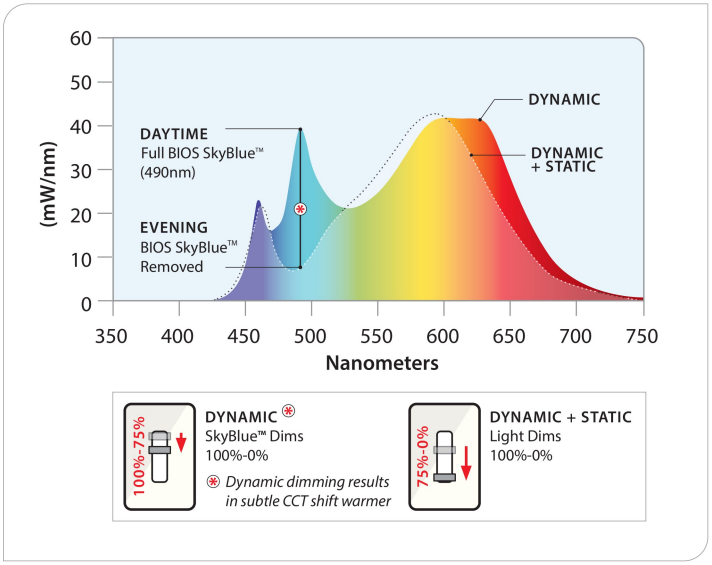


Blu Hue

bios ILLUMINATED

BluHue BIOS SkyBlue™ circadian LED lighting brings the benefits of blue skies inside. Newly discovered blue-sky receptors in our eyes drive improved daytime alertness, mood, brain function, and strengthens circadian rhythms leading to overall better health and well-being.

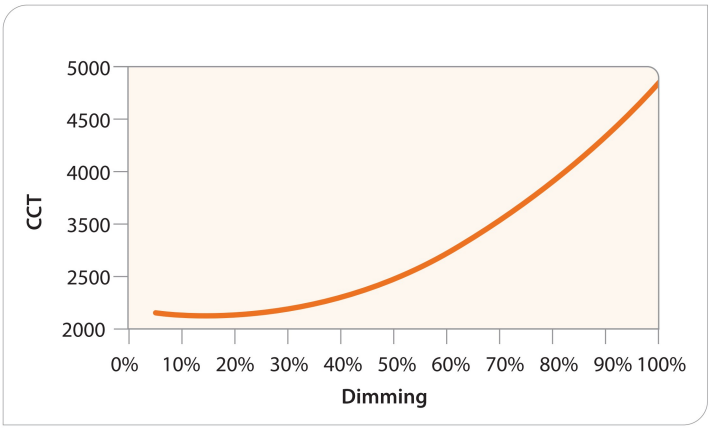
— Circadian rhythms play an integral role in physical and mental health.
— BluHue BIOS SkyBlue pinpoints peak 490nm sensitivity to provide the most benefit from an electric light source.
— At night, simply dim the lights to remove SkyBlue™ wavelengths (specify "Blu_D" to dim Cyan SkyBlue spike separately [night mode]).



Amber Hue

AmberHue is Prudential Lighting's Warm Dim offering. It transitions bright white light to warm amber light as brightness is dimmed, reflecting sunlight's transitioning from intense blue midday light to a dimmed golden hue near sunset, also reminiscent of soft glowing candlelight.

— Warm Dim 2200K-5000K.
— Color temperature warms as the luminaire is dimmed.
— Calm, relaxing mood communicated – hospitality, residential feel.



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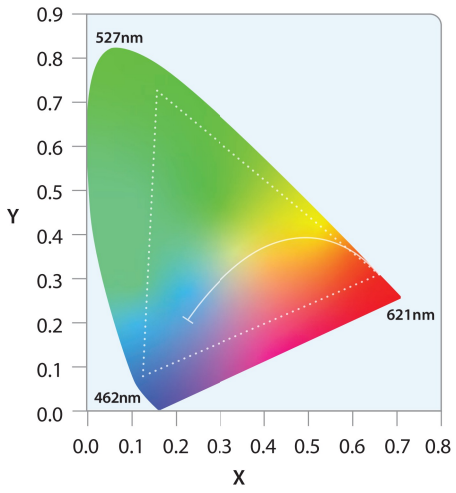
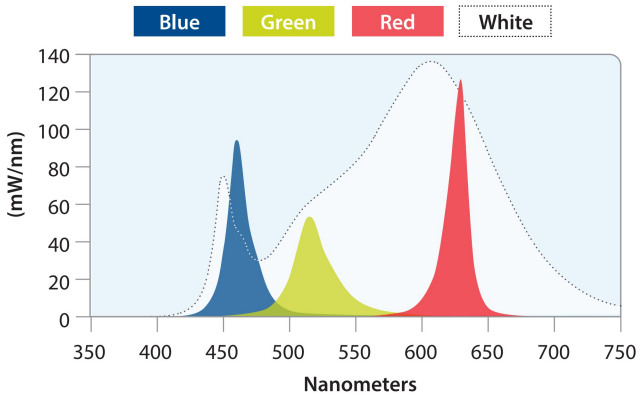
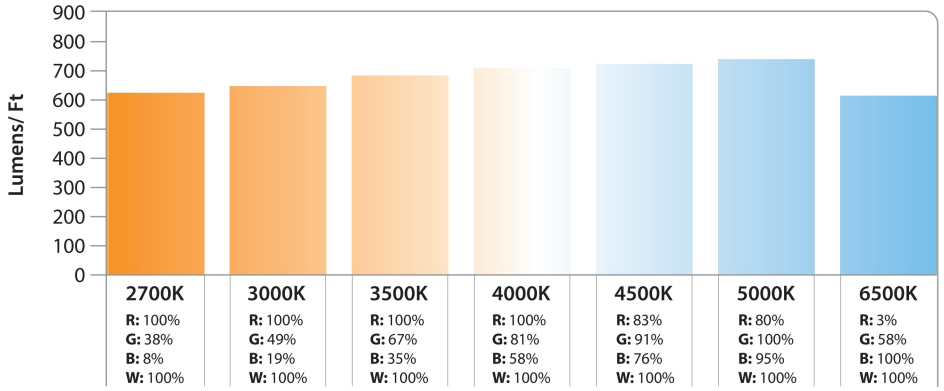
ChromaHue offers a vibrant full gamut of colors for seemingly endless architectural interior applications. Rich color-changing light offers tremendous design flexibility while white light can be achieved with the White chip, or mixing of Red, Green and Blue light. No longer just for the entertainment industry, ChromaHue can be intermixed on BionicPro luminaires for mood-creating indirect illumination combined with static white direct light.

— RGBW LED array (Red, Green, Blue, White) with full spectrum color and white light on the black body curve.
— Four-channel control, DMX drivers.
— Any color point within the triangle can be reached by setting the proper output levels for each individual red, green, blue and white channels.
— Standard DMX is one zone with one XLR drop at start, one XLR return at the end.





CONSTRUCTED WHITES



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Wet BionicPro3 | Linear

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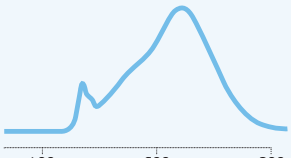
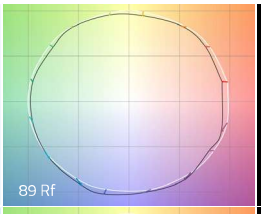
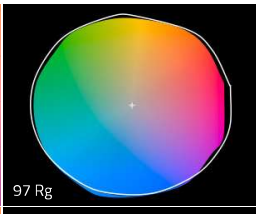
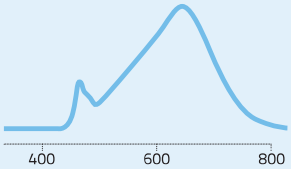
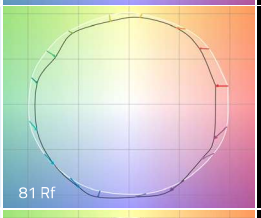
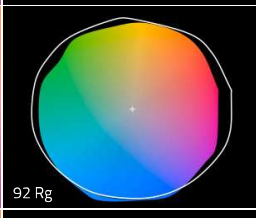
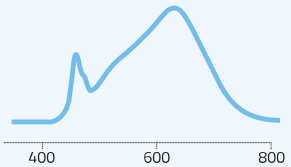
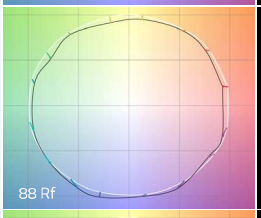
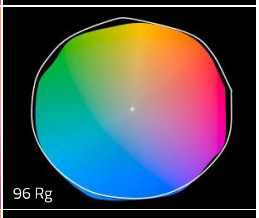
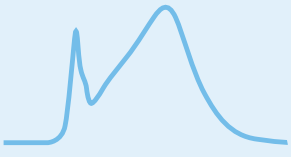
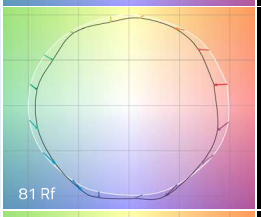
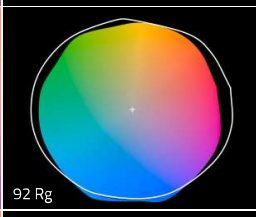
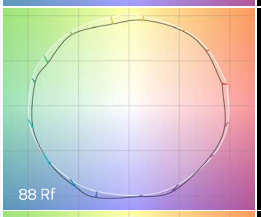
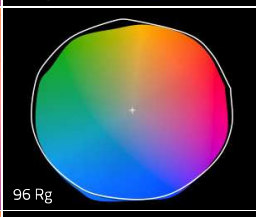
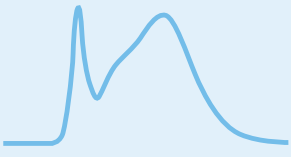
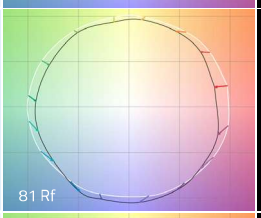
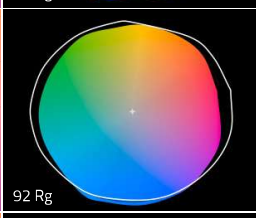
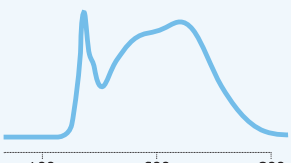
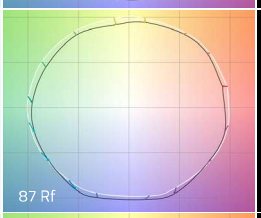
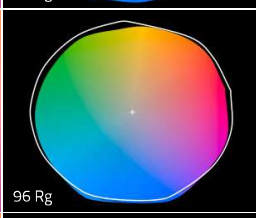
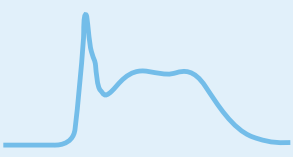
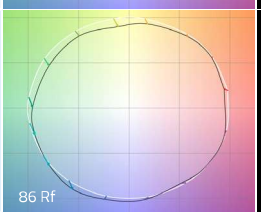
LM79 & TM30 DATA:

	MEASURED CCT	MEASURED LUMENS	CRI	R9	DuV	SPD	TM30 — COLOR VECTOR	TM30 — COLOR DISTORTION
LED27	2680	80%	93	58	0.001			
LED3	3042	95%	82	6	0.001			
LED3-90	3016	85%	93	61	0.000			
LED35	3482	100%	82	3	0.002			
LED35-90	3417	85%	93	67	0.000			
LED4	3952	102%	82	4	0.003			
LED4-90	3882	85%	92	67	0.003			
LED5-90	4889	85%	94	84	0.002			

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WDGE2 LED

Architectural Wall Sconce
Precision Refractive Optic

Catalog Number

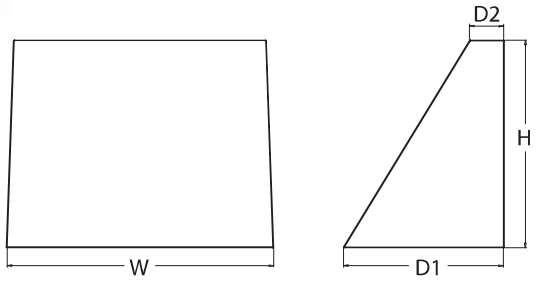
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

Depth (D1):	7"
Depth (D2):	1.5"
Height:	9"
Width:	11.5"
Weight: (without options)	13.5 lbs



Introduction

The WDGE LED family is designed to meet specifier's every wall-mounted lighting need in a widely accepted shape that blends with any architecture. The clean rectilinear design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® AIR wireless controls, the WDGE family provides additional energy savings and code compliance.

WDGE2 with industry leading precision refractive optics provides great uniform distribution and optical control. When combined with multiple integrated emergency battery backup options, including an 18W cold temperature option, the WDGE2 becomes the ideal wall-mounted lighting solution for pedestrian scale applications in any environment.

design select — Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect. *See ordering tree for details

WDGE LED Family Overview

Luminaire	Optics	Standard EM, 0°C	Cold EM, -20°C	Sensor	Approximate Lumens (4000K, 80CRI)						
					P0	P1	P2	P3	P4	P5	P6
WDGE1 LED	Visual Comfort	4W		--	750	1,200	2,000	--	--	--	--
WDGE2 LED	Visual Comfort	10W	18W	Standalone / nLight	--	1,200	2,000	3,000	4,500	6,000	--
WDGE2 LED	Precision Refractive	10W	18W	Standalone / nLight	700	1,200	2,000	3,200	4,200	--	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	--	7,500	8,500	10,000	12,000	--	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000	25,000

Ordering Information

EXAMPLE: WDGE2 LED P3 40K 80CRI T3M MVOLT SRM DDBXD

Series	Package	Color Temperature		CRI	Distribution	Voltage	Mounting	
WDGE2 LED	P0[1]	27K 2700K	40K 4000K	70CRI[4]	T1S Type I Short	MVOLT	**Shipped included**	**Shipped separately**
	P1[2]	30K 3000K	50K 5000K	80CRI	T2M Type II Medium	347[5]	SRM Surface mounting bracket	AWS 3/8inch Architectural wall spacer[7]
	P2[2]	35K 3500K	AMB[3] Amber	LW[3] Limited Wavelength	T3M Type III Medium	480[5]	ICW Indirect Canopy/Ceiling Washer bracket (dry/damp locations only)[6]	PBBW Surface-mounted back box (top, left, right conduit entry). Use when there is no junction box available[7]
	P3[2]				T4M Type IV Medium			
	P4[2]				TFTM Forward Throw Medium			

R

Options

E10WH	Emergency battery backup, Certified in CA Title 20 MAEDBS (10W, 5°C min)
E20WC	Emergency battery backup, Certified in CA Title 20 MAEDBS (18W, -20°C min)
PE	Photocell, Button Type[8]
DMG	0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately)[9]
BCE	Bottom conduit entry for back box (PBBW). Total of 4 entry points.
CCE	Coastal Construction[7]

Standalone Sensors/Controls

PIR	Bi-level (100/35%) motion sensor for 8–15' mounting heights. Intended for use on switched circuits with external dusk to dawn switching.
PIRH	Bi-level (100/35%) motion sensor for 15–30' mounting heights. Intended for use on switched circuits with external dusk to dawn switching
PIR1FC3V	Bi-level (100/35%) motion sensor for 8–15' mounting heights with photocell pre-programmed for dusk to dawn operation.
PIRH1FC3V	Bi-level (100/35%) motion sensor for 15–30' mounting heights with photocell pre-programmed for dusk to dawn operation.

Networked Sensors/Controls

NLTAIR2 PIR	Embedded wireless controls by nLight with Passive Infrared Occ sensor and on/off photocell for 8–15' mounting heights.
NLTAIR2 PIRH	Embedded wireless controls by nLight with Passive Infrared Occ sensor and on/off photocell for 15–30' mounting heights.
NLTAIREM2 PIR	Embedded wireless controls by nLight with UL924 listed emegency operation, Passive Infrared Occ sensor and on/off photocell for 8–15' mounting heights
NLTAIREM2 PIRH	Embedded wireless controls by nLight with UL924 listed emegency operation, Passive Infrared Occ sensor and on/off photocell for 15–30' mounting heights.

See page 4 for out of box functionality

Finish

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DSSXD	Sandstone
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white
DSSTXD	Textured sandstone

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Accessories

Ordered and shipped separately.

WDGEAWS DDBXD U	WDGE 3/8inch Architectural Wall Spacer (specify finish)
WDGE2PBBW DDBXD U	WDGE2 surface-mounted back box (specify finish)

NOTES

1 P0 option not available with sensors/controls.
2 P1-P4 not available with AMB and LW.
3 AMB and LW always go together.
4 70CRI only available with T3M and T4M.
5 347V and 480V not available with E10WH or E20WC.
6 Not qualified for DLC. Not available with emergency battery backup or sensors/controls.
7 For PBBW and AWS with CCE option, require an RFA.
8 PE not available in 480V or with sensors/controls.
9 DMG option not available with sensors/controls.

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Performance Package	System Watts	Dist. Type	27K (2700K, 80 CRI)					30K (3000K, 80 CRI)					40K (4000K, 80 CRI)					50K (5000K, 80 CRI)					Amber (Limited Wavelength)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P0	7W	T1S	636	92	0	0	0	666	97	0	0	0	699	101	0	0	1	691	100	0	0	1	712	47	0	0	1
		T2M	662	96	0	0	0	693	101	0	0	0	728	106	0	0	0	719	104	0	0	0	741	48	0	0	0
		T3M	662	96	0	0	0	693	101	0	0	0	728	106	0	0	0	719	104	0	0	0	741	48	0	0	0
		T4M	648	94	0	0	0	679	98	0	0	0	712	103	0	0	0	704	102	0	0	0	726	47	0	0	0
		TFTM	652	95	0	0	0	683	99	0	0	0	717	104	0	0	0	708	103	0	0	0	730	48	0	0	1
P1	11W	T1S	1,105	99	0	0	1	1,157	104	0	0	1	1,215	109	0	0	1	1,200	107	0	0	1					
		T2M	1,150	103	0	0	1	1,204	108	0	0	1	1,264	113	0	0	1	1,249	112	0	0	1					
		T3M	1,150	103	0	0	1	1,205	108	0	0	1	1,265	113	0	0	1	1,250	112	0	0	1					
		T4M	1,126	101	0	0	1	1,179	106	0	0	1	1,238	111	0	0	1	1,223	110	0	0	1					
		TFTM	1,133	101	0	0	1	1,186	106	0	0	1	1,245	112	0	0	1	1,230	110	0	0	1					
P2	19W	T1S	1,801	95	1	0	1	1,886	99	1	0	1	1,981	104	1	0	1	1,957	103	1	0	1					
		T2M	1,875	99	1	0	1	1,963	103	1	0	1	2,061	109	1	0	1	2,037	107	1	0	1					
		T3M	1,876	99	1	0	1	1,964	103	1	0	1	2,062	109	1	0	1	2,038	107	1	0	1					
		T4M	1,836	97	1	0	1	1,922	101	1	0	1	2,018	106	1	0	1	1,994	105	1	0	1					
		TFTM	1,847	97	1	0	1	1,934	102	1	0	1	2,030	107	1	0	1	2,006	106	1	0	1					
P3	32W	T1S	2,809	87	1	0	1	2,942	92	1	0	1	3,089	96	1	0	1	3,052	95	1	0	1					
		T2M	2,924	91	1	0	1	3,062	95	1	0	1	3,215	100	1	0	1	3,176	99	1	0	1					
		T3M	2,925	91	1	0	1	3,063	95	1	0	1	3,216	100	1	0	1	3,177	99	1	0	1					
		T4M	2,862	89	1	0	1	2,997	93	1	0	1	3,147	98	1	0	1	3,110	97	1	0	1					
		TFTM	2,880	90	1	0	1	3,015	94	1	0	1	3,166	99	1	0	1	3,128	97	1	0	1					
P4	47W	T1S	3,729	80	1	0	1	3,904	84	1	0	1	4,099	88	1	0	1	4,051	87	1	0	1					
		T2M	3,881	83	1	0	1	4,063	87	1	0	1	4,267	91	1	0	1	4,216	90	1	0	1					
		T3M	3,882	83	1	0	1	4,065	87	1	0	1	4,268	91	1	0	1	4,217	90	1	0	1					
		T4M	3,799	81	1	0	1	3,978	85	1	0	1	4,177	90	1	0	1	4,127	88	1	0	1					
		TFTM	3,822	82	1	0	1	4,002	86	1	0	1	4,202	90	1	0	1	4,152	89	1	0	1					

Performance Package	System Watts	Dist. Type	27K (2700K, 70 CRI)					30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P0	7W	T3M	737	107	0	0	0	763	111	0	0	0	822	119	0	0	0	832	121	0	0	1
		T4M	721	105	0	0	0	746	108	0	0	0	804	117	0	0	1	814	118	0	0	1
P1	11W	T3M	1,280	115	0	0	1	1,325	119	0	0	1	1,427	128	1	0	1	1,445	129	1	0	1
		T4M	1,253	112	0	0	1	1,297	116	0	0	1	1,397	125	0	0	1	1,415	127	0	0	1
P2	19W	T3M	2,087	110	1	0	1	2,160	114	1	0	1	2,327	123	1	0	1	2,357	124	1	0	1
		T4M	2,042	108	1	0	1	2,114	111	1	0	1	2,278	120	1	0	1	2,306	121	1	0	1
P3	32W	T3M	3,254	101	1	0	1	3,369	105	1	0	1	3,629	113	1	0	1	3,675	114	1	0	1
		T4M	3,185	99	1	0	1	3,297	103	1	0	1	3,552	111	1	0	1	3,597	112	1	0	1
P4	47W	T3M	4,319	93	1	0	1	4,471	96	1	0	1	4,817	103	1	0	2	4,878	105	1	0	2
		T4M	4,227	91	1	0	1	4,376	94	1	0	2	4,714	101	1	0	2	4,774	102	1	0	2

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Electrical Load

Performance Package	System Watts	Current (A)					
		120Vac	208Vac	240Vac	277Vac	347Vac	480Vac
P0	7.0	0.061	0.042	0.04	0.039	--	--
	9.0	--	--	--	--	0.031	0.021
P1	11.0	0.100	0.064	0.059	0.054	--	--
	14.1	--	--	--	--	0.046	0.031
P2	19.0	0.168	0.106	0.095	0.083	--	--
	22.8	--	--	--	--	0.067	0.050
P3	32.0	0.284	0.163	0.144	0.131	--	--
	37.1	--	--	--	--	0.107	0.079
P4	47.0	0.412	0.234	0.207	0.185	--	--
	53.5	--	--	--	--	0.153	0.112

Lumen Output in Emergency Mode (4000K, 80 CRI, T3M)

Option	Lumens
E10WH	1,358
E20WC	2,230

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.97

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a 25°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.96	>0.93	>0.87

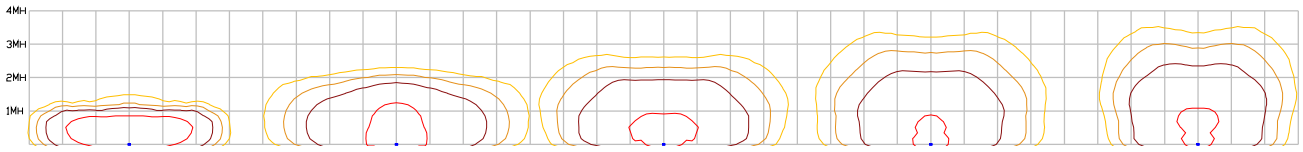
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting WDGE LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards.

LEGEND

0.25 fc
0.5 fc
1.0 fc
3.0 fc

MH = 10ft
Grid = 10ft x 10ft



"P3 40K 80CRI T1S" "P3 40K 80CRI T2M" "P3 40K 80CRI T3M" "P3 40K 80CRI T4M" "P3 40K 80CRI TFTM"

Emergency Egress Options

Emergency Battery Backup

The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product. All emergency battery backup configurations include an independent secondary driver with an integral relay to immediately detect loss of normal power and automatically energize the luminaire. The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time normal power is lost and maintain a minimum of 60% of the light output at the end of 90minutes.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9

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Control / Sensor Options

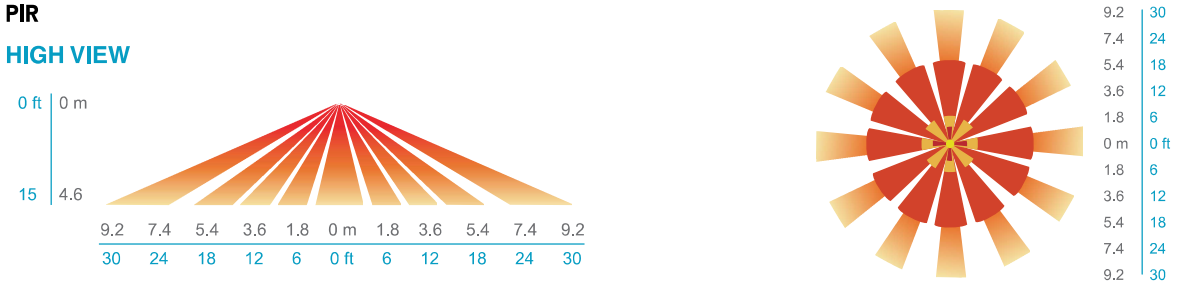
Motion/Ambient Sensor (PIR_, PIRH_)

Motion/Ambeint sensor (Sensor Switch MSOD) is integrated into the the luminaire. The sensor provides both Motion and Daylight based dimming of the luminaire. For motion detection, the sensor utilizes 100% Digital Passive Infrared (PIR) technology that is tuned for walking size motion while preventing false tripping from the environment. The integrated photocell enables additional energy savings during daytime periods when there is sufficient daylight. Optimize sensor coverage by either selecting PIR or PIRH option. PIR option comes with a sensor lens that is optimized to provide maximum coverage for mounting heights between 8-15ft, while PIRH is optimized for 15-40ft mounting height.

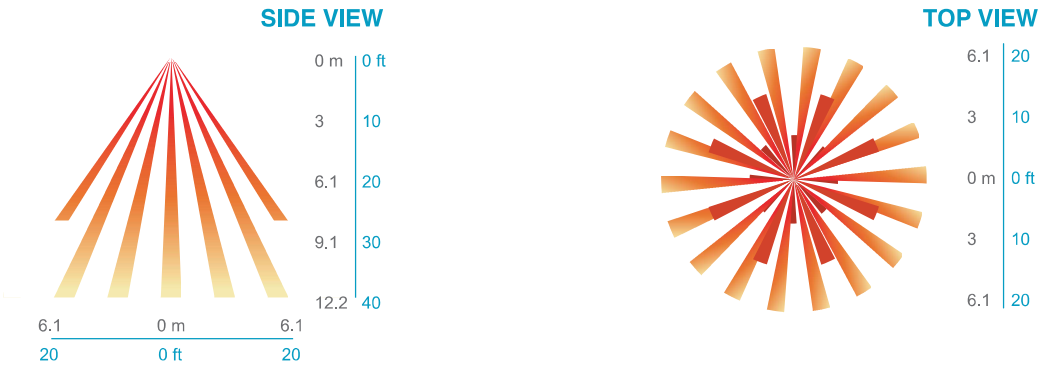
Networked Control (NLTAIR2)

nLight® AIR is a wireless lighting controls platform that allows for seamless integration of both indoor and outdoor luminaires. Five-tier security architecture, 900 MHz wireless communication and app (CLAIRITY™ Pro) based configurability combined together make nLight® AIR a secure, reliable and easy to use platform.

PIR



PIRH



Option	Dim Level	High Level (when triggered	Photocell Operation	Motion Time Delay	Ramp-down Time	Ramp-up Time
PIR or PIRH	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
PIR1FC3V, PIRH1FC3V	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 1fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
NLTAIR2 PIR, NLTAIR2 PIRH, NLTAIREM2 PIR, NLTAIREM2 PIRH (out of box)	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	7.5 min	5 min	Motion - 3 sec Photocell - 45 sec

UL 924 Response – nLight AIR Devices with EM Option

- NLTAIREM2 devices will remain at their high-end trim and ignore wireless lighting control commands, unless a normal-power-sensed (NPS) broadcast is received at least every 8 seconds.
- Using the CLAIRITY+ mobile app, NLTAIREM2 devices must be associated with a group that includes a normal power sensing device to receive NPS broadcasts.
- The non-emergency devices, NLTAIR2 PIR and NLTAIR2 PIRH, with version 3.4 or later firmware can be used for normal power sensing.

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Mounting, Options & Accessories



Motion/Ambient Sensor

D = 7"

H = 9" (Standalone controls)
11" (nLight AIR controls, 2" antenna will be pointing down behind the sensor)

W = 11.5"



PBBW – Surface-Mounted Back Box
Use when there is no junction box available.

D = 1.75"

H = 9"

W = 11.5"



AWS – 3/8inch Architectural Wall Spacer

D = 0.38"

H = 4.4"

W = 7.5"

FEATURES & SPECIFICATIONS

INTENDED USE
Common architectural look, with clean rectilinear shape, of the WDGE LED was designed to blend with any type of construction, whether it be tilt-up, frame or brick. Applications include commercial offices, warehouses, hospitals, schools, malls, restaurants, and other commercial buildings.

CONSTRUCTION
The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP66 rating for the luminaire.

FINISH
Exterior painted parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS
Individually formed acrylic lenses are engineered for superior application efficiency which maximizes the light in the areas where it is most needed. The WDGE LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine consists of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L91/100,000 hours at 25°C). The electronic driver has a power factor of >90%, THD <20%. Luminaire comes with built in 6kV surge protection, which meets a minimum Category C low exposure (per ANSI/IEEE C62.41.2). Fixture ships standard with 0-10v dimmable driver.

INSTALLATION
A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections. The 3/8" Architectural Wall Spacer (AWS) can be used to create a floating appearance or to accommodate small imperfections in the wall surface. The ICW option can be used to mount the luminaire inverted for indirect lighting in dry and damp locations. Design can withstand up to a 1.5 G vibration load rating per ANSI C136.31.

LISTINGS
CSA certified to U.S. and Canadian standards. Luminaire is IP66 rated. PIR options are rated for wet location. Rated for -40°C minimum ambient. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified. International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 2700K and 3000K color temperature only and SRM mounting only.

GOVERNMENT PROCUREMENT
BABA – Build America Buy America: Product qualifies as produced in the United States under the definitions of the Build America, Buy America Act.
Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY
5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at:
www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

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NLS LIGHTING

VSS-1

SITE LIGHTING

FORM AND FUNCTION

- Sleek, low profile housing
- Engineered for optimum thermal management
- Low depreciation rate
- Optical system designed for:
  - Parking Lots
  - Commercial Applications

CONSTRUCTION

- Die Formed heavy duty Aluminum
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP-65 seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP-67 level seal around each PCB

BUY AMERICAN

To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).



PROUDLY MADE IN THE U.S.A.

LED WATTAGE CHART

	32L	48L	64L
700 milliamps	71w	104w	136w
1050 milliamps	106w	156w	205w

Project Name:

Type:

Cat#	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
Value Series Square 1 **(VSS-1)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)**	32 **(32L)** 48 **(48L)** 64 **(64L)**	700 **(7)** 1050 **(1)**	Amber 585-600nM **(AMBER)**❺❼ 2700K, 70 CRI **(27K7)**❺ 2700K, 80 CRI **(27K8)**❶❺ 3000K, 70 CRI **(30K7)**❺ 3000K, 80 CRI **(30K8)**❶❺ 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)**❶ 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)**❶	120-277 **(UNV)** 347-480 **(HV)**	Direct Pole 6" Arm Single, D180 **(DPS6)**❷ Direct Pole 10" Arm D90, T90, T120, Quad **(DPS10)**❷ Knuckle Mount **(KM)** Wall Mount **(WM)**❸ Tennis Arm **(TA)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Custom **(CS)**	Bird Spikes **(BS)** Marine Grade Finish **(MGF)** Photocell **(PC)**❹ Nema 7-Pin Receptacle **(PE7)** Photocell + Receptacle **(PCR)** Receptacle + Shorting Cap **(PER)** FSP-211 with Motion Sensor **(FSP-8)**❹*8'+ Below* **(FSP-20)**❹*9'-20'Heights* **(FSP-40)**❹*21'-40' Heights* Quick Mount Bracket **(QMB)** Retrofit Mount Bracket **(RQMB)** Round Pole Adaptor 3"- 4" Pole **(RPA4)** Round Pole Adaptor 5"- 6" Pole **(RPA5)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Automotive House Side Shield **(AHS)** House Side Shield **(HSS)** Buy American **(BAA)**❽ Trade American **(TAA)**❽ Build America Buy American **(BABA)**❽ Custom Controls Integration **(CCI)**❻

Notes:

❶ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
❷ For Round Pole Specify RPA4 or RPA5
❸ Includes 6" Bolt On Arm
❹ Universal Voltage 120-277
❺ 3000K or lower must be selected to meet International Dark Sky Association certification
❻ Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
❼ Turtle Safe
❽ Consult factory for all BAA/TAA/BABA requests

PRODUCT SPECIFICATIONS

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP-65 compartment
- CRI 70, 80 or 90
- Color temperatures: Amber, 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplies as standard.

OPTIONS

- **BIRD SPIKES (BS)**—Offers effective and humane deterrent for larger bird species and provides cost-effective long-term solution to nuisance bird infestations and protect your property.
- **MARINE GRADE FINISH (MGF)**—A multi-step process creating protective finishing coat against harsh environments.
  - Chemically washed in a 5 stage cleaning system.
  - Pre-baked
  - Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer.
  - 1-2 feet inside pole coverage top and bottom.
  - Oven Baked.
  - Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- **SHIELDS (HSS, AHS)**—House Side Shield (HSS) is designed for full property line cut-off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.
- **ROUND POLE ADAPTER (RPA)–** When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3"-4" round poles, and RPA5 when installing on 5"-6" round poles.

CONTROLS

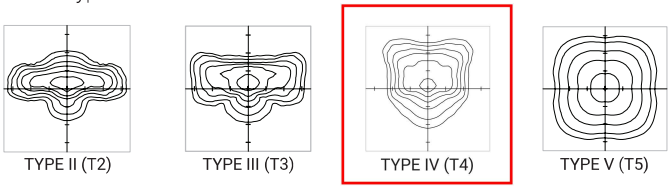
- **FSP-211 (FSP-X)**—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
  - FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.
- **NEMA 7-PIN RECEPTACLE (PE7)**—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

• Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

OPTICS

Silicone optics high photothermal stability and light output provides higher powered LEDs with minimized lumen depreciation LED life. UV and thermal stability with scratch resistance increases exterior application durability.

- IES Types



FINISH

- 5 mils electrostatic powder coat.
- NLS' standard high-quality finishes prevent corrosion protects against extreme environmental conditions

WARRANTY

Five-year limited warranty for drivers and LEDs.

LISTINGS

- Certified to UL 1598
- CSA C22.2 No. 250.0
- IP65/ IP67 Rated
- Dark Sky Approved
- IK10 Rated

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/wp-content/uploads/cs/NLS_BuyAmerica(n).pdf

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
Call Us Today (310) 341-2037
nlslighting.com

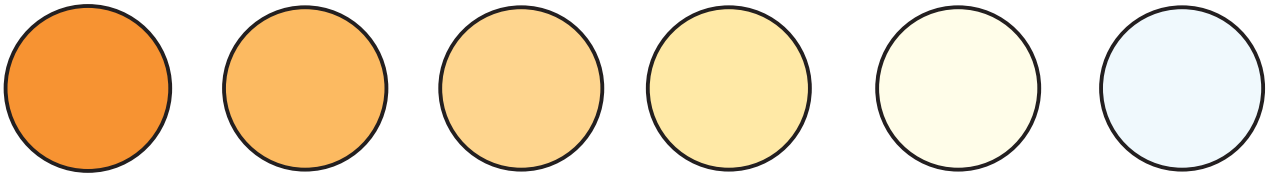
PRODUCT SPECIFICATIONS

LUMENS

PART NUMBER	T2	LM/W	BUG	T3 HSS	LM/W	BUG	T3	LM/W	BUG	T4 AHS	LM/W	T4 HSS	LM/W	BUG	T4	LM/W	BUG	T5	LM/W	BUG	Watts
VSS-1-32L-7-30K7	7384	104	B1-U0-G1	4118	58	B0-U0-G1	7242	102	B2-U0-G2	5112	72	4047	57	B0-U0-G1	7668	108	B2-U0-G2	8179	115	B3-U0-G2	71
VSS-1-32L-7-40K7	8023	113	B2-U0-G2	4402	62	B0-U0-G1	7952	112	B2-U0-G2	5396	76	4331	61	B0-U0-G1	8307	117	B2-U0-G2	8946	126	B3-U0-G2	71
VSS-1-32L-7-50K7	8662	122	B2-U0-G2	4686	66	B0-U0-G1	8520	120	B2-U0-G2	5680	80	4615	65	B0-U0-G2	8946	126	B2-U0-G2	9585	135	B3-U0-G2	71
VSS-1-32L-1-30K7	10706	101	B2-U0-G2	6148	58	B0-U0-G2	10600	100	B2-U0-G2	7632	72	6042	57	B0-U0-G2	10812	102	B2-U0-G2	11125	105	B4-U0-G2	106
VSS-1-32L-1-40K7	11660	110	B2-U0-G2	6572	62	B0-U0-G2	11554	109	B2-U0-G2	8056	76	6466	61	B0-U0-G2	11766	111	B2-U0-G2	12190	115	B4-U0-G2	106
VSS-1-32L-1-50K7	12508	118	B2-U0-G2	6996	66	B0-U0-G2	12402	117	B2-U0-G2	8480	80	6890	65	B0-U0-G2	12508	118	B2-U0-G2	13144	124	B4-U0-G2	106
VSS-1-48L-7-30K7	10816	104	B2-U0-G2	6032	58	B0-U0-G2	10712	103	B2-U0-G2	7488	72	5928	57	B0-U0-G2	11232	108	B2-U0-G2	12272	118	B4-U0-G2	104
VSS-1-48L-7-40K7	11752	113	B2-U0-G2	6448	62	B0-U0-G2	11648	112	B2-U0-G2	7904	76	6344	61	B0-U0-G2	12168	117	B2-U0-G2	13312	128	B4-U0-G2	104
VSS-1-48L-7-50K7	12688	122	B2-U0-G2	6864	66	B0-U0-G2	12480	120	B2-U0-G2	8320	80	6760	65	B0-U0-G2	13104	126	B3-U0-G3	14248	137	B4-U0-G2	104
VSS-1-48L-1-30K7	16559	106	B3-U0-G3	9048	58	B0-U0-G2	15756	101	B3-U0-G3	11232	72	8892	57	B1-U0-G2	15912	102	B3-U0-G3	16536	106	B4-U0-G2	156
VSS-1-48L-1-40K7	17160	110	B3-U0-G3	9672	62	B1-U0-G2	17004	109	B3-U0-G3	11856	76	9516	61	B1-U0-G2	17316	111	B3-U0-G3	17940	115	B4-U0-G2	156
VSS-1-48L-1-50K7	18408	118	B3-U0-G3	10296	66	B1-U0-G2	18252	117	B3-U0-G3	12480	80	10140	65	B1-U0-G2	18408	118	B3-U0-G3	19188	123	B4-U0-G2	156
VSS-1-64L-7-30K7	14144	104	B2-U0-G2	7888	58	B0-U0-G2	13736	101	B3-U0-G3	9792	72	7752	57	B0-U0-G2	14688	108	B3-U0-G3	16048	118	B4-U0-G2	136
VSS-1-64L-7-40K7	15368	113	B3-U0-G3	8432	62	B0-U0-G2	14824	109	B3-U0-G3	10336	76	8296	61	B1-U0-G2	15912	117	B3-U0-G3	17408	128	B4-U0-G2	136
VSS-1-64L-7-50K7	16592	122	B3-U0-G3	8976	66	B0-U0-G2	16048	118	B3-U0-G3	10880	80	8840	65	B1-U0-G2	17136	126	B3-U0-G3	18632	137	B4-U0-G2	136
VSS-1-64L-1-30K7	21730	106	B3-U0-G3	11890	58	B1-U0-G2	20705	101	B3-U0-G3	14760	72	11685	57	B1-U0-G2	20910	102	B3-U0-G3	21730	106	B5-U0-G3	205
VSS-1-64L-1-40K7	22550	110	B3-U0-G3	12710	62	B1-U0-G2	22345	109	B3-U0-G3	15580	76	12505	61	B1-U0-G3	22755	111	B3-U0-G3	23575	115	B5-U0-G3	205
VSS-1-64L-1-50K7	24190	118	B3-U0-G3	13530	66	B1-U0-G2	23780	116	B3-U0-G3	16400	80	13325	65	B1-U0-G3	24190	118	B3-U0-G4	25215	123	B5-U0-G3	205

Lumen Maintenance Data							
Ambient Temperature	Drive Current	L90 Hours*	L70 Hours**	30,000 Hours*	50,000 Hours*	60,00 Hours*	100,000 Hours**
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	38,000	96,000	93.0%	85.4%	81.8%	68.8%
*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21							

LED KELVIN RANGE



AMBER 585-600 nm | 2700K 70 CRI | 3000K 70 CRI | 3500K 80 CRI | 4000K 70 CRI | 5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

PRODUCT SPECIFICATIONS

DIMENSION	VSS-1
A	17 in. SQ
B	5 in.
Weight	23 lbs

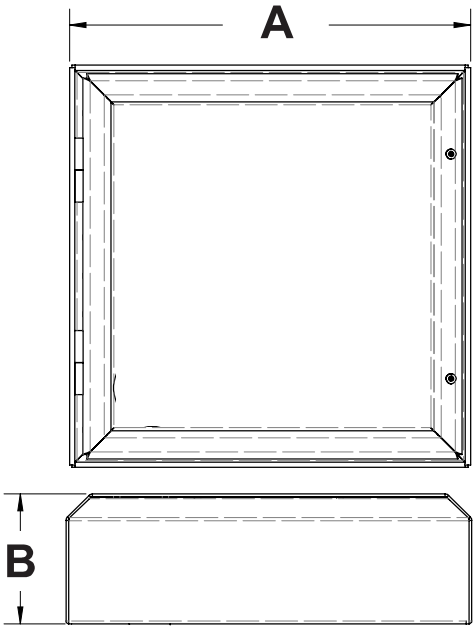
EPA

EPA	SGL	D90	D180	T90	T120	QD
VSS-1	0.90	1.52	1.80	2.34	2.43	2.34

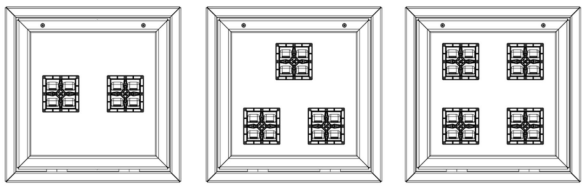
DPX ARM LENGTH

DPX ARM LENGTH	SGL	D90	D180	T90	T120	QD
VSS-1	6"	10"	6"	10"	10"	10"

*6" - **DPX6** | 10" - **DPX10***



OPTICAL CONFIGURATIONS

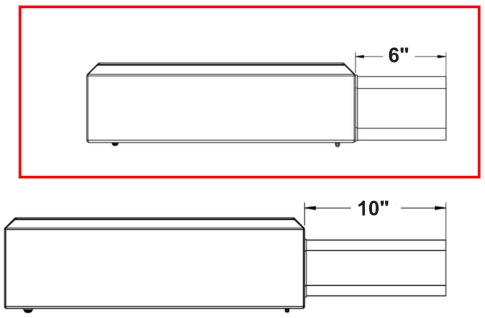


VSS-1 / 32L | VSS-1 / 48L | VSS-1 / 64L

PRODUCT SPECIFICATIONS

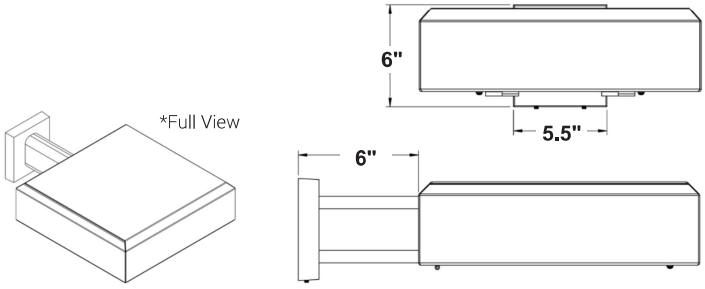
DIRECT POLE (DP)

Standard mounting arm is extruded aluminum in lengths of 6", And 10"
*Arm lengths may vary depending on configuration



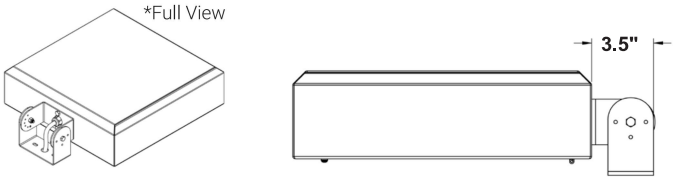
WALL MOUNT (WM)

Cast Aluminum Plate for direct wall mount.
6" extruded aluminum arm mounts directly to a cast wall mount box.



TRUNNION MOUNT (TM)

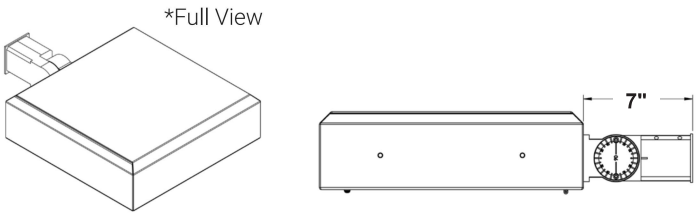
Steel bolt-on-mounting for adjustable installation with a maximum uplift of 90°.



KNUCKLE MOUNT (KM)

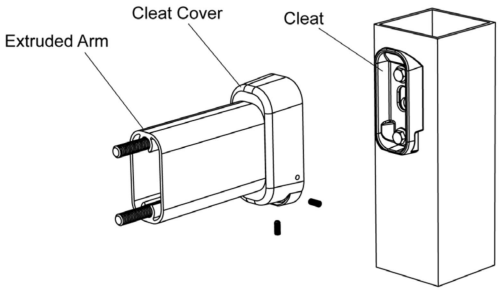
Die Cast Knuckle great for adjustable installation on 2-3/8" OD vertical or horizontal tenon.

- Max Uptilt of 110 degrees
- Adjustable in 5 degree increments



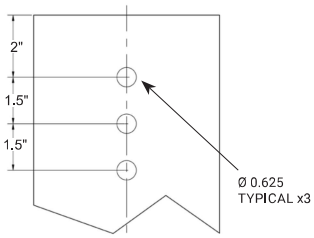
PRODUCT SPECIFICATIONS

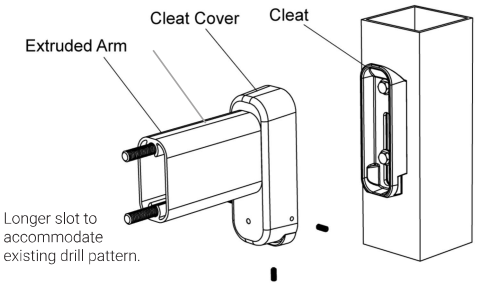
Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures.



QUICK MOUNT BRACKET (QMB)
DIRECT POLE (DP6/DP10)

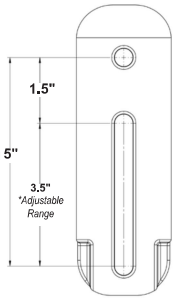
DRILL PATTERN



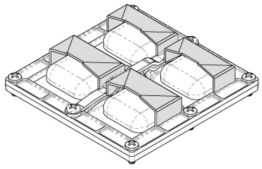


RETROFIT QUICK MOUNT BRACKET (RQMB)

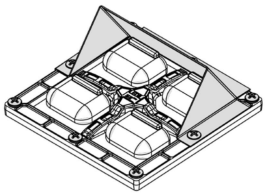
RQMB DRILL PATTERN



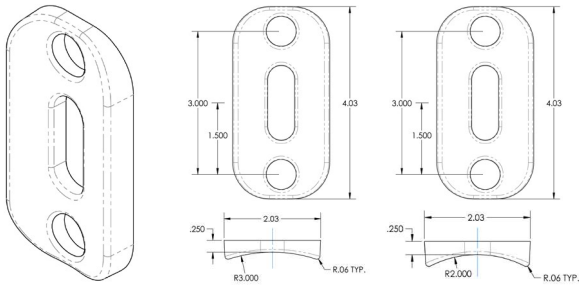
HOUSE SIDE SHIELD



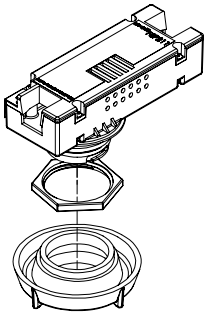
AUTOMOTIVE
HOUSE SIDE SHIELD



RPA4 / RPA5



FSP-211



NLS LIGHTING

VSS-1

SITE LIGHTING

FORM AND FUNCTION
- Sleek, low profile housing
- Engineered for optimum thermal management
- Low depreciation rate
- Optical system designed for:
  - Parking Lots
  - Commercial Applications

CONSTRUCTION
- Die Formed heavy duty Aluminum
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP-65 seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP-67 level seal around each PCB

BUY AMERICAN
To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).



PROUDLY MADE IN THE U.S.A.

LED WATTAGE CHART

	32L	48L	64L
700 milliamps	71w	104w	136w
1050 milliamps	106w	156w	205w

Project Name:

Type:

Cat#	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
Value Series Square 1 **(VSS-1)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)**	32 **(32L)** 48 **(48L)** 64 **(64L)**	700 **(7)** 1050 **(1)**	Amber 585-600nM **(AMBER)**❺❼ 2700K, 70 CRI **(27K7)**❺ 2700K, 80 CRI **(27K8)**❶❺ 3000K, 70 CRI **(30K7)**❺ 3000K, 80 CRI **(30K8)**❶❺ 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)**❶ 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)**❶	120-277 **(UNV)** 347-480 **(HV)**	Direct Pole 6" Arm Single, DT180 **(DPS6)**❷ Direct Pole 10" Arm D90, T90, T120, Quad **(DPS10)**❷ Knuckle Mount **(KM)** Wall Mount **(WM)**❸ Tennis Arm **(TA)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Custom **(CS)**	Bird Spikes **(BS)** Marine Grade Finish **(MGF)** Photocell **(PC)**❹ Nema 7-Pin Receptacle **(PE7)** Photocell + Receptacle **(PCR)** Receptacle + Shorting Cap **(PER)** FSP-211 with Motion Sensor **(FSP-8)**❹*8'+ Below* **(FSP-20)**❹*9'-20'Heights* **(FSP-40)**❹*21'-40' Heights* Quick Mount Bracket **(QMB)** Retrofit Mount Bracket **(RQMB)** Round Pole Adaptor 3"- 4" Pole **(RPA4)** Round Pole Adaptor 5"- 6" Pole **(RPA5)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Automotive House Side Shield **(AHS)** House Side Shield **(HSS)** Buy American **(BAA)**❽ Trade American **(TAA)**❽ Build America Buy American **(BABA)**❽ Custom Controls Integration **(CCI)**❻

Notes:
❶ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
❷ For Round Pole Specify RPA4 or RPA5
❸ Includes 6" Bolt On Arm
❹ Universal Voltage 120-277
❺ 3000K or lower must be selected to meet International Dark Sky Association certification
❻ Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
❼ Turtle Safe
❽ Consult factory for all BAA/TAA/BABA requests

PRODUCT SPECIFICATIONS

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP-65 compartment
- CRI 70, 80 or 90
- Color temperatures: Amber, 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplies as standard.

OPTIONS

- **BIRD SPIKES (BS)**—Offers effective and humane deterrent for larger bird species and provides cost-effective long-term solution to nuisance bird infestations and protect your property.
- **MARINE GRADE FINISH (MGF)**—A multi-step process creating protective finishing coat against harsh environments.
  - Chemically washed in a 5 stage cleaning system.
  - Pre-baked
  - Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer.
  - 1-2 feet inside pole coverage top and bottom.
  - Oven Baked.
  - Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- **SHIELDS (HSS, AHS)**—House Side Shield (HSS) is designed for full property line cut-off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.
- **ROUND POLE ADAPTER (RPA)–** When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3"-4" round poles, and RPA5 when installing on 5"-6" round poles.

CONTROLS

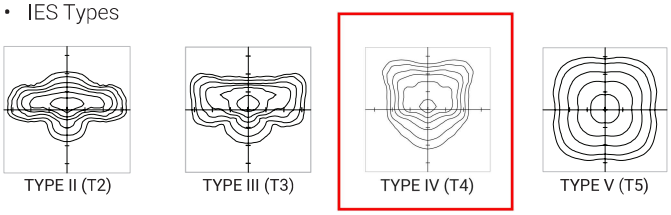
- **FSP-211 (FSP-X)**—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
  - FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.
- **NEMA 7-PIN RECEPTACLE (PE7)**—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

• Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

OPTICS

Silicone optics high photothermal stability and light output provides higher powered LEDs with minimized lumen depreciation LED life. UV and thermal stability with scratch resistance increases exterior application durability.

- IES Types



TYPE II (T2) | TYPE III (T3) | TYPE IV (T4) | TYPE V (T5)

FINISH

- 5 mils electrostatic powder coat.
- NLS' standard high-quality finishes prevent corrosion protects against extreme environmental conditions

WARRANTY

Five-year limited warranty for drivers and LEDs.

LISTINGS

- Certified to UL 1598
- CSA C22.2 No. 250.0
- IP65/ IP67 Rated
- Dark Sky Approved
- IK10 Rated

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/wp-content/uploads/cs/NLS_BuyAmerica(n).pdf

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

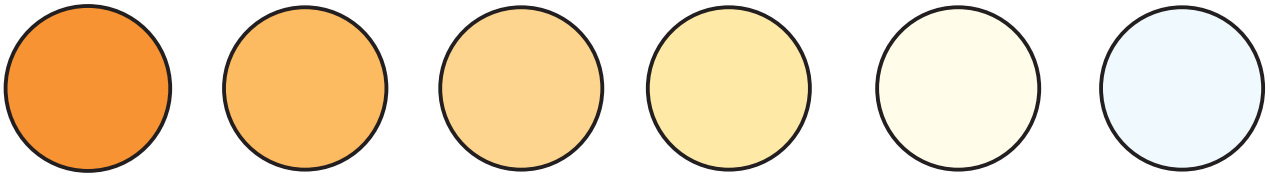
PRODUCT SPECIFICATIONS

LUMENS

PART NUMBER	T2	LM/W	BUG	T3 HSS	LM/W	BUG	T3	LM/W	BUG	T4 AHS	LM/W	T4 HSS	LM/W	BUG	T4	LM/W	BUG	T5	LM/W	BUG	Watts
VSS-1-32L-7-30K7	7384	104	B1-U0-G1	4118	58	B0-U0-G1	7242	102	B2-U0-G2	5112	72	4047	57	B0-U0-G1	7668	108	B2-U0-G2	8179	115	B3-U0-G2	71
VSS-1-32L-7-40K7	8023	113	B2-U0-G2	4402	62	B0-U0-G1	7952	112	B2-U0-G2	5396	76	4331	61	B0-U0-G1	8307	117	B2-U0-G2	8946	126	B3-U0-G2	71
VSS-1-32L-7-50K7	8662	122	B2-U0-G2	4686	66	B0-U0-G1	8520	120	B2-U0-G2	5680	80	4615	65	B0-U0-G2	8946	126	B2-U0-G2	9585	135	B3-U0-G2	71
VSS-1-32L-1-30K7	10706	101	B2-U0-G2	6148	58	B0-U0-G2	10600	100	B2-U0-G2	7632	72	6042	57	B0-U0-G2	10812	102	B2-U0-G2	11125	105	B4-U0-G2	106
VSS-1-32L-1-40K7	11660	110	B2-U0-G2	6572	62	B0-U0-G2	11554	109	B2-U0-G2	8056	76	6466	61	B0-U0-G2	11766	111	B2-U0-G2	12190	115	B4-U0-G2	106
VSS-1-32L-1-50K7	12508	118	B2-U0-G2	6996	66	B0-U0-G2	12402	117	B2-U0-G2	8480	80	6890	65	B0-U0-G2	12508	118	B2-U0-G2	13144	124	B4-U0-G2	106
VSS-1-48L-7-30K7	10816	104	B2-U0-G2	6032	58	B0-U0-G2	10712	103	B2-U0-G2	7488	72	5928	57	B0-U0-G2	11232	108	B2-U0-G2	12272	118	B4-U0-G2	104
VSS-1-48L-7-40K7	11752	113	B2-U0-G2	6448	62	B0-U0-G2	11648	112	B2-U0-G2	7904	76	6344	61	B0-U0-G2	12168	117	B2-U0-G2	13312	128	B4-U0-G2	104
VSS-1-48L-7-50K7	12688	122	B2-U0-G2	6864	66	B0-U0-G2	12480	120	B2-U0-G2	8320	80	6760	65	B0-U0-G2	13104	126	B3-U0-G3	14248	137	B4-U0-G2	104
VSS-1-48L-1-30K7	16559	106	B3-U0-G3	9048	58	B0-U0-G2	15756	101	B3-U0-G3	11232	72	8892	57	B1-U0-G2	15912	102	B3-U0-G3	16536	106	B4-U0-G2	156
VSS-1-48L-1-40K7	17160	110	B3-U0-G3	9672	62	B1-U0-G2	17004	109	B3-U0-G3	11856	76	9516	61	B1-U0-G2	17316	111	B3-U0-G3	17940	115	B4-U0-G2	156
VSS-1-48L-1-50K7	18408	118	B3-U0-G3	10296	66	B1-U0-G2	18252	117	B3-U0-G3	12480	80	10140	65	B1-U0-G2	18408	118	B3-U0-G3	19188	123	B4-U0-G2	156
VSS-1-64L-7-30K7	14144	104	B2-U0-G2	7888	58	B0-U0-G2	13736	101	B3-U0-G3	9792	72	7752	57	B0-U0-G2	14688	108	B3-U0-G3	16048	118	B4-U0-G2	136
VSS-1-64L-7-40K7	15368	113	B3-U0-G3	8432	62	B0-U0-G2	14824	109	B3-U0-G3	10336	76	8296	61	B1-U0-G2	15912	117	B3-U0-G3	17408	128	B4-U0-G2	136
VSS-1-64L-7-50K7	16592	122	B3-U0-G3	8976	66	B0-U0-G2	16048	118	B3-U0-G3	10880	80	8840	65	B1-U0-G2	17136	126	B3-U0-G3	18632	137	B4-U0-G2	136
VSS-1-64L-1-30K7	21730	106	B3-U0-G3	11890	58	B1-U0-G2	20705	101	B3-U0-G3	14760	72	11685	57	B1-U0-G2	20910	102	B3-U0-G3	21730	106	B5-U0-G3	205
VSS-1-64L-1-40K7	22550	110	B3-U0-G3	12710	62	B1-U0-G2	22345	109	B3-U0-G3	15580	76	12505	61	B1-U0-G3	22755	111	B3-U0-G3	23575	115	B5-U0-G3	205
VSS-1-64L-1-50K7	24190	118	B3-U0-G3	13530	66	B1-U0-G2	23780	116	B3-U0-G3	16400	80	13325	65	B1-U0-G3	24190	118	B3-U0-G4	25215	123	B5-U0-G3	205

Lumen Maintenance Data							
Ambient Temperature	Drive Current	L90 Hours*	L70 Hours**	30,000 Hours*	50,000 Hours*	60,00 Hours*	100,000 Hours**
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	38,000	96,000	93.0%	85.4%	81.8%	68.8%
*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21							

LED KELVIN RANGE



AMBER 585-600 nm | 2700K 70 CRI | 3000K 70 CRI | 3500K 80 CRI | 4000K 70 CRI | 5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

PRODUCT SPECIFICATIONS

DIMENSION	VSS-1
A	17 in. SQ
B	5 in.
Weight	23 lbs

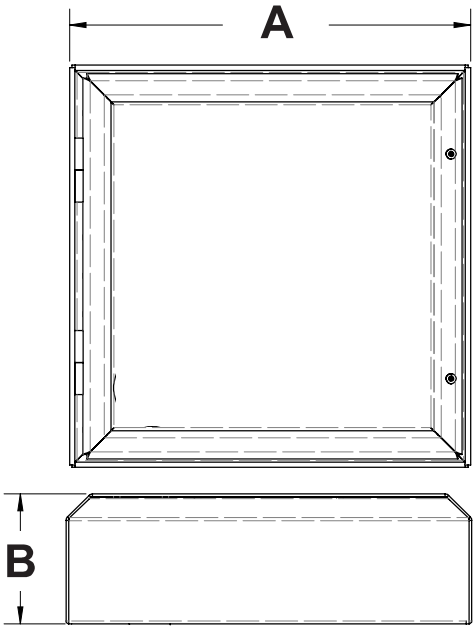
EPA

EPA	SGL	D90	D180	T90	T120	QD
VSS-1	0.90	1.52	1.80	2.34	2.43	2.34

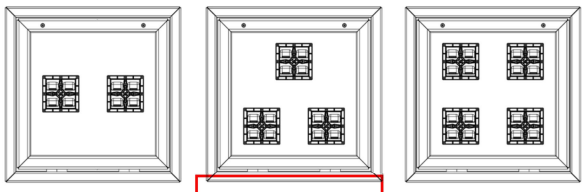
DPX ARM LENGTH

DPX ARM LENGTH	SGL	D90	D180	T90	T120	QD
VSS-1	6"	10"	6"	10"	10"	10"

*6" - **DPX6** | 10" - **DPX10***



OPTICAL CONFIGURATIONS

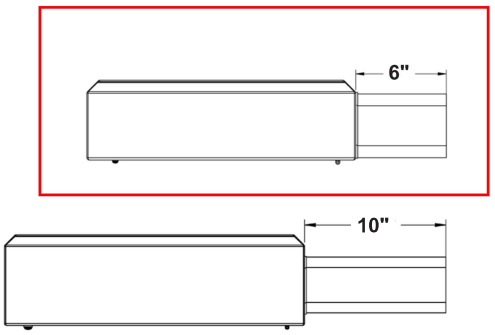


VSS-1 / 32L | VSS-1 / 48L | VSS-1 / 64L

PRODUCT SPECIFICATIONS

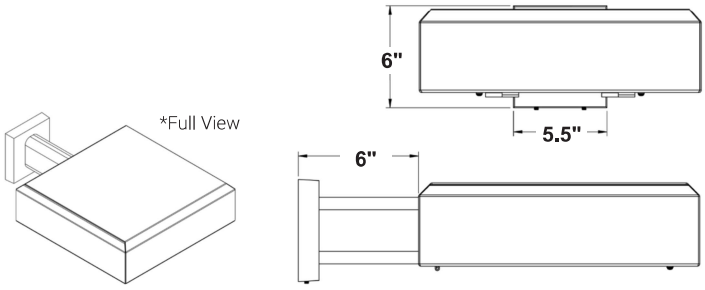
DIRECT POLE (DP)

Standard mounting arm is extruded aluminum in lengths of 6", And 10"
*Arm lengths may vary depending on configuration



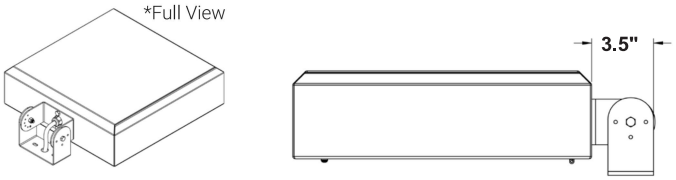
WALL MOUNT (WM)

Cast Aluminum Plate for direct wall mount.
6" extruded aluminum arm mounts directly to a cast wall mount box.



TRUNNION MOUNT (TM)

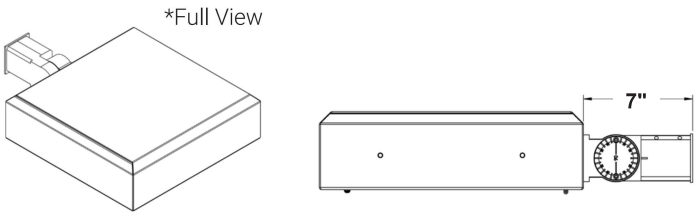
Steel bolt-on-mounting for adjustable installation with a maximum uplift of 90°.



KNUCKLE MOUNT (KM)

Die Cast Knuckle great for adjustable installation on 2-3/8" OD vertical or horizontal tenon.

- Max Uptilt of 110 degrees
- Adjustable in 5 degree increments



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701 Kingshill Place, Carson, CA 90746
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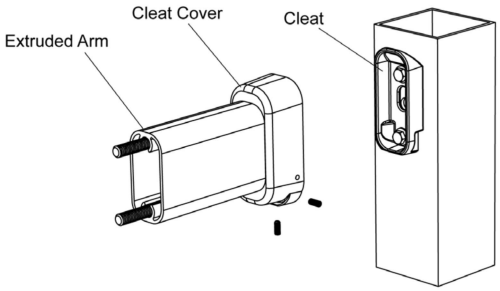
nlslighting.com

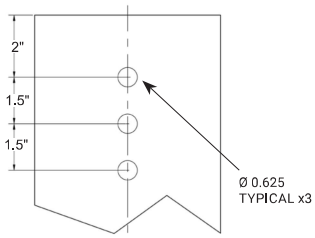
PRODUCT SPECIFICATIONS

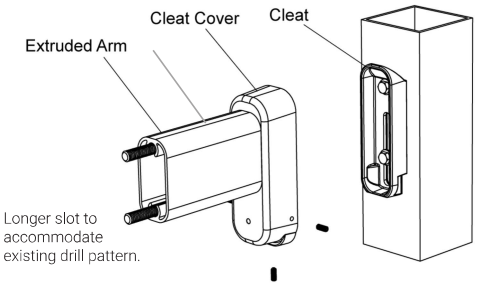
Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures.



QUICK MOUNT BRACKET (QMB)
DIRECT POLE (DP6/DP10)

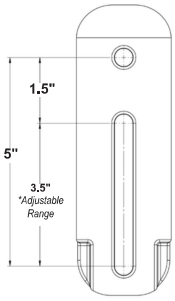
DRILL PATTERN



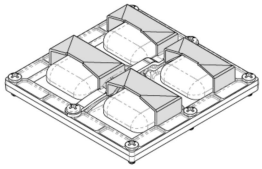


RETROFIT QUICK MOUNT BRACKET (RQMB)

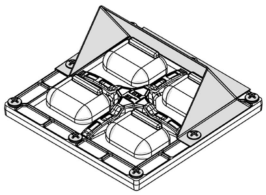
RQMB DRILL PATTERN



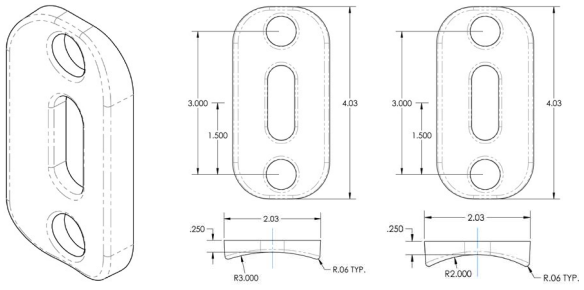
HOUSE SIDE SHIELD



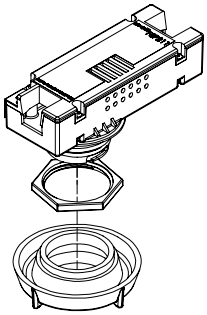
AUTOMOTIVE
HOUSE SIDE SHIELD



RPA4 / RPA5



FSP-211



NLS LIGHTING

VSS-1

SITE LIGHTING

FORM AND FUNCTION

- Sleek, low profile housing
- Engineered for optimum thermal management
- Low depreciation rate
- Optical system designed for:
  - Parking Lots
  - Commercial Applications

CONSTRUCTION

- Die Formed heavy duty Aluminum
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP-65 seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP-67 level seal around each PCB

BUY AMERICAN

To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).



PROUDLY MADE IN THE U.S.A.

LED WATTAGE CHART

	32L	48L	64L
700 milliamps	71w	104w	136w
1050 milliamps	106w	156w	205w

Project Name:

Type:

Cat#	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
Value Series Square 1 **(VSS-1)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)**	32 **(32L)** 48 **(48L)** 64 **(64L)**	700 **(7)** 1050 **(1)**	Amber 585-600nM **(AMBER)**❺❼ 2700K, 70 CRI **(27K7)**❺ 2700K, 80 CRI **(27K8)**❶❺ 3000K, 70 CRI **(30K7)**❺ 3000K, 80 CRI **(30K8)**❶❺ 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)**❶ 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)**❶	120-277 **(UNV)** 347-480 **(HV)**	Direct Pole 6" Arm Single, D180 **(DPS6)**❷ Direct Pole 10" Arm D90, T90, T120, Quad **(DPS10)**❷ Knuckle Mount **(KM)** Wall Mount **(WM)**❸ Tennis Arm **(TA)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Custom **(CS)**	Bird Spikes **(BS)** Marine Grade Finish **(MGF)** Photocell **(PC)**❹ Nema 7-Pin Receptacle **(PE7)** Photocell + Receptacle **(PCR)** Receptacle + Shorting Cap **(PER)** FSP-211 with Motion Sensor **(FSP-8)**❹*8'+ Below* **(FSP-20)**❹*9'-20'Heights* **(FSP-40)**❹*21'-40' Heights* Quick Mount Bracket **(QMB)** Retrofit Mount Bracket **(RQMB)** Round Pole Adaptor 3"- 4" Pole **(RPA4)** Round Pole Adaptor 5"- 6" Pole **(RPA5)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Automotive House Side Shield **(AHS)** House Side Shield **(HSS)** Buy American **(BAA)**❽ Trade American **(TAA)**❽ Build America Buy American **(BABA)**❽ Custom Controls Integration **(CCI)**❻

Notes:

❶ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
❷ For Round Pole Specify RPA4 or RPA5
❸ Includes 6" Bolt On Arm
❹ Universal Voltage 120-277
❺ 3000K or lower must be selected to meet International Dark Sky Association certification
❻ Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
❼ Turtle Safe
❽ Consult factory for all BAA/TAA/BABA requests

PRODUCT SPECIFICATIONS

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP-65 compartment
- CRI 70, 80 or 90
- Color temperatures: Amber, 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplies as standard.

OPTIONS

- **BIRD SPIKES (BS)**—Offers effective and humane deterrent for larger bird species and provides cost-effective long-term solution to nuisance bird infestations and protect your property.
- **MARINE GRADE FINISH (MGF)**—A multi-step process creating protective finishing coat against harsh environments.
  - Chemically washed in a 5 stage cleaning system.
  - Pre-baked
  - Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer.
  - 1-2 feet inside pole coverage top and bottom.
  - Oven Baked.
  - Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- **SHIELDS (HSS, AHS)**—House Side Shield (HSS) is designed for full property line cut-off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.
- **ROUND POLE ADAPTER (RPA)–** When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3"-4" round poles, and RPA5 when installing on 5"-6" round poles.

CONTROLS

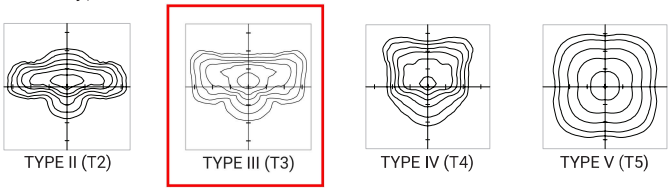
- **FSP-211 (FSP-X)**—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
  - FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.
- **NEMA 7-PIN RECEPTACLE (PE7)**—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

• Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

OPTICS

Silicone optics high photothermal stability and light output provides higher powered LEDs with minimized lumen depreciation LED life. UV and thermal stability with scratch resistance increases exterior application durability.

- IES Types



FINISH

- 5 mils electrostatic powder coat.
- NLS' standard high-quality finishes prevent corrosion protects against extreme environmental conditions

WARRANTY

Five-year limited warranty for drivers and LEDs.

LISTINGS

- Certified to UL 1598
- CSA C22.2 No. 250.0
- IP65/ IP67 Rated
- Dark Sky Approved
- IK10 Rated

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/wp-content/uploads/cs/NLS_BuyAmerica(n).pdf

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
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nlslighting.com

PRODUCT SPECIFICATIONS

LUMENS

PART NUMBER	T2	LM/W	BUG	T3 HSS	LM/W	BUG	T3	LM/W	BUG	T4 AHS	LM/W	T4 HSS	LM/W	BUG	T4	LM/W	BUG	T5	LM/W	BUG	Watts
VSS-1-32L-7-30K7	7384	104	B1-U0-G1	4118	58	B0-U0-G1	7242	102	B2-U0-G2	5112	72	4047	57	B0-U0-G1	7668	108	B2-U0-G2	8179	115	B3-U0-G2	71
VSS-1-32L-7-40K7	8023	113	B2-U0-G2	4402	62	B0-U0-G1	7952	112	B2-U0-G2	5396	76	4331	61	B0-U0-G1	8307	117	B2-U0-G2	8946	126	B3-U0-G2	71
VSS-1-32L-7-50K7	8662	122	B2-U0-G2	4686	66	B0-U0-G1	8520	120	B2-U0-G2	5680	80	4615	65	B0-U0-G2	8946	126	B2-U0-G2	9585	135	B3-U0-G2	71
VSS-1-32L-1-30K7	10706	101	B2-U0-G2	6148	58	B0-U0-G2	10600	100	B2-U0-G2	7632	72	6042	57	B0-U0-G2	10812	102	B2-U0-G2	11125	105	B4-U0-G2	106
VSS-1-32L-1-40K7	11660	110	B2-U0-G2	6572	62	B0-U0-G2	11554	109	B2-U0-G2	8056	76	6466	61	B0-U0-G2	11766	111	B2-U0-G2	12190	115	B4-U0-G2	106
VSS-1-32L-1-50K7	12508	118	B2-U0-G2	6996	66	B0-U0-G2	12402	117	B2-U0-G2	8480	80	6890	65	B0-U0-G2	12508	118	B2-U0-G2	13144	124	B4-U0-G2	106
VSS-1-48L-7-30K7	10816	104	B2-U0-G2	6032	58	B0-U0-G2	10712	103	B2-U0-G2	7488	72	5928	57	B0-U0-G2	11232	108	B2-U0-G2	12272	118	B4-U0-G2	104
VSS-1-48L-7-40K7	11752	113	B2-U0-G2	6448	62	B0-U0-G2	11648	112	B2-U0-G2	7904	76	6344	61	B0-U0-G2	12168	117	B2-U0-G2	13312	128	B4-U0-G2	104
VSS-1-48L-7-50K7	12688	122	B2-U0-G2	6864	66	B0-U0-G2	12480	120	B2-U0-G2	8320	80	6760	65	B0-U0-G2	13104	126	B3-U0-G3	14248	137	B4-U0-G2	104
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VSS-1-48L-1-50K7	18408	118	B3-U0-G3	10296	66	B1-U0-G2	18252	117	B3-U0-G3	12480	80	10140	65	B1-U0-G2	18408	118	B3-U0-G3	19188	123	B4-U0-G2	156
VSS-1-64L-7-30K7	14144	104	B2-U0-G2	7888	58	B0-U0-G2	13736	101	B3-U0-G3	9792	72	7752	57	B0-U0-G2	14688	108	B3-U0-G3	16048	118	B4-U0-G2	136
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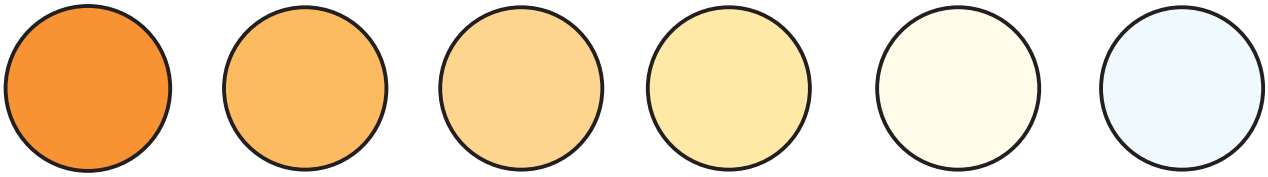
VSS-1-64L-1-30K7	21730	106	B3-U0-G3	11890	58	B1-U0-G2	20705	101	B3-U0-G3	14760	72	11685	57	B1-U0-G2	20910	102	B3-U0-G3	21730	106	B5-U0-G3	205
VSS-1-64L-1-40K7	22550	110	B3-U0-G3	12710	62	B1-U0-G2	22345	109	B3-U0-G3	15580	76	12505	61	B1-U0-G3	22755	111	B3-U0-G3	23575	115	B5-U0-G3	205
VSS-1-64L-1-50K7	24190	118	B3-U0-G3	13530	66	B1-U0-G2	23780	116	B3-U0-G3	16400	80	13325	65	B1-U0-G3	24190	118	B3-U0-G4	25215	123	B5-U0-G3	205

Lumen Maintenance Data							
Ambient Temperature	Drive Current	L90 Hours*	L70 Hours**	30,000 Hours*	50,000 Hours*	60,00 Hours*	100,000 Hours**
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	38,000	96,000	93.0%	85.4%	81.8%	68.8%
*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21							

LED KELVIN RANGE



AMBER 585-600 nm | 2700K 70 CRI | 3000K 70 CRI | 3500K 80 CRI | 4000K 70 CRI | 5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

PRODUCT SPECIFICATIONS

DIMENSION	VSS-1
A	17 in. SQ
B	5 in.
Weight	23 lbs

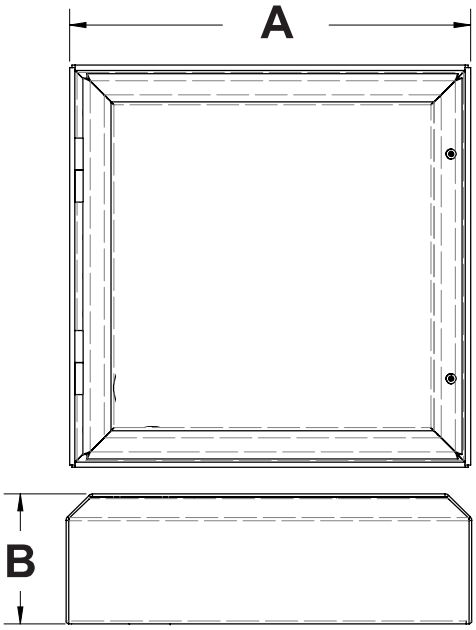
EPA

EPA	SGL	D90	D180	T90	T120	QD
VSS-1	0.90	1.52	1.80	2.34	2.43	2.34

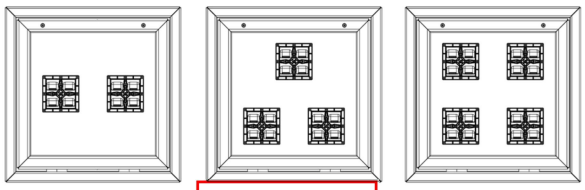
DPX ARM LENGTH

DPX ARM LENGTH	SGL	D90	D180	T90	T120	QD
VSS-1	6"	10"	6"	10"	10"	10"

*6" - **DPX6** | 10" - **DPX10***



OPTICAL CONFIGURATIONS

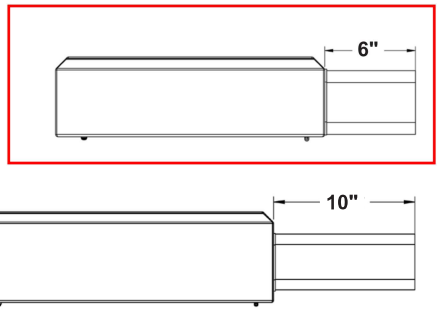


VSS-1 / 32L | VSS-1 / 48L | VSS-1 / 64L

PRODUCT SPECIFICATIONS

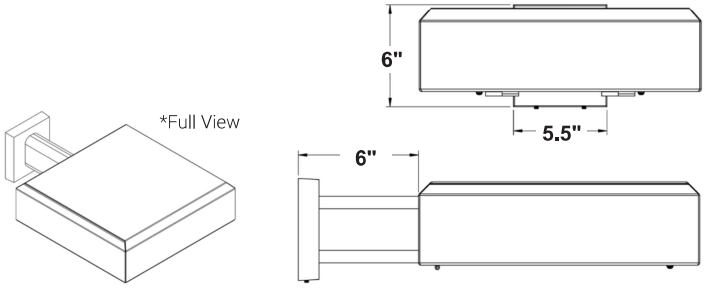
DIRECT POLE (DP)

Standard mounting arm is extruded aluminum in lengths of 6", And 10"
*Arm lengths may vary depending on configuration



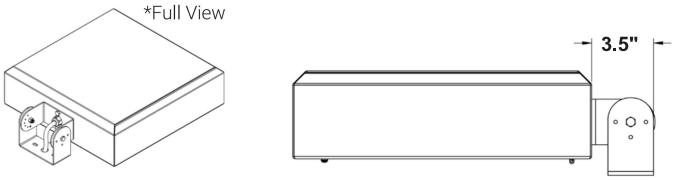
WALL MOUNT (WM)

Cast Aluminum Plate for direct wall mount.
6" extruded aluminum arm mounts directly to a cast wall mount box.



TRUNNION MOUNT (TM)

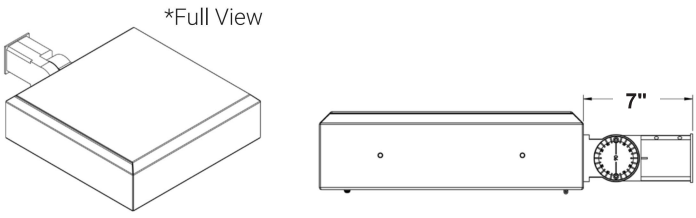
Steel bolt-on-mounting for adjustable installation with a maximum uplift of 90°.



KNUCKLE MOUNT (KM)

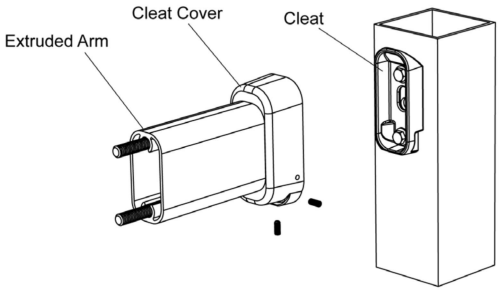
Die Cast Knuckle great for adjustable installation on 2-3/8" OD vertical or horizontal tenon.

- Max Uptilt of 110 degrees
- Adjustable in 5 degree increments



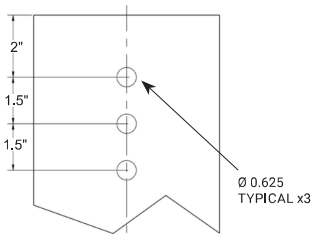
PRODUCT SPECIFICATIONS

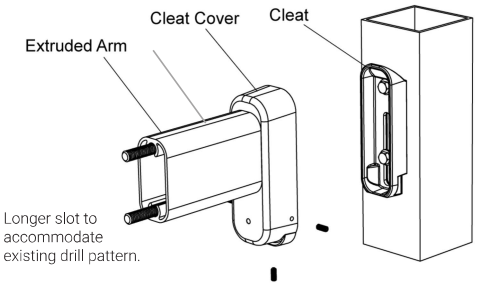
Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures.



QUICK MOUNT BRACKET (QMB)
DIRECT POLE (DP6/DP10)

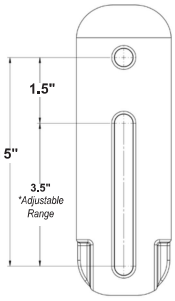
DRILL PATTERN



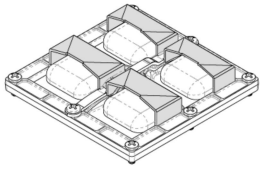


RETROFIT QUICK MOUNT BRACKET (RQMB)

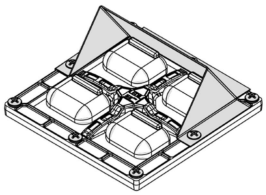
RQMB DRILL PATTERN



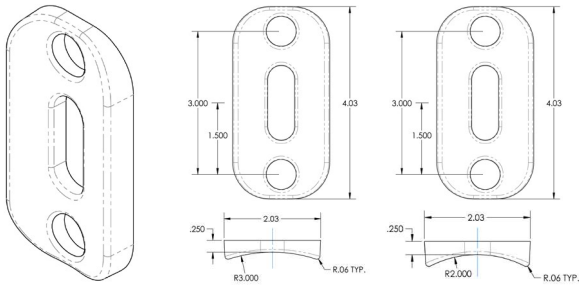
HOUSE SIDE SHIELD



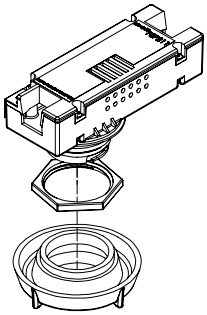
AUTOMOTIVE
HOUSE SIDE SHIELD



RPA4 / RPA5



FSP-211



NLS LIGHTING

VSS-1

SITE LIGHTING

FORM AND FUNCTION
- Sleek, low profile housing
- Engineered for optimum thermal management
- Low depreciation rate
- Optical system designed for:
  - Parking Lots
  - Commercial Applications

CONSTRUCTION
- Die Formed heavy duty Aluminum
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP-65 seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP-67 level seal around each PCB

BUY AMERICAN
To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).



PROUDLY MADE IN THE U.S.A.

LED WATTAGE CHART

	32L	48L	64L
700 milliamps	71w	104w	136w
1050 milliamps	106w	156w	205w

Project Name:

Type:

Cat#	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
Value Series Square 1 **(VSS-1)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)**	32 **(32L)** 48 **(48L)** 64 **(64L)**	700 **(7)** 1050 **(1)**	Amber 585-600nM **(AMBER)**❺❼ 2700K, 70 CRI **(27K7)**❺ 2700K, 80 CRI **(27K8)**❶❺ 3000K, 70 CRI **(30K7)**❺ 3000K, 80 CRI **(30K8)**❶❺ 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)**❶ 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)**❶	120-277 **(UNV)** 347-480 **(HV)**	Direct Pole 6" Arm Single, DT80 **(DPS6)**❷ Direct Pole 10" Arm D90, T90, T120, Quad **(DPS10)**❷ Knuckle Mount **(KM)** Wall Mount **(WM)**❸ Tennis Arm **(TA)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Custom **(CS)**	Bird Spikes **(BS)** Marine Grade Finish **(MGF)** Photocell **(PC)**❹ Nema 7-Pin Receptacle **(PE7)** Photocell + Receptacle **(PCR)** Receptacle + Shorting Cap **(PER)** FSP-211 with Motion Sensor **(FSP-8)**❹*8'+ Below* **(FSP-20)**❹*9'-20'Heights* **(FSP-40)**❹*21'-40' Heights* Quick Mount Bracket **(QMB)** Retrofit Mount Bracket **(RQMB)** Round Pole Adaptor 3"- 4" Pole **(RPA4)** Round Pole Adaptor 5"- 6" Pole **(RPA5)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Automotive House Side Shield **(AHS)** House Side Shield **(HSS)** Buy American **(BAA)**❽ Trade American **(TAA)**❽ Build America Buy American **(BABA)**❽ Custom Controls Integration **(CCI)**❻

Notes:
❶ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
❷ For Round Pole Specify RPA4 or RPA5
❸ Includes 6" Bolt On Arm
❹ Universal Voltage 120-277
❺ 3000K or lower must be selected to meet International Dark Sky Association certification
❻ Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
❼ Turtle Safe
❽ Consult factory for all BAA/TAA/BABA requests

PRODUCT SPECIFICATIONS

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP-65 compartment
- CRI 70, 80 or 90
- Color temperatures: Amber, 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplies as standard.

OPTIONS

- **BIRD SPIKES (BS)**—Offers effective and humane deterrent for larger bird species and provides cost-effective long-term solution to nuisance bird infestations and protect your property.
- **MARINE GRADE FINISH (MGF)**—A multi-step process creating protective finishing coat against harsh environments.
  - Chemically washed in a 5 stage cleaning system.
  - Pre-baked
  - Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer.
  - 1-2 feet inside pole coverage top and bottom.
  - Oven Baked.
  - Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- **SHIELDS (HSS, AHS)**—House Side Shield (HSS) is designed for full property line cut-off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.
- **ROUND POLE ADAPTER (RPA)–** When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3"-4" round poles, and RPA5 when installing on 5"-6" round poles.

CONTROLS

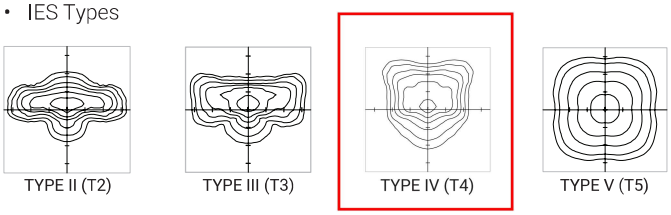
- **FSP-211 (FSP-X)**—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
  - FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.
- **NEMA 7-PIN RECEPTACLE (PE7)**—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

• Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

OPTICS

Silicone optics high photothermal stability and light output provides higher powered LEDs with minimized lumen depreciation LED life. UV and thermal stability with scratch resistance increases exterior application durability.

- IES Types



TYPE II (T2) | TYPE III (T3) | TYPE IV (T4) | TYPE V (T5)

FINISH

- 5 mils electrostatic powder coat.
- NLS' standard high-quality finishes prevent corrosion protects against extreme environmental conditions

WARRANTY

Five-year limited warranty for drivers and LEDs.

LISTINGS

- Certified to UL 1598
- CSA C22.2 No. 250.0
- IP65/ IP67 Rated
- Dark Sky Approved
- IK10 Rated

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/wp-content/uploads/cs/NLS_BuyAmerica(n).pdf

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

PRODUCT SPECIFICATIONS

LUMENS

PART NUMBER	T2	LM/W	BUG	T3 HSS	LM/W	BUG	T3	LM/W	BUG	T4 AHS	LM/W	T4 HSS	LM/W	BUG	T4	LM/W	BUG	T5	LM/W	BUG	Watts
VSS-1-32L-7-30K7	7384	104	B1-U0-G1	4118	58	B0-U0-G1	7242	102	B2-U0-G2	5112	72	4047	57	B0-U0-G1	7668	108	B2-U0-G2	8179	115	B3-U0-G2	71
VSS-1-32L-7-40K7	8023	113	B2-U0-G2	4402	62	B0-U0-G1	7952	112	B2-U0-G2	5396	76	4331	61	B0-U0-G1	8307	117	B2-U0-G2	8946	126	B3-U0-G2	71
VSS-1-32L-7-50K7	8662	122	B2-U0-G2	4686	66	B0-U0-G1	8520	120	B2-U0-G2	5680	80	4615	65	B0-U0-G2	8946	126	B2-U0-G2	9585	135	B3-U0-G2	71
VSS-1-32L-1-30K7	10706	101	B2-U0-G2	6148	58	B0-U0-G2	10600	100	B2-U0-G2	7632	72	6042	57	B0-U0-G2	10812	102	B2-U0-G2	11125	105	B4-U0-G2	106
VSS-1-32L-1-40K7	11660	110	B2-U0-G2	6572	62	B0-U0-G2	11554	109	B2-U0-G2	8056	76	6466	61	B0-U0-G2	11766	111	B2-U0-G2	12190	115	B4-U0-G2	106
VSS-1-32L-1-50K7	12508	118	B2-U0-G2	6996	66	B0-U0-G2	12402	117	B2-U0-G2	8480	80	6890	65	B0-U0-G2	12508	118	B2-U0-G2	13144	124	B4-U0-G2	106
VSS-1-48L-7-30K7	10816	104	B2-U0-G2	6032	58	B0-U0-G2	10712	103	B2-U0-G2	7488	72	5928	57	B0-U0-G2	11232	108	B2-U0-G2	12272	118	B4-U0-G2	104
VSS-1-48L-7-40K7	11752	113	B2-U0-G2	6448	62	B0-U0-G2	11648	112	B2-U0-G2	7904	76	6344	61	B0-U0-G2	12168	117	B2-U0-G2	13312	128	B4-U0-G2	104
VSS-1-48L-7-50K7	12688	122	B2-U0-G2	6864	66	B0-U0-G2	12480	120	B2-U0-G2	8320	80	6760	65	B0-U0-G2	13104	126	B3-U0-G3	14248	137	B4-U0-G2	104
VSS-1-48L-1-30K7	16559	106	B3-U0-G3	9048	58	B0-U0-G2	15756	101	B3-U0-G3	11232	72	8892	57	B1-U0-G2	15912	102	B3-U0-G3	16536	106	B4-U0-G2	156
VSS-1-48L-1-40K7	17160	110	B3-U0-G3	9672	62	B1-U0-G2	17004	109	B3-U0-G3	11856	76	9516	61	B1-U0-G2	17316	111	B3-U0-G3	17940	115	B4-U0-G2	156
VSS-1-48L-1-50K7	18408	118	B3-U0-G3	10296	66	B1-U0-G2	18252	117	B3-U0-G3	12480	80	10140	65	B1-U0-G2	18408	118	B3-U0-G3	19188	123	B4-U0-G2	156
VSS-1-64L-7-30K7	14144	104	B2-U0-G2	7888	58	B0-U0-G2	13736	101	B3-U0-G3	9792	72	7752	57	B0-U0-G2	14688	108	B3-U0-G3	16048	118	B4-U0-G2	136
VSS-1-64L-7-40K7	15368	113	B3-U0-G3	8432	62	B0-U0-G2	14824	109	B3-U0-G3	10336	76	8296	61	B1-U0-G2	15912	117	B3-U0-G3	17408	128	B4-U0-G2	136
VSS-1-64L-7-50K7	16592	122	B3-U0-G3	8976	66	B0-U0-G2	16048	118	B3-U0-G3	10880	80	8840	65	B1-U0-G2	17136	126	B3-U0-G3	18632	137	B4-U0-G2	136
VSS-1-64L-1-30K7	21730	106	B3-U0-G3	11890	58	B1-U0-G2	20705	101	B3-U0-G3	14760	72	11685	57	B1-U0-G2	20910	102	B3-U0-G3	21730	106	B5-U0-G3	205
VSS-1-64L-1-40K7	22550	110	B3-U0-G3	12710	62	B1-U0-G2	22345	109	B3-U0-G3	15580	76	12505	61	B1-U0-G3	22755	111	B3-U0-G3	23575	115	B5-U0-G3	205
VSS-1-64L-1-50K7	24190	118	B3-U0-G3	13530	66	B1-U0-G2	23780	116	B3-U0-G3	16400	80	13325	65	B1-U0-G3	24190	118	B3-U0-G4	25215	123	B5-U0-G3	205

Lumen Maintenance Data							
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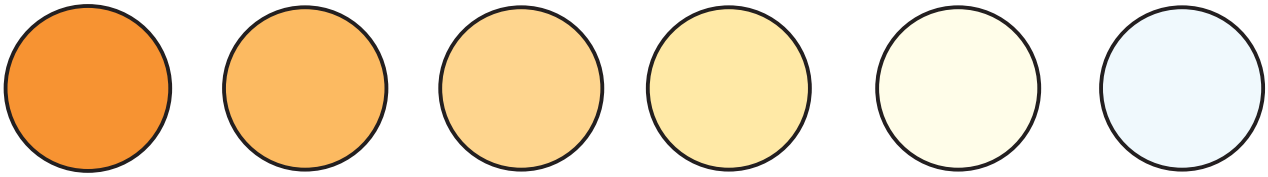
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	38,000	96,000	93.0%	85.4%	81.8%	68.8%
*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21							

LED KELVIN RANGE



AMBER 585-600 nm | 2700K 70 CRI | 3000K 70 CRI | 3500K 80 CRI | 4000K 70 CRI | 5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

PRODUCT SPECIFICATIONS

DIMENSION	VSS-1
A	17 in. SQ
B	5 in.
Weight	23 lbs

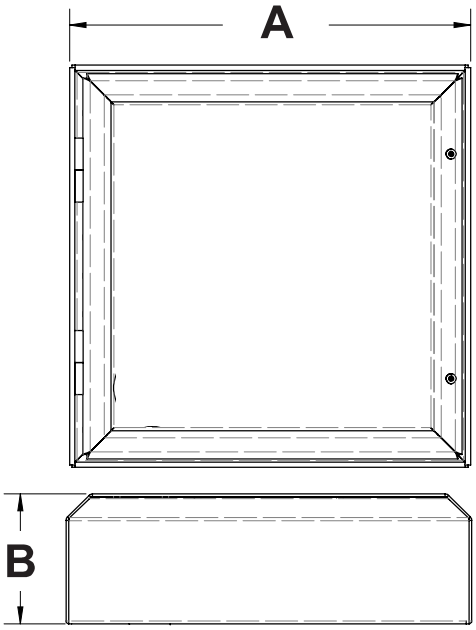
EPA

EPA	SGL	D90	D180	T90	T120	QD
VSS-1	0.90	1.52	1.80	2.34	2.43	2.34

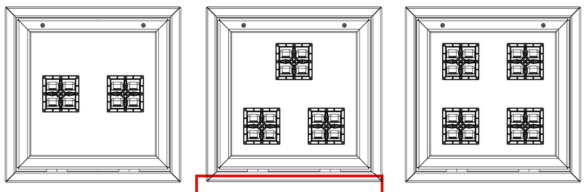
DPX ARM LENGTH

DPX ARM LENGTH	SGL	D90	D180	T90	T120	QD
VSS-1	6"	10"	6"	10"	10"	10"

*6" - **DPX6** | 10" - **DPX10***



OPTICAL CONFIGURATIONS

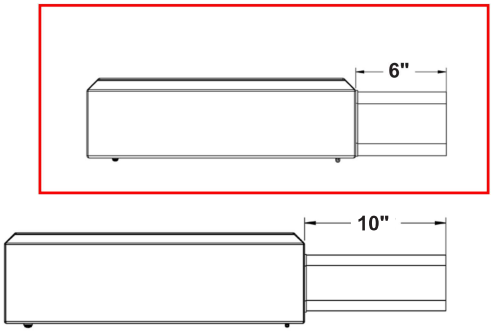


VSS-1 / 32L | **VSS-1 / 48L** | VSS-1 / 64L

PRODUCT SPECIFICATIONS

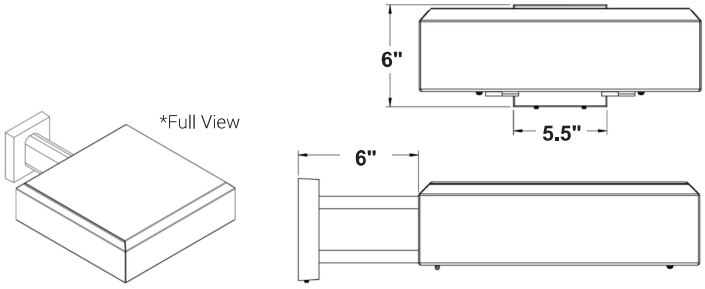
DIRECT POLE (DP)

Standard mounting arm is extruded aluminum in lengths of 6", And 10"
*Arm lengths may vary depending on configuration



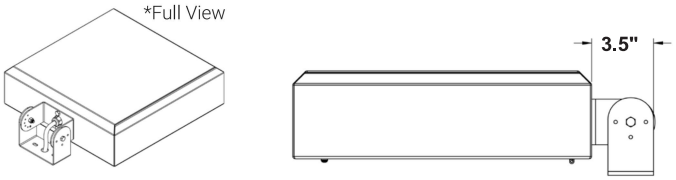
WALL MOUNT (WM)

Cast Aluminum Plate for direct wall mount.
6" extruded aluminum arm mounts directly to a cast wall mount box.



TRUNNION MOUNT (TM)

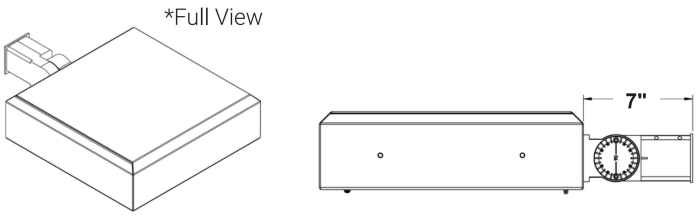
Steel bolt-on-mounting for adjustable installation with a maximum uplift of 90°.



KNUCKLE MOUNT (KM)

Die Cast Knuckle great for adjustable installation on 2-3/8" OD vertical or horizontal tenon.

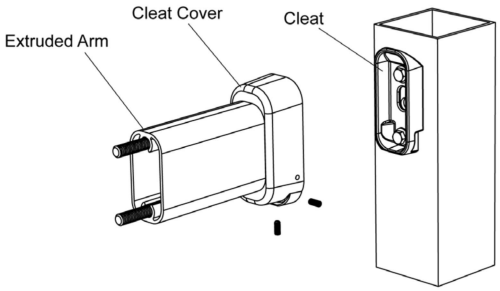
- Max Uptilt of 110 degrees
- Adjustable in 5 degree increments



NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
Call Us Today (310) 341-2037
nlslighting.com

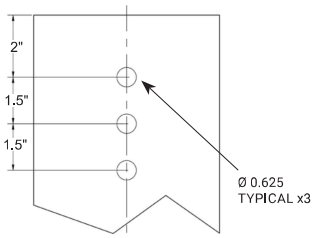
PRODUCT SPECIFICATIONS

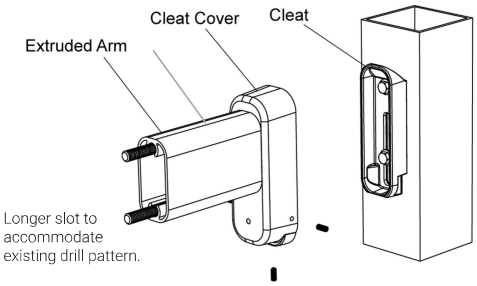
Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures.



QUICK MOUNT BRACKET (QMB)
DIRECT POLE (DP6/DP10)

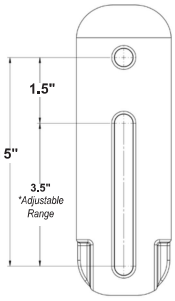
DRILL PATTERN



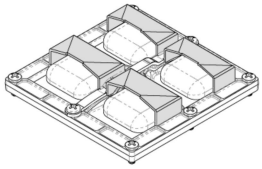


RETROFIT QUICK MOUNT BRACKET (RQMB)

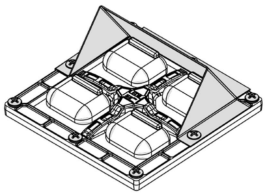
RQMB DRILL PATTERN



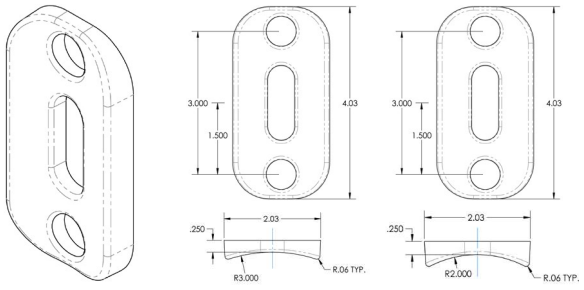
HOUSE SIDE SHIELD



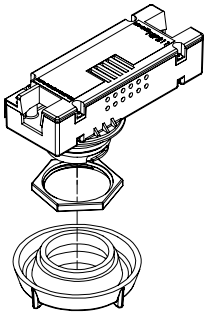
AUTOMOTIVE
HOUSE SIDE SHIELD



RPA4 / RPA5



FSP-211



NLS LIGHTING

VSS-1

SITE LIGHTING

FORM AND FUNCTION
- Sleek, low profile housing
- Engineered for optimum thermal management
- Low depreciation rate
- Optical system designed for:
  - Parking Lots
  - Commercial Applications

CONSTRUCTION
- Die Formed heavy duty Aluminum
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP-65 seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP-67 level seal around each PCB

BUY AMERICAN
To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).



PROUDLY MADE IN THE U.S.A.

LED WATTAGE CHART

	32L	48L	64L
700 milliamps	71w	104w	136w
1050 milliamps	106w	156w	205w

Project Name:

Type:

Cat#	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
Value Series Square 1 **(VSS-1)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)**	32 **(32L)** 48 **(48L)** 64 **(64L)**	700 **(7)** 1050 **(1)**	Amber 585-600nM **(AMBER)**❺❼ 2700K, 70 CRI **(27K7)**❺ 2700K, 80 CRI **(27K8)**❶❺ 3000K, 70 CRI **(30K7)**❺ 3000K, 80 CRI **(30K8)**❶❺ 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)**❶ 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)**❶	120-277 **(UNV)** 347-480 **(HV)**	Direct Pole 6" Arm Single, D180 **(DPS6)**❷ Direct Pole 10" Arm D90, T90, T120, Quad **(DPS10)**❷ Knuckle Mount **(KM)** Wall Mount **(WM)**❸ Tennis Arm **(TA)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Custom **(CS)**	Bird Spikes **(BS)** Marine Grade Finish **(MGF)** Photocell **(PC)**❹ Nema 7-Pin Receptacle **(PE7)** Photocell + Receptacle **(PCR)** Receptacle + Shorting Cap **(PER)** FSP-211 with Motion Sensor **(FSP-8)**❹*8'+ Below* **(FSP-20)**❹*9'-20'Heights* **(FSP-40)**❹*21'-40' Heights* Quick Mount Bracket **(QMB)** Retrofit Mount Bracket **(RQMB)** Round Pole Adaptor 3"- 4" Pole **(RPA4)** Round Pole Adaptor 5"- 6" Pole **(RPA5)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Automotive House Side Shield **(AHS)** House Side Shield **(HSS)** Buy American **(BAA)**❽ Trade American **(TAA)**❽ Build America Buy American **(BABA)**❽ Custom Controls Integration **(CCI)**❻

Notes:
❶ Consult Factory for Lead Time. Consult Factory for 90 CRI Requests.
❷ For Round Pole Specify RPA4 or RPA5
❸ Includes 6" Bolt On Arm
❹ Universal Voltage 120-277
❺ 3000K or lower must be selected to meet International Dark Sky Association certification
❻ Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
❼ Turtle Safe
❽ Consult factory for all BAA/TAA/BABA requests

PRODUCT SPECIFICATIONS

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP-65 compartment
- CRI 70, 80 or 90
- Color temperatures: Amber, 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplies as standard.

OPTIONS

- **BIRD SPIKES (BS)**—Offers effective and humane deterrent for larger bird species and provides cost-effective long-term solution to nuisance bird infestations and protect your property.
- **MARINE GRADE FINISH (MGF)**—A multi-step process creating protective finishing coat against harsh environments.
  - Chemically washed in a 5 stage cleaning system.
  - Pre-baked
  - Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer.
  - 1-2 feet inside pole coverage top and bottom.
  - Oven Baked.
  - Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- **SHIELDS (HSS, AHS)**—House Side Shield (HSS) is designed for full property line cut-off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.
- **ROUND POLE ADAPTER (RPA)–** When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3"-4" round poles, and RPA5 when installing on 5"-6" round poles.

CONTROLS

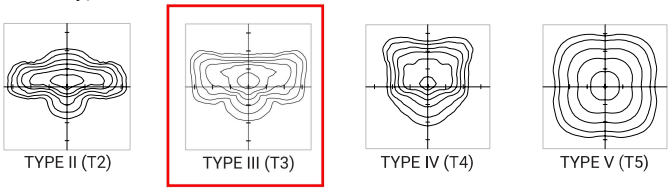
- **FSP-211 (FSP-X)**—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
  - FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.
- **NEMA 7-PIN RECEPTACLE (PE7)**—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

• Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

OPTICS

Silicone optics high photothermal stability and light output provides higher powered LEDs with minimized lumen depreciation LED life. UV and thermal stability with scratch resistance increases exterior application durability.

- IES Types



FINISH

- 5 mils electrostatic powder coat.
- NLS' standard high-quality finishes prevent corrosion protects against extreme environmental conditions

WARRANTY

Five-year limited warranty for drivers and LEDs.

LISTINGS

- Certified to UL 1598
- CSA C22.2 No. 250.0
- IP65/ IP67 Rated
- Dark Sky Approved
- IK10 Rated

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/wp-content/uploads/cs/NLS_BuyAmerica(n).pdf

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

NLS LIGHTING
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nlslighting.com

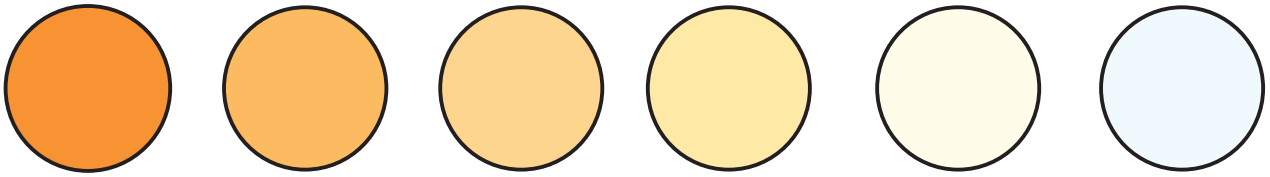
PRODUCT SPECIFICATIONS

LUMENS

PART NUMBER	T2	LM/W	BUG	T3 HSS	LM/W	BUG	T3	LM/W	BUG	T4 AHS	LM/W	T4 HSS	LM/W	BUG	T4	LM/W	BUG	T5	LM/W	BUG	Watts
VSS-1-32L-7-30K7	7384	104	B1-U0-G1	4118	58	B0-U0-G1	7242	102	B2-U0-G2	5112	72	4047	57	B0-U0-G1	7668	108	B2-U0-G2	8179	115	B3-U0-G2	71
VSS-1-32L-7-40K7	8023	113	B2-U0-G2	4402	62	B0-U0-G1	7952	112	B2-U0-G2	5396	76	4331	61	B0-U0-G1	8307	117	B2-U0-G2	8946	126	B3-U0-G2	71
VSS-1-32L-7-50K7	8662	122	B2-U0-G2	4686	66	B0-U0-G1	8520	120	B2-U0-G2	5680	80	4615	65	B0-U0-G2	8946	126	B2-U0-G2	9585	135	B3-U0-G2	71
VSS-1-32L-1-30K7	10706	101	B2-U0-G2	6148	58	B0-U0-G2	10600	100	B2-U0-G2	7632	72	6042	57	B0-U0-G2	10812	102	B2-U0-G2	11125	105	B4-U0-G2	106
VSS-1-32L-1-40K7	11660	110	B2-U0-G2	6572	62	B0-U0-G2	11554	109	B2-U0-G2	8056	76	6466	61	B0-U0-G2	11766	111	B2-U0-G2	12190	115	B4-U0-G2	106
VSS-1-32L-1-50K7	12508	118	B2-U0-G2	6996	66	B0-U0-G2	12402	117	B2-U0-G2	8480	80	6890	65	B0-U0-G2	12508	118	B2-U0-G2	13144	124	B4-U0-G2	106
VSS-1-48L-7-30K7	10816	104	B2-U0-G2	6032	58	B0-U0-G2	10712	103	B2-U0-G2	7488	72	5928	57	B0-U0-G2	11232	108	B2-U0-G2	12272	118	B4-U0-G2	104
VSS-1-48L-7-40K7	11752	113	B2-U0-G2	6448	62	B0-U0-G2	11648	112	B2-U0-G2	7904	76	6344	61	B0-U0-G2	12168	117	B2-U0-G2	13312	128	B4-U0-G2	104
VSS-1-48L-7-50K7	12688	122	B2-U0-G2	6864	66	B0-U0-G2	12480	120	B2-U0-G2	8320	80	6760	65	B0-U0-G2	13104	126	B3-U0-G3	14248	137	B4-U0-G2	104
VSS-1-48L-1-30K7	16559	106	B3-U0-G3	9048	58	B0-U0-G2	15756	101	B3-U0-G3	11232	72	8892	57	B1-U0-G2	15912	102	B3-U0-G3	16536	106	B4-U0-G2	156
VSS-1-48L-1-40K7	17160	110	B3-U0-G3	9672	62	B1-U0-G2	17004	109	B3-U0-G3	11856	76	9516	61	B1-U0-G2	17316	111	B3-U0-G3	17940	115	B4-U0-G2	156
VSS-1-48L-1-50K7	18408	118	B3-U0-G3	10296	66	B1-U0-G2	18252	117	B3-U0-G3	12480	80	10140	65	B1-U0-G2	18408	118	B3-U0-G3	19188	123	B4-U0-G2	156
VSS-1-64L-7-30K7	14144	104	B2-U0-G2	7888	58	B0-U0-G2	13736	101	B3-U0-G3	9792	72	7752	57	B0-U0-G2	14688	108	B3-U0-G3	16048	118	B4-U0-G2	136
VSS-1-64L-7-40K7	15368	113	B3-U0-G3	8432	62	B0-U0-G2	14824	109	B3-U0-G3	10336	76	8296	61	B1-U0-G2	15912	117	B3-U0-G3	17408	128	B4-U0-G2	136
VSS-1-64L-7-50K7	16592	122	B3-U0-G3	8976	66	B0-U0-G2	16048	118	B3-U0-G3	10880	80	8840	65	B1-U0-G2	17136	126	B3-U0-G3	18632	137	B4-U0-G2	136
VSS-1-64L-1-30K7	21730	106	B3-U0-G3	11890	58	B1-U0-G2	20705	101	B3-U0-G3	14760	72	11685	57	B1-U0-G2	20910	102	B3-U0-G3	21730	106	B5-U0-G3	205
VSS-1-64L-1-40K7	22550	110	B3-U0-G3	12710	62	B1-U0-G2	22345	109	B3-U0-G3	15580	76	12505	61	B1-U0-G3	22755	111	B3-U0-G3	23575	115	B5-U0-G3	205
VSS-1-64L-1-50K7	24190	118	B3-U0-G3	13530	66	B1-U0-G2	23780	116	B3-U0-G3	16400	80	13325	65	B1-U0-G3	24190	118	B3-U0-G4	25215	123	B5-U0-G3	205

Lumen Maintenance Data							
Ambient Temperature	Drive Current	L90 Hours*	L70 Hours**	30,000 Hours*	50,000 Hours*	60,00 Hours*	100,000 Hours**
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	38,000	96,000	93.0%	85.4%	81.8%	68.8%
*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21							

LED KELVIN RANGE



AMBER 585-600 nm | 2700K 70 CRI | 3000K 70 CRI | 3500K 80 CRI | 4000K 70 CRI | 5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

PRODUCT SPECIFICATIONS

DIMENSION	VSS-1
A	17 in. SQ
B	5 in.
Weight	23 lbs

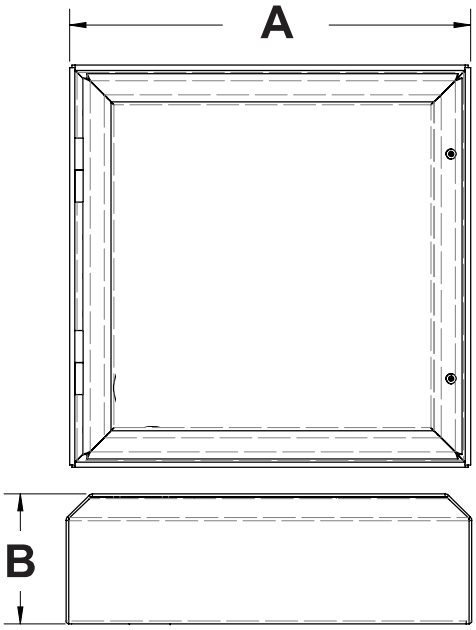
EPA

EPA	SGL	D90	D180	T90	T120	QD
VSS-1	0.90	1.52	1.80	2.34	2.43	2.34

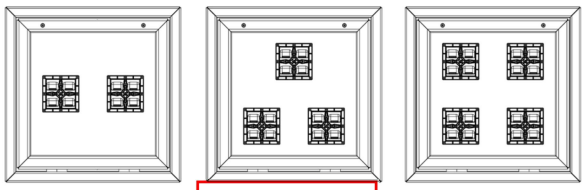
DPX ARM LENGTH

DPX ARM LENGTH	SGL	D90	D180	T90	T120	QD
VSS-1	6"	10"	6"	10"	10"	10"

*6" - **DPX6** | 10" - **DPX10***



OPTICAL CONFIGURATIONS

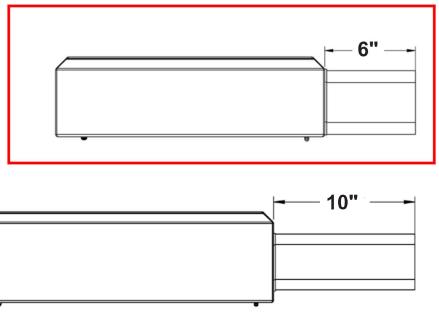


VSS-1 / 32L | VSS-1 / 48L | VSS-1 / 64L

PRODUCT SPECIFICATIONS

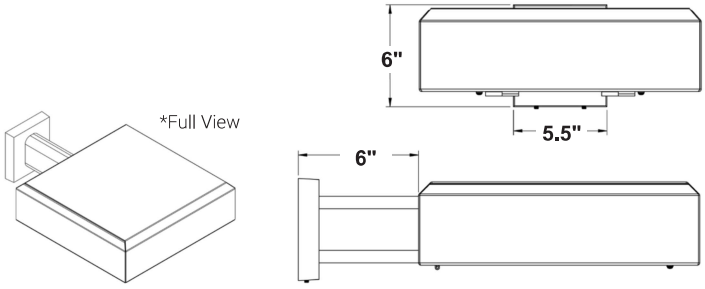
DIRECT POLE (DP)

Standard mounting arm is extruded aluminum in lengths of 6", And 10"
*Arm lengths may vary depending on configuration



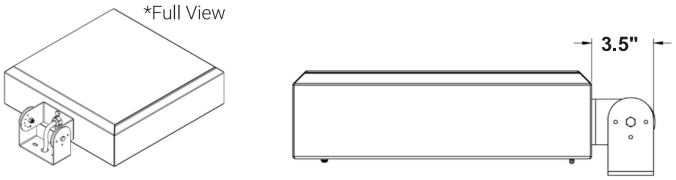
WALL MOUNT (WM)

Cast Aluminum Plate for direct wall mount.
6" extruded aluminum arm mounts directly to a cast wall mount box.



TRUNNION MOUNT (TM)

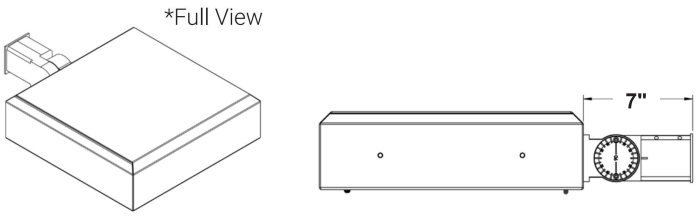
Steel bolt-on-mounting for adjustable installation with a maximum uplift of 90°.



KNUCKLE MOUNT (KM)

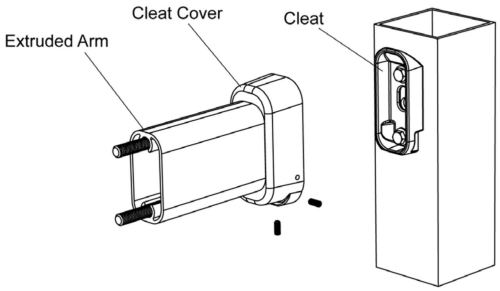
Die Cast Knuckle great for adjustable installation on 2-3/8" OD vertical or horizontal tenon.

- Max Uptilt of 110 degrees
- Adjustable in 5 degree increments



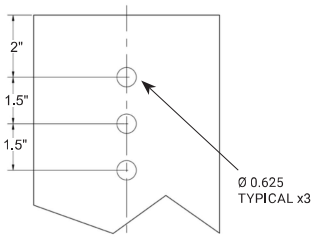
PRODUCT SPECIFICATIONS

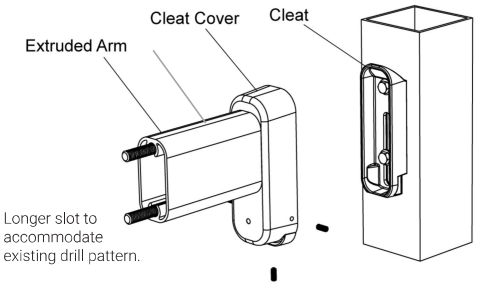
Optional Cast Aluminum Bracket designed for quick mounting on Direct Square or Round Poles. Cleat mounts directly to pole for easily hung fixtures.



QUICK MOUNT BRACKET (QMB)
DIRECT POLE (DP6/DP10)

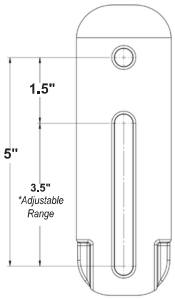
DRILL PATTERN



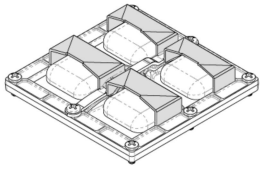


RETROFIT QUICK MOUNT BRACKET (RQMB)

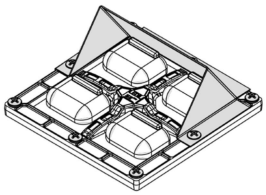
RQMB DRILL PATTERN



HOUSE SIDE SHIELD



AUTOMOTIVE
HOUSE SIDE SHIELD



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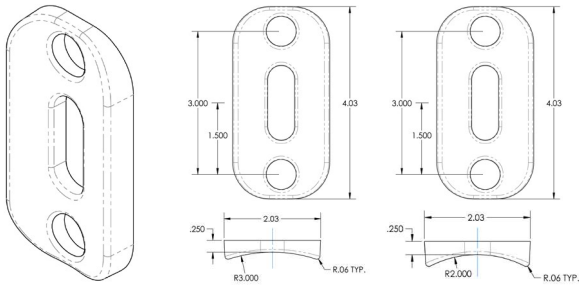
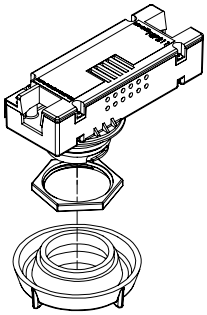


FSP-211



Site Plan and Traffic Advisory Review Committee **1. 3.**

Meeting Date: 07/07/2026

Title

CY32-26

Request of Southwest Minnesota Housing Partnership for an amendment to the previously approved planned unit development, PUD, to allow for the usage of Scheid Hall and to allow for parking lot and related infrastructure improvements at the property. The subject property is described as Outlot B, School Sisters of Notre Dame Subdivision, according to the plat thereof on file at the County Recorder's Office, Blue Earth County, Minnesota, to be described as Lot 1, Block 1, Good Counsel Hill subdivision (170 Good Counsel Drive, BE County PID's R010905379005, R010908201007).

Applicant

The applicant is Southwest Minnesota Housing Partnership.

Request

The applicant is seeking an amendment to a previously approved planned unit development.

Location

The subject property is addressed at 170 Good Counsel Drive and is legally described as Outlot B, School Sisters of Notre Dame Subdivision, according to the plat thereof on file at the County Recorder's Office, Blue Earth County, Minnesota, to be described as Lot 1, Block 1, Good Counsel Hill subdivision. Current Blue Earth County PID's include R010905379005 and R010908201007.

Existing Land Use

The property was previously used by the School Sisters of Notre Dame.

Zoning

The subject property is zoned O-R, Office Residential.

Review

Southwest Minnesota Housing Partnership, SWMHP, is seeking an amendment to the previously approved planned unit development, PUD, to allow for the usage of Scheid Hall and to allow for parking lot and related infrastructure improvements at the property. The subject property is described as Outlot B, School Sisters of Notre Dame Subdivision, according to the plat thereof on file at the County Recorder's Office, Blue Earth County, Minnesota, to be described as Lot 1, Block 1, Good Counsel Hill subdivision (170 Good Counsel Drive, BE County PID's R010905379005, R010908201007).

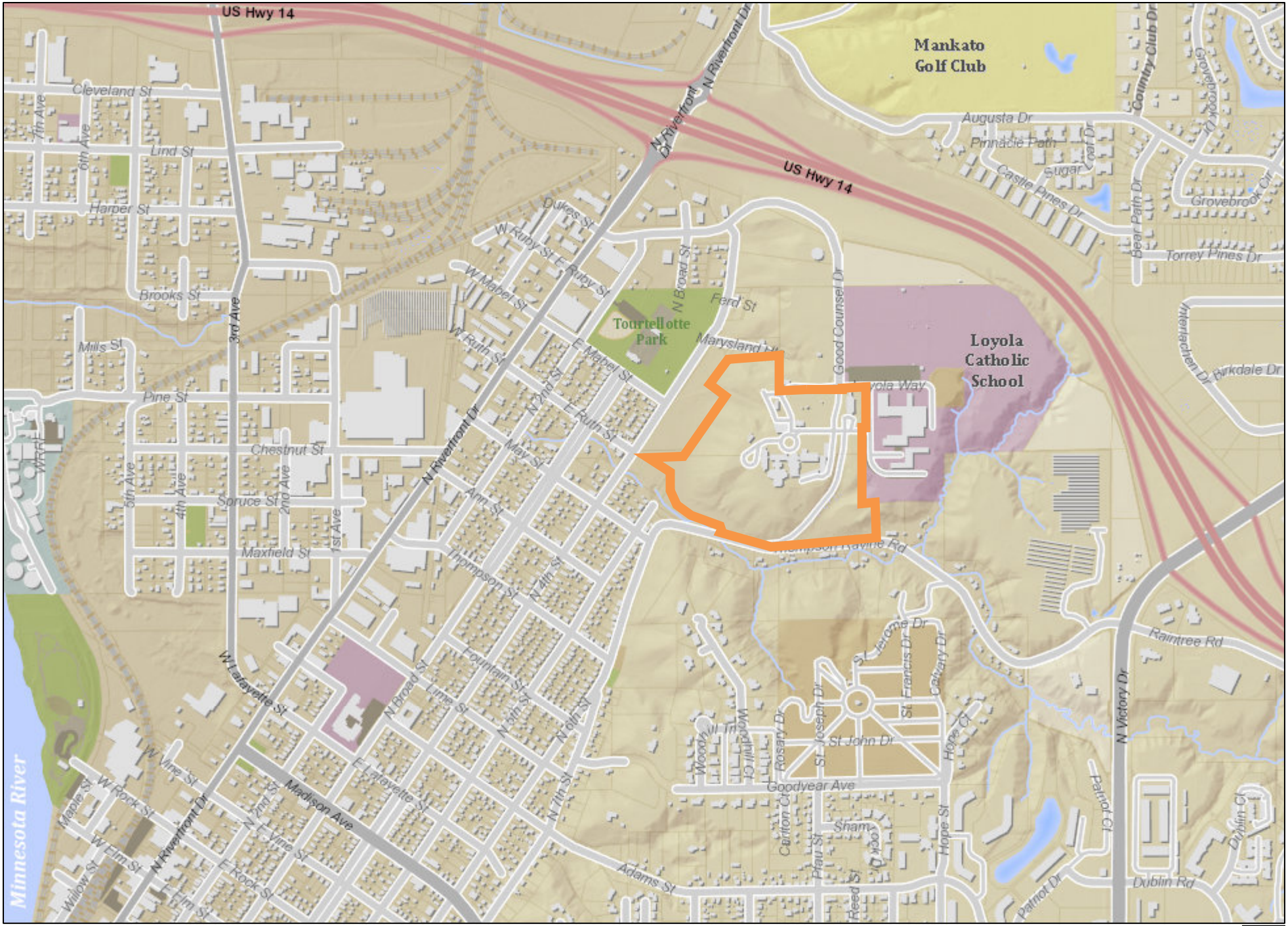
The applicant has requested to amend the previous planned unit development. The previous planned unit development was approved by the City Council on May 11, 2026, and that information can be found here. The current application, referenced in the submittal materials as PUD #2, proposes to include the use of Scheid Hall and approval to implement parking and associated infrastructure on the subject property. The amendment request includes proposal specifics as follows:

1) A total of 239 parking spots to be constructed, and associated stormwater management plans. SWMHP is requesting that this number be approved to be adequate to support the uses in the original PUD approval (with minor amendments as outlined).
2) The residential re-use of Scheid Hall for up to 5 residential units.

Attachments

General Location Map
Aerial Plan
PUD Request #2

General Location Map



Date: June 2026

Author:

This information is to be used for reference purposes only. The City of Mankato does not guarantee accuracy of the material contained herein and is not responsible for misuse or misinterpretation.

N

Aerial Map



Date: June 2026

Author:

This information is to be used for reference purposes only. The City of Mankato does not guarantee accuracy of the material contained herein and is not responsible for misuse or misinterpretation.

N

Date: June 23, 2026

To: Molly Westman, Planning Coordinator, City of Mankato

From: Jen Theneman, Director of Real Estate and Community Initiatives, SWMHP

Re: Good Counsel Planned Unit Development #2 Submission (Phase 1 Amendment)

This request from Southwest Minnesota Housing Partnership (SWMHP) to the City is to amend the PUD approved by the City Council on May 11, 2026 (to be called PUD #2) to include Scheid Hall residential use and to gain approval of a revised parking plan to accommodate the parking needs of the first phase of re-use of the property.

On May 11, 2026, SWMHP received approval for a PUD, CUP, and Preliminary/Final Plat to reuse the existing buildings for a variety of uses for the Good Counsel Hill property. As part of the contingencies of approval from the City, the approving resolution clearly excluded Scheid Hall residential uses and limited the use of the property to the extent that parking compliant with city code could be achieved. Also, the approving resolution limited off-site parking allowances to 10 Chapel-only events per year. Over the past month, SWMHP has been working tirelessly to prepare the appropriate documents for meeting the contingencies of approval of the four land use applications, as well as preparing stormwater plans, building plans and permit sets for the development of additional parking and full re-use of Theresa, Isidore, and Scheid Halls. Additionally, SWMHP has been having discussions with potential tenants and partners for the eventual occupancy of the space. Therefore, an amendment is needed to accommodate a more refined vision of who will use the space.

Specifically, the amendment request is to allow:

1) A total of 239 parking spots to be constructed, and associated stormwater management plans. SWMHP is requesting that this number be approved to be adequate to support the uses in the original PUD approval (with minor amendments as outlined below)
2) The residential re-use of Scheid Hall for up to 5 residential units

Parking Request

A total of 239 parking spots, and associated stormwater management infrastructure are planned to be constructed as part of the adaptive re-use projects associated with the

original PUD approval. SWMHP is requesting that this number be approved to be adequate to support the following uses:

- 58 residential units in Isidore and Theresa Halls (same as previous PUD)
- Up to 5 residential units in Scheid Hall
- 4,000 square feet of office use (reduction in amount from previous PUD)
- 2,000 square feet of accessory office spaces
- A 400-seat chapel/event space (for unlimited events)
- Up to 300-seat conferencing/gathering areas in Theresa (lower and first floor - not to be used at the same time as the chapel)
- A 5-bed commercially-leased area in Theresa Hall previously designated as guest suites.

Providing parking on this site is inordinately difficult and has consumed the majority of thought, planning, and discussion about the re-use of this beautiful, historic community asset. There are four competing factors at play. The first factor is the city code. The second factor is the historic preservation requirements and guidelines governing the Historic Designation leading to the use of Historic Tax Credits, the primary financing source for several of the projects to maintain the integrity and condition of the complex. The third factor is the business need for parking on the site. And finally, the environmental attributes, including the sensitive bluff areas and the woodland along the bluff, both which limit the location and amount of parking and stormwater infrastructure that can be built. SWMHP is working to balance these competing interests and develop a reasonable, adequate parking plan that honors city code, environmental stewardship, and the historic nature of the site without under-building or over-building parking.

In order to meet the stormwater management requirements associated with the additional parking proposed, SWMHP has worked with its engineers to develop a stormwater management plan that accommodates a large pond/sedimentation basin to the north of the existing Scheid Hall and which will collect the runoff from the majority of the paved areas. Additionally, due to grade challenges, there is a smaller stormwater collection area on the southwest corner of proposed parking areas to capture runoff from the parking area located on the western portion of the site. These areas were carefully selected to minimize impact of the historic turnaround and lawn areas (in order to satisfy NPS and SHPO's requirements to minimize impact and honor historic significant features of the property). While tree removal will be required to accommodate these areas, the bluff and woodland conservation easement will not be impacted.

1) City Code. It is difficult to determine the total number of parking stalls required for this project for the following reasons:
    a. The assembly use functions more like a religious use design as the historic use, but is no longer "church" parking standards. Because there is more assembly space on site than will be used at once (at the same time), it is difficult to calculate the parking code requirements.

b. Regarding commercial use of the 5 guest suites, there is no provision in city code for a care initiative that utilizes a non-medication administration model. The tenants are not planning medical healthcare, assisted living or hospice. Their intent is more closely considered master leasing of rooms for the short-term stay of a client who has chosen to live out their days with assistance for comfort, food and bathing, rather than in a clinical or home setting.
c. Based on SWMHP's evaluation, a total of 239 parking spaces are required by the city code for the above uses and the plan shows 239 spaces.

2) Historic Preservation Requirements. The project is applying for Historic Designation, which will lead to the future ability to use Federal and Minnesota State Historic Tax Credits (HTCs). In pursuing Historic Designation, SWMHP has contracted with New History, who has supported the completion of a National Park Service (NPS-the ultimate grantor of designation for the National Historic Register) Part 1 application. Consequently, all work, including site work, is subject to review and approval by the State Historic Preservation Office (SHPO) and the National Park Service (NPS). All site work must meet the Secretary of the Interior's Standards for Rehabilitation (the "Standards"). To meet the Standards, SHPO and NPS expect sensitive site and landscaping improvements that retain the historic property's significant features. For the site, these include the soft-to-hardscape ratio, (former agricultural) green areas, existing trees and vegetation, and unique features such as statues, the historic turnaround/loop on the western portion of the property, and the green lawn in front of Theresa Hall.

   During an in-person meeting on May 26, the applicant presented a site plan to SHPO reflecting the significant landscaping changes required to meet City Code parking requirements. SHPO stated that these improvements would not be approved due to their significant impact on the historic site's character (i.e., the incremental loss of green space). Therefore, the revised plans attempt to accommodate the desires of SHPO while minimizing the impact to the environment.

3) Business Needs.
   a. The market need for parking is an important consideration for the housing, assembly and office uses. This includes both number of stalls and location of these stalls (as close to the building and its entrances as possible). Furthermore, the residential tenants have certain expectations and needs related to parking that run alongside, but not always in coordination with, the needs of office and assembly/event attendees. Each of these sub-populations have different needs, expectations, and behavior regarding parking.
   b. Over the past 3 months, interest in booking events on the property has been high. Demand for concerts, weddings, conferences, meetings, and

performances is larger than expected, therefore SWMHP is requesting to accommodate unlimited events (with provision of a shuttle to off-site parking as the guest counts dictate) with the proposal. SWMHP views this as an interim solution. It is the expressed intent of SWMHP to eventually provide parking for all events on the hill through additional parking lots or the future possibility of a shared parking agreement with the neighboring property.

4) Environmental Constraints.
    a. This property offers gorgeous vistas, topography, and woodlands. As discussed at the last Council meeting, many community members, including Tourtellotte and Loyola neighbors enjoy the beauty of the hill. It is the desire of all stakeholders to preserve and enhance the beauty and enjoyment of this space. Given the existing buildings' proximity to the bluff, adding parking in a convenient and sensible location becomes challenging.
    b. SWMHP wishes to balance environmental impacts with City requirements, while maintaining historic significance and cost-conscious initiatives in order to keep housing and other uses reasonably priced for community benefit.

Based on balancing all these factors, SWMHP is proposing a total of 239 stalls located on the included site plan. **SWMHP specifically requests that this parking plan be approved to satisfy the parking needs of the above uses, with the addition of allowances/requirements for shuttles for unlimited large events (over 100 people attending). If this request cannot be accommodated, SWMHP asks that the City put a denial of the parking plan/allowance request in the resolution to be submitted with the SHPO Part 2 Historic Review application. SWMHP must show that efforts are being made to minimize historic and environmental impact through a PUD for parking as proposed in order to move forward in SHPO review.**

Scheid Hall Request

We request evaluation for the residential re-use of Scheid Hall for up to 5 residential units. At the time of PUD approval, the plans for Scheid Hall were not finalized. SWMHP has finalized building permit layouts for Scheid Hall and therefore, seeks to include the use of the building for residential apartments in this amendment. The plans are included for reference and the number of units is reflected in the parking calculation.

SWMHP is asking for a PUD amendment to include Scheid Hall residential units in PUD approval.

Next Steps/Schedule

SWMHP is eager to finalize tenant finish/remodel plans for the first phase of this adaptive re-use, which includes:

1) Re-model/re-use of Scheid Hall as up to 5 rental units;
2) Isidore Hall West (original building) for 16 rental units and 3,000 sq. ft of leased office (to be used by SWMHP's offices and another Mankato-based non-profits);
3) Isidore Hall East for 11 rental units, and 500 square feet of office space;
4) Theresa Hall for use of the Chapel and conferencing/gathering space for assembly/events (unlimited), and 26 rental units, 5 leased residental spaces (previously guest suites), and 1,000 sq ft of leased office space (to be used by a local non-profit and housing property management);
5) SWMHP desires to start construction on the residential component of the project July/August 2026, for occupancy by the end of 2026.

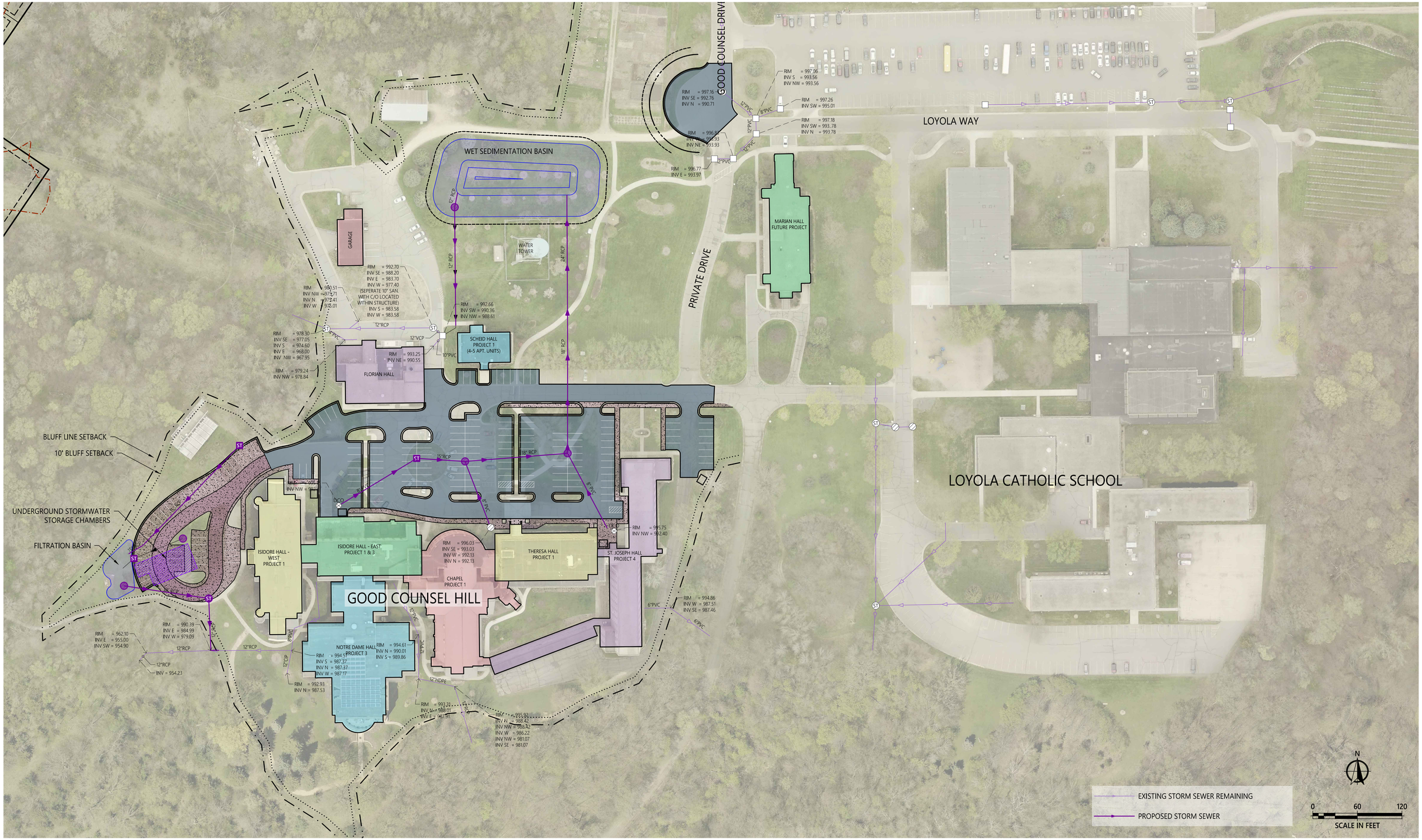
Future Requests – SWMHP intends to submit an amendment to the PUD and IO amendment for the tenant finish and occupancy of Notre Dame Hall as an assisted living community (same as historic use) by September of 2026 for occupancy Spring of 2027.

SWMHP intends to remodel/re-use St. Joseph's Hall for approximately 50 rental units. In addition to a future request for local housing vouchers, applications for future funding to accomplish this complex task are intended to be submitted throughout 2027. If successful, construction could start in early 2028 for a Fall 2028 occupancy.

SWMHP remains extremely excited about the potential of the reuse of the Good Counsel campus. Diligent pursuit of partners, financing, and the development of plans that find a balance between environmental and historic preservation, while at the same time meeting the desires of the city and the needs of the future residents, guests, and office occupants, are constantly top of mind. SWMHP feels confident this plan meets that balance, and that updated iterations and opportunities will necessitate amendments and innovations in the future. Our desire is to honor the legacy vision of this beautiful campus, therefore SWMHP may be seeking alternative storm water designs in future PUD amendments to minimize the impact on existing green space and trees on top of the hill. The future of this campus is impactful for City of Mankato economic development, preservation of important history, and the number one strategic priority of housing. This project provides a place for workforce, individuals, families, seniors, small business, nonprofits and more, a safe place to call home.

We appreciate the collaboration with City Staff, Planning Commission and City Council to date, and invite all parties to recognize the uniqueness of the opportunities before us, and creatively create successful outcomes for city policy, historic preservation and the community we all serve.

THIS SHEET IS ONLY VALID IF PRINTED IN COLOR



© 2026 WIDSETH FILE: W:\PROJECTS\SOUTHWEST MINNESOTA HOUSING PARTNERSHIP (SWMHP)-49049\2025-1059\CADD\CIVIL\GOOD COUNCIL\C-UT-2025-10591.DWG PLOTTED BY: VANESSA HINES, June 19, 2026

WIDSETH
ARCHITECTS ▪ ENGINEERS ▪ SCIENTISTS ▪ SURVEYORS

DRAWN BY: RSH
CHECKED BY: CNB

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.
NOT FOR CONSTRUCTION
CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

DATE	REV#	REVISIONS DESCRIPTION

GOOD COUNSEL

STORM SEWER PLAN

PROJECT #: 2025-10591

EXHIBIT 5

WIDSETH

Good Counsel – Main Campus
Mankato, MN

HYDRAULIC DESIGN SUMMARY REPORT

For

Southwest Minnesota Housing Partnership

January 2026

Prepared by:
Widseth Consulting Engineers, Rochester, Minnesota

Project # 2025-10591

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.

Andre Ringle 06/19/2026

Andre T. Ringle Lic. No. 60708

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2 **Hydrologic Soils Group Map**

3 **Pre-Development Drainage Map & Hydraulic Model for the 2-year, 10-year, & 100-year storm events**

4 **Post-Development Drainage Map & Hydraulic Model for the 2-year, 10-year, & 100-year storm events**

DRAINAGE REPORT

Project Name: **Good Counsel Main Campus – Mankato, MN**
Widseth Project # 2025-10591

SECTION 1.0 – Project Summary and Proposed Site Improvements

We have completed our analysis and design recommendation for the stormwater management system associated with the above referenced project. This design was guided by the MPCA NPDES permit and MnDOT.

Hydrologic & Hydraulic Modeling

The HydroCAD™ Ver. 10.0 modeling software was utilized to develop the hydrologic contributions serving the proposed project site. This software is adept at modeling urban drainage settings and can provide storage routing calculations under dynamic outlet conditions.

In accordance with MnDOT Technical Memorandum No. 13_08_B_04, NOAA Atlas 14 precipitation frequency data was utilized. Basin characteristics developed using the survey, along with NOAA Atlas 14 rainfall data, peak flows were generated utilizing SCS procedures. Where storage routing calculations were completed, SCS Unit Hydrograph procedures were utilized. See Appendix 1 for NOAA Atlas 14 precipitation frequency table.

PRE-Improvement Condition

The existing site consists of a developed campus that includes several buildings, an existing parking lot, and on-site utilities. There are steep, forested slopes surrounding the existing campus.

The existing soils on the project site are classified as HSG C/D according to web soil survey. See Appendix 2 for Soils Map.

POST-Improvement Condition

Proposed site improvements include the reconstruction and expansion of the existing parking lot and the associated stormwater and utility improvements to accommodate the expanded parking lot.

The stormwater runoff from the site will flow to proposed stormwater treatment basins located throughout the site. There will be one wet sedimentation basin and three filtration basins. Infiltration was not considered due to the presence of type D soils. Stormwater from the basins will be routed to existing storm sewer that flows down the adjacent bluff. The proposed stormwater improvements will reduce the runoff rate from the site and peak rate of water flowing directly down the bluff.

SECTION 2.0 – Water Quality Volume

Impervious Area:

Proposed impervious surface:	5.89	acres
Existing impervious surface:	4.75	acres
New & Reconstructed Impervious surface:	2.27	acres

Subcatchment / Node	Basin Type	Subcatchment Area (acres)	Impervious Area (acres)	Elevation of Max Water Quality Volume	Proposed Water Quality Volume (ft^3)
1S (1P)	Wet Sedimentation Basin	4.032	2.359	989.0	12462
3S (2P)	Filtration Basin	1.269	0.935	993.5	4691
Total		5.301	3.294		17153

Impervious area shown is the entire impervious area planned to be routed to the given basin and does not represent the new and reconstructed impervious in a given catchment area.

The choice of BMP was made primarily due the presence of HSG C/D soils throughout the project area. Filtration basins were chosen for smaller drainage areas while a wet sedimentation basin was chosen for the largest drainage area due to the availability of horizontal and vertical space. An infiltration rate of 1.63 was chosen for the filter basin media because it is the same rate as Type A soils in the Design Infiltration Rates table of the MN Stormwater Manual. The media expected to perform at least at this level through the majority of its useful lifespan.

Water Quality Volume:

Required Water Quality Volume:	0.21	acres-feet
Proposed Water Quality Volume:	0.39	acres-feet
Excess Water Quality Volume:	0.18	acres-feet

The required water quality volume was calculated using 1.1” of depth across the entire new and reconstructed impervious area.

SECTION 3.0 – PRE & POST-Improvement Discharge Rates:

Discharge Rates:
See Tables 1 & 2 for the PRE-Improvement & POST-Improvement Conditions for discharge rates for the 2, 10, and 100-year storm events.

Table 1 – PRE-Improvement Discharge Rates

Subcatchment	HydroCAD Node	Area (acres)	CN	2-Year Storm (cfs)	10-Year Storm (cfs)	100-Year Storm (cfs)
NW Storm Sewer	1R	4.887	88	6.3	24.9	46.3
West Storm Sewer	2R	1.739	85	1	3.4	6
West Bluff	3R	0.613	92	1.7	8.0	15.6
South Storm Sewer	4R	1.19	91	1.9	6.4	11.5
SE Bluff - To Road	5R	1.578	85	1.9	7.7	14.5
East Storm Sewer	6R	0.411	88	0.6	1.7	2.8
North Bluff	7R	0.492	97	0.3	1.6	3.3
Total		10.91	88	13.7	53.7	100

Table 2 – POST-Improvement Discharge Rates

Subcatchment	HydroCAD Node	Area (acres)	CN	2-Year Storm (cfs)	10-Year Storm (cfs)	100-Year Storm (cfs)
NW Storm Sewer	1R	5.343	91	2.6	13.9	20.5
West Storm Sewer	2R	2.034	91	1	7.0	11.5
West Bluff	3R	0.502	82	0.6	3.7	7.5
South Storm Sewer	4R	2.144	91	1.9	6.4	11.5
SE Bluff - To Road	5R	0.099	80	1.3	5.8	10.6
East Storm Sewer	6R	0.788	91	0.6	1.7	2.8
North Bluff	7R	0.000	-	0.0	0.0	0.0
Total		10.91	90	8	38.5	64.4

SECTION 4.0 – Risk Assessment

All proposed stormwater treatment basins and low points have HWL's at least one foot below the lowest adjacent FFE and emergency overflow of sufficient width to convey flows beyond the design storm.

IN order to ensure sufficient outlet capacity during all seasons, larger grates than necessary were chosen for the filtration basin as it is near wooded areas. The grate was then modeled with a 50% reduction in outflow to simulate clogging.

The flow rates into the west storm sewer are proposed to increase while the overall flows and overland flowrates to the west bluff are proposed to decrease. Because the flow rates in minor (less than 2-year) storms are not projected to increase, the increased flowrates to the storm sewer is not anticipated to cause erosion concerns. A more thorough analysis of the storm sewer system will be conducted as part of the full build drainage report.

Minor Adjustments

Minor adjustments in placement of structures and conveyance piping orientation will not invalidate this design/analysis. A variety of design and performance data can be found in the attached summary results information. Additional calculations and results will be stored in the project design file. Any exceptions to system contribution, sizing, invert elevations or locations should be revisited before final plans, specifications, and engineering.

Appendix

1 NOAA Atlas 14 Precipitation Frequency Table
2 Hydrologic Soils Group Map
3 Pre-Development Drainage Map & Hydrology Calculations for the 2, 10, & 100-year storm events (HydroCAD)
4 Post-Development Drainage Map & Hydrology Calculations for the 2, 10, & 100-year storm events (HydroCAD)

APPENDIX 1

NOAA Atlas 14
Precipitation Frequency Table

NOAA Atlas 14, Volume 8, Version 2
Location name: Mankato, Minnesota, USA*
Latitude: 44.1661°, Longitude: -94.0054°
Elevation: 778 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.376** (0.297-0.489)	**0.448** (0.353-0.582)	**0.569** (0.447-0.741)	**0.673** (0.525-0.879)	**0.821** (0.619-1.10)	**0.938** (0.690-1.27)	**1.06** (0.751-1.45)	**1.18** (0.805-1.66)	**1.36** (0.884-1.93)	**1.49** (0.944-2.14)
10-min	**0.551** (0.434-0.715)	**0.656** (0.517-0.853)	**0.833** (0.655-1.08)	**0.985** (0.769-1.29)	**1.20** (0.907-1.61)	**1.37** (1.01-1.86)	**1.55** (1.10-2.13)	**1.74** (1.18-2.43)	**1.99** (1.30-2.83)	**2.18** (1.38-3.14)
15-min	**0.671** (0.530-0.873)	**0.800** (0.631-1.04)	**1.02** (0.798-1.32)	**1.20** (0.938-1.57)	**1.46** (1.11-1.96)	**1.68** (1.23-2.26)	**1.89** (1.34-2.60)	**2.12** (1.44-2.96)	**2.42** (1.58-3.45)	**2.66** (1.69-3.82)
30-min	**0.909** (0.718-1.18)	**1.09** (0.857-1.41)	**1.39** (1.09-1.81)	**1.64** (1.28-2.15)	**2.01** (1.52-2.69)	**2.30** (1.69-3.11)	**2.60** (1.84-3.57)	**2.91** (1.98-4.07)	**3.34** (2.18-4.76)	**3.67** (2.32-5.27)
60-min	**1.18** (0.928-1.53)	**1.40** (1.10-1.81)	**1.78** (1.39-2.31)	**2.11** (1.65-2.76)	**2.60** (1.97-3.51)	**3.01** (2.22-4.08)	**3.44** (2.44-4.74)	**3.89** (2.64-5.45)	**4.52** (2.95-6.46)	**5.02** (3.18-7.21)
2-hr	**1.44** (1.15-1.84)	**1.70** (1.36-2.18)	**2.16** (1.72-2.78)	**2.58** (2.04-3.32)	**3.20** (2.46-4.27)	**3.72** (2.78-4.99)	**4.27** (3.08-5.83)	**4.86** (3.35-6.76)	**5.70** (3.76-8.07)	**6.38** (4.08-9.06)
3-hr	**1.62** (1.30-2.05)	**1.90** (1.53-2.41)	**2.41** (1.93-3.06)	**2.88** (2.29-3.67)	**3.59** (2.79-4.77)	**4.20** (3.17-5.61)	**4.85** (3.52-6.59)	**5.56** (3.86-7.69)	**6.58** (4.38-9.26)	**7.40** (4.76-10.4)
6-hr	**1.90** (1.55-2.38)	**2.23** (1.82-2.79)	**2.83** (2.30-3.55)	**3.39** (2.74-4.26)	**4.26** (3.35-5.59)	**5.00** (3.82-6.59)	**5.80** (4.27-7.79)	**6.68** (4.70-9.14)	**7.94** (5.35-11.1)	**8.98** (5.84-12.5)
12-hr	**2.17** (1.79-2.66)	**2.55** (2.10-3.14)	**3.24** (2.67-4.00)	**3.88** (3.18-4.81)	**4.87** (3.88-6.29)	**5.70** (4.41-7.41)	**6.60** (4.92-8.74)	**7.59** (5.39-10.2)	**9.00** (6.12-12.4)	**10.1** (6.68-14.0)
24-hr	**2.47** (2.07-2.99)	**2.87** (2.40-3.48)	**3.60** (3.00-4.37)	**4.28** (3.55-5.22)	**5.33** (4.31-6.79)	**6.22** (4.88-7.98)	**7.19** (5.42-9.40)	**8.25** (5.94-11.0)	**9.77** (6.72-13.3)	**11.0** (7.32-15.1)
2-day	**2.87** (2.44-3.42)	**3.24** (2.75-3.86)	**3.94** (3.33-4.70)	**4.61** (3.87-5.53)	**5.67** (4.65-7.14)	**6.59** (5.24-8.35)	**7.61** (5.82-9.83)	**8.73** (6.37-11.5)	**10.4** (7.23-14.0)	**11.7** (7.88-15.8)
3-day	**3.14** (2.69-3.70)	**3.52** (3.01-4.15)	**4.23** (3.61-5.01)	**4.91** (4.16-5.84)	**5.99** (4.95-7.46)	**6.92** (5.54-8.68)	**7.94** (6.11-10.2)	**9.07** (6.66-11.9)	**10.7** (7.52-14.4)	**12.1** (8.17-16.2)
4-day	**3.35** (2.89-3.93)	**3.75** (3.23-4.40)	**4.50** (3.86-5.29)	**5.20** (4.43-6.14)	**6.29** (5.22-7.76)	**7.22** (5.81-8.99)	**8.24** (6.37-10.5)	**9.36** (6.90-12.2)	**11.0** (7.74-14.6)	**12.3** (8.38-16.5)
7-day	**3.88** (3.38-4.49)	**4.35** (3.78-5.03)	**5.18** (4.49-6.01)	**5.93** (5.11-6.91)	**7.06** (5.90-8.56)	**8.00** (6.49-9.80)	**9.01** (7.02-11.3)	**10.1** (7.50-13.0)	**11.6** (8.26-15.3)	**12.9** (8.84-17.1)
10-day	**4.39** (3.86-5.04)	**4.92** (4.31-5.64)	**5.82** (5.08-6.69)	**6.61** (5.74-7.64)	**7.77** (6.52-9.30)	**8.72** (7.11-10.6)	**9.72** (7.62-12.0)	**10.8** (8.05-13.7)	**12.3** (8.74-16.0)	**13.4** (9.27-17.7)
20-day	**6.03** (5.37-6.80)	**6.70** (5.96-7.56)	**7.80** (6.90-8.82)	**8.72** (7.67-9.90)	**9.99** (8.46-11.7)	**11.0** (9.06-13.0)	**12.0** (9.49-14.6)	**13.0** (9.81-16.2)	**14.4** (10.4-18.4)	**15.4** (10.8-20.1)
30-day	**7.45** (6.69-8.31)	**8.26** (7.40-9.22)	**9.56** (8.54-10.7)	**10.6** (9.42-11.9)	**12.0** (10.3-13.9)	**13.1** (10.9-15.4)	**14.2** (11.3-17.0)	**15.2** (11.5-18.8)	**16.6** (12.0-21.0)	**17.5** (12.4-22.7)
45-day	**9.24** (8.37-10.2)	**10.3** (9.29-11.4)	**11.9** (10.7-13.2)	**13.2** (11.8-14.7)	**14.9** (12.7-16.9)	**16.1** (13.4-18.6)	**17.2** (13.8-20.5)	**18.3** (14.0-22.4)	**19.7** (14.4-24.8)	**20.7** (14.6-26.6)
60-day	**10.8** (9.80-11.8)	**12.0** (10.9-13.2)	**13.9** (12.6-15.3)	**15.4** (13.9-17.1)	**17.4** (14.9-19.6)	**18.8** (15.7-21.5)	**20.0** (16.1-23.6)	**21.2** (16.3-25.7)	**22.7** (16.6-28.3)	**23.6** (16.8-30.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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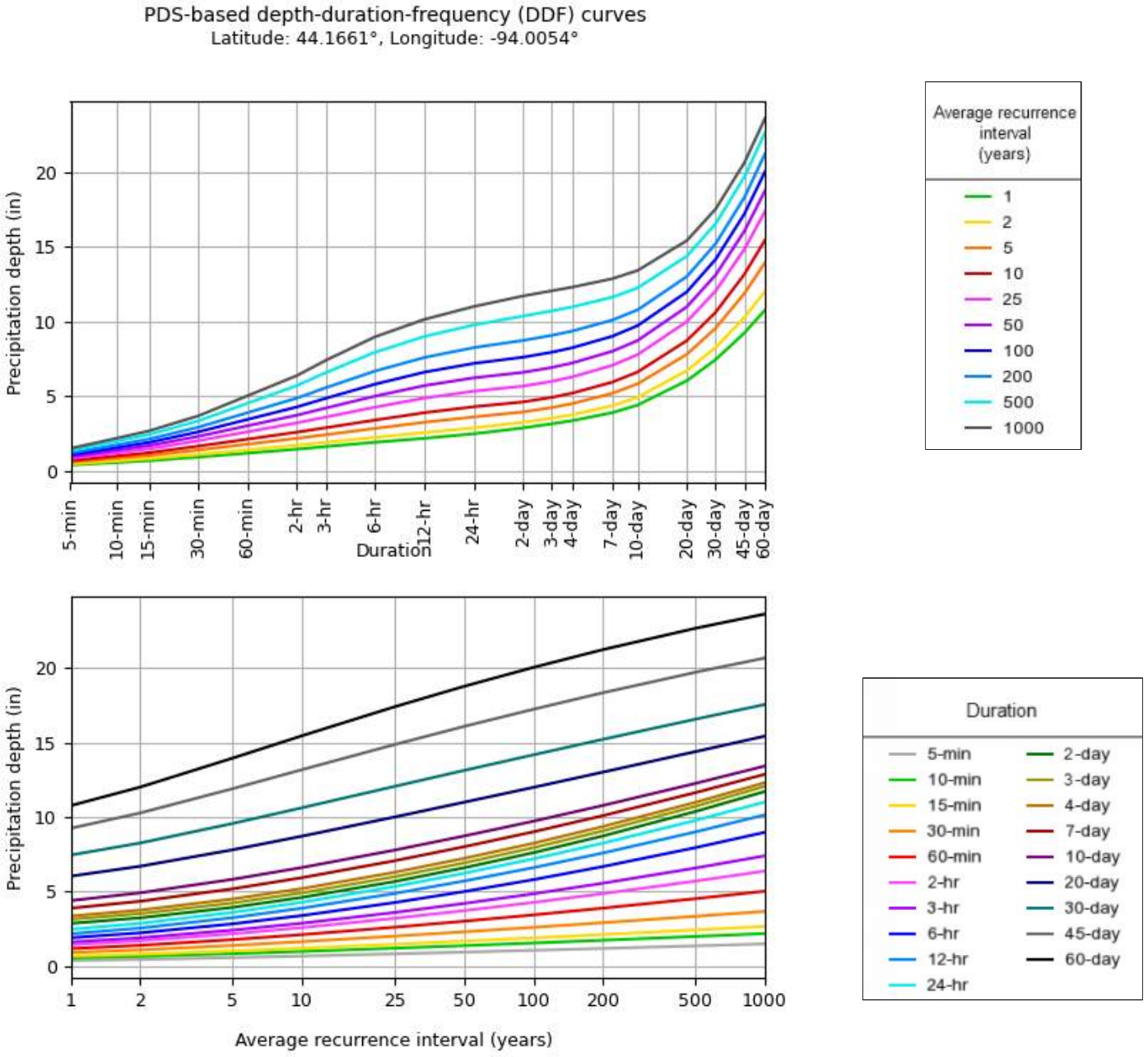
PF graphical



NOAA Atlas 14, Volume 8, Version 2

Created (GMT): Tue Aug 26 15:52:00 2025

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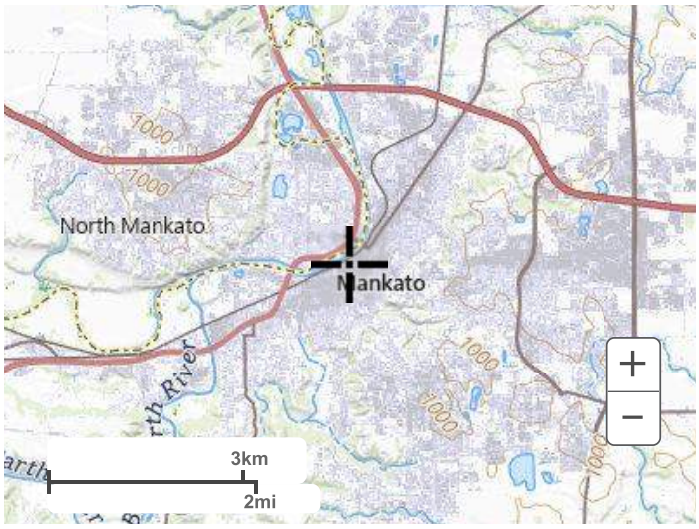
Maps & aerials

Small scale terrain



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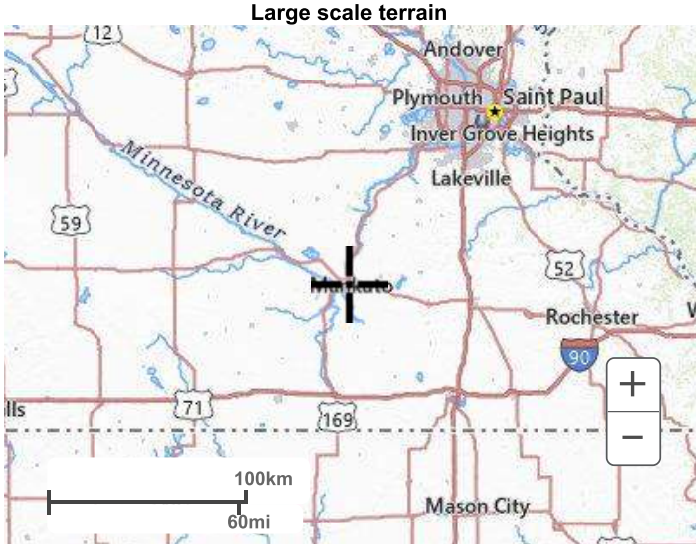
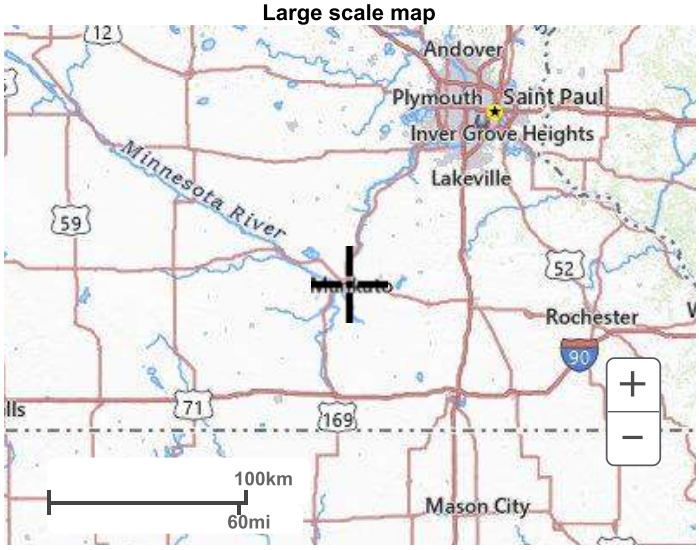


Large scale map



Large scale aerial



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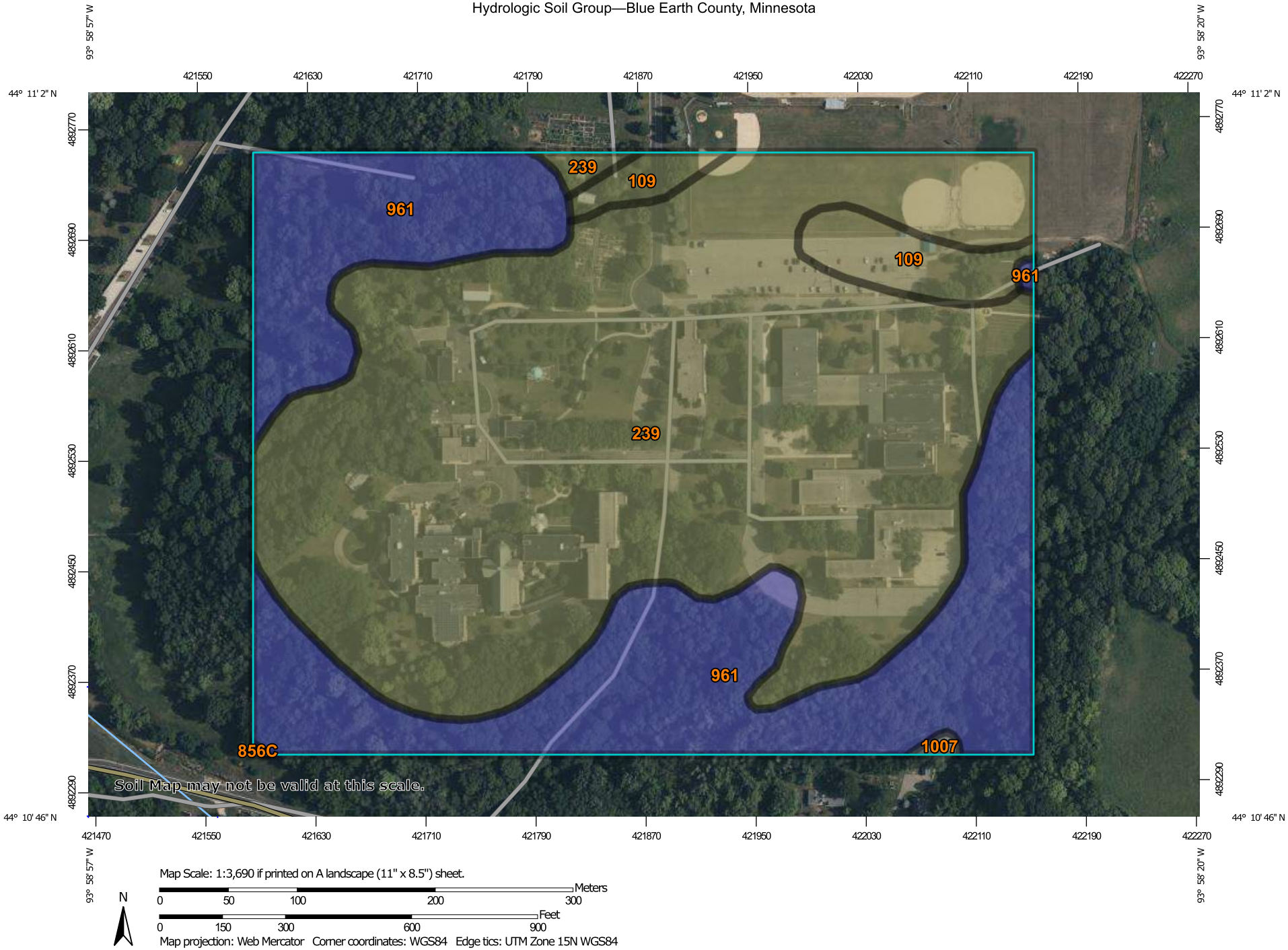
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX 2

Hydrologic Soils Group Map



Map Scale: 1:3,690 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

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.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Blue Earth County, Minnesota
Survey Area Data: Version 23, Sep 9, 2025

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

Date(s) aerial images were photographed: Jul 2, 2023—Aug 8, 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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
109	Cordova clay loam, 0 to 2 percent slopes	C/D	2.4	4.0%
239	Le Sueur loam, 1 to 3 percent slopes	C/D	39.8	64.8%
856C	Terril-Urban land complex, 6 to 15 percent slopes	B	0.0	0.0%
961	Storden complex, very steep	B	19.0	31.0%
1007	Alluvial-Urban land complex		0.1	0.2%
Totals for Area of Interest			**61.4**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX 3

Pre-Development Drainage Area Map And HydroCAD Report

PRE-DEVELOPMENT DRAINAGE MAP

EXISTING SUBCATCHMENT BOUNDARY	
EXISTING IMPERVIOUS AREA	



DRAWN BY: ATR

CHECKED BY: CNB

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.

CRAIG N. BRITTON LIC. NO.: 44228 DATE: JANUARY 2026

DATE	REV#	REVISIONS DESCRIPTION

WIDSETH
ARCHITECTS · ENGINEERS · SCIENTISTS · SURVEYORS

PRE-DEVELOPMENT DRAINAGE MAP

GOOD COUNSEL MAIN CAMPUS

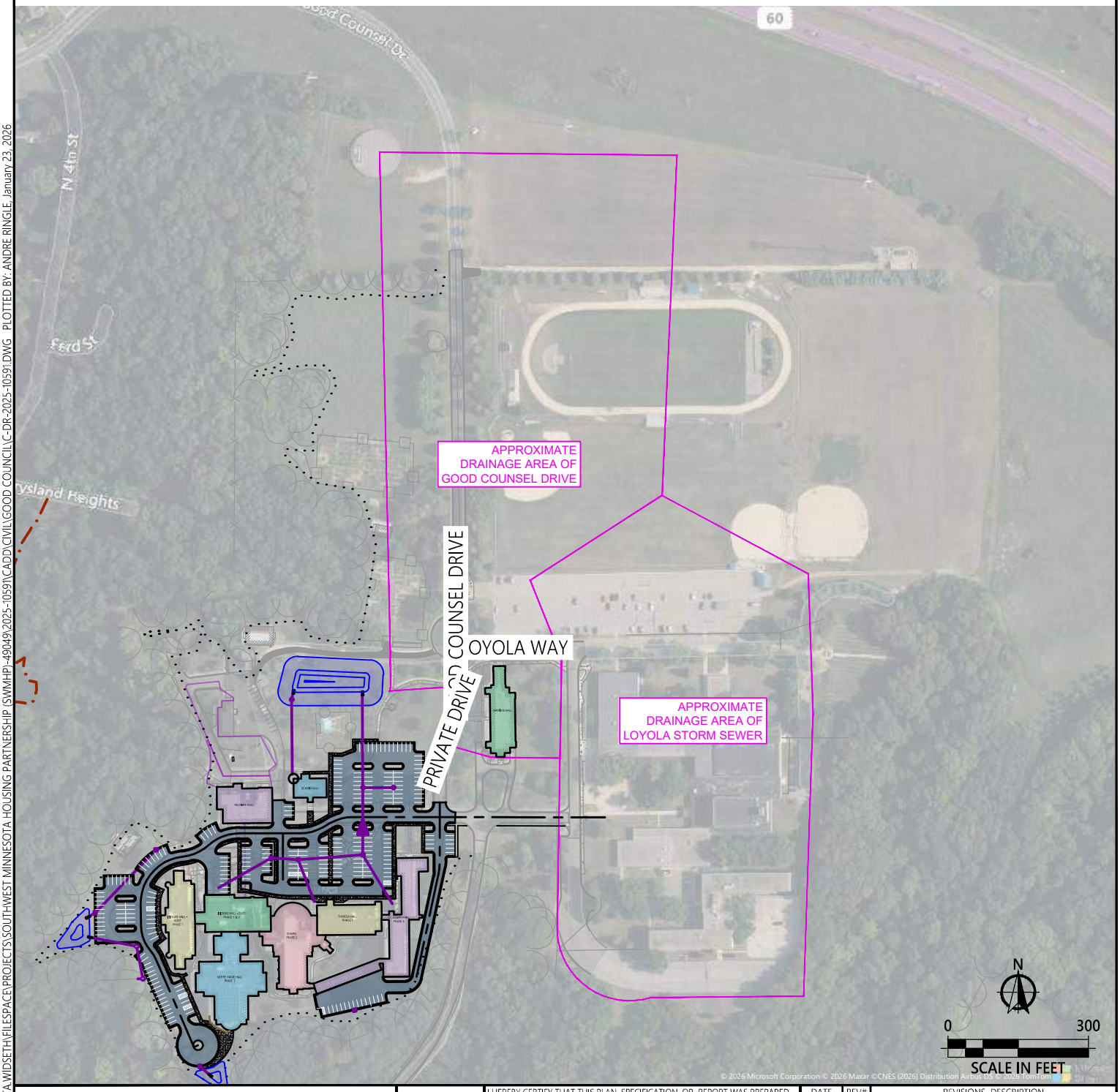
-

PROJECT #: 2025-10591

© 2026 WIDSETH FILE: W:\PROJECTS\SOUTHWEST MINNESOTA HOUSING PARTNERSHIP (SWMHP)-49049\2025-10591\CADD\CIVIL\GOOD COUNCIL\C-DR-2025-10591.DWG PLOTTED BY: ANDRE RINGLE, June 19, 2026

LOYOLA STORM SEWER DRAINAGE MAP

SUBCATCHMENT BOUNDARY	



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DRAWN BY: ATR CHECKED BY: CNB	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 PROFESSION UNDER THE LAWS OF THE STATE OF MINNESOTA. SIGNER NAME LIC. NO.: NUMBER DATE: JANUARY 2026	DATE	REV#	REVISIONS DESCRIPTION

WIDSETH
ARCHITECTS · ENGINEERS · SCIENTISTS · SURVEYORS

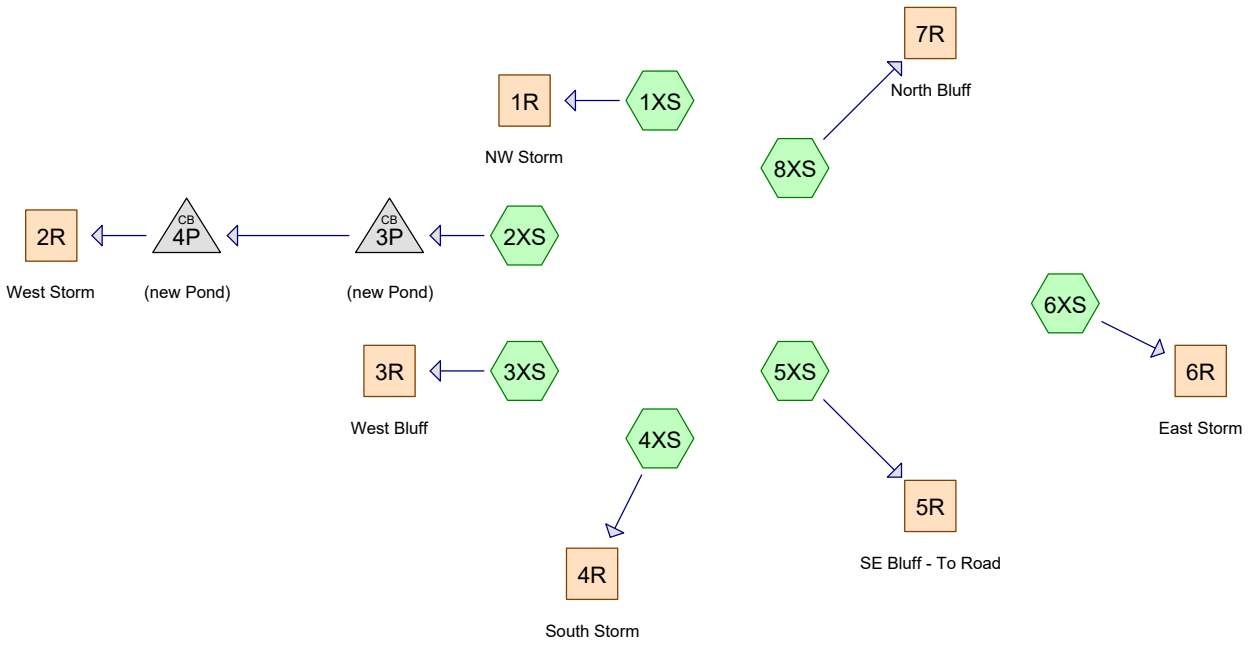
LOYOLA STORM SEWER DRAINAGE MAP

GOOD COUNSEL MAIN CAMPUS

-

PROJECT #: 2025-10591

© 2026 WIDSETH FILE: \\DATA.WIDSETH\FILESPACE\PROJECTS\SOUTHWEST MINNESOTA HOUSING PARTNERSHIP (SWMHP)-49049\2025-10591\CADD\CIVIL\GOOD COUNCIL\C-DR-2025-10591.DWG PLOTTED BY: ANDRE RINGLE, January 23, 2026



Subcat Reach Pond Link

Routing Diagram for Pre-Development
Prepared by Widseth Smith Nolting, Printed 6/19/2026
HydroCAD® 10.20-9a s/n 01722 © 2026 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	MSE 24-hr	3	Default	24.00	1	1.70	2
2	10-YR	MSE 24-hr	3	Default	24.00	1	4.28	2
3	100-YR	MSE 24-hr	3	Default	24.00	1	7.19	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.030	80	>75% Grass cover, Good, HSG D (1XS, 2XS, 3XS, 4XS, 5XS, 8XS)
4.732	98	Paved parking, HSG D (1XS, 2XS, 3XS, 4XS, 5XS, 6XS)
10.762	**88**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
10.762	HSG D	1XS, 2XS, 3XS, 4XS, 5XS, 6XS, 8XS
0.000	Other	
10.762		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	6.030	0.000	6.030	>75% Grass cover, Good	1XS, 2XS, 3XS, 4XS, 5XS, 8XS
0.000	0.000	0.000	4.732	0.000	4.732	Paved parking	1XS, 2XS, 3XS, 4XS, 5XS, 6XS
0.000	**0.000**	**0.000**	**10.762**	**0.000**	**10.762**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1XS: Runoff Area=216,068 sf 45.85% Impervious Runoff Depth>0.70"
Tc=7.0 min CN=88 Runoff=6.3 cfs 0.287 af

Subcatchment2XS: Runoff Area=26,713 sf 64.20% Impervious Runoff Depth>0.93"
Tc=7.0 min CN=92 Runoff=1.0 cfs 0.048 af

Subcatchment3XS: Runoff Area=75,763 sf 26.31% Impervious Runoff Depth>0.55"
Tc=7.0 min CN=85 Runoff=1.7 cfs 0.080 af

Subcatchment4XS: Runoff Area=51,828 sf 60.81% Impervious Runoff Depth>0.87"
Tc=7.0 min CN=91 Runoff=1.9 cfs 0.086 af

Subcatchment5XS: Runoff Area=68,786 sf 38.28% Impervious Runoff Depth>0.64"
Tc=7.0 min CN=87 Runoff=1.9 cfs 0.085 af

Subcatchment6XS: Runoff Area=12,130 sf 100.00% Impervious Runoff Depth>1.43"
Tc=7.0 min CN=98 Runoff=0.6 cfs 0.033 af

Subcatchment8XS: Runoff Area=17,512 sf 0.00% Impervious Runoff Depth>0.36"
Tc=7.0 min CN=80 Runoff=0.3 cfs 0.012 af

Reach 1R: NW Storm Inflow=6.3 cfs 0.287 af
Outflow=6.3 cfs 0.287 af

Reach 2R: West Storm Inflow=1.0 cfs 0.048 af
Outflow=1.0 cfs 0.048 af

Reach 3R: West Bluff Inflow=1.7 cfs 0.080 af
Outflow=1.7 cfs 0.080 af

Reach 4R: South Storm Inflow=1.9 cfs 0.086 af
Outflow=1.9 cfs 0.086 af

Reach 5R: SE Bluff - To Road Inflow=1.9 cfs 0.085 af
Outflow=1.9 cfs 0.085 af

Reach 6R: East Storm Inflow=0.6 cfs 0.033 af
Outflow=0.6 cfs 0.033 af

Reach 7R: North Bluff Inflow=0.3 cfs 0.012 af
Outflow=0.3 cfs 0.012 af

Pond 3P: (new Pond) Peak Elev=979.61' Inflow=1.0 cfs 0.048 af
12.0" Round Culvert n=0.013 L=87.0' S=0.2769 '/' Outflow=1.0 cfs 0.048 af

Pond 4P: (new Pond) Peak Elev=955.42' Inflow=1.0 cfs 0.048 af
12.0" Round Culvert n=0.013 L=13.0' S=0.0515 '/' Outflow=1.0 cfs 0.048 af

Total Runoff Area = 10.762 ac Runoff Volume = 0.631 af Average Runoff Depth = 0.70"
56.03% Pervious = 6.030 ac 43.97% Impervious = 4.732 ac

Summary for Subcatchment 1XS:

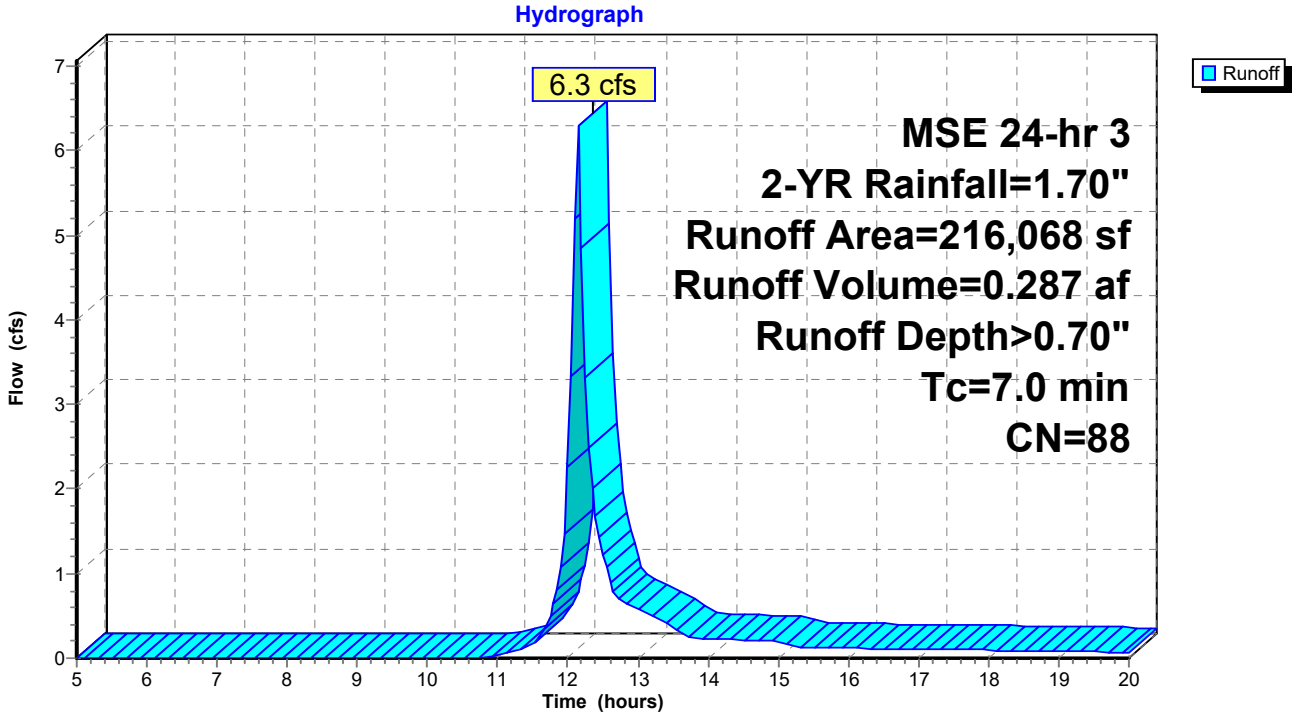
Runoff = 6.3 cfs @ 12.15 hrs, Volume= 0.287 af, Depth> 0.70"
Routed to Reach 1R : NW Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
99,068	98	Paved parking, HSG D
117,000	80	>75% Grass cover, Good, HSG D
216,068	88	Weighted Average
117,000		54.15% Pervious Area
99,068		45.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 1XS:



Summary for Subcatchment 2XS:

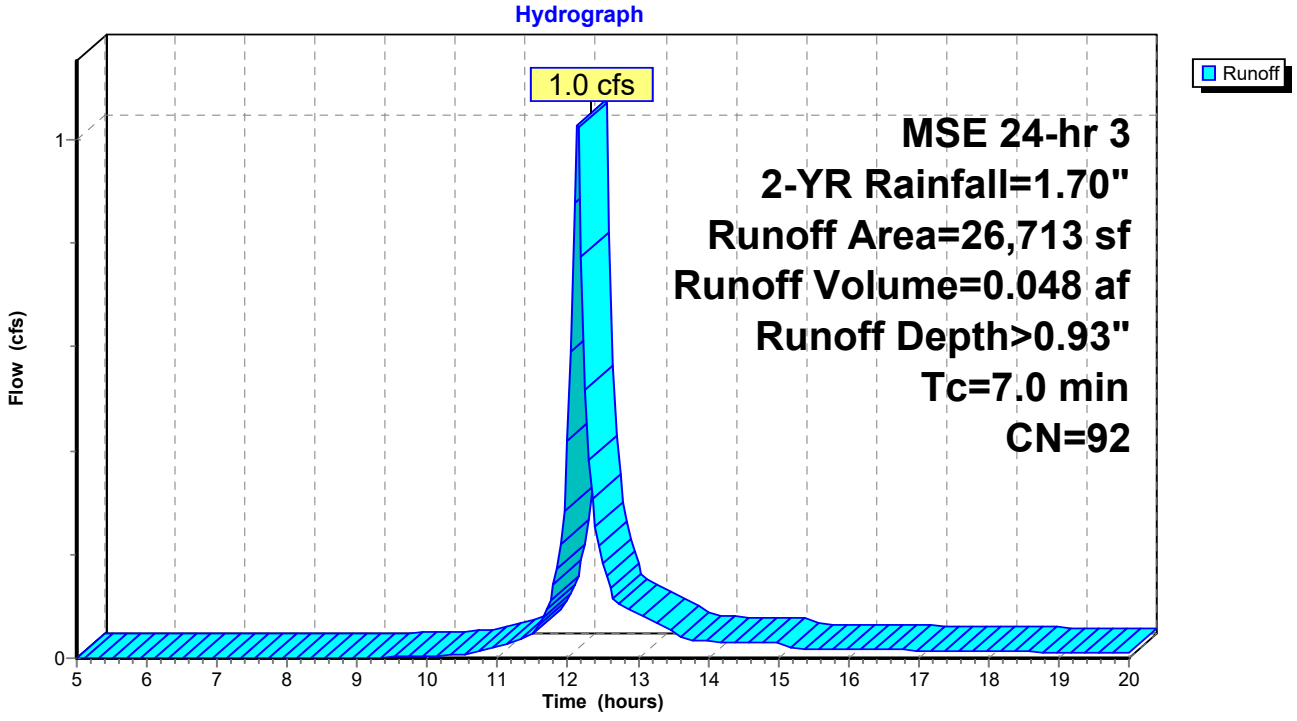
Runoff = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af, Depth> 0.93"
Routed to Pond 3P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
17,151	98	Paved parking, HSG D
9,562	80	>75% Grass cover, Good, HSG D
26,713	92	Weighted Average
9,562		35.80% Pervious Area
17,151		64.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 2XS:



Summary for Subcatchment 3XS:

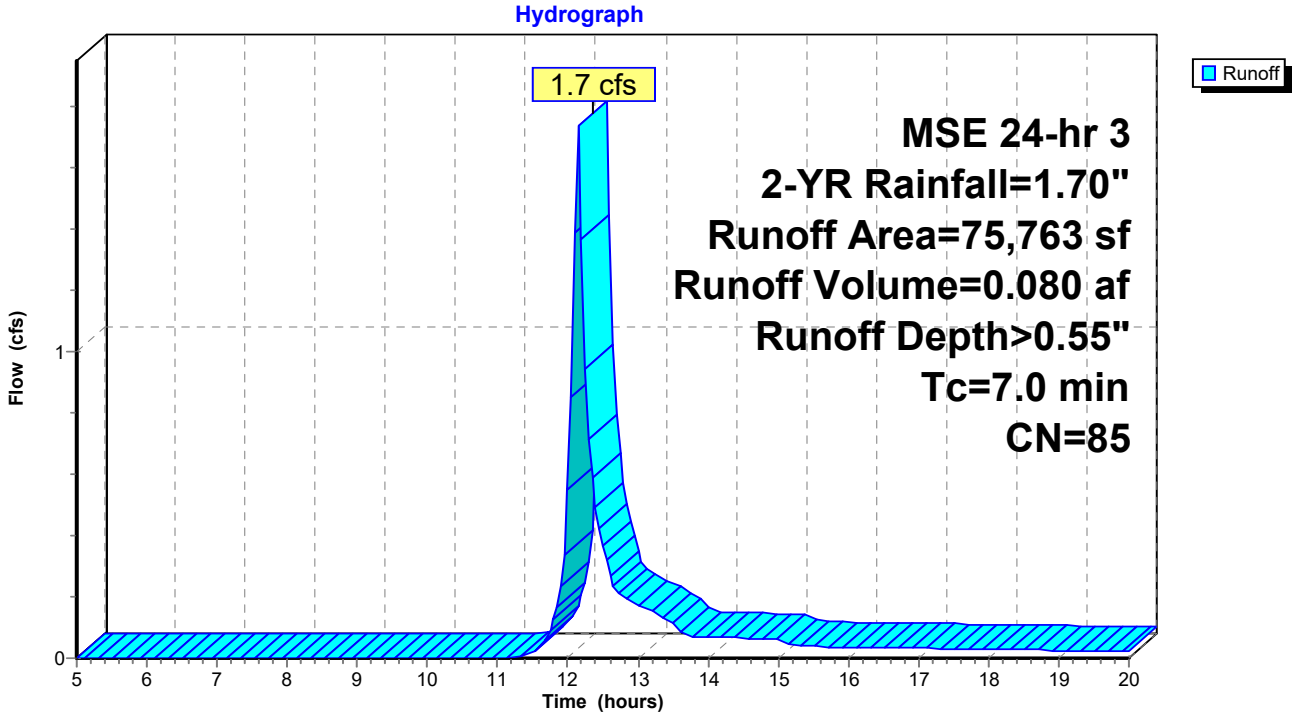
Runoff = 1.7 cfs @ 12.15 hrs, Volume= 0.080 af, Depth> 0.55"
Routed to Reach 3R : West Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
19,931	98	Paved parking, HSG D
55,832	80	>75% Grass cover, Good, HSG D
75,763	85	Weighted Average
55,832		73.69% Pervious Area
19,931		26.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 3XS:



Summary for Subcatchment 4XS:

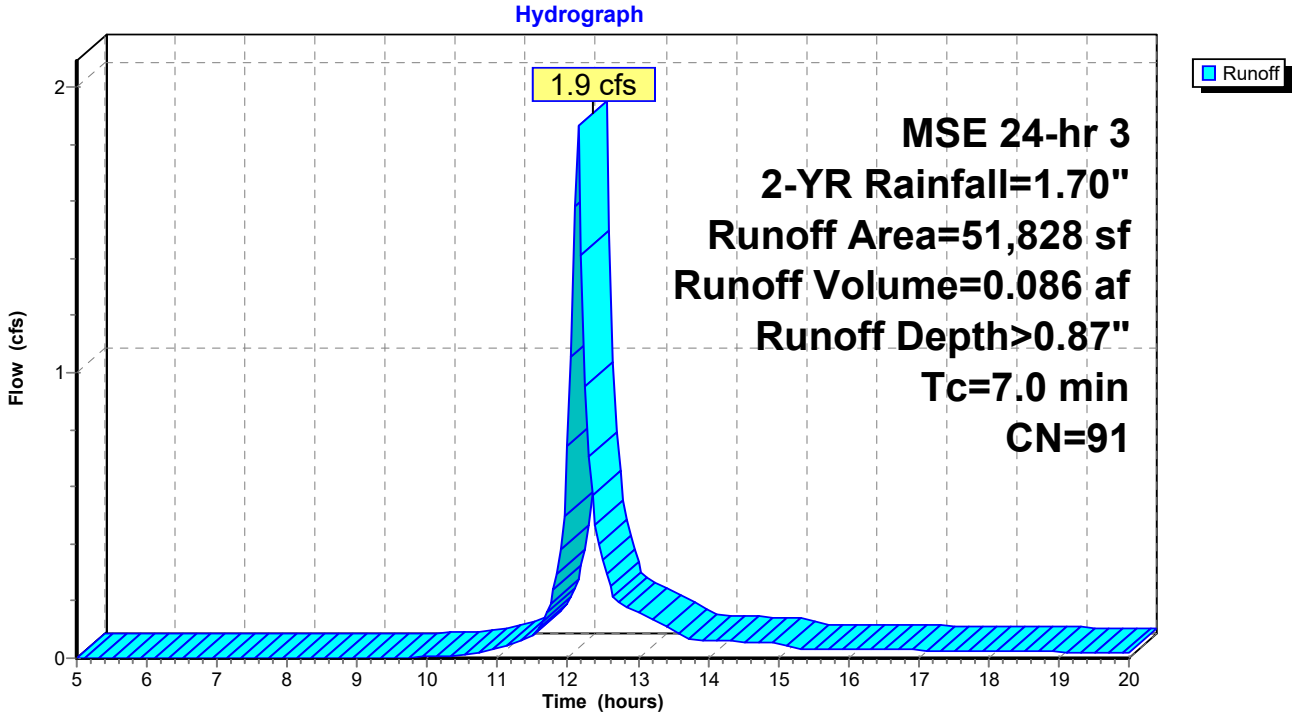
Runoff = 1.9 cfs @ 12.14 hrs, Volume= 0.086 af, Depth> 0.87"
Routed to Reach 4R : South Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
31,516	98	Paved parking, HSG D
20,312	80	>75% Grass cover, Good, HSG D
51,828	91	Weighted Average
20,312		39.19% Pervious Area
31,516		60.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 4XS:



Summary for Subcatchment 5XS:

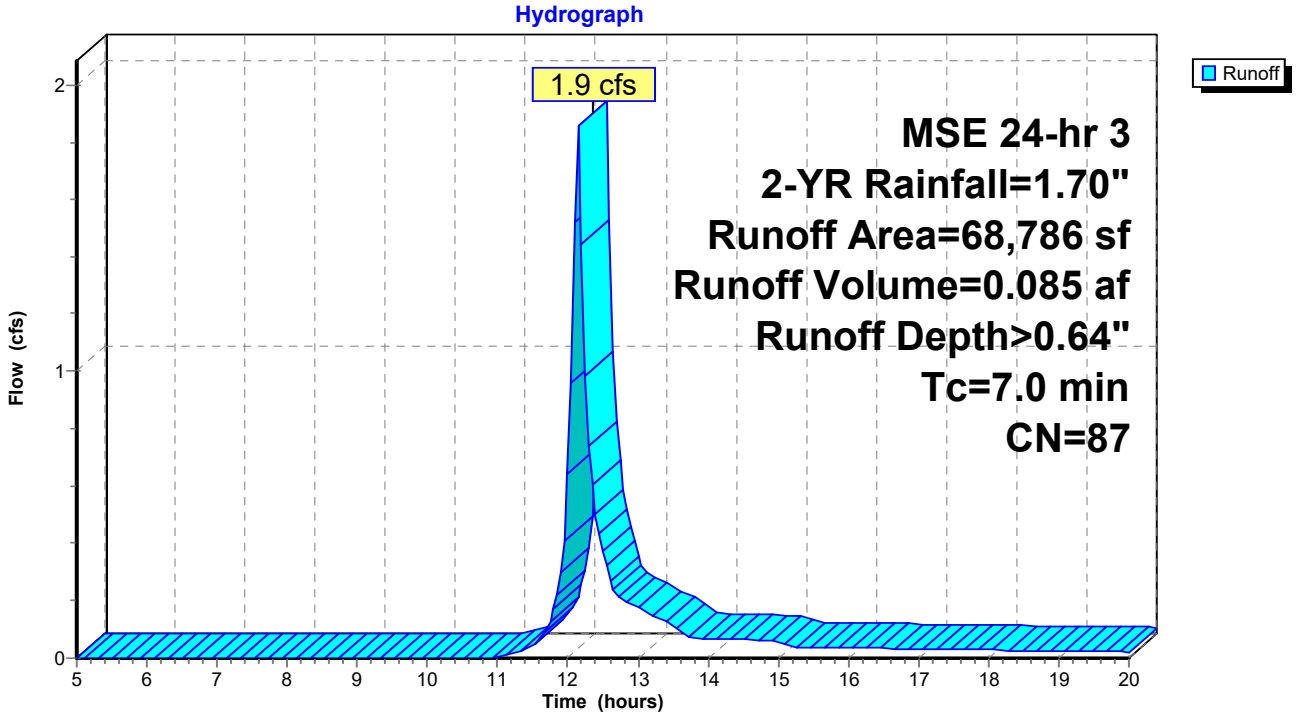
Runoff = 1.9 cfs @ 12.15 hrs, Volume= 0.085 af, Depth> 0.64"
Routed to Reach 5R : SE Bluff - To Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
26,329	98	Paved parking, HSG D
42,457	80	>75% Grass cover, Good, HSG D
68,786	87	Weighted Average
42,457		61.72% Pervious Area
26,329		38.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 5XS:



Summary for Subcatchment 6XS:

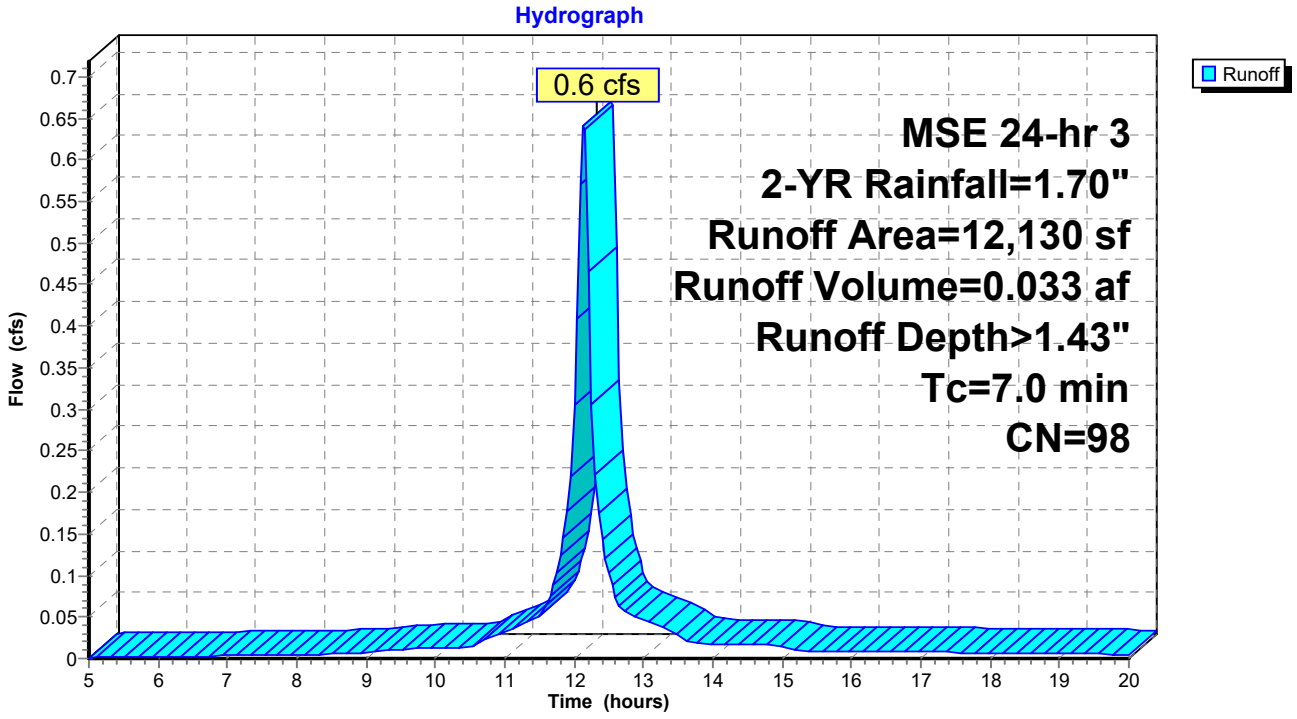
Runoff = 0.6 cfs @ 12.14 hrs, Volume= 0.033 af, Depth> 1.43"
Routed to Reach 6R : East Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
12,130	98	Paved parking, HSG D
0	80	>75% Grass cover, Good, HSG D
12,130	98	Weighted Average
12,130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 6XS:



Summary for Subcatchment 8XS:

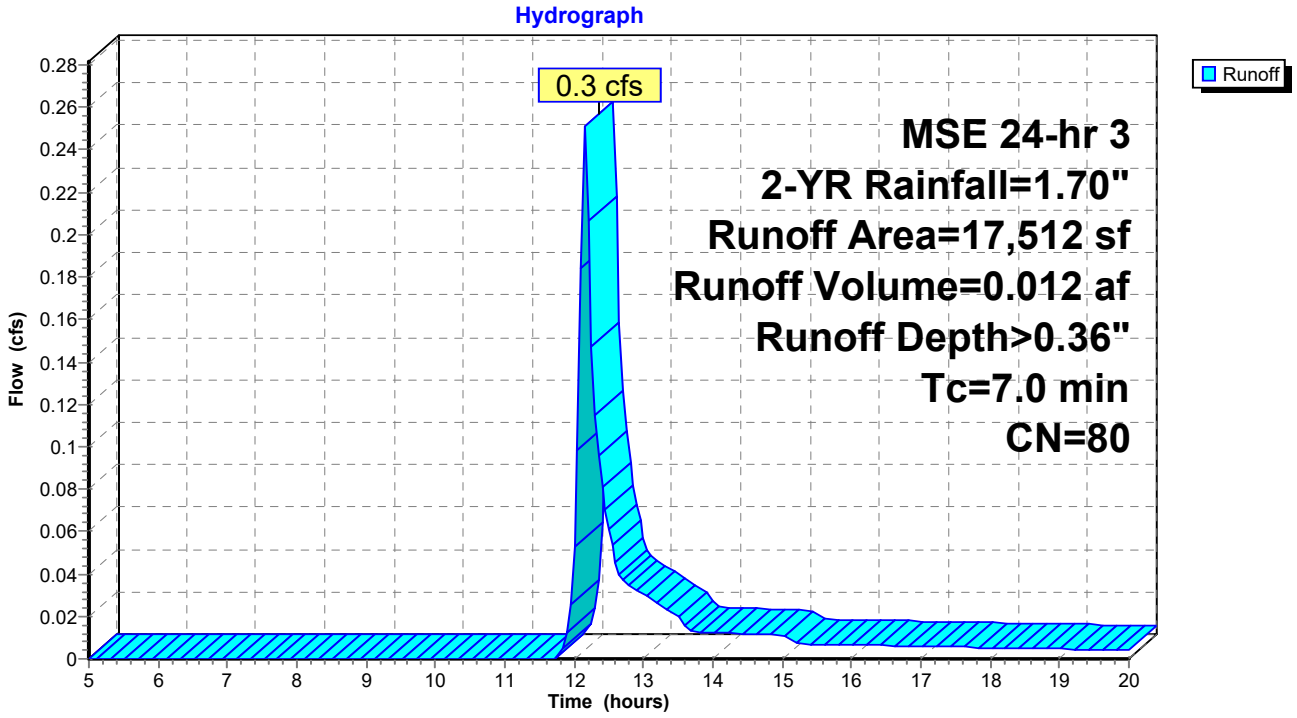
Runoff = 0.3 cfs @ 12.15 hrs, Volume= 0.012 af, Depth> 0.36"
Routed to Reach 7R : North Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
17,512	80	>75% Grass cover, Good, HSG D
17,512		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 8XS:

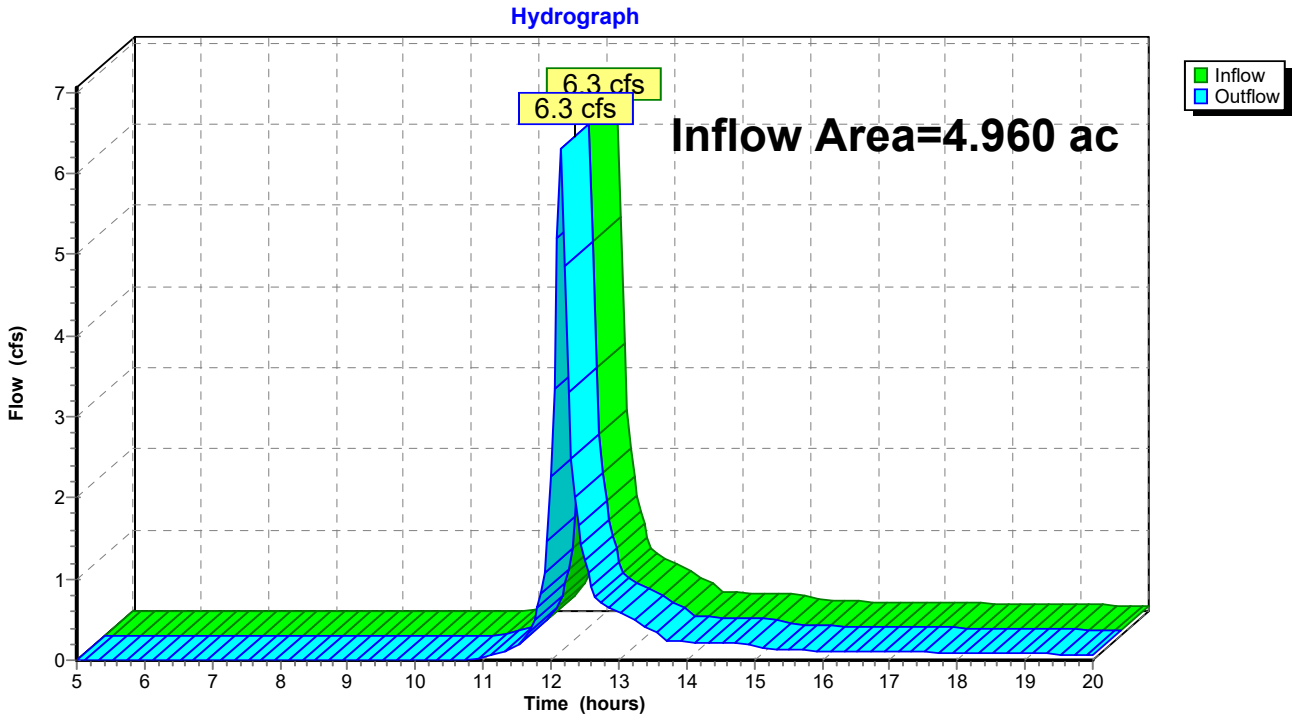


Summary for Reach 1R: NW Storm

Inflow Area = 4.960 ac, 45.85% Impervious, Inflow Depth > 0.70" for 2-YR event
Inflow = 6.3 cfs @ 12.15 hrs, Volume= 0.287 af
Outflow = 6.3 cfs @ 12.15 hrs, Volume= 0.287 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: NW Storm

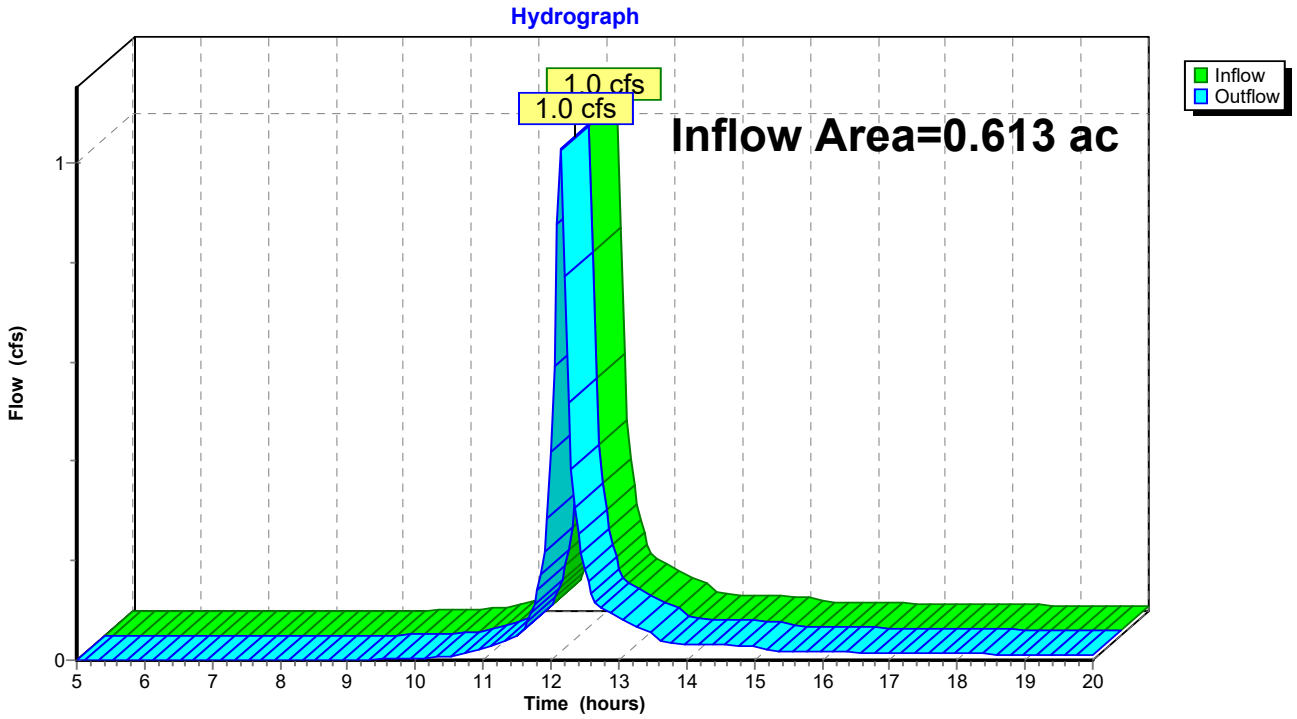


Summary for Reach 2R: West Storm

Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 0.93" for 2-YR event
Inflow = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af
Outflow = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: West Storm

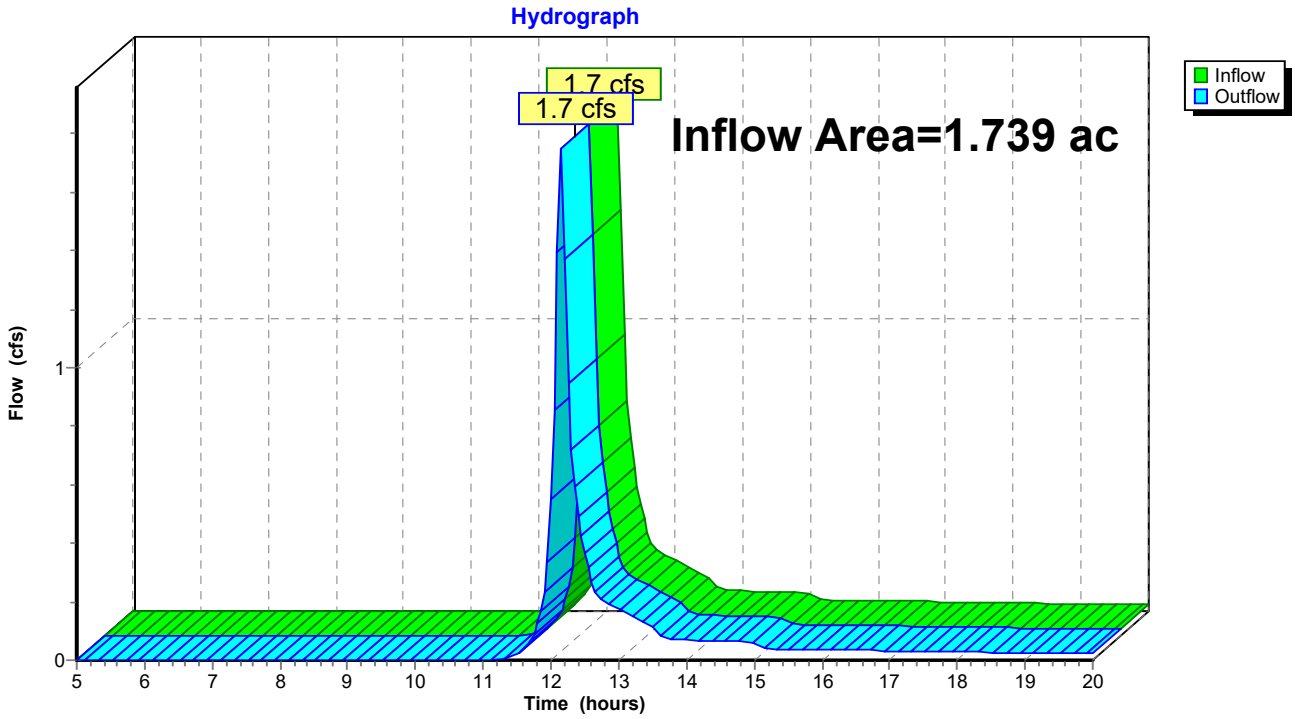


Summary for Reach 3R: West Bluff

Inflow Area = 1.739 ac, 26.31% Impervious, Inflow Depth > 0.55" for 2-YR event
Inflow = 1.7 cfs @ 12.15 hrs, Volume= 0.080 af
Outflow = 1.7 cfs @ 12.15 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 3R: West Bluff

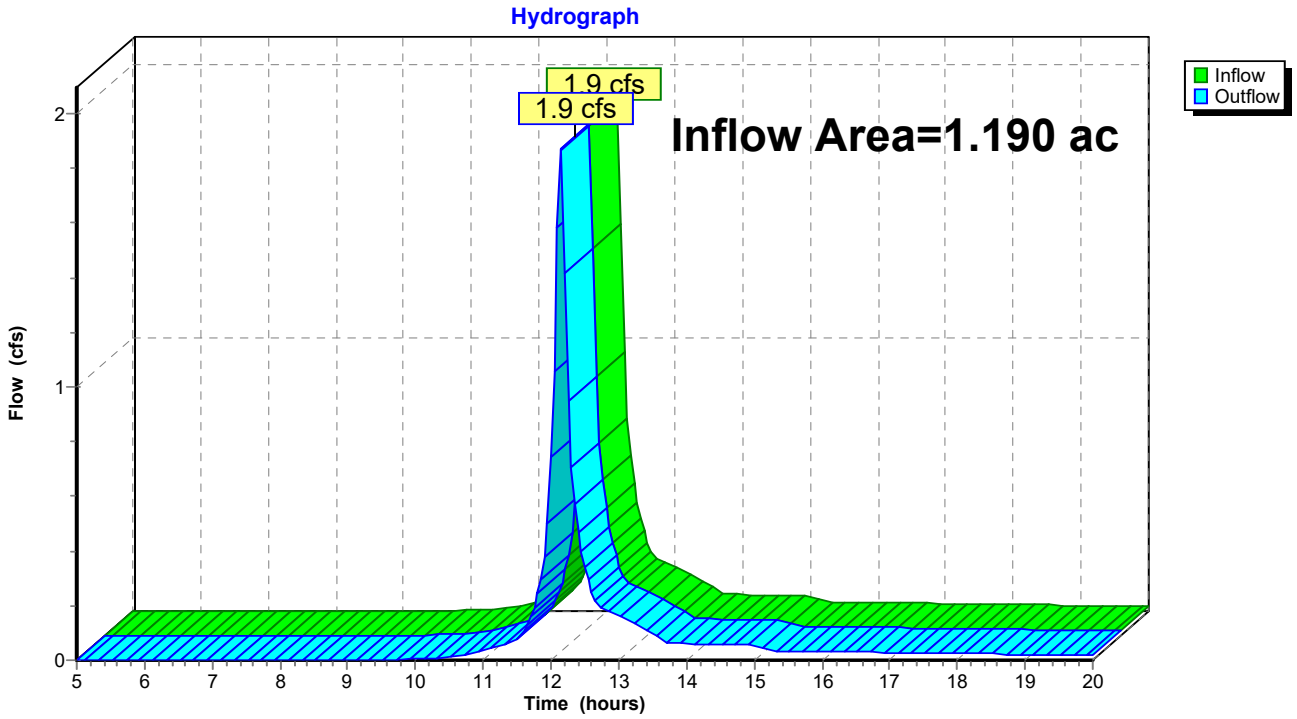


Summary for Reach 4R: South Storm

Inflow Area = 1.190 ac, 60.81% Impervious, Inflow Depth > 0.87" for 2-YR event
Inflow = 1.9 cfs @ 12.14 hrs, Volume= 0.086 af
Outflow = 1.9 cfs @ 12.14 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: South Storm

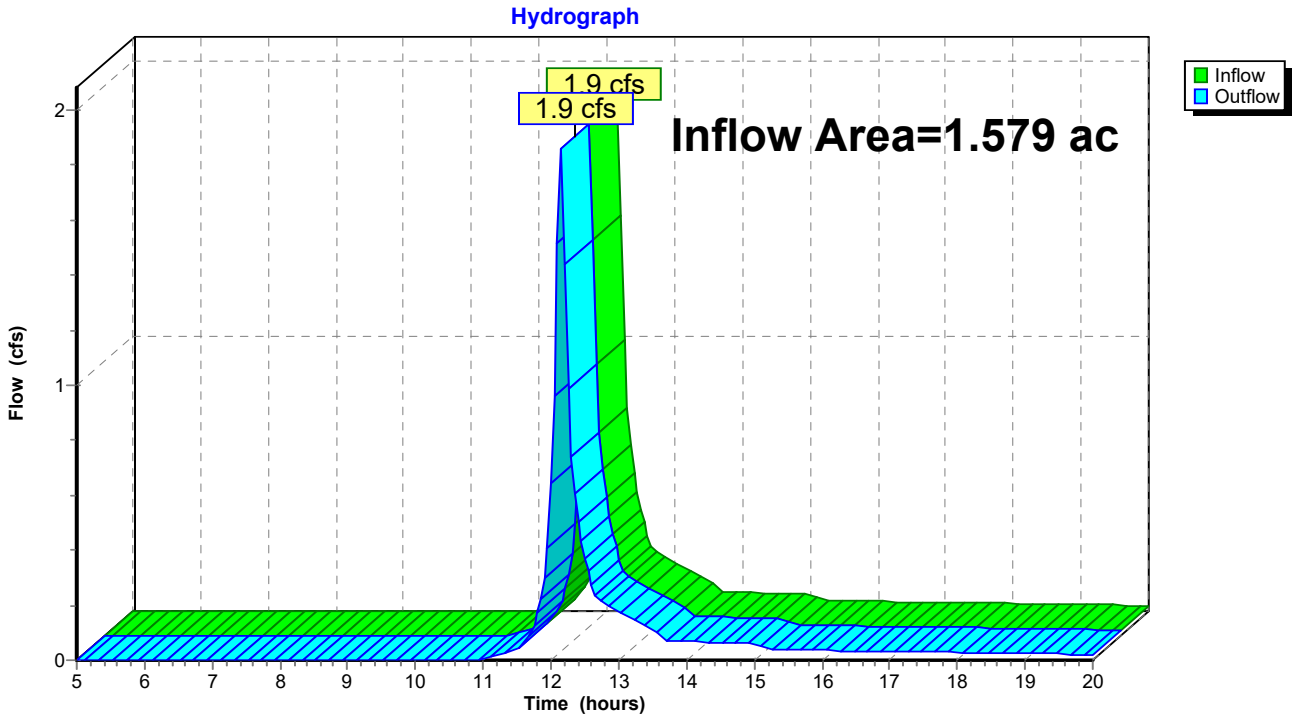


Summary for Reach 5R: SE Bluff - To Road

Inflow Area = 1.579 ac, 38.28% Impervious, Inflow Depth > 0.64" for 2-YR event
Inflow = 1.9 cfs @ 12.15 hrs, Volume= 0.085 af
Outflow = 1.9 cfs @ 12.15 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SE Bluff - To Road

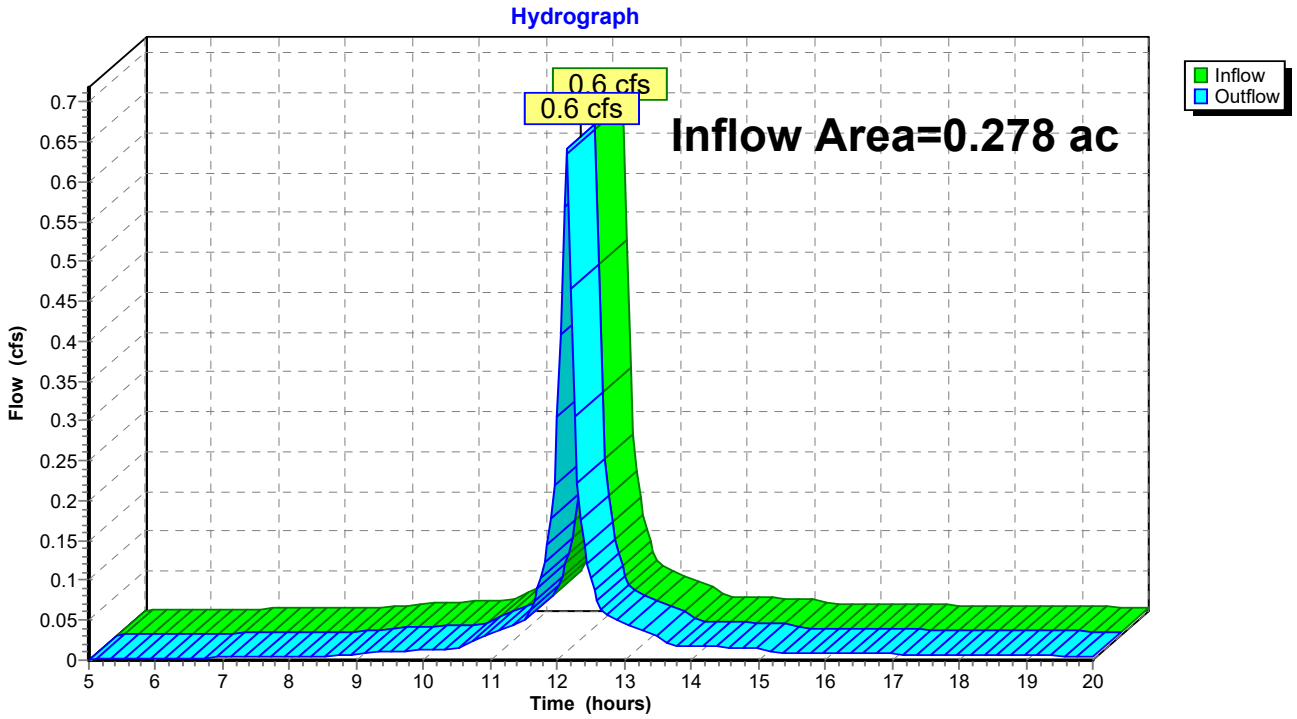


Summary for Reach 6R: East Storm

Inflow Area = 0.278 ac,100.00% Impervious, Inflow Depth > 1.43" for 2-YR event
Inflow = 0.6 cfs @ 12.14 hrs, Volume= 0.033 af
Outflow = 0.6 cfs @ 12.14 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: East Storm

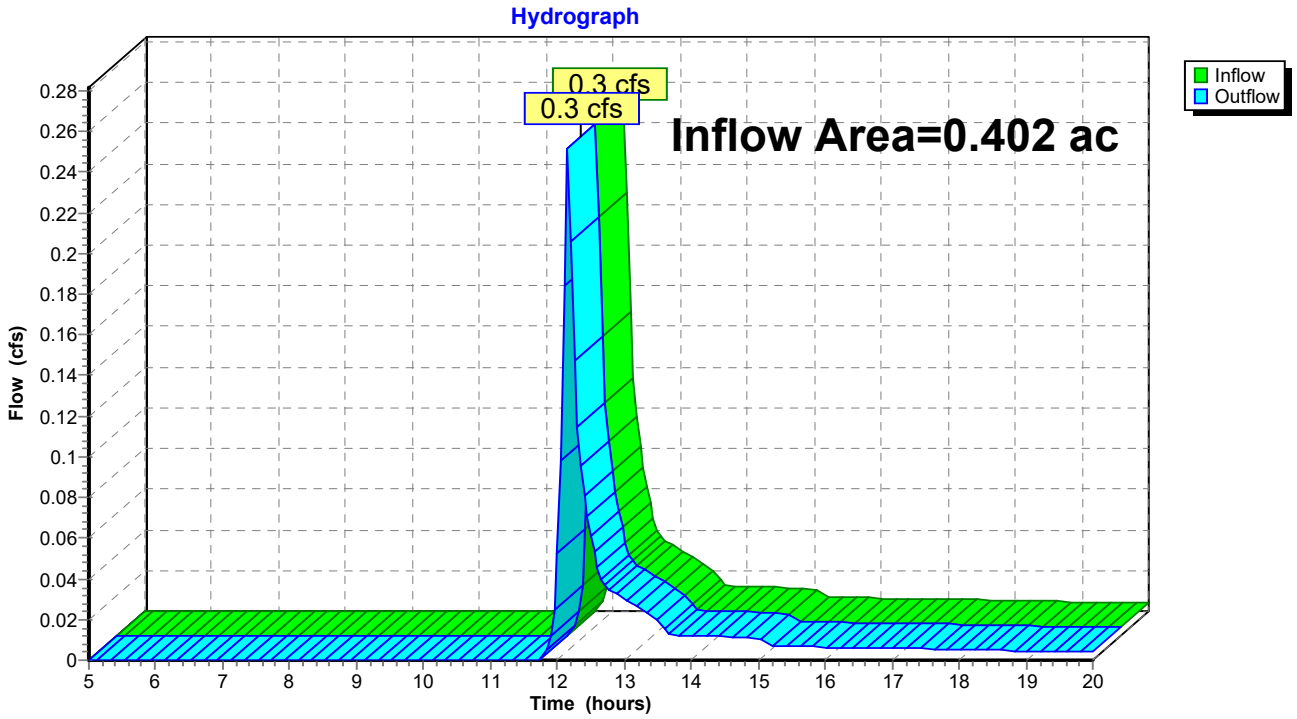


Summary for Reach 7R: North Bluff

Inflow Area = 0.402 ac, 0.00% Impervious, Inflow Depth > 0.36" for 2-YR event
Inflow = 0.3 cfs @ 12.15 hrs, Volume= 0.012 af
Outflow = 0.3 cfs @ 12.15 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: North Bluff



Summary for Pond 3P: (new Pond)

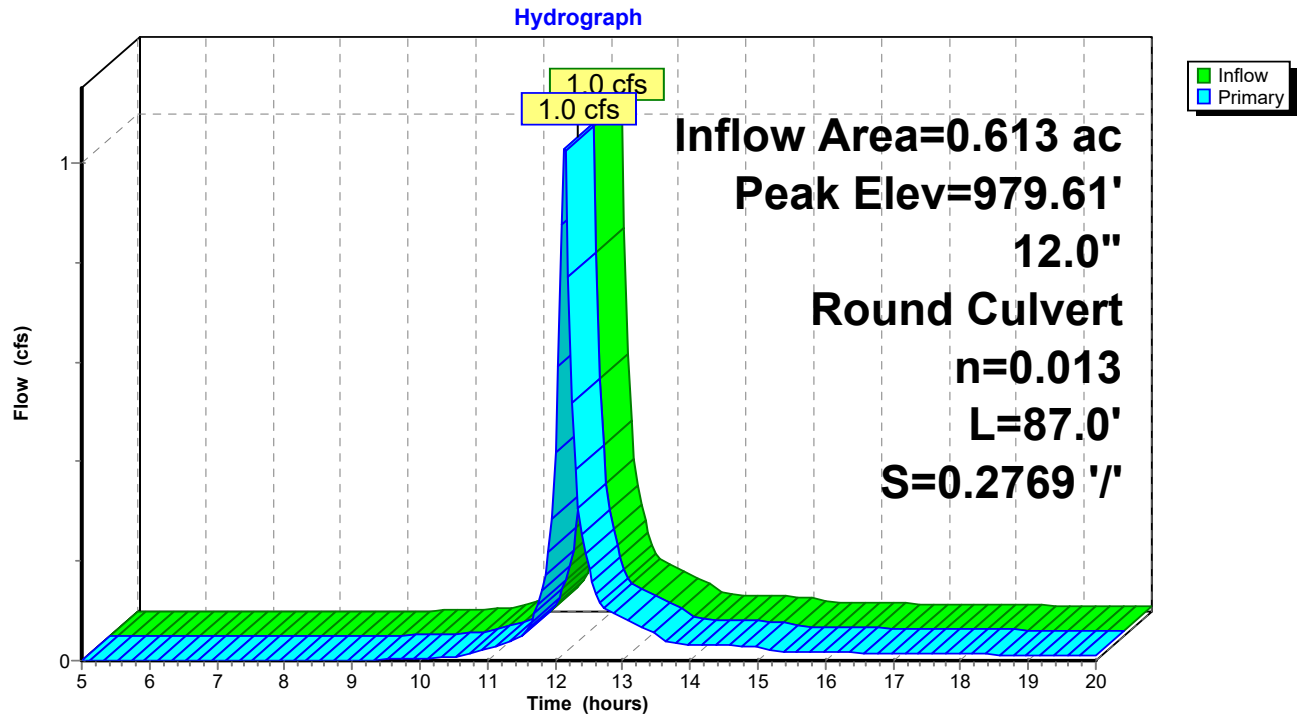
Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 0.93" for 2-YR event
Inflow = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af
Outflow = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af
Routed to Pond 4P : (new Pond)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 979.61' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	979.09'	**12.0" Round RCP_Round 12"** L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 979.09' / 955.00' S= 0.2769 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.0 cfs @ 12.14 hrs HW=979.61' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 1.0 cfs @ 2.45 fps)

Pond 3P: (new Pond)



Summary for Pond 4P: (new Pond)

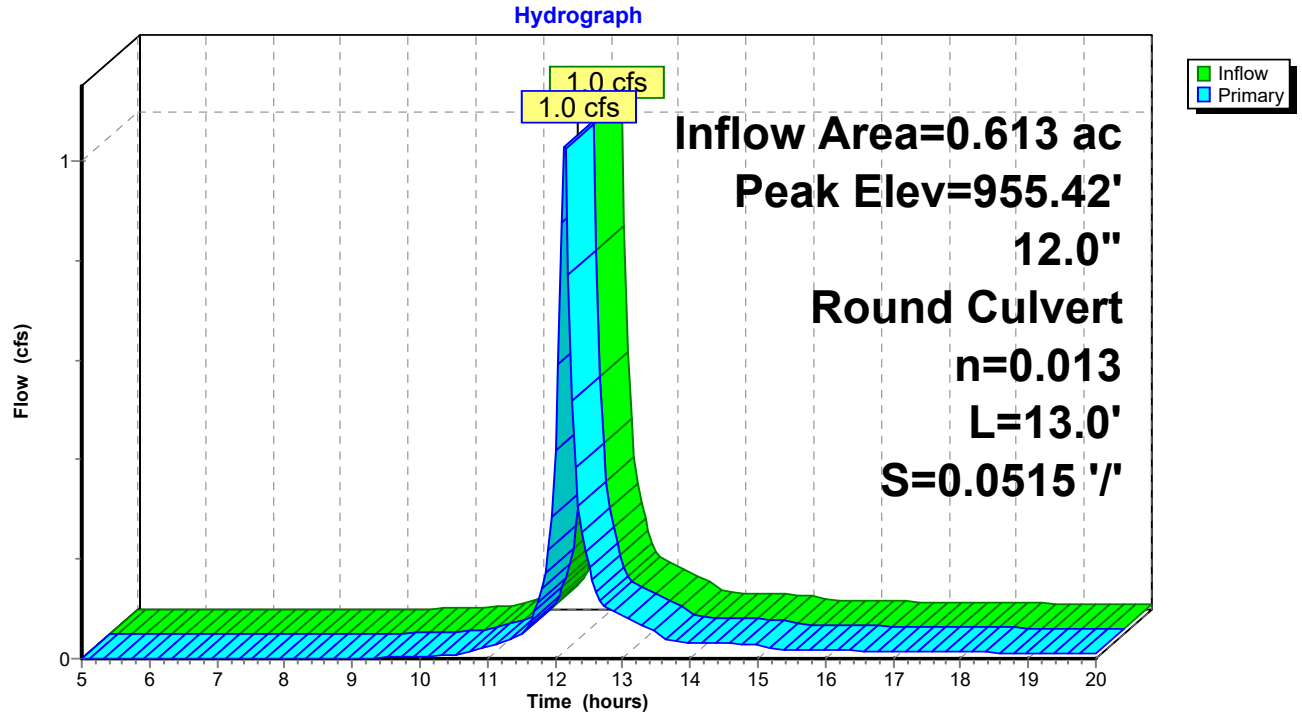
Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 0.93" for 2-YR event
Inflow = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af
Outflow = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af
Routed to Reach 2R : West Storm

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 955.42' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	954.90'	**12.0" Round RCP_Round 12"** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 954.90' / 954.23' S= 0.0515 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.0 cfs @ 12.14 hrs HW=955.42' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 1.0 cfs @ 2.45 fps)

Pond 4P: (new Pond)



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1XS: Runoff Area=216,068 sf 45.85% Impervious Runoff Depth>2.88"
Tc=7.0 min CN=88 Runoff=24.9 cfs 1.191 af

Subcatchment2XS: Runoff Area=26,713 sf 64.20% Impervious Runoff Depth>3.28"
Tc=7.0 min CN=92 Runoff=3.4 cfs 0.167 af

Subcatchment3XS: Runoff Area=75,763 sf 26.31% Impervious Runoff Depth>2.61"
Tc=7.0 min CN=85 Runoff=8.0 cfs 0.378 af

Subcatchment4XS: Runoff Area=51,828 sf 60.81% Impervious Runoff Depth>3.18"
Tc=7.0 min CN=91 Runoff=6.4 cfs 0.315 af

Subcatchment5XS: Runoff Area=68,786 sf 38.28% Impervious Runoff Depth>2.79"
Tc=7.0 min CN=87 Runoff=7.7 cfs 0.367 af

Subcatchment6XS: Runoff Area=12,130 sf 100.00% Impervious Runoff Depth>3.89"
Tc=7.0 min CN=98 Runoff=1.7 cfs 0.090 af

Subcatchment8XS: Runoff Area=17,512 sf 0.00% Impervious Runoff Depth>2.18"
Tc=7.0 min CN=80 Runoff=1.6 cfs 0.073 af

Reach 1R: NW Storm Inflow=24.9 cfs 1.191 af
Outflow=24.9 cfs 1.191 af

Reach 2R: West Storm Inflow=3.4 cfs 0.167 af
Outflow=3.4 cfs 0.167 af

Reach 3R: West Bluff Inflow=8.0 cfs 0.378 af
Outflow=8.0 cfs 0.378 af

Reach 4R: South Storm Inflow=6.4 cfs 0.315 af
Outflow=6.4 cfs 0.315 af

Reach 5R: SE Bluff - To Road Inflow=7.7 cfs 0.367 af
Outflow=7.7 cfs 0.367 af

Reach 6R: East Storm Inflow=1.7 cfs 0.090 af
Outflow=1.7 cfs 0.090 af

Reach 7R: North Bluff Inflow=1.6 cfs 0.073 af
Outflow=1.6 cfs 0.073 af

Pond 3P: (new Pond) Peak Elev=980.38' Inflow=3.4 cfs 0.167 af
12.0" Round Culvert n=0.013 L=87.0' S=0.2769 '/' Outflow=3.4 cfs 0.167 af

Pond 4P: (new Pond) Peak Elev=956.19' Inflow=3.4 cfs 0.167 af
12.0" Round Culvert n=0.013 L=13.0' S=0.0515 '/' Outflow=3.4 cfs 0.167 af

Total Runoff Area = 10.762 ac Runoff Volume = 2.581 af Average Runoff Depth = 2.88"
56.03% Pervious = 6.030 ac 43.97% Impervious = 4.732 ac

Summary for Subcatchment 1XS:

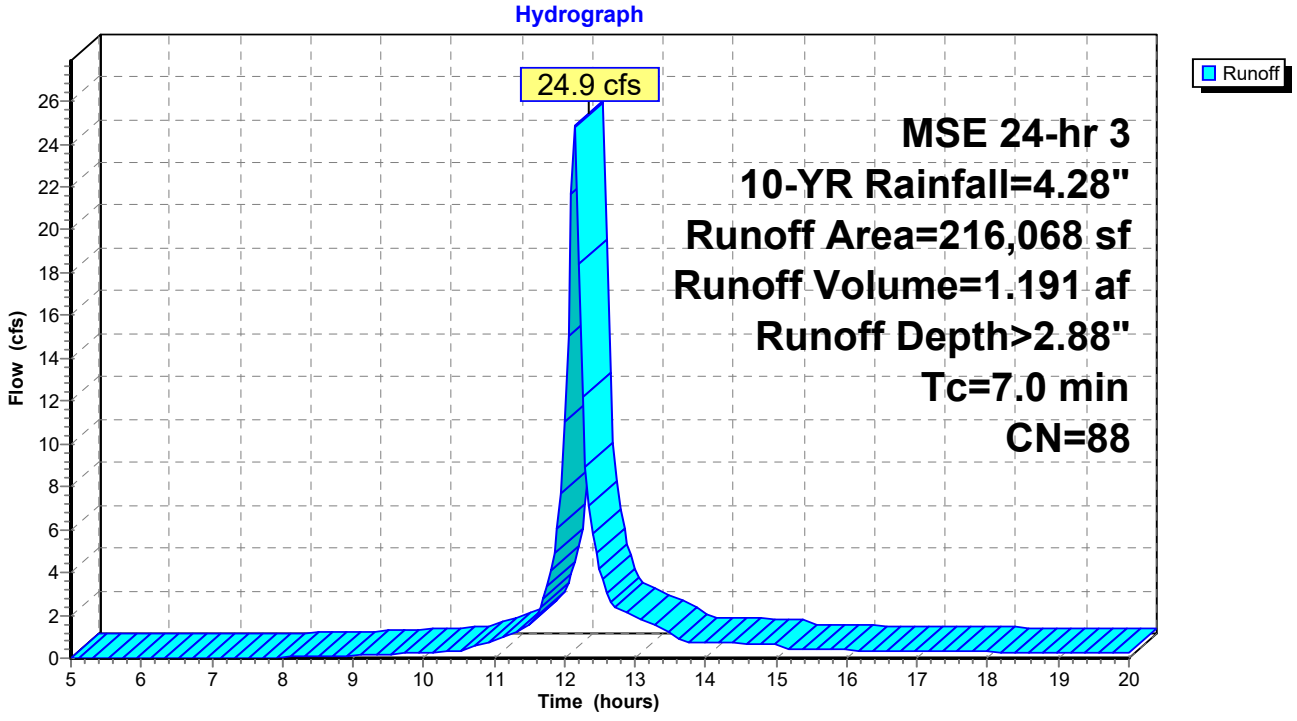
Runoff = 24.9 cfs @ 12.14 hrs, Volume= 1.191 af, Depth> 2.88"
Routed to Reach 1R : NW Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
99,068	98	Paved parking, HSG D
117,000	80	>75% Grass cover, Good, HSG D
216,068	88	Weighted Average
117,000		54.15% Pervious Area
99,068		45.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 1XS:



Summary for Subcatchment 2XS:

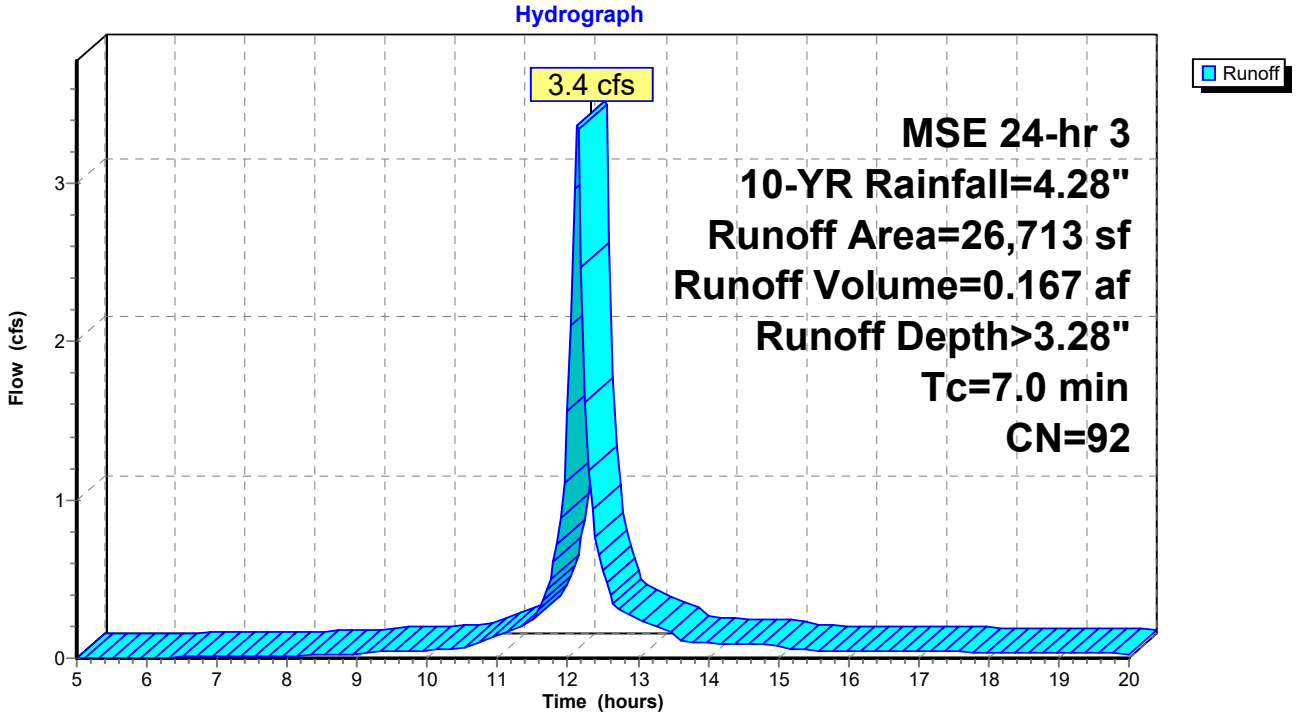
Runoff = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af, Depth> 3.28"
Routed to Pond 3P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
17,151	98	Paved parking, HSG D
9,562	80	>75% Grass cover, Good, HSG D
26,713	92	Weighted Average
9,562		35.80% Pervious Area
17,151		64.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 2XS:



Summary for Subcatchment 3XS:

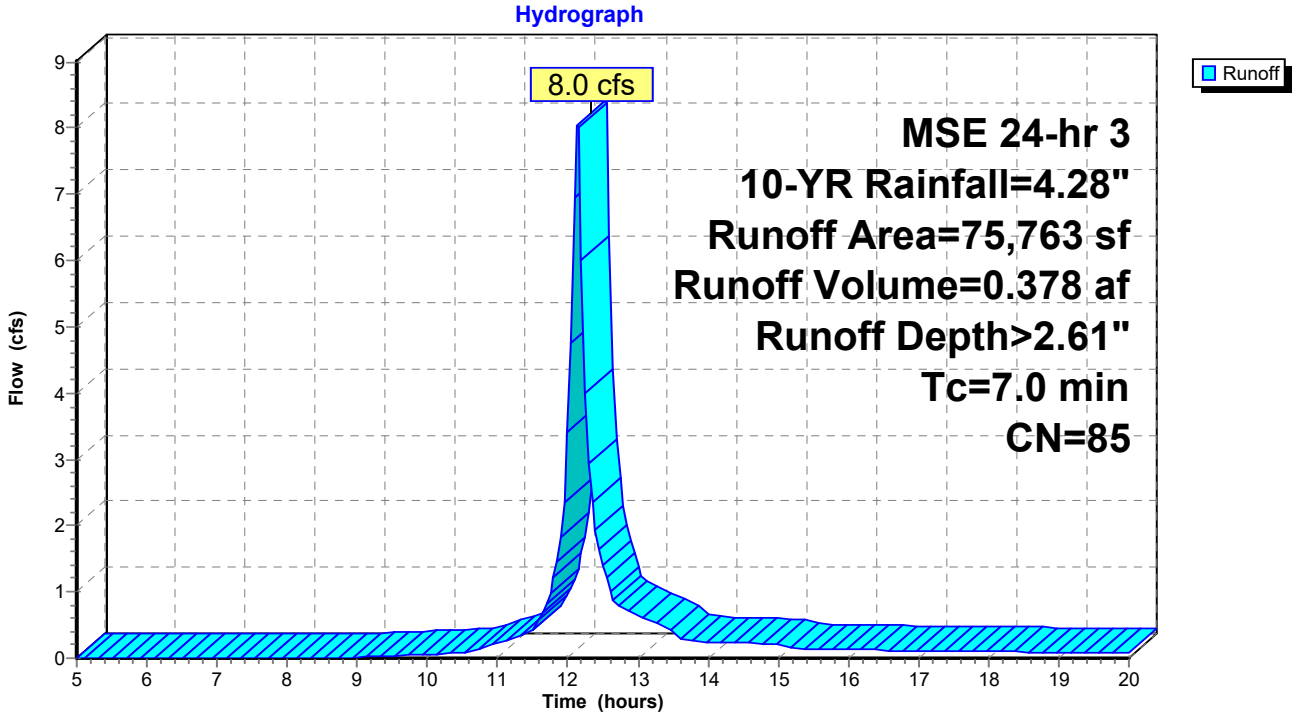
Runoff = 8.0 cfs @ 12.14 hrs, Volume= 0.378 af, Depth> 2.61"
Routed to Reach 3R : West Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
19,931	98	Paved parking, HSG D
55,832	80	>75% Grass cover, Good, HSG D
75,763	85	Weighted Average
55,832		73.69% Pervious Area
19,931		26.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 3XS:



Summary for Subcatchment 4XS:

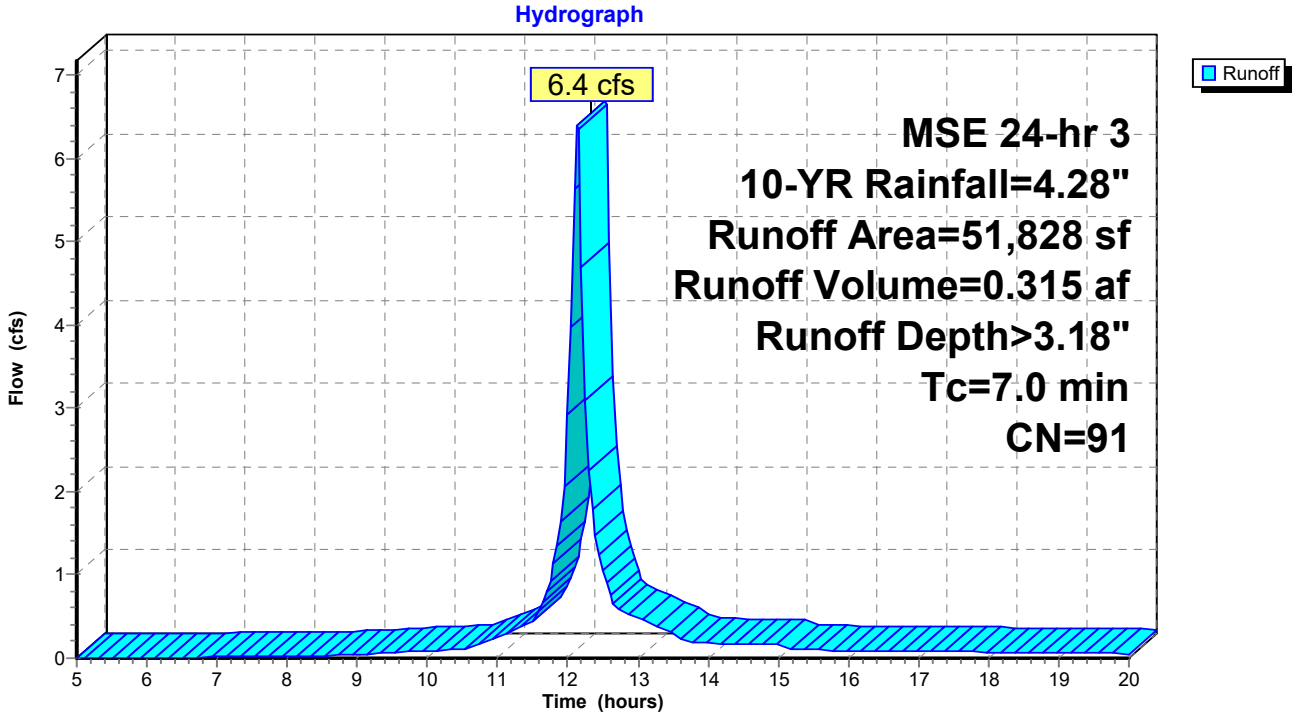
Runoff = 6.4 cfs @ 12.14 hrs, Volume= 0.315 af, Depth> 3.18"
Routed to Reach 4R : South Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
31,516	98	Paved parking, HSG D
20,312	80	>75% Grass cover, Good, HSG D
51,828	91	Weighted Average
20,312		39.19% Pervious Area
31,516		60.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 4XS:



Summary for Subcatchment 5XS:

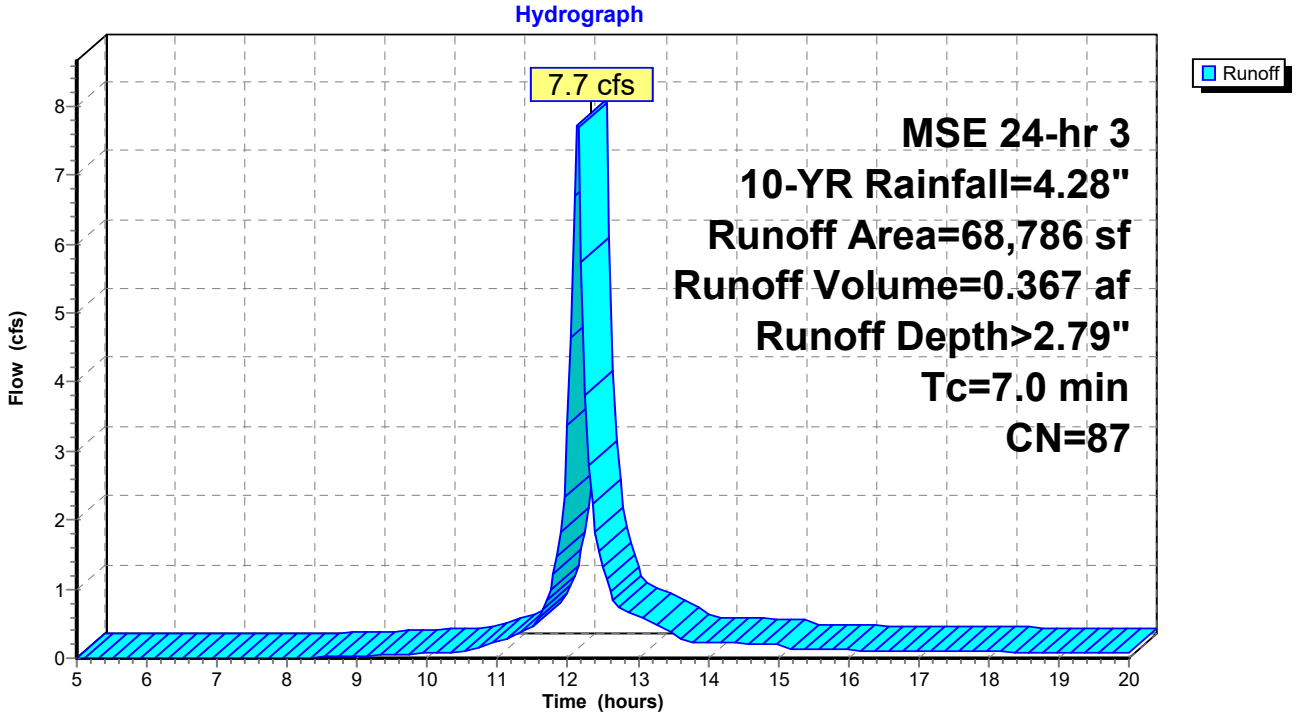
Runoff = 7.7 cfs @ 12.14 hrs, Volume= 0.367 af, Depth> 2.79"
Routed to Reach 5R : SE Bluff - To Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
26,329	98	Paved parking, HSG D
42,457	80	>75% Grass cover, Good, HSG D
68,786	87	Weighted Average
42,457		61.72% Pervious Area
26,329		38.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 5XS:



Summary for Subcatchment 6XS:

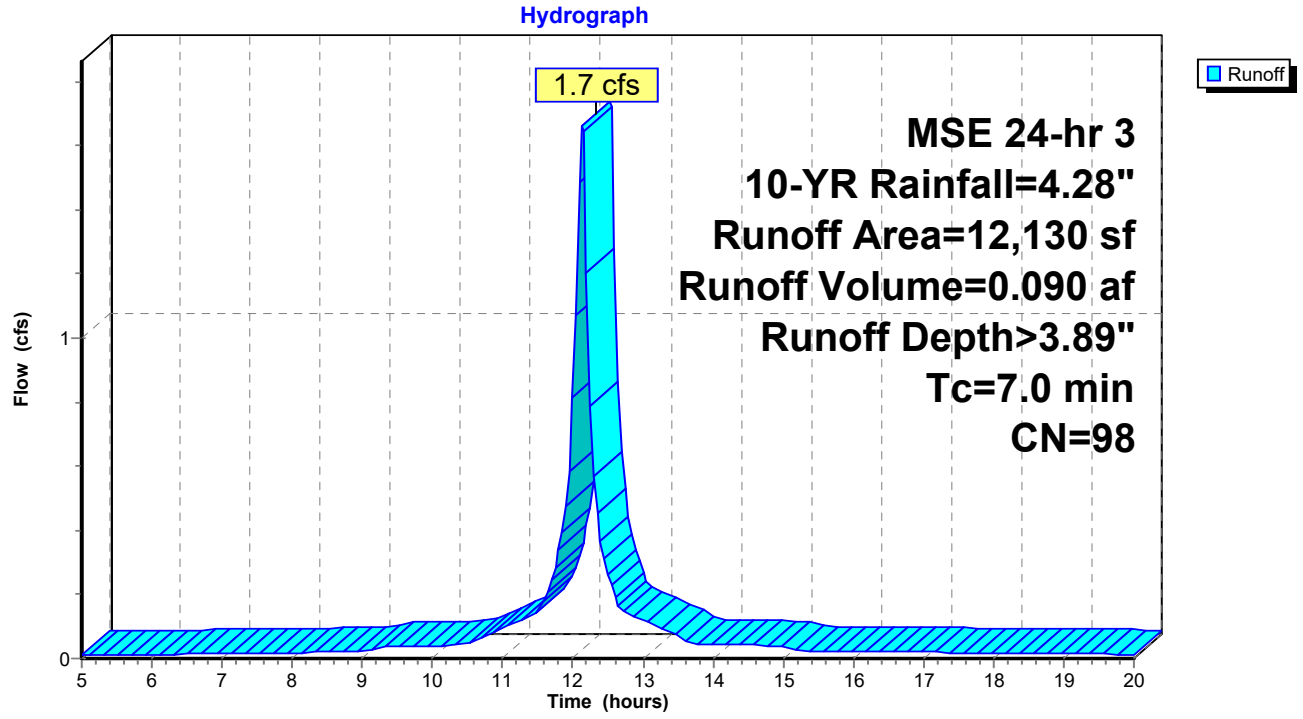
Runoff = 1.7 cfs @ 12.14 hrs, Volume= 0.090 af, Depth> 3.89"
Routed to Reach 6R : East Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
12,130	98	Paved parking, HSG D
0	80	>75% Grass cover, Good, HSG D
12,130	98	Weighted Average
12,130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 6XS:



Summary for Subcatchment 8XS:

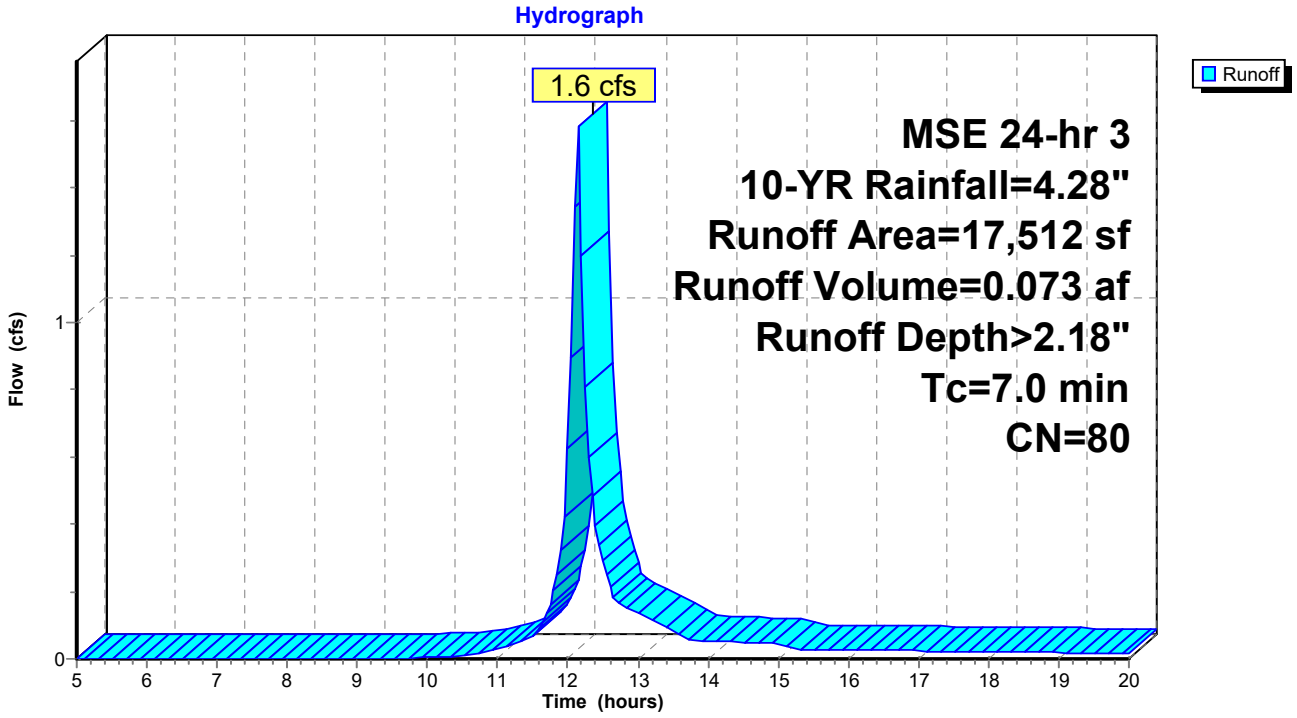
Runoff = 1.6 cfs @ 12.14 hrs, Volume= 0.073 af, Depth> 2.18"
Routed to Reach 7R : North Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
17,512	80	>75% Grass cover, Good, HSG D
17,512		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 8XS:

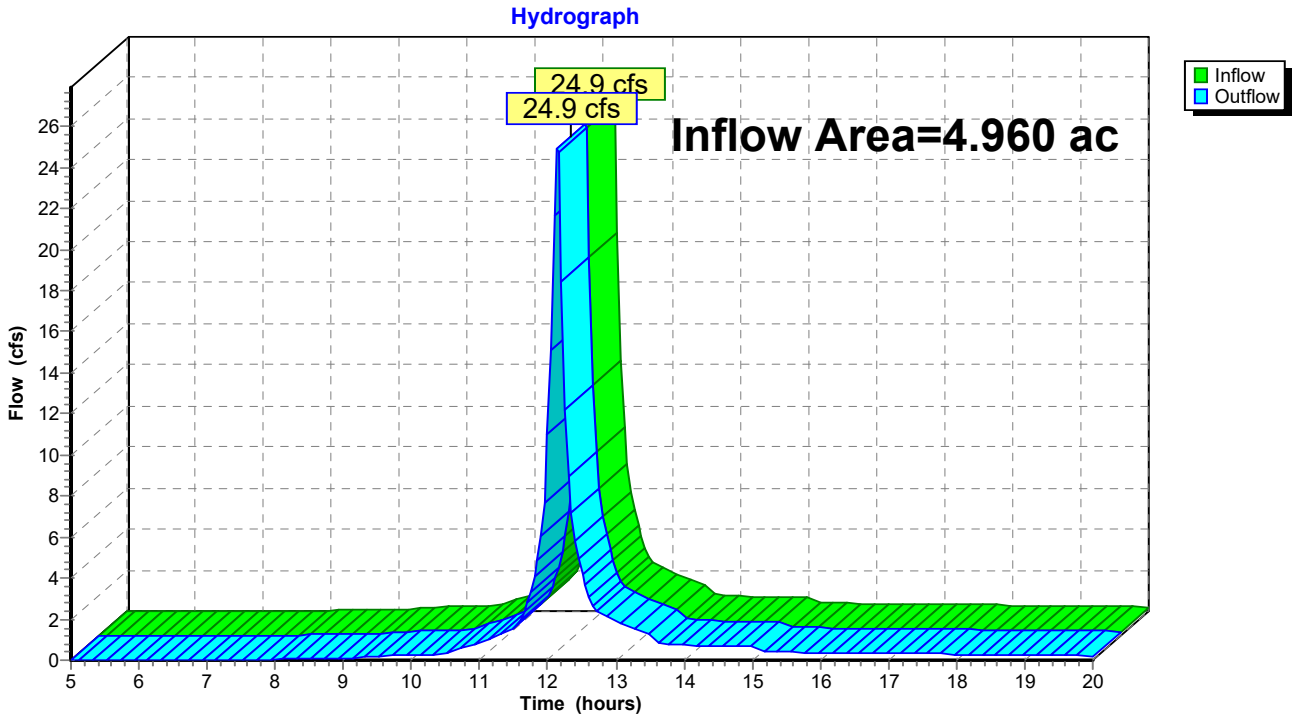


Summary for Reach 1R: NW Storm

Inflow Area = 4.960 ac, 45.85% Impervious, Inflow Depth > 2.88" for 10-YR event
Inflow = 24.9 cfs @ 12.14 hrs, Volume= 1.191 af
Outflow = 24.9 cfs @ 12.14 hrs, Volume= 1.191 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: NW Storm

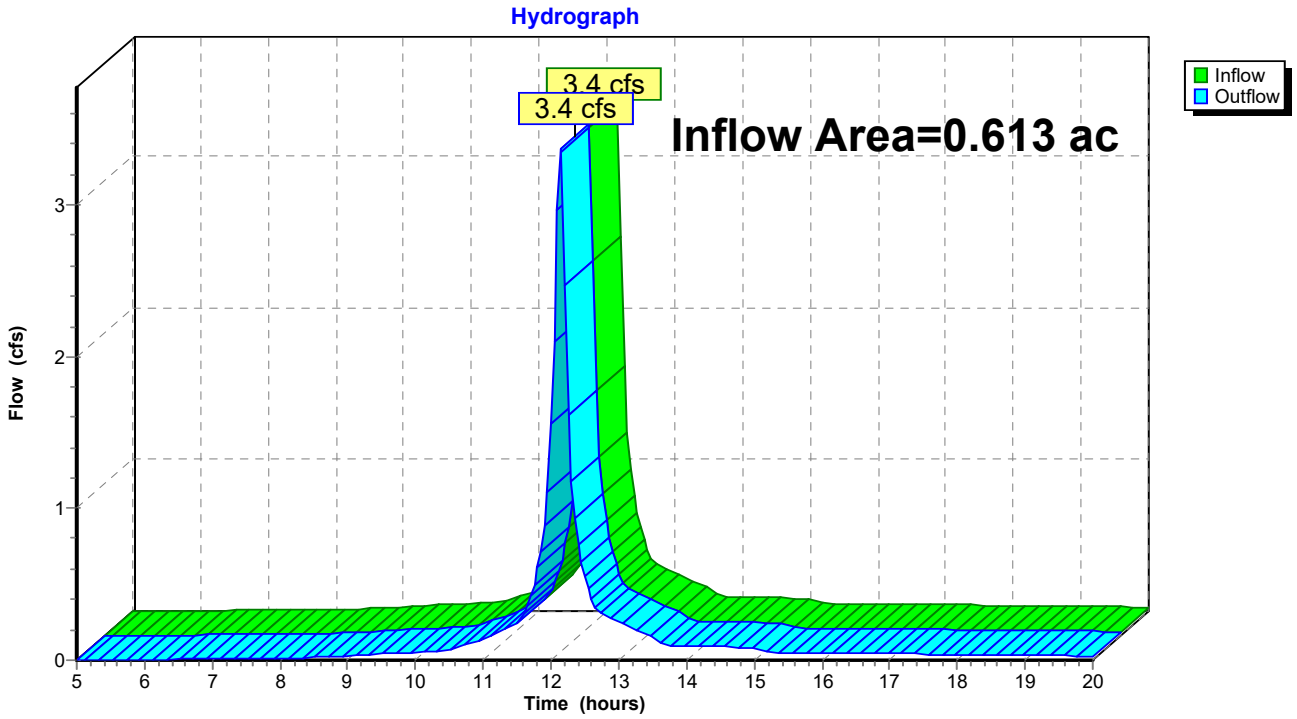


Summary for Reach 2R: West Storm

Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 3.28" for 10-YR event
Inflow = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af
Outflow = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: West Storm

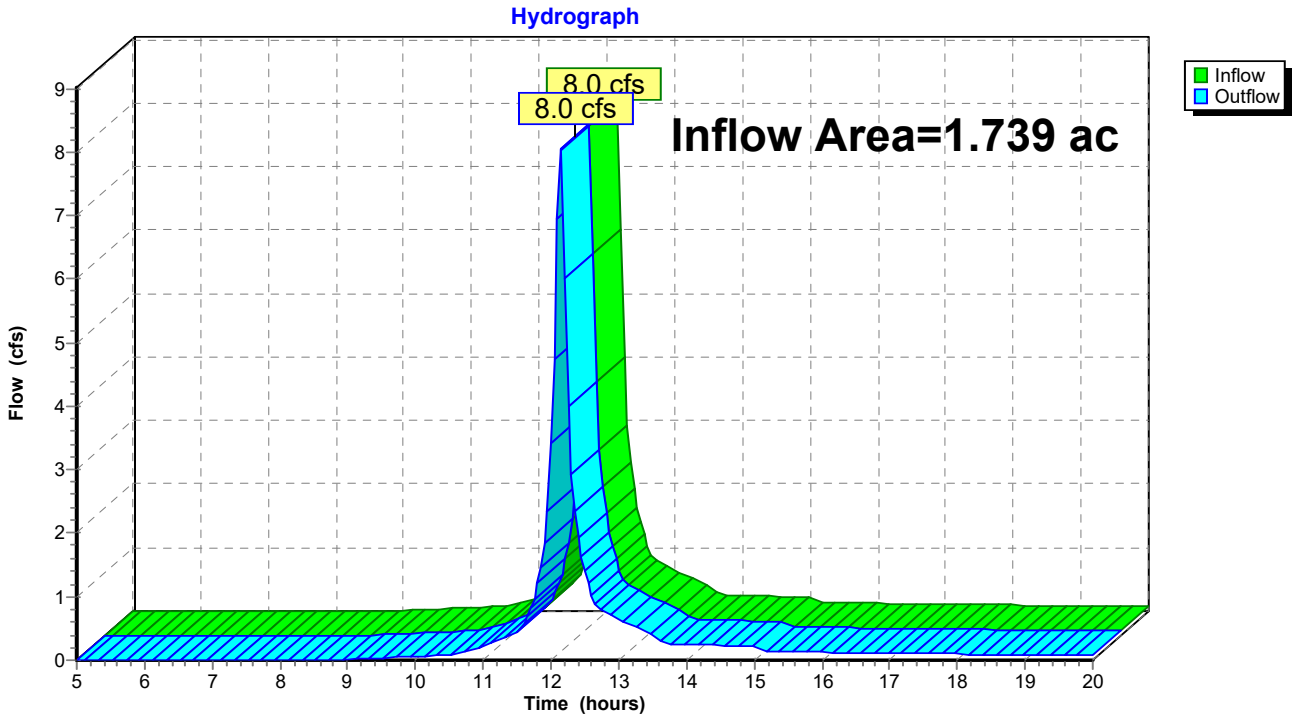


Summary for Reach 3R: West Bluff

Inflow Area = 1.739 ac, 26.31% Impervious, Inflow Depth > 2.61" for 10-YR event
Inflow = 8.0 cfs @ 12.14 hrs, Volume= 0.378 af
Outflow = 8.0 cfs @ 12.14 hrs, Volume= 0.378 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 3R: West Bluff

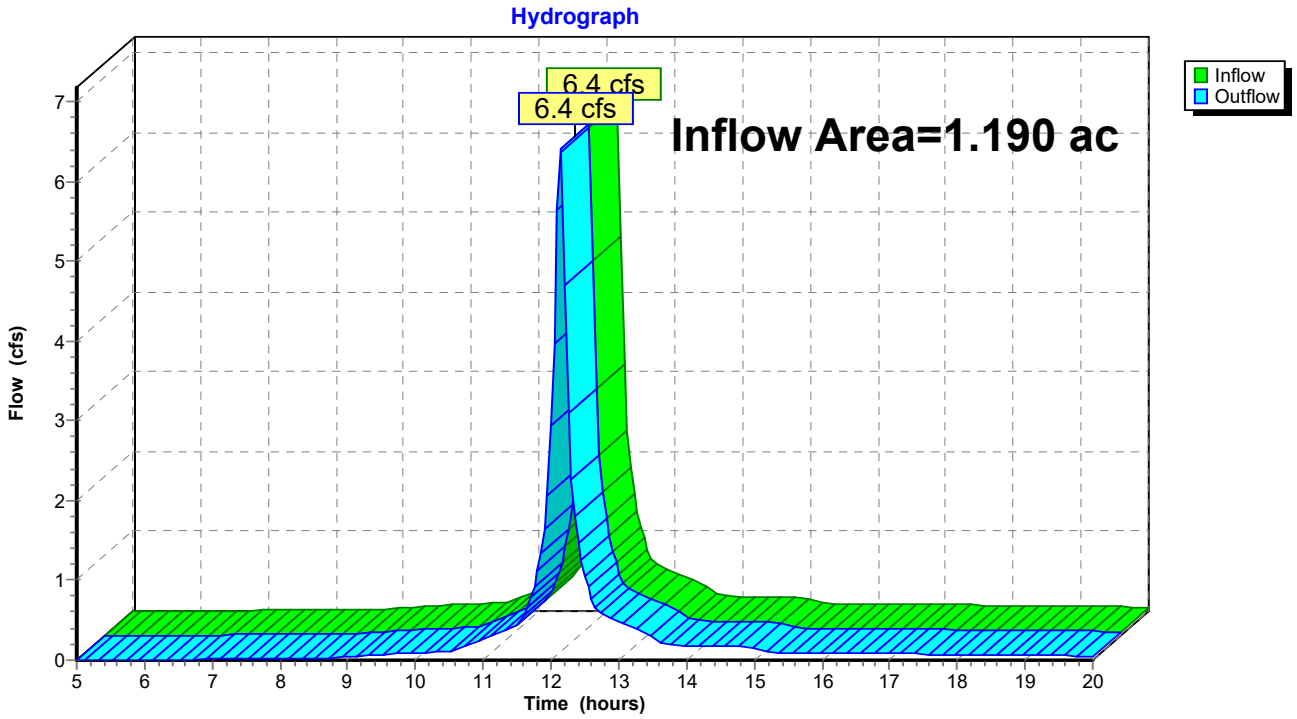


Summary for Reach 4R: South Storm

Inflow Area = 1.190 ac, 60.81% Impervious, Inflow Depth > 3.18" for 10-YR event
Inflow = 6.4 cfs @ 12.14 hrs, Volume= 0.315 af
Outflow = 6.4 cfs @ 12.14 hrs, Volume= 0.315 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: South Storm

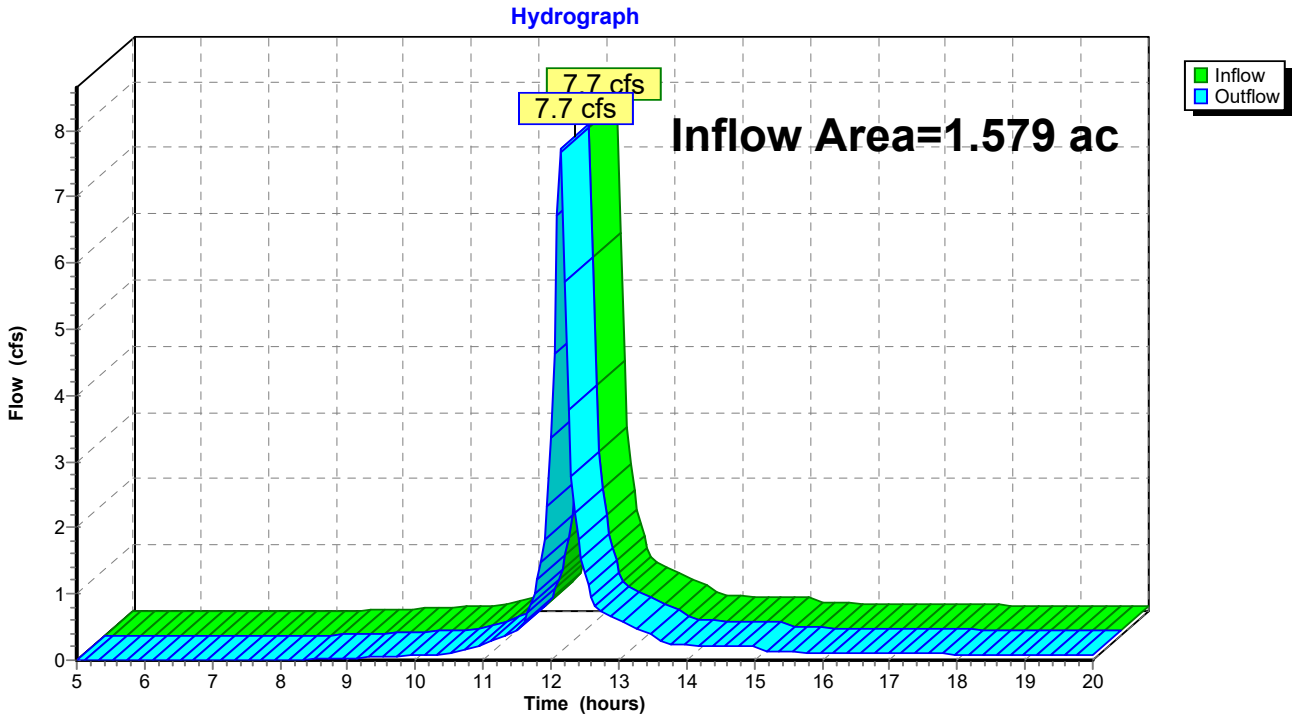


Summary for Reach 5R: SE Bluff - To Road

Inflow Area = 1.579 ac, 38.28% Impervious, Inflow Depth > 2.79" for 10-YR event
Inflow = 7.7 cfs @ 12.14 hrs, Volume= 0.367 af
Outflow = 7.7 cfs @ 12.14 hrs, Volume= 0.367 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SE Bluff - To Road

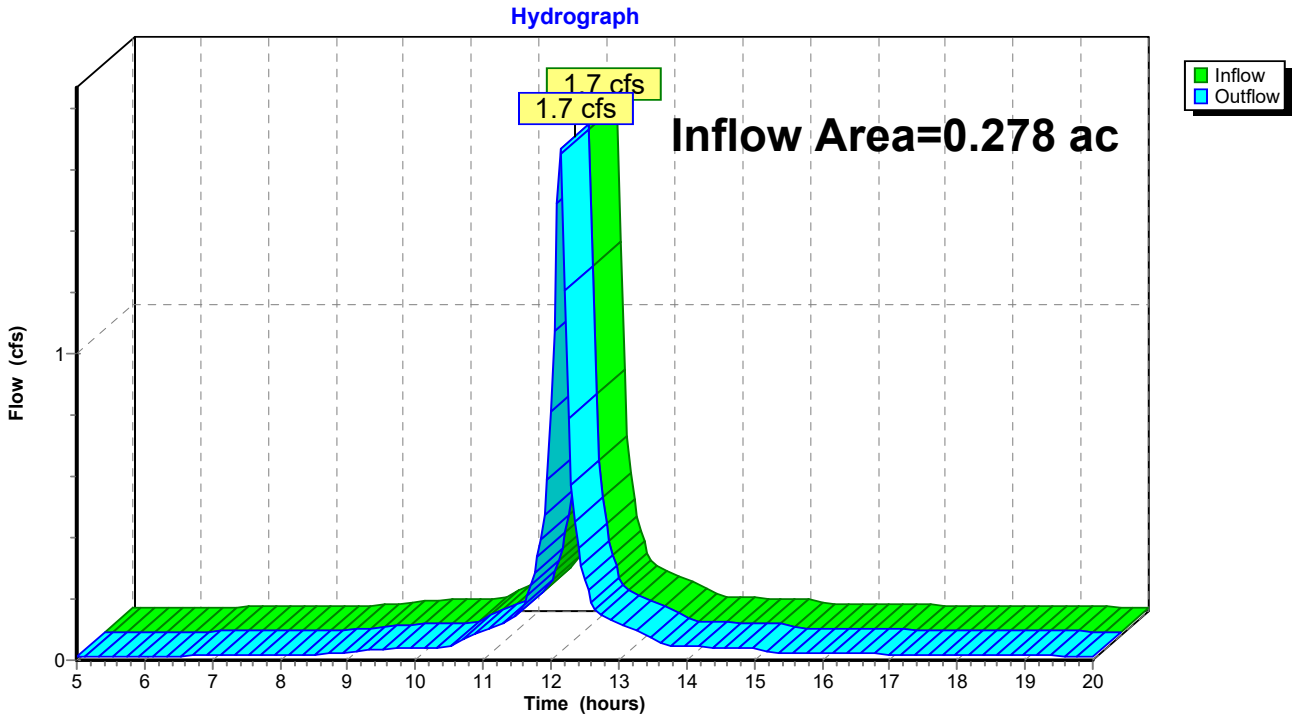


Summary for Reach 6R: East Storm

Inflow Area = 0.278 ac,100.00% Impervious, Inflow Depth > 3.89" for 10-YR event
Inflow = 1.7 cfs @ 12.14 hrs, Volume= 0.090 af
Outflow = 1.7 cfs @ 12.14 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: East Storm

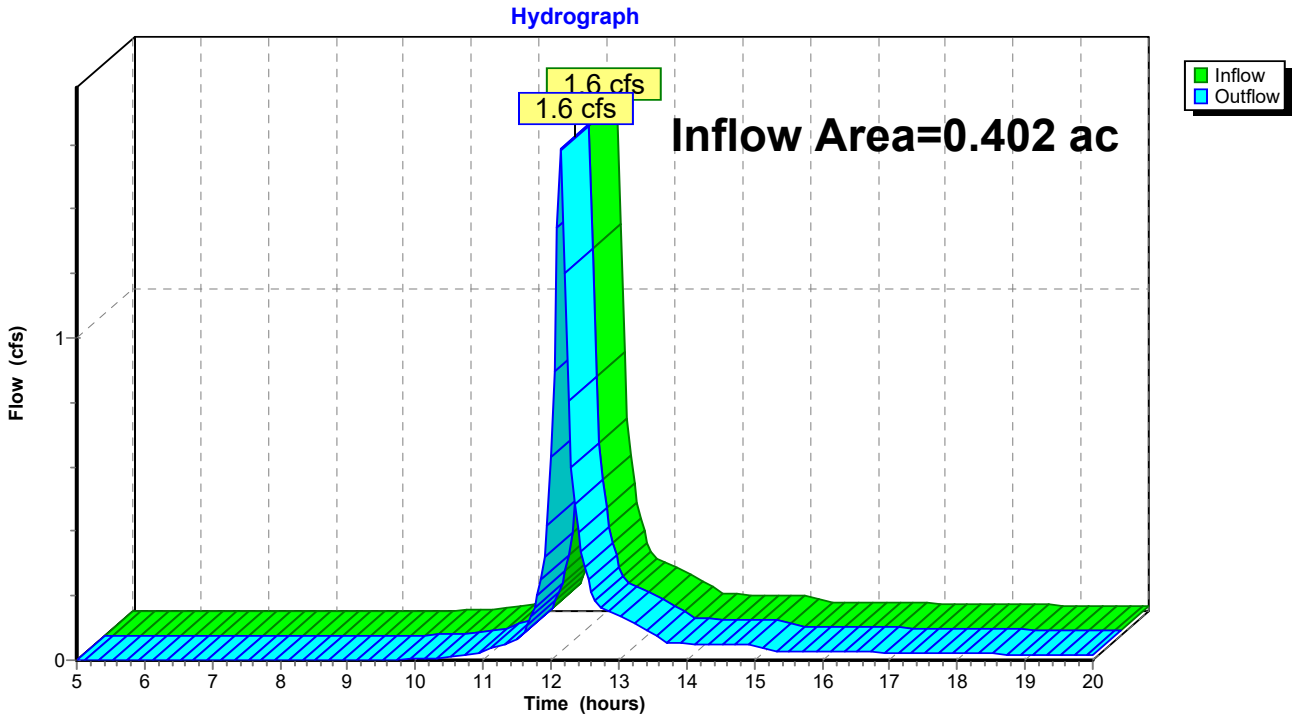


Summary for Reach 7R: North Bluff

Inflow Area = 0.402 ac, 0.00% Impervious, Inflow Depth > 2.18" for 10-YR event
Inflow = 1.6 cfs @ 12.14 hrs, Volume= 0.073 af
Outflow = 1.6 cfs @ 12.14 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: North Bluff



Summary for Pond 3P: (new Pond)

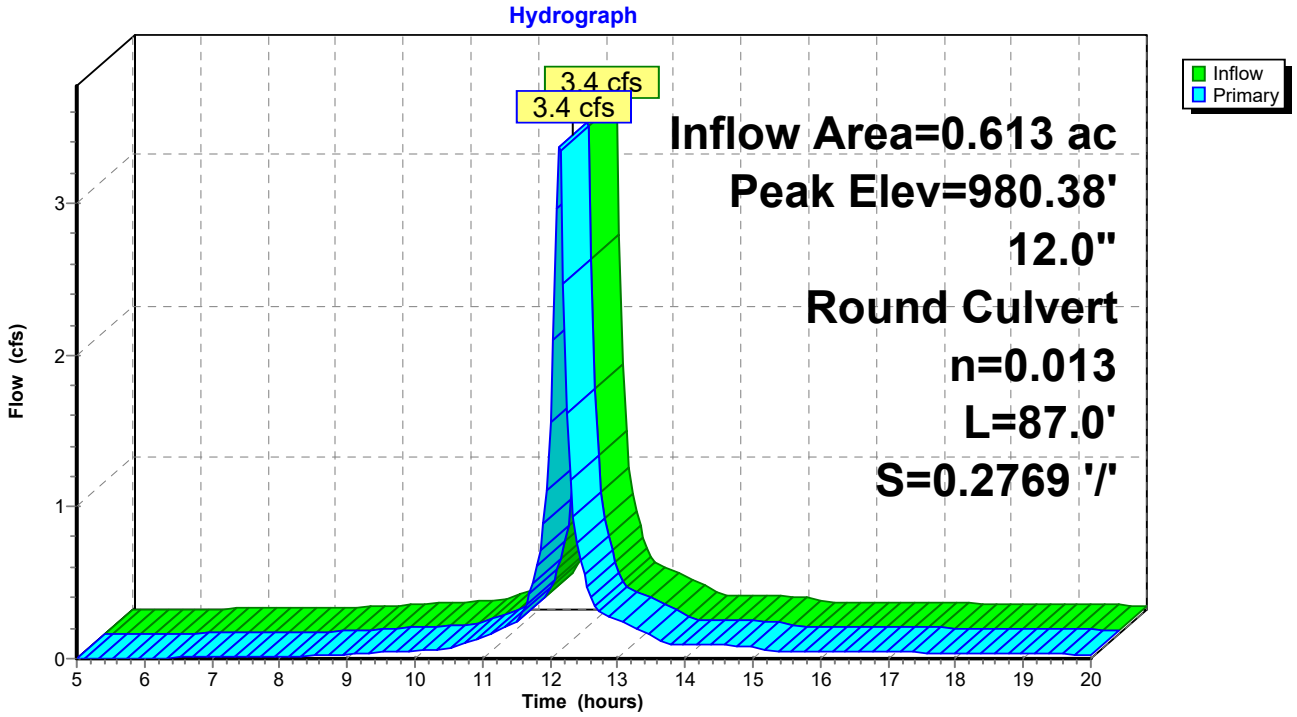
Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 3.28" for 10-YR event
Inflow = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af
Outflow = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min
Primary = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af
Routed to Pond 4P : (new Pond)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 980.38' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	979.09'	**12.0" Round RCP_Round 12"** L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 979.09' / 955.00' S= 0.2769 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.3 cfs @ 12.14 hrs HW=980.34' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 3.3 cfs @ 4.17 fps)

Pond 3P: (new Pond)



Summary for Pond 4P: (new Pond)

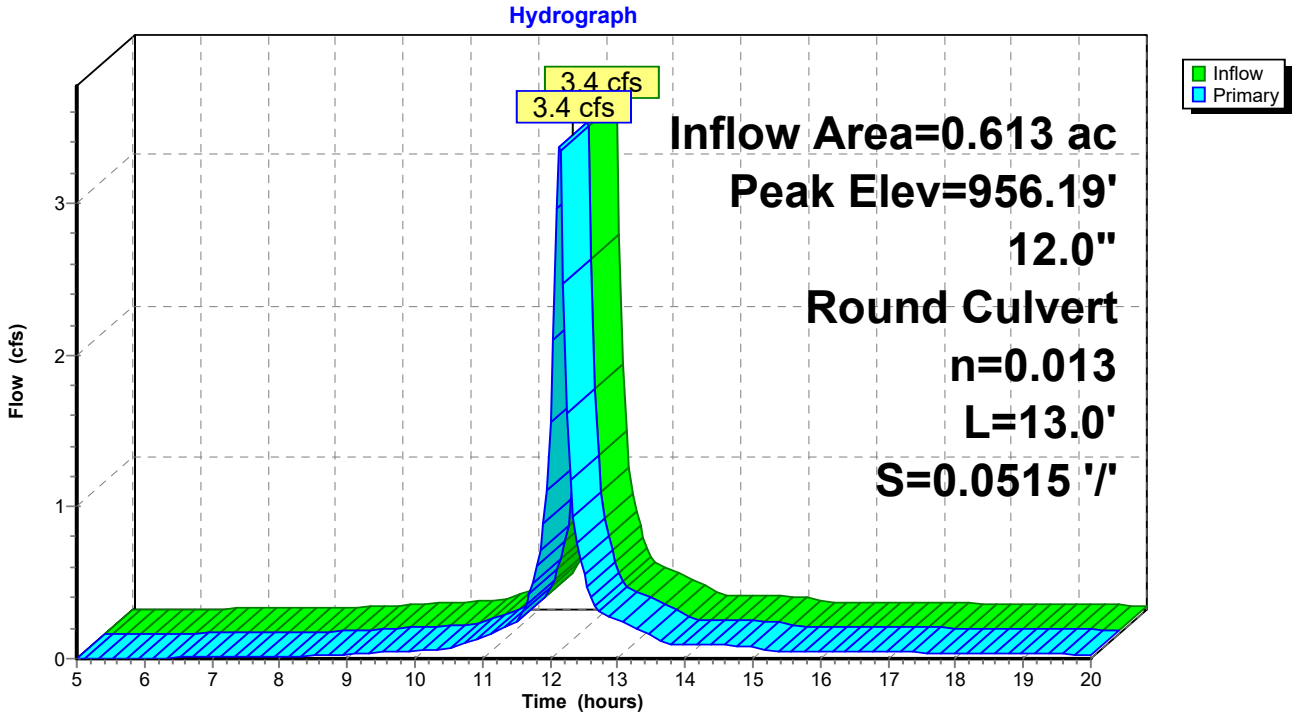
Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 3.28" for 10-YR event
Inflow = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af
Outflow = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min
Primary = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af
Routed to Reach 2R : West Storm

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 956.19' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	954.90'	**12.0" Round RCP_Round 12"** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 954.90' / 954.23' S= 0.0515 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.3 cfs @ 12.14 hrs HW=956.15' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 3.3 cfs @ 4.17 fps)

Pond 4P: (new Pond)



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1XS: Runoff Area=216,068 sf 45.85% Impervious Runoff Depth>5.59"
Tc=7.0 min CN=88 Runoff=46.3 cfs 2.311 af

Subcatchment2XS: Runoff Area=26,713 sf 64.20% Impervious Runoff Depth>6.04"
Tc=7.0 min CN=92 Runoff=6.0 cfs 0.309 af

Subcatchment3XS: Runoff Area=75,763 sf 26.31% Impervious Runoff Depth>5.25"
Tc=7.0 min CN=85 Runoff=15.6 cfs 0.761 af

Subcatchment4XS: Runoff Area=51,828 sf 60.81% Impervious Runoff Depth>5.93"
Tc=7.0 min CN=91 Runoff=11.5 cfs 0.588 af

Subcatchment5XS: Runoff Area=68,786 sf 38.28% Impervious Runoff Depth>5.48"
Tc=7.0 min CN=87 Runoff=14.5 cfs 0.721 af

Subcatchment6XS: Runoff Area=12,130 sf 100.00% Impervious Runoff Depth>6.64"
Tc=7.0 min CN=98 Runoff=2.8 cfs 0.154 af

Subcatchment8XS: Runoff Area=17,512 sf 0.00% Impervious Runoff Depth>4.69"
Tc=7.0 min CN=80 Runoff=3.3 cfs 0.157 af

Reach 1R: NW Storm Inflow=46.3 cfs 2.311 af
Outflow=46.3 cfs 2.311 af

Reach 2R: West Storm Inflow=6.0 cfs 0.309 af
Outflow=6.0 cfs 0.309 af

Reach 3R: West Bluff Inflow=15.6 cfs 0.761 af
Outflow=15.6 cfs 0.761 af

Reach 4R: South Storm Inflow=11.5 cfs 0.588 af
Outflow=11.5 cfs 0.588 af

Reach 5R: SE Bluff - To Road Inflow=14.5 cfs 0.721 af
Outflow=14.5 cfs 0.721 af

Reach 6R: East Storm Inflow=2.8 cfs 0.154 af
Outflow=2.8 cfs 0.154 af

Reach 7R: North Bluff Inflow=3.3 cfs 0.157 af
Outflow=3.3 cfs 0.157 af

Pond 3P: (new Pond) Peak Elev=982.07' Inflow=6.0 cfs 0.309 af
12.0" Round Culvert n=0.013 L=87.0' S=0.2769 '/' Outflow=6.0 cfs 0.309 af

Pond 4P: (new Pond) Peak Elev=957.88' Inflow=6.0 cfs 0.309 af
12.0" Round Culvert n=0.013 L=13.0' S=0.0515 '/' Outflow=6.0 cfs 0.309 af

Total Runoff Area = 10.762 ac Runoff Volume = 5.000 af Average Runoff Depth = 5.58"
56.03% Pervious = 6.030 ac 43.97% Impervious = 4.732 ac

Summary for Subcatchment 1XS:

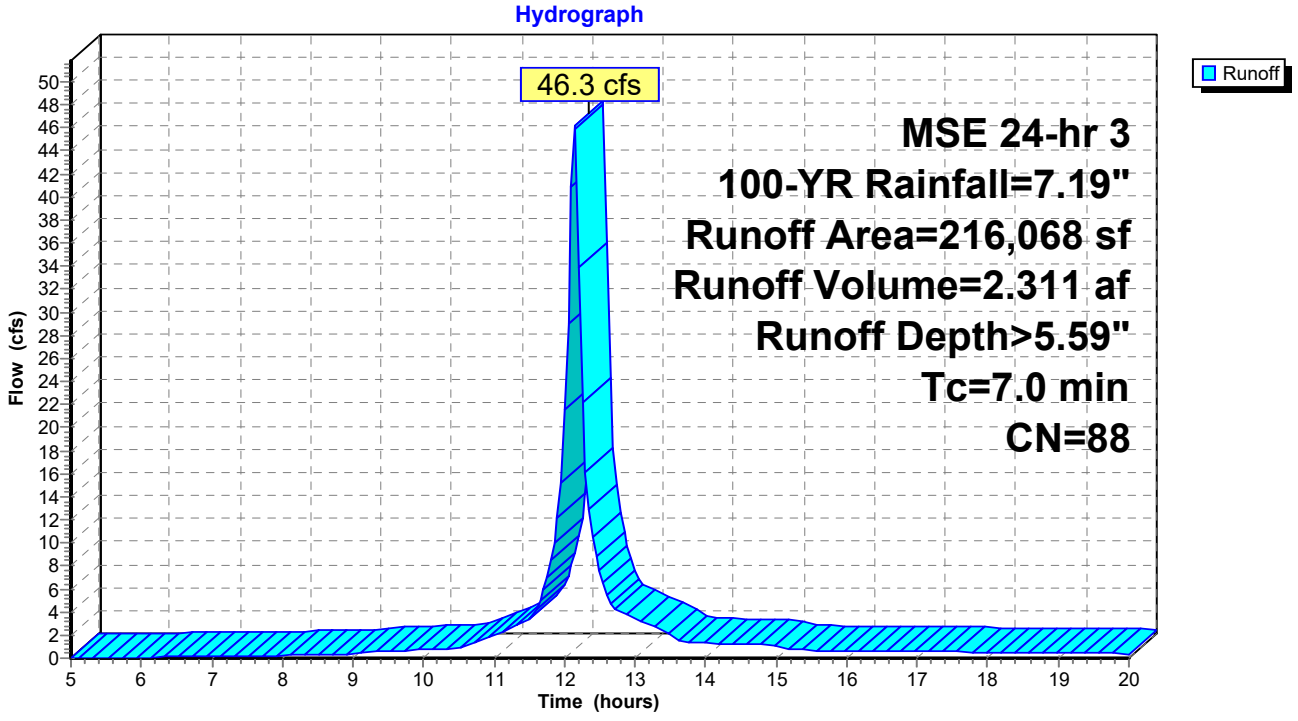
Runoff = 46.3 cfs @ 12.14 hrs, Volume= 2.311 af, Depth> 5.59"
Routed to Reach 1R : NW Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
99,068	98	Paved parking, HSG D
117,000	80	>75% Grass cover, Good, HSG D
216,068	88	Weighted Average
117,000		54.15% Pervious Area
99,068		45.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 1XS:



Summary for Subcatchment 2XS:

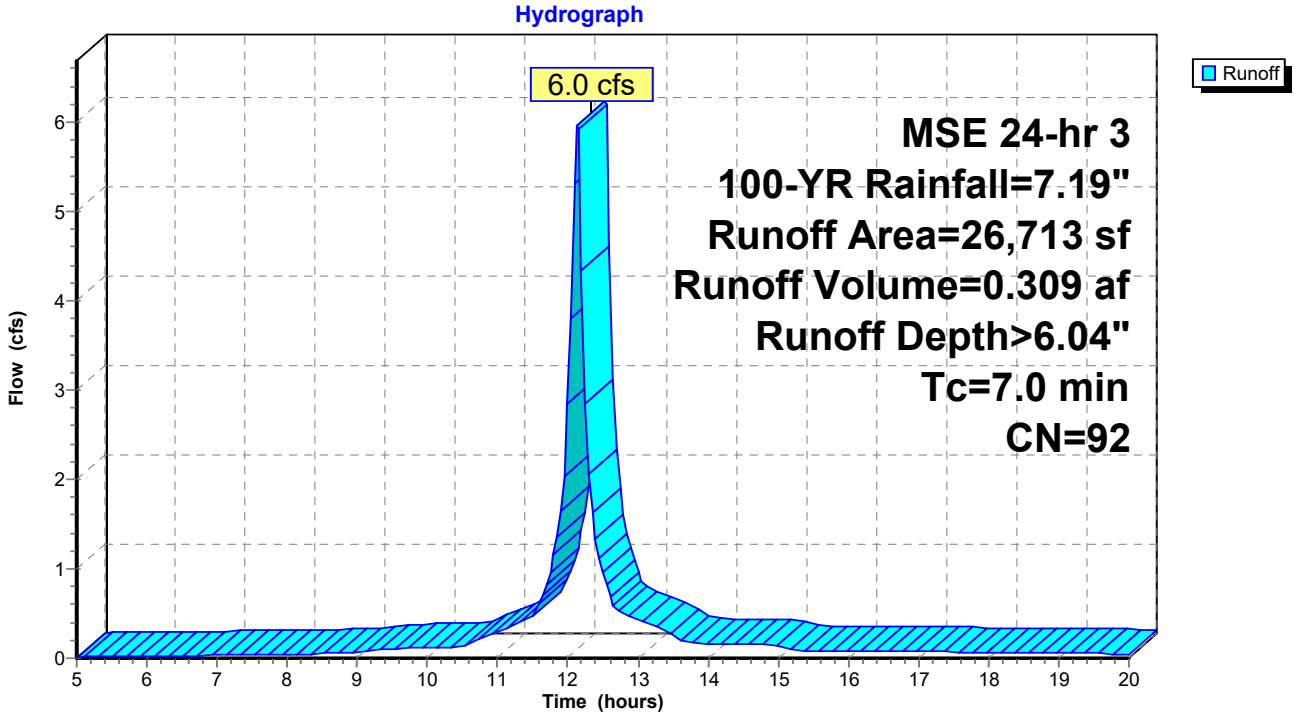
Runoff = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af, Depth> 6.04"
Routed to Pond 3P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
17,151	98	Paved parking, HSG D
9,562	80	>75% Grass cover, Good, HSG D
26,713	92	Weighted Average
9,562		35.80% Pervious Area
17,151		64.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 2XS:



Summary for Subcatchment 3XS:

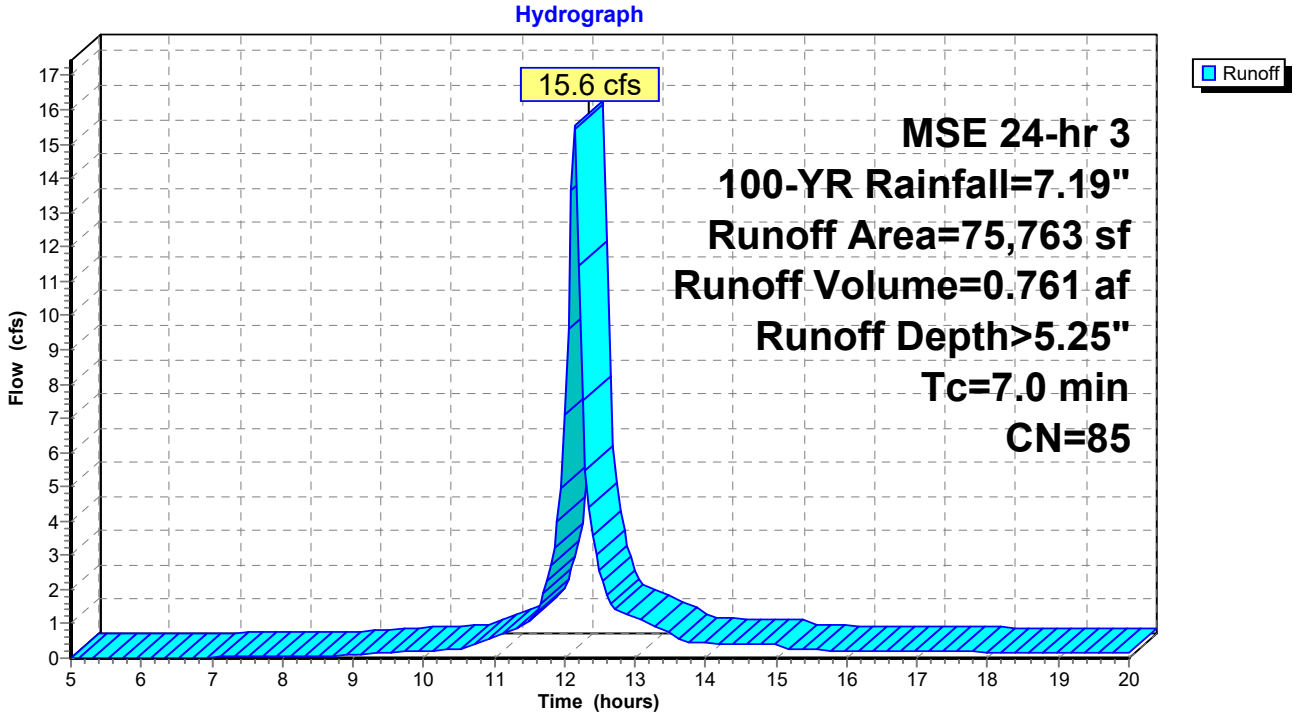
Runoff = 15.6 cfs @ 12.14 hrs, Volume= 0.761 af, Depth> 5.25"
Routed to Reach 3R : West Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
19,931	98	Paved parking, HSG D
55,832	80	>75% Grass cover, Good, HSG D
75,763	85	Weighted Average
55,832		73.69% Pervious Area
19,931		26.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 3XS:



Summary for Subcatchment 4XS:

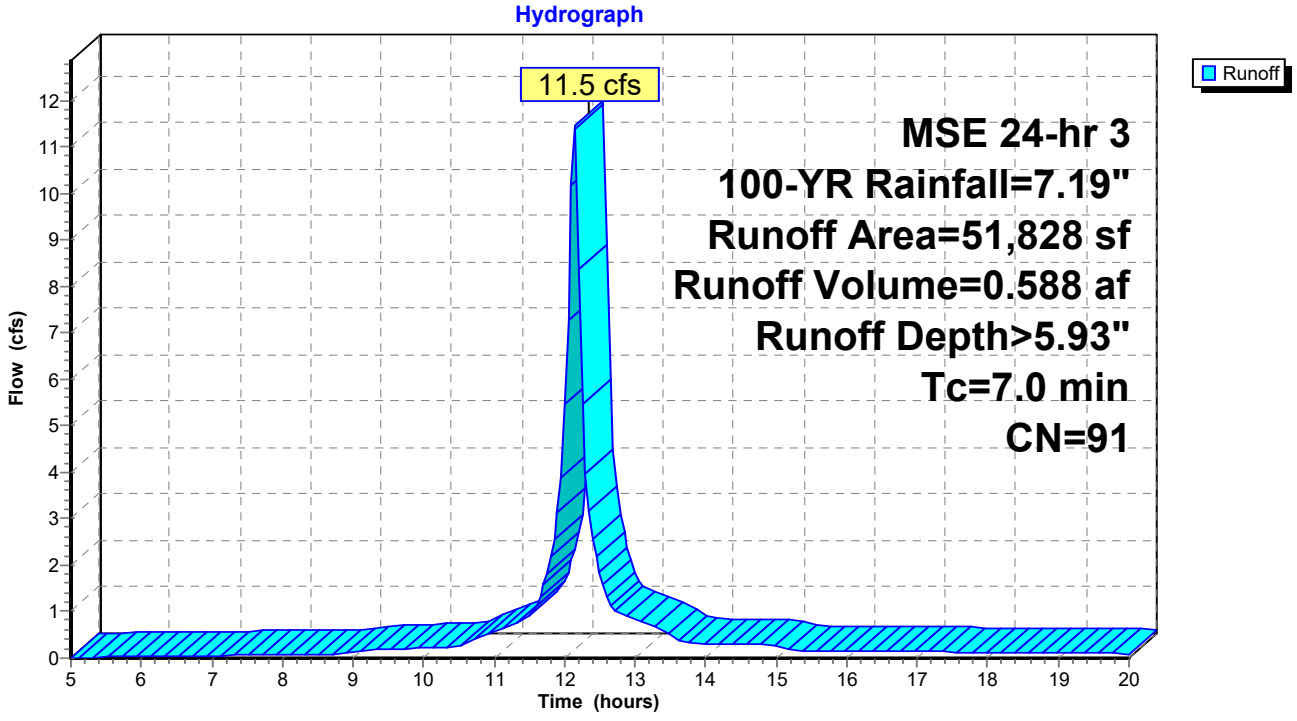
Runoff = 11.5 cfs @ 12.14 hrs, Volume= 0.588 af, Depth> 5.93"
Routed to Reach 4R : South Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
31,516	98	Paved parking, HSG D
20,312	80	>75% Grass cover, Good, HSG D
51,828	91	Weighted Average
20,312		39.19% Pervious Area
31,516		60.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 4XS:



Summary for Subcatchment 5XS:

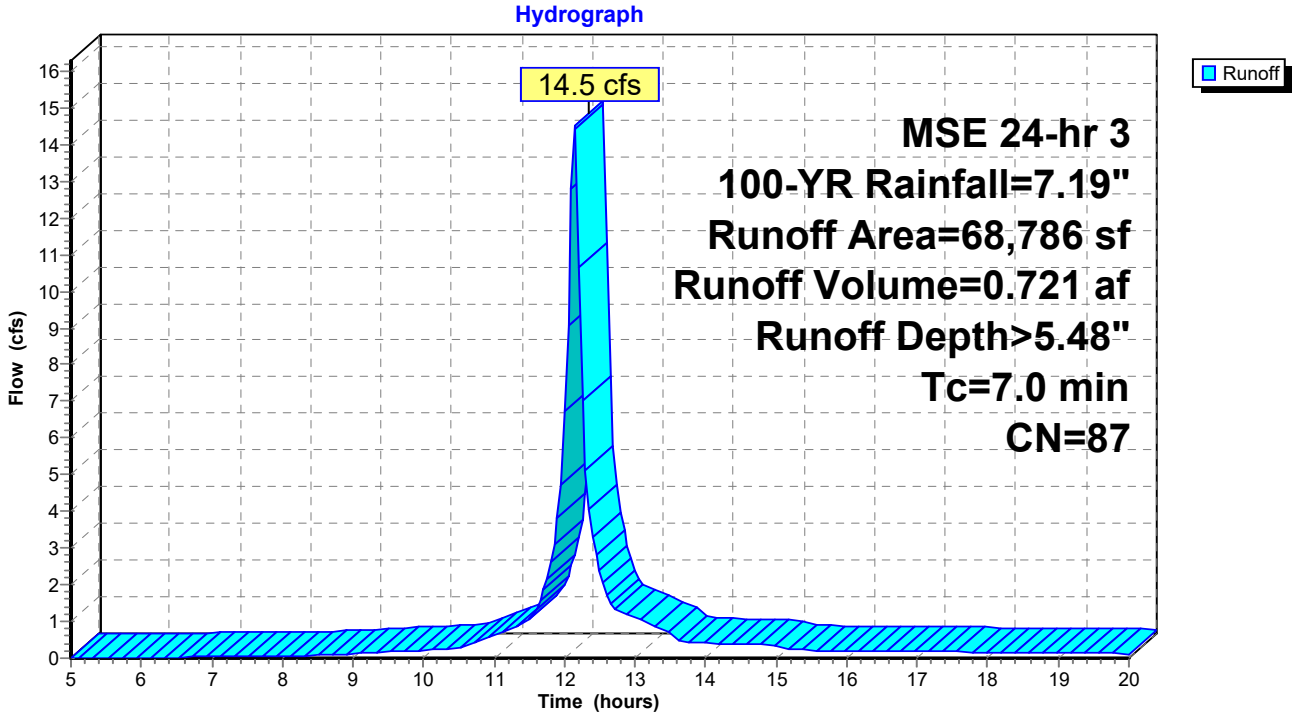
Runoff = 14.5 cfs @ 12.14 hrs, Volume= 0.721 af, Depth> 5.48"
Routed to Reach 5R : SE Bluff - To Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
26,329	98	Paved parking, HSG D
42,457	80	>75% Grass cover, Good, HSG D
68,786	87	Weighted Average
42,457		61.72% Pervious Area
26,329		38.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 5XS:



Summary for Subcatchment 6XS:

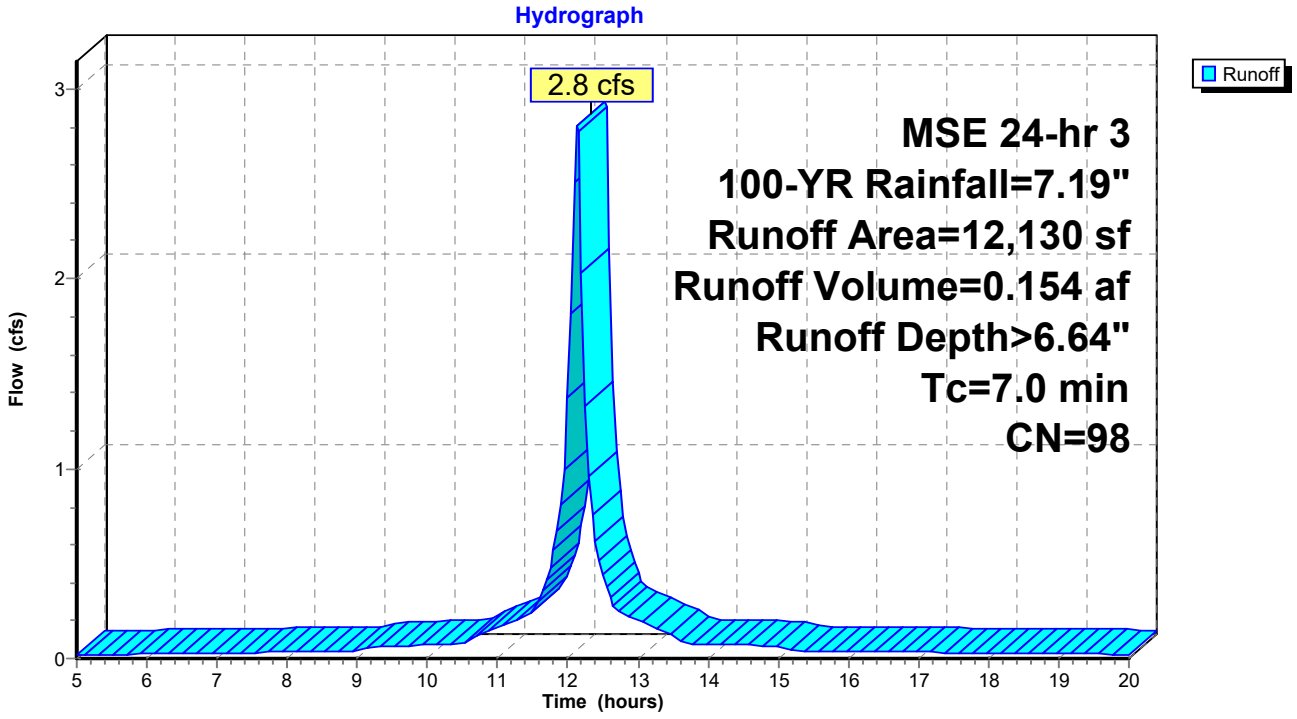
Runoff = 2.8 cfs @ 12.14 hrs, Volume= 0.154 af, Depth> 6.64"
Routed to Reach 6R : East Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
12,130	98	Paved parking, HSG D
0	80	>75% Grass cover, Good, HSG D
12,130	98	Weighted Average
12,130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 6XS:



Summary for Subcatchment 8XS:

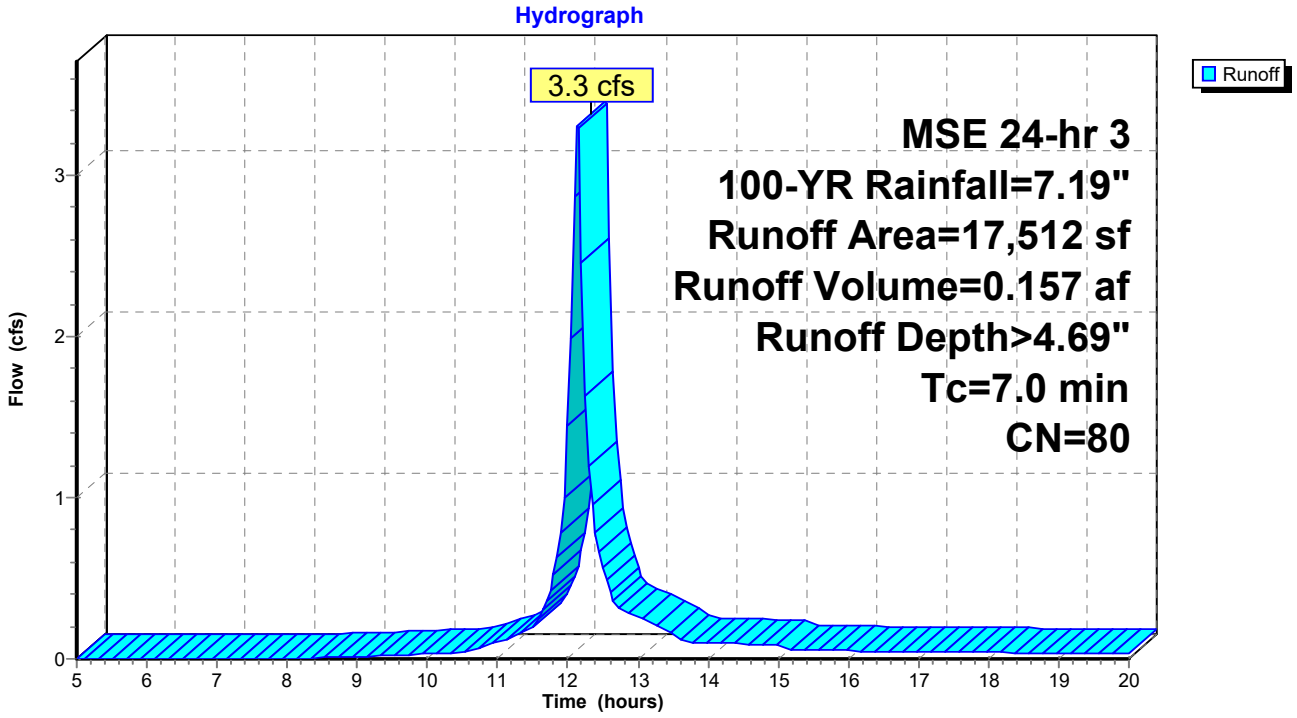
Runoff = 3.3 cfs @ 12.14 hrs, Volume= 0.157 af, Depth> 4.69"
Routed to Reach 7R : North Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
17,512	80	>75% Grass cover, Good, HSG D
17,512		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 8XS:

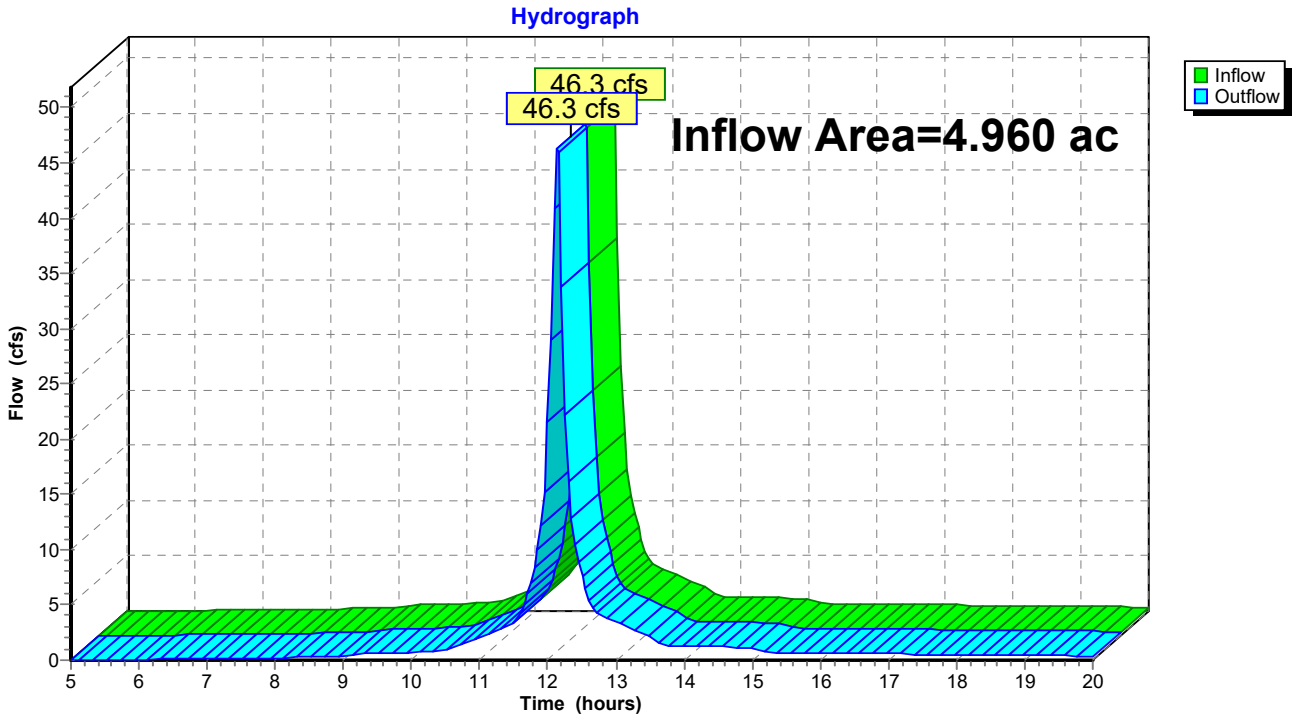


Summary for Reach 1R: NW Storm

Inflow Area = 4.960 ac, 45.85% Impervious, Inflow Depth > 5.59" for 100-YR event
Inflow = 46.3 cfs @ 12.14 hrs, Volume= 2.311 af
Outflow = 46.3 cfs @ 12.14 hrs, Volume= 2.311 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: NW Storm

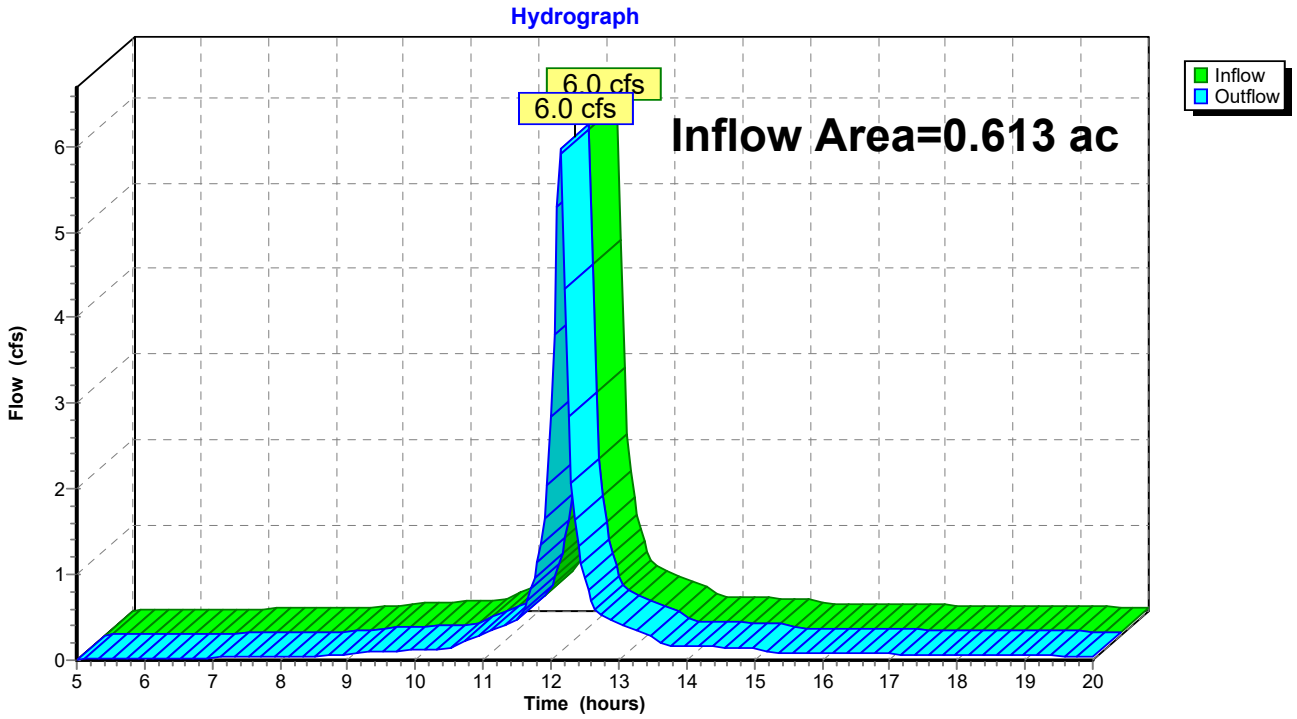


Summary for Reach 2R: West Storm

Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 6.04" for 100-YR event
Inflow = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af
Outflow = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: West Storm

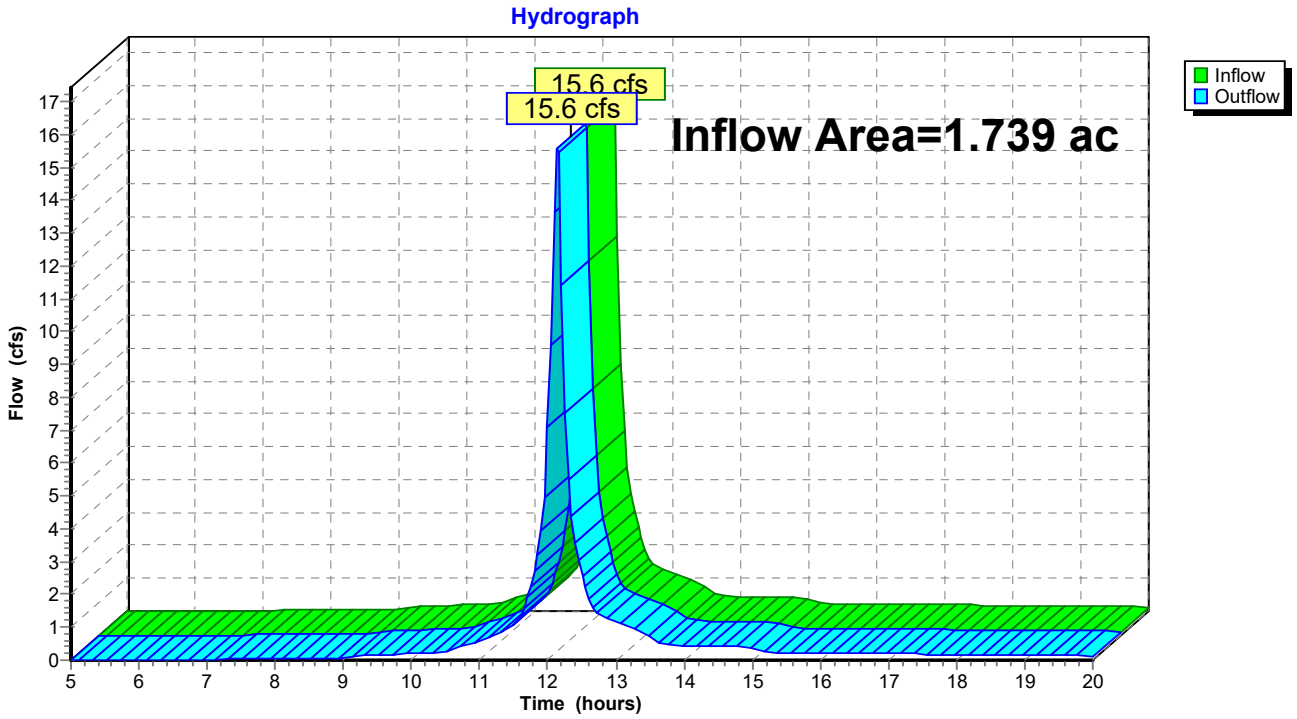


Summary for Reach 3R: West Bluff

Inflow Area = 1.739 ac, 26.31% Impervious, Inflow Depth > 5.25" for 100-YR event
Inflow = 15.6 cfs @ 12.14 hrs, Volume= 0.761 af
Outflow = 15.6 cfs @ 12.14 hrs, Volume= 0.761 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 3R: West Bluff

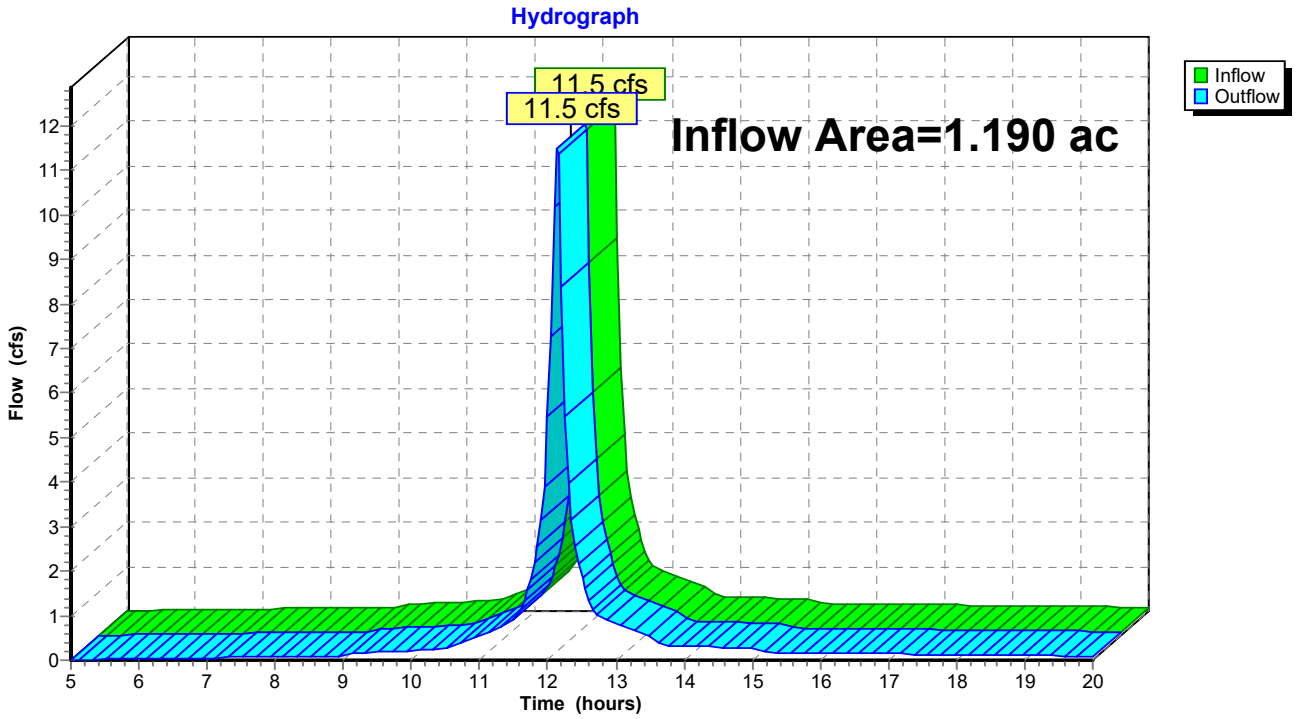


Summary for Reach 4R: South Storm

Inflow Area = 1.190 ac, 60.81% Impervious, Inflow Depth > 5.93" for 100-YR event
Inflow = 11.5 cfs @ 12.14 hrs, Volume= 0.588 af
Outflow = 11.5 cfs @ 12.14 hrs, Volume= 0.588 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: South Storm

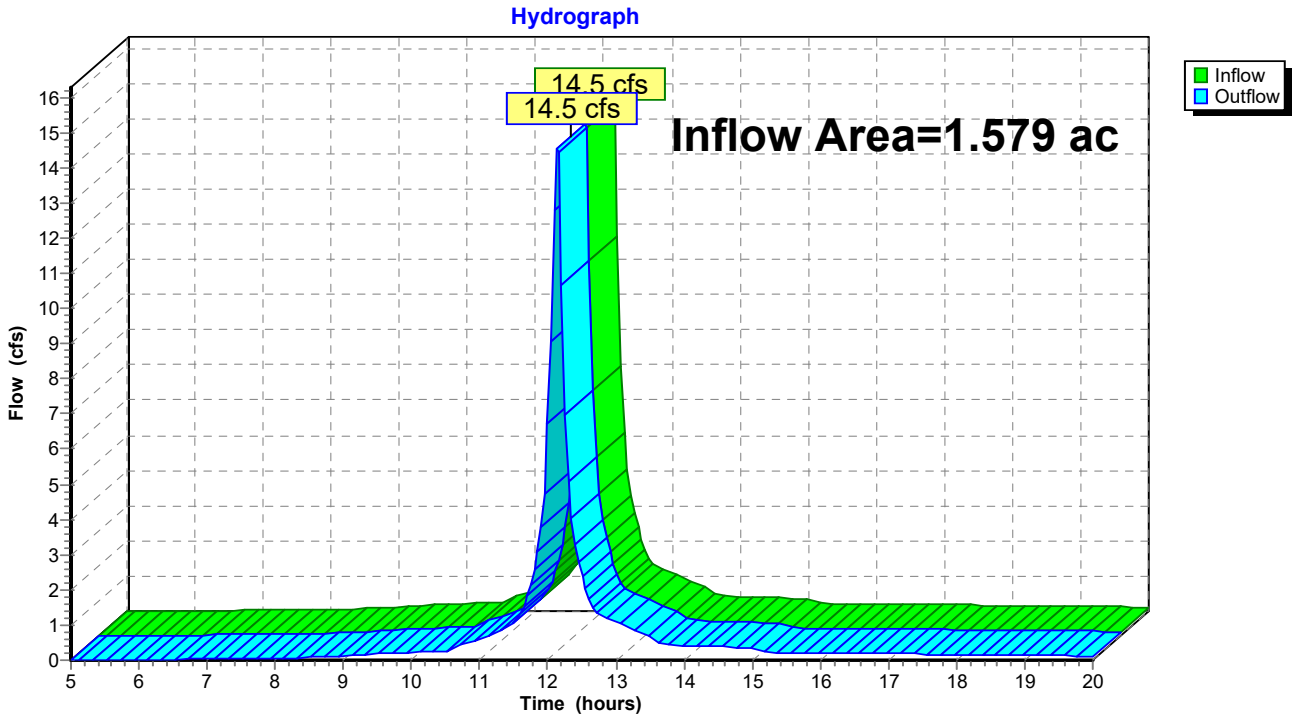


Summary for Reach 5R: SE Bluff - To Road

Inflow Area = 1.579 ac, 38.28% Impervious, Inflow Depth > 5.48" for 100-YR event
Inflow = 14.5 cfs @ 12.14 hrs, Volume= 0.721 af
Outflow = 14.5 cfs @ 12.14 hrs, Volume= 0.721 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SE Bluff - To Road

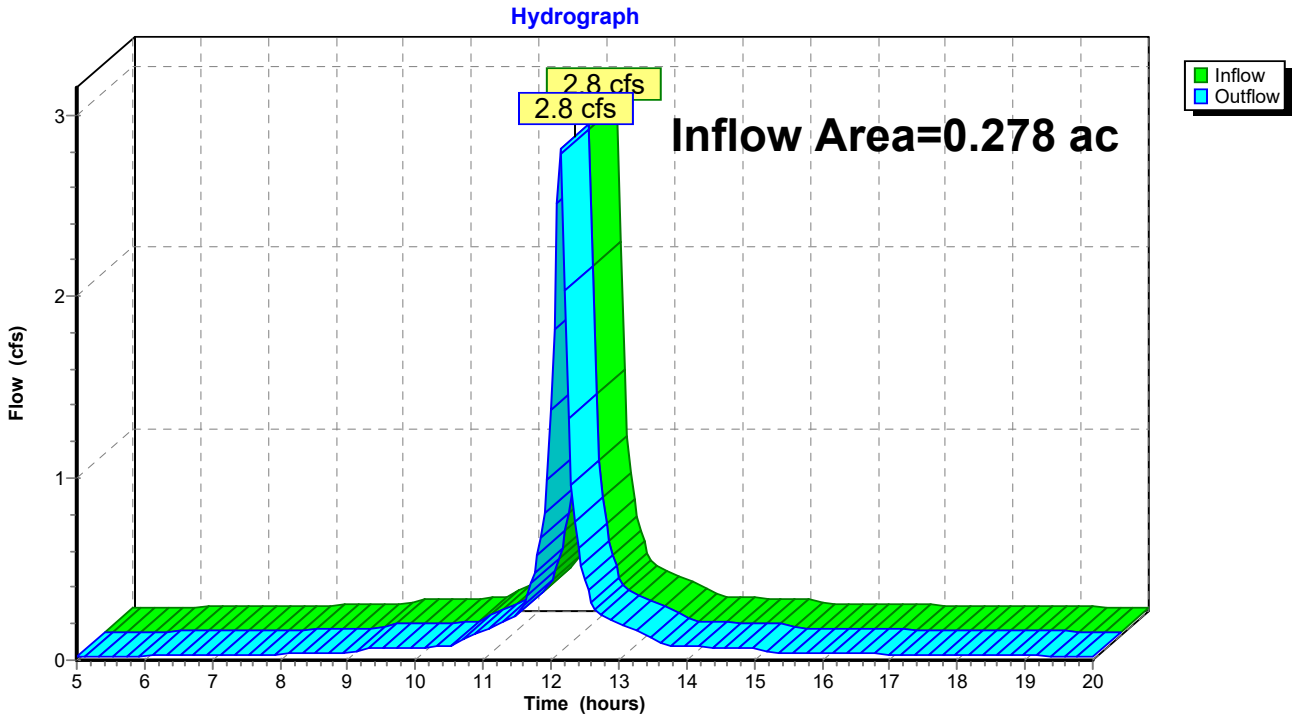


Summary for Reach 6R: East Storm

Inflow Area = 0.278 ac,100.00% Impervious, Inflow Depth > 6.64" for 100-YR event
Inflow = 2.8 cfs @ 12.14 hrs, Volume= 0.154 af
Outflow = 2.8 cfs @ 12.14 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: East Storm

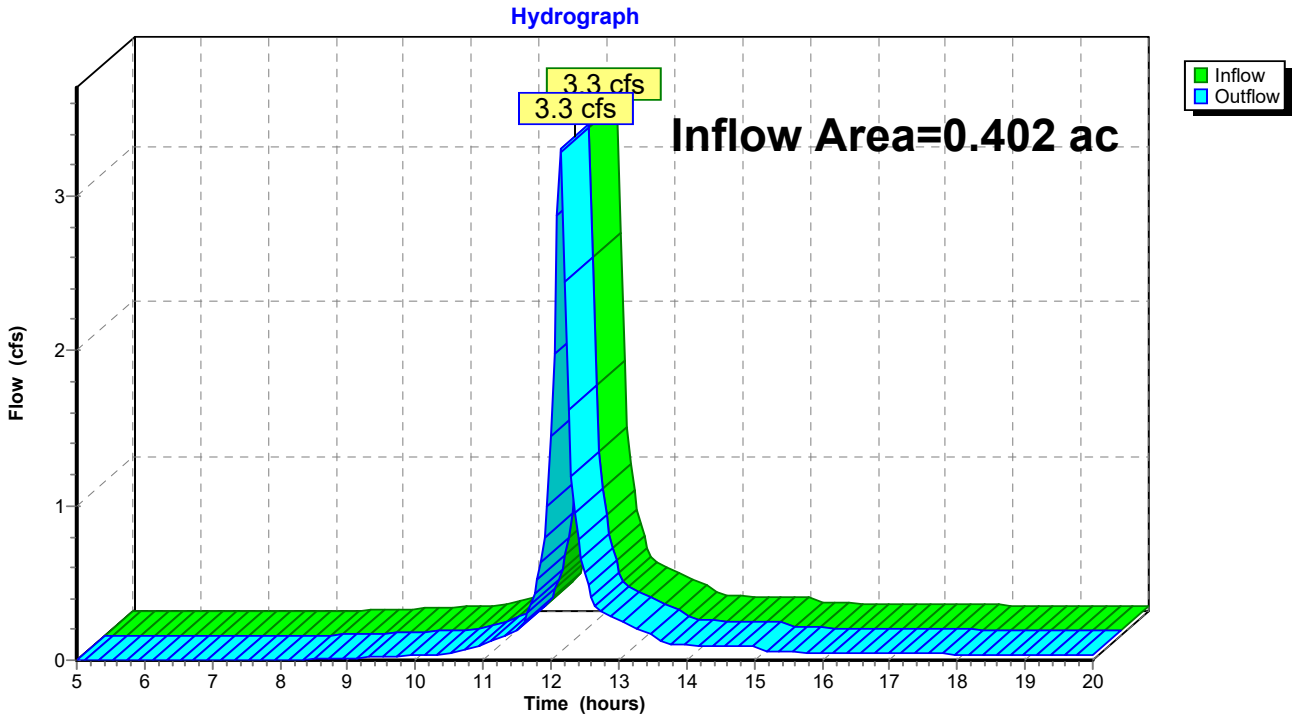


Summary for Reach 7R: North Bluff

Inflow Area = 0.402 ac, 0.00% Impervious, Inflow Depth > 4.69" for 100-YR event
Inflow = 3.3 cfs @ 12.14 hrs, Volume= 0.157 af
Outflow = 3.3 cfs @ 12.14 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: North Bluff



Summary for Pond 3P: (new Pond)

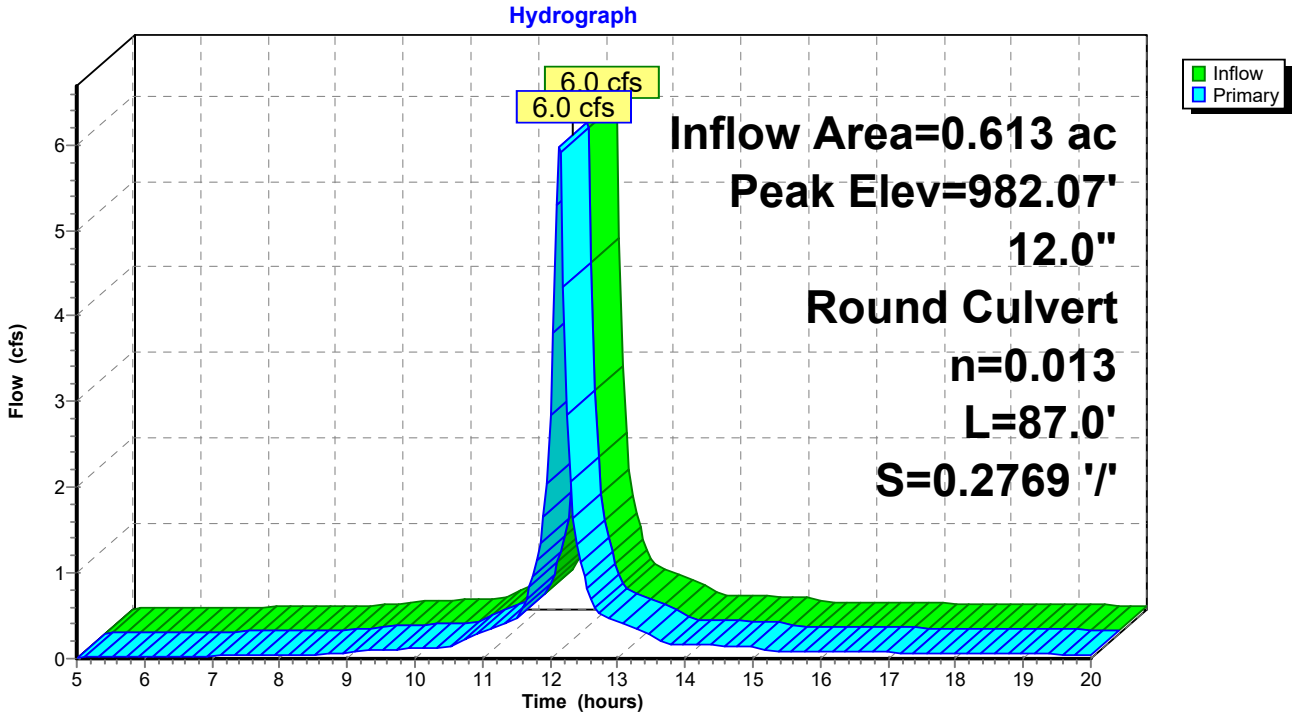
Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 6.04" for 100-YR event
Inflow = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af
Outflow = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af, Atten= 0%, Lag= 0.0 min
Primary = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af
Routed to Pond 4P : (new Pond)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 982.07' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	979.09'	**12.0" Round RCP_Round 12"** L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 979.09' / 955.00' S= 0.2769 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=5.8 cfs @ 12.14 hrs HW=981.93' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 5.8 cfs @ 7.37 fps)

Pond 3P: (new Pond)



Summary for Pond 4P: (new Pond)

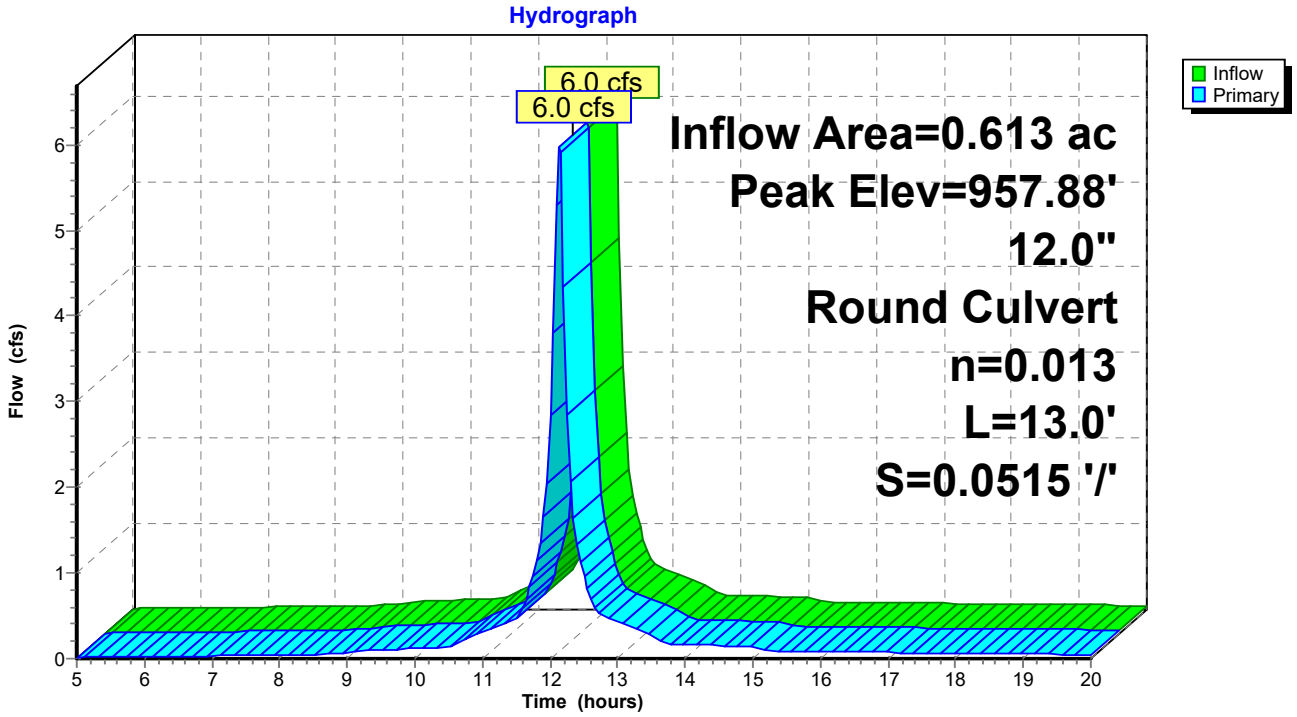
Inflow Area = 0.613 ac, 64.20% Impervious, Inflow Depth > 6.04" for 100-YR event
Inflow = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af
Outflow = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af, Atten= 0%, Lag= 0.0 min
Primary = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af
Routed to Reach 2R : West Storm

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 957.88' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	954.90'	**12.0" Round RCP_Round 12"** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 954.90' / 954.23' S= 0.0515 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=5.8 cfs @ 12.14 hrs HW=957.74' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 5.8 cfs @ 7.37 fps)

Pond 4P: (new Pond)

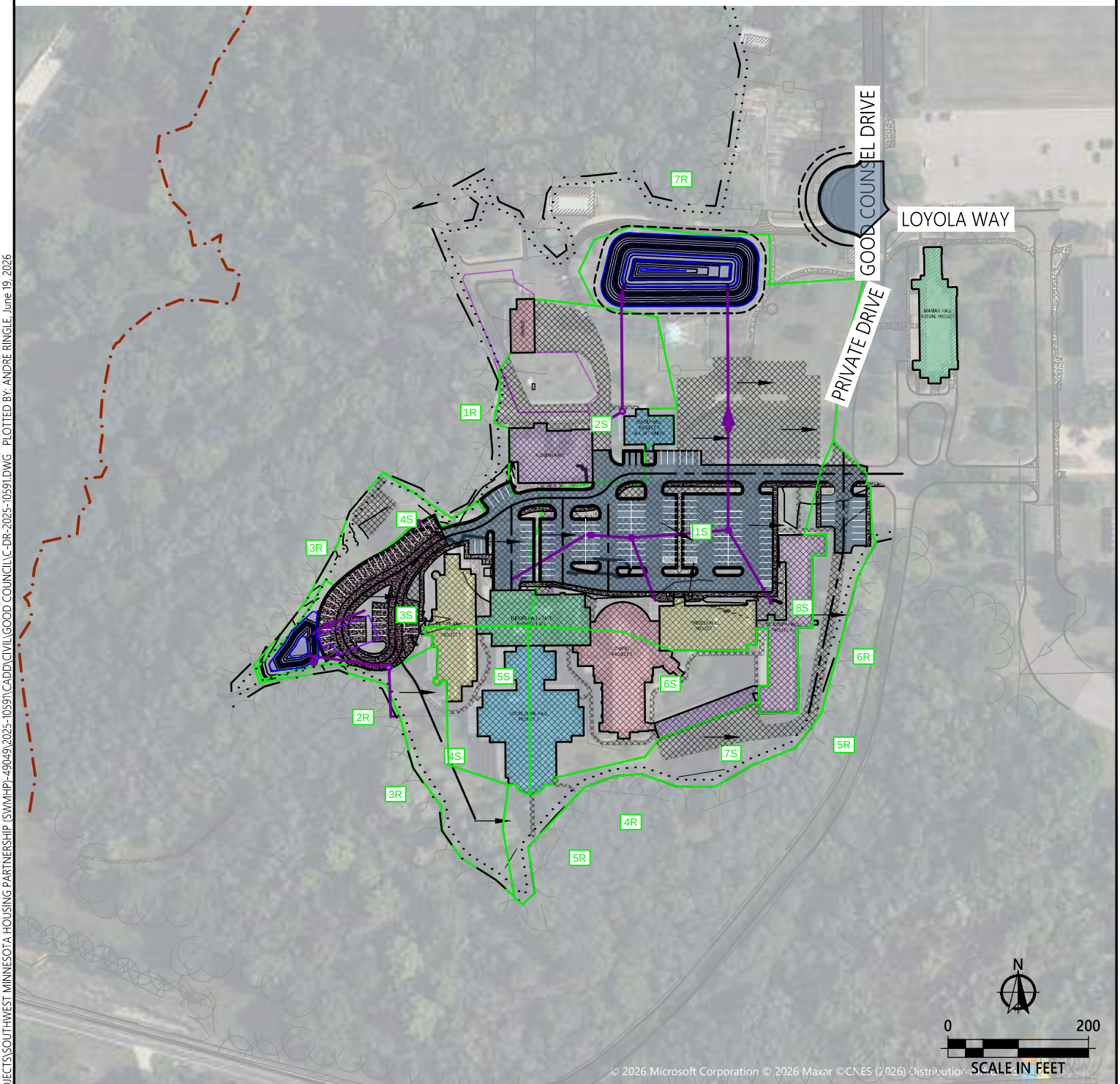


APPENDIX 4

Post-Development Drainage Area Map And HydroCAD Report

POST-DEVELOPMENT DRAINAGE MAP

PROPOSED SUBCATCHMENT BOUNDARY	
PROPOSED IMPERVIOUS AREA	



DRAWN BY: ATR
CHECKED BY: CNB

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 PROFESSION UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNER NAME LIC. NO.: NUMBER DATE: JANUARY 2026

DATE	REV#	REVISIONS DESCRIPTION

WIDSETH
ARCHITECTS · ENGINEERS · SCIENTISTS · SURVEYORS

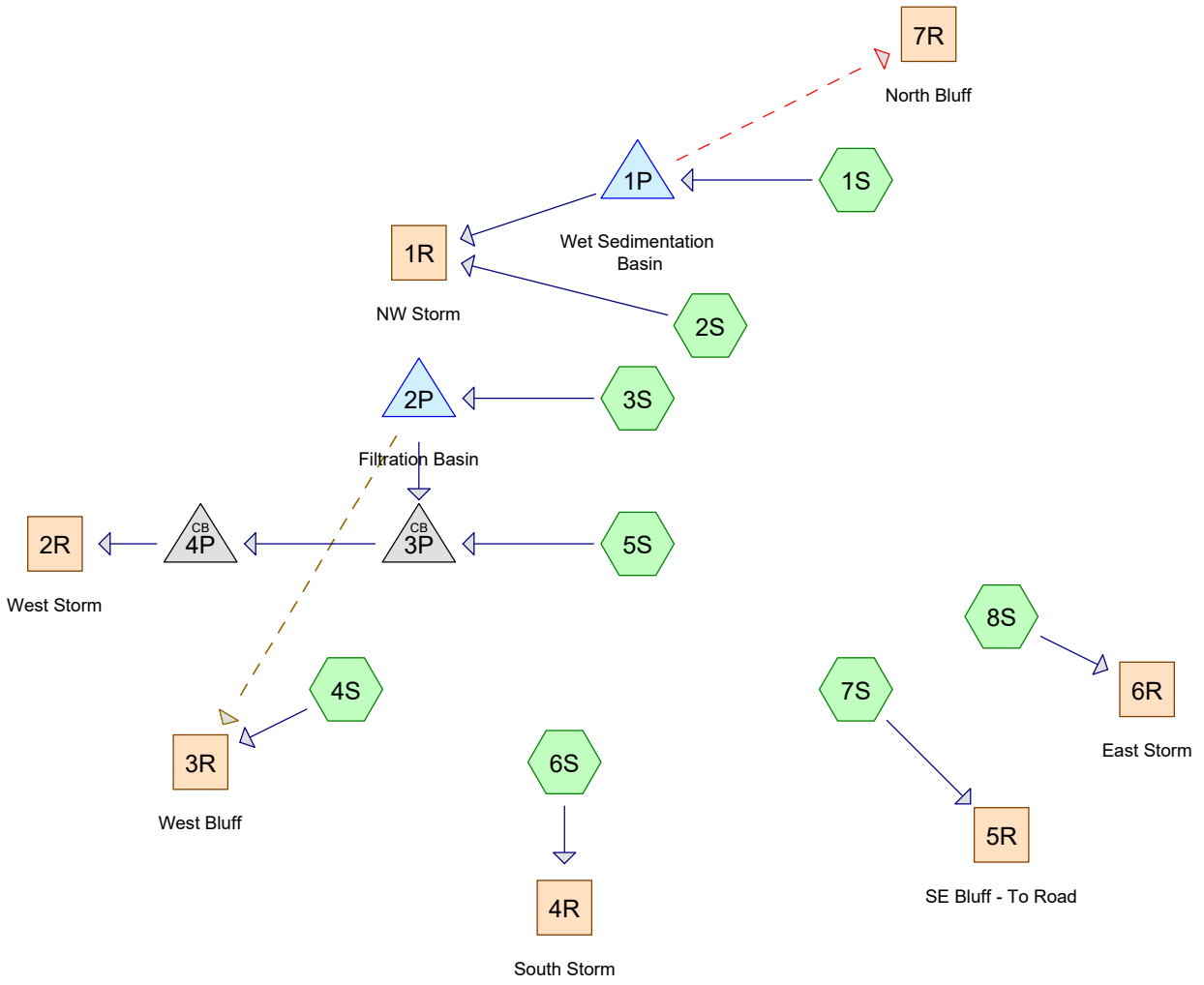
POST-DEVELOPMENT DRAINAGE MAP

GOOD COUNSEL MAIN CAMPUS

-

PROJECT #: 2025-10591

© 2026 WIDSETH FILE: W:\PROJECTS\SOUTHWEST MINNESOTA HOUSING PARTNERSHIP (SWMHP)-49049\2025-10591\CADD\CIVIL\GOOD COUNCIL\C-DR-2025-10591.DWG PLOTTED BY: ANDRE RINGLE, June 19, 2026



Subcat Reach Pond Link

Routing Diagram for Post-Development
Prepared by Widseth Smith Nolting, Printed 6/19/2026
HydroCAD® 10.20-9a s/n 01722 © 2026 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	MSE 24-hr	3	Default	24.00	1	1.70	2
2	10-YR	MSE 24-hr	3	Default	24.00	1	4.28	2
3	100-YR	MSE 24-hr	3	Default	24.00	1	7.19	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.365	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S)
5.397	98	Paved parking, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S)
10.762	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
10.762	HSG D	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S
0.000	Other	
10.762		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	5.365	0.000	5.365	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S
0.000	0.000	0.000	5.397	0.000	5.397	Paved parking	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S
0.000	**0.000**	**0.000**	**10.762**	**0.000**	**10.762**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=175,645 sf 46.16% Impervious Runoff Depth>0.70"
Tc=7.0 min CN=88 Runoff=5.1 cfs 0.234 af

Subcatchment2S: Runoff Area=57,101 sf 58.18% Impervious Runoff Depth>0.81"
Tc=7.0 min CN=90 Runoff=1.9 cfs 0.088 af

Subcatchment3S: Runoff Area=55,265 sf 73.72% Impervious Runoff Depth>1.00"
Tc=7.0 min CN=93 Runoff=2.3 cfs 0.106 af

Subcatchment4S: Runoff Area=39,227 sf 6.44% Impervious Runoff Depth>0.40"
Tc=7.0 min CN=81 Runoff=0.6 cfs 0.030 af

Subcatchment5S: Runoff Area=26,713 sf 64.20% Impervious Runoff Depth>0.93"
Tc=7.0 min CN=92 Runoff=1.0 cfs 0.048 af

Subcatchment6S: Runoff Area=51,828 sf 60.81% Impervious Runoff Depth>0.87"
Tc=7.0 min CN=91 Runoff=1.9 cfs 0.086 af

Subcatchment7S: Runoff Area=50,881 sf 32.92% Impervious Runoff Depth>0.60"
Tc=7.0 min CN=86 Runoff=1.3 cfs 0.058 af

Subcatchment8S: Runoff Area=12,130 sf 100.00% Impervious Runoff Depth>1.43"
Tc=7.0 min CN=98 Runoff=0.6 cfs 0.033 af

Reach 1R: NW Storm Inflow=2.6 cfs 0.312 af
Outflow=2.6 cfs 0.312 af

Reach 2R: West Storm Inflow=1.0 cfs 0.056 af
Outflow=1.0 cfs 0.056 af

Reach 3R: West Bluff Inflow=0.6 cfs 0.030 af
Outflow=0.6 cfs 0.030 af

Reach 4R: South Storm Inflow=1.9 cfs 0.086 af
Outflow=1.9 cfs 0.086 af

Reach 5R: SE Bluff - To Road Inflow=1.3 cfs 0.058 af
Outflow=1.3 cfs 0.058 af

Reach 6R: East Storm Inflow=0.6 cfs 0.033 af
Outflow=0.6 cfs 0.033 af

Reach 7R: North Bluff Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Pond 1P: Wet Sedimentation Basin Peak Elev=987.27' Storage=10,188 cf Inflow=5.1 cfs 0.234 af
Primary=1.0 cfs 0.224 af Secondary=0.0 cfs 0.000 af Outflow=1.0 cfs 0.224 af

Pond 2P: Filtration Basin Peak Elev=983.33' Storage=4,241 cf Inflow=2.3 cfs 0.106 af
Primary=0.0 cfs 0.009 af Secondary=0.0 cfs 0.000 af Tertiary=0.0 cfs 0.000 af Outflow=0.0 cfs 0.009 af

Pond 3P: Peak Elev=979.62' Inflow=1.0 cfs 0.056 af
12.0" Round Culvert n=0.013 L=87.0' S=0.2769 '/' Outflow=1.0 cfs 0.056 af

Pond 4P: Peak Elev=955.43' Inflow=1.0 cfs 0.056 af
12.0" Round Culvert n=0.013 L=13.0' S=0.0515 '/' Outflow=1.0 cfs 0.056 af

Total Runoff Area = 10.762 ac Runoff Volume = 0.682 af Average Runoff Depth = 0.76"
49.85% Pervious = 5.365 ac 50.15% Impervious = 5.397 ac

Summary for Subcatchment 1S:

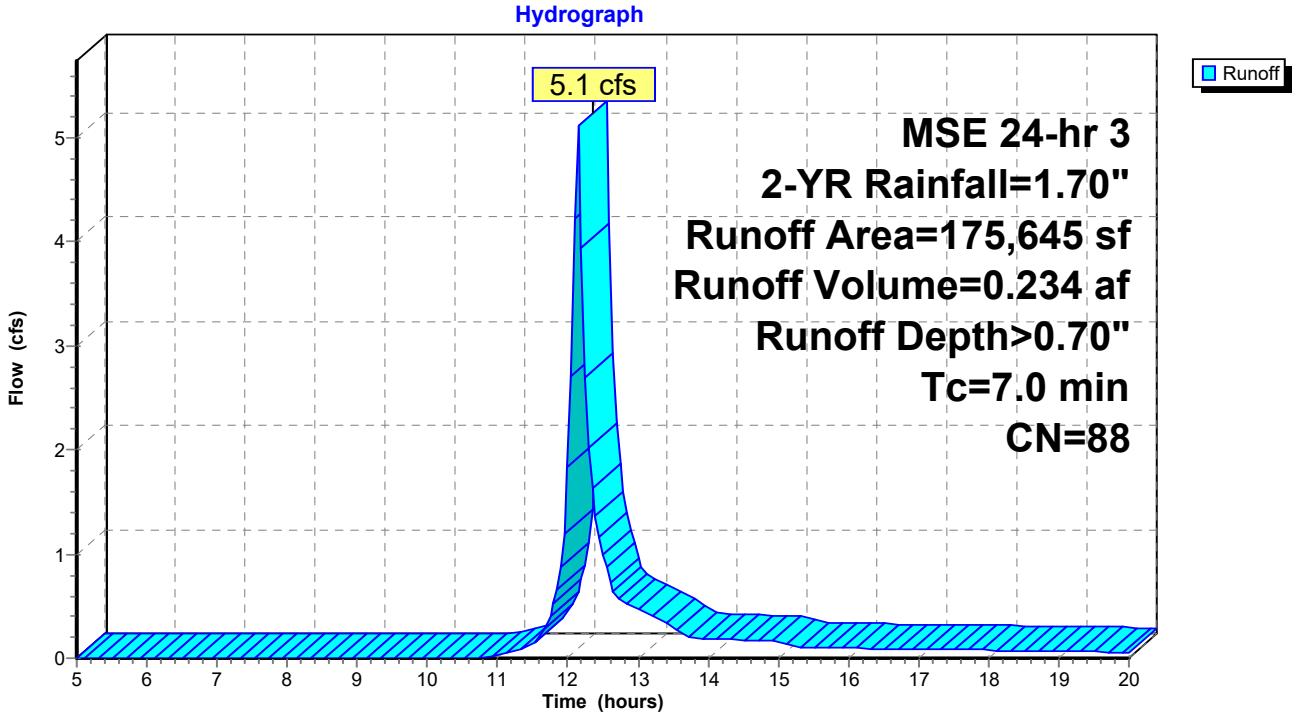
Runoff = 5.1 cfs @ 12.15 hrs, Volume= 0.234 af, Depth> 0.70"
Routed to Pond 1P : Wet Sedimentation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
81,069	98	Paved parking, HSG D
94,576	80	>75% Grass cover, Good, HSG D
175,645	88	Weighted Average
94,576		53.84% Pervious Area
81,069		46.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 1S:



Summary for Subcatchment 2S:

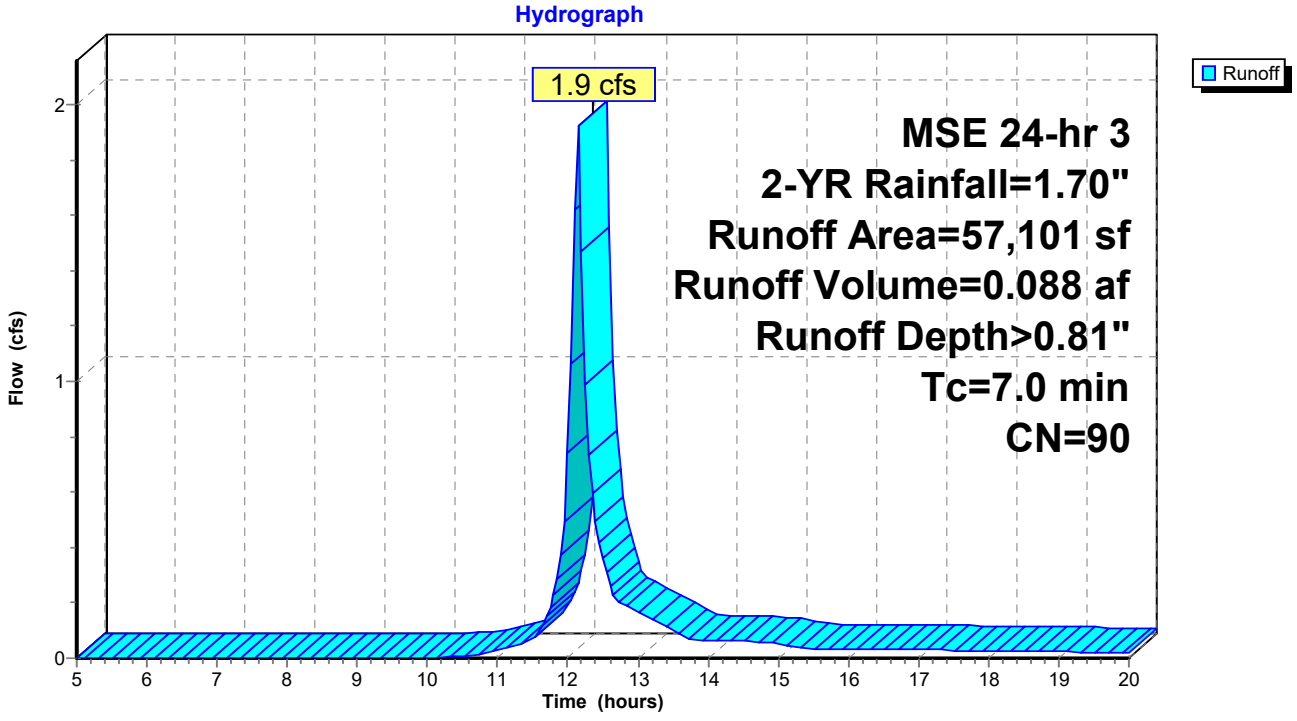
Runoff = 1.9 cfs @ 12.15 hrs, Volume= 0.088 af, Depth> 0.81"
Routed to Reach 1R : NW Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
33,220	98	Paved parking, HSG D
23,881	80	>75% Grass cover, Good, HSG D
57,101	90	Weighted Average
23,881		41.82% Pervious Area
33,220		58.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 2S:



Summary for Subcatchment 3S:

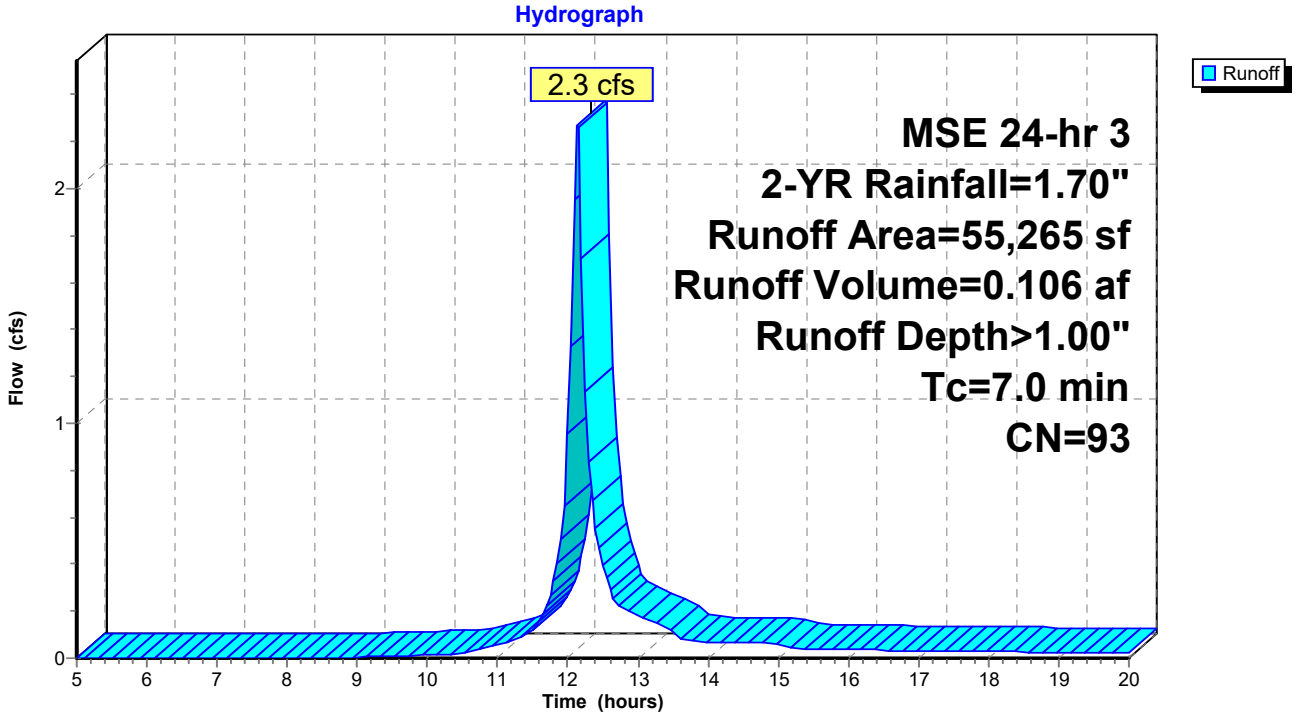
Runoff = 2.3 cfs @ 12.14 hrs, Volume= 0.106 af, Depth> 1.00"
Routed to Pond 2P : Filtration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
40,744	98	Paved parking, HSG D
14,521	80	>75% Grass cover, Good, HSG D
55,265	93	Weighted Average
14,521		26.28% Pervious Area
40,744		73.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 3S:



Summary for Subcatchment 4S:

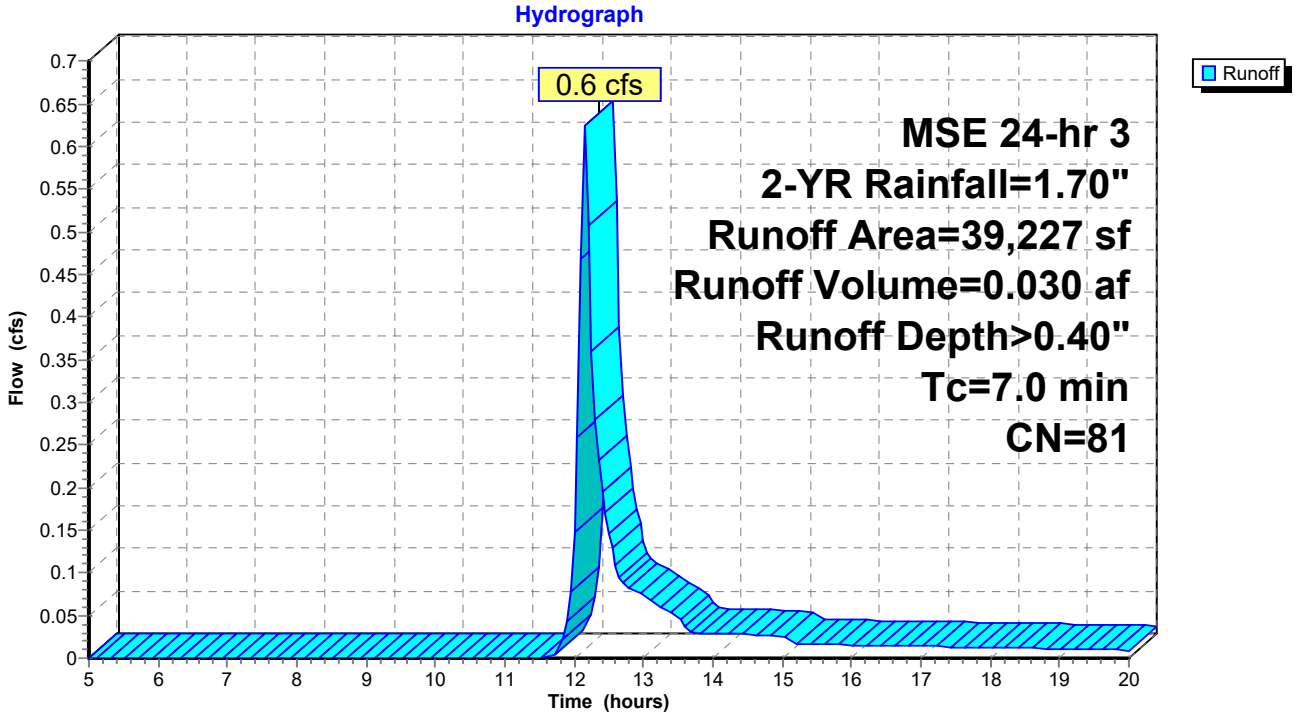
Runoff = 0.6 cfs @ 12.15 hrs, Volume= 0.030 af, Depth> 0.40"
Routed to Reach 3R : West Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
2,525	98	Paved parking, HSG D
36,702	80	>75% Grass cover, Good, HSG D
39,227	81	Weighted Average
36,702		93.56% Pervious Area
2,525		6.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 4S:



Summary for Subcatchment 5S:

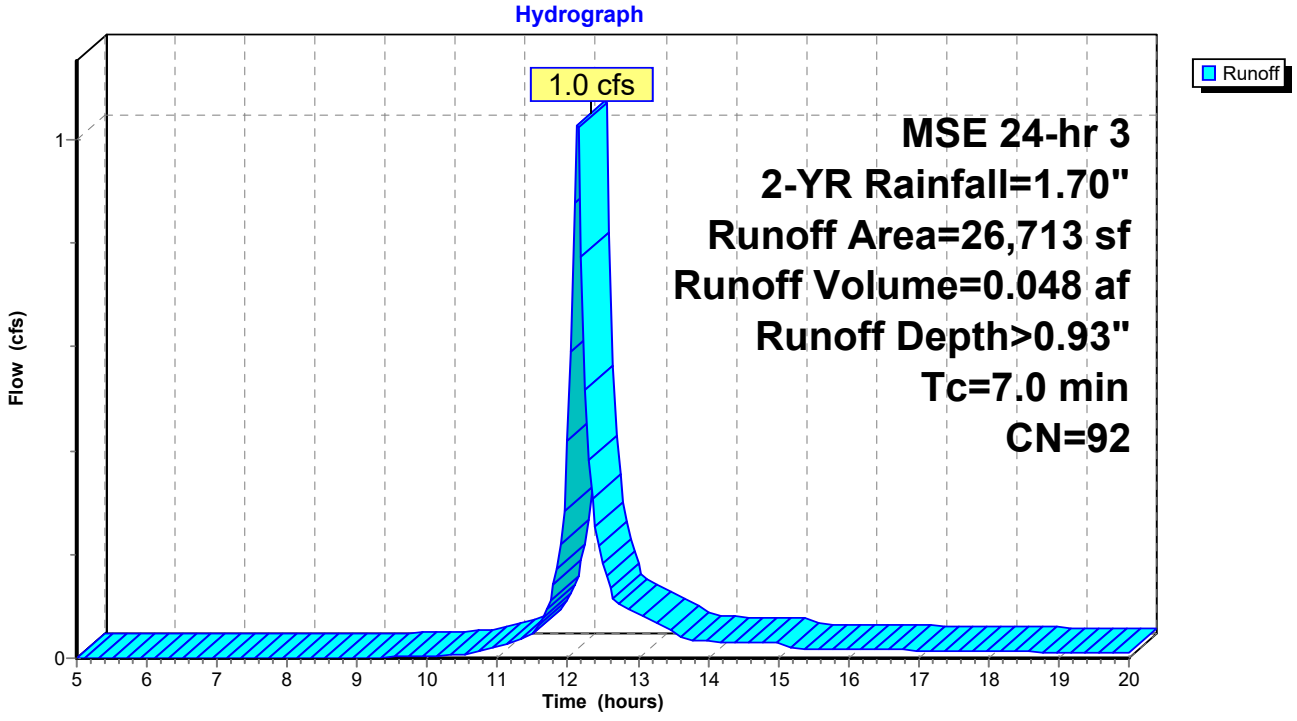
Runoff = 1.0 cfs @ 12.14 hrs, Volume= 0.048 af, Depth> 0.93"
Routed to Pond 3P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
17,151	98	Paved parking, HSG D
9,562	80	>75% Grass cover, Good, HSG D
26,713	92	Weighted Average
9,562		35.80% Pervious Area
17,151		64.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 5S:



Summary for Subcatchment 6S:

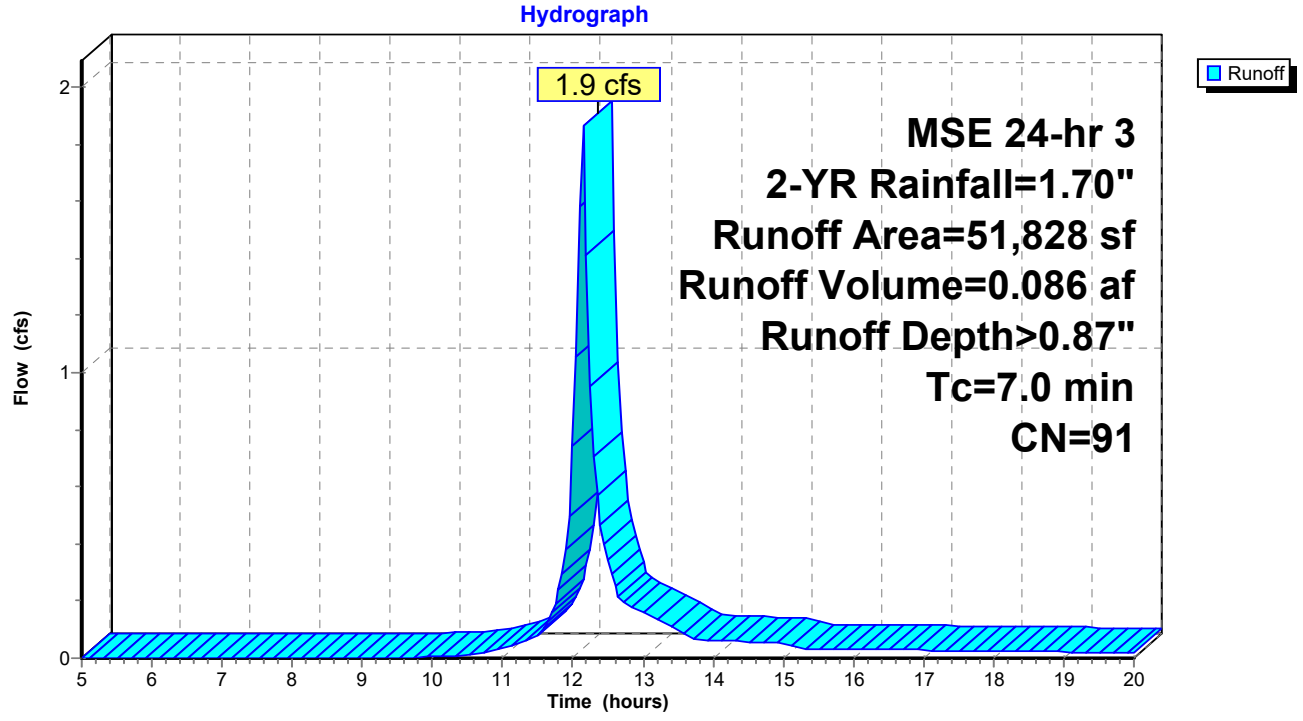
Runoff = 1.9 cfs @ 12.14 hrs, Volume= 0.086 af, Depth> 0.87"
Routed to Reach 4R : South Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
31,516	98	Paved parking, HSG D
20,312	80	>75% Grass cover, Good, HSG D
51,828	91	Weighted Average
20,312		39.19% Pervious Area
31,516		60.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 6S:



Summary for Subcatchment 7S:

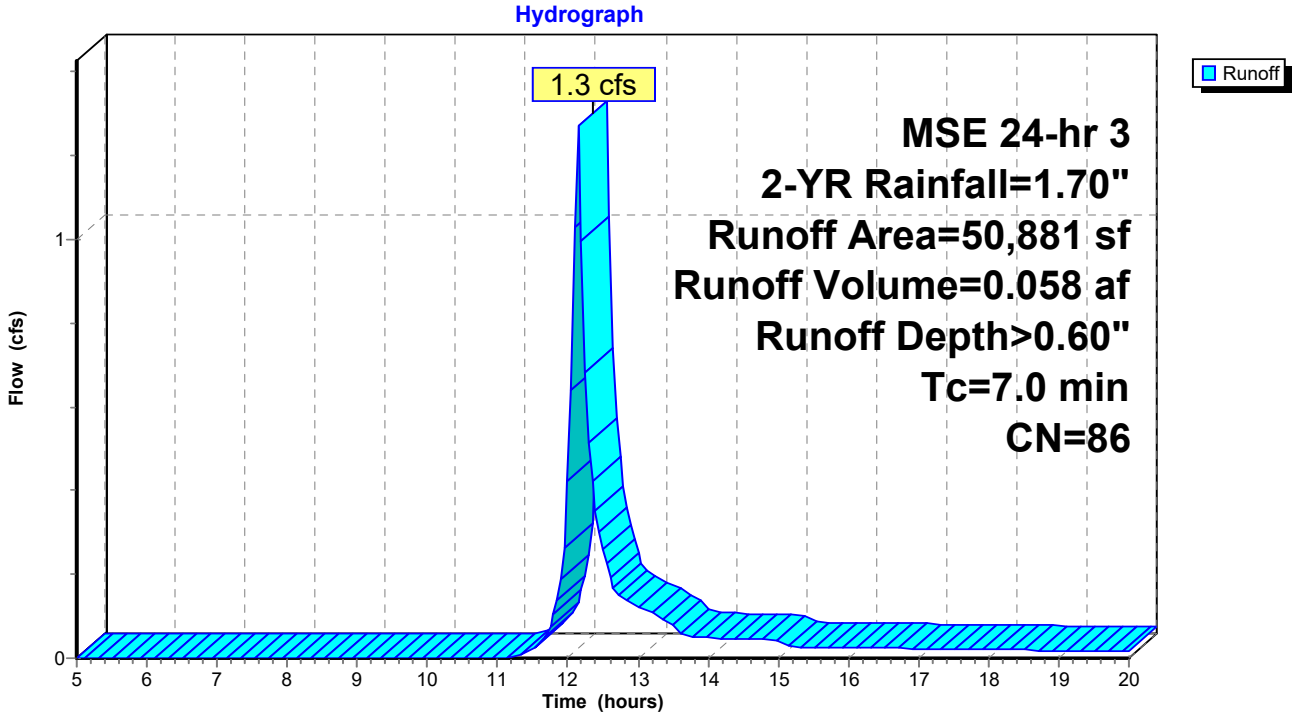
Runoff = 1.3 cfs @ 12.15 hrs, Volume= 0.058 af, Depth> 0.60"
Routed to Reach 5R : SE Bluff - To Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
16,752	98	Paved parking, HSG D
34,129	80	>75% Grass cover, Good, HSG D
50,881	86	Weighted Average
34,129		67.08% Pervious Area
16,752		32.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 7S:



Summary for Subcatchment 8S:

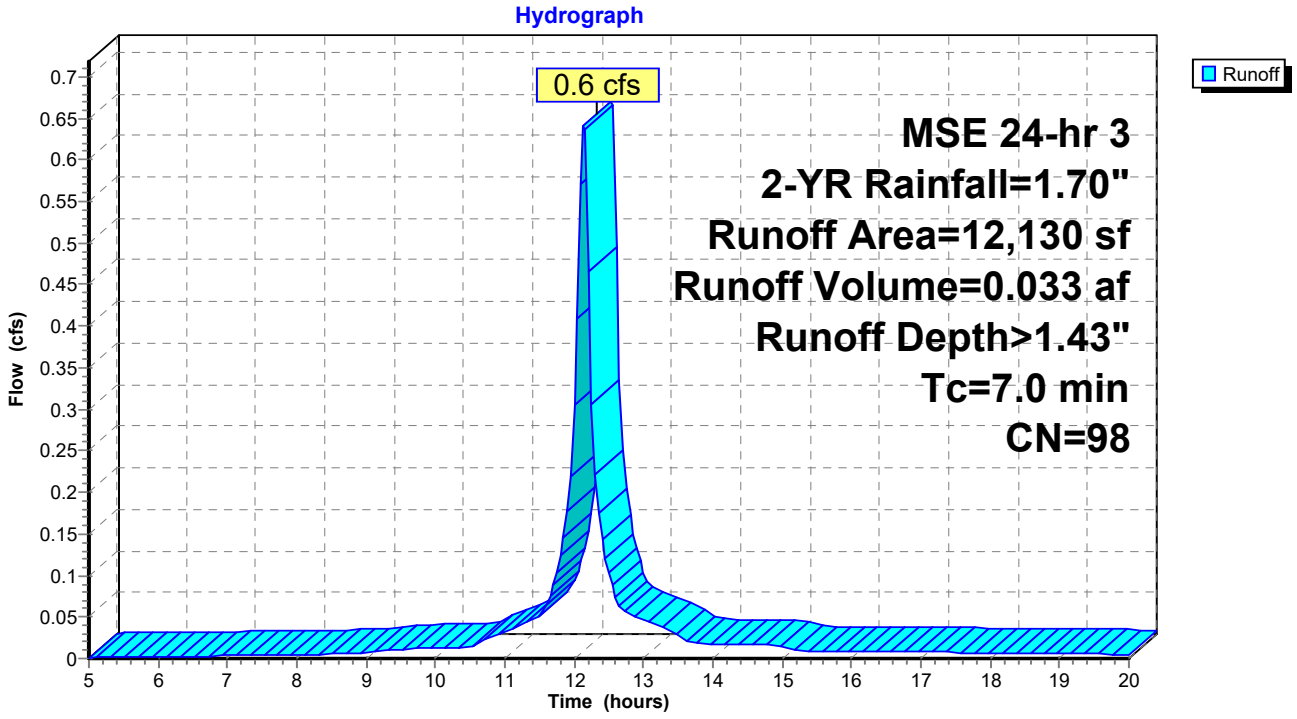
Runoff = 0.6 cfs @ 12.14 hrs, Volume= 0.033 af, Depth> 1.43"
Routed to Reach 6R : East Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=1.70"

Area (sf)	CN	Description
12,130	98	Paved parking, HSG D
0	80	>75% Grass cover, Good, HSG D
12,130	98	Weighted Average
12,130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 8S:

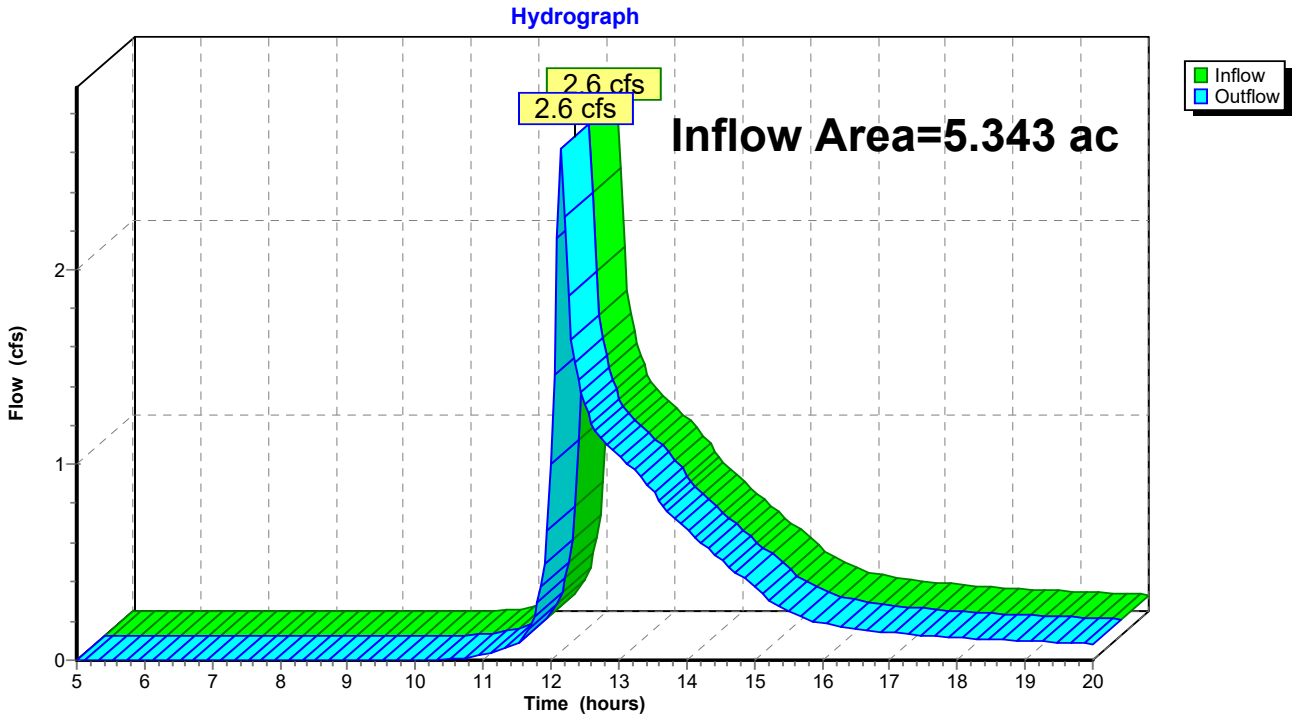


Summary for Reach 1R: NW Storm

Inflow Area = 5.343 ac, 49.10% Impervious, Inflow Depth > 0.70" for 2-YR event
Inflow = 2.6 cfs @ 12.15 hrs, Volume= 0.312 af
Outflow = 2.6 cfs @ 12.15 hrs, Volume= 0.312 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: NW Storm

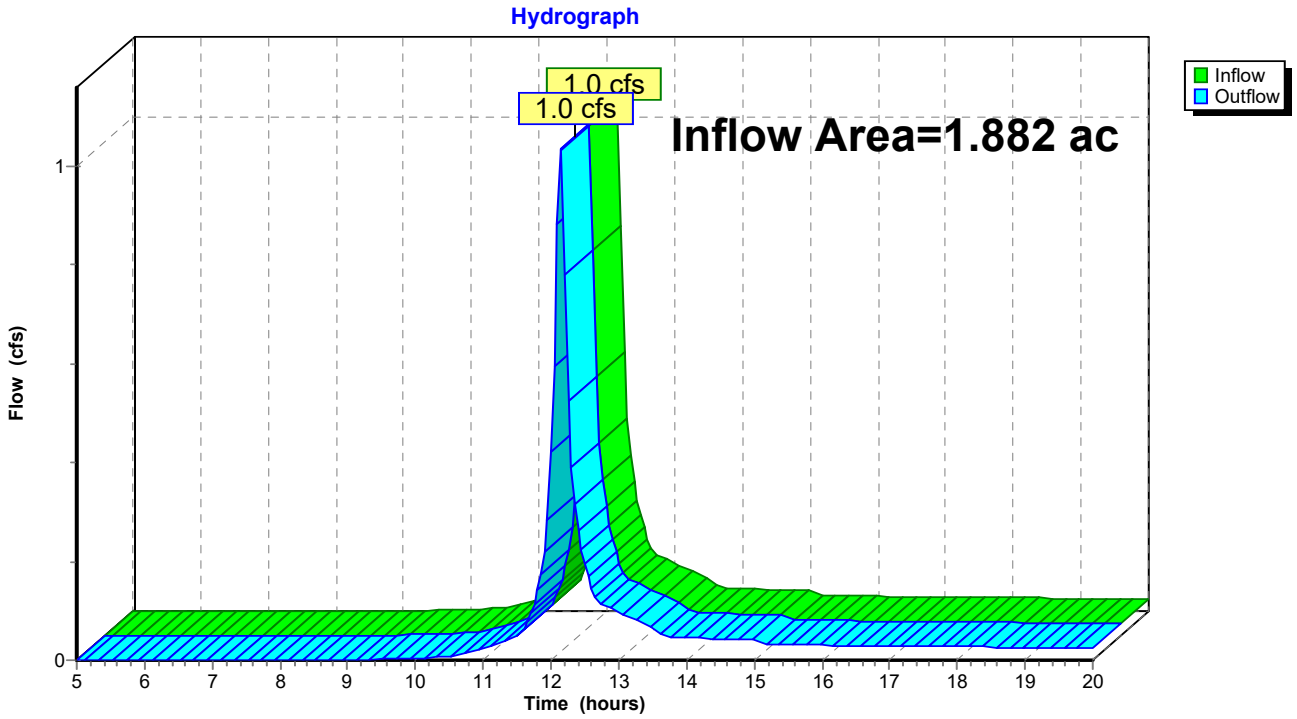


Summary for Reach 2R: West Storm

Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 0.36" for 2-YR event
Inflow = 1.0 cfs @ 12.14 hrs, Volume= 0.056 af
Outflow = 1.0 cfs @ 12.14 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: West Storm

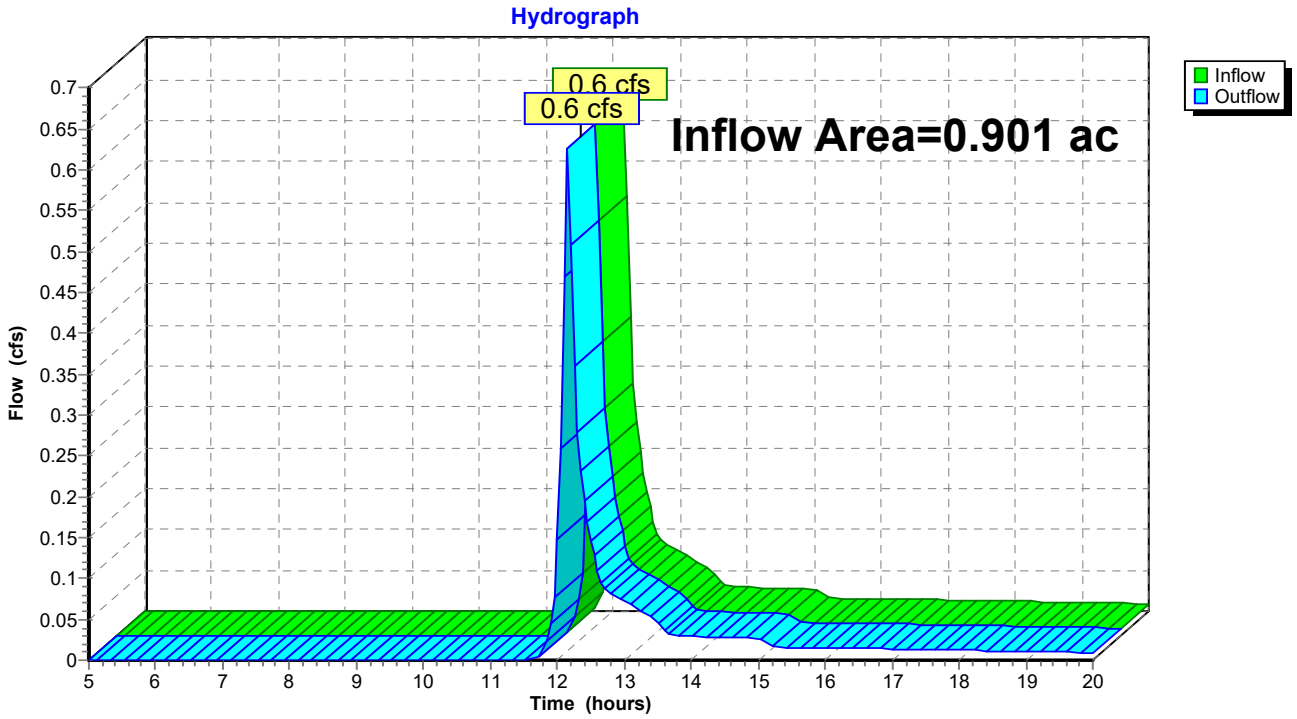


Summary for Reach 3R: West Bluff

Inflow Area = 0.901 ac, 6.44% Impervious, Inflow Depth > 0.40" for 2-YR event
Inflow = 0.6 cfs @ 12.15 hrs, Volume= 0.030 af
Outflow = 0.6 cfs @ 12.15 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 3R: West Bluff

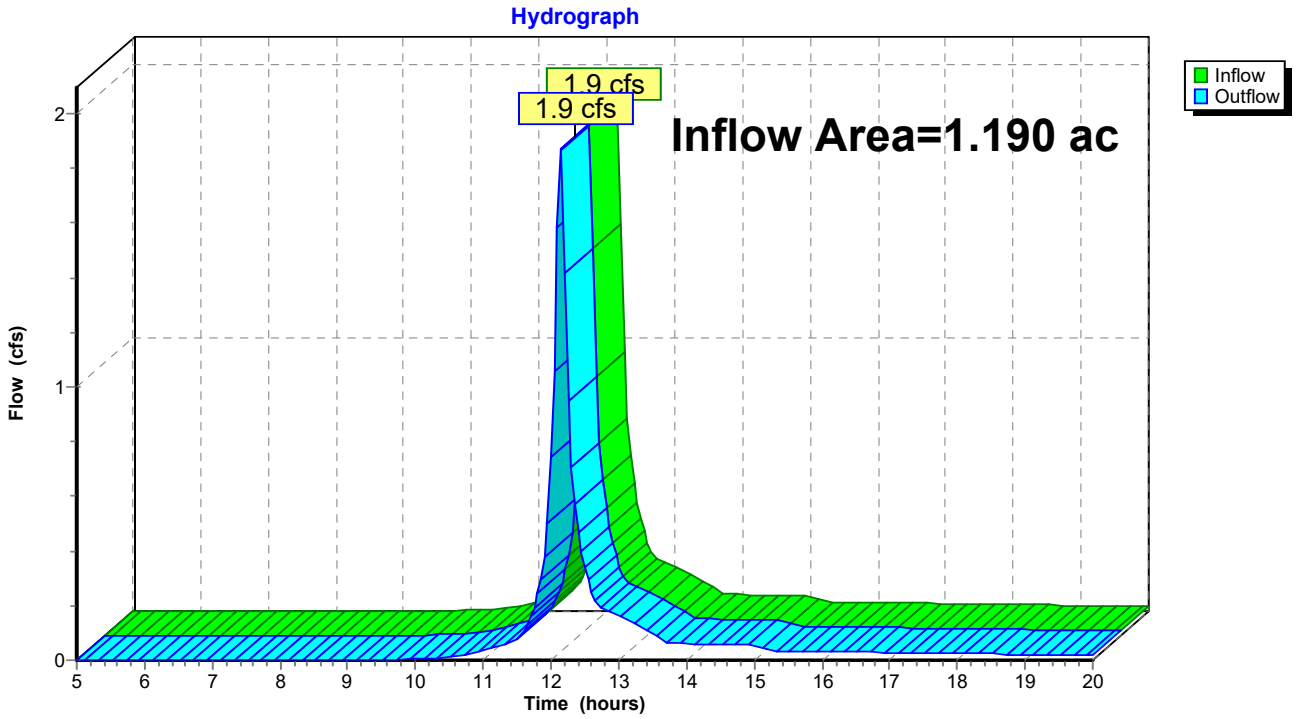


Summary for Reach 4R: South Storm

Inflow Area = 1.190 ac, 60.81% Impervious, Inflow Depth > 0.87" for 2-YR event
Inflow = 1.9 cfs @ 12.14 hrs, Volume= 0.086 af
Outflow = 1.9 cfs @ 12.14 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: South Storm

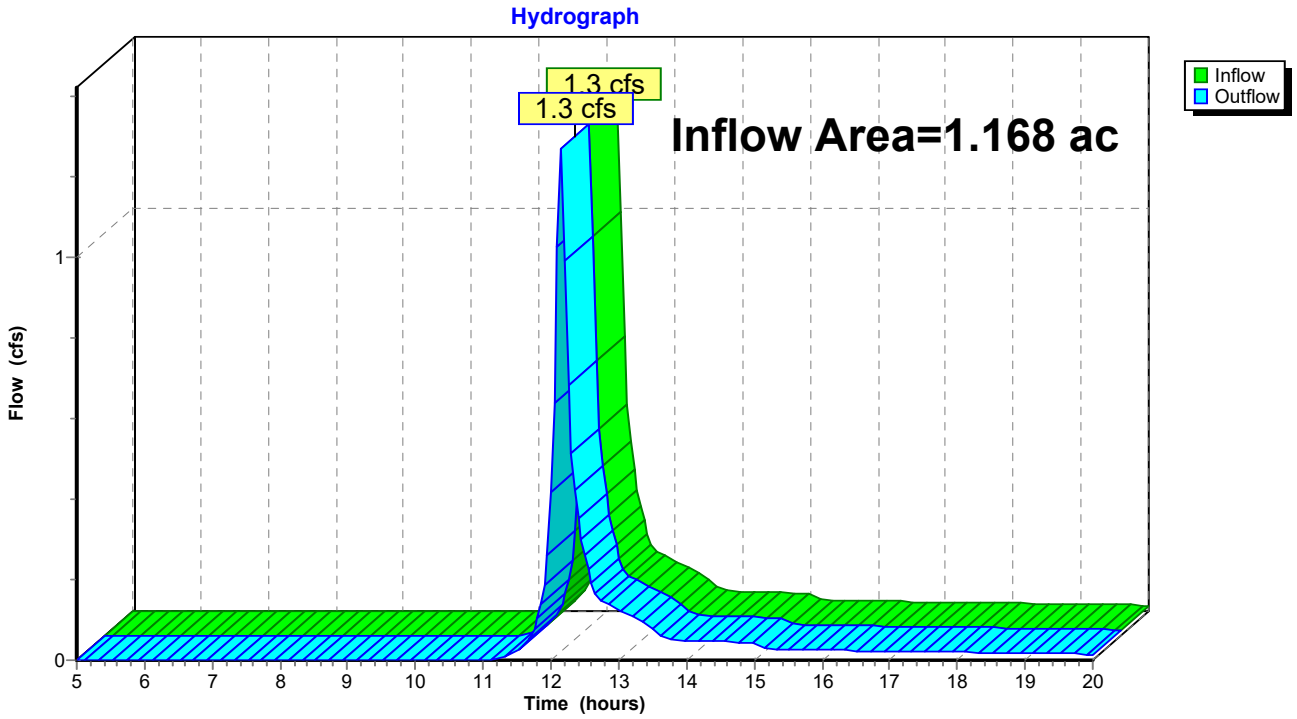


Summary for Reach 5R: SE Bluff - To Road

Inflow Area = 1.168 ac, 32.92% Impervious, Inflow Depth > 0.60" for 2-YR event
Inflow = 1.3 cfs @ 12.15 hrs, Volume= 0.058 af
Outflow = 1.3 cfs @ 12.15 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SE Bluff - To Road

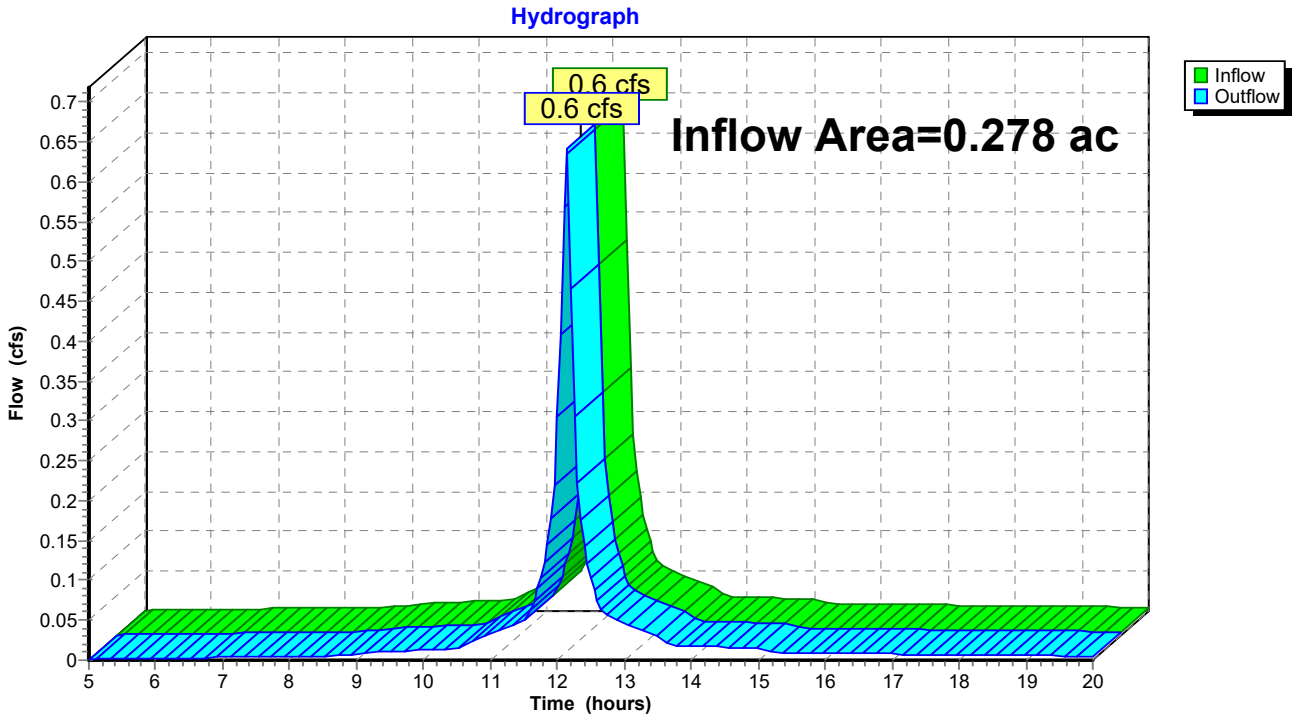


Summary for Reach 6R: East Storm

Inflow Area = 0.278 ac,100.00% Impervious, Inflow Depth > 1.43" for 2-YR event
Inflow = 0.6 cfs @ 12.14 hrs, Volume= 0.033 af
Outflow = 0.6 cfs @ 12.14 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: East Storm

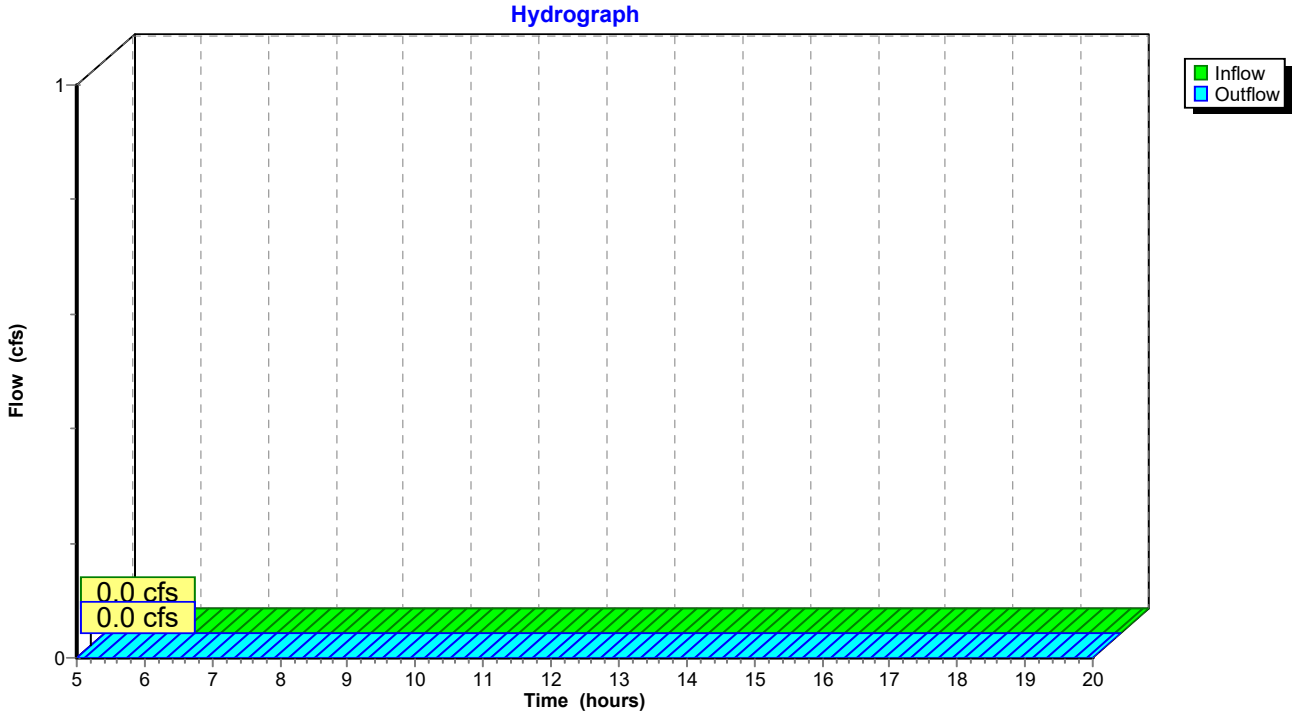


Summary for Reach 7R: North Bluff

Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: North Bluff



Summary for Pond 1P: Wet Sedimentation Basin

Inflow Area = 4.032 ac, 46.16% Impervious, Inflow Depth > 0.70" for 2-YR event
Inflow = 5.1 cfs @ 12.15 hrs, Volume= 0.234 af
Outflow = 1.0 cfs @ 12.52 hrs, Volume= 0.224 af, Atten= 81%, Lag= 22.3 min
Primary = 1.0 cfs @ 12.52 hrs, Volume= 0.224 af
Routed to Reach 1R : NW Storm
Secondary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 7R : North Bluff

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 986.00' Surf.Area= 2,905 sf Storage= 5,818 cf
Peak Elev= 987.27' @ 12.52 hrs Surf.Area= 3,701 sf Storage= 10,188 cf (4,370 cf above start)

Plug-Flow detention time= 228.1 min calculated for 0.090 af (39% of inflow)
Center-of-Mass det. time= 53.6 min (845.7 - 792.1)

Volume	Invert	Avail.Storage	Storage Description
#1	981.00'	52,963 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) x 0.5

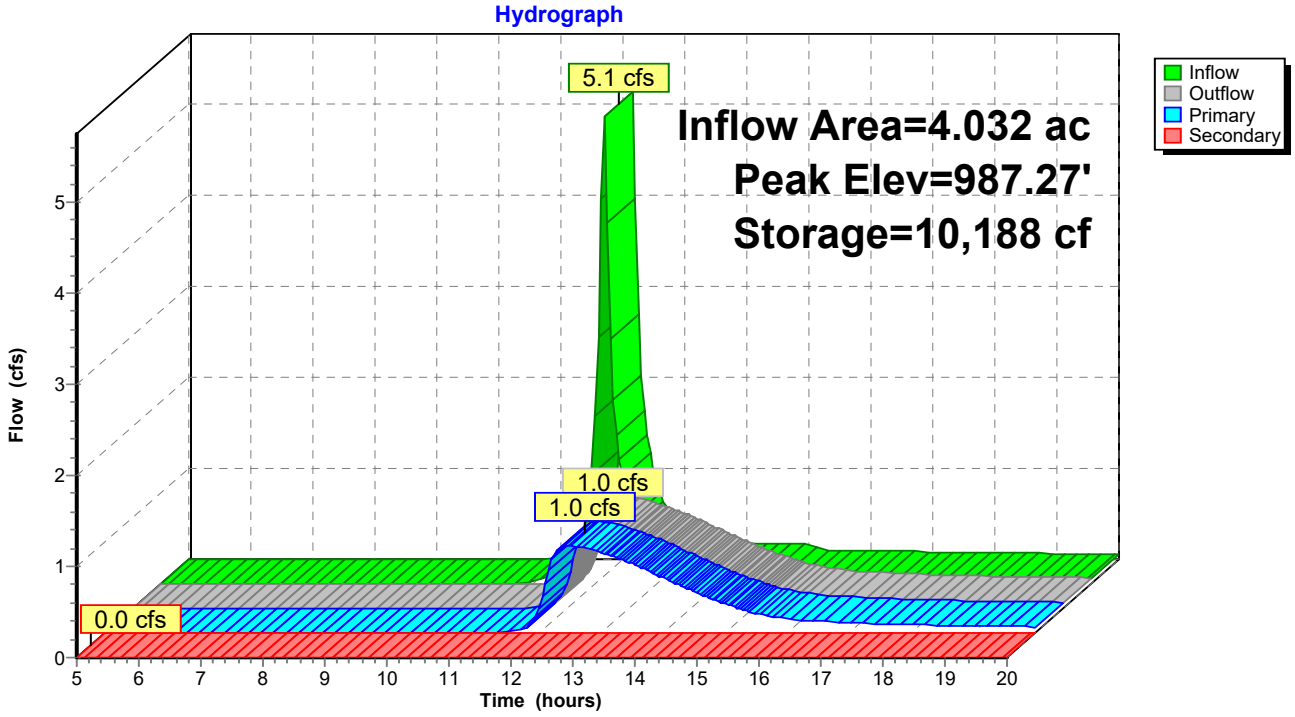
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
981.00	108	0	0
985.00	3,406	7,028	7,028
986.50	7,012	7,814	14,842
995.00	11,323	77,924	92,765
996.00	15,000	13,162	105,927

Device	Routing	Invert	Outlet Devices
#1	Primary	981.69'	**12.0" Round Culvert** L= 169.0' Ke= 0.500 Inlet / Outlet Invert= 981.69' / 980.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	986.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	989.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height
#4	Device 1	990.00'	**HAALA 48" ID Pond Skimmer** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 Disch. (cfs) 0.000 1.320 3.740 6.870 10.580 14.790 19.250 20.790 22.220 23.570 24.850 30.430 35.140 39.280 43.030 46.480 49.690 52.700 55.560
#5	Secondary	995.50'	**20.0' long x 20.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.0 cfs @ 12.52 hrs HW=987.27' (Free Discharge)
└─**1=Culvert** (Passes 1.0 cfs of 6.0 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 1.0 cfs @ 4.86 fps)
  └─**3=Sharp-Crested Rectangular Weir**(Controls 0.0 cfs)
  └─**4=HAALA 48" ID Pond Skimmer**(Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 5.00 hrs HW=986.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)

Pond 1P: Wet Sedimentation Basin



Summary for Pond 2P: Filtration Basin

Inflow Area = 1.269 ac, 73.72% Impervious, Inflow Depth > 1.00" for 2-YR event
Inflow = 2.3 cfs @ 12.14 hrs, Volume= 0.106 af
Outflow = 0.0 cfs @ 20.00 hrs, Volume= 0.009 af, Atten= 99%, Lag= 471.4 min
Primary = 0.0 cfs @ 20.00 hrs, Volume= 0.009 af
Routed to Pond 3P :
Secondary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 3R : West Bluff
Tertiary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 3R : West Bluff

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 983.33' @ 20.00 hrs Surf.Area= 679 sf Storage= 4,241 cf

Plug-Flow detention time= 315.8 min calculated for 0.009 af (8% of inflow)
Center-of-Mass det. time= 202.3 min (978.7 - 776.4)

Volume	Invert	Avail.Storage	Storage Description
#1	982.00'	6,940 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) x 0.5
#2A	981.25'	3,536 cf	**36.08'W x 70.23'L x 5.50'H Field A** Impervious 13,938 cf Overall - 5,097 cf Embedded = 8,841 cf x 40.0% Voids
#3A	982.00'	5,097 cf	**ADS_StormTech MC-3500 d +Cap** x 45 Inside #2 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 45 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf
		15,573 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
982.00	588	0	0
987.00	3,470	10,145	10,145
988.00	4,000	3,735	13,880

Device	Routing	Invert	Outlet Devices
#1	Primary	980.00'	**12.0" Round Culvert** L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 980.00' / 978.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	982.00'	**1.630 in/hr Exfiltration over Surface area above 982.00'** Excluded Surface area = 294 sf Phase-In= 0.01'
#3	Device 1	983.50'	**24" Nyloplast Dome Grate X 0.50** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 Disch. (cfs) 0.000 0.660 1.870 3.440 5.290 6.400 7.010 7.570 8.100 8.590 9.050 11.090 12.800 14.310 15.680 16.940 18.100 19.200 20.240
#4	Secondary	986.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

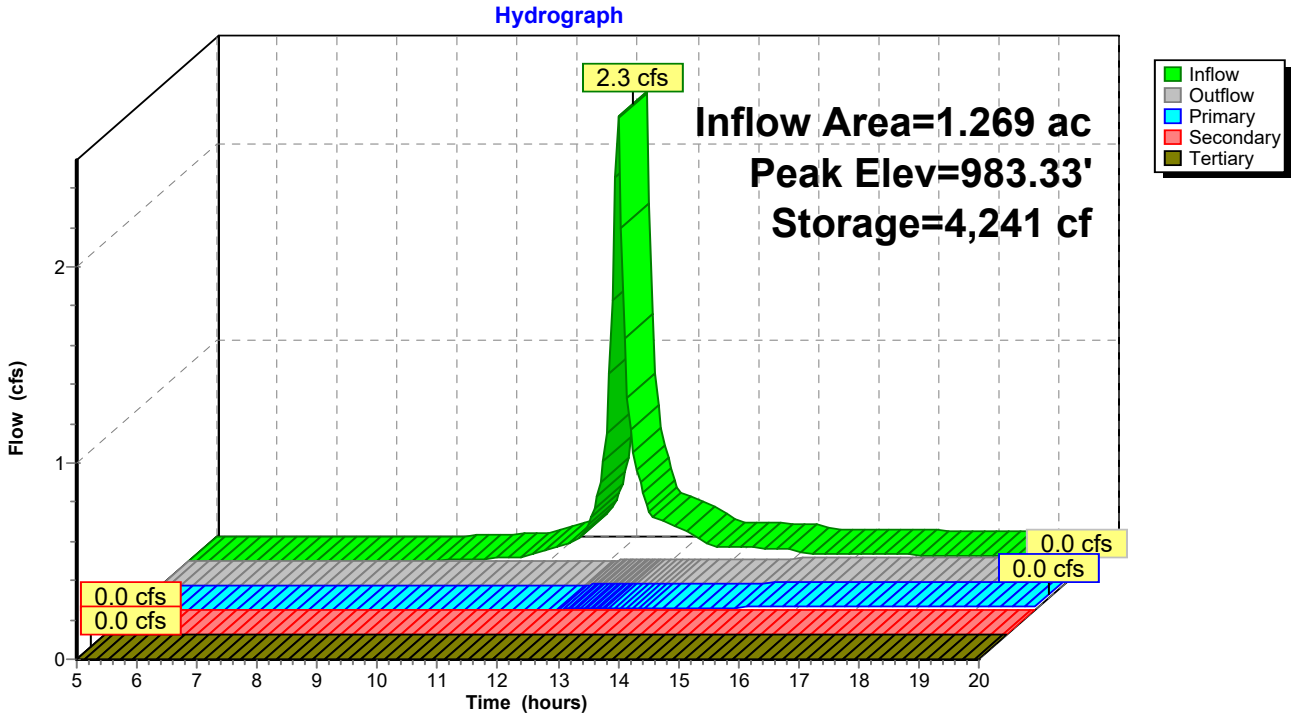
#5 Tertiary 987.00' **133.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.0 cfs @ 20.00 hrs HW=983.33' (Free Discharge)
└─**1=Culvert** (Passes 0.0 cfs of 4.7 cfs potential flow)
└─**2=Exfiltration** (Exfiltration Controls 0.0 cfs)
└─**3=24" Nyloplast Dome Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 5.00 hrs HW=981.25' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Tertiary OutFlow Max=0.0 cfs @ 5.00 hrs HW=981.25' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 2P: Filtration Basin



Summary for Pond 3P:

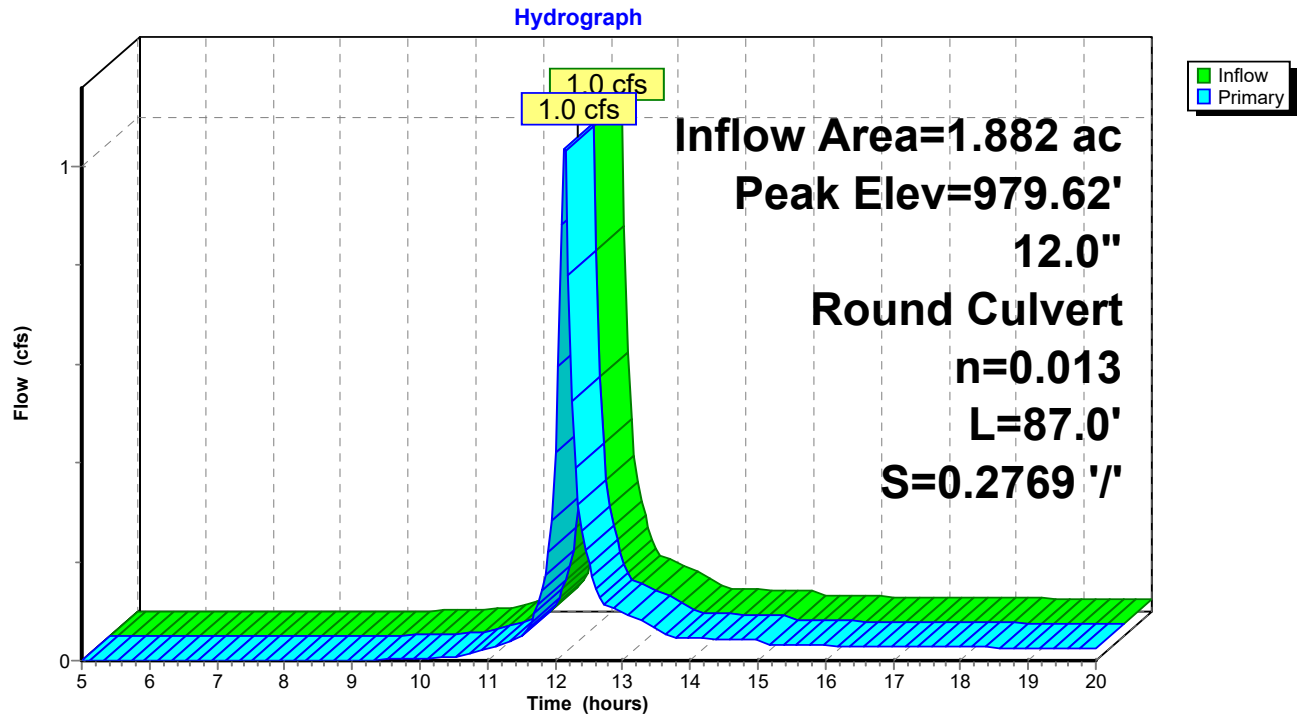
Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 0.36" for 2-YR event
Inflow = 1.0 cfs @ 12.14 hrs, Volume= 0.056 af
Outflow = 1.0 cfs @ 12.14 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 12.14 hrs, Volume= 0.056 af
Routed to Pond 4P :

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 979.62' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	979.09'	**12.0" Round RCP_Round 12"** L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 979.09' / 955.00' S= 0.2769 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.0 cfs @ 12.14 hrs HW=979.61' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 1.0 cfs @ 2.45 fps)

Pond 3P:



Summary for Pond 4P:

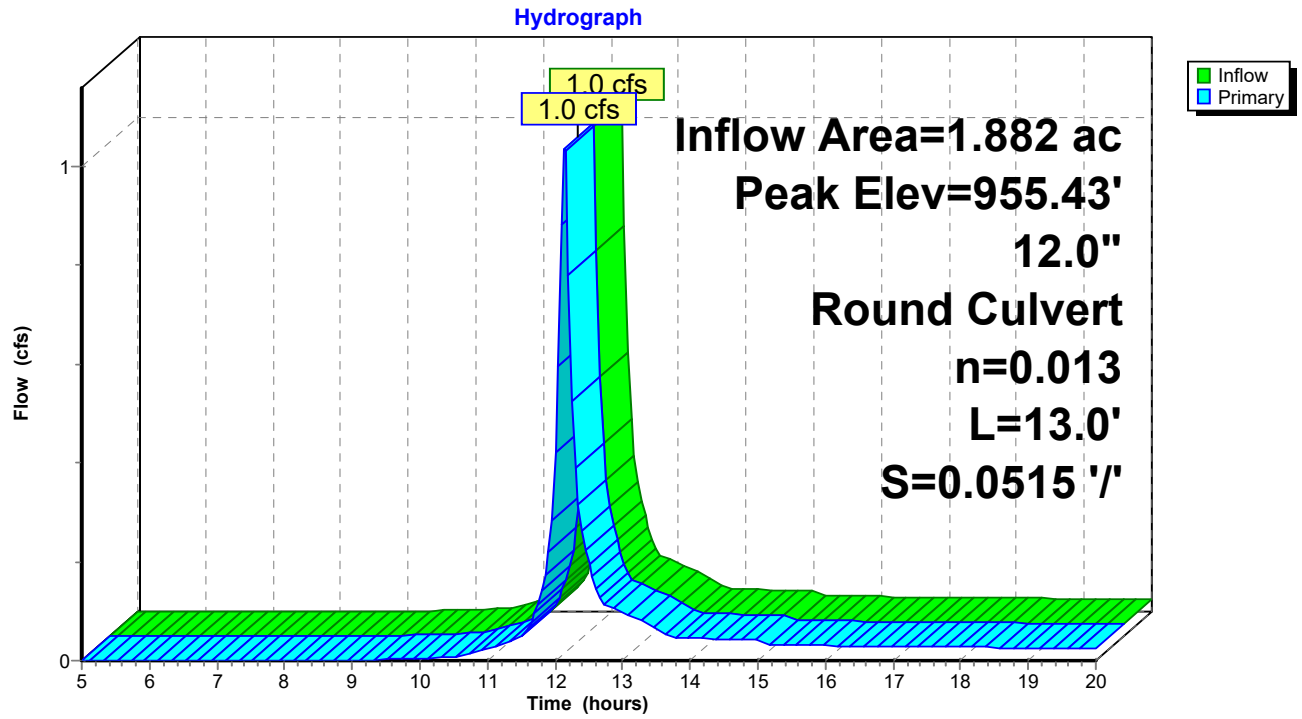
Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 0.36" for 2-YR event
Inflow = 1.0 cfs @ 12.14 hrs, Volume= 0.056 af
Outflow = 1.0 cfs @ 12.14 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 12.14 hrs, Volume= 0.056 af
Routed to Reach 2R : West Storm

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 955.43' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	954.90'	**12.0" Round RCP_Round 12"** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 954.90' / 954.23' S= 0.0515 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.0 cfs @ 12.14 hrs HW=955.42' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 1.0 cfs @ 2.45 fps)

Pond 4P:



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=175,645 sf 46.16% Impervious Runoff Depth>2.88"
Tc=7.0 min CN=88 Runoff=20.2 cfs 0.968 af

Subcatchment2S: Runoff Area=57,101 sf 58.18% Impervious Runoff Depth>3.08"
Tc=7.0 min CN=90 Runoff=6.9 cfs 0.336 af

Subcatchment3S: Runoff Area=55,265 sf 73.72% Impervious Runoff Depth>3.38"
Tc=7.0 min CN=93 Runoff=7.1 cfs 0.357 af

Subcatchment4S: Runoff Area=39,227 sf 6.44% Impervious Runoff Depth>2.26"
Tc=7.0 min CN=81 Runoff=3.7 cfs 0.170 af

Subcatchment5S: Runoff Area=26,713 sf 64.20% Impervious Runoff Depth>3.28"
Tc=7.0 min CN=92 Runoff=3.4 cfs 0.167 af

Subcatchment6S: Runoff Area=51,828 sf 60.81% Impervious Runoff Depth>3.18"
Tc=7.0 min CN=91 Runoff=6.4 cfs 0.315 af

Subcatchment7S: Runoff Area=50,881 sf 32.92% Impervious Runoff Depth>2.70"
Tc=7.0 min CN=86 Runoff=5.6 cfs 0.262 af

Subcatchment8S: Runoff Area=12,130 sf 100.00% Impervious Runoff Depth>3.89"
Tc=7.0 min CN=98 Runoff=1.7 cfs 0.090 af

Reach 1R: NW Storm Inflow=13.9 cfs 1.285 af
Outflow=13.9 cfs 1.285 af

Reach 2R: West Storm Inflow=7.0 cfs 0.416 af
Outflow=7.0 cfs 0.416 af

Reach 3R: West Bluff Inflow=3.7 cfs 0.170 af
Outflow=3.7 cfs 0.170 af

Reach 4R: South Storm Inflow=6.4 cfs 0.315 af
Outflow=6.4 cfs 0.315 af

Reach 5R: SE Bluff - To Road Inflow=5.6 cfs 0.262 af
Outflow=5.6 cfs 0.262 af

Reach 6R: East Storm Inflow=1.7 cfs 0.090 af
Outflow=1.7 cfs 0.090 af

Reach 7R: North Bluff Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Pond 1P: Wet Sedimentation Basin Peak Elev=990.22' Storage=22,234 cf Inflow=20.2 cfs 0.968 af
Primary=7.3 cfs 0.949 af Secondary=0.0 cfs 0.000 af Outflow=7.3 cfs 0.949 af

Pond 2P: Filtration Basin Peak Elev=984.29' Storage=6,885 cf Inflow=7.1 cfs 0.357 af
Primary=4.1 cfs 0.249 af Secondary=0.0 cfs 0.000 af Tertiary=0.0 cfs 0.000 af Outflow=4.1 cfs 0.249 af

Pond 3P: Peak Elev=983.00' Inflow=7.0 cfs 0.416 af
12.0" Round Culvert n=0.013 L=87.0' S=0.2769 '/' Outflow=7.0 cfs 0.416 af

Pond 4P: Peak Elev=958.81' Inflow=7.0 cfs 0.416 af
12.0" Round Culvert n=0.013 L=13.0' S=0.0515 '/' Outflow=7.0 cfs 0.416 af

Total Runoff Area = 10.762 ac Runoff Volume = 2.666 af Average Runoff Depth = 2.97"
49.85% Pervious = 5.365 ac 50.15% Impervious = 5.397 ac

Summary for Subcatchment 1S:

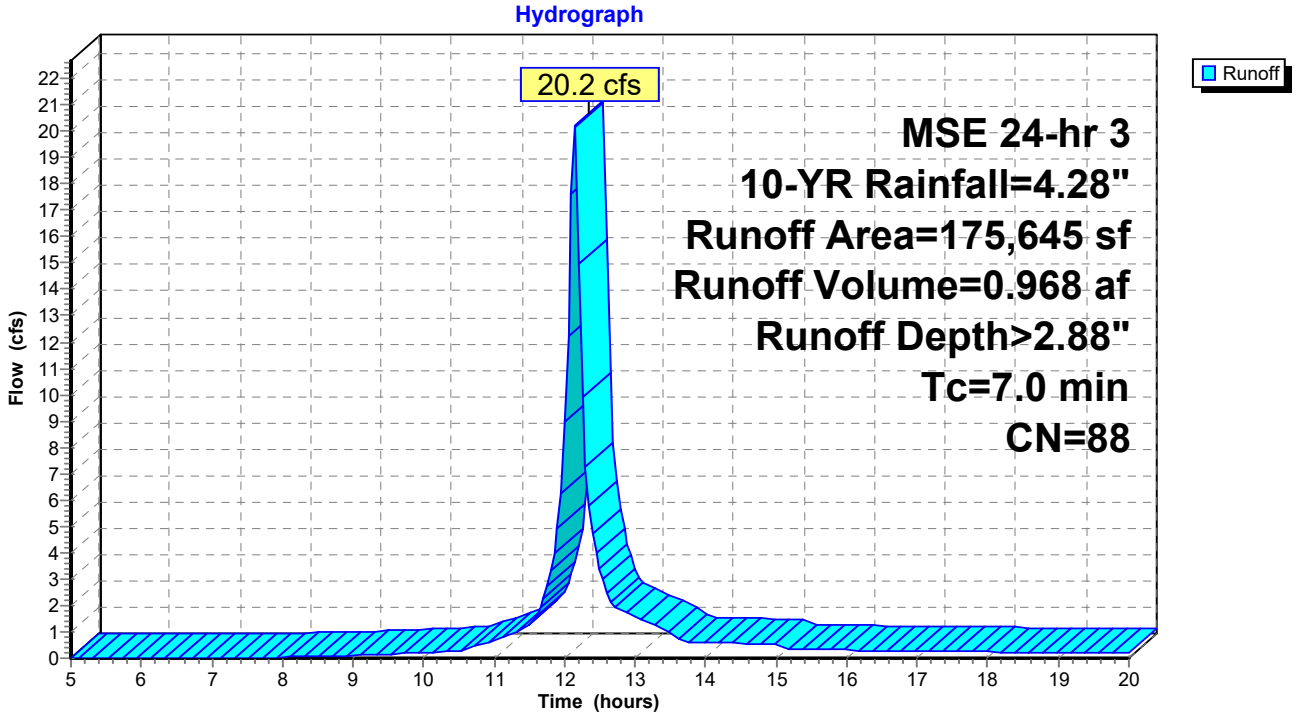
Runoff = 20.2 cfs @ 12.14 hrs, Volume= 0.968 af, Depth> 2.88"
Routed to Pond 1P : Wet Sedimentation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
81,069	98	Paved parking, HSG D
94,576	80	>75% Grass cover, Good, HSG D
175,645	88	Weighted Average
94,576		53.84% Pervious Area
81,069		46.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 1S:



Summary for Subcatchment 2S:

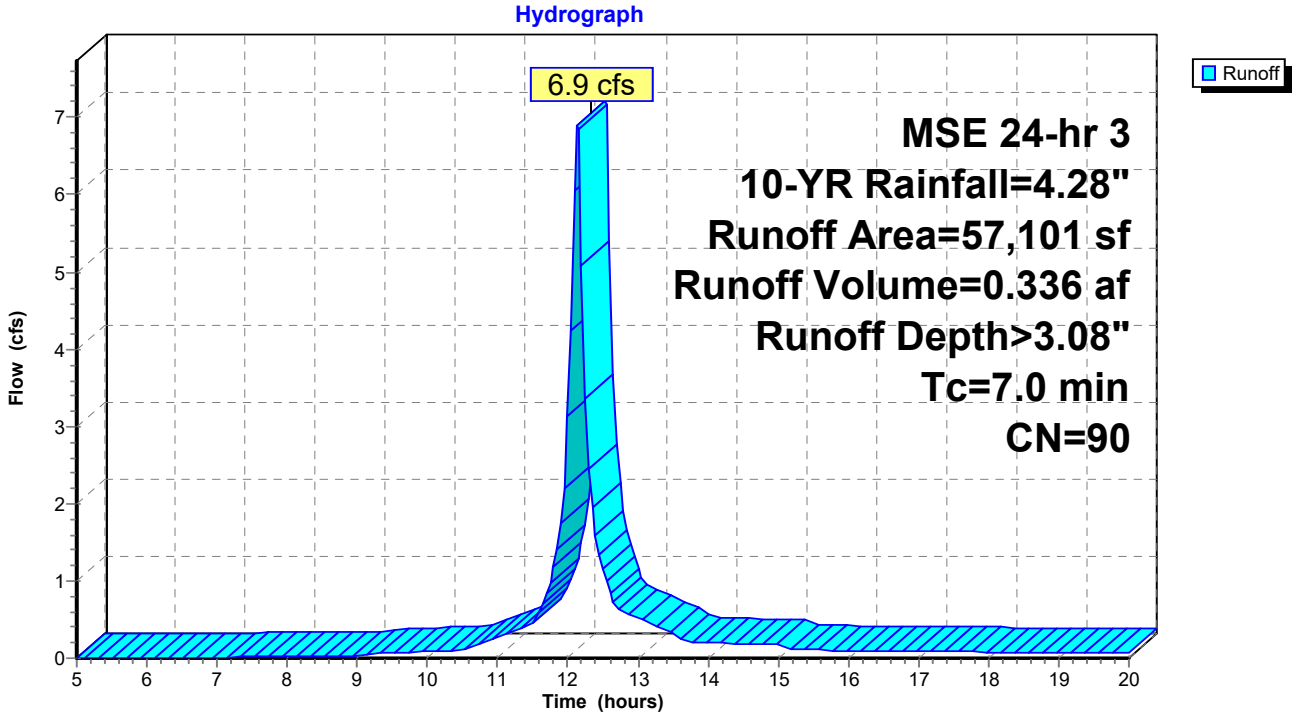
Runoff = 6.9 cfs @ 12.14 hrs, Volume= 0.336 af, Depth> 3.08"
Routed to Reach 1R : NW Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
33,220	98	Paved parking, HSG D
23,881	80	>75% Grass cover, Good, HSG D
57,101	90	Weighted Average
23,881		41.82% Pervious Area
33,220		58.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 2S:



Summary for Subcatchment 3S:

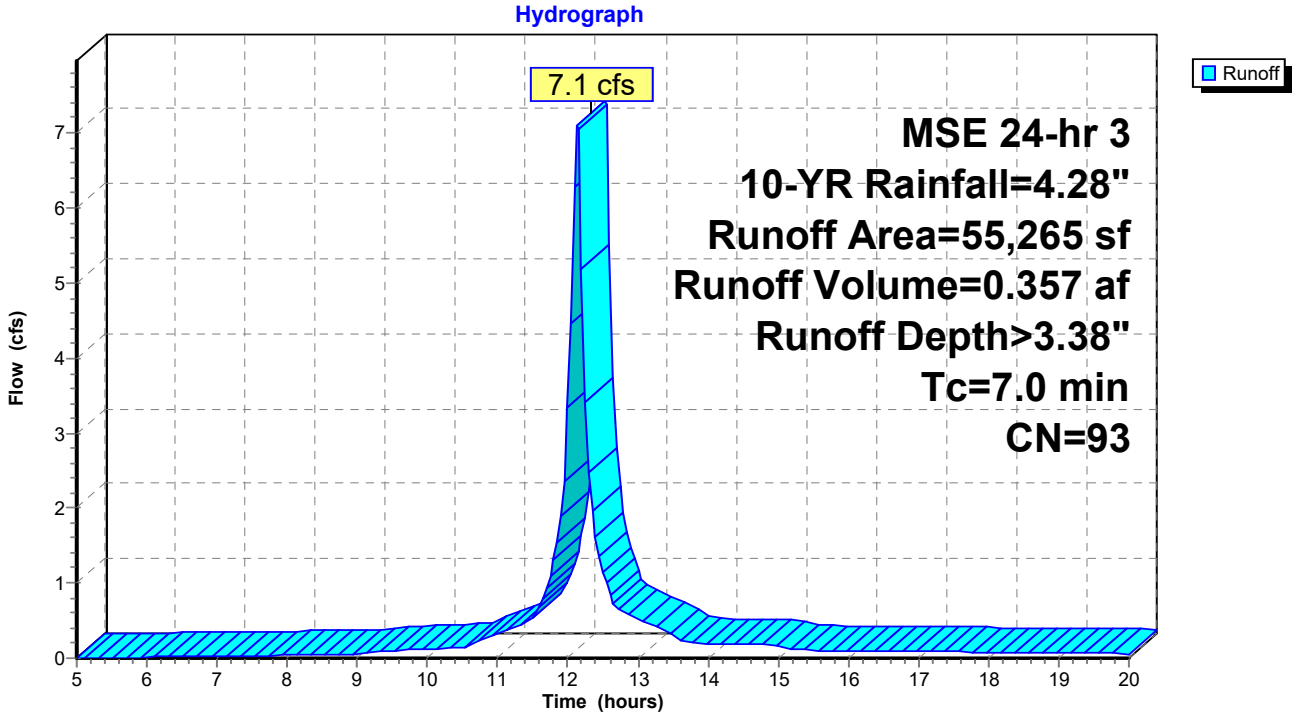
Runoff = 7.1 cfs @ 12.14 hrs, Volume= 0.357 af, Depth> 3.38"
Routed to Pond 2P : Filtration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
40,744	98	Paved parking, HSG D
14,521	80	>75% Grass cover, Good, HSG D
55,265	93	Weighted Average
14,521		26.28% Pervious Area
40,744		73.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 3S:



Summary for Subcatchment 4S:

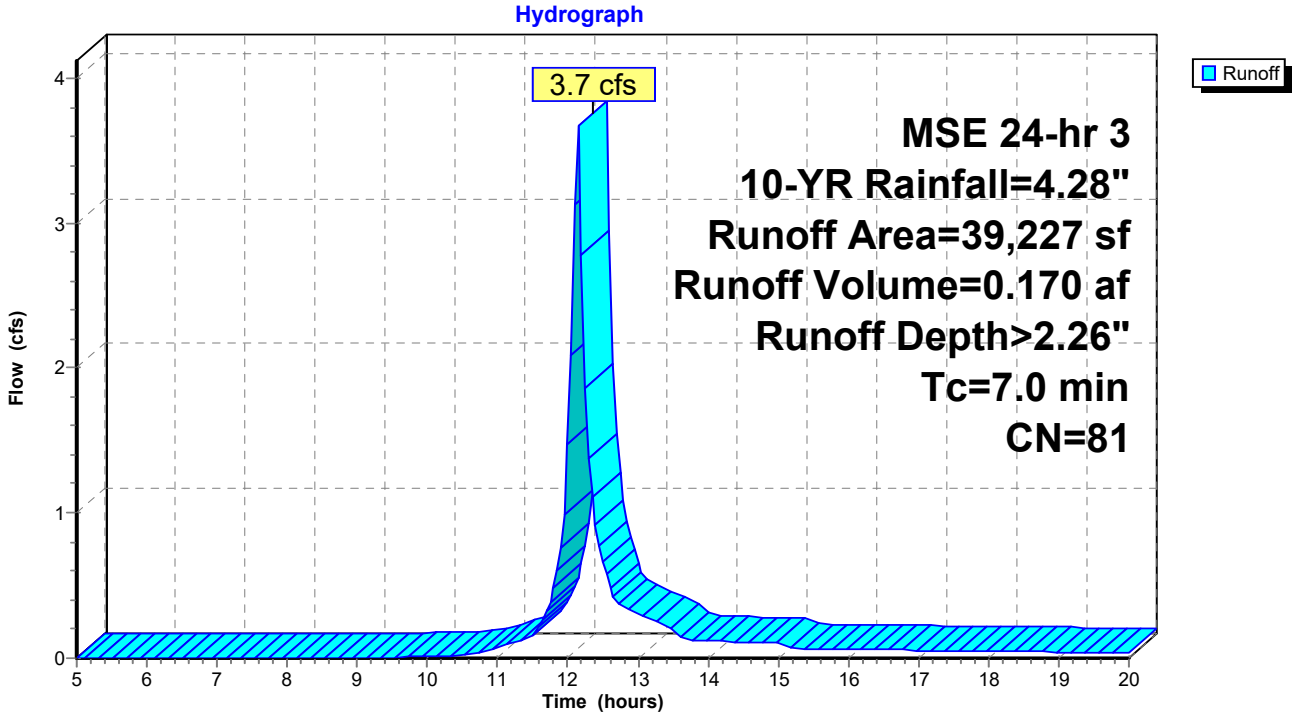
Runoff = 3.7 cfs @ 12.14 hrs, Volume= 0.170 af, Depth> 2.26"
Routed to Reach 3R : West Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
2,525	98	Paved parking, HSG D
36,702	80	>75% Grass cover, Good, HSG D
39,227	81	Weighted Average
36,702		93.56% Pervious Area
2,525		6.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 4S:



Summary for Subcatchment 5S:

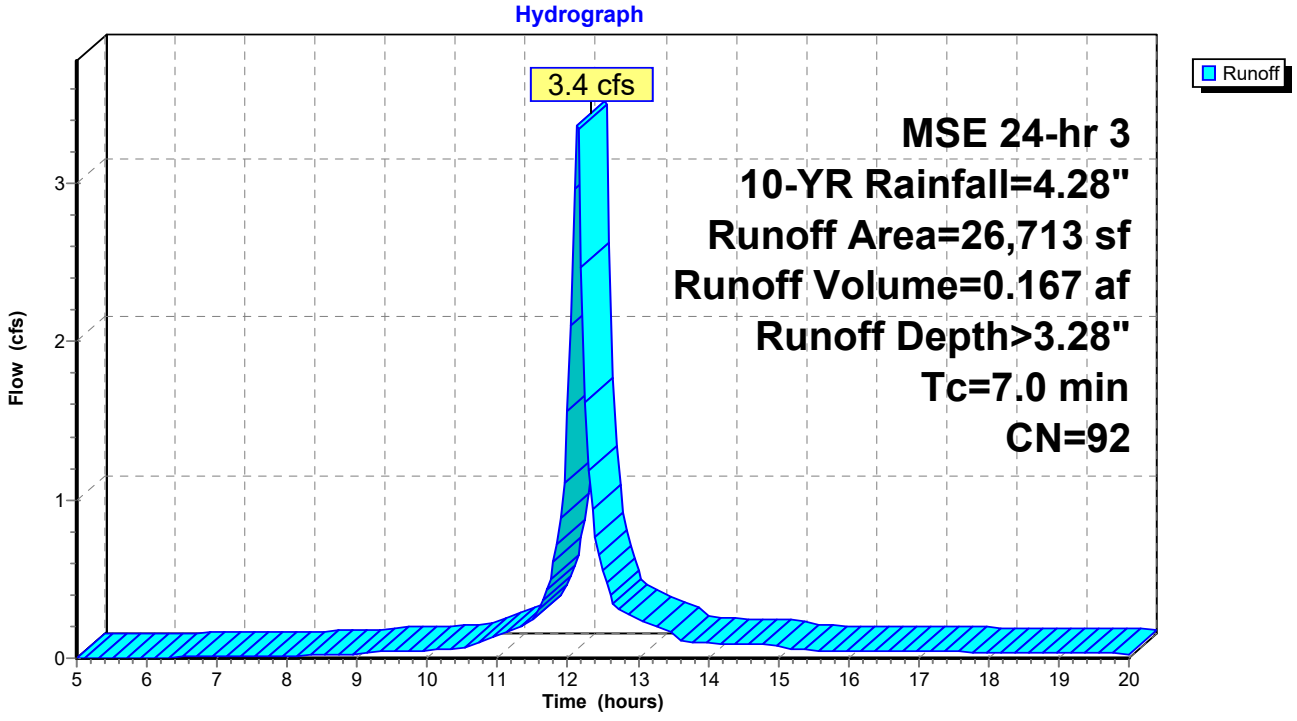
Runoff = 3.4 cfs @ 12.14 hrs, Volume= 0.167 af, Depth> 3.28"
Routed to Pond 3P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
17,151	98	Paved parking, HSG D
9,562	80	>75% Grass cover, Good, HSG D
26,713	92	Weighted Average
9,562		35.80% Pervious Area
17,151		64.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 5S:



Summary for Subcatchment 6S:

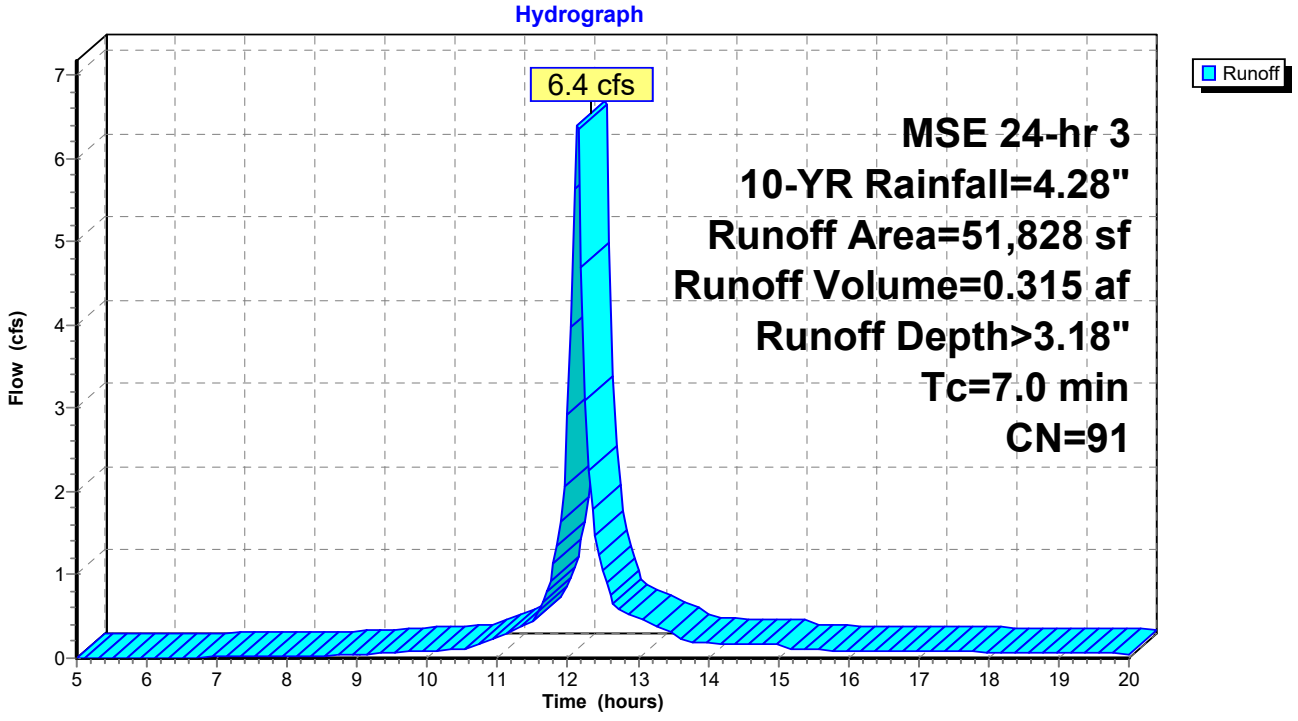
Runoff = 6.4 cfs @ 12.14 hrs, Volume= 0.315 af, Depth> 3.18"
Routed to Reach 4R : South Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
31,516	98	Paved parking, HSG D
20,312	80	>75% Grass cover, Good, HSG D
51,828	91	Weighted Average
20,312		39.19% Pervious Area
31,516		60.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 6S:



Summary for Subcatchment 7S:

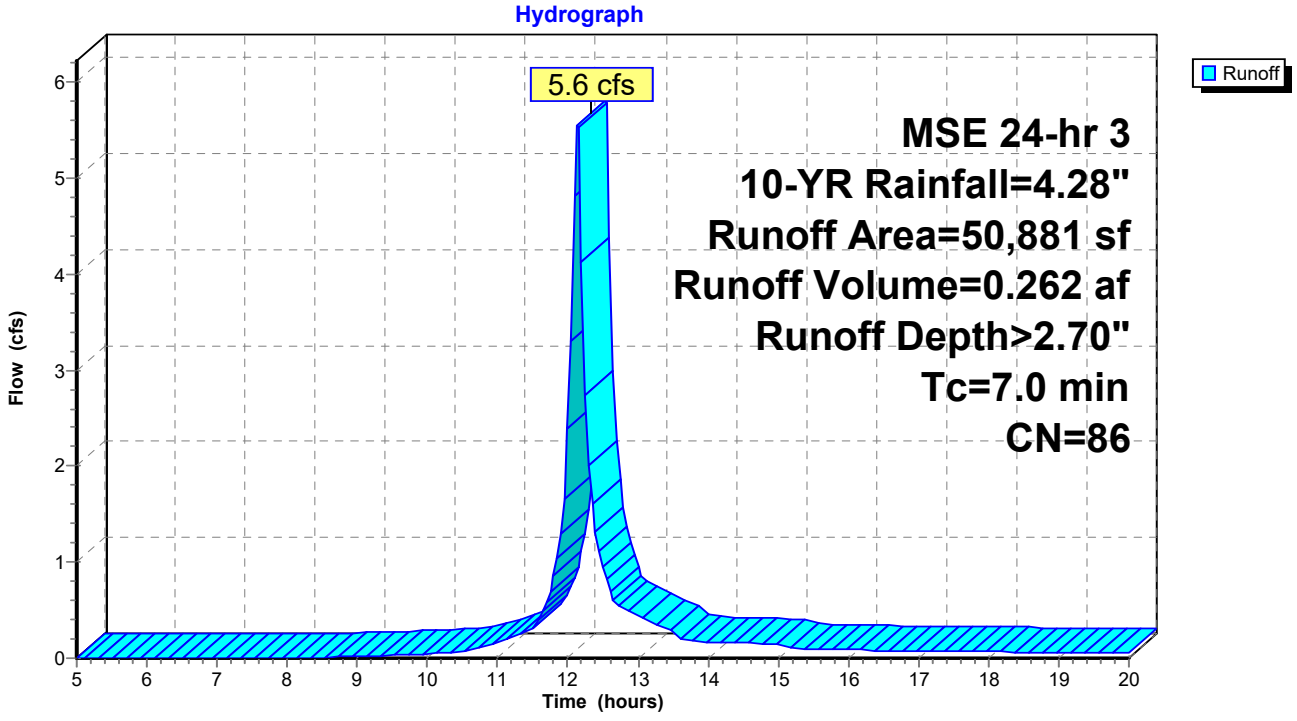
Runoff = 5.6 cfs @ 12.14 hrs, Volume= 0.262 af, Depth> 2.70"
Routed to Reach 5R : SE Bluff - To Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
16,752	98	Paved parking, HSG D
34,129	80	>75% Grass cover, Good, HSG D
50,881	86	Weighted Average
34,129		67.08% Pervious Area
16,752		32.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 7S:



Summary for Subcatchment 8S:

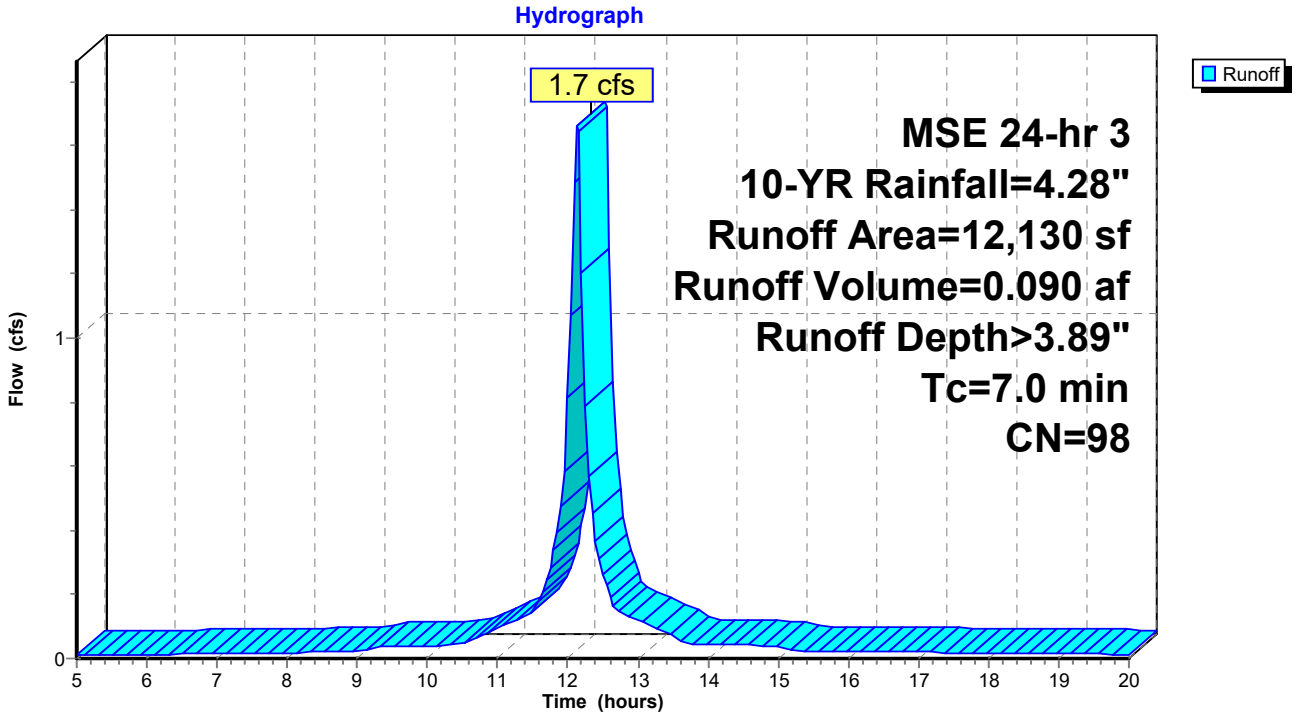
Runoff = 1.7 cfs @ 12.14 hrs, Volume= 0.090 af, Depth> 3.89"
Routed to Reach 6R : East Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=4.28"

Area (sf)	CN	Description
12,130	98	Paved parking, HSG D
0	80	>75% Grass cover, Good, HSG D
12,130	98	Weighted Average
12,130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 8S:

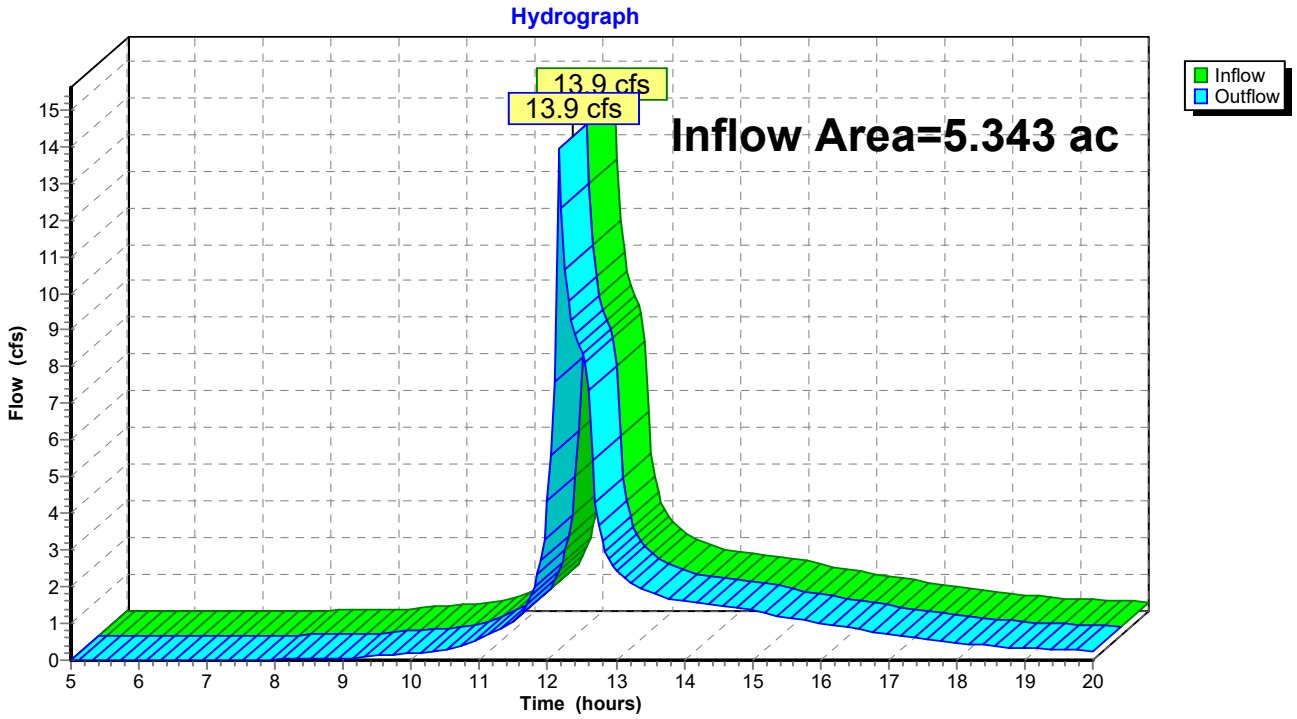


Summary for Reach 1R: NW Storm

Inflow Area = 5.343 ac, 49.10% Impervious, Inflow Depth > 2.89" for 10-YR event
Inflow = 13.9 cfs @ 12.17 hrs, Volume= 1.285 af
Outflow = 13.9 cfs @ 12.17 hrs, Volume= 1.285 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: NW Storm

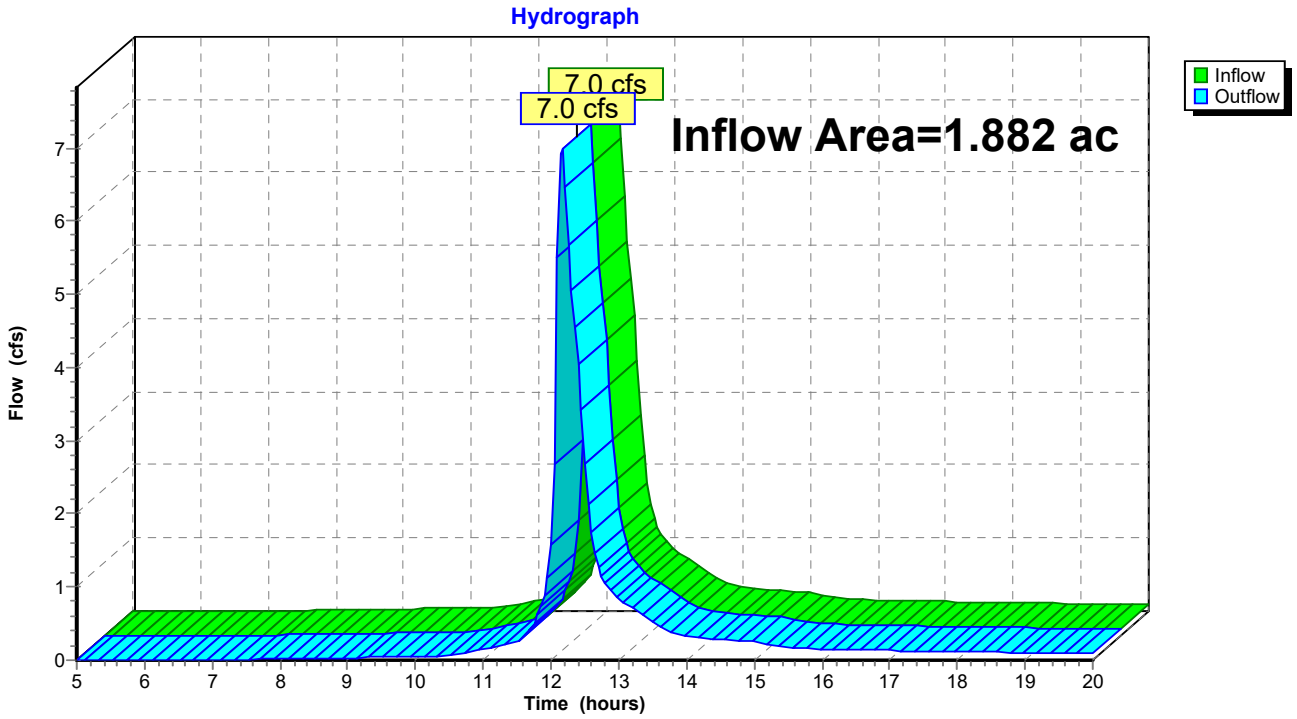


Summary for Reach 2R: West Storm

Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 2.65" for 10-YR event
Inflow = 7.0 cfs @ 12.16 hrs, Volume= 0.416 af
Outflow = 7.0 cfs @ 12.16 hrs, Volume= 0.416 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: West Storm

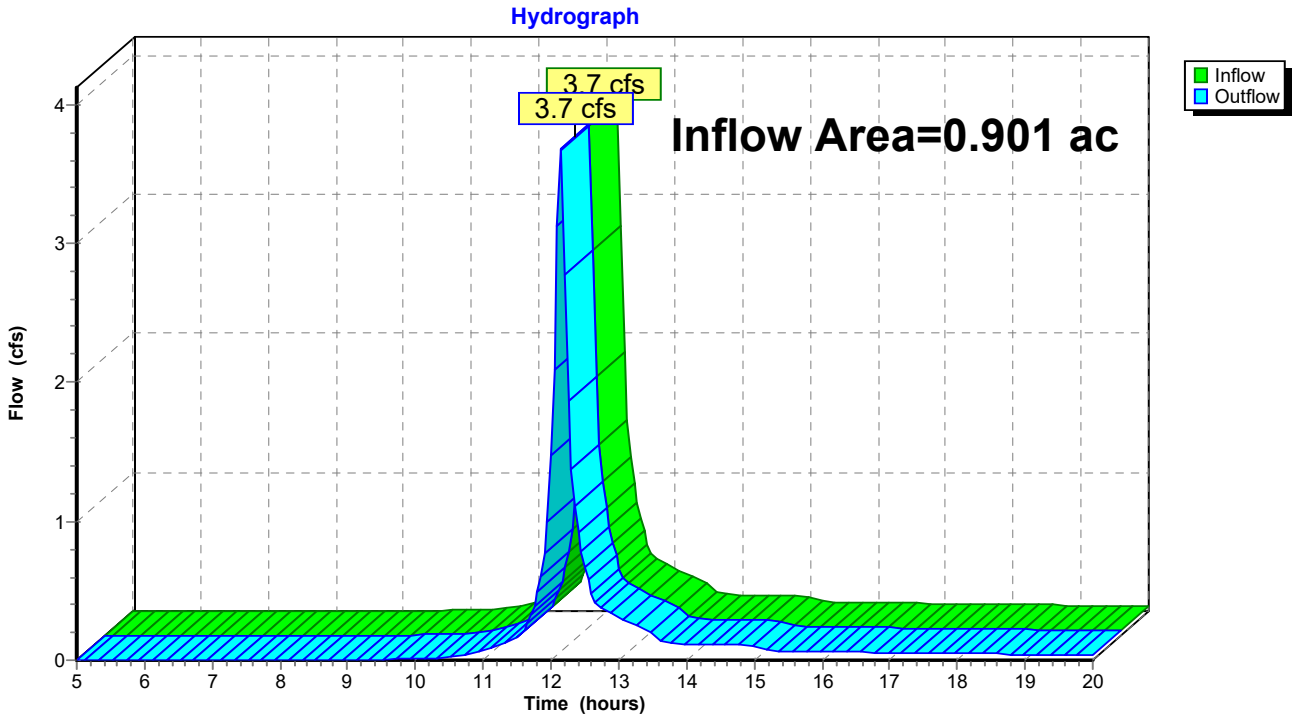


Summary for Reach 3R: West Bluff

Inflow Area = 0.901 ac, 6.44% Impervious, Inflow Depth > 2.26" for 10-YR event
Inflow = 3.7 cfs @ 12.14 hrs, Volume= 0.170 af
Outflow = 3.7 cfs @ 12.14 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 3R: West Bluff

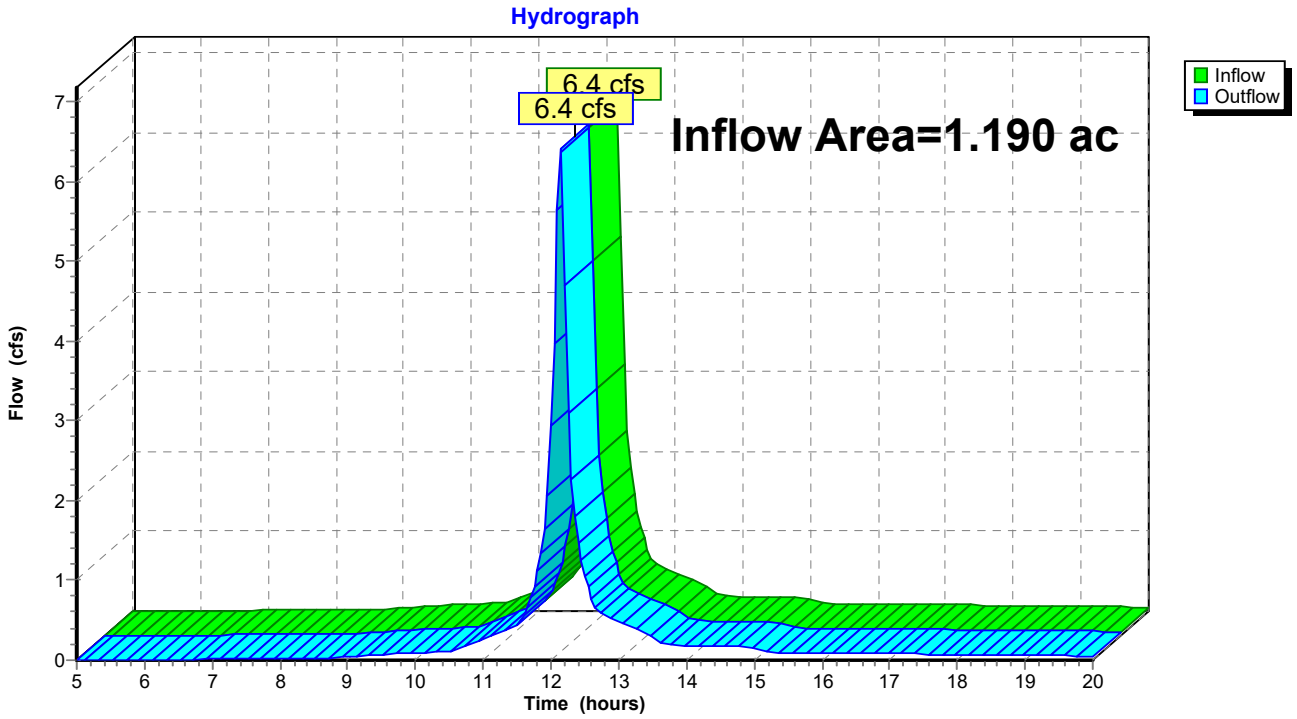


Summary for Reach 4R: South Storm

Inflow Area = 1.190 ac, 60.81% Impervious, Inflow Depth > 3.18" for 10-YR event
Inflow = 6.4 cfs @ 12.14 hrs, Volume= 0.315 af
Outflow = 6.4 cfs @ 12.14 hrs, Volume= 0.315 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: South Storm

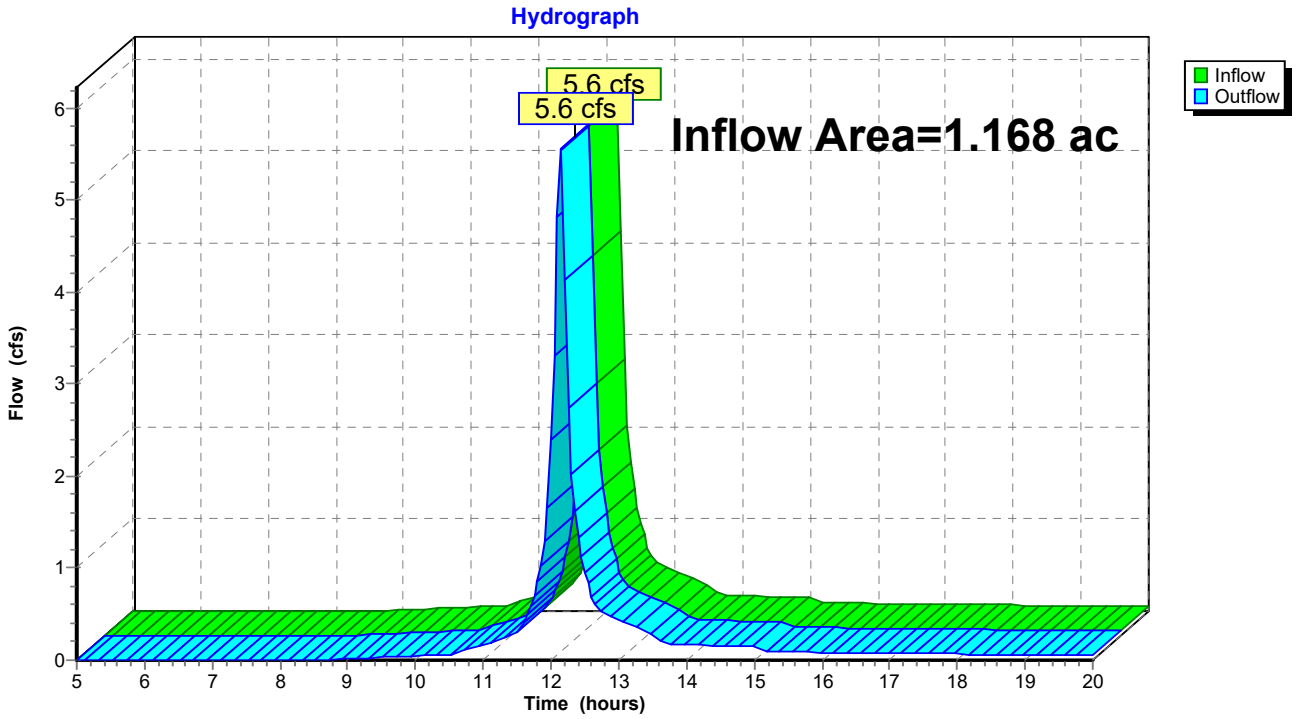


Summary for Reach 5R: SE Bluff - To Road

Inflow Area = 1.168 ac, 32.92% Impervious, Inflow Depth > 2.70" for 10-YR event
Inflow = 5.6 cfs @ 12.14 hrs, Volume= 0.262 af
Outflow = 5.6 cfs @ 12.14 hrs, Volume= 0.262 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SE Bluff - To Road

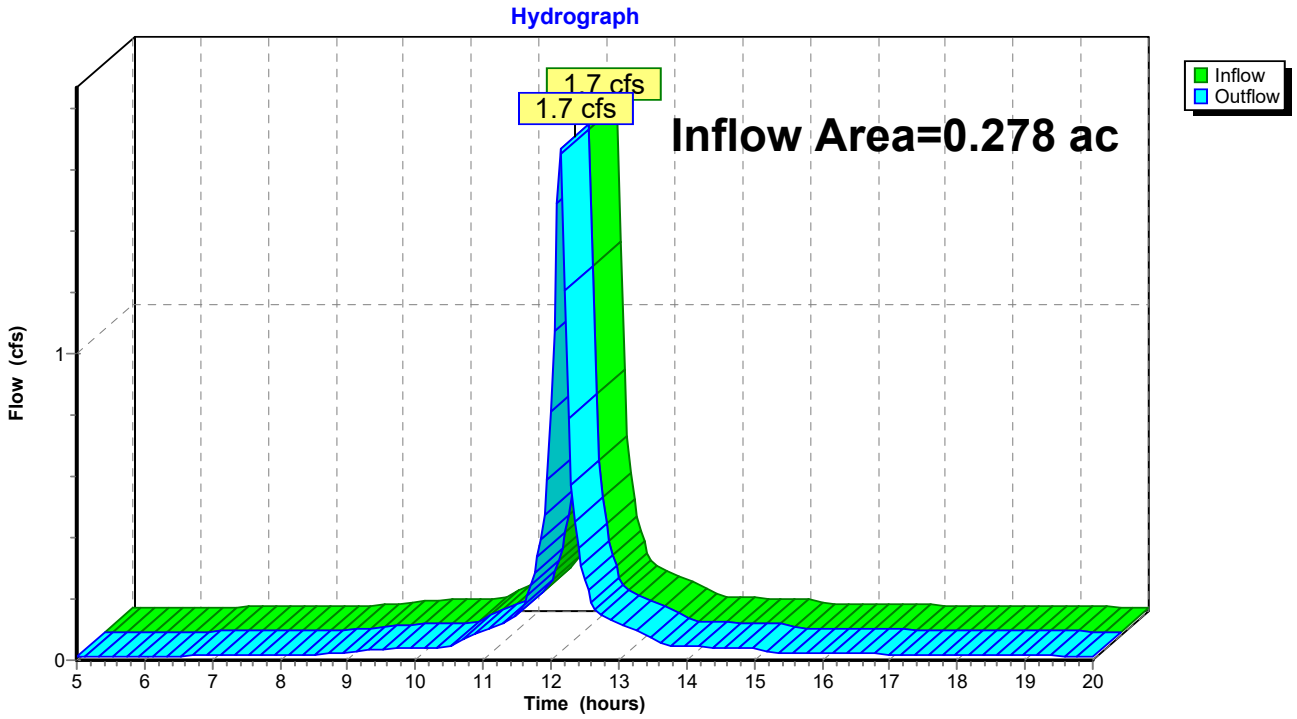


Summary for Reach 6R: East Storm

Inflow Area = 0.278 ac,100.00% Impervious, Inflow Depth > 3.89" for 10-YR event
Inflow = 1.7 cfs @ 12.14 hrs, Volume= 0.090 af
Outflow = 1.7 cfs @ 12.14 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: East Storm

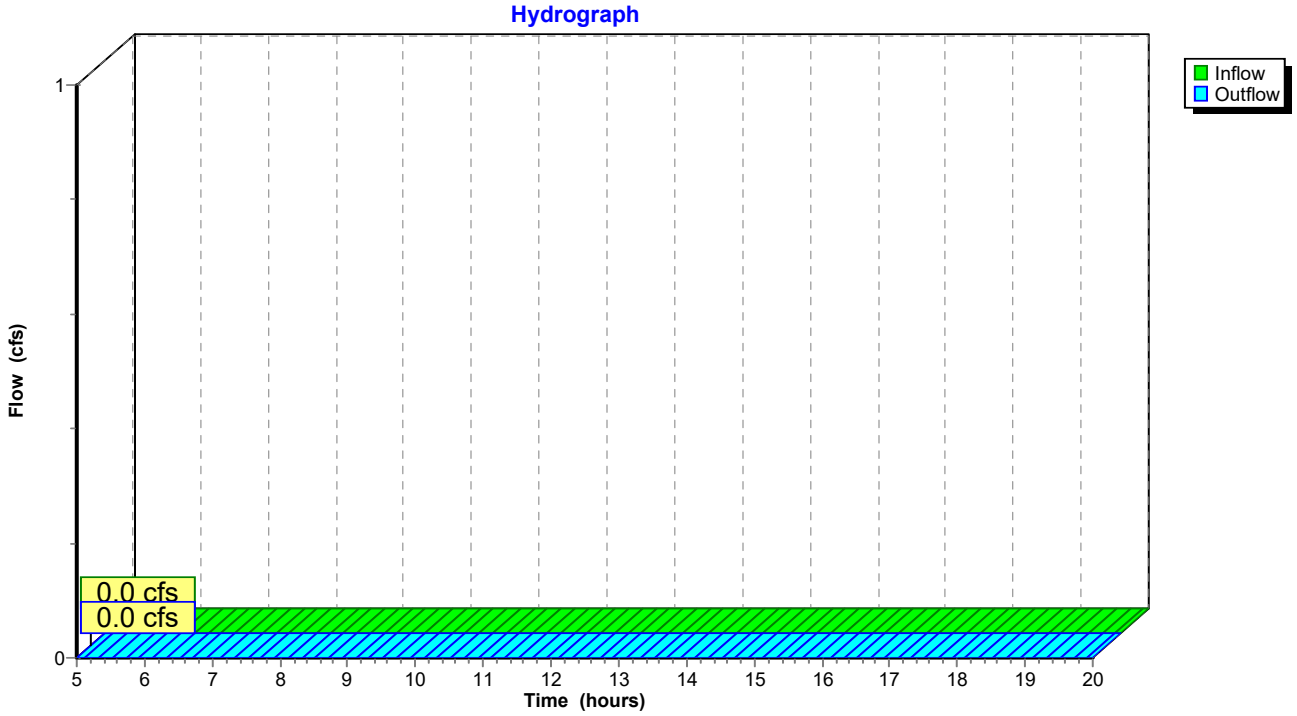


Summary for Reach 7R: North Bluff

Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: North Bluff



Summary for Pond 1P: Wet Sedimentation Basin

Inflow Area = 4.032 ac, 46.16% Impervious, Inflow Depth > 2.88" for 10-YR event
Inflow = 20.2 cfs @ 12.14 hrs, Volume= 0.968 af
Outflow = 7.3 cfs @ 12.31 hrs, Volume= 0.949 af, Atten= 64%, Lag= 9.8 min
Primary = 7.3 cfs @ 12.31 hrs, Volume= 0.949 af
Routed to Reach 1R : NW Storm
Secondary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 7R : North Bluff

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 986.00' Surf.Area= 2,905 sf Storage= 5,818 cf
Peak Elev= 990.22' @ 12.31 hrs Surf.Area= 4,450 sf Storage= 22,234 cf (16,416 cf above start)

Plug-Flow detention time= 121.4 min calculated for 0.813 af (84% of inflow)
Center-of-Mass det. time= 60.4 min (828.9 - 768.5)

Volume	Invert	Avail.Storage	Storage Description
#1	981.00'	52,963 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) x 0.5

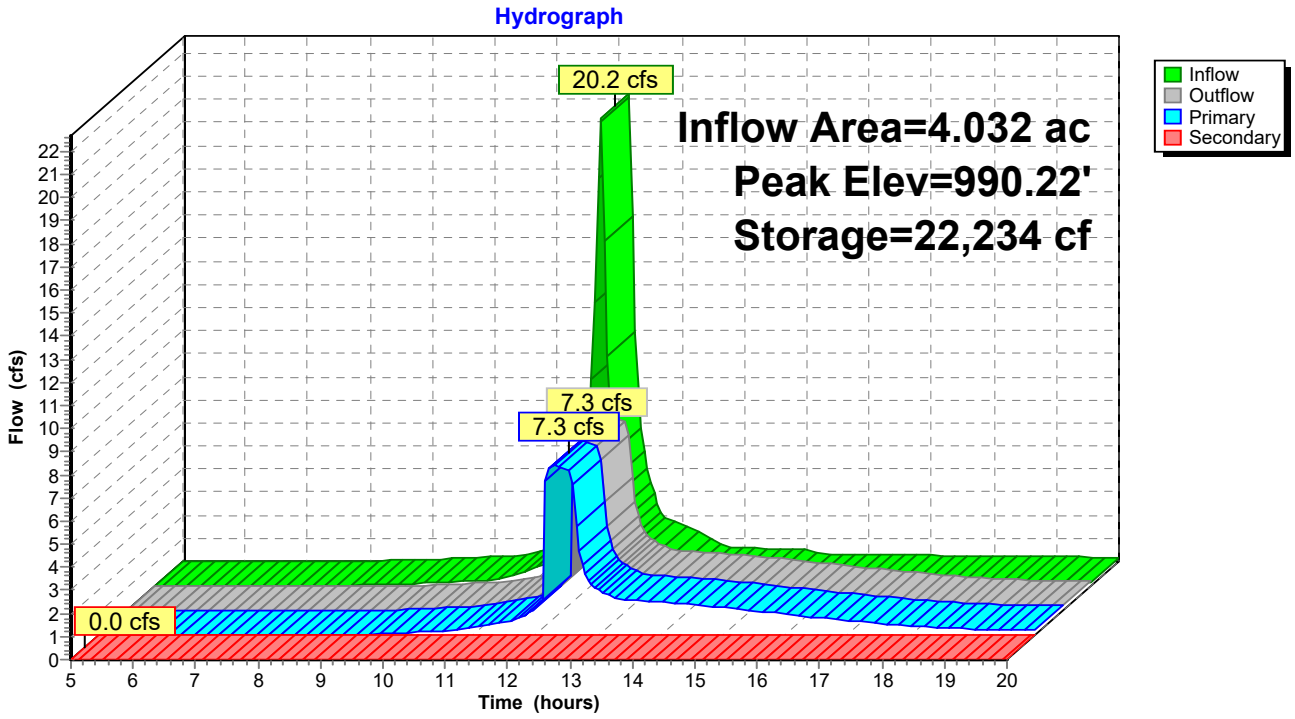
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
981.00	108	0	0
985.00	3,406	7,028	7,028
986.50	7,012	7,814	14,842
995.00	11,323	77,924	92,765
996.00	15,000	13,162	105,927

Device	Routing	Invert	Outlet Devices
#1	Primary	981.69'	**12.0" Round Culvert** L= 169.0' Ke= 0.500 Inlet / Outlet Invert= 981.69' / 980.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	986.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	989.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height
#4	Device 1	990.00'	**HAALA 48" ID Pond Skimmer** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 Disch. (cfs) 0.000 1.320 3.740 6.870 10.580 14.790 19.250 20.790 22.220 23.570 24.850 30.430 35.140 39.280 43.030 46.480 49.690 52.700 55.560
#5	Secondary	995.50'	**20.0' long x 20.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.3 cfs @ 12.31 hrs HW=990.22' (Free Discharge)
└─**1=Culvert** (Barrel Controls 7.3 cfs @ 9.34 fps)
  └─**2=Orifice/Grate** (Passes < 1.9 cfs potential flow)
  └─**3=Sharp-Crested Rectangular Weir** (Passes < 19.0 cfs potential flow)
  └─**4=HAALA 48" ID Pond Skimmer** (Passes < 4.4 cfs potential flow)

Secondary OutFlow Max=0.0 cfs @ 5.00 hrs HW=986.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 1P: Wet Sedimentation Basin



Summary for Pond 2P: Filtration Basin

Inflow Area = 1.269 ac, 73.72% Impervious, Inflow Depth > 3.38" for 10-YR event
Inflow = 7.1 cfs @ 12.14 hrs, Volume= 0.357 af
Outflow = 4.1 cfs @ 12.24 hrs, Volume= 0.249 af, Atten= 43%, Lag= 5.8 min
Primary = 4.1 cfs @ 12.24 hrs, Volume= 0.249 af
Routed to Pond 3P :
Secondary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 3R : West Bluff
Tertiary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 3R : West Bluff

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 984.29' @ 12.24 hrs Surf.Area= 954 sf Storage= 6,885 cf

Plug-Flow detention time= 97.7 min calculated for 0.248 af (69% of inflow)
Center-of-Mass det. time= 46.7 min (802.1 - 755.4)

Volume	Invert	Avail.Storage	Storage Description
#1	982.00'	6,940 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) x 0.5
#2A	981.25'	3,536 cf	**36.08'W x 70.23'L x 5.50'H Field A** Impervious 13,938 cf Overall - 5,097 cf Embedded = 8,841 cf x 40.0% Voids
#3A	982.00'	5,097 cf	**ADS_StormTech MC-3500 d +Cap** x 45 Inside #2 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 45 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf
		15,573 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
982.00	588	0	0
987.00	3,470	10,145	10,145
988.00	4,000	3,735	13,880

Device	Routing	Invert	Outlet Devices
#1	Primary	980.00'	**12.0" Round Culvert** L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 980.00' / 978.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	982.00'	**1.630 in/hr Exfiltration over Surface area above 982.00'** Excluded Surface area = 294 sf Phase-In= 0.01'
#3	Device 1	983.50'	**24" Nyloplast Dome Grate X 0.50** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 Disch. (cfs) 0.000 0.660 1.870 3.440 5.290 6.400 7.010 7.570 8.100 8.590 9.050 11.090 12.800 14.310 15.680 16.940 18.100 19.200 20.240
#4	Secondary	986.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

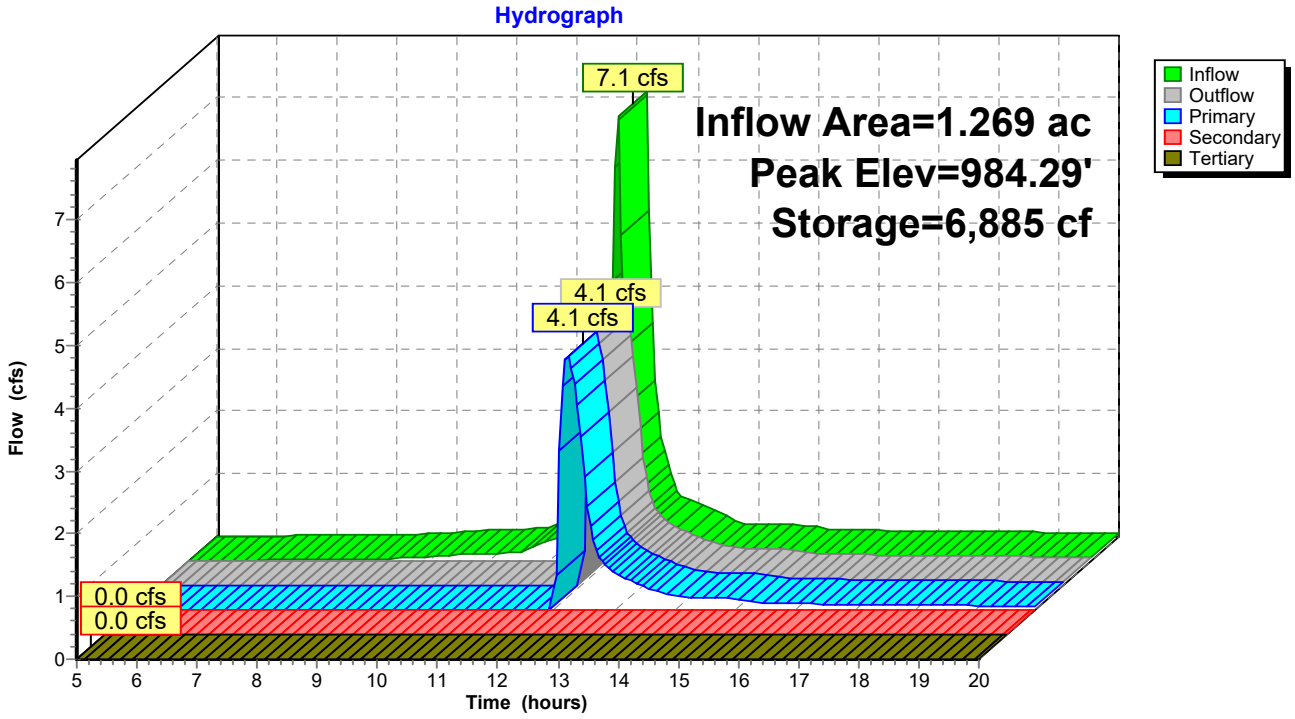
#5 Tertiary 987.00' **133.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=4.0 cfs @ 12.24 hrs HW=984.28' (Free Discharge)
└─**1=Culvert** (Passes 4.0 cfs of 5.2 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.0 cfs)
  └─**3=24" Nyloplast Dome Grate** (Custom Controls 4.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 5.00 hrs HW=981.25' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Tertiary OutFlow Max=0.0 cfs @ 5.00 hrs HW=981.25' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 2P: Filtration Basin



Summary for Pond 3P:

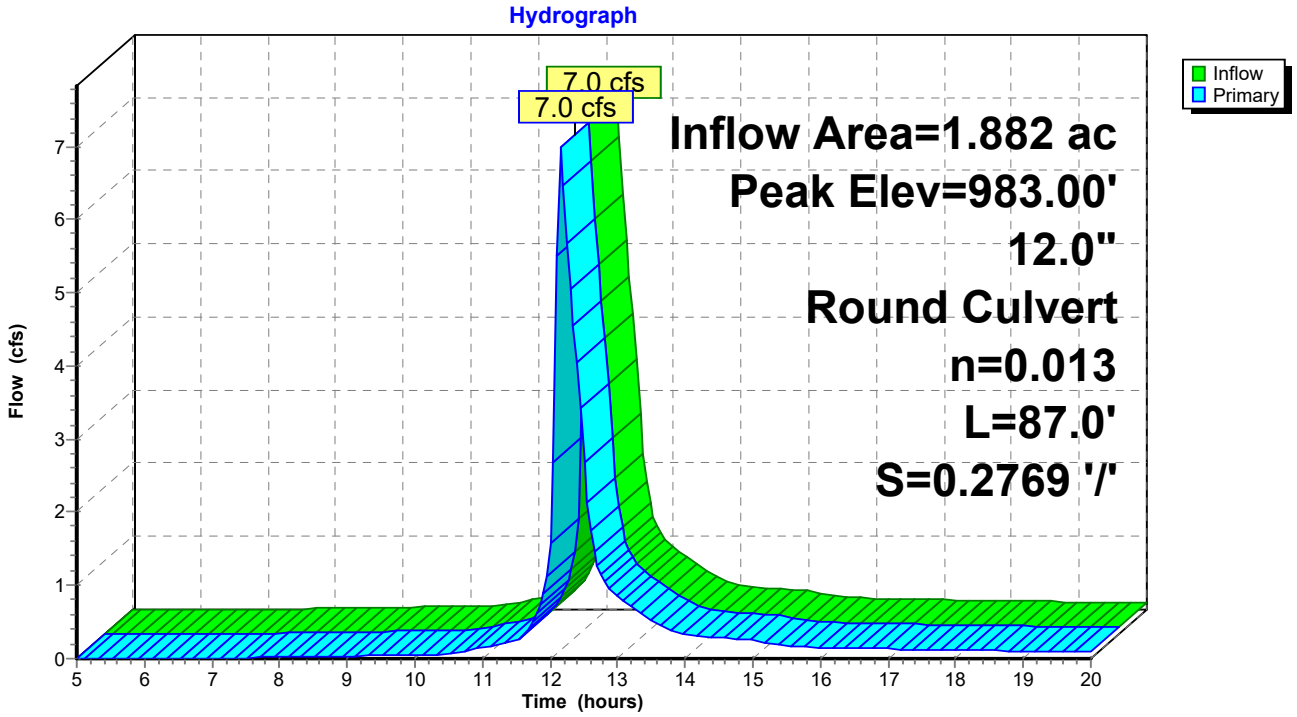
Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 2.65" for 10-YR event
Inflow = 7.0 cfs @ 12.16 hrs, Volume= 0.416 af
Outflow = 7.0 cfs @ 12.16 hrs, Volume= 0.416 af, Atten= 0%, Lag= 0.0 min
Primary = 7.0 cfs @ 12.16 hrs, Volume= 0.416 af
Routed to Pond 4P :

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 983.00' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	979.09'	**12.0" Round RCP_Round 12"** L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 979.09' / 955.00' S= 0.2769 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=6.8 cfs @ 12.16 hrs HW=982.84' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 6.8 cfs @ 8.68 fps)

Pond 3P:



Summary for Pond 4P:

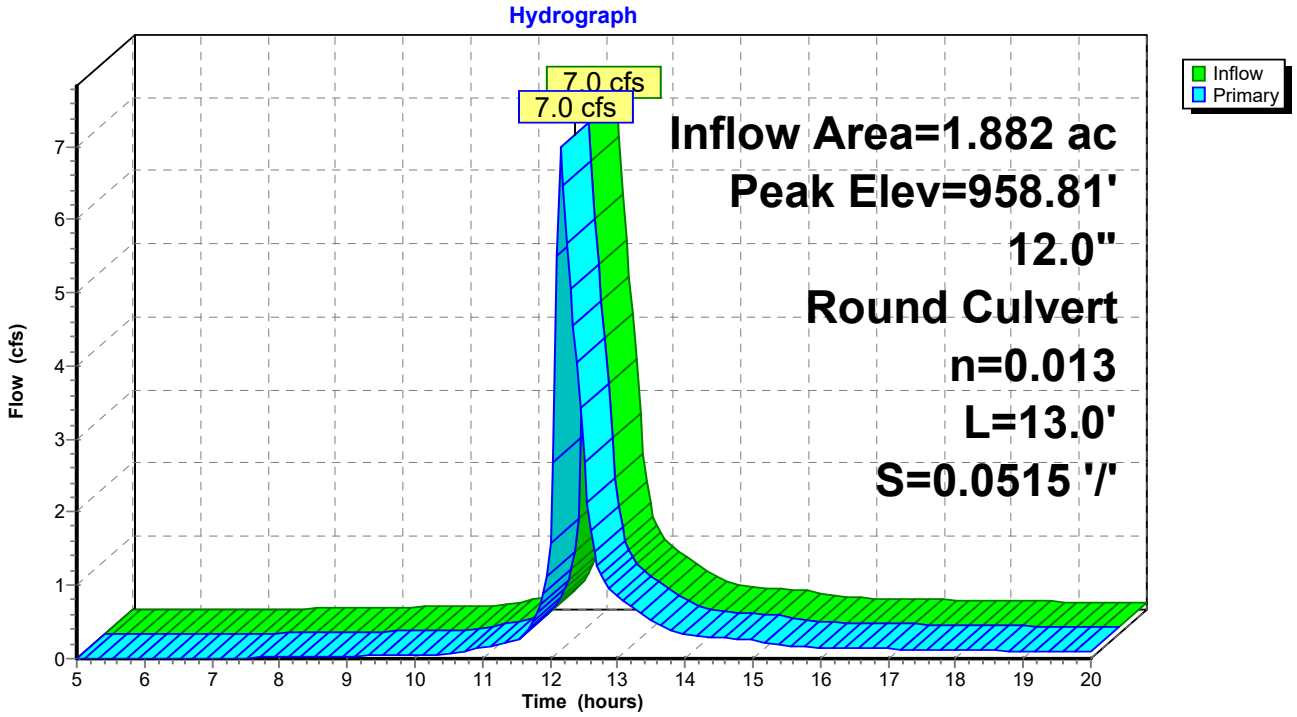
Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 2.65" for 10-YR event
Inflow = 7.0 cfs @ 12.16 hrs, Volume= 0.416 af
Outflow = 7.0 cfs @ 12.16 hrs, Volume= 0.416 af, Atten= 0%, Lag= 0.0 min
Primary = 7.0 cfs @ 12.16 hrs, Volume= 0.416 af
Routed to Reach 2R : West Storm

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 958.81' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	954.90'	**12.0" Round RCP_Round 12"** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 954.90' / 954.23' S= 0.0515 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=6.8 cfs @ 12.16 hrs HW=958.65' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 6.8 cfs @ 8.68 fps)

Pond 4P:



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=175,645 sf 46.16% Impervious Runoff Depth>5.59"
Tc=7.0 min CN=88 Runoff=37.6 cfs 1.878 af

Subcatchment2S: Runoff Area=57,101 sf 58.18% Impervious Runoff Depth>5.82"
Tc=7.0 min CN=90 Runoff=12.5 cfs 0.636 af

Subcatchment3S: Runoff Area=55,265 sf 73.72% Impervious Runoff Depth>6.15"
Tc=7.0 min CN=93 Runoff=12.5 cfs 0.651 af

Subcatchment4S: Runoff Area=39,227 sf 6.44% Impervious Runoff Depth>4.80"
Tc=7.0 min CN=81 Runoff=7.5 cfs 0.360 af

Subcatchment5S: Runoff Area=26,713 sf 64.20% Impervious Runoff Depth>6.04"
Tc=7.0 min CN=92 Runoff=6.0 cfs 0.309 af

Subcatchment6S: Runoff Area=51,828 sf 60.81% Impervious Runoff Depth>5.93"
Tc=7.0 min CN=91 Runoff=11.5 cfs 0.588 af

Subcatchment7S: Runoff Area=50,881 sf 32.92% Impervious Runoff Depth>5.36"
Tc=7.0 min CN=86 Runoff=10.6 cfs 0.522 af

Subcatchment8S: Runoff Area=12,130 sf 100.00% Impervious Runoff Depth>6.64"
Tc=7.0 min CN=98 Runoff=2.8 cfs 0.154 af

Reach 1R: NW Storm Inflow=20.5 cfs 2.481 af
Outflow=20.5 cfs 2.481 af

Reach 2R: West Storm Inflow=11.5 cfs 0.850 af
Outflow=11.5 cfs 0.850 af

Reach 3R: West Bluff Inflow=7.5 cfs 0.360 af
Outflow=7.5 cfs 0.360 af

Reach 4R: South Storm Inflow=11.5 cfs 0.588 af
Outflow=11.5 cfs 0.588 af

Reach 5R: SE Bluff - To Road Inflow=10.6 cfs 0.522 af
Outflow=10.6 cfs 0.522 af

Reach 6R: East Storm Inflow=2.8 cfs 0.154 af
Outflow=2.8 cfs 0.154 af

Reach 7R: North Bluff Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Pond 1P: Wet Sedimentation Basin Peak Elev=993.83' Storage=39,954 cf Inflow=37.6 cfs 1.878 af
Primary=8.7 cfs 1.846 af Secondary=0.0 cfs 0.000 af Outflow=8.7 cfs 1.846 af

Pond 2P: Filtration Basin Peak Elev=985.53' Storage=10,217 cf Inflow=12.5 cfs 0.651 af
Primary=5.8 cfs 0.541 af Secondary=0.0 cfs 0.000 af Tertiary=0.0 cfs 0.000 af Outflow=5.8 cfs 0.541 af

Pond 3P: Peak Elev=988.80' Inflow=11.5 cfs 0.850 af
12.0" Round Culvert n=0.013 L=87.0' S=0.2769 '/' Outflow=11.5 cfs 0.850 af

Pond 4P: Peak Elev=964.61' Inflow=11.5 cfs 0.850 af
12.0" Round Culvert n=0.013 L=13.0' S=0.0515 '/' Outflow=11.5 cfs 0.850 af

Total Runoff Area = 10.762 ac Runoff Volume = 5.098 af Average Runoff Depth = 5.68"
49.85% Pervious = 5.365 ac 50.15% Impervious = 5.397 ac

Summary for Subcatchment 1S:

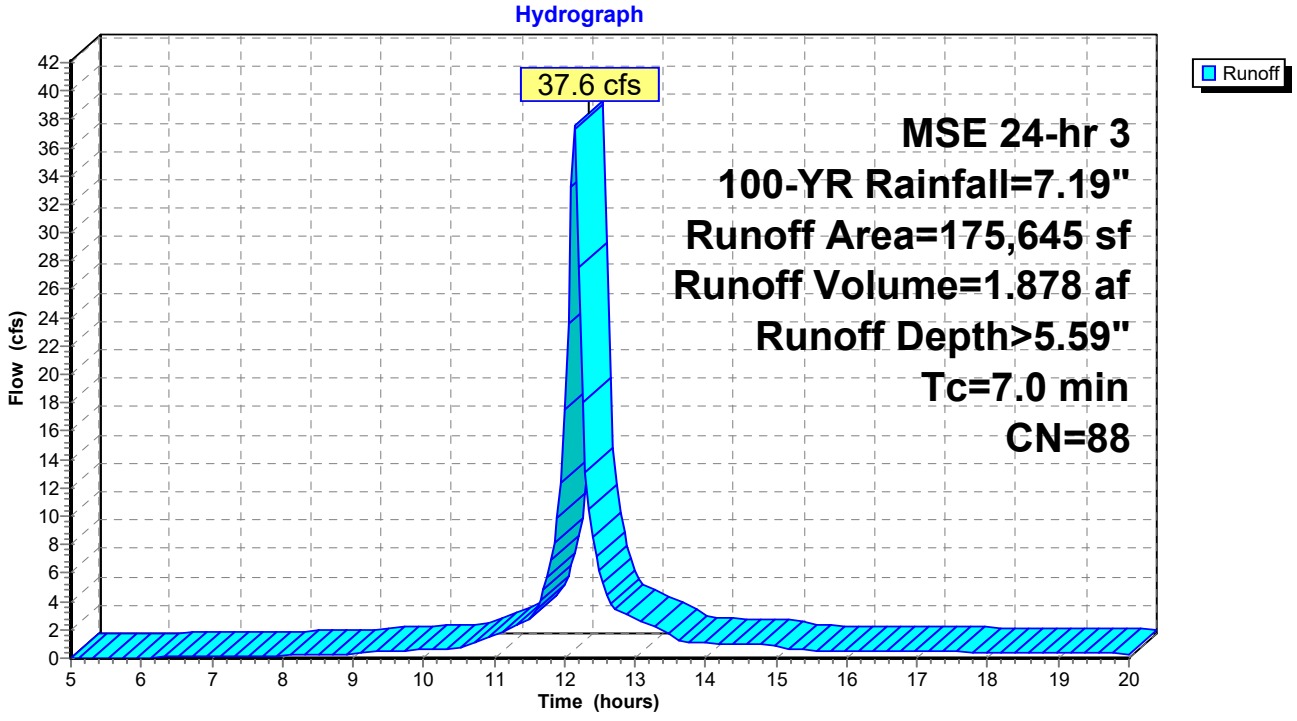
Runoff = 37.6 cfs @ 12.14 hrs, Volume= 1.878 af, Depth> 5.59"
Routed to Pond 1P : Wet Sedimentation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
81,069	98	Paved parking, HSG D
94,576	80	>75% Grass cover, Good, HSG D
175,645	88	Weighted Average
94,576		53.84% Pervious Area
81,069		46.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 1S:



Summary for Subcatchment 2S:

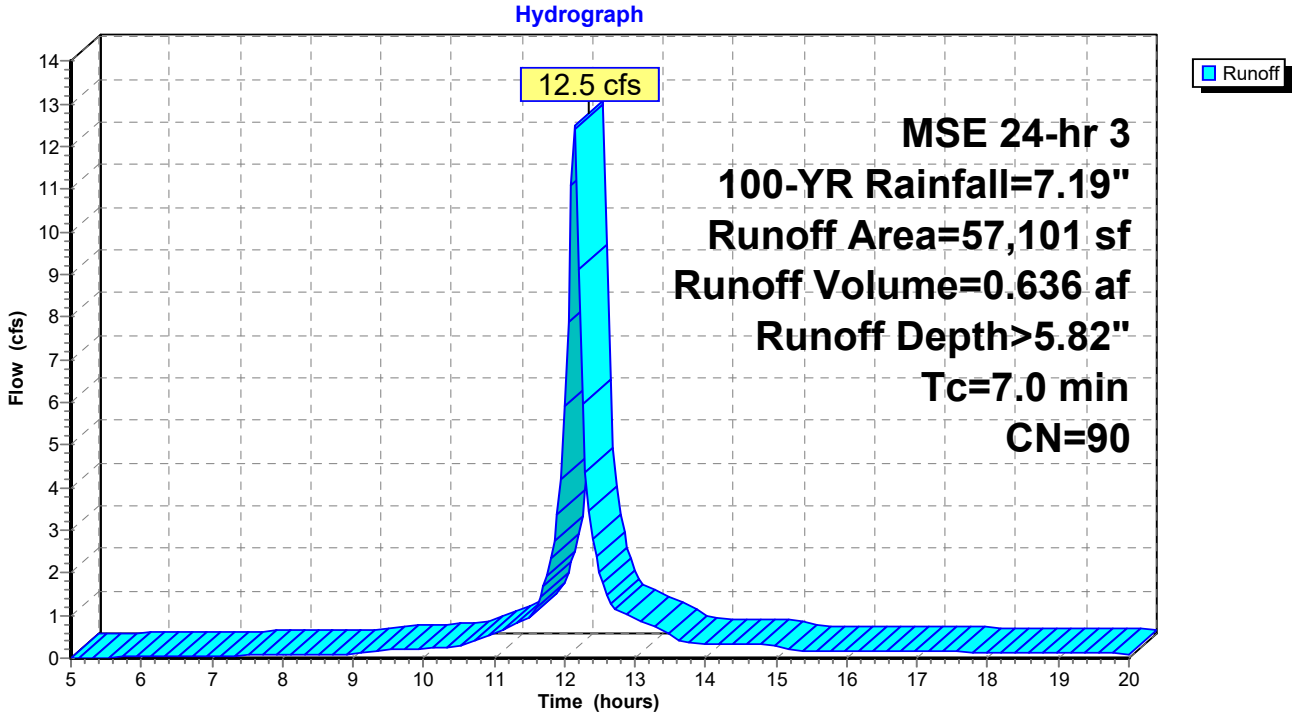
Runoff = 12.5 cfs @ 12.14 hrs, Volume= 0.636 af, Depth> 5.82"
Routed to Reach 1R : NW Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
33,220	98	Paved parking, HSG D
23,881	80	>75% Grass cover, Good, HSG D
57,101	90	Weighted Average
23,881		41.82% Pervious Area
33,220		58.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 2S:



Summary for Subcatchment 3S:

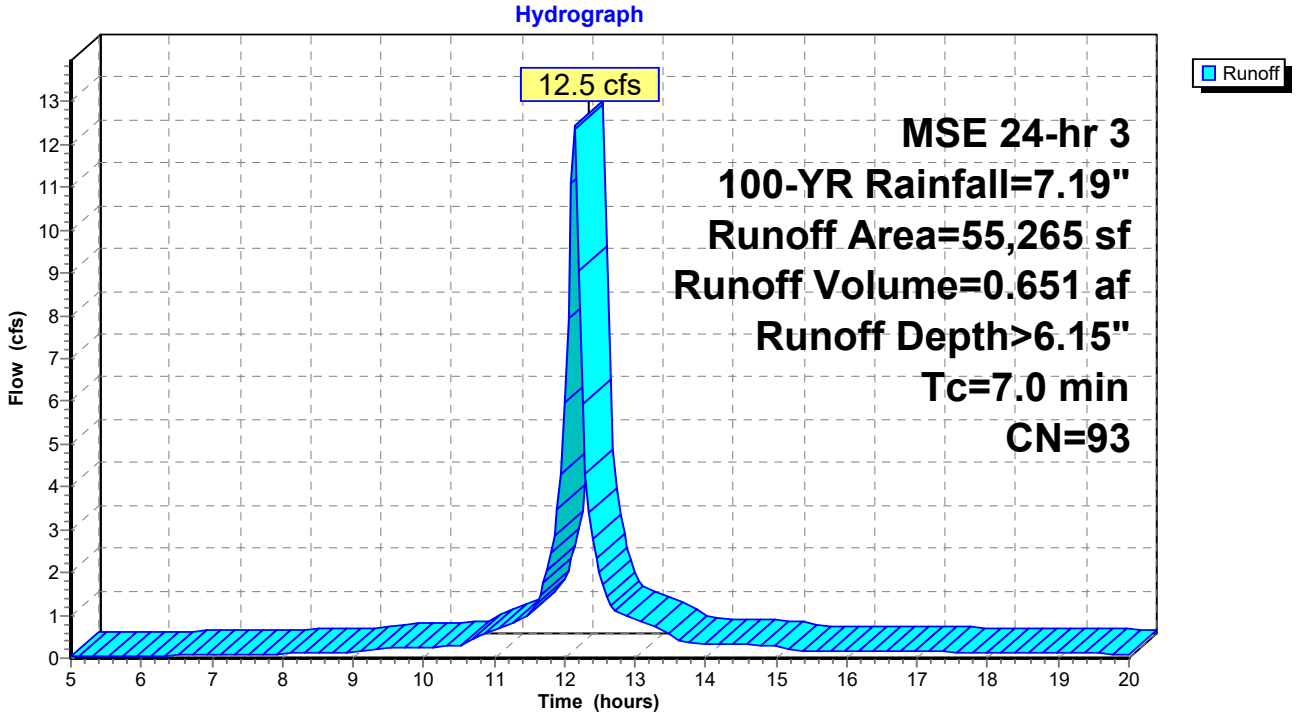
Runoff = 12.5 cfs @ 12.14 hrs, Volume= 0.651 af, Depth> 6.15"
Routed to Pond 2P : Filtration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
40,744	98	Paved parking, HSG D
14,521	80	>75% Grass cover, Good, HSG D
55,265	93	Weighted Average
14,521		26.28% Pervious Area
40,744		73.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 3S:



Summary for Subcatchment 4S:

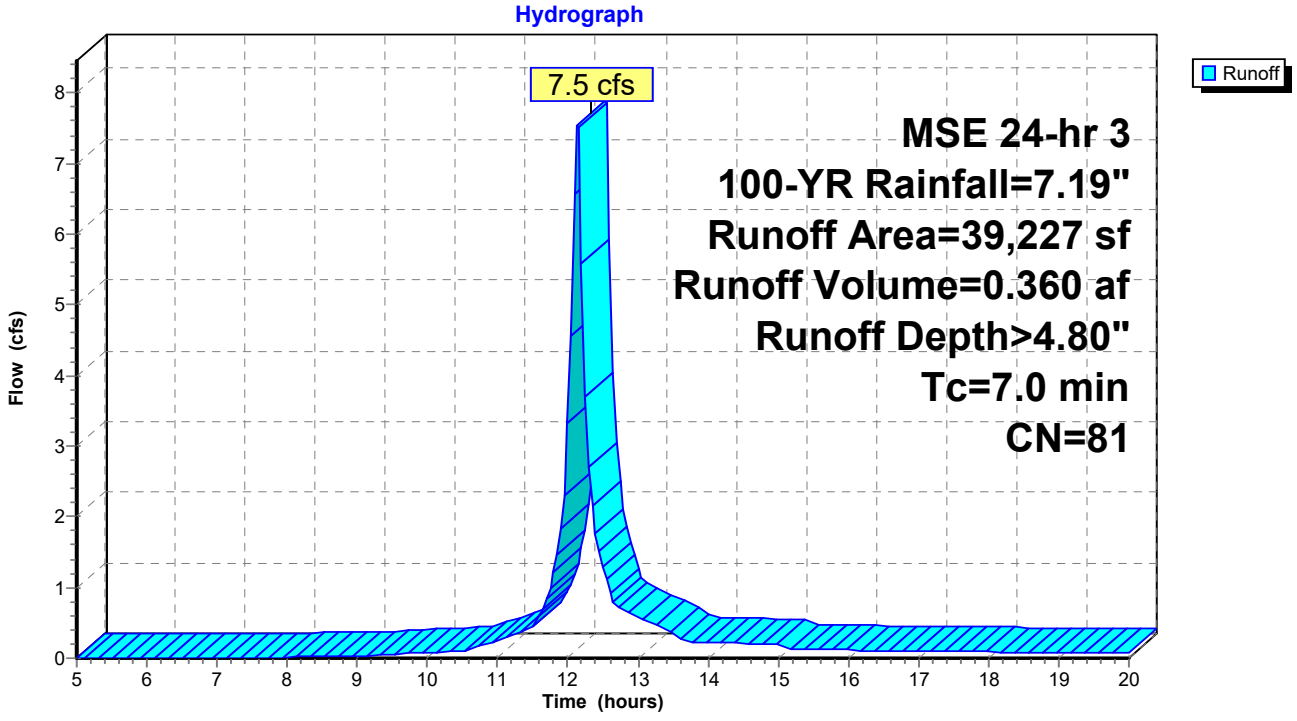
Runoff = 7.5 cfs @ 12.14 hrs, Volume= 0.360 af, Depth> 4.80"
Routed to Reach 3R : West Bluff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
2,525	98	Paved parking, HSG D
36,702	80	>75% Grass cover, Good, HSG D
39,227	81	Weighted Average
36,702		93.56% Pervious Area
2,525		6.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 4S:



Summary for Subcatchment 5S:

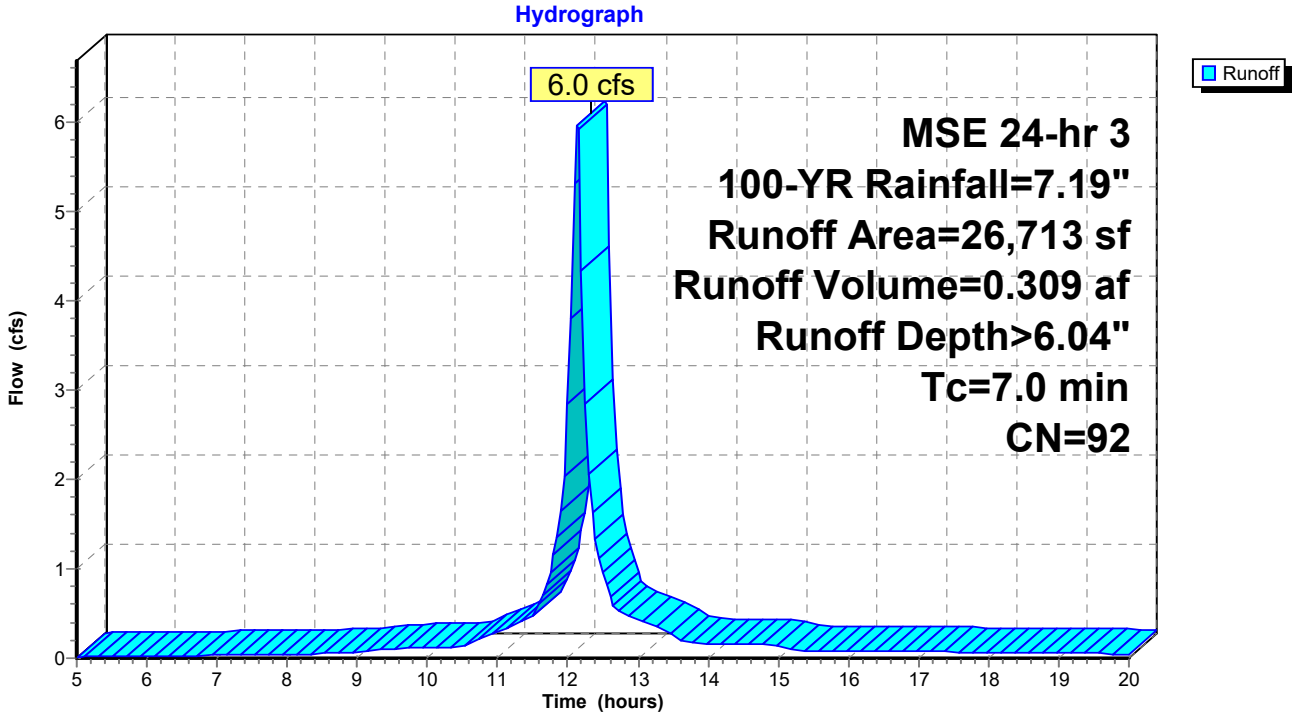
Runoff = 6.0 cfs @ 12.14 hrs, Volume= 0.309 af, Depth> 6.04"
Routed to Pond 3P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
17,151	98	Paved parking, HSG D
9,562	80	>75% Grass cover, Good, HSG D
26,713	92	Weighted Average
9,562		35.80% Pervious Area
17,151		64.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 5S:



Summary for Subcatchment 6S:

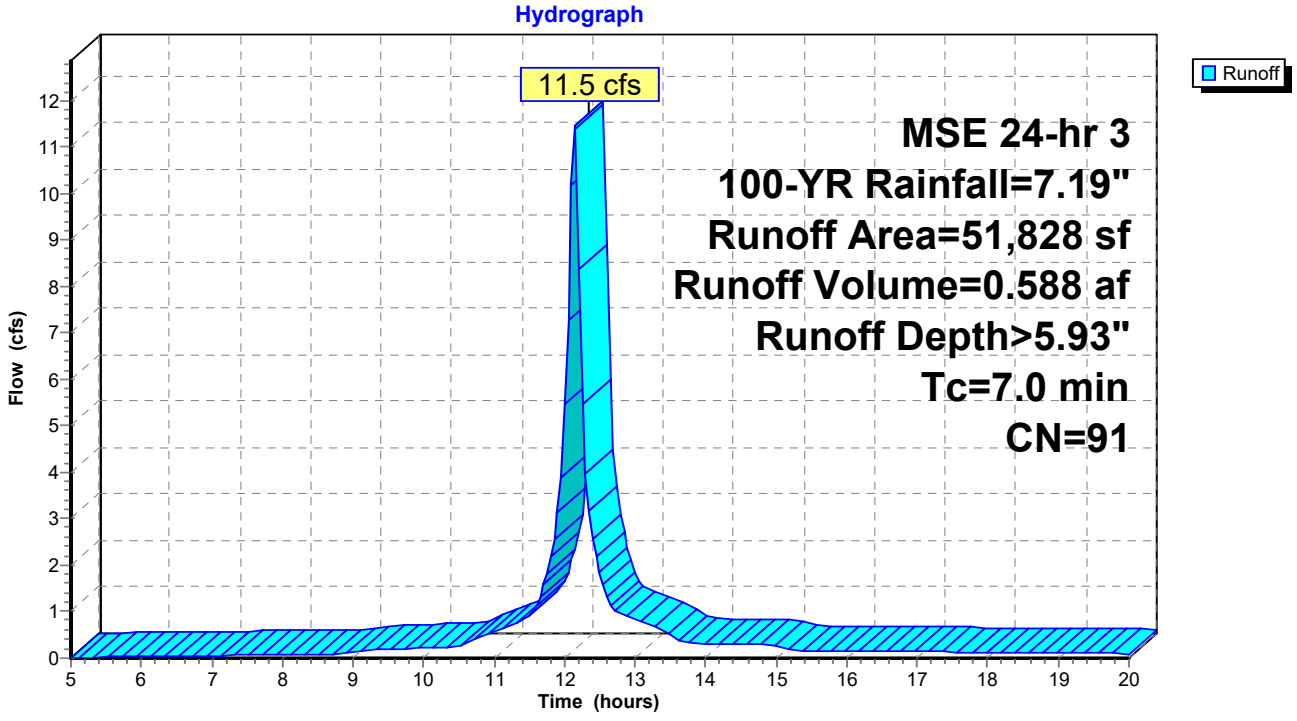
Runoff = 11.5 cfs @ 12.14 hrs, Volume= 0.588 af, Depth> 5.93"
Routed to Reach 4R : South Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
31,516	98	Paved parking, HSG D
20,312	80	>75% Grass cover, Good, HSG D
51,828	91	Weighted Average
20,312		39.19% Pervious Area
31,516		60.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 6S:



Summary for Subcatchment 7S:

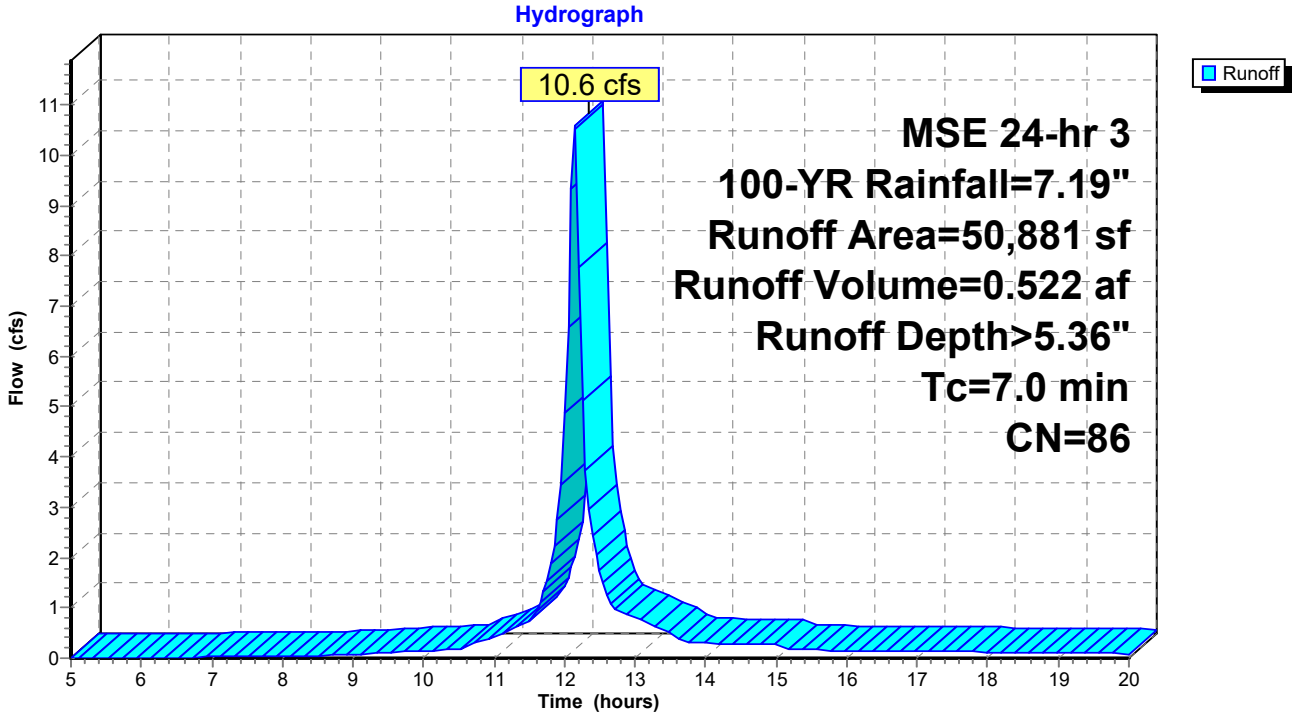
Runoff = 10.6 cfs @ 12.14 hrs, Volume= 0.522 af, Depth> 5.36"
Routed to Reach 5R : SE Bluff - To Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
16,752	98	Paved parking, HSG D
34,129	80	>75% Grass cover, Good, HSG D
50,881	86	Weighted Average
34,129		67.08% Pervious Area
16,752		32.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 7S:



Summary for Subcatchment 8S:

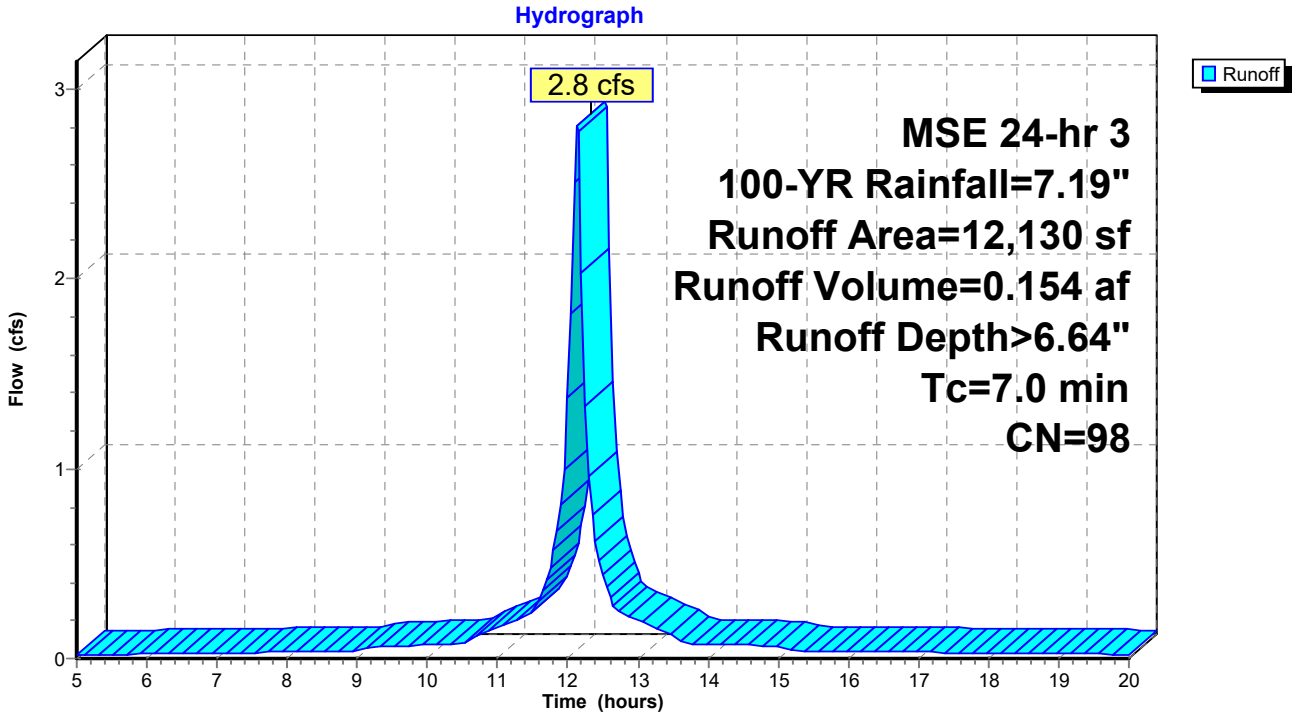
Runoff = 2.8 cfs @ 12.14 hrs, Volume= 0.154 af, Depth> 6.64"
Routed to Reach 6R : East Storm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=7.19"

Area (sf)	CN	Description
12,130	98	Paved parking, HSG D
0	80	>75% Grass cover, Good, HSG D
12,130	98	Weighted Average
12,130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry,**

Subcatchment 8S:

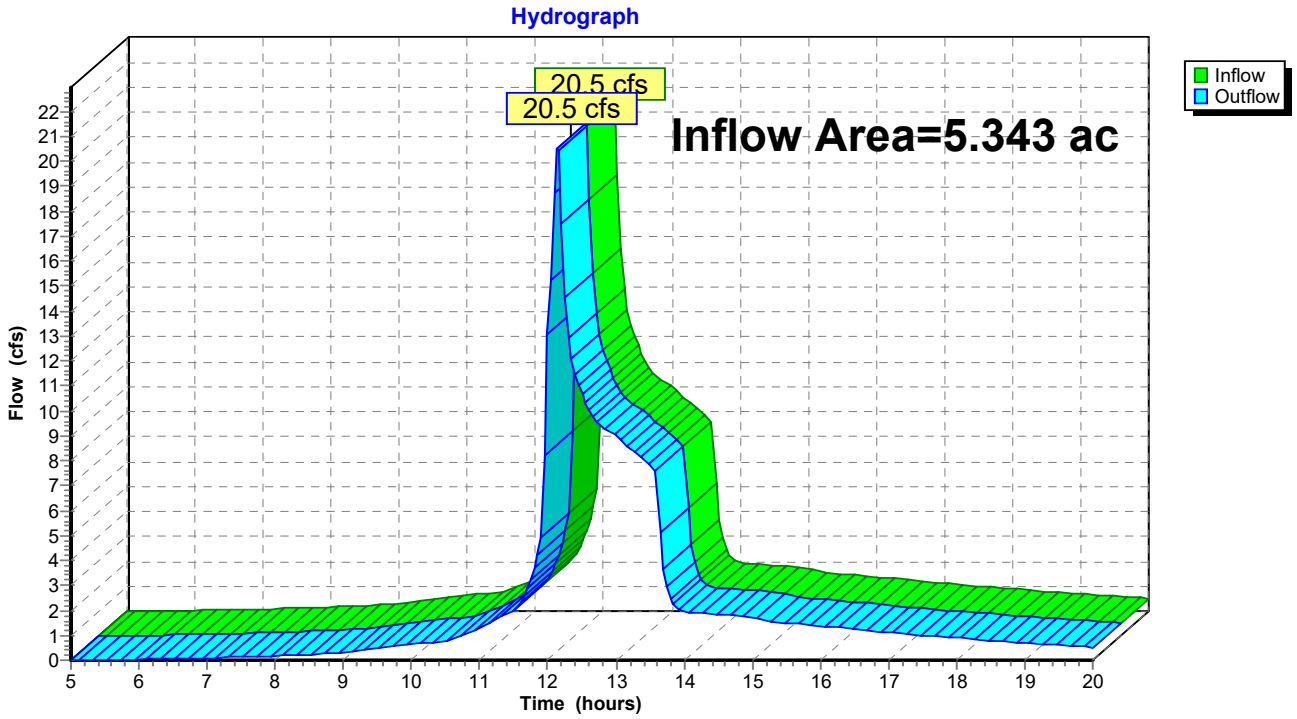


Summary for Reach 1R: NW Storm

Inflow Area = 5.343 ac, 49.10% Impervious, Inflow Depth > 5.57" for 100-YR event
Inflow = 20.5 cfs @ 12.14 hrs, Volume= 2.481 af
Outflow = 20.5 cfs @ 12.14 hrs, Volume= 2.481 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: NW Storm

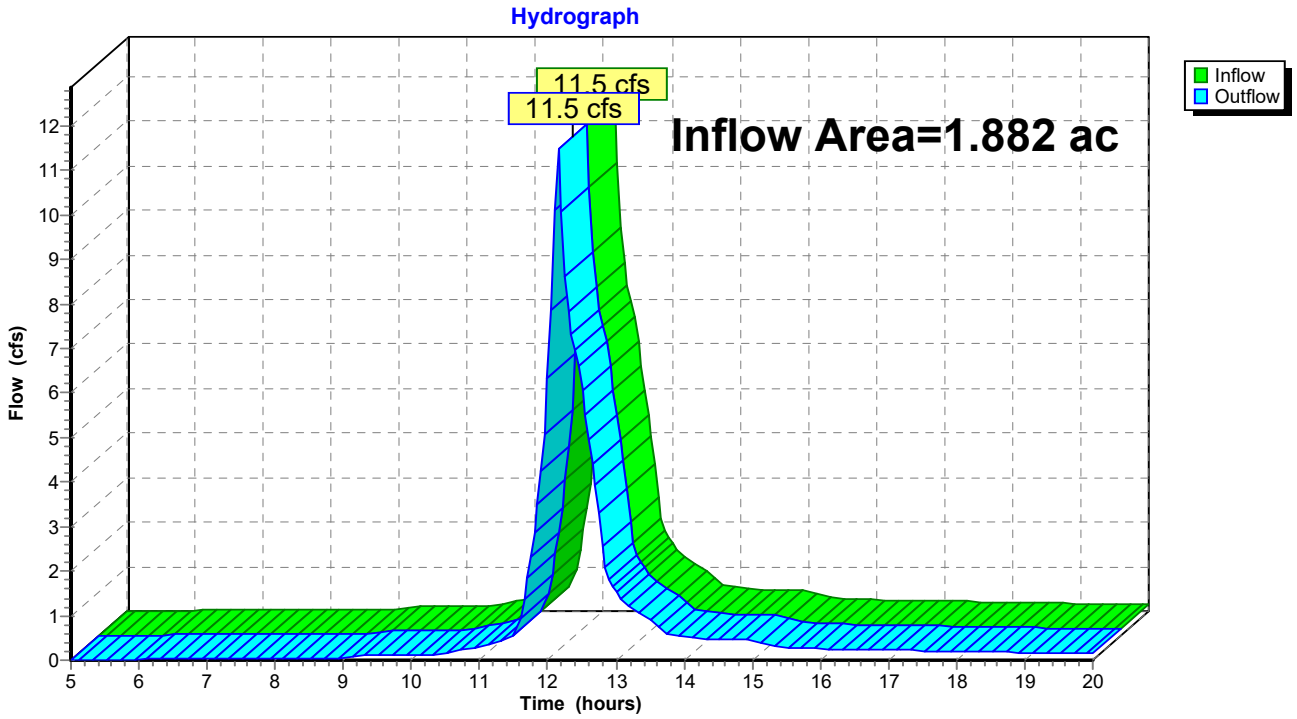


Summary for Reach 2R: West Storm

Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 5.42" for 100-YR event
Inflow = 11.5 cfs @ 12.15 hrs, Volume= 0.850 af
Outflow = 11.5 cfs @ 12.15 hrs, Volume= 0.850 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: West Storm

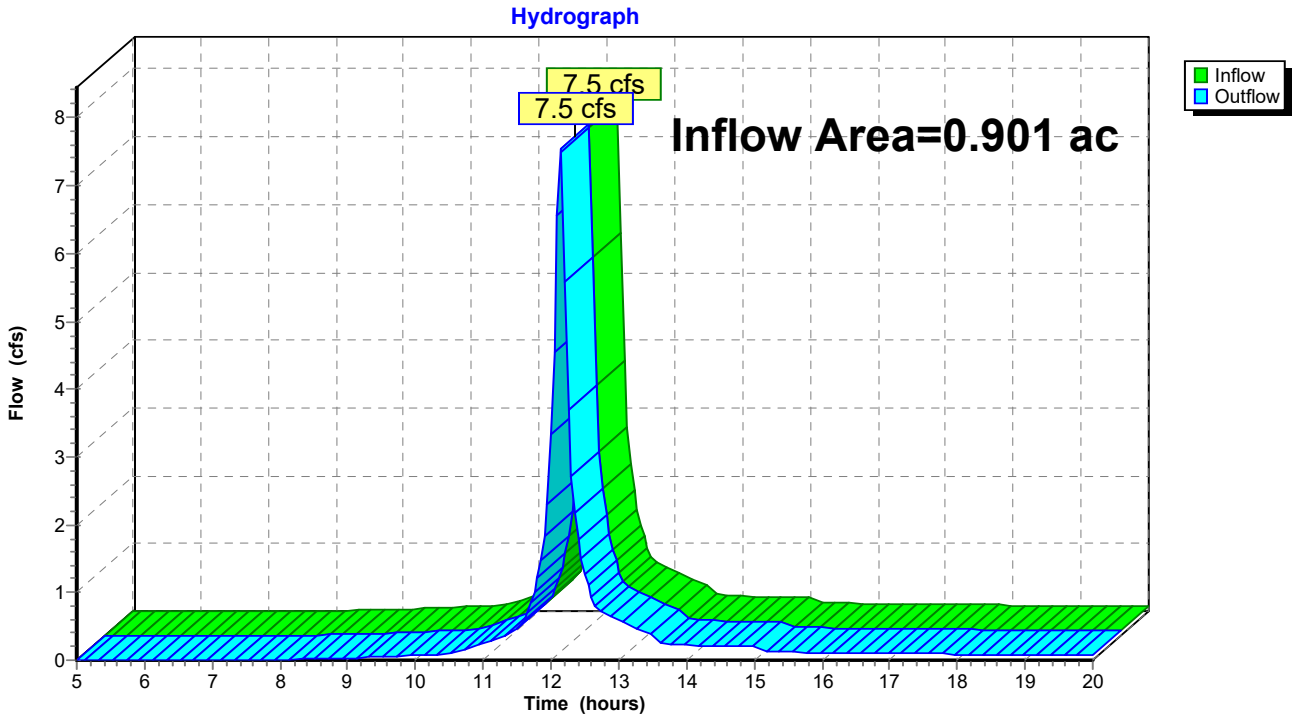


Summary for Reach 3R: West Bluff

Inflow Area = 0.901 ac, 6.44% Impervious, Inflow Depth > 4.80" for 100-YR event
Inflow = 7.5 cfs @ 12.14 hrs, Volume= 0.360 af
Outflow = 7.5 cfs @ 12.14 hrs, Volume= 0.360 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 3R: West Bluff

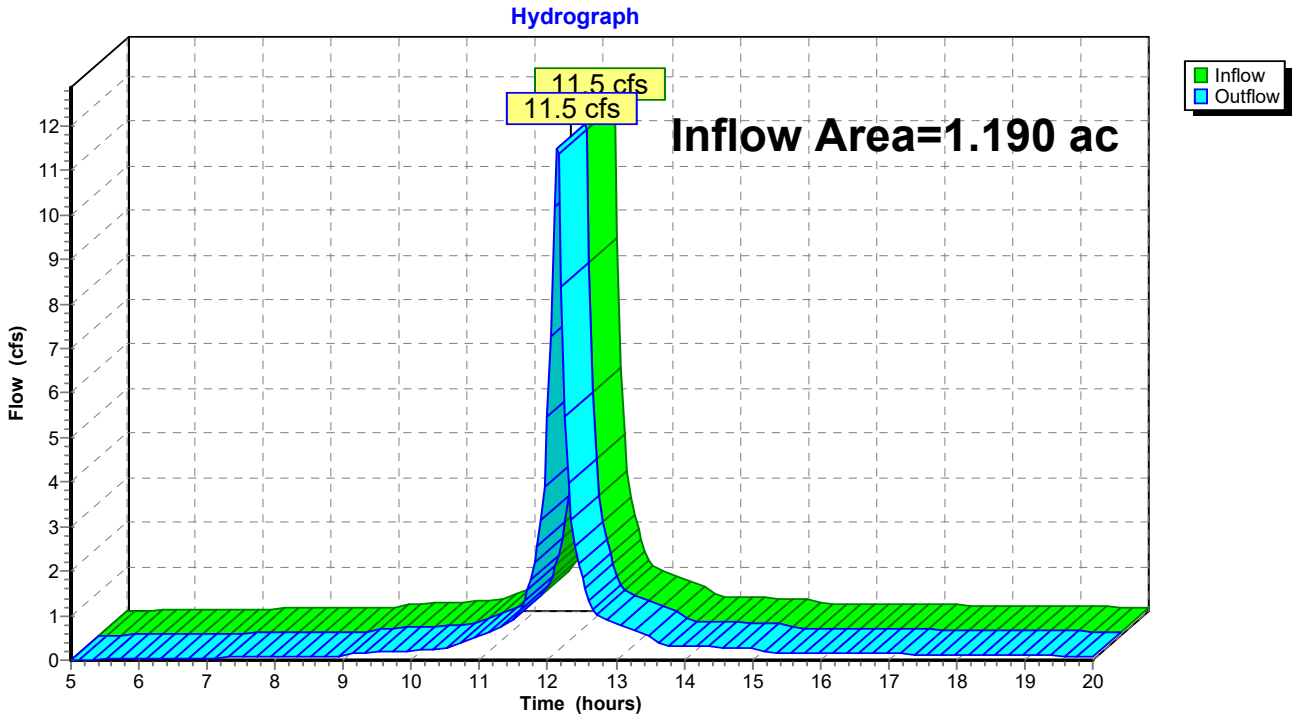


Summary for Reach 4R: South Storm

Inflow Area = 1.190 ac, 60.81% Impervious, Inflow Depth > 5.93" for 100-YR event
Inflow = 11.5 cfs @ 12.14 hrs, Volume= 0.588 af
Outflow = 11.5 cfs @ 12.14 hrs, Volume= 0.588 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: South Storm

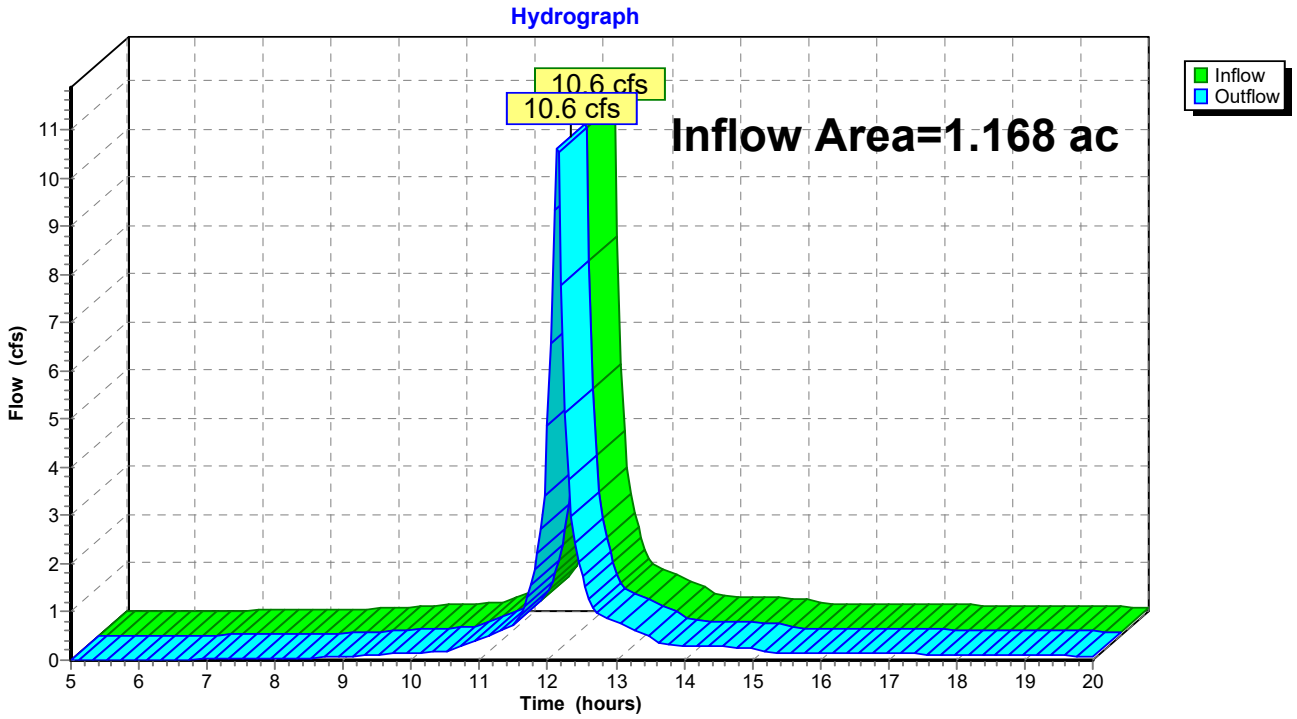


Summary for Reach 5R: SE Bluff - To Road

Inflow Area = 1.168 ac, 32.92% Impervious, Inflow Depth > 5.36" for 100-YR event
Inflow = 10.6 cfs @ 12.14 hrs, Volume= 0.522 af
Outflow = 10.6 cfs @ 12.14 hrs, Volume= 0.522 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SE Bluff - To Road

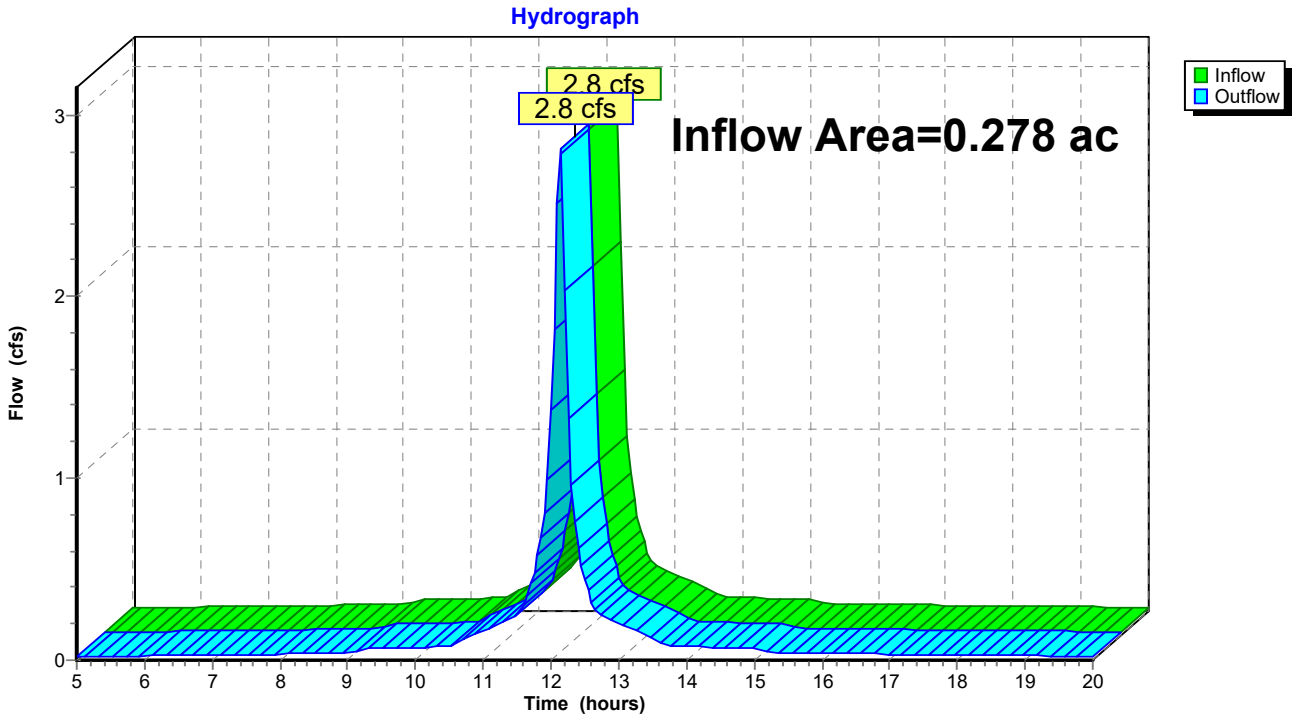


Summary for Reach 6R: East Storm

Inflow Area = 0.278 ac,100.00% Impervious, Inflow Depth > 6.64" for 100-YR event
Inflow = 2.8 cfs @ 12.14 hrs, Volume= 0.154 af
Outflow = 2.8 cfs @ 12.14 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: East Storm

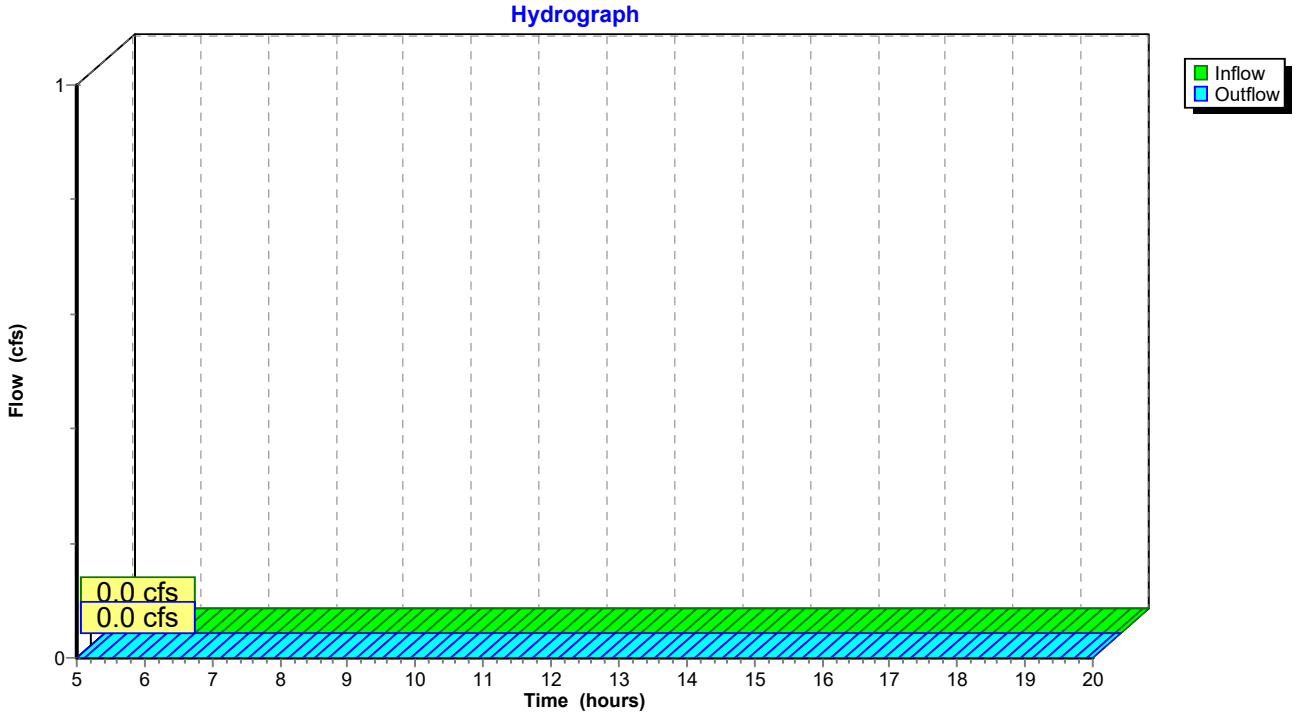


Summary for Reach 7R: North Bluff

Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 7R: North Bluff



Summary for Pond 1P: Wet Sedimentation Basin

Inflow Area = 4.032 ac, 46.16% Impervious, Inflow Depth > 5.59" for 100-YR event
Inflow = 37.6 cfs @ 12.14 hrs, Volume= 1.878 af
Outflow = 8.7 cfs @ 12.40 hrs, Volume= 1.846 af, Atten= 77%, Lag= 15.7 min
Primary = 8.7 cfs @ 12.40 hrs, Volume= 1.846 af
Routed to Reach 1R : NW Storm
Secondary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 7R : North Bluff

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 986.00' Surf.Area= 2,905 sf Storage= 5,818 cf
Peak Elev= 993.83' @ 12.40 hrs Surf.Area= 5,366 sf Storage= 39,954 cf (34,136 cf above start)

Plug-Flow detention time= 101.1 min calculated for 1.712 af (91% of inflow)
Center-of-Mass det. time= 57.4 min (814.4 - 757.0)

Volume	Invert	Avail.Storage	Storage Description
#1	981.00'	52,963 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) x 0.5

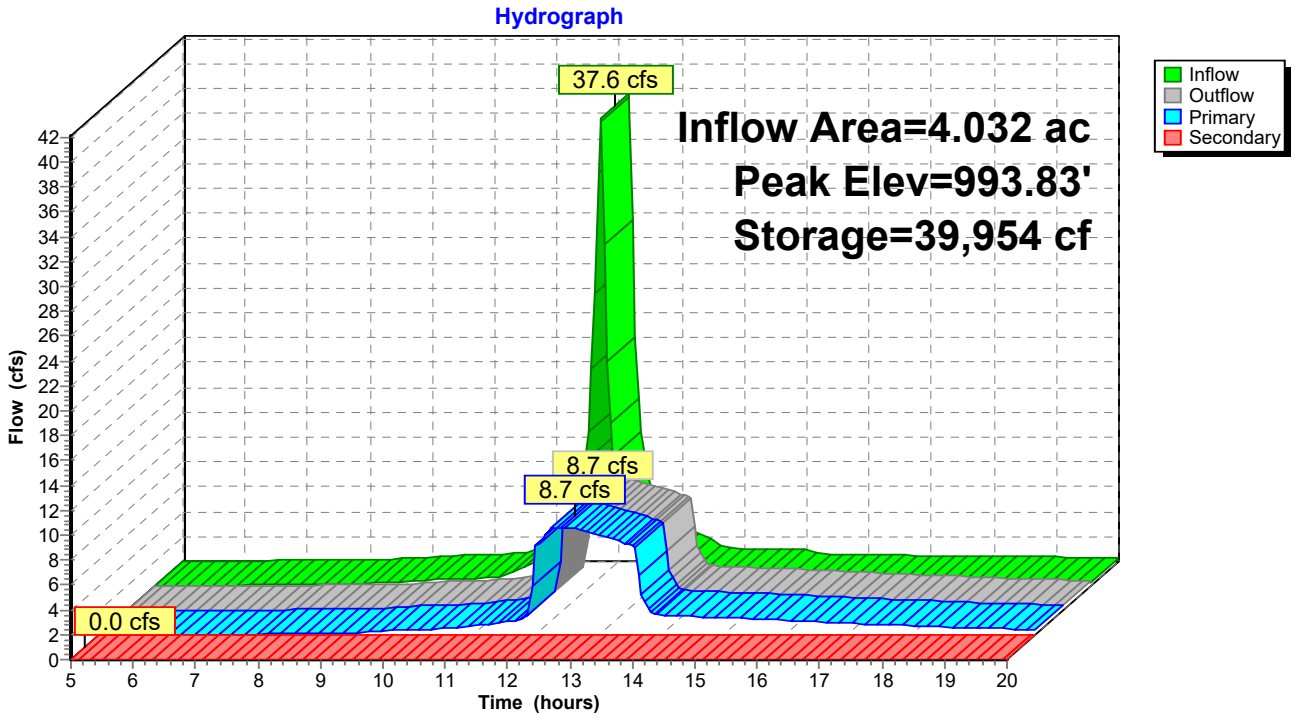
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
981.00	108	0	0
985.00	3,406	7,028	7,028
986.50	7,012	7,814	14,842
995.00	11,323	77,924	92,765
996.00	15,000	13,162	105,927

Device	Routing	Invert	Outlet Devices
#1	Primary	981.69'	**12.0" Round Culvert** L= 169.0' Ke= 0.500 Inlet / Outlet Invert= 981.69' / 980.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	986.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	989.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height
#4	Device 1	990.00'	**HAALA 48" ID Pond Skimmer** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 Disch. (cfs) 0.000 1.320 3.740 6.870 10.580 14.790 19.250 20.790 22.220 23.570 24.850 30.430 35.140 39.280 43.030 46.480 49.690 52.700 55.560
#5	Secondary	995.50'	**20.0' long x 20.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.7 cfs @ 12.40 hrs HW=993.83' (Free Discharge)
└─**1=Culvert** (Barrel Controls 8.7 cfs @ 11.02 fps)
  ├─**2=Orifice/Grate** (Passes < 2.6 cfs potential flow)
  ├─**3=Sharp-Crested Rectangular Weir** (Passes < 167.7 cfs potential flow)
  └─**4=HAALA 48" ID Pond Skimmer** (Passes < 48.6 cfs potential flow)

Secondary OutFlow Max=0.0 cfs @ 5.00 hrs HW=986.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 1P: Wet Sedimentation Basin



Summary for Pond 2P: Filtration Basin

Inflow Area = 1.269 ac, 73.72% Impervious, Inflow Depth > 6.15" for 100-YR event
Inflow = 12.5 cfs @ 12.14 hrs, Volume= 0.651 af
Outflow = 5.8 cfs @ 12.26 hrs, Volume= 0.541 af, Atten= 54%, Lag= 7.3 min
Primary = 5.8 cfs @ 12.26 hrs, Volume= 0.541 af
Routed to Pond 3P :
Secondary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 3R : West Bluff
Tertiary = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 3R : West Bluff

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 985.53' @ 12.26 hrs Surf.Area= 1,311 sf Storage= 10,217 cf

Plug-Flow detention time= 79.7 min calculated for 0.539 af (83% of inflow)
Center-of-Mass det. time= 40.1 min (786.2 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	982.00'	6,940 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) x 0.5
#2A	981.25'	3,536 cf	**36.08'W x 70.23'L x 5.50'H Field A** Impervious 13,938 cf Overall - 5,097 cf Embedded = 8,841 cf x 40.0% Voids
#3A	982.00'	5,097 cf	**ADS_StormTech MC-3500 d +Cap** x 45 Inside #2 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 45 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf
		15,573 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
982.00	588	0	0
987.00	3,470	10,145	10,145
988.00	4,000	3,735	13,880

Device	Routing	Invert	Outlet Devices
#1	Primary	980.00'	**12.0" Round Culvert** L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 980.00' / 978.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	982.00'	**1.630 in/hr Exfiltration over Surface area above 982.00'** Excluded Surface area = 294 sf Phase-In= 0.01'
#3	Device 1	983.50'	**24" Nyloplast Dome Grate X 0.50** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 Disch. (cfs) 0.000 0.660 1.870 3.440 5.290 6.400 7.010 7.570 8.100 8.590 9.050 11.090 12.800 14.310 15.680 16.940 18.100 19.200 20.240
#4	Secondary	986.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

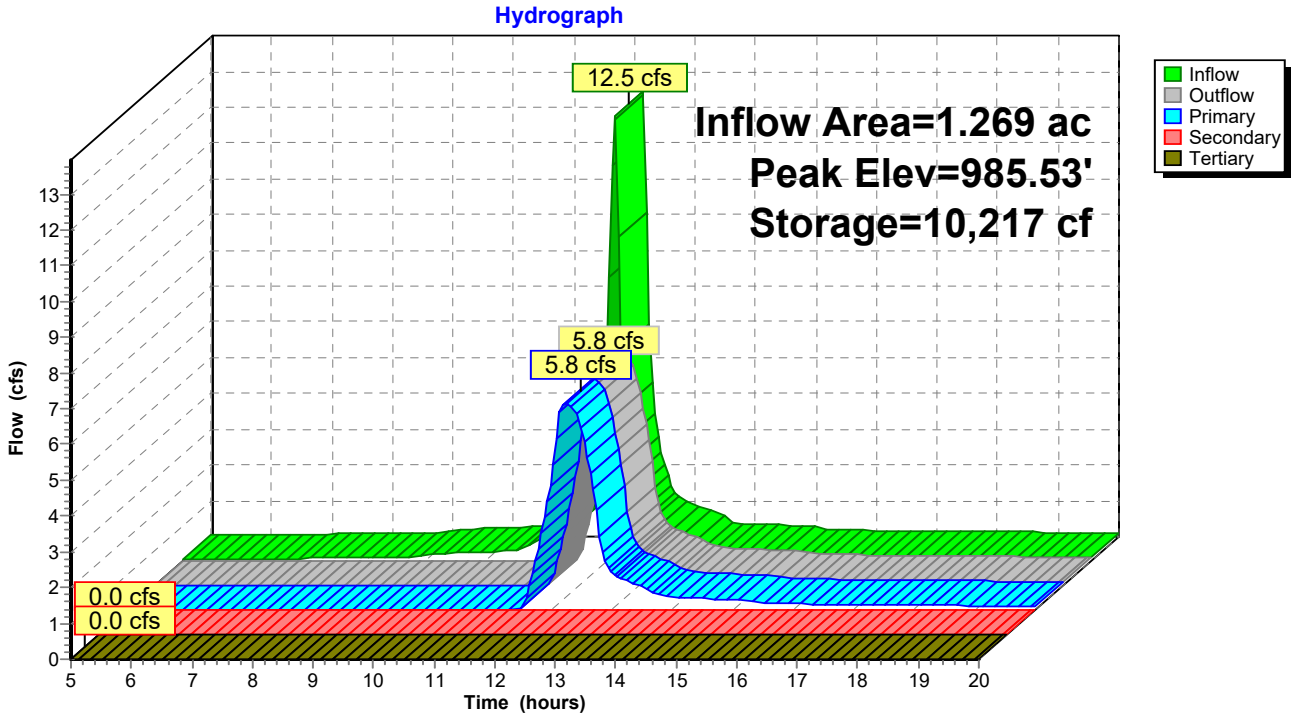
#5 Tertiary 987.00' **133.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=5.8 cfs @ 12.26 hrs HW=985.51' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.8 cfs @ 7.34 fps)
└**2=Exfiltration** (Passes < 0.0 cfs potential flow)
└**3=24" Nyloplast Dome Grate** (Passes < 6.4 cfs potential flow)

Secondary OutFlow Max=0.0 cfs @ 5.00 hrs HW=981.25' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Tertiary OutFlow Max=0.0 cfs @ 5.00 hrs HW=981.25' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 2P: Filtration Basin



Summary for Pond 3P:

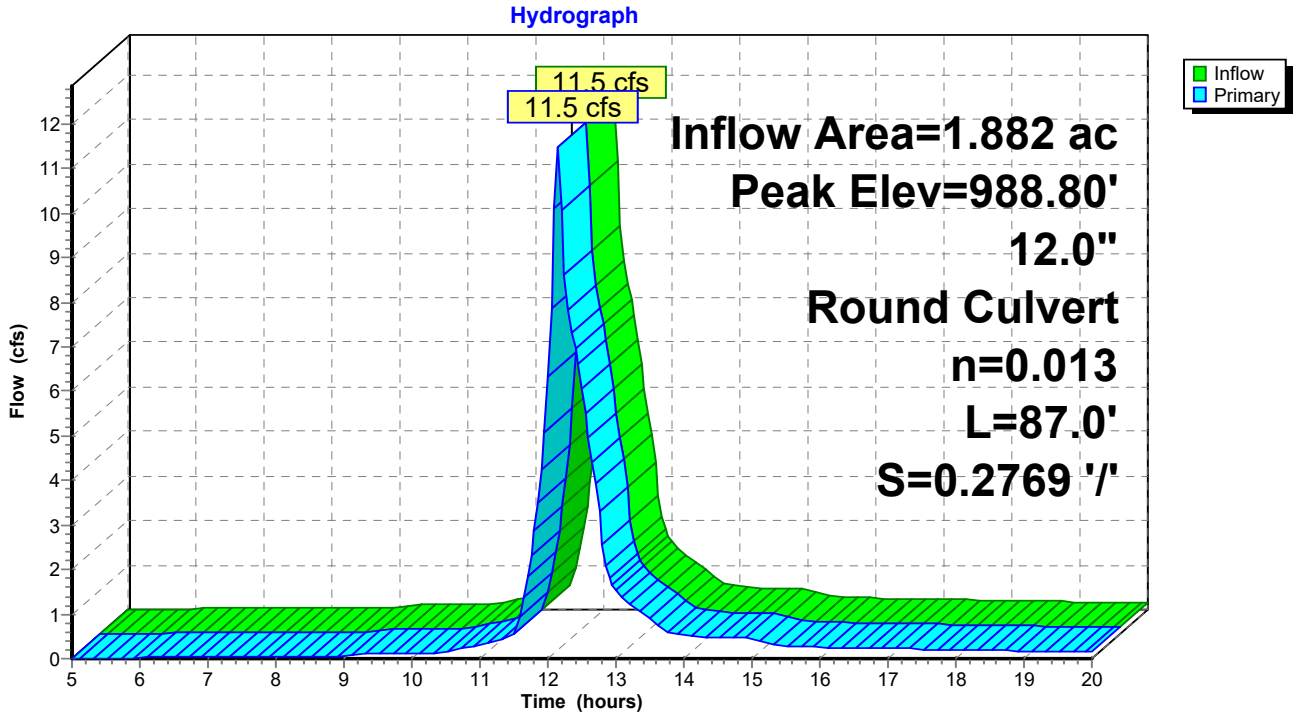
Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 5.42" for 100-YR event
Inflow = 11.5 cfs @ 12.15 hrs, Volume= 0.850 af
Outflow = 11.5 cfs @ 12.15 hrs, Volume= 0.850 af, Atten= 0%, Lag= 0.0 min
Primary = 11.5 cfs @ 12.15 hrs, Volume= 0.850 af
Routed to Pond 4P :

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 988.80' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	979.09'	**12.0" Round RCP_Round 12"** L= 87.0' Ke= 0.500 Inlet / Outlet Invert= 979.09' / 955.00' S= 0.2769 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=11.5 cfs @ 12.15 hrs HW=988.78' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 11.5 cfs @ 14.60 fps)

Pond 3P:



Summary for Pond 4P:

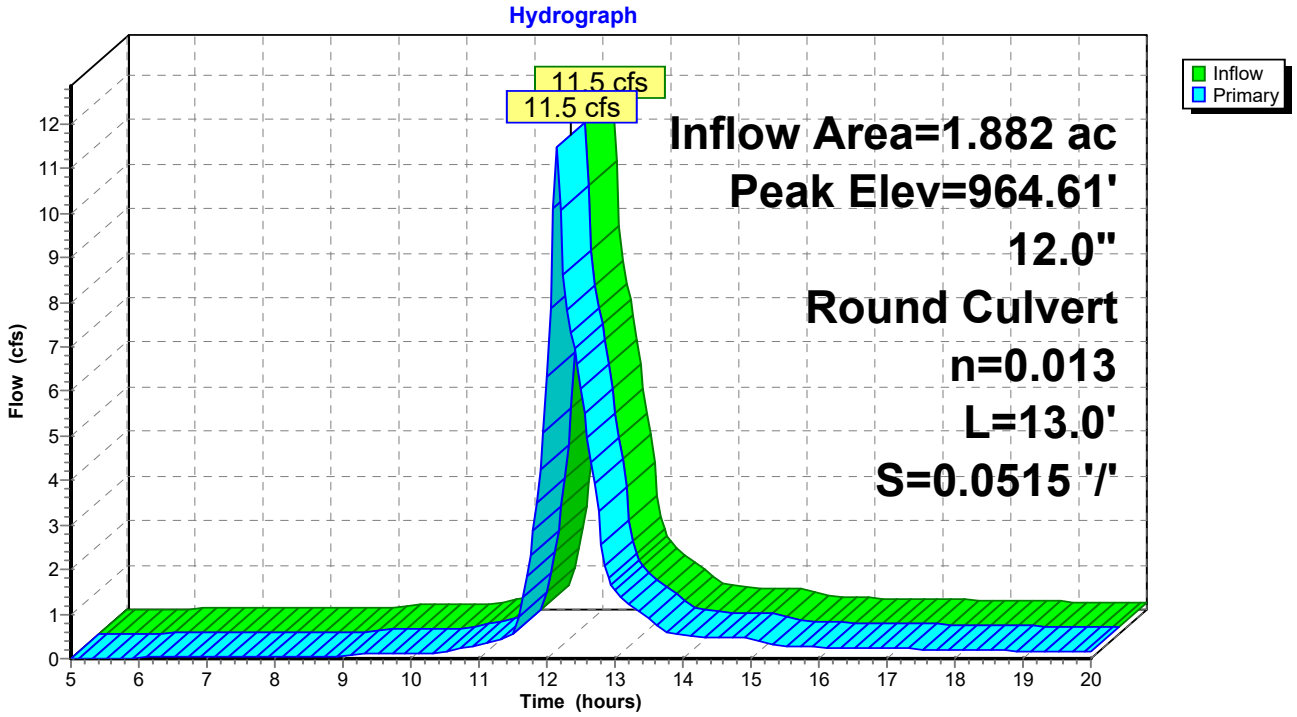
Inflow Area = 1.882 ac, 70.62% Impervious, Inflow Depth > 5.42" for 100-YR event
Inflow = 11.5 cfs @ 12.15 hrs, Volume= 0.850 af
Outflow = 11.5 cfs @ 12.15 hrs, Volume= 0.850 af, Atten= 0%, Lag= 0.0 min
Primary = 11.5 cfs @ 12.15 hrs, Volume= 0.850 af
Routed to Reach 2R : West Storm

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 964.61' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	954.90'	**12.0" Round RCP_Round 12"** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 954.90' / 954.23' S= 0.0515 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=11.5 cfs @ 12.15 hrs HW=964.59' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 11.5 cfs @ 14.60 fps)

Pond 4P:



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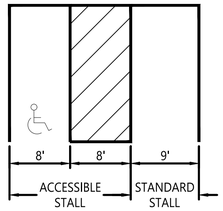

TYPICAL PARKING LOT STRIPING

PARKING:

EXISTING STALLS TO REMAIN:	34 STALLS
NEW SURFACE PARKING:	185 STALLS
GARAGE PARKING:	20 STALLS
TOTAL:	**239 STALLS**

PROPOSED LEGEND

- BITUMINOUS SURFACE
- CONCRETE SURFACE
- CURB & GUTTER
- STORM SEWER CATCH BASIN
- STORM SEWER CLEANOUT
- STORM SEWER INLET STRUCTURE
- STORM SEWER MANHOLE
- STORM SEWER GRAVITY MAIN
- STORM SEWER DRAINTILE
- HYDRANT
- WATER MAIN VALVE
- WATER MAIN PIPE

EXISTING LEGEND

- SHRUB
- TREE - CONIFEROUS
- TREE - DECIDUOUS
- EDGE OF WOODS
- BUILDING
- CHAINLINK FENCE
- RETAINING WALL
- UNDERGROUND FIBER OPTIC LINE
- OVERHEAD TELEPHONE LINE
- UNDERGROUND TELEPHONE LINE
- OVERHEAD TV LINE
- UNDERGROUND TV LINE
- UNDERGROUND FIBER OPTIC LINE
- UNDERGROUND TELEPHONE LINE
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- UNDERGROUND ELECTRIC LINE
- NATURAL GAS LINE
- SANITARY MANHOLE
- SANITARY GRAVITY MAIN
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- CULVERT APRON
- STORM SEWER INLET STRUCTURE
- STORM SEWER MANHOLE
- STORM SEWER GRAVITY MAIN
- CURB STOP
- FIRE HYDRANT
- WATER MAIN LINE

N

0 50 100

SCALE IN FEET

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CHECKED BY: CNB

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NOT FOR CONSTRUCTION

CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

DATE	REV#	REVISIONS DESCRIPTION

GOOD COUNSEL

SITE PLAN - OVERALL

C2.0

PROJECT #: 2025-10591

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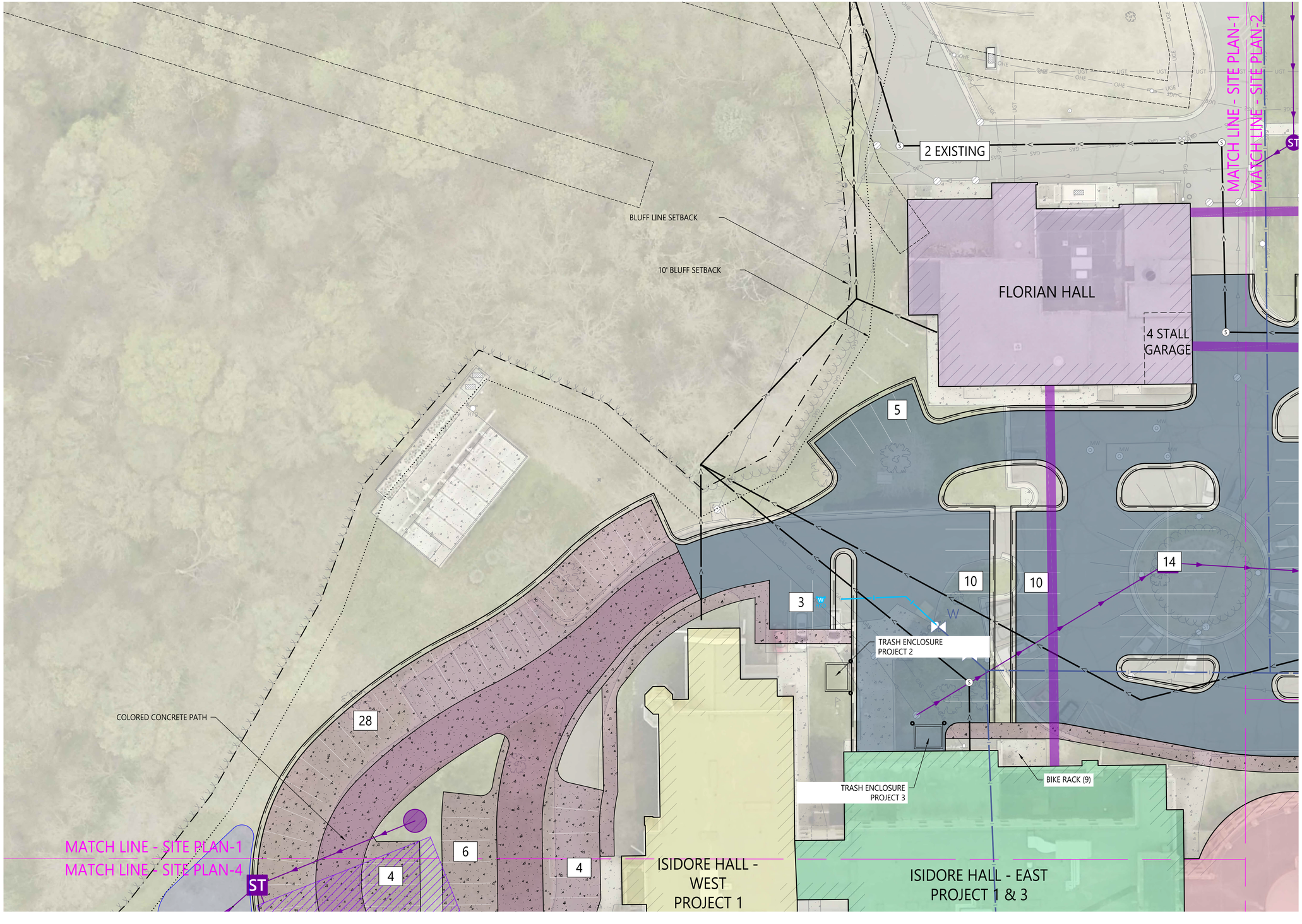

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- WATER MAIN LINE

N

0 20 40

SCALE IN FEET

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GOOD COUNSEL

SITE PLAN - ENLARGEMENT

C2.1

PROJECT #: 2025-10591

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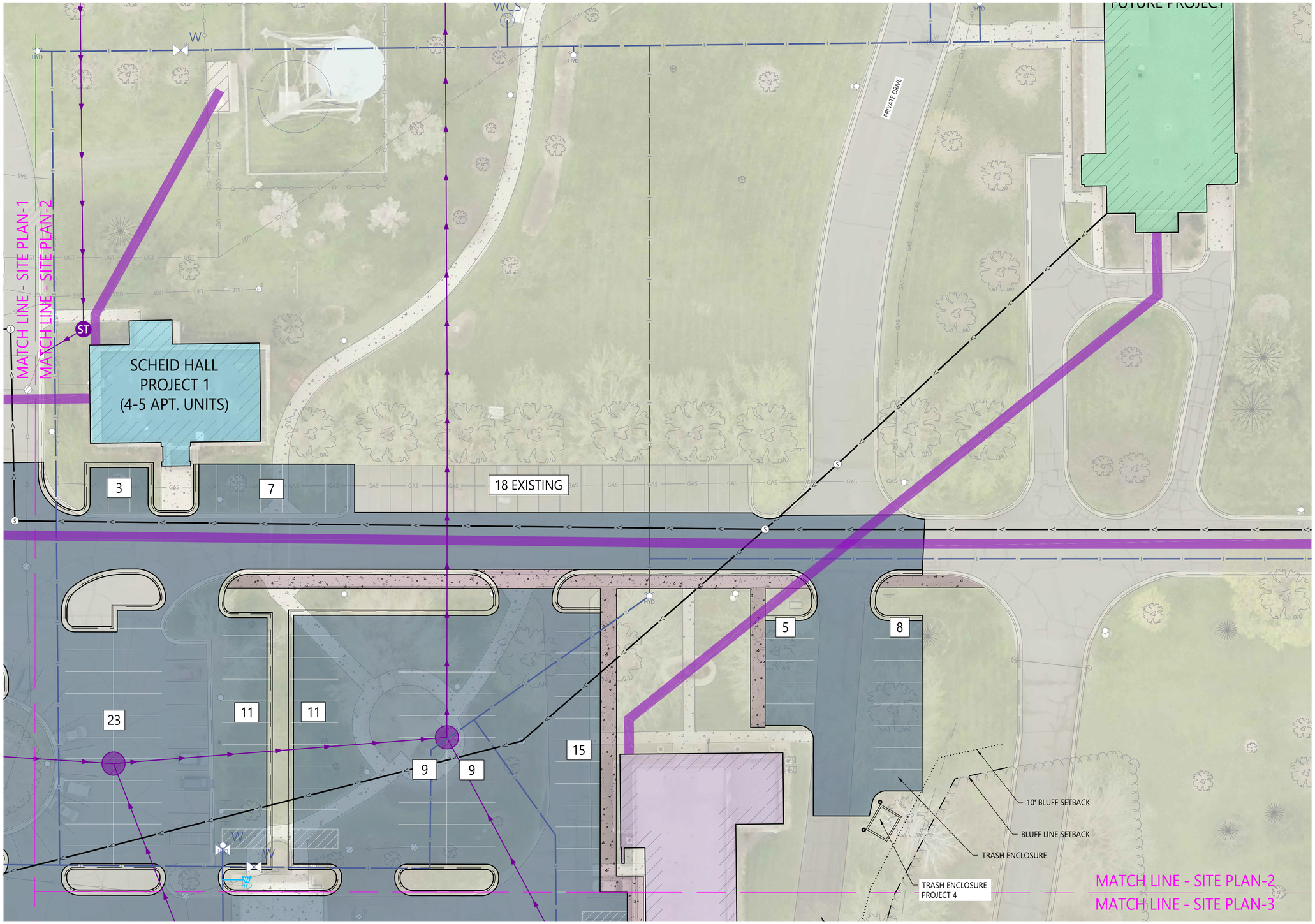

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SITE PLAN - ENLARGEMENT

C2.2

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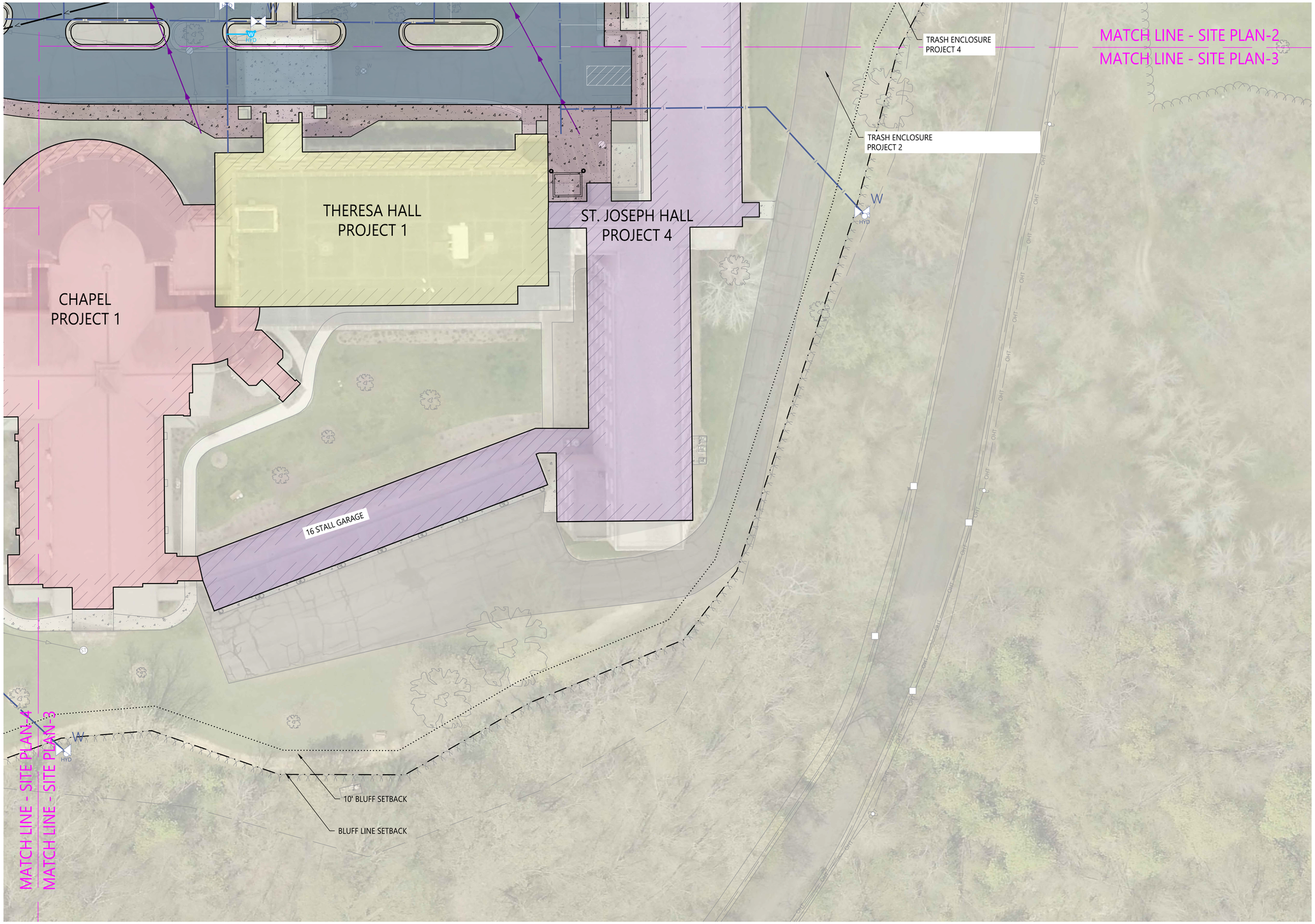

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GOOD COUNSEL

SITE PLAN - ENLARGEMENT

C2.3

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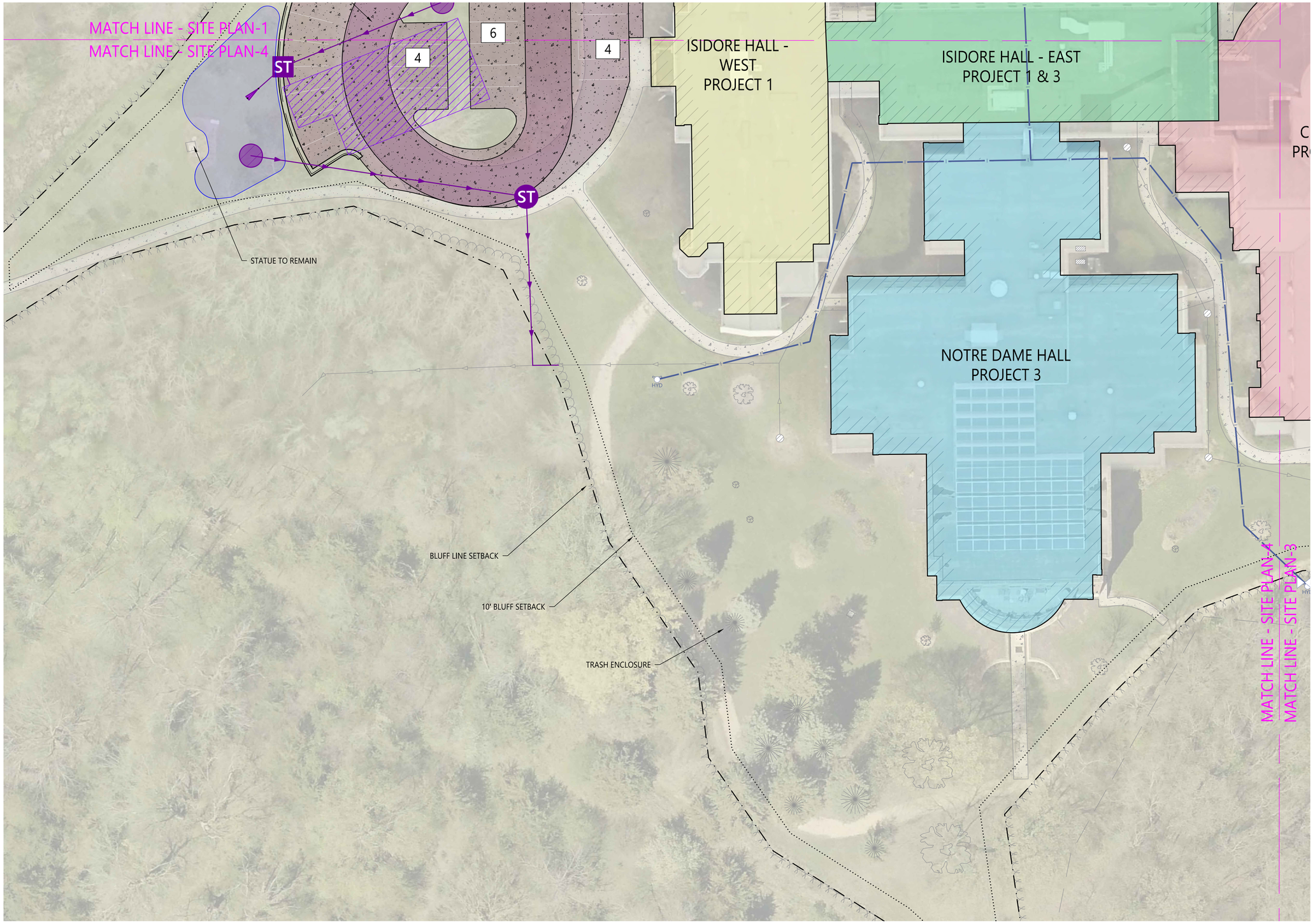

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GOOD COUNSEL

SITE PLAN - ENLARGEMENT

C2.4

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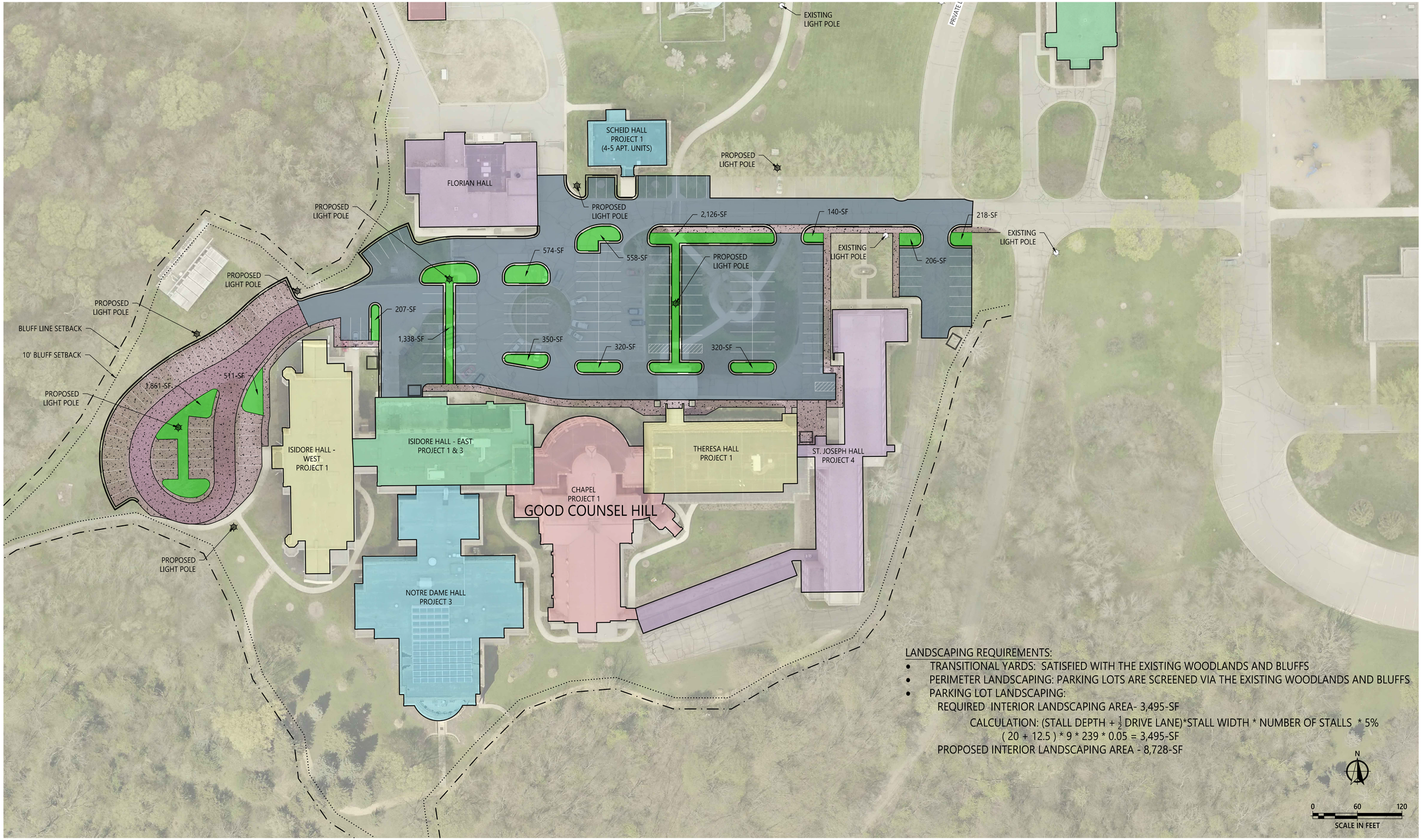

LANDSCAPING REQUIREMENTS:

- TRANSITIONAL YARDS: SATISFIED WITH THE EXISTING WOODLANDS AND BLUFFS
- PERIMETER LANDSCAPING: PARKING LOTS ARE SCREENED VIA THE EXISTING WOODLANDS AND BLUFFS
- PARKING LOT LANDSCAPING:
  - REQUIRED INTERIOR LANDSCAPING AREA- 3,495-SF
    - CALCULATION: (STALL DEPTH + $\frac{1}{2}$ DRIVE LANE)*STALL WIDTH * NUMBER OF STALLS * 5%
    - (20 + 12.5) * 9 * 239 * 0.05 = 3,495-SF
  - PROPOSED INTERIOR LANDSCAPING AREA - 8,728-SF

N

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CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

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GOOD COUNSEL

LANDSCAPE AND LIGHTING PLAN

PROJECT #: 2025-10591

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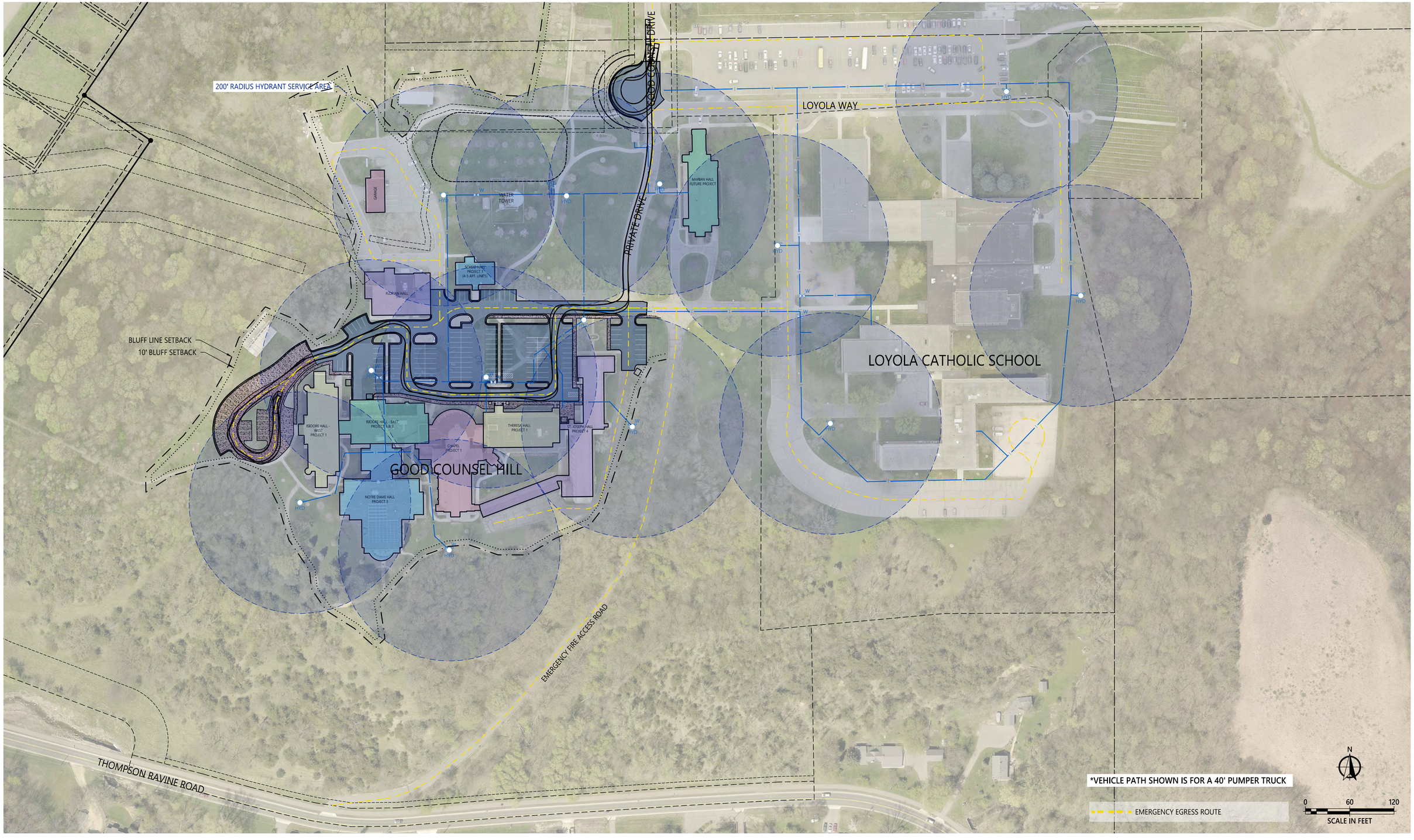

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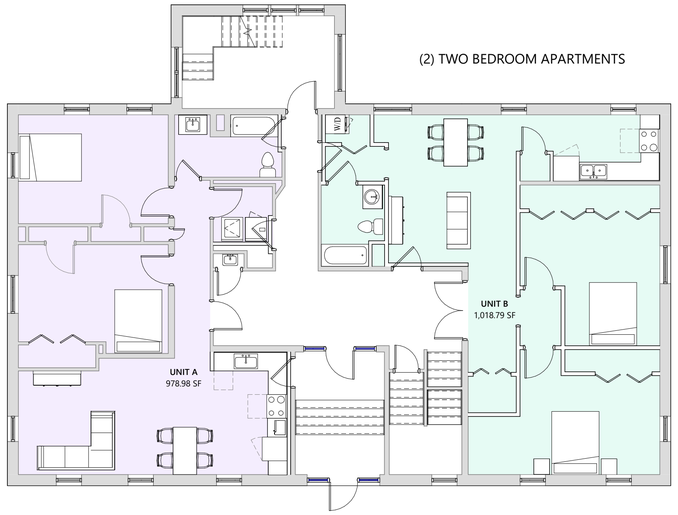
CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

DATE	REV#	REVISIONS DESCRIPTION

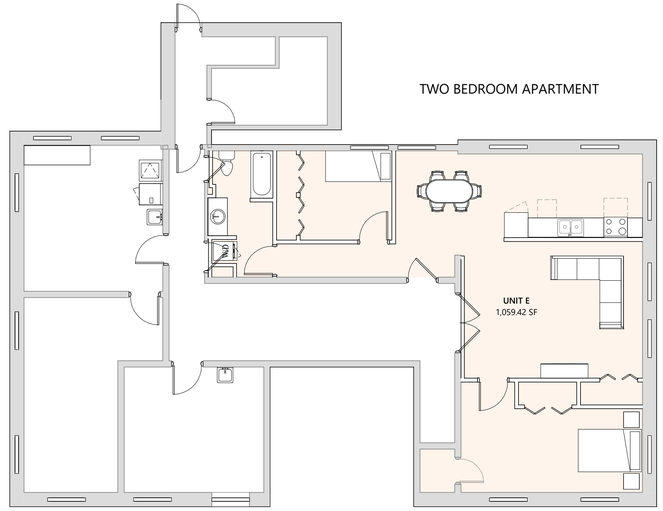
GOOD COUNSEL

FIRE PROTECTION & TRAFFIC CIRCULATION PLAN

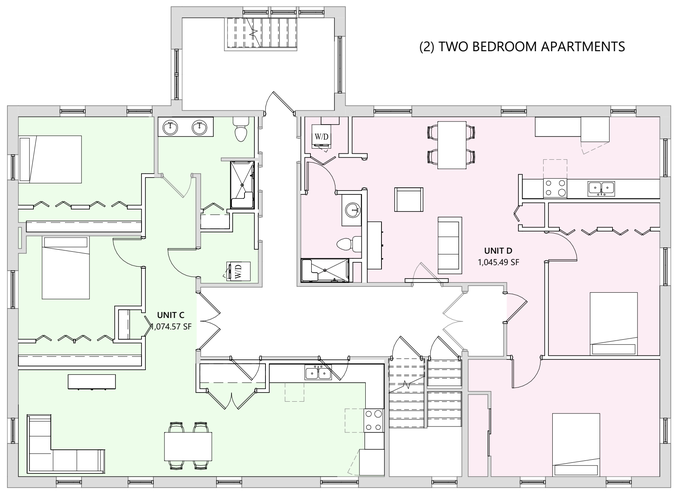
PROJECT #: 2025-10591



4 FIRST LEVEL PLAN
1/8" = 1'-0"



2 LOWER LEVEL FLOOR PLAN
1/8" = 1'-0"



6 SECOND LEVEL PLAN
1/8" = 1'-0"

SCHEID HALL:

FIVE TOTAL PROPOSED TWO BEDROOM APARTMENTS

GRAPHIC SCALE: 1/8"
0' 12'-0" 24'-0"
N

2025-10591

GOOD COUNSEL HILL

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PRELIMINARY
NOT FOR CONSTRUCTION
06/08/26

<PROJECT ARCHITECT> LIC #: <#####> DATE: <MM-DD-YYYY>

DATE	REV#	REVISIONS DESCRIPTION

GOOD COUNSEL HILL

SCHEID HALL FLOOR PLANS

A1.1

PROJECT #: 2025-10591

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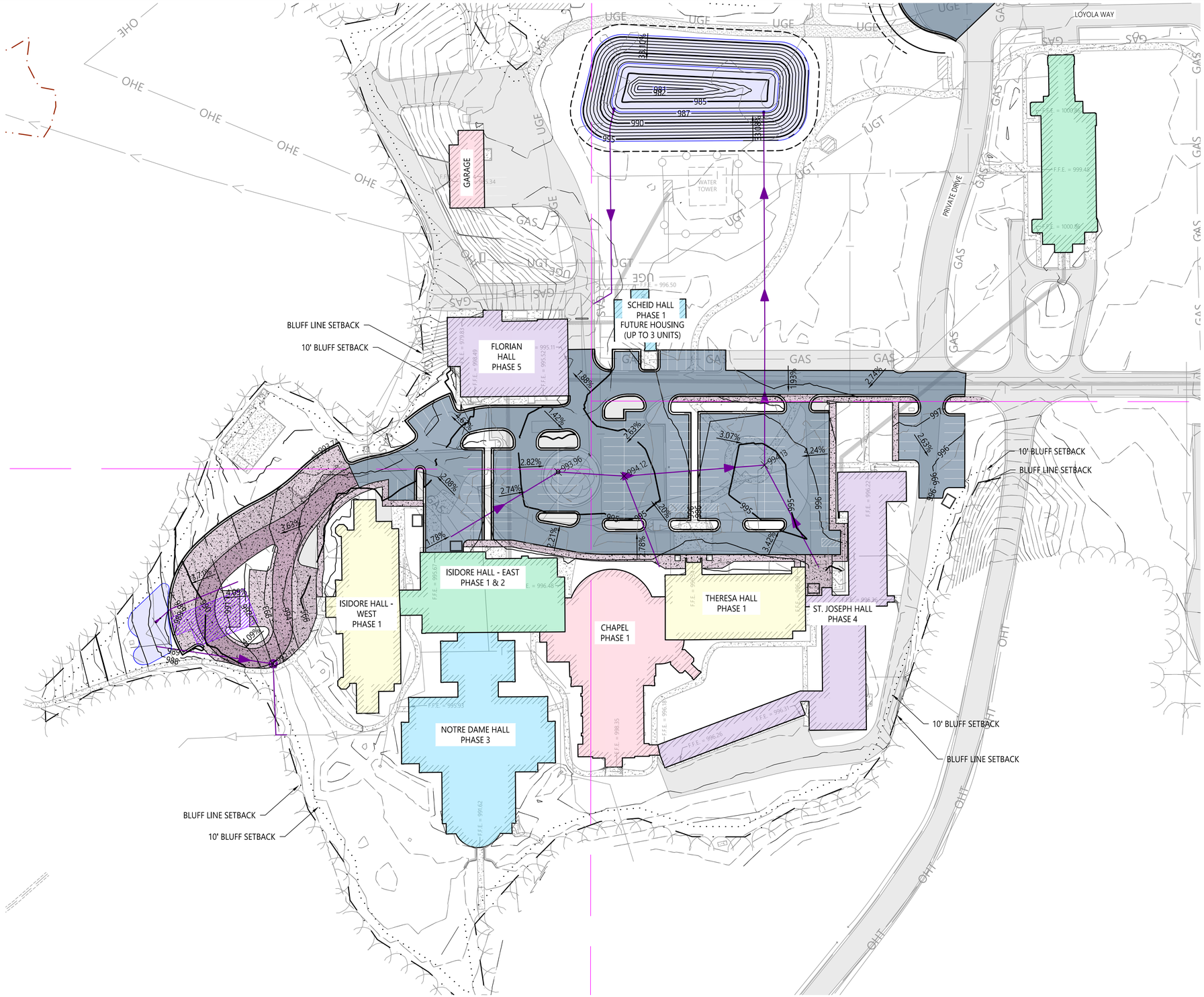

PROPOSED LEGEND

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- CURB & GUTTER
- STORM SEWER CATCH BASIN
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EXISTING LEGEND

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- STORM SEWER GRAVITY MAIN
- CURB STOP
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- WATER MAIN LINE

GENERAL GRADING NOTES

- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-2, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".
- ALL CONSTRUCTION SHALL CONFORM TO LOCAL, STATE, AND FEDERAL REGULATIONS INCLUDING THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS.
- HAULING HOURS MUST BE CONFIRMED WITH THE CITY PRIOR TO BEGINNING WORK.
- SPOT ELEVATIONS SHOWN INDICATE FINISHED PAVEMENT ELEVATIONS, GUTTER FLOW LINE OF CURB GUTTER (FL), BACK OF CURB ELEVATIONS (TC), TOP OF SIDEWALK (TW), AND FINISHED SURFACE GRADE, UNLESS OTHERWISE NOTED.
- ALL SLOPES SHALL BE GRADED TO 3:1 OR FLATTER, UNLESS OTHERWISE NOTED ON THE PLANS.

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DRAWN BY: RSH
CHECKED BY: CNB

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CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

DATE	REV#	REVISIONS DESCRIPTION

GOOD COUNSEL

GRADING PLAN - OVERALL

C4.0

PROJECT #: 2025-10591

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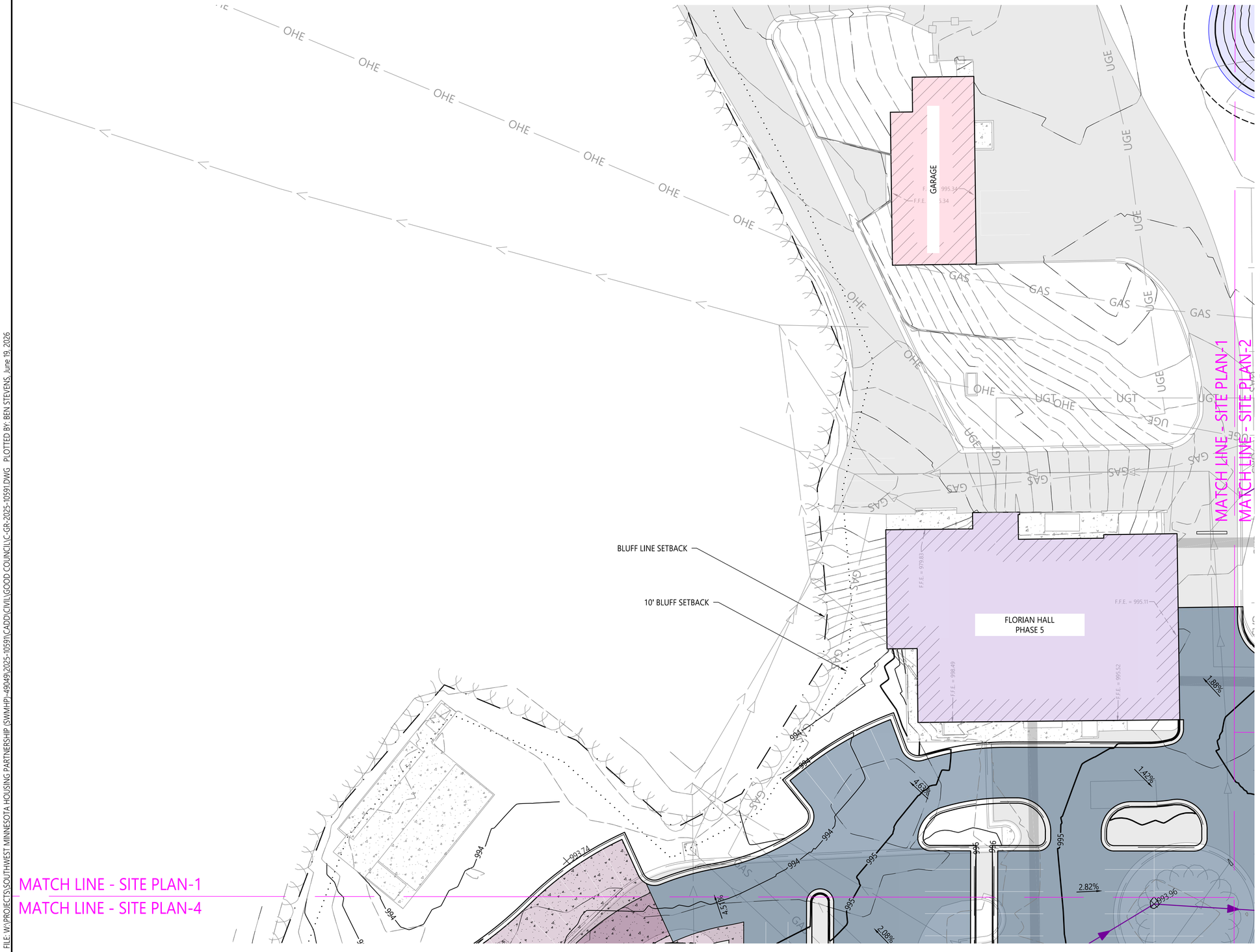

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- OVERHEAD TV LINE
- UNDERGROUND TV LINE
- UNDERGROUND FIBER OPTIC LINE
- UNDERGROUND TELEPHONE LINE
- LIGHT POLE
- UNDERGROUND ELECTRIC LINE
- NATURAL GAS LINE
- SANITARY MANHOLE
- SANITARY GRAVITY MAIN
- STORM SEWER CATCH BASIN
- CULVERT APRON
- STORM SEWER INLET STRUCTURE
- STORM SEWER MANHOLE
- STORM SEWER GRAVITY MAIN
- CURB STOP
- FIRE HYDRANT
- WATER MAIN LINE

GENERAL GRADING NOTES

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SCALE IN FEET

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WIDSETH
ARCHITECTS ▪ ENGINEERS ▪ SCIENTISTS ▪ SURVEYORS

DRAWN BY: RSH
CHECKED BY: CNB

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NOT FOR CONSTRUCTION

CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

DATE	REV#	REVISIONS DESCRIPTION

GOOD COUNSEL

GRADING PLAN - ENLARGEMENT

C4.1

PROJECT #: 2025-10591

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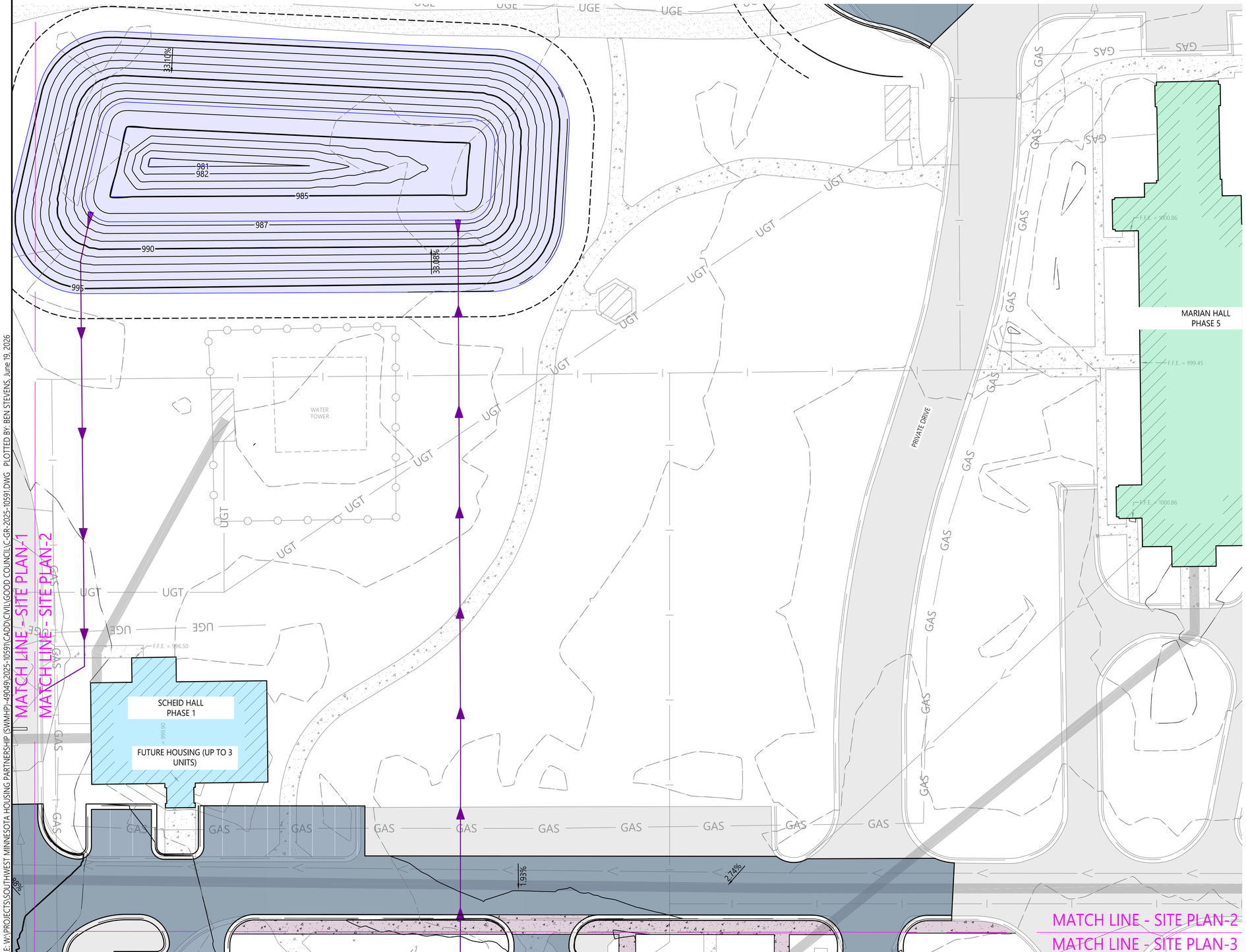
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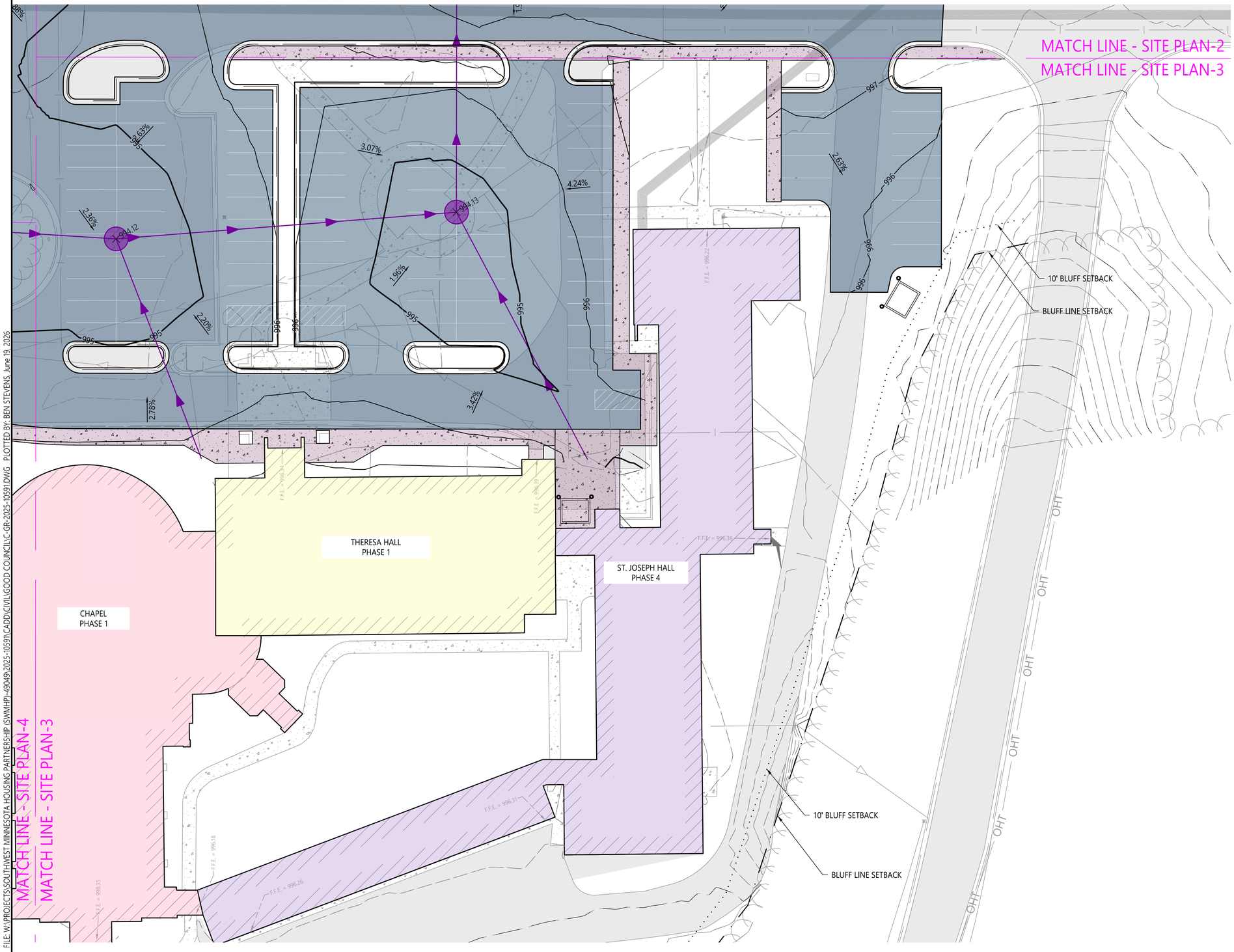

PROPOSED LEGEND

- BITUMINOUS SURFACE
- CONCRETE SURFACE
- CURB & GUTTER
- STORM SEWER CATCH BASIN
- STORM SEWER CLEANOUT
- STORM SEWER INLET STRUCTURE
- STORM SEWER MANHOLE
- STORM SEWER GRAVITY MAIN
- STORM SEWER DRAINTILE

EXISTING LEGEND

- SHRUB
- TREE - CONIFEROUS
- TREE - DECIDUOUS
- EDGE OF WOODS
- BUILDING
- CHAINLINK FENCE
- RETAINING WALL
- UNDERGROUND FIBER OPTIC LINE
- OVERHEAD TELEPHONE LINE
- UNDERGROUND TELEPHONE LINE
- OVERHEAD TV LINE
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SCALE IN FEET

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ARCHITECTS ▪ ENGINEERS ▪ SCIENTISTS ▪ SURVEYORS

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CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

DATE	REV#	REVISIONS DESCRIPTION

GOOD COUNSEL

GRADING PLAN - ENLARGEMENT

C4.3

PROJECT #: 2025-10591

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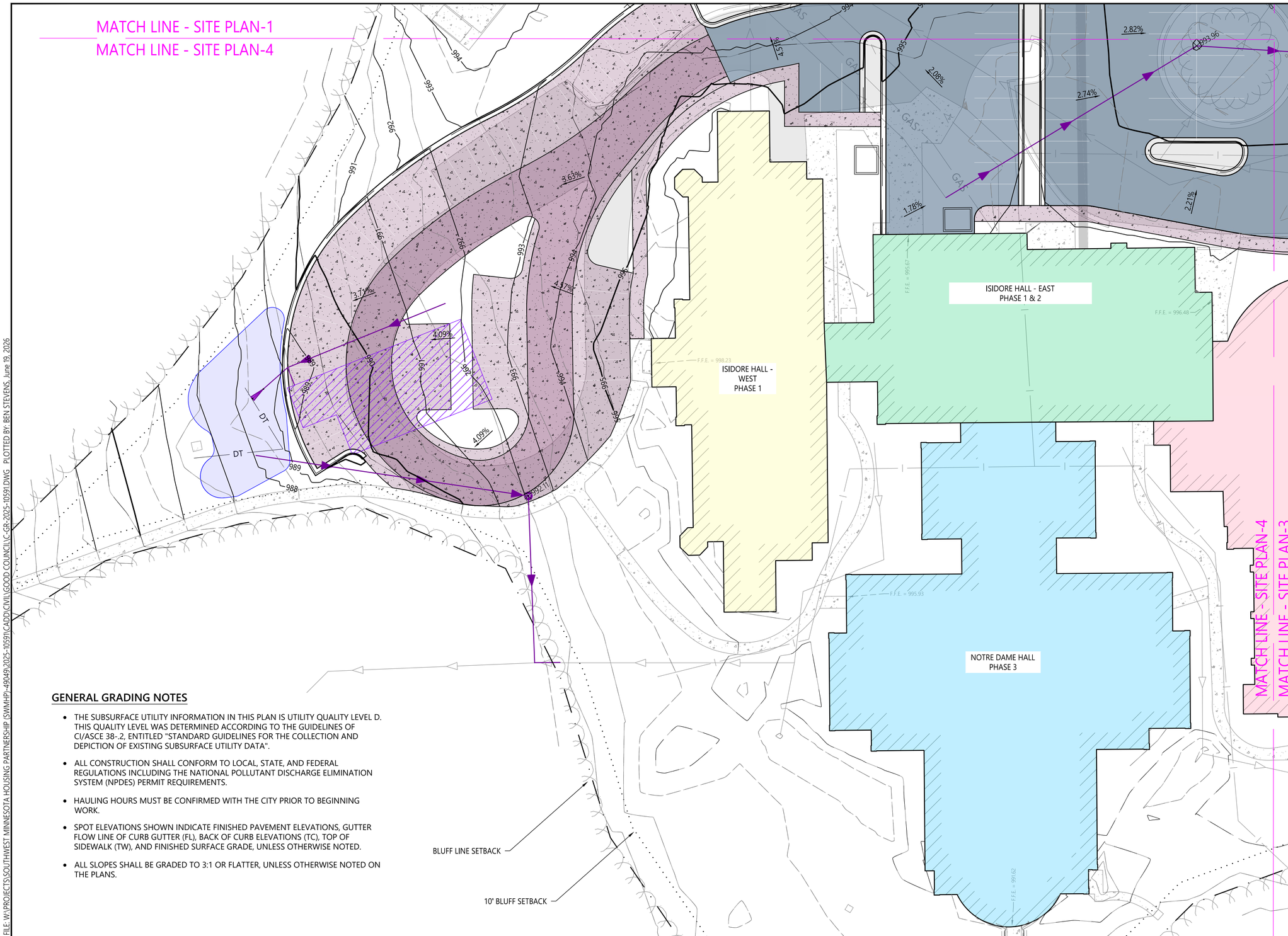

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SCALE IN FEET

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CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

DATE	REV#	REVISIONS DESCRIPTION

GOOD COUNSEL

GRADING PLAN - ENLARGEMENT

C4.4

PROJECT #: 2025-10591

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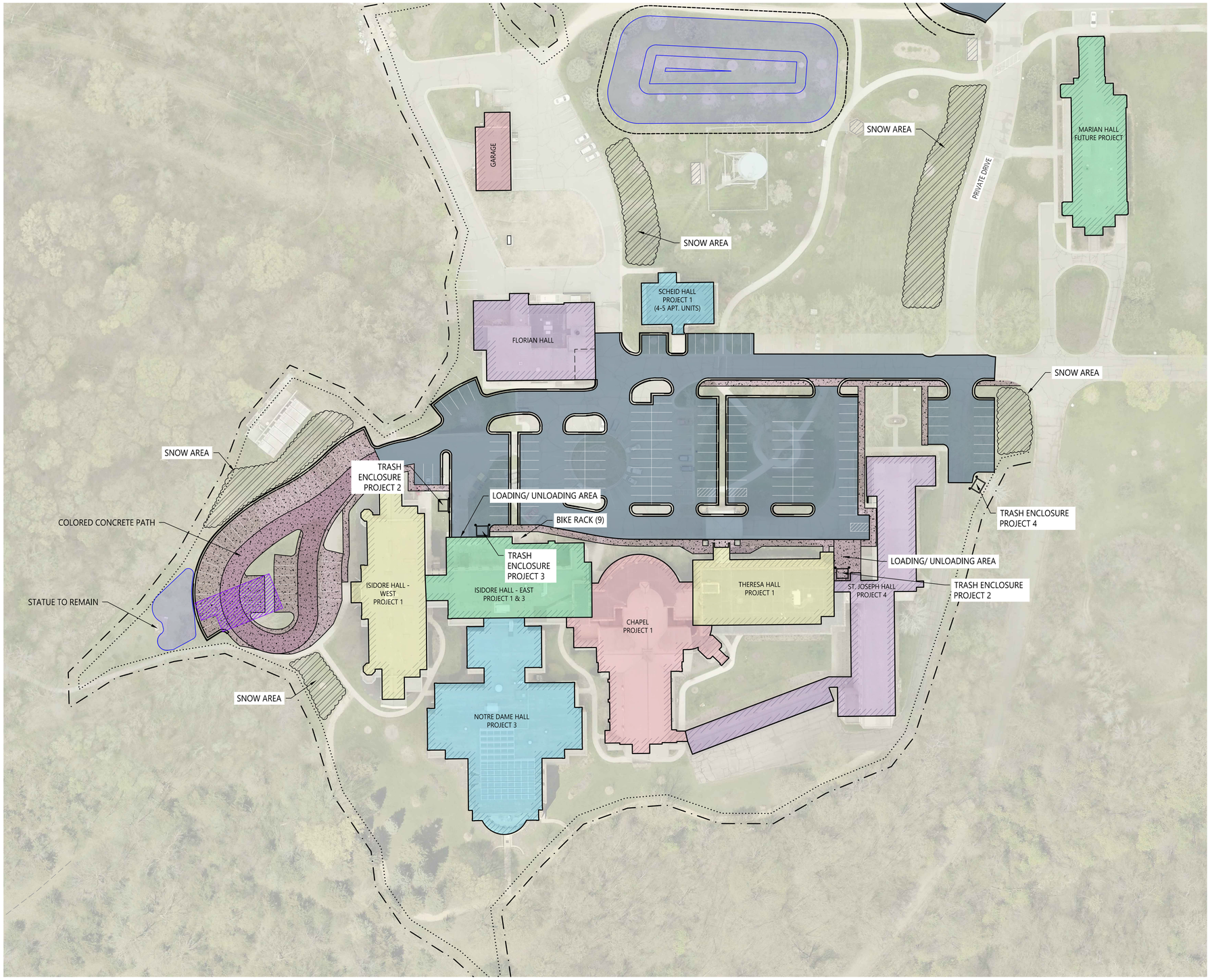

ROADWAY/PAVEMENT LINEWORK - PROPOSED

SNOW PILING AREA

0 50 100

SCALE IN FEET

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CRAIG N. BRITTON LIC. NO.: 44228 DATE: 03/24/2026

DATE	REV#	REVISIONS DESCRIPTION

GOOD COUNSEL

SNOW REMOVAL, REFUSE AND LOADING PLAN

PROJECT #: 2025-10591

Site Plan and Traffic Advisory Review Committee **1. 4.**

Meeting Date: 07/07/2026

Title

CY33-26

Request of ERM on behalf of CenterPoint Energy, the property owner, for a final plat review of Centerpoint Energy Mankato First Addition, and for a conditional use permit to allow for a hydrogen facility that uses energy from a 1 megawatt on-site solar panel array on a property zoned M-2, Heavy Industrial. The subject property is described as part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, a tract of land located in the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of a parcel lying within the Southeast Quarter of the Northwest Quarter, Section 5, Township 108 North, Range 26 West, all located in the City of Mankato, Blue Earth County (2400 N. Riverfront Drive, BE County PID's R010905176004, R010905176003, R010905176002, R010905176001).

Applicant

The applicant is ERM, on behalf of CenterPoint Energy.

Request

The applicant is requesting a final plat review of Centerpoint Energy Mankato First Addition, and a conditional use permit to allow for a hydrogen facility that uses energy from a 1 megawatt onsite solar panel array on a property zoned M-2, Heavy Industrial.

Location

The subject property is described as part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, a tract of land located in the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of a parcel lying within the Southeast Quarter of the Northwest Quarter, Section 5, Township 108 North, Range 26 West, all located in the City of Mankato, Blue Earth County (2400 N. Riverfront Drive, BE County PID's R010905176004, R010905176003, R010905176002, R010905176001).

Existing Land Use

The subject property is currently in use by CenterPoint Energy Minnesota, as an industrial use. The subject property also includes a portion of agricultural land used for row cropping.

Zoning

The subject property is currently zoned M-2, Heavy Industrial District.

Other Board or Commission

The Planning Commission reviewed the preliminary plat at their February 25th, 2026, meeting. Final action on that request occurred at the March 9th, 2026, City Council meeting.

Environmentally Sensitive Areas

There are multiple wetlands located on the subject property. One wetland area was delineated on the southern property boundary. A second wetland was noted to be centrally located on the southern half of the site, directly east of the railroad track termination. The third wetland was delineated along the southwestern property boundary, just north of the railroad track as shown on the proposed preliminary plat.

The applicant proposes no impacts to the three delineated wetland areas depicted on the approved preliminary plat.

Public Utilities

The subject property is currently served by public utilities.

Review

The applicant, ERM, on behalf of CenterPoint Energy, is requesting a final plat review of CenterPoint Energy Mankato First Addition, and a conditional use permit to allow for a hydrogen facility that uses energy from a 1 megawatt onsite solar panel array on a property zoned M-2, Heavy Industrial. The subject property is located at 2400 N. Riverfront Drive.

The Preliminary Plat of "CenterPoint Energy Mankato First Addition" was approved by the Planning Commission at their February 25th, 2026, meeting. Followed by City Council approval at their March 9th, 2026, meeting.

The applicant is seeking to plat the subject property in order to further develop the property in two construction phases, with a solar array and a green hydrogen production & storage facility. As the site preparations and power supply (the solar array) for the hydrogen power facility are regulatorily required to be in place prior to the hydrogen facility itself, construction will be separated into two phases. Phase 1 will include site preparation, installation of erosion and sediment controls, initial grading, and installation of the Solar Array. Phase 2 will include hydrogen production and storage facility construction, final grading, and site stabilization. Additionally, the applicant attests that Best Management Practices (BMPs) will be implemented throughout all phases to prevent sediment discharge and protect water quality.

Phase 1 is scheduled to commence in the 3rd quarter of 2026 and Phase 2 is anticipated in the 4th quarter of 2026, although the applicant notes that the intended timeline may be subject to change due to typical development impediments.

Previous Site Plan Review:

The proposed project, largely as it, was previously reviewed by the Site Plan and Traffic Advisory Committee on 06/09/2026. At this time, the Committee provided a series of comments to the applicant and subsequent responses to said comments then provided by the applicant. The request was withdrawn prior to Planning Commission review and resubmitted for the July 2026 cycle. With resubmittal, some minor modifications were made, which are summarized as follows:

- An updated Drainage Report dated June 15, 2026, has been provided. The applicant made modifications based on feedback provided by Public Works / Construction Services Staff.
- An updated narrative from Muska Electric for the glare study has been provided.
- A narrative has been provided by Muska Electric to accompany the Solar Decommissioning Estimate.
- The originally provided narrative received minor edits to increase the degree of detail within multiple sections.
- The applicant has provided a Developable Area Map which distinguishes between developable and non-developable land for the purposes of Parkland Dedication calculations.

Final Plat:

The proposed Final Plat mirrors the approved Preliminary Plat, as it proposes the creation of a one-lot, one-block, subdivision containing approximately 14.83 acres. As the property is currently unplatted, subdivision approval is required to bring the parcels into conformance with City subdivision regulations and to support current and future development on the site. Of note, there are no new public dedications proposed with the plat.

The proposed final plat depicts 10' standard drainage and utility easements around the subject parcel.

The approved preliminary plat showed multiple wetlands located on the subject property. The applicant has received a Notice of Decision for a "no-loss" decision under Minnesota Rule 8420.0415. Subpart A. Based on this finding, the proposal will not impact existing wetlands located on the subject property.

As was noted with the Preliminary Plat review, because the property was never platted previously, payment in lieu of parkland dedication is required. Due to an amendment to the City Code, the City's Parkland Dedication policy has been updated to remove areas of undevelopable land from the payment in lieu of parkland dedication calculation. Because of this change, the previous payment requirement of $45,973, which was based on a 14.83 acre area, has been reduced to $43,400 to account for the 0.83 acres of undevelopable wetlands. To summarize, the applicant shall provide payment in lieu of parkland dedication in the amount of $43,400 prior to affixing signatures on the Final Plat.

Private Access Easement:
The proposed plat area is subject to a private Access Easement Agreement with the property owner of the adjacent agricultural field. This access agreement allows said adjacent property owner direct access through the subject property in order to access and farm their adjacent portion of property. CenterPoint Energy states that they are coordinating with the owner of the private easements to ensure continued access is provided between North Riverfront Drive and the property immediately west of CenterPoint's subject property. Documented proof of an agreement or of a reasonable continuation of the easement condition, shall be required to be provided by the applicant prior to Planning Commission review.

Conditional Use Permit:
The requested Conditional Use Permit contains two interconnected components, the solar panel array and the hydrogen power facility.
The applicant states that the proposed project will include a hydrogen power facility that utilizes renewable energy, in the form of an onsite 1 megawatt (MW) solar panel array, to split water into hydrogen and oxygen.

The applicant has provided an Emergency Vehicle Access & Hydrant Coverage plan, which displays the City's largest fire engine circulating throughout the site as well as the coverage distance of each onsite hydrant.

The applicant does not propose any modifications to site access, or parking/loading areas. The applicant states that the proposed project is an unmanned facility, requiring monthly, quarterly, and annual routine maintenance by 1–3 trained personnel. They also assert that any construction-related disruptions will be minor and temporary.

Hydrogen Facility:
The proposed hydrogen production and storage facility will be installed within the existing gravel area located east of the existing onsite propane tanks. The proposed 2,208 square foot (24'x92') building largely reflects the existing structures on the subject property, with proposed exterior metal siding and a standing seam metal roof. Provided floor plans show a large open area for plant equipment as well as a small office space and a restroom. Additional hydrogen plant process equipment is shown to be installed north and east of the proposed building. An outdoor aggregate containment structure is also noted with the proposal.

The hydrogen facility will consist of the electrolyzer, balance of plant, water treatment system, blending infrastructure, and compression and storage systems. The hydrogen facility is an unmanned facility that will operate continuously, except during occasional periods of scheduled maintenance. The facility will be monitored remotely 24/7 by trained staff at CenterPoint Energy's Gas Control Center in Minneapolis.

Major components of the hydrogen facility include: RODI skid, water and oxygen separation skid, electrolyzer stack, power supply and rectifier skid, cooling systems, hydrogen handling and compression equipment, PLC control system, power distribution equipment, backup generator, Hydrogen gas compressor, and mobile hydrogen storage. The mobile hydrogen storage unit will have a maximum storage capacity of 146 kg of hydrogen at 6500 psi and is designed to be towed by commercial transport.

The proposed building for the hydrogen facility will require both water and sanitary municipal services. During normal continuous operation, the hydrogen facility is expected to consume approximately 2 gallons of water per minute (2,880 gallons/day or 86,400 gallons/month). The water treatment skid will discharge approximately 1 gallon of wastewater per minute, while the remaining gallon is consumed in the production of hydrogen (1,440 gallons/day or 43,200 gallons/month). For context, the proposed water usage is similar to other heavy industrial uses within Mankato and Mankato's Water Treatment plant is designed to treat up to 12 million gallons of water per day.*

All outside mechanical equipment associated with the hydrogen power facility will be sufficiently screened from the Public ROW by fencing.

The applicant states that the proposed hydrogen plant will be operated and maintained in a similar way to a comparable hydrogen blending facility operational in Minneapolis since 2022.

The applicant has provided a Photometric Plan for the proposed exterior safety lighting associated with the hydrogen facility.

Solar Array:
The solar panel array will consist of approximately 2,120 individual 590W panels on roughly 3.2 acres of land west of the current CenterPoint Energy facility at 2400 N. Riverfront Drive. Panels are proposed to sit approximately 8 feet above grade (at their highest point) and will be fixed with a 20-degree tilt to steel racking, which itself will be attached to steel-driven posts embedded into the soil. The panels themselves will be silicon-based with an anti-reflective coating to reduce glare. Aside from the panels themselves, the array will include inverters, switchgear and a transformer. The applicant intends the solar panel array to be accessible through a locked gate near the southwestern corner of the property. The proposed cover plantings (ground cover) inside the solar array footprint will consist of a combination of low-growth natives and a pollinator-friendly seed mix. Maintenance of the site vegetation will be managed by a qualified third-party vendor that will ensure pollinator-friendly vegetation is maintained, and noxious weeds are removed.

The applicant proposes to erect a 7-foot-tall chain-link perimeter fence around the solar panel array in order to restrict access to the facility.

The onsite solar panel array is expected to operate on the property in the interim for a 25-year term. The applicant states that they are currently coordinating with Xcel Energy, regarding how the solar array will interact with the local grid when power production exceeds demand from the hydrogen facility.

A decommissioning plan estimate has been provided by the applicant that depicts the assumed costs of decommissioning the solar site if/when it is no longer utilized. The applicant acknowledges that they will be responsible for costs associated with decommissioning the system and restoring the site at the end of its service life / end of use. The solar panel array will be decommissioned, and the site restored to a condition comparable to its pre-conditional condition once the equipment reaches the end of its useful service life, unless a plan is submitted to the City of Mankato to "repower" the facility. A financial surety will be provided to the City of Mankato to ensure decommissioning of the equipment. The hydrogen facility can operate independently of the solar panel array and is not expected to be decommissioned alongside the solar array.

The applicant intends to screen the solar facility from public right-of-ways by planting six Blue Spruce along the southern property boundary. The applicant had attested that the existing berm area for the rail line provides screening of the panel and that excessive screening may reduce the effectiveness of the solar array. The applicant does not intend to remove any trees or existing vegetative screening with the proposed project.

Glare Study:
The applicant has provided a Glare Study for all proposed site improvements. Said Glare Study noted that the proposed solar array would create (9) locations for potential glare (see page 1 & 2). Specifically, "*glare with potential for temporary after-image*", also known as "flash blindness". The aforementioned Glare Study depicts

both areas of potential green and yellow glare (defined on page 53). The applicant hired, Muska Electric, notes that yellow glare is of higher concern. Following comment from previous Site Plan Review, the applicant has provided an updated narrative from Muska Electric that adds additional clarification. The applicant states that the glare study analysis excludes the screening benefits provided by any newly planted trees or by the rail spur and its earthen berm. It is their belief that these site features would provide additional screening of the panels from the Hwy 14 ROW.

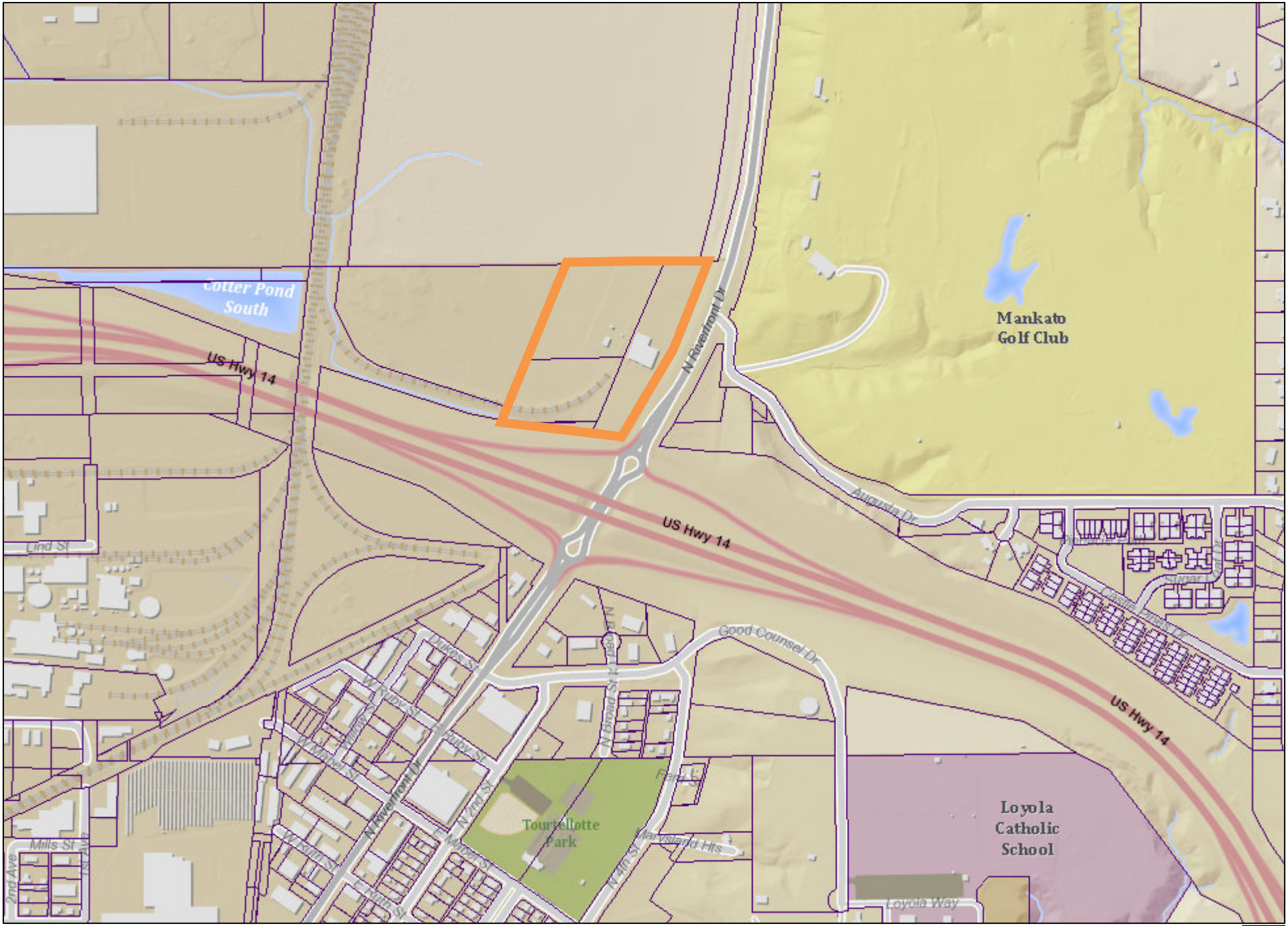
The applicant has attested that they are coordinating with MnDOT Staff, specifically Rylan Juran of the Office of Aetonautics, and Scott Thompson, the District 7 Traffic Engineer. The applicant shall ensure that any conditions conveyed by MnDOT shall be met prior to building permit submittal.

Noise Assessment:
The applicant has provided a pre-construction noise study/assessment of the proposed project. The applicant states that operational project noise levels were shown to be less than 50 dBA at the nearest residential and recreational property lines for both daytime and nighttime hours, which the applicant indicates achieves the MPCA limits noise levels for residential locations to 50 dBA or less during nighttime hours per (Minn. R. 7030.0040).

Attachments

General Location Map
Aerial
Approved Preliminary Plat
Final Plat
Site Plan
Site Plan - Hydrogen Plant
Exterior Elevations
Floor Plans
Renderings
Grading Plan
Utility Plan
Narrative
Project Detail Narrative
Screening Plan
Fire Access & Hydrant Coverage Plan
Existing Conditions
Plan Details
Photometric Plan
Misc Details
Wetland -NOD
Solar Decommissioning Estimate & Narrative
NRHP Narrative
Glare Study
Noise Study
Drainage Study
Developable Area Map
June Site Plan Comment Response Letter

General Location Map



Date: February 2026

Author:

This information is to be used for reference purposes only. The City of Mankato does not guarantee accuracy of the material contained herein and is not responsible for misuse or misinterpretation.

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Aerial Map



Date: February 2026

Author:

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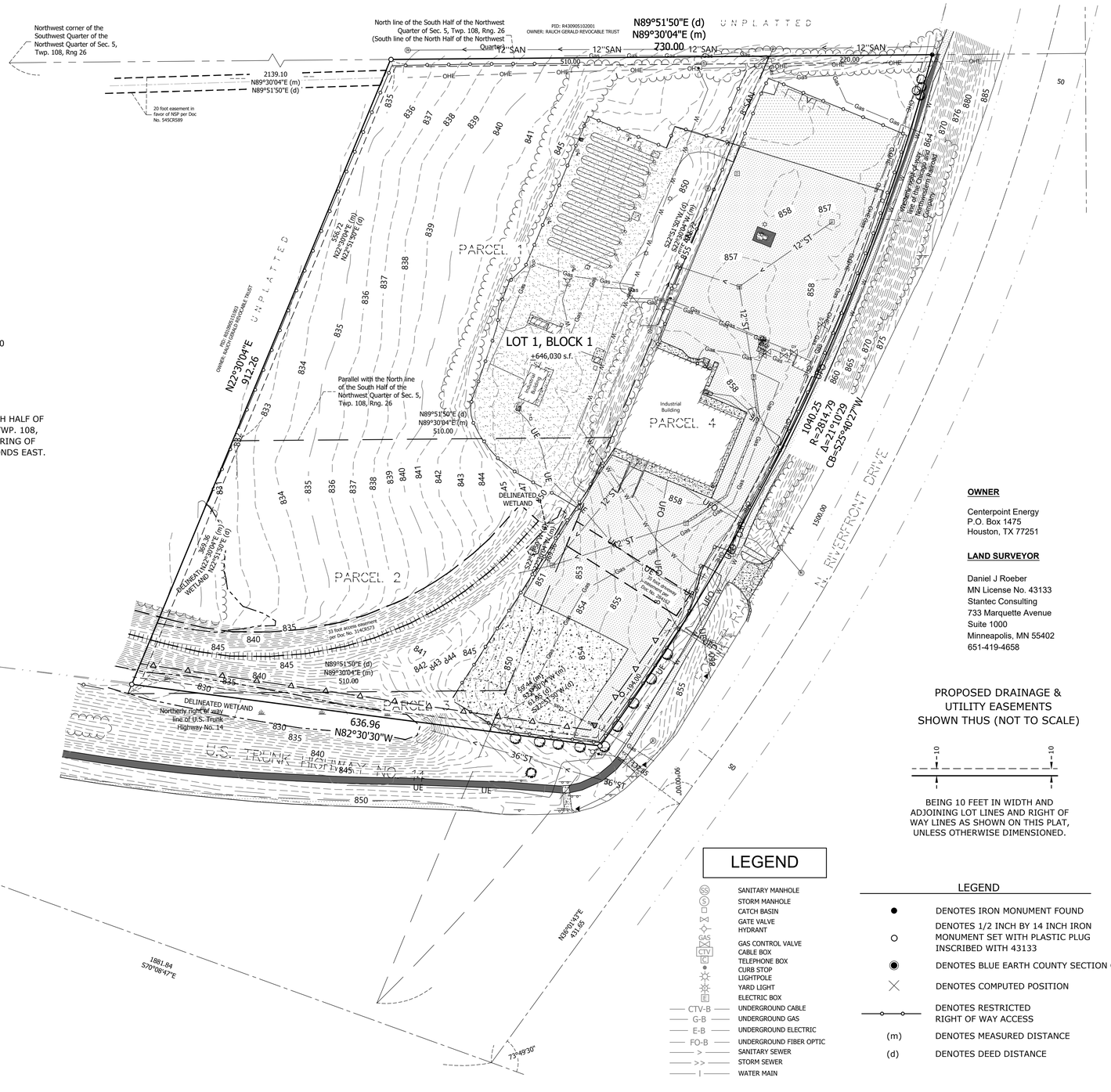
THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. DO NOT SCALE THE DRAWING. ANY ERRORS, OR OMISSIONS SHALL BE REPORTED TO STANTEC WITHOUT DELAY. THE COPYRIGHTS TO ALL DESIGNS AND DRAWINGS ARE THE PROPERTY OF STANTEC. REPRODUCTION OR USE FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY STANTEC IS FORBIDDEN.

PRELIMINARY PLAT
of
CNP MANKATO FIRST ADDITION



0 80 160

GRAPHIC SCALE IN FEET
1 inch = 80 feet

BEARING ORIENTATION

BASED ON THE NORTH LINE OF THE SOUTH HALF OF THE NORTHWEST QUARTER OF SEC. 5, TWP. 108, RNG. 26, WHICH HAS AN ASSUMED BEARING OF SOUTH 89 DEGREES 51 MINUTES 50 SECONDS EAST.

OWNER

Centerpoint Energy
P.O. Box 1475
Houston, TX 77251

LAND SURVEYOR

Daniel J Roeber
MN License No. 43133
Stantec Consulting
733 Marquette Avenue
Suite 1000
Minneapolis, MN 55402
651-419-4658

PROPOSED DRAINAGE & UTILITY EASEMENTS SHOWN THUS (NOT TO SCALE)

10 10

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

LEGEND

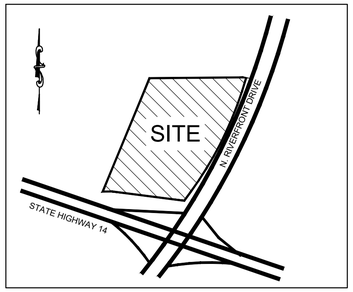
- SS — SANITARY MANHOLE
- S — STORM MANHOLE
- CB — CATCH BASIN
- GV — GATE VALVE
- HYDRANT
- GAS — GAS CONTROL VALVE
- CTV — CABLE BOX
- TELEPHONE BOX
- CURB STOP
- LIGHTPOLE
- YARD LIGHT
- ELECTRIC BOX
- CTV-B — UNDERGROUND CABLE
- G-B — UNDERGROUND GAS
- E-B — UNDERGROUND ELECTRIC
- FO-B — UNDERGROUND FIBER OPTIC
- > — SANITARY SEWER
- >> — STORM SEWER
- I — WATER MAIN

LEGEND

- ● — DENOTES IRON MONUMENT FOUND
- ○ — DENOTES 1/2 INCH BY 14 INCH IRON MONUMENT SET WITH PLASTIC PLUG INSCRIBED WITH 43133
- ◉ — DENOTES BLUE EARTH COUNTY SECTION CORNER
- × — DENOTES COMPUTED POSITION
- DENOTES RESTRICTED RIGHT OF WAY ACCESS
- (m) — DENOTES MEASURED DISTANCE
- (d) — DENOTES DEED DISTANCE

LOCATION MAP

NOT TO SCALE



LAND DESCRIPTION

PARCEL 1:
All that part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West described as: Commencing at the northwest corner of the Southwest Quarter of the Northwest Quarter of Section 5; thence North 89 degrees, 51 minutes, 50 seconds East (assumed bearing) along the North line of the South Half of the Northwest Quarter of Section 5, a distance of 2139.10 feet to a point 220.00 feet West of the westerly right-of-way line of the Chicago and Northwestern Railway Company, said point being the point of beginning; thence South 22 degrees, 51 minutes, 50 seconds West, 556.72 feet; thence South 89 degrees, 51 minutes, 50 seconds West and parallel with the North line of the South Half of the Northwest Quarter of Section 5, a distance of 510.00 feet; thence North 22 degrees, 51 minutes, 50 seconds East, 556.72 feet to a point on the North line of the South Half of the Northwest Quarter of Section 5; thence North 89 degrees, 51 minutes, 50 seconds East along said North line, 510.00 feet to the point of beginning.

PARCEL 2:

All that part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West described as: Commencing at the northwest corner of the Southwest Quarter of the Northwest Quarter of Section 5; thence North 89 degrees, 51 minutes, 50 seconds East (assumed bearing) along the North line of the South Half of the Northwest Quarter of Section 5, a distance of 2139.10 feet to a point 220.00 feet West of the westerly right-of-way line of the Chicago and Northwestern Railroad Company; thence South 22 degrees, 51 minutes, 50 seconds West, 556.72 feet to the point of beginning; thence continuing South 22 degrees, 51 minutes, 50 seconds West, 369.36 feet; thence South 89 degrees, 51 minutes, 50 seconds West and parallel with the North line of the South Half of the Northwest Quarter of Section 5, a distance of 510.00 feet; thence North 22 degrees, 51 minutes, 50 seconds East, 369.36 feet; thence North 89 degrees, 51 minutes, 50 seconds East and parallel with the North line of the South Half of the Northwest Quarter of Section 5, a distance of 510.00 feet to the point of beginning.

PARCEL 3:

A tract of land located in the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West, described as follows: A triangular tract of land lying northerly of the northerly right of way line of new Minnesota Trunk Highway No. 14 described as:
Commencing at the northwest corner of the Southwest Quarter of the Northwest Quarter of Section 5, Township 108 North. Range 26 West: thence North 89 degrees 51 minutes 50 seconds East (assumed bearing) along the North line of the South Half of the Northwest Quarter of Section 5, a distance of 2139.10 feet to a point 220.00 feet West of the westerly right of way line of the Chicago and Northwestern Railroad Company; thence South 22 degrees 51 minutes 50 seconds West, 926.08 feet to a found ½" I.D. iron pipe survey marker, said point being the point of beginning; thence continuing South 22 degrees 51 minutes 50 seconds West, 61.95 feet to a point on the northerly right of way line of new U.S. Trunk Highway No. 14; thence North 82 degrees 17 minutes 15 seconds West along said right of way line, 417.60 feet; thence North 89 degrees 51 minutes 50 seconds East 437.89 feet to the point of beginning.

PARCEL 4:

That part lying within the Southeast Quarter of the Northwest Quarter, Section 5, Township 108 North, Range 26 West of the parcel of land described as follows: Commencing at a point on the South line of the North Half of the Northwest Quarter of Section 5, in Township 108 North, Range 26, where the said line intersects the westerly line of the right-of-way the Chicago and North Western Railway Company and thence following in and on the westerly line of said railway right-of-way in a southerly and westerly direction distance of 1500 feet; thence in a straight line northerly and to a point on the south line of the North Half of the Northwest Quarter of Section 5, in Township 108 North of Range 26 West, 220 feet West from the point of commencement; thence east along said last mentioned line a distance of 220 feet to the point of commencement.

MISCELLANEOUS NOTES

1. The property described and easements shown hereon is the same as the property described in the title commitment, prepared by Commonwealth Land Title Insurance Company, (Issuing Agent, The Title Team), Commitment No. MA 250043, with a Commitment Date of November 7, 2025 at 7:00 AM.
2. The subject property contains ±14.83 acres (±646,030 square feet).
3. Topographic information shown provided by IMEG with a topographic survey date of October 21, 2025.
4. Wetlands shown per Wetland Delineation Report prepared by ERM dated October 9, 2025.
5. Current Zoning per City of Mankato (Blue Earth County) GIS map = M-2 Heavy Industrial.
6. Setback information provided by the City of Mankato:
   - 6.1. Setback - Impervious Parking/Storage:
     - 6.1.1. Front yard: 15 feet
     - 6.1.2. Side yard: 6 feet
     - 6.1.3. Rear yard: Not Required
     - 6.1.4. Transitional yard: NA
   - 6.2. Setback - Building:
     - 6.2.1. Front yard: 30 feet
     - 6.2.2. Side yard: 15 feet
     - 6.2.3. Rear yard: Not Required
     - 6.2.4. Transitional yard: NA

ITEMS CORRESPONDING TO SCHEDULE B

3 Easement dated June 23, 1949, recorded March 17, 1950, in Book 8, Page 369, as Document No. 216278.
a. Partial Release of Easement dated October 21, 2015, recorded December 1, 2015, as Document No. 545CR589. *(SHOWN ON SURVEY. DOES NOT AFFECT SUBJECT PROPERTY)*
4. Easement in Deed, dated September 29, 1945, recorded September 29, 1945, in Book 133, Page 293 as Document No. 199854. *(BLANKET EASEMENT SUBJECT TO PARCEL 4).*
5. Agreement dated July 30, 1970, recorded August 5, 1970, as Document No. Doc No. 284162. *(SUBJECT TO PARCEL 4. SHOWN ON SURVEY)*
6. Easement dated November 3, 1977, recorded November 3, 1977, as Document No. 316320. *(DOES NOT AFFECT SUBJECT PROPERTY AS IT APPEARS TO DESCRIBE AN AREA SOUTH OF NEW U.S. HIGHWAY 14).*
7. Agreement dated November 7, 1972, recorded August 3, 1990, as Document No. 314CR573. *(SHOWN ON SURVEY).*

Stantec
Minneapolis Office
733 Marquette Ave
Suite 1000
Minneapolis, MN 55402
Phone: 612-712-2000
Website:www.stantec.com

REVISION	DATE
Added Drainage & Utility Easement	Feb. 16, 2026
Update per City Comments	Feb. 22, 2026
Update Boundary	May 14, 2026
Update Wetlands	May 18, 2026

SURVEY BY :
DRAWN BY : DJR
DESIGNED BY :
CHECKED BY :
APPROVED BY :
DATE : JANUARY 26, 2026

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 LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.
PRINT NAME: DANIEL J ROEBER
SIGNATURE:
DATE: JANUARY 26, 2026
LIC. NO. 43133

CNP MANKATO FIRST ADDITION
PRELIMINARY PLAT
CenterPoint Energy

193807564 V401
PROJECT NUMBER
193807564
SHEET NUMBER
V4.01

Plot Date: 05/19/2026 - 2:29pm
Drawing name: \\us029-spfs01\shared_projects\193807564\CAD\Dwg\193807564 V401.dwg
Xrefs: 193807564 IMEG_TOPO

CENTERPOINT ENERGY MANKATO FIRST ADDITION

KNOW ALL PERSONS BY THESE PRESENTS: That CenterPoint Energy Resources Corp d/b/a CenterPoint Energy Minnesota Gas, owner of the following described property situated in the County of Blue Earth, State of Minnesota, to wit:

All that part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West described as: Commencing at the northwest corner of the Southwest Quarter of the Northwest Quarter of Section 5; thence North 89 degrees, 51 minutes, 50 seconds East (assumed bearing) along the North line of the South Half of the Northwest Quarter of Section 5, a distance of 2139.10 feet to a point 220.00 feet West of the westerly right-of-way line of the Chicago and Northwestern Railway Company, said point being the point of beginning; thence South 22 degrees, 51 minutes, 50 seconds West, 556.72 feet; thence South 89 degrees, 51 minutes, 50 seconds West and parallel with the North line of the South Half of the Northwest Quarter of Section 5, a distance of 510.00 feet; thence North 22 degrees, 51 minutes, 50 seconds East, 556.72 feet to a point on the North line of the South Half of the Northwest Quarter of Section 5; thence North 89 degrees, 51 minutes, 50 seconds East along said North line, 510.00 feet to the point of beginning.
AND
All that part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West described as: Commencing at the northwest corner of the Southwest Quarter of the Northwest Quarter of Section 5; thence North 89 degrees, 51 minutes, 50 seconds East (assumed bearing) along the North line of the South Half of the Northwest Quarter of Section 5, a distance of 2139.10 feet to a point 220.00 feet West of the westerly right-of-way line of the Chicago and Northwestern Railroad Company; thence South 22 degrees, 51 minutes, 50 seconds West, 556.72 feet to the point of beginning; thence continuing South 22 degrees, 51 minutes, 50 seconds West, 369.36 feet; thence South 89 degrees, 51 minutes, 50 seconds West and parallel with the North line of the South Half of the Northwest Quarter of Section 5, a distance of 510.00 feet; thence North 22 degrees, 51 minutes, 50 seconds East, 369.36 feet; thence North 89 degrees, 51 minutes, 50 seconds East and parallel with the North line of the South Half of the Northwest Quarter of Section 5, a distance of 510.00 feet to the point of beginning.
AND
A tract of land located in the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West, described as follows: A triangular tract of land lying northerly of the northerly right of way line of new Minnesota Trunk Highway No. 14 described as:
Commencing at the northwest corner of the Southwest Quarter of the Northwest Quarter of Section 5, Township 108 North. Range 26 West: thence North 89 degrees 51 minutes 50 seconds East (assumed bearing) along the North line of the South Half of the Northwest Quarter of Section 5, a distance of 2139.10 feet to a point 220.00 feet West of the westerly right of way line of the Chicago and Northwestern Railroad Company; thence South 22 degrees 51 minutes 50 seconds West, 926.08 feet to a found ½'' I.D. iron pipe survey marker, said point being the point of beginning; thence continuing South 22 degrees 51 minutes 50 seconds West, 61.95 feet to a point on the northerly right of way line of new U.S. Trunk Highway No. 14; thence North 82 degrees 17 minutes 15 seconds West along said right of way line, 417.60 feet; thence North 89 degrees 51 minutes 50 seconds East 437.89 feet to the point of beginning.
AND
That part lying within the Southeast Quarter of the Northwest Quarter, Section 5, Township 108 North, Range 26 West of the parcel of land described as follows: Commencing at a point on the South line of the North Half of the Northwest Quarter of Section 5, in Township 108 North, Range 26, where the said line intersects the westerly line of the right-of-way the Chicago and North Western Railway Company and thence following in and on the westerly line of said railway right-of-way in a southerly and westerly direction distance of 1500 feet; thence in a straight line northerly and to a point on the south line of the North Half of the Northwest Quarter of Section 5, in Township 108 North of Range 26 West, 220 feet West from the point of commencement; thence east along said last mentioned line a distance of 220 feet to the point of commencement. Said area lying northerly right of way line of new U.S. Trunk Highway No. 14.

Has caused the same to be surveyed and platted as CENTERPOINT ENERGY MANKATO FIRST ADDITION and do hereby dedicate to the public for public use the public ways and the easements for drainage and utility purposes as created by this plat.

In witness whereof said CenterPoint Energy Resources Corp d/b/a CenterPoint Energy Minnesota Gas, has caused these presents to be signed by its proper officer this _____ day of _____, 20_____.

Signed: CenterPoint Energy Resources Corp d/b/a CenterPoint Energy Minnesota Gas

By: _____
_____ as _____

STATE OF _____
COUNTY OF _____

This instrument was acknowledged before me on this _____ day of _____, 20_____ by _____ as _____, of CenterPoint Energy Resources Corp d/b/a CenterPoint Energy Minnesota Gas.

_____(Notary Signature)

_____(Notary Printed Name)

Notary Public, _____County, State of _____

My Commission Expires _____

SURVEYOR'S CERTIFICATE

I, Daniel J. Roeber, 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_____ .

_____

Daniel J. Roeber, Licensed Land Surveyor
Minnesota License Number 43133

STATE OF MINNESOTA
COUNTY OF _____

This instrument was acknowledged before me on this _____ day of _____, 20_____, by Daniel J. Roeber, a Licensed Land Surveyor.

_____(Notary Signature)

_____(Notary Printed Name)

Notary Public, _____ County, State of Minnesota

My Commission Expires _____

APPROVALS

PLANNING COMMISSION

Be it known that on this _____ day of _____, 20_____, the Planning Commission of the City of Mankato did duly review this plat of CENTERPOINT ENERGY MANKATO FIRST ADDITION.

By _____ Chairperson By _____ Secretary:

CITY COUNCIL OF CITY OF MANKATO, MINNESOTA

Be it known that on this _____ day of _____, 20_____, the City Council of the City of Mankato did duly approve this plat of CENTERPOINT ENERGY MANKATO FIRST ADDITION, and that, as per Minnesota Statutes, Section 505.03, Subd. 2, this plat has been submitted to and written comments and recommendations have been received from the Blue Earth Highway Engineer and the Commissioner of Transportation.

By _____ Mayor: By _____ Secretary:

TITLE OPINION

I, _____, Licensed Attorney, State of Minnesota, do hereby certify that the owner as indicated hereon represents all ownership interest in the land encompassed by this plat.

By _____ , Licensed Attorney By _____
(signature) (printed name)

BLUE EARTH COUNTY PROPERTY AND ENVIRONMENTAL RESOURCES

I hereby certify that there are no delinquent taxes and/or delinquent special assessments, that the current taxes have been paid and that the transfer has been entered on the land described herein on the _____ day of _____, 20_____.

_____
Blue Earth County Property and Environmental Resources Director

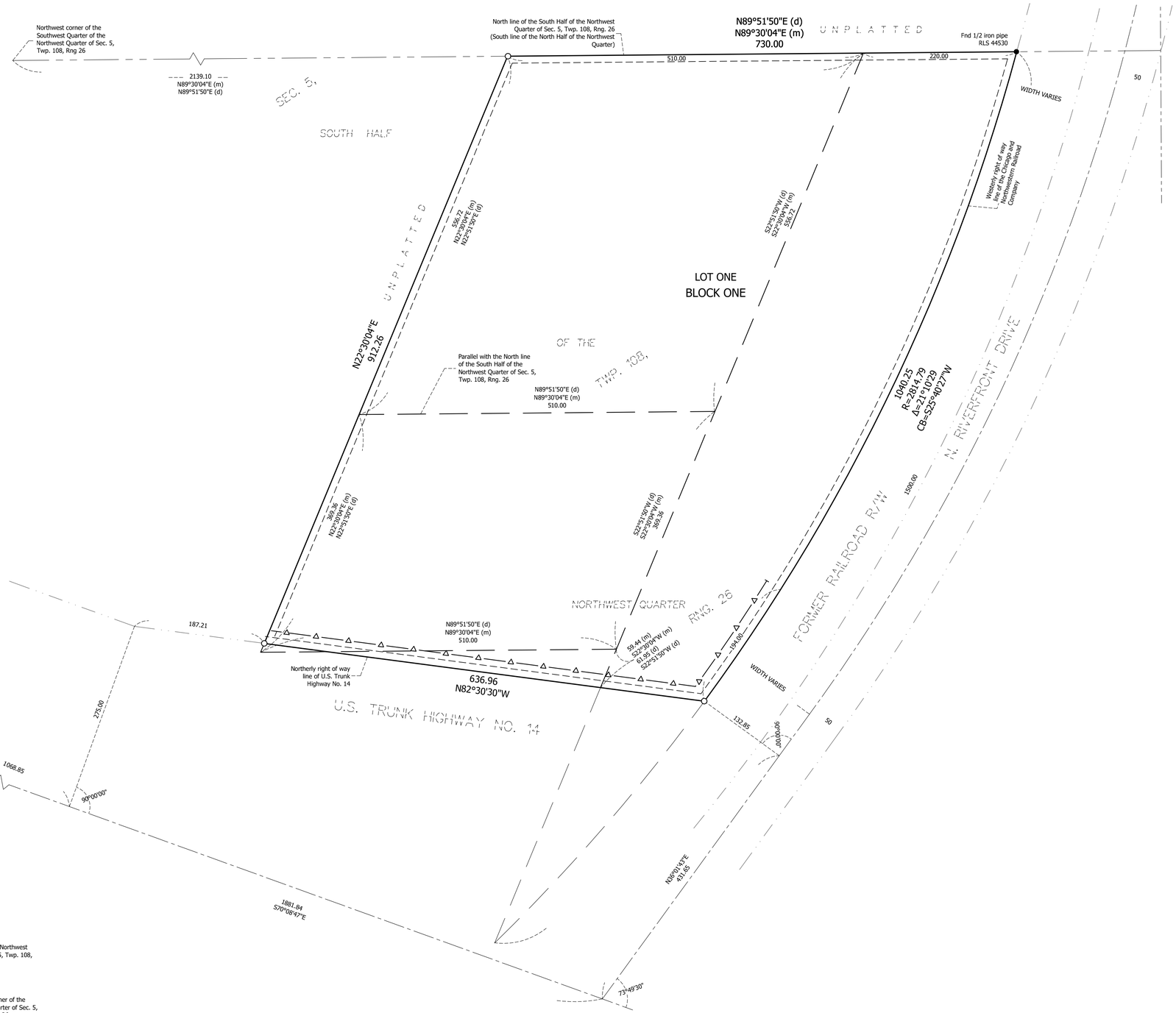
COUNTY RECORDER

I hereby certify that this instrument was filed in my office for record on this, the _____ day of _____, 20_____, at _____o'clock ___M., and that was duly recorded on _____ Plats, Number _____.

_____
Blue Earth County Recorder

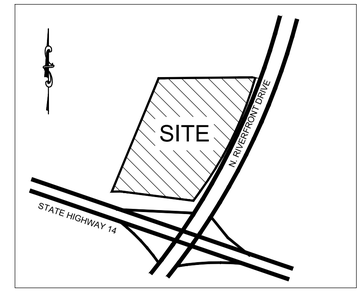
Stantec

CENTERPOINT ENERGY MANKATO FIRST ADDITION



LOCATION MAP

NOT TO SCALE



0 80 160

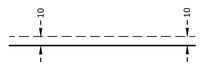
GRAPHIC SCALE IN FEET
1 inch = 80 feet

BEARING ORIENTATION

BASED ON THE NORTH LINE OF THE SOUTH HALF OF THE NORTHWEST QUARTER OF SEC. 5, TWP. 108, RNG. 26, WHICH HAS AN ASSUMED BEARING OF SOUTH 89 DEGREES 51 MINUTES 50 SECONDS EAST.

DRAINAGE & UTILITY EASEMENTS SHOWN THUS:

(NOT TO SCALE)



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

LEGEND

●	DENOTES IRON MONUMENT FOUND
○	DENOTES 1/2 INCH BY 14 INCH IRON PIPE MONUMENT SET WITH PLASTIC PLUG INSCRIBED WITH "STANTEC 43133", IN ACCORDANCE WITH MN STATE STATUTE 505.021, SUBD. 10.
-△——△-	DENOTES RESTRICTED RIGHT OF WAY ACCESS
(m)	DENOTES MEASURED DISTANCE
(d)	DENOTES DEED DISTANCE

Stantec



SITE PLAN LEGEND

- PROPERTY BOUNDARY LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC CABLE
- EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING CONCRETE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED SOLAR PANEL ARRAYS
- PHASE 1 CONSTRUCTION AREA
- PHASE 2 CONSTRUCTION AREA
- IMPERVIOUS AREA SETBACK
- BUILDING SETBACK

NOTES:

1. THE PROPERTY DESCRIBED AND EASEMENTS SHOWN HEREON IS THE SAME AS THE PROPERTY DESCRIBED IN THE TITLE COMMITMENT, PREPARED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY, (ISSUING AGENT, THE TITLE TEAM), COMMITMENT NO. MA 250043, WITH A COMMITMENT DATE OF NOVEMBER 7, 2025 AT 7:00 AM.
2. THE SUBJECT PROPERTY CONTAINS ±14.83 ACRES (±646,030 SQUARE FEET).
3. WETLANDS SHOWN PER WETLAND DELINEATION REPORT PREPARED BY ERM DATED OCTOBER 9, 2025.
4. CURRENT ZONING PER CITY OF MANKATO (BLUE EARTH COUNTY) GIS MAP = M-2 HEAVY INDUSTRIAL.
5. TOPOGRAPHIC SURVEY COMPLETED BY IMEG ON OCTOBER 21, 2025.
6. SOLAR LAYOUT PROVIDED BY VERSIRIS ENERGY DATED DECEMBER 29, 2025.
7. BUILDING LAYOUT PROVIDED BY STANDBY SYSTEMS DATED APRIL 30, 2026.
8. TREES ALONG EDGE OF GRAVEL AND ADJACENT TO EXISTING BUILDING ARE SCHEDULED FOR REMOVAL PRIOR TO PROJECT CONSTRUCTION
9. APPROXIMATE HYDRANT AND TIE-IN LOCATION BASED ON CITY UTILITY MAP AND PREVIOUS AS-BUILT SURVEY.

EXISTING ZONING	M-2 HEAVY INDUSTRIAL DISTRICT	
	REQUIRED	PROVIDED
MINIMUM LOT WIDTH	100 FT	1034 FT
FRONT YARD SETBACK (IMPERVIOUS)	15 FT	306 FT
FRONT YARD SETBACK (BUILDING)	30 FT	110 FT
SIDE YARD SETBACK (IMPERVIOUS)	6 FT	329 FT
SIDE YARD SETBACK (BUILDING)	15 FT	51 FT
REAR YARD SETBACK	NONE	NONE
BUILDING HEIGHT	NONE	NONE

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

OVERALL SITE PLAN

DRAWING NO. C4

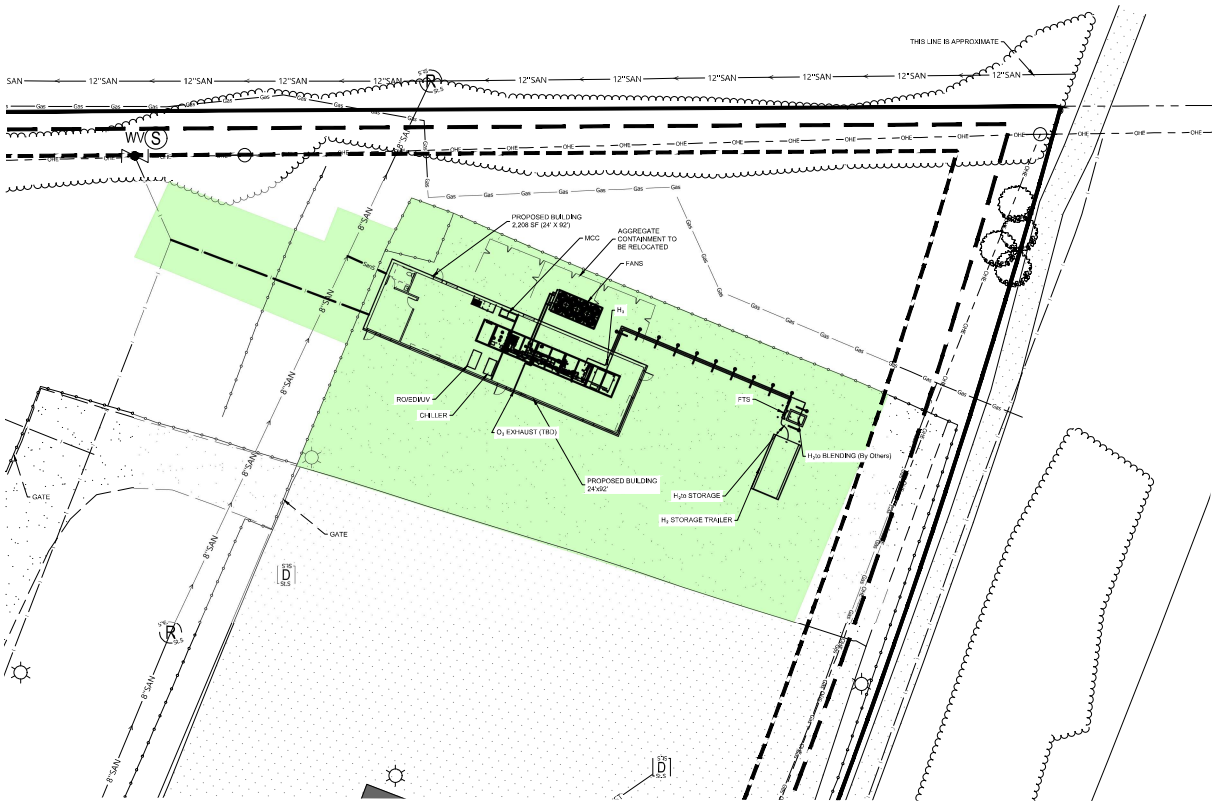
MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV. 0

SCALE	DESIGNED BY	PROJECT NUMBER	SHEET NO.
1" = 60'	WS	0764026	C4.01
DATE DRAWN: 05/26/2026	DRAWN BY: JB		

Environmental Resources Management, Inc.

FILE PATH: C:\Users\jessica.bell\OneDrive - ERM\04 Mankato Hydrogen Plant_CAD\CUP\PhaseC_Site Plan.dwg DWG By: Jessica Bell



N

SCALE 1" = 20'

0 20 40 60 FEET

SITE PLAN LEGEND

- PROPERTY BOUNDARY LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC CABLE
- EXISTING SEWER LINE
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- PROPOSED FENCE
- PROPOSED SOLAR PANEL ARRAYS
- PHASE 1 CONSTRUCTION AREA
- PHASE 2 CONSTRUCTION AREA
- IMPERVIOUS AREA SETBACK
- BUILDING SETBACK

NOTES:

1. THE PROPERTY DESCRIBED AND EASEMENTS SHOWN HEREON IS THE SAME AS THE PROPERTY DESCRIBED IN THE TITLE COMMITMENT, PREPARED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY, (ISSUING AGENT, THE TITLE TEAM), COMMITMENT NO. MA 250043, WITH A COMMITMENT DATE OF NOVEMBER 7, 2025 AT 7:00 AM.
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3. WETLANDS SHOWN PER WETLAND DELINEATION REPORT PREPARED BY ERM DATED OCTOBER 9, 2025.
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9. APPROXIMATE HYDRANT AND TIE-IN LOCATION BASED ON CITY UTILITY MAP AND PREVIOUS AS-BUILT SURVEY.

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

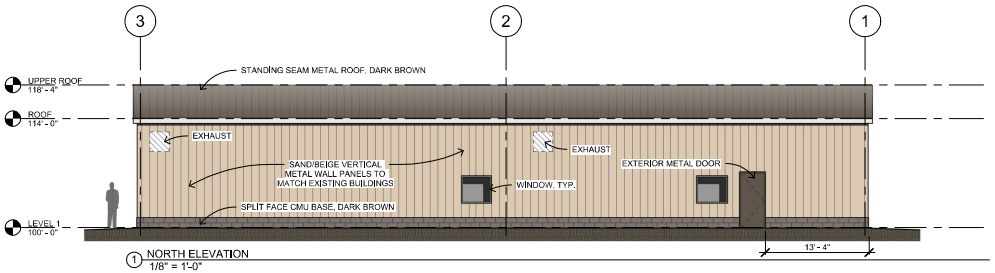
ERM

SITE PLAN - INSET

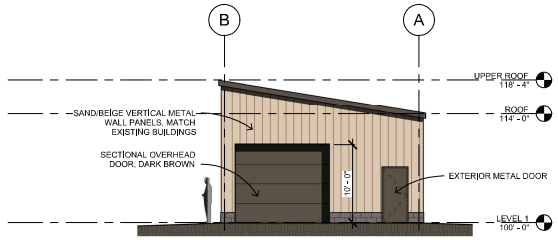
MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

SCALE 1" = 20'	DESIGNED BY WS	PROJECT NUMBER 0764026	DISCIPLINE NO. C4
DATE DRAWN 05/26/2026	DRAWN BY JB		REV. 0
			SHEET NO. C4.02

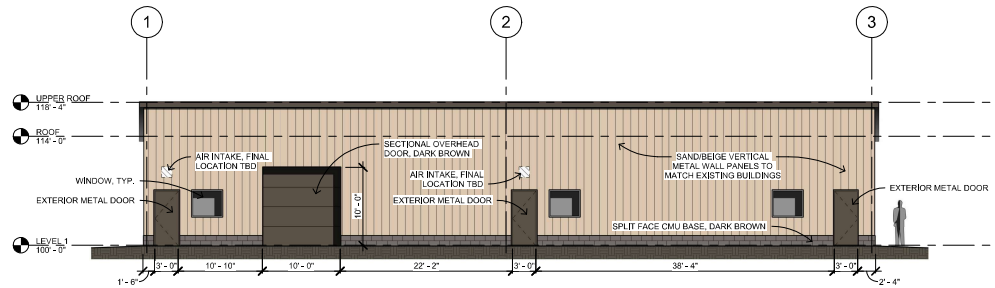
Environmental Resources Management, Inc.



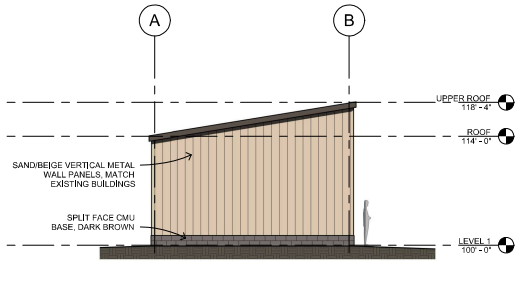
1 NORTH ELEVATION
1/8" = 1'-0"



2 EAST ELEVATION
1/8" = 1'-0"



3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

BLOOM HAY DOBBS

MIDTOWN COMMONS

2324 UNIVERSITY AVE W, SUITE 200, ST. PAUL, MN 55114

PH. 612.338.4590

CENTERPOINT ENERGY - MANKATO
2400 N RIVERFRONT DR, MANKATO, MN 56001
CONTACT: DENNIS DAAS
PHONE: (651) 270-0050

CONSULTANT

PROJECT NAME: CENTERPOINT ENERGY - MANKATO GREEN HYDROGEN
PROJECT NUMBER: 18009.008
DATE: 03/27/2026

REVISIONS

NUMBER	DESCRIPTION	DATE

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 ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME

SIGNATURE

LICENSE NO.

03/27/2026

DATE

DRAFT
FOR DISCUSSION ONLY

Not For Construction

SHEET TITLE:

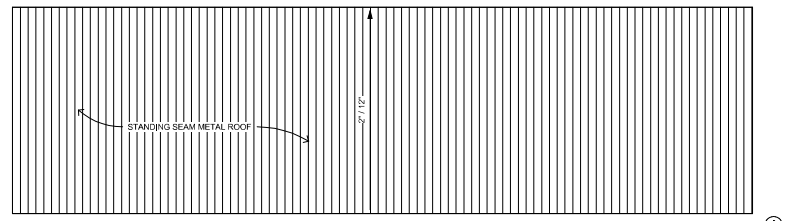
BUILDING ELEVATIONS

SHEET NUMBER:

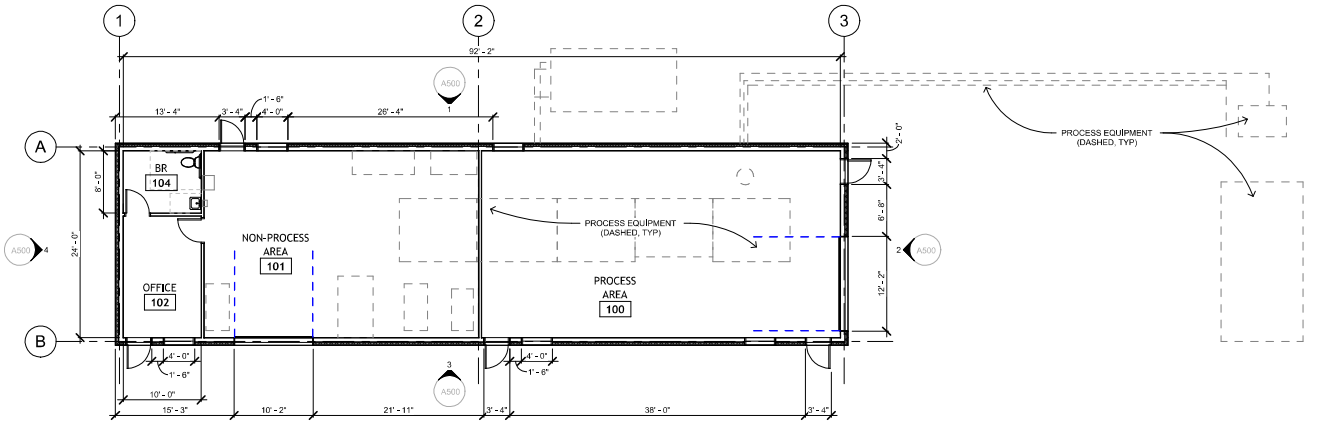
A500

3/27/2026 3:27:31 PM © BLOOM HAY DOBBS, CONTRACTOR
H:_18000.000 - 2018\18009.008 - CTRP - Mankato\Drawings and Graphics\REVIT\CenterPoint Mankato.rvt

3/27/2026 3:27:26 PM E:\2026 Mr. Docs\...



2 ROOF PLAN
1/8" = 1'-0"



1 LEVEL 1 FLOOR PLAN
1/8" = 1'-0"

BLOOM HAY DOBBS

MIDTOWN COMMONS

2324 UNIVERSITY AVE W, SUITE 200, ST. PAUL, MN 55114

PH. 612.338.4590

CENTERPOINT ENERGY - MANKATO
2400 N RIVERFRONT DR, MANKATO, MN 56001
CONTACT: DENNIS DAAS
PHONE: (651) 270-0050

CONSULTANT

PROJECT NAME: CENTERPOINT ENERGY - MANKATO GREEN HYDROGEN
PROJECT NUMBER: 18009.008
DATE: 03/27/2026

REVISIONS

NUMBER	DESCRIPTION	DATE

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 ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME

SIGNATURE

LICENSE NO.

03/27/2026
DATE

DRAFT
FOR DISCUSSION ONLY

Not For Construction

SHEET TITLE:

FLOOR PLAN AND ROOF PLAN

SHEET NUMBER:

A210

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CenterPoint Energy

Mankato Hydrogen Energy Plant Project

CUP / Final Plat Application – May 2026

Visual Rendering
Overhead

Looking North



ERM

CenterPoint Energy

Mankato Hydrogen Energy Plant Project

CUP / Final Plat Application – May 2026

Visual Rendering
Overhead

Looking East



ERM

CenterPoint Energy

Mankato Hydrogen Energy Plant Project

CUP / Final Plat Application – May 2026

Visual Rendering
Overhead

Looking South



ERM

CenterPoint Energy

Mankato Hydrogen Energy Plant Project

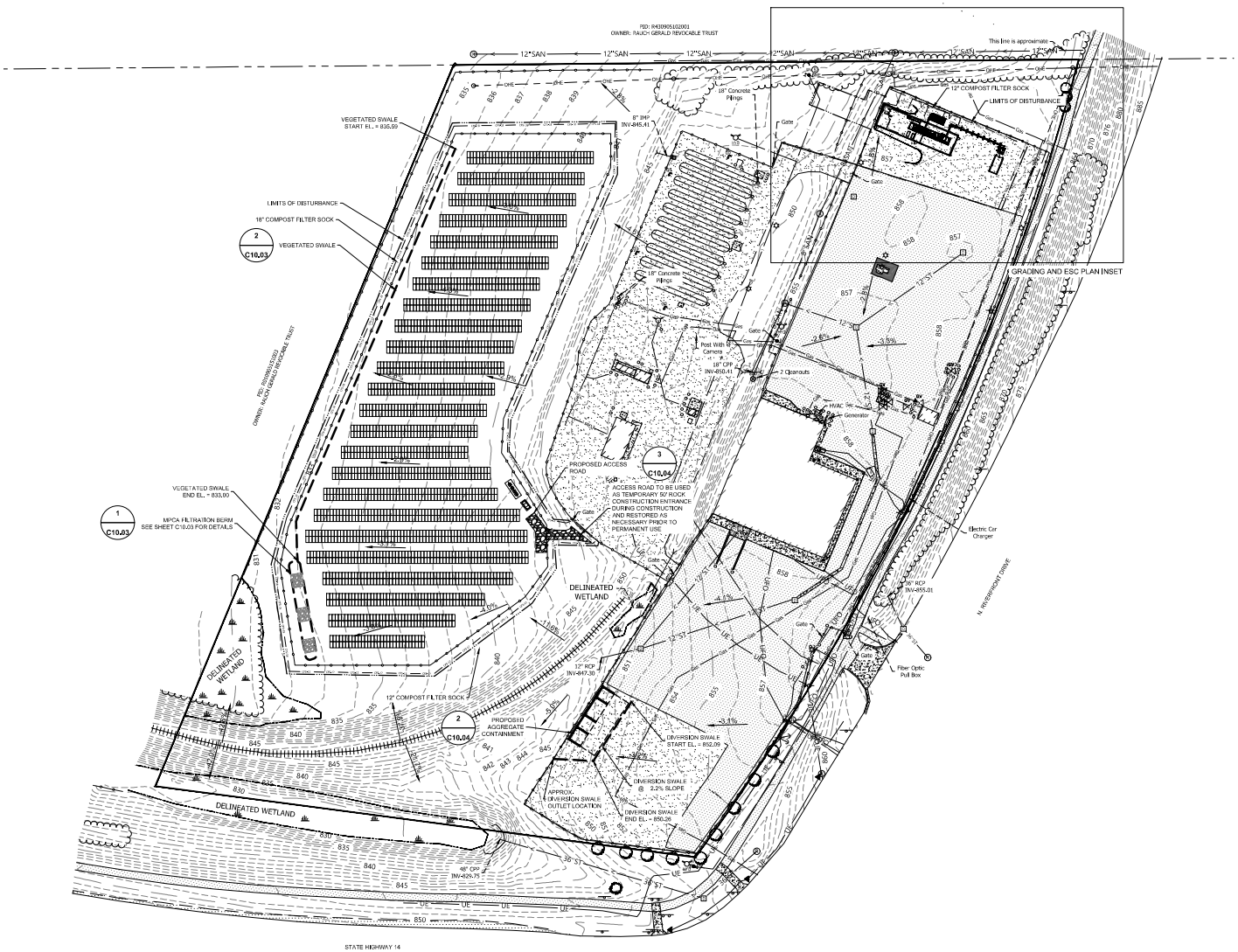
CUP / Final Plat Application – May 2026

Visual Rendering
Overhead

Looking West



ERM



N

SCALE 1" = 60'

0 60 120 180 FEET

GRADING AND ESC PLAN LEGEND

- PROPERTY BOUNDARY LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC CABLE
- EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING CONCRETE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED SOLAR PANEL ARRAYS
- PROPOSED COMPOST FILTER SOCK (CFS)
- PROPOSED STORMWATER FEATURE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED ROCK CONSTRUCTION ENTRANCE

NOTES:

1. ESTIMATED TOTAL AREA OF DISTURBANCE: 4.04 ACRES

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

OVERALL GRADING & ESC PLAN

DESCRIPTION NO.: C8

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV.: 0

SCALE	1" = 60'	DESIGNED BY	WS	PROJECT NUMBER	0764026	SHEET NO.	C8.01
DATE DRAWN	05/26/2026	DRAWN BY	JB				

Environmental Resources Management, Inc.

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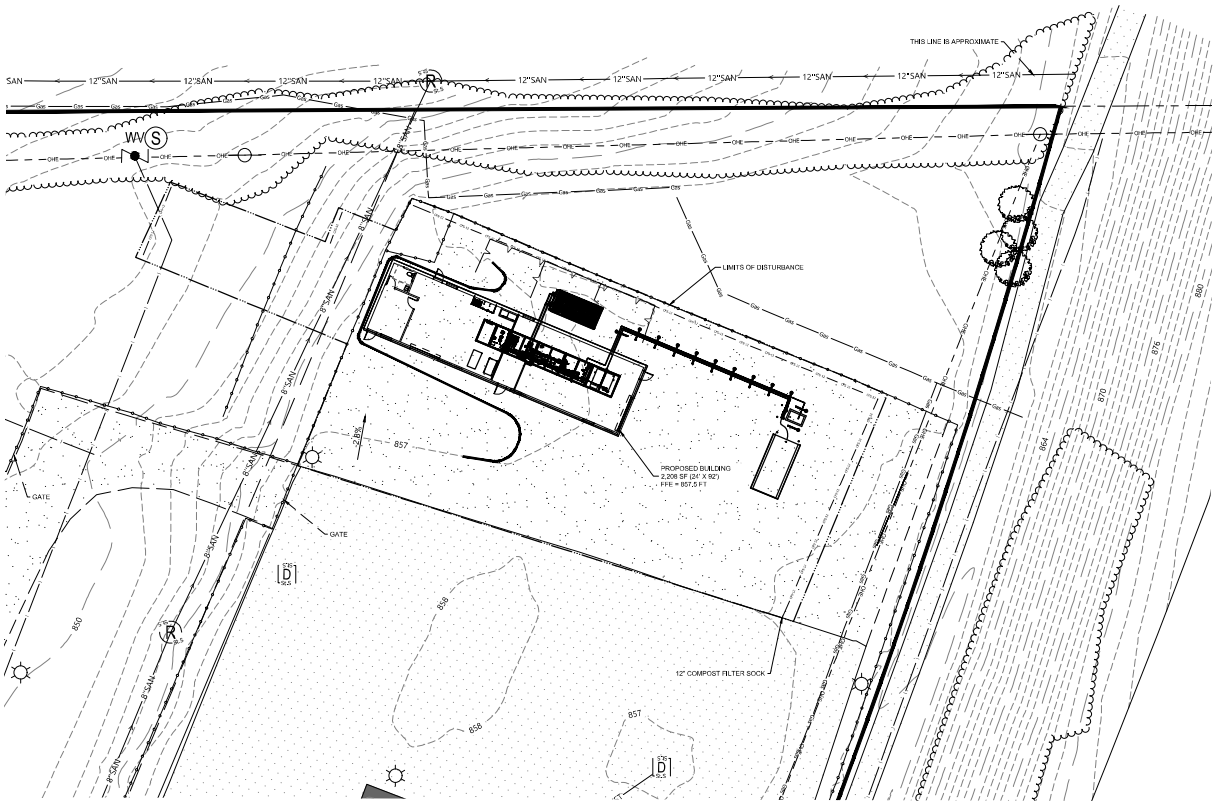

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SCALE 1" = 20'

0 20 40 60 FEET

GRADING AND ESC PLAN LEGEND

- PROPERTY BOUNDARY LINE
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- Gas — EXISTING GAS LINE
- UFO — EXISTING FIBER OPTIC CABLE
- 12"S — EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- UE — EXISTING UNDERGROUND ELECTRIC
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING CONCRETE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED SOLAR PANEL ARRAYS
- PROPOSED COMPOST FILTER SOCK (CFS)
- PROPOSED STORMWATER FEATURE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED CONTOUR

NOTES:

1. ESTIMATED TOTAL AREA OF DISTURBANCE: 4.04 ACRES

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

GRADING & ESC PLAN - INSET

DESCRIPTION NO.: C8

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV.: 0

SCALE	1" = 20'	DESIGNED BY	WS	PROJECT NUMBER	0764026	SHEET NO.	C8.02
DATE DRAWN	05/26/2026	DRAWN BY	JB				

Environmental Resources Management, Inc.

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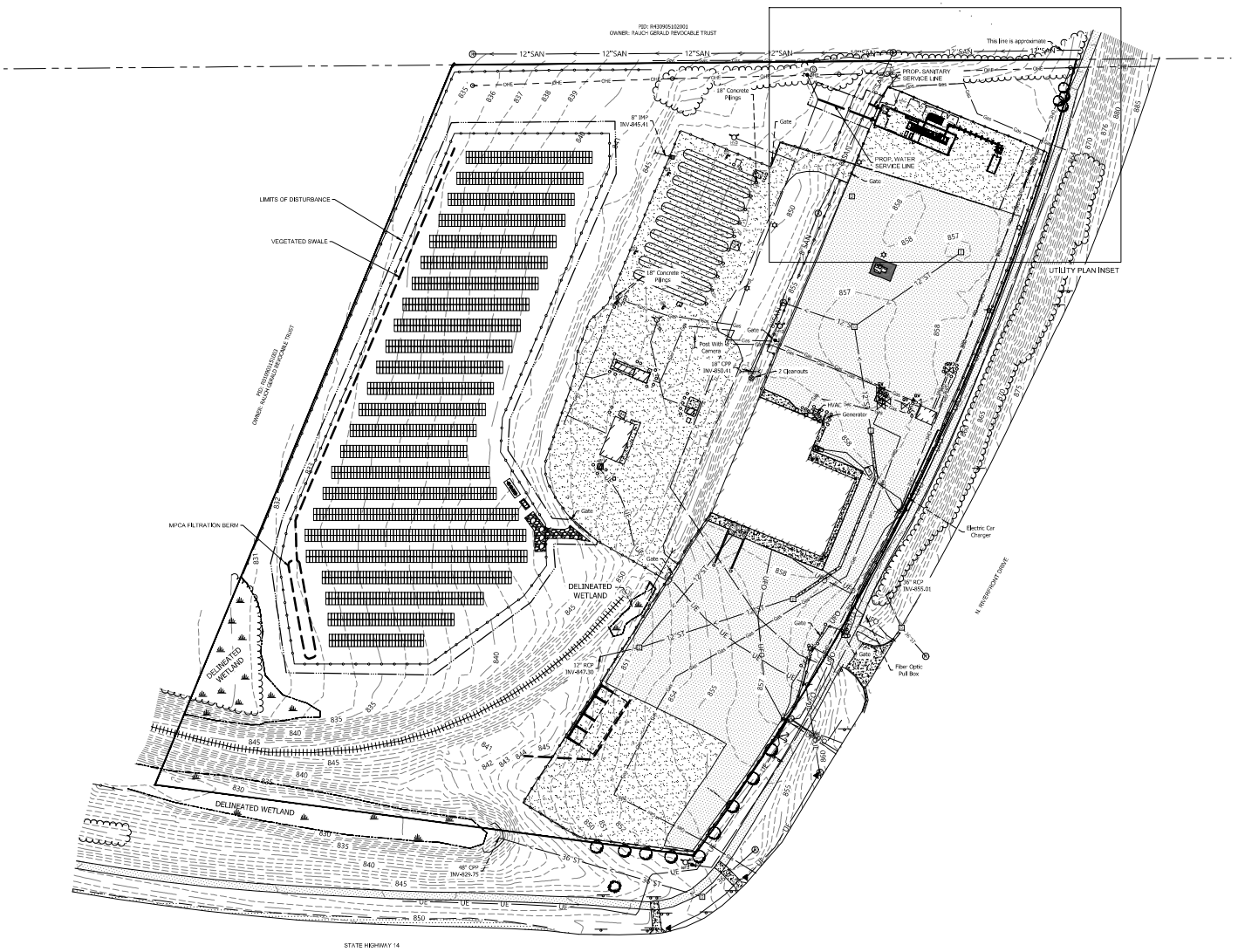

N

SCALE 1" = 60'

0 60 120 180 FEET

UTILITY PLAN LEGEND

- PROPERTY BOUNDARY LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC CABLE
- EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING CONCRETE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED STORMWATER FEATURE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED WATER SERVICE LINE
- PROPOSED SANITARY SERVICE LINE

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

OVERALL UTILITY PLAN

DESCRIPTION C9

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV. 0

SCALE	1" = 60'	DESIGNED BY	WS	PROJECT NUMBER	0764026	SHEET NO.	C9.01
DATE DRAWN	05/26/2026	DRAWN BY	JB				

Environmental Resources Management, Inc.

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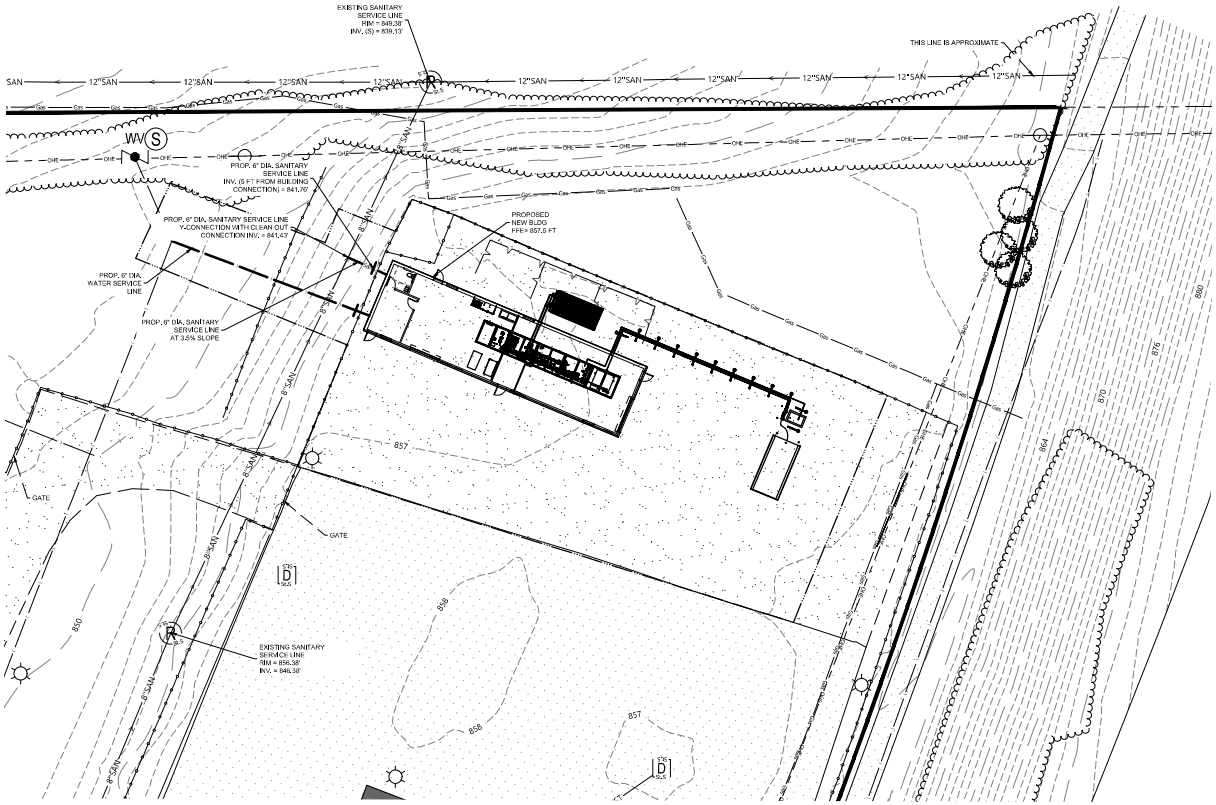

SCALE 1" = 20'

0 20 40 60 FEET

UTILITY PLAN LEGEND

- PROPERTY BOUNDARY LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC CABLE
- EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING CONCRETE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED STORMWATER FEATURE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED WATER SERVICE LINE
- PROPOSED SANITARY SERVICE LINE

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

UTILITY PLAN - INSET

DESCRIPTION NO.: C9

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV.: 0

SCALE	1" = 20'	DESIGNED BY	WS	PROJECT NUMBER	0764026	SHEET NO.	C9.02
DATE DRAWN	05/26/2026	DRAWN BY	JB				

Environmental Resources Management, Inc.

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Mankato Hydrogen Energy Plant

Conditional Use Permit – City of Mankato

2400 North Riverfront Drive

Mankato, Minnesota 56001

PREPARED BY

ERM

June 23, 2026

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APPENDIX B	TITLE WORK AND LEGAL DISCRIPTION
APPENDIX C	CIVIL PLAN SET
APPENDIX D	DRAINAGE REPORT
APPENDIX E	FLOOR AND ELEVATION PLANS
APPENDIX F	GLINT AND GLARE STUDY
APPENDIX G	HISTORICAL RESOURCE REVIEW
APPENDIX H	NOISE ASSESSMENT
APPENDIX I	DECOMMISSIONING COSTS - SOLAR ARRAY
APPENDIX J	WETLAND CONSERVATION ACT – NOTICE OF DECISION
FIGURES	VISUAL RENDERINGS, BUILDING DESIGN, FLOOR PLAN, BUILDING ELEVATIONS, PHOTOMETRICS PLAN, AGGREGATE CONTAINMENT, DEVELOPABLE AREA MAP

1. OVERVIEW

1.1 PROJECT DESCRIPTION

CenterPoint Energy Minnesota Gas (CenterPoint) is submitting this application to the City of Mankato for a Final Plat and Conditional Use Permit (CUP) to install a green hydrogen production and storage facility at their existing site located at 2400 North Riverfront Drive in Mankato, Minnesota 56001. The proposed facility is referred to as the Mankato Hydrogen Energy Plant Project (Project) and is located in an M-2 Industrial District.

The proposed Project will include a hydrogen facility that uses renewable energy from a 1 megawatt (MW) on-site solar panel array to split water into hydrogen and oxygen. The hydrogen will either be blended at low concentrations into the existing natural gas distribution system or stored on-site in a mobile hydrogen storage unit. The solar panel array will consist of approximately 2,120 590W panels on roughly 3.2 acres of land within a restored prairie located west of the current facility. The hydrogen production and storage facility will be installed within an existing gravel area located east of the existing on-site propane tanks.

The on-site solar panel array is expected to operate on the property for the interim for 25 years. CenterPoint is coordinating with Xcel Energy, the site's electric utility, regarding how solar array will interact with the local grid when production exceeds demand from the hydrogen facility.

The on-site solar panel consists of steel driven posts embedded into the ground, with modules attached to the top of the posts via fixed steel racking. The panels are planned to sit approximately 8 feet off the ground at the highest point with a 20-degree tilt. The Project utilizes silicon based solar panels which have an anti-reflective coating. The solar panel array will be accessible through a locked gate near the southwest corner of the property. The cover plantings inside the solar array footprint will be a combination of low growth native crops and a seed mix that promotes pollinator friendly habitats.

1.2 PROPOSED USE AND JUSTIFICATION

In July 2024, CenterPoint received approval from the Minnesota Public Utilities Commission to implement a diverse set of innovative pilot projects that aim to reduce greenhouse gas emissions and advance decarbonization efforts for our Minnesota customers. The projects are part of a five-year innovation plan submitted under a landmark state energy law: the Natural Gas Innovation Act (NGIA). Passed with bipartisan support, NGIA created a new regulatory framework for natural gas utilities to invest in renewable energy resources and innovative technologies.

As part of this NGIA strategy, CenterPoint is exploring the potential of green hydrogen to reduce carbon emissions across their natural gas distribution system. This Project is one of the pilot projects CenterPoint is using to explore green hydrogen's potential. More information about CenterPoint's green hydrogen programs can be found at the following link:

https://www.centerpointenergy.com/en-us/residential/services/cleaner-energy-and-innovation/green-hydrogen?sa=mn

1.3 PROJECT PHASING AND CONSTRUCTION SCHEDULE

Construction will occur in two phases to minimize environmental impacts and maintain compliance with applicable regulations. Phase 1, scheduled to commence in the 3rd quarter of 2026, will include site preparation, installation of erosion and sediment controls, initial grading, and installation of the Solar Array. Phase 2, anticipated to commence in the 4th quarter of 2026, will include hydrogen production and storage facility construction, final grading, and site stabilization. Best Management Practices (BMPs) will be implemented throughout all phases to prevent sediment discharge and protect water quality. CenterPoint understands that a pre-construction meeting with the property owner, the contractor, and City staff is required after all BMPs are installed and prior to site work (as noted on Sheet C8.01 of the CUP Civil Plans in Appendix C). The schedule is subject to change pending weather conditions, permitting timelines, and equipment delivery lead times, and all work will be coordinated with local agencies to ensure compliance.

1.4 VARIANCE – NOT REQUIRED

A variance will not be required in connection with the proposed conditional use, as the Project has been designed to comply with all applicable City of Mankato zoning, setback, access, and site development standards. The facility will be located within an existing industrial area, utilize established access routes, and will not introduce impacts that would necessitate deviations from City Code requirements. As such, no conditions have been identified that would warrant a variance request.

Additionally, the site is currently zoned M-2 Heavy Industrial and will remain under this designation following the installation of the Project.

2. PRELIMINARY AND FINAL PLATS

The Preliminary and Final Plats for the Project are included as an attachment to the ePortal online CUP application (Appendix A).

3. TITLE WORK AND LEGAL DISCRIPTION

The CenterPoint Mankato Facility is legally described as part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, a tract of land located in the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of a parcel lying within the Southeast Quarter of the Northwest Quarter, Section 5, Township 108 North, Range 26 West, all located in the City of Mankato, Blue Earth County (2400 N. Riverfront Drive / BEC PID's R010905176004, R010905176003, R010905176002, R010905176001).

A Microsoft Word (docx) standard format with the subject property legal description was included as an attachment to the ePortal online CUP application (Appendix B).

4. CIVIL PLAN SET

A Civil Plan Set consisting of the following information was included as an attachment to the ePortal online CUP application (Appendix C).

4.1 DEVELOPMENT CONCEPT PLAN

Plans included in the ePortal online CUP application (Appendix C) include a Site Plan, Emergency Access Plan, Grading Drainage and Erosion Control Plan, Landscape and Screening Plan, Photometric Plan Utility Plan, and Phasing Plan.

Additionally, the Developable Area Map included in the attached Figures provides a breakdown of developable and non-developable areas of the subject property. Wetland and wetland setback areas have been designated as non-developable areas. Based on our calculations, the following was determined:

Total Developable Area = 14.0 Acres
Total Non-Developable Area = 0.83 Acres

4.2 DRAINAGE REPORT

A Drainage Report was included in the application in Appendix D. This report uses the MSE 3 MN distribution for NOAA 14 per Section 3.2.1 of the City of Mankato Grading Manual, and the MPCA Solar Panel Calculator per guidance on MPCA website.

4.3 EASEMENTS

The Preliminary Plat identifies all private easements. The proposed Project disturbance limits described in this application will not impact the private easements. CenterPoint is coordinating with the owner of the private easements to ensure continued access is provided between North Riverfront Drive and the property immediately west of CenterPoint's property. CenterPoint will ensure that continued access is available to the adjacent property owner, with all applicable documentation provided for public record on the subject property, as applicable.

A 10-foot drainage and utility easement is proposed around the parcel boundary, as shown in the Preliminary Plat.

5. ACCESS AND TRAFFIC ROUTES

5.1 SITE ACCESS

The hydrogen facility will be accessible through the existing main facility entrance and paved access routes, while the solar panel array will be accessible through a locked gate at the southeast edge of the array. No new access points from public roadways or turning lanes on public rights-of-way will be required.

5.2 PARKING AND LOADING PLAN

No off-street parking or loading facilities will be required.

5.3 TRAFFIC CIRCULATION PATTERNS

The project will use the existing site access routes and will have minimal impact on existing traffic circulation patterns. This is an unmanned facility, requiring monthly, quarterly, and annual routine maintenance by one to three trained personnel; therefore, no long-term changes to roadway

configuration or traffic flow are anticipated. Any construction-related disruptions will be minor and temporary, with normal traffic circulation maintained throughout the construction period.

5.4 EMERGENCY VEHICLE ACCESS AND FIRE HYDRANT LOCATION PLAN

An Emergency Vehicle Access and Fire Hydrant Location Plan is included as an attachment to the ePortal online CUP application in the Civil Plan Set – Sheet 5.01 (Appendix C). The plan was prepared in accordance with the City of Mankato Fire Department Access Guidelines and depicts emergency vehicle circulation and turning radius, site access routes, and fire hydrant locations. Emergency and fire vehicle access to the facility is currently provided via strobe access and will continue as such.

The facility currently has three fire hydrants in proximity to the hydrogen facility. Access to the existing fire hydrants is not restricted and remains readily available to emergency personnel. Therefore, no additional fire hydrants are necessary or proposed as part of the Project.

6. BUILDING PLAN

6.1 BUILDING MATERIALS

The proposed Building Design will be consistent with the existing building materials found on site. A photo of a similar building is included in the attached Figures.

6.2 FLOOR AND ELEVATION PLANS

The floor and elevation plans of the proposed hydrogen facility building are part of the Archtectural Plan set that was included as an attachment to the ePortal online CUP application (Appendix E).

7. FENCING

A 7-foot-tall perimeter fence is proposed around the solar panel installation to restrict access to the system from unqualified personnel. In addition, mechanical equipment will be screened with fencing, including the proposed fans located east of the proposed hydrogen building. All fencing will comply with City of Mankato screening requirements, and a fence permit will be obtained prior to installation. Refer to the Civil Plan Set – Sheet C4.02 and 10.04 that was included as an attachment to the ePortal online CUP application (Appendix C).

8. GLINT AND GLARE STUDY

The Glint and Glare Study indicates that yellow glare may occur at select receptor locations (eastbound highway, westbound entrance ramp, and westbound highway), with a maximum of 1,725 minutes per year. This glare is expected between April and September annually, equating to approximately 10 minutes per day. No yellow glare was identified for flight paths (FP1, FP2), and results at observation point receptor locations are not of concern, as they do not impact traffic or neighbors. Federal Aviation Administration (FAA) pre-screening also determined that the Project is not required to file a Notice with the FAA. A copy of the Glint and Glare Study and FAA Pre-screening Results were included as attachments to the ePortal online CUP application (Appendix F).

The analysis conservatively excludes the screening benefits provided by new trees, as described in the Civil Plan, and the existing 10-ft high earthen berm separating the roadway from the solar array. CenterPoint will ensure screening on site is sufficient to protect drivers from hazardous glare. CenterPoint is also coordinating with MnDOT, including Rylan Juran with the Office of Aeronautics and Scott Thompson the District 7 Traffic Engineer, regarding the glare analysis and any associated comments.

9. GRADING, EROSION, AND SEDIMENT CONTROL PLAN

The Project is located on privately owned land held by CenterPoint, encompassing approximately 14.83-acres across four parcels. Of this area, approximately 4.0 acres will be disturbed during construction. BMPs will be implemented to prevent sediment release from the construction site. Refer to the attached Civil Plans – Sheets 8.01, 8.02, 10.01, 10.02, and 10.03 (Appendix C) for the planned BMP locations. Where necessary, final grading will restore the site to pre-construction contours.

Pursuant to the requirements outlined by the City of Mankato Ordinance, Chapter 8 – Erosion and Sediment Control, CenterPoint will apply for a land-disturbing activity permit. In addition, CenterPoint will apply to the Minnesota Pollution Control Agency for coverage under the National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Program – Construction Stormwater General Permit (MNR100001).

10. HISTORICAL RESOURCE REVIEW

A review of the National Park Service's National Register of Historic Places database confirmed that no historic structures, cultural resources, or design features are present within the proposed project. The closest listed historic property (Stewart, William E., House) is situated approximately 1.65 miles southwest of the proposed project. As a result, no impacts are anticipated by the Project on any historic properties. Refer to the attached National Historic Place review memo (Appendix G).

11. LIGHTING (PHOTOMETRIC) PLAN

A Photometric Plan and details are included as an attachment to the ePortal online CUP application in the Civil Plan Set – Sheet 7.01 (Appendix C). As indicated in this plan, adequate safety and security lighting is proposed for the hydrogen facility building.

12. LANDSCAPING AND SCREENING PLAN

A Landscaping and Screening Plan has been developed in coordination with the City standards. Refer to the Civil Plan Set – Sheet 6.01 that was included as an attachment to the ePortal online CUP application (Appendix C). CenterPoint will install landscaping and ground cover prior to completion and operation of the solar array, in compliance with Mankato City Code.

13. NOISE ASSESSMENT

A pre-construction noise assessment has been completed for the Project. The assessment included detailed noise calculations of the major facility noise generating equipment operating under full-

load conditions and a comparison to the noise regulations within the State of Minnesota Administrative Rules.

The operational noise assessment revealed that Project-generated noise levels are expected to be in compliance with the applicable noise regulations. Operational Project noise levels were shown to be less than 50 dBA at the nearest residential and recreational property lines for both daytime and nighttime hours. The noise calculations did not include factors such as the barrier effect of existing buildings and equipment, the screening effect of vegetation, or changes in topography, resulting in a conservative assessment. A copy of the report was included as an attachment to the ePortal online CUP application (Appendix H).

Additionally, the proposed construction of the Project will be within working hours, between the hours of 7am and 7pm, Monday through Friday. Weekend work may take place if there are significant project construction delays due to weather. These hours are flexible and are intended to work with the community to control noise and disturbance.

14. OPERATIONS, MAINTENANCE, AND SAFETY PLAN

CenterPoint has significant experience in hydrogen production and has safely operated a similar hydrogen blending facility in Minneapolis, Minnesota since 2022. Lessons learned from that facility continue to inform system design, safety protocols, and operational practices for this Project.

The Project will be designed, constructed, and operated in accordance with applicable federal, state, and local regulations and permit conditions. Required permits and approvals will be obtained, as applicable, prior to corresponding construction and operational activities. A comprehensive Operations and Maintenance (O&M) Manual will be developed and implemented to ensure safe, reliable operation and long-term system performance while protecting human health, the environment, and the surrounding community. The manual will include procedures for emergency response, routine inspections, preventive maintenance, and system testing, and will incorporate industry best practices and site-specific conditions. The final manual can be available to the City for review upon request following construction.

Hazards associated with the Project, including hydrogen, oxygen, electricity, natural gas, and personnel and vehicle traffic, have been evaluated through a safety risk assessment conducted during design. Mitigation measures have been incorporated into system design and will guide ongoing operations. Environmental protection measures will include stormwater and erosion controls, spill prevention and response procedures, and proper waste management practices to minimize the potential for impacts to surrounding resources.

To further reduce environmental risk, the facility will implement spill prevention and response measures, including maintaining appropriately sized and strategically located spill response kits, secondary containment where applicable (e.g., for fuels, oils, or chemicals), and training personnel in proper spill response procedures. Any releases will be promptly contained, cleaned up, documented, and reported in accordance with regulatory requirements. The site will also maintain

clearly posted emergency contact information consistent with CenterPoint's emergency communication protocols to ensure rapid response coordination.

CenterPoint will prioritize community safety through controlled site access, perimeter fencing, clear signage, and coordination with local emergency responders. The facility will be designed and operated to minimize noise, traffic, and visual impacts.

14.1 EMERGENCY RESPONSE

A site-specific Emergency Response Plan will be developed and maintained for the facility. This plan will include emergency contacts, notification procedures, coordination with emergency services, description of site-specific hazards, description of on-site emergency equipment and controls, detailed response procedures for emergency scenarios, and other information necessary to prepare for and react to emergencies. The Emergency Response Plan will be periodically reviewed and updated based on operational experience and evolving best practices.

Prior to start of Operation, CenterPoint will coordinate with First Responders including local fire, police, EMS, and emergency management officials to provide training related to site-specific hazards. Training may include classroom briefings, tabletop exercises, or site walk-throughs, as appropriate. Updated site maps, emergency contact information, and safety documentation will be provided to responding agencies.

14.2 HYDROGEN FACILITY

The hydrogen facility will consist of the electrolyzer, balance of plant, water treatment system, blending infrastructure, and compression and storage systems. All equipment will meet applicable industry standards and hazard classifications. The hydrogen facility is an unmanned facility that will operate continuously, except during occasional periods of scheduled maintenance. The facility requires routine monthly, quarterly, and annual maintenance and is designed to be started and stopped locally.

Key safety system features include hazardous detection, notification, and response systems that collectively monitor for hazardous accumulation of hydrogen and oxygen, notify site operators of any hazards, and shut down the system in a safe manner if hazards are detected. Other key safety features include, but are not limited to, manual emergency shutdown buttons, relief stacks, and oxygen venting systems. The facility will be monitored remotely 24/7 by trained staff at CenterPoint's Gas Control Center in Minneapolis.

Major components of the hydrogen facility include:

- RODI skid
- Water and oxygen separation skid
- Electrolyzer stack
- Power supply and rectifier skid
- Cooling systems
- Hydrogen handling and compression equipment
- PLC control system

- Power distribution equipment
- Backup generator
- Hydrogen gas compressor
- Mobile hydrogen storage

The mobile hydrogen storage unit will have a maximum storage capacity of 146 kg of hydrogen at 6500 psi. The unit is designed to be towed by commercial transport. The unit will be managed in accordance with applicable storage, handling, and transportation safety requirements, including regular inspection and secure containment to prevent accidental releases.

The proposed building for the hydrogen facility will require both water and sanitary municipal services, also discussed in Section 17 – Utility Services Plan. Water service will connect through a planned 6-inch lateral to the existing 8-inch watermain, and sewer service will connect through a planned 6-inch lateral to the existing 8-inch sanitary line. During normal continuous operation, the hydrogen facility is expected to consume approximately 2 gallons of water per minute. The water treatment skid will discharge approximately 1 gallon of wastewater per minute, while the remaining gallon is consumed in the production of hydrogen.

14.3 SOLAR PANEL ARRAY

Design and installation of all components of the solar array will be in accordance with applicable electrical and fire safety codes. All equipment will be appropriate for the range of electrical demand it will be exposed to, with appropriate disconnects, circuit breakers, and labeling as necessary. The array will also be monitored remotely 24/7 by trained staff at CenterPoint's Gas Control Center in Minneapolis.

The solar array will be surrounded by a new chain-link fence to restrict access for unauthorized personnel. The site will be accessible via a locked gate at the southeast edge of the array. Signage will be installed to deter trespassing and provide safety information.

Major components of the solar array include:

- Approximately 2,120 590W panels (~8 feet high, 20-degree tilt)
- Fixed racking and pilings
- Inverters, switchgear, and transformer

A pollinator-friendly vegetative mix will be used for ground cover beneath the array to support local ecosystems, reduce erosion, and improve soil stability. CenterPoint will work with a qualified third-party vendor to manage site vegetation, including conducting regular maintenance to ensure site meets applicable pollinator-friendly requirements and remove observed noxious weeds. Vegetation management may include mechanical methods and selective herbicide application, as needed, in accordance with applicable regulations and label requirements to prevent impacts to non-target species, surface water, and groundwater.

Stormwater management practices will be implemented to minimize runoff, control erosion, and prevent sediment transport from the site. Routine inspections will ensure that drainage features and ground cover remain effective.

14.4 COMMITMENT TO COMPLIANCE AND COMMUNICATION

CenterPoint will maintain compliance with applicable requirements throughout the life of the facility and will promptly address any health, safety, or environmental concerns. The company is committed to transparent communication with City staff, regulatory agencies, and the community, and will provide safety information and respond to inquiries as requested.

15. SITE RESTORATION AND DECOMMISSIONING

CenterPoint will be responsible for costs associated with decommissioning the system and restoring the site at the end of its service life or if the system is permanently taken out of use.

The solar panel array will be decommissioned at the end of its useful life or within one year of termination of energy generation use. Decommissioning will include a complete removal of the solar panels, racking systems, vertical pilings, wire, conduits, and associated infrastructure, with the site restored to a condition comparable to its pre-conditional condition unless an alternative plan is approved by the City of Mankato to repower or repurpose the facility. All applicable equipment will be removed and either recycled or disposed of in accordance with applicable regulations within a reasonable timeline after being determined to have reached the end of its useful service life.

A financial surety, based on a certified engineer's removal cost estimate, will be provided to the City of Mankato prior to issuance of a building permit and maintained through site reclamation to ensure decommissioning of the equipment. CenterPoint proposes a surety of $70,000 to cover decommissioning costs, and an engineered decommissioning plan and cost estimate for the solar array is included in Appendix I. The surety amount will be reevaluated every five years (with a final review within one year of decommissioning), and CenterPoint will coordinate required documentation submittals with the City of Mankato and cover associated engineering costs.

The hydrogen facility can operate independently from the solar panel array and is not expected to be decommissioned alongside the solar array. The facility is located within an existing industrial area and is designed for long-term operation. Components will be repaired or replaced as needed to maintain safe and reliable performance. In the event the hydrogen facility is permanently taken out of service, CenterPoint will implement a formal decommissioning process.

16. TREES

No tree removal will be required within City rights-of-way as part of the Project.

17. UTILITY SERVICES PLAN

The proposed building for the hydrogen facility will require both water and sanitary municipal services. Water service will connect through a planned 6-inch lateral to the existing 8-inch watermain, and sewer service will connect through a planned 6-inch lateral to the existing 8-inch sanitary line. Refer to the Civil Plan Set – Sheets 9.01 and 9.02 that was included as an attachment to the ePortal online CUP application (Appendix C).

During normal continuous operation, the hydrogen facility is expected to consume approximately 2 gallons of water per minute. The water treatment skid will discharge approximately 1 gallon of wastewater per minute, while the remaining gallon is consumed in the production of hydrogen. Based on these rates:

Estimate Daily Water Use:

- 2 gallons/min × 60 minutes/hour × 24 hours/day = 2,880 gallons/day

Estimated Daily Wastewater Discharge:

- 1 gallon/min × 60 minutes/hour × 24 hours/day = 1,440 gallons/day

Estimated Monthly (30-day) Water Use:

- 2,880 gallons/day × 30 days = 86,400 gallons/month

Estimated Monthly (30-day) Wastewater Discharge:

- 1,440 gallons/day × 30 days = 43,200 gallons/month

These estimates reflect continuous operation and will be used for utility planning, service sizing, and evaluating billing impacts. If operational schedules change or if the City requires a different calculation basis (e.g., maximum day or average month), updated estimates can be provided. CenterPoint will also complete MPCA Industrial pretreatment discharge to a municipal wastewater treatment facility application (wq-wwprm7-23) to obtain Industrial Pretreatment Discharge authorization from MPCA and City of Mankato prior to any facility discharge events.

18. WETLAND DELINEATION

CenterPoint completed a wetland delineation survey and received a Notice of Decision from the City of Mankato Technical Evaluation Panel (TEP) on December 10, 2025, confirming a no-loss determination under Minnesota Rule 8420.0415, Subpart A (“an activity that will not impact a wetland”). A copy of the issued Notice of Decision was included as an attachment to the ePortal online CUP application (Appendix J).

19. ZONING

No zoning changes are required. The site is currently zoned M-2 Heavy Industrial and will remain under this designation following the installation of the Project.

CenterPoint Energy

Mankato Hydrogen Energy Plant Project

CUP / Final Plat Application – May 2026

Proposed Building

- The proposed building to be constructed at Mankato Facility site will be similar in appearance to the example photo to the right.
- Exterior metal siding and roof
- Standing seam metal roof
- 24-foot x 92-foot (2,208-square foot) area
- 18-foot side wall height



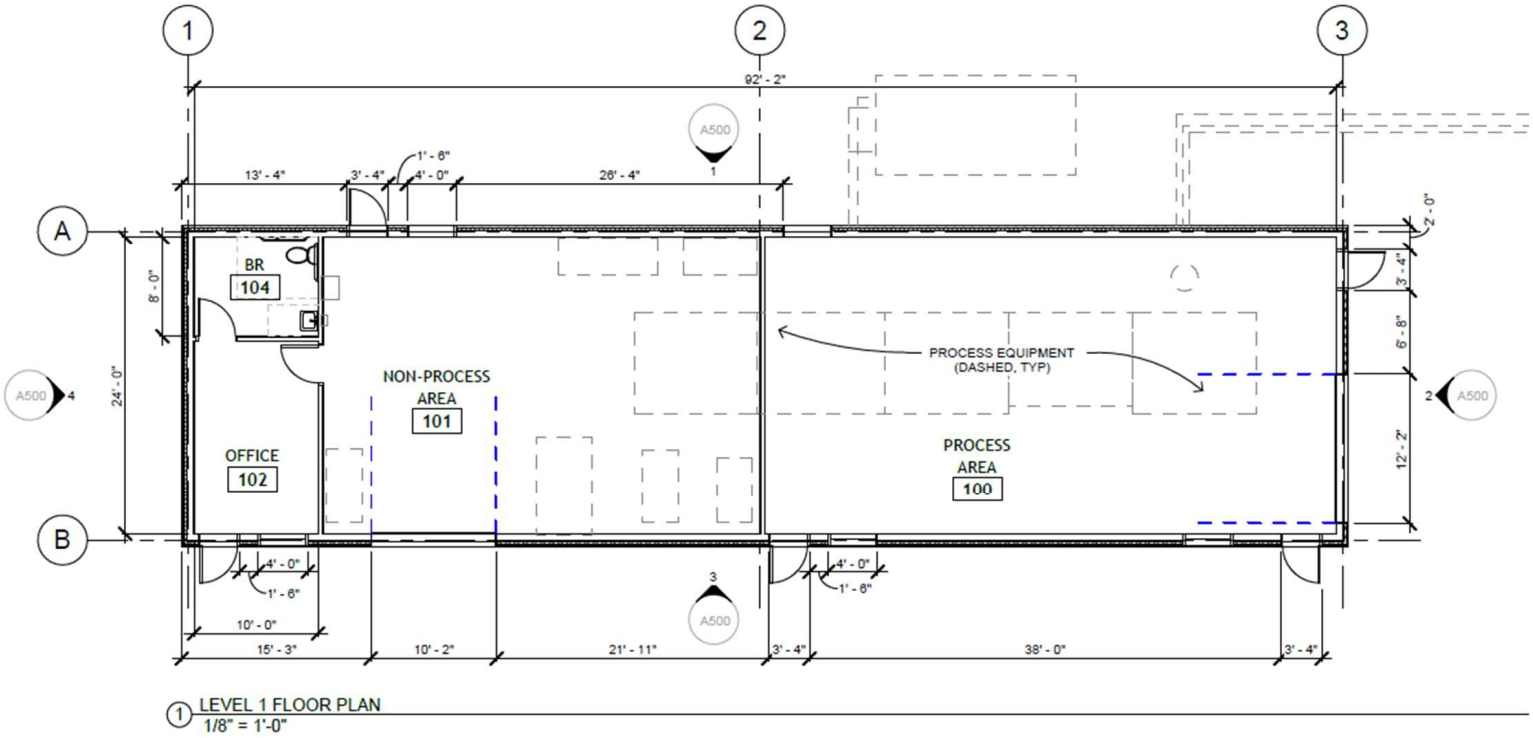
ERM

CenterPoint Energy

Mankato Hydrogen Energy Plant Project``

CUP / Final Plat Application – May 2026

Proposed Building Floor Plan



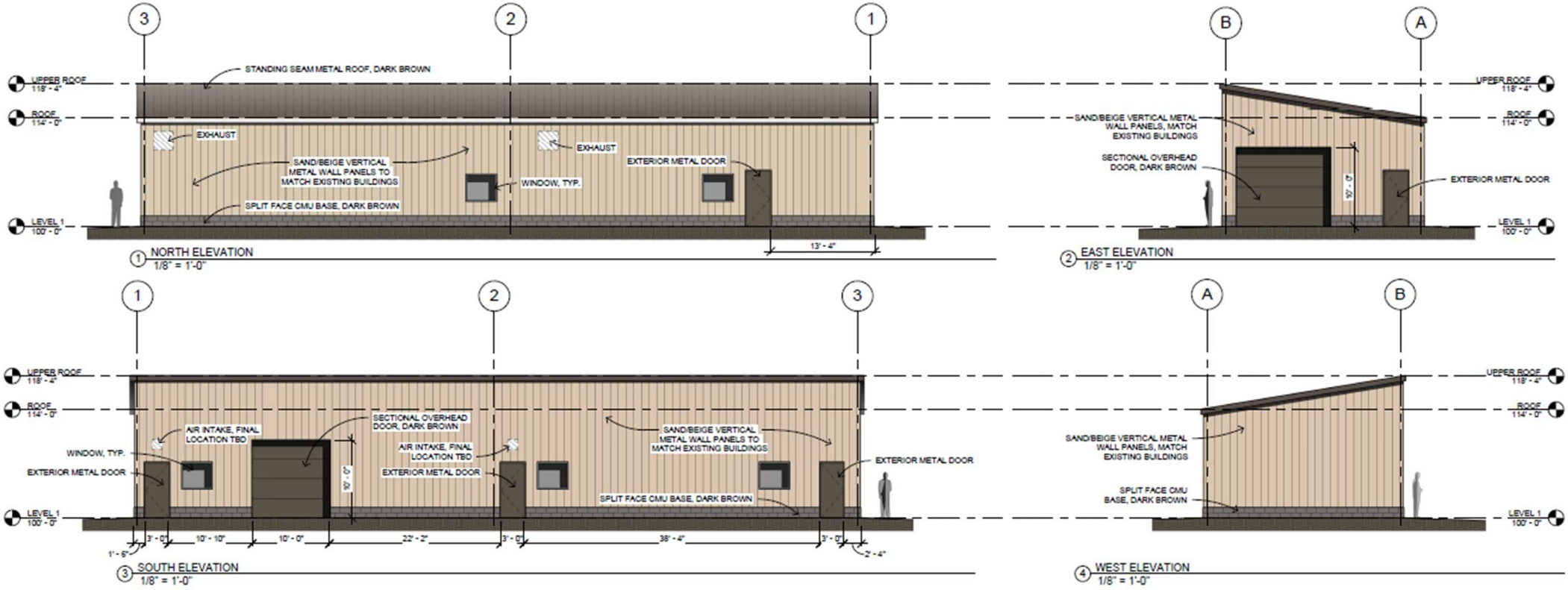
1 LEVEL 1 FLOOR PLAN
1/8" = 1'-0"

CenterPoint Energy

Mankato Hydrogen Energy Plant Project

CUP / Final Plat Application – May 2026

Proposed Building Elevations



ERM

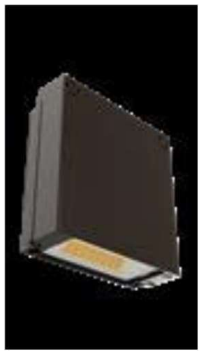
CenterPoint Energy

Mankato Hydrogen Energy Plant Project

CUP / Final Plat Application – May 2026

Photometrics Plan

- Proposed - 5 box lights on building
- WPX0 LED, 1650 Lumen setting, 4000K Setting, 120-277V
- Lumens per Lamp = 1645





Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Site	+	0.5 fc	5.7 fc	0.0 fc	N/A	N/A

ERM

CenterPoint Energy

Mankato Hydrogen Energy Plant Project

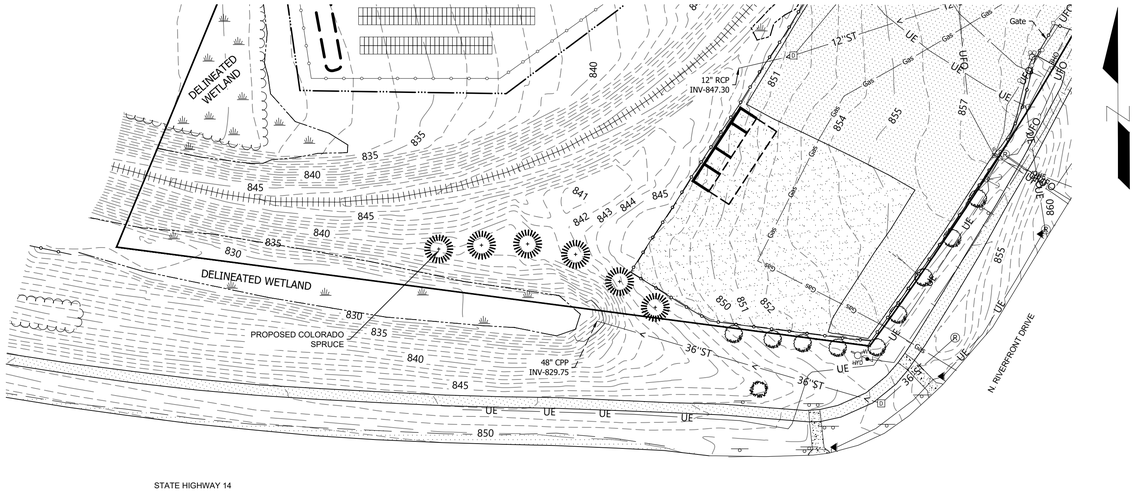
CUP / Final Plat Application – May 2026

Aggregate Containment

- The containment structure will house aggregate currently stored elsewhere on site.
- The proposed concrete aggregate containment will be similar in appearance to the example photo to the right.
- 36-foot x 75-foot area
- 4-foot side wall height
- 6-foot back wall height
- 8-inch thick concrete pad
- 8-inch concrete walls



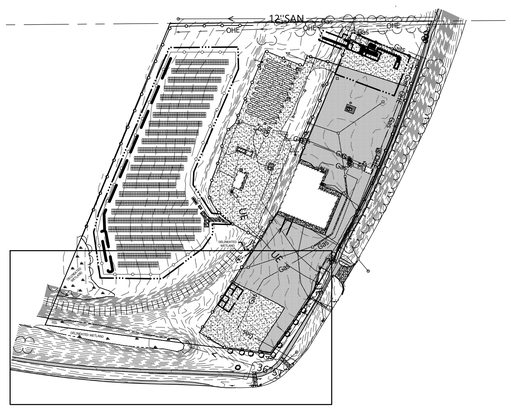
ERM



SCREENING PLAN INSET

SCALE 1" = 60'

0 60 120 180 FEET



SCREENING PLAN INSET

GENERAL SITE LAYOUT

SCALE 1" = 200'

0 200 400 600 FEET



PRECONDITION SCREENING 3D RENDERING



POSTCONDITION SCREENING 3D RENDERING

PLANT SCHEDULE

CODE	QTY	COMMON NAME/LATIN NAME	SIZE	ROOT	REMARKS
	6	COLORADO SPRUCE	6'	B&B	FULL FORM TO GRADE
		Picea pungens			SPACE EVENLY

SCREENING & PLANTING NOTES

GENERAL PLANTING NOTES, IRRIGATION NOTES, AND PLANTING DETAILS TO BE SUBMITTED WITH FINAL DESIGN.

REFER TO GRADING PLAN FOR GRADES AND EROSION CONTROL.

REMOVE WIRING, TWINE OR ROPES AND BURLAP FROM THE TOP AND SIDES OF THE ROOT BALL FOR BALLED AND BURLAPPED PLANTS.

REMOVE CONTAINERS AND CUT CIRCLING ROOTS IF PLANTS ARE CONTAINER GROWN.

MULCH DEPTH SHALL BE A MAXIMUM OF FOUR INCHES, AND SHALL BE KEPT AT LEAST TWO INCHES AWAY FROM THE STEM OF THE TREES.

THE LANDSCAPE CONTRACTOR SHALL REPAIR ALL DAMAGE TO THE SITE CAUSED BY THE PLANTING OPERATION AT NO COST TO THE OWNER.

ALL PLANTINGS SHALL RECEIVE FERTILIZER AS FOLLOWS: (NO PHOSPHORUS) *10-0-20 GRANULAR FERTILIZER APPLIED AT THE TIME OF PLANTING AT A RATE OF 12 OZ PER 2.5 CALIPER INCHES OF TREE AND 6 OZ PER SHRUB. *10-0-10 FERTILIZER APPLIED THE FOLLOWING SPRING AT SAME RATE.

ALL DISTRUBED AREAS SHALL BE SEEDED WITH A PRAIRIE SEED MIX OR APPROVED ALTERNATIVE.

SCREENING PLAN LEGEND

- PROPERTY BOUNDARY LINE
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- Gas — EXISTING GAS LINE
- UFO — EXISTING FIBER OPTIC CABLE
- 12"ST — EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- UE — EXISTING UNDERGROUND ELECTRIC
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING CONCRETE

TREE/ARBORVITAE

NOTES:

TREE TO HAVE SHREDDED HARDWOOD MULCH UNLESS NOTED OTHERWISE. NO MULCH TO BE IN CONTACT WITH TRUNK.

SCARIFY BOTTOM AND SIDES OF HOLE PRIOR TO PLANTING.

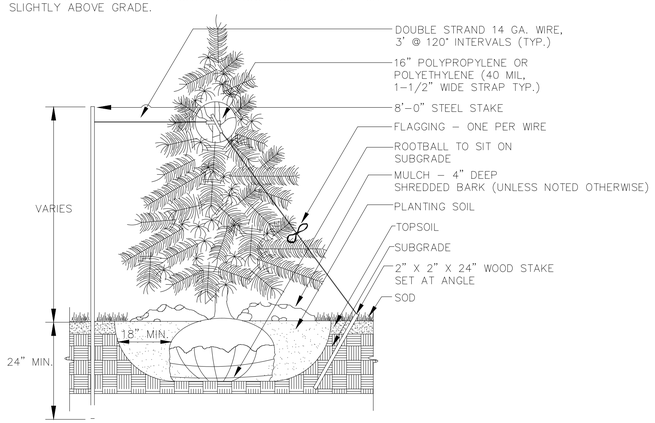
TWO ALTERNATE METHODS OF TREE STAKING ARE ILLUSTRATED.

IT IS THE CONTRACTOR'S OPTION TO STAKE TREES; HOWEVER, THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TREES IN A PLUMB POSITION THROUGHOUT THE GUARANTEE PERIOD.

PLACE ROOT COLLAR AT OR JUST ABOVE FINISHED GRADE.

THE HOLE FOR PLANTING MUST BE AT LEAST TWICE THE WIDTH OF THE ROOT BALL

ALL TREES TO BE PLANTED WITH THE ROOT COLLAR LEVEL OR SLIGHTLY ABOVE GRADE.



ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

SCREENING PLAN

DISCIPLINE NO. C6

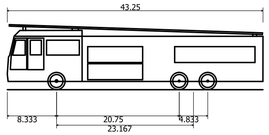
MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV. 0

SCALE	DESIGNED BY	PROJECT NUMBER	SHEET NO.
1" = 60'	WS	0764026	C6.01
DATE DRAWN 05/26/2026	DRAWN BY JB		

Environmental Resources Management, Inc.

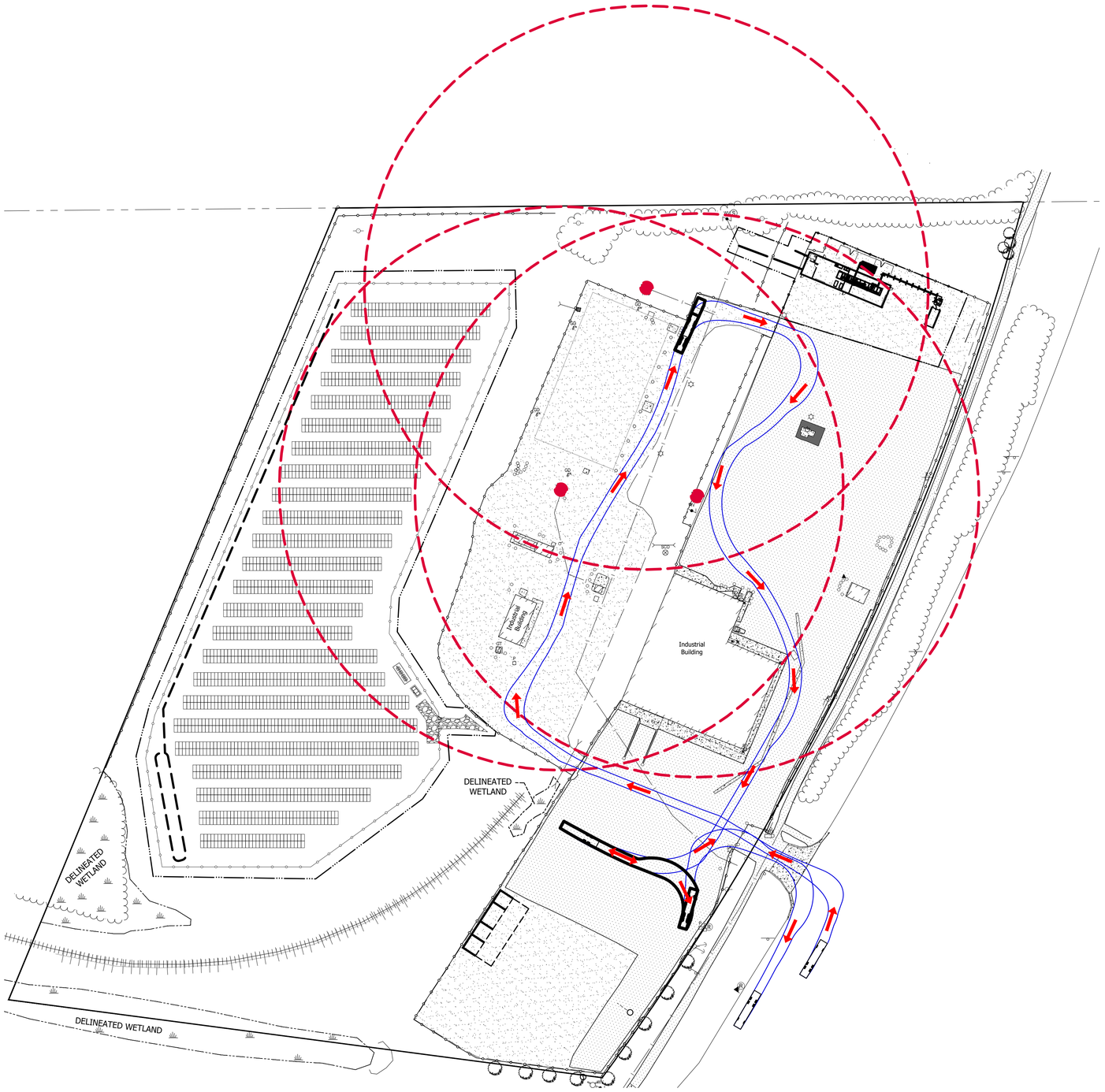
FILE PATH: C:\Users\jessica.blat\OneDrive - ERM\064419 CenterPoint Energy Environmental Support (Client) - Mankato Hydrogen Plant_CAD\CUP\05_Screening Plan.dwg SCREENING PLAN, PRINTED ON 5/18/2026 BY: Jessica Blat



E-ONE Heavy Walk-In Rescue	
Overall Length	43.250ft
Overall Width	8.333ft
Overall Body Height	11.000ft
Min Body Ground Clearance	1.393ft
Track Width	8.333ft
Lock-to-lock time	6.00s
Max Wheel Angle	45.00°

NOTES:

1. DESIGN VEHICLE USED IS E-ONE HEAVY WALK-IN RESCUE.
2. THE DESIGN VEHICLE DIMENSIONS EXCEED THE CITY'S "TURNING RADIUS REQUIREMENT A" VEHICLE.



N

SCALE 1" = 60'

0 60 120 180 FEET

EMERGENCY ACCESS PLAN LEGEND

- PROPERTY BOUNDARY LINE
- ZONING SETBACKS
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- Gas — EXISTING GAS LINE
- UFO — EXISTING FIBER OPTIC CABLE
- 12"ST — EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- OHW — EXISTING TRANSMISSION LINE
- UE — EXISTING UNDERGROUND ELECTRIC
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED SOLAR PANEL ARRAYS
- EDGE OF VEHICLE TRACKING PATH
- VEHICLE PATH DIRECTION
- FIRE HYDRANT LOCATION
- FIRE HYDRANT 300' RADIUS

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

EMERGENCY ACCESS PLAN

DISCIPLINE NO. C5

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV. 0

SCALE	DESIGNED BY	PROJECT NUMBER	SHEET NO.
1"=60'	WS	0764026	C5.01
DATE DRAWN 05/26/2026	DRAWN BY JB		

Environmental Resources Management, Inc.

FILE PATH: C:\Users\jessica.blatt\OneDrive - ERM\0064159 CenterPoint Energy Environmental Support (Client) - Mankato Hydrogen Plant_CAD\CUP\07_Emergency Access Exhibit.dwg EMERGENCY ACCESS EXHIBIT, PRINTED ON 4/16/2026 BY Jessica Blatt



N

SCALE 1" = 60'

0 60 120 180 FEET

EXISTING CONDITIONS LEGEND

- PROPERTY BOUNDARY LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC CABLE
- EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING CONCRETE

NOTES:

1. THE PROPERTY DESCRIBED AND EASEMENTS SHOWN HEREON IS THE SAME AS THE PROPERTY DESCRIBED IN THE TITLE COMMITMENT, PREPARED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY, (ISSUING AGENT, THE TITLE TEAM), COMMITMENT NO, MA 250043, WITH A COMMITMENT DATE OF NOVEMBER 7, 2025 AT 7:00 AM.
2. THE SUBJECT PROPERTY CONTAINS ±14.83 ACRES (±646,030 SQUARE FEET).
3. WETLANDS SHOWN PER WETLAND DELINEATION REPORT PREPARED BY ERM DATED OCTOBER 9, 2025.
4. CURRENT ZONING PER CITY OF MANKATO (BLUE EARTH COUNTY) GIS MAP = M-2 HEAVY INDUSTRIAL.
5. TOPOGRAPHIC SURVEY COMPLETED BY IMEG ON OCTOBER 21, 2025.
6. APPROXIMATE HYDRANT AND TIE-IN LOCATION BASED ON CITY UTILITY MAP AND PREVIOUS AS-BUILT SURVEY.

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

OVERALL EXISTING CONDITIONS

DESCRIPTION NO.: C3

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV.: 0

SCALE	1" = 60'	DESIGNED BY	WS	PROJECT NUMBER	0764026	SHEET NO.	C3.01
DATE DRAWN	05/26/2026	DRAWN BY	JB				

Environmental Resources Management, Inc.

FILE PATH: C:\Users\jwebb2\ERM\Denver - SDM\0064169 CenterPoint Energy Environmental Support (Dan) - Mankato Hydrogen Plant_CAD\CUP\03-04_Existing Conditions.dwg DWGNAME: EXISTING CONDITIONS PLOTTED ON: 4/14/2026 BY: Jessica Webb

SITE DESCRIPTION

PROJECT NAME AND LOCATION:
MANKATO HYDROGEN ENERGY PLANT
2400 N RIVERFRONT DR
MANKATO, MN 56001
COORDINATES: 44.190286, -93.981120

OWNER NAME, ADDRESS, AND EMAIL:
CENTERPOINT ENERGY
PO BOX 59038
MINNEAPOLIS MN 55459
ANDREW.ROCKWELL@CENTERPOINTENERGY.COM

DESCRIPTION:
A 1-MEGAWATT (MW) HYDROGEN PLANT AND A 1 MW ON-SITE SOLAR PANEL ARRAY IN THE CITY OF MANKATO, BLUE EARTH COUNTY, MINNESOTA.

SOIL DISTURBING ACTIVITIES WILL INCLUDE: CLEARING AND GRUBBING; PERIMETER, AND OTHER EROSION AND SEDIMENT CONTROLS; GRADING; GRAVEL PLACEMENT AND FINAL PLANTING AND SEEDING.

CURVE NUMBERS: PRE-DEVELOPMENT CURVE NUMBER - 80
POST-DEVELOPMENT CURVE NUMBER - 80

SITE AREA: THE SITE'S APPROXIMATE ACREAGE IS 14.83 ACRES. 4.04 ACRES WILL BE DISTURBED BY CONSTRUCTION ACTIVITIES.

SOIL TYPES:

18	35
85	94B
1039	

SEQUENCE OF MAJOR ACTIVITIES:
THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS:

1. PHASE 1 CONSTRUCTION
   - 1.1. INSTALL PERIMETER CONTROLS
   - 1.2. INSTALL ROCK CONSTRUCTION ENTRANCE
   - 1.3. CLEAR AND GRUB
   - 1.4. FULL SITE GRADING
   - 1.5. PILE TOPSOIL WITHIN PERIMETER EROSION AND SEDIMENT CONTROLS
   - 1.6. STABILIZE DENUDED AREAS AND STOCKPILES WITHIN 14 DAYS OF LAST CONSTRUCTION ACTIVITY IN THAT AREA
   - 1.7. CONSTRUCTION OF ACCESS ROAD
   - 1.8. INSTALLATION OF SOLAR ARRAY EQUIPMENT AND FACILITIES
   - 1.9. FINAL GRADING, REMOVE TEMPORARY LAYDOWN AREA, AND INSTALL PERMANENT SEEDING
   - 1.10. INSTALL FILTRATION BERM AND ASSOCIATED OUTLET STRUCTURES
   - 1.11. RESEED ANY DISTURBED AREAS AND LANDSCAPE SITE
   - 1.12. REMOVAL OF TEMPORARY CONTROLS UPON SITE STABILIZATION
2. PHASE 2 CONSTRUCTION
   - 2.1. INSTALL PERIMETER CONTROLS
   - 2.2. INSTALLATION AND CONSTRUCTION OF HYDROGEN PLANT FACILITIES
   - 2.3. RESTORATION ANY DISTURBED AREAS
   - 2.4. REMOVAL OF TEMPORARY CONTROLS UPON SITE STABILIZATION

NAME OF RECEIVING WATERS: THE ENTIRE SITE ULTIMATELY DRAINS TO THE MINNESOTA RIVER.

GENERAL NOTES

ALL CONSTRUCTION ACTIVITIES MUST COMPLY WITH ALL LOCAL EROSION/SEDIMENT CONTROL, WASTE DISPOSAL, SANITARY AND HEALTH REGULATIONS.

ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST MEET THE STANDARDS AND SPECIFICATIONS OF THE MPCA STORMWATER MANUAL.

OTHER EROSION CONTROL ITEMS MAY BE NECESSARY DUE TO ENVIRONMENTAL CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION AND IMPLEMENTATION OF ADDITIONAL EROSION CONTROL ITEMS, AT THE ENGINEER'S DISCRETION.

REGULAR INSPECTION AND MAINTENANCE WILL BE PROVIDED FOR ALL EROSION AND SEDIMENT CONTROL PRACTICES.

THE CONTRACTOR SHALL USE EROSION CONTROL MEASURES AS NECESSARY TO PREVENT SEDIMENT MOVEMENT INTO AREAS DESIGNATED AS WETLANDS.

NO SOLID OR LIQUID WASTE SHALL BE DISCHARGED INTO STORM WATER RUNOFF.
ADDITIONAL EROSION AND SEDIMENT CONTROL BMP'S MAY BE REQUIRED AS IDENTIFIED BY THE DESC INSPECTOR.

CONTROLS

EROSION AND SEDIMENT CONTROLS: COMPOST FILTER SOCK AND ROCK CONSTRUCTION ENTRANCE

STABILIZATION PRACTICES

TEMPORARY STABILIZATION - TOPSOIL STOCKPILES AND DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES WILL BE STABILIZED WITH TEMPORARY SEED AND MULCH NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY IN THAT AREA. THE TEMPORARY SEED SHALL BE APPLIED AS PER THE TEMPORARY SEEDING SPECIFICATIONS.

PERMANENT STABILIZATION - DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES PERMANENTLY CEASES SHALL BE STABILIZED WITH PERMANENT SEED NO LATER THAN 14 DAYS OR WITHIN 7 DAYS FOR AREAS THAT DRAIN TO SPECIAL OR IMPAIRED WATERS AFTER THE LAST CONSTRUCTION ACTIVITY.

STORMWATER MANAGEMENT
STORMWATER DRAINAGE WILL BE PROVIDED VIA DIVERSION SWALE AND A FILTRATION BERM.

OTHER CONTROLS

WASTE DISPOSAL:
ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER RENTED FROM A LICENSED SOLID WASTE MANAGEMENT COMPANY. THE DUMPSTER WILL MEET ALL LOCAL, CITY AND STATE SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED A MINIMUM OF TWICE PER WEEK OR MORE OFTEN IF NECESSARY, AND THE TRASH WILL BE HAULED OFF-SITE. NO CONSTRUCTION WASTE MATERIALS WILL BE BURIED ONSITE. ALL PERSONNEL WILL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL. NOTICES STATING THESE PRACTICES WILL BE POSTED IN THE OFFICE TRAILER. THE INDIVIDUAL WHO MANAGES THE DAY-TO-DAY SITE OPERATIONS WILL BE RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED. ALL CONSTRUCTION AND DEMOLITION DEBRIS (C&D) WASTE WILL BE DISPOSED OF IN A MINNESOTA POLLUTION CONTROL AGENCY APPROVED C&D LANDFILL.

HAZARDOUS WASTE:
ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES. THE INDIVIDUAL WHO MANAGES DAY-TO-DAY SITE OPERATIONS WILL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES ARE FOLLOWED.

SANITARY WASTE:
ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF THREE TIMES PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR, AS REQUIRED BY LOCAL REGULATION.

OFF-SITE VEHICLE TRACKING:
OFF-SITE TRACKING OF SEDIMENTS SHALL BE MINIMIZED. A STABILIZED CONSTRUCTION ENTRANCE WILL BE PROVIDED TO HELP REDUCE VEHICLE TRACKING OF SEDIMENTS. ALL PAVED STREETS ADJACENT TO THE SITE WILL BE SWEPT DAILY TO REMOVE ANY EXCESS MUD, DIRT OR ROCK TRACKED FROM THE SITE. DUMP TRUCKS HAULING MATERIAL FROM THE CONSTRUCTION SITE WILL BE COVERED WITH A TARPAULIN.

DEWATERING ACTIVITIES:
THERE SHALL BE NO TURBID DISCHARGES TO SURFACE WATERS, RESULTING FROM DEWATERING ACTIVITIES. SEDIMENT-LADEN WATER MUST PASS THROUGH A SETTLING POND, FILTER BAG, OR OTHER COMPARABLE PRACTICE, PRIOR TO DISCHARGE.

PROCESS WASTEWATER:
ALL PROCESS WASTEWATER (EQUIPMENT WASHING, LEACHATE FROM ON-SITE WASTE DISPOSAL, ETC.) SHALL BE COLLECTED AND DISPOSED OF AT A PUBLICLY OWNED TREATMENT WORKS.

TIMING OF CONTROLS/MEASURES

AS INDICATED IN THE SEQUENCE OF MAJOR ACTIVITIES, CONSTRUCTION ENTRANCE(S) AND COMPOST FILTER SOCK WILL BE CONSTRUCTED PRIOR TO CLEARING OR GRADING OF ANY OTHER PORTIONS OF THE SITE. SEDIMENT CONTROL DEVICES SHALL BE IMPLEMENTED FOR ALL AREAS REMAINING DISTURBED LONGER THAN 14 DAYS AND/OR WITHIN 7 DAYS OF ANY GRUBBING ACTIVITIES. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN 14 DAYS WILL BE STABILIZED WITH A TEMPORARY SEED. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, THAT AREA WILL BE STABILIZED WITH PERMANENT SEED AND MULCH.

INVENTORY FOR POLLUTION PREVENTION PLAN

- COMPOST FILTER SOCK
- ROCK CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT

SPILL PREVENTION

MATERIAL MANAGEMENT PRACTICES:
THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORMWATER RUNOFF.

GOOD HOUSEKEEPING: THE FOLLOWING GOOD HOUSEKEEPING PRACTICES WILL BE FOLLOWED ONSITE DURING THE CONSTRUCTION PROJECT.

1. AN EFFORT WILL BE MADE TO STORE ONLY ENOUGH PRODUCT REQUIRED TO DO THE JOB.
2. ALL MATERIALS STORED ONSITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.
3. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER'S LABEL.
4. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.
5. WHENEVER POSSIBLE, ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
6. MANUFACTURERS' RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.
7. THE SITE SUPERINTENDENT WILL INSPECT DAILY TO VERIFY PROPER USE AND DISPOSAL OF MATERIALS ONSITE.

HAZARDOUS PRODUCTS: THESE PRACTICES ARE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS.

1. PRODUCTS WILL BE KEPT IN ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.
2. ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED; THEY CONTAIN IMPORTANT PRODUCT INFORMATION.
3. IF SURPLUS PRODUCT MUST BE DISPOSED OF, MANUFACTURERS' OR LOCAL AND STATE RECOMMENDED METHODS FOR PROPER DISPOSAL WILL BE FOLLOWED.

PRODUCT SPECIFIC PRACTICES

THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ONSITE:

PETROLEUM PRODUCTS - ALL ONSITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT SUBSTANCES USED ONSITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

FUEL STORAGE TANKS SHALL BE LOCATED AWAY FROM SURFACE WATERS AND STORM SEWER SYSTEM INLETS. FUEL TANKS SHALL BE STORED IN A DIKED AREA CAPABLE OF HOLDING 150% OF THE TANK CAPACITY.

FERTILIZERS - FERTILIZERS USED WILL NOT BE APPLIED.

SOIL STERILENT/PRE-EMERGENT - CONTRACTOR SHALL PLACE ON THE PROPOSED SUBGRADE AND ON THE FINISHED GRADE WITHIN THE LIMITS OF DISTURBANCE AS DIRECTED BY THE OWNER.

PAINTS - ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM BUT WILL BE PROPERLY DISPOSED OF ACCORDING TO MANUFACTURERS' INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.

CONCRETE TRUCKS - CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON THE SITE.

SPILL CONTROL PRACTICES

IN ADDITION TO THE GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTIONS OF THIS PLAN, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:

1. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY. MANUFACTURERS' RECOMMENDED METHODS FOR SPILL CLEANUP POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.
2. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ONSITE. EQUIPMENT AND MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUST PANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC AND METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.
3. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.
4. SPILLS WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.
5. SOILS CONTAMINATED BY PETROLEUM OR OTHER CHEMICAL SPILLS MUST BE TREATED/DISPOSED AT AN MPCA APPROVED SOLID WASTE MANAGEMENT FACILITY OR HAZARDOUS WASTE TREATMENT, STORAGE OR DISPOSAL FACILITY (TSDF).
6. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM REOCCURRING AND HOW TO CLEAN UP THE SPILL IF THERE IS ANOTHER ONE. A DESCRIPTION OF THE SPILL, WHAT CAUSED IT, AND THE CLEANUP MEASURES WILL ALSO BE INCLUDED.
7. THE SITE SUPERINTENDENT RESPONSIBLE FOR THE DAY-TO-DAY SITE OPERATIONS, WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. THEY WILL DESIGNATE SITE PERSONNEL WHO WILL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS WILL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. THE NAMES OF RESPONSIBLE SPILL PERSONNEL WILL BE POSTED IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

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NOTES AND DETAILS

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

DISCIPLINE NO.	REV.	SCALE	DESIGNED BY	DATE DRAWN	DRAWN BY	PROJECT NUMBER	SHEET NO.
C10	0	N.T.S.	WS	05/26/2026	JB	0764026	C10.01

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DUST CONTROL

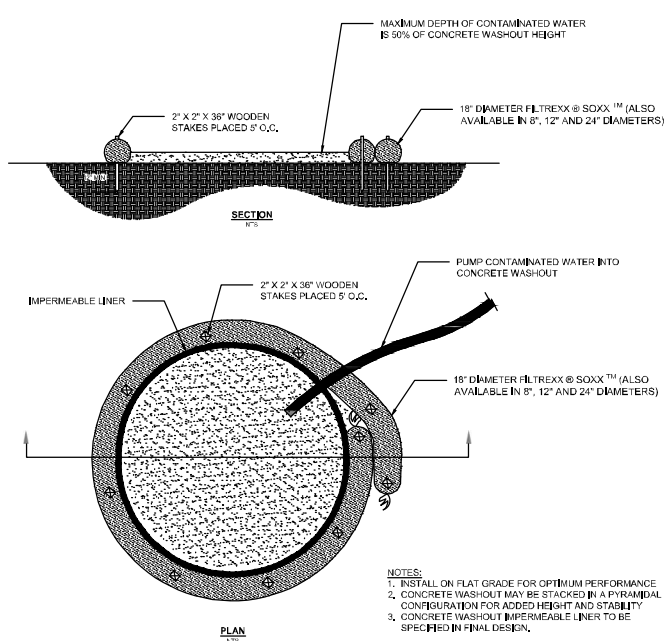
DUST CONTROL INVOLVES PREVENTING OR REDUCING DUST FROM EXPOSED SOILS OR OTHER SOURCES DURING LAND DISTURBING, DEMOLITION AND CONSTRUCTION ACTIVITIES TO REDUCE THE PRESENCE OF AIRBORNE SUBSTANCES WHICH MAY PRESENT HEALTH HAZARDS, TRAFFIC SAFETY PROBLEMS OR HARM ANIMAL OR PLANT LIFE.

THE FOLLOWING SPECIFICATIONS FOR DUST CONTROL SHALL BE FOLLOWED ONSITE:

1. VEGETATIVE COVER AND/MULCH - APPLY TEMPORARY OR PERMANENT SEEDING AND MULCH TO AREAS THAT WILL REMAIN IDLE FOR OVER 14 DAYS. SAVING EXISTING TREES AND LARGE SHRUBS WILL ALSO REDUCE SOIL AND AIR MOVEMENT ACROSS DISTURBED AREAS. SEE TEMPORARY SEEDING; PERMANENT SEEDING; MULCHING PRACTICES; AND TREE AND NATURAL AREA PROTECTION PRACTICES.
2. WATERING - SPRAY SITE WITH WATER UNTIL THE SURFACE IS WET BEFORE AND DURING GRADING AND REPEAT AS NEEDED, ESPECIALLY ON HAUL ROADS AND OTHER HEAVY TRAFFIC ROUTES. WATERING SHALL BE DONE AT A RATE THAT PREVENTS DUST BUT DOES NOT CAUSE SOIL EROSION. WETTING AGENTS SHALL BE UTILIZED ACCORDING TO MANUFACTURERS INSTRUCTIONS.
3. STONE - GRADED ROADWAYS AND OTHER SUITABLE AREAS WILL BE STABILIZED USING CRUSHED STONE OR COARSE GRAVEL AS SOON AS PRACTICABLE AFTER REACHING AN INTERIM OR FINAL GRADE. CRUSHED STONE OR COARSE GRAVEL CAN BE USED AS A PERMANENT COVER TO PROVIDE CONTROL OF SOIL EMISSIONS.
4. BARRIERS - EXISTING WINDBREAK VEGETATION SHALL BE MARKED AND PRESERVED. SNOW FENCING OR OTHER SUITABLE BARRIER MAY BE PLACED PERPENDICULAR TO PREVAILING AIR CURRENTS AT INTERVALS OF ABOUT 15 TIMES THE BARRIER HEIGHT TO CONTROL AIR CURRENTS AND BLOWING SOIL.
5. OPERATION AND MAINTENANCE - WHEN TEMPORARY DUST CONTROL MEASURES ARE USED; REPETITIVE TREATMENT SHOULD BE APPLIED AS NEEDED TO ACCOMPLISH CONTROL.
6. STREET CLEANING - PAVED AREAS THAT HAVE ACCUMULATED SEDIMENT FROM CONSTRUCTION SHOULD BE CLEANED DAILY, OR AS NEEDED, UTILIZING A STREET SWEEPER OR BUCKET - TYPE ENDLOADER OR SCRAPER.

CONCRETE WASHOUT

SPECIFICATIONS FOR CONCRETE WASHOUT



NOTES:
1. INSTALL ON FLAT GRADE FOR OPTIMUM PERFORMANCE.
2. 18" DIAMETER FILTER SOCK MAY BE STACKED ONTO DOUBLE 24" DIAMETER SOCKS IN PYRAMIDAL CONFIGURATION FOR ADDED HEIGHT.
3. A SUITABLE GEOMEMBRANE SHALL BE PLACED AT THE LOCATION OF THE WASHOUT PRIOR TO INSTALLING THE SOCKS

*APDATED FROM FILTREXX

1. THE RESIDUE OR CONTENTS OF ALL CONCRETE MIXERS, DUMP TRUCKS, OTHER CONVEYANCE EQUIPMENT AND FINISHING TOOLS SHALL BE WASHED INTO CONCRETE CLEAN-OUT STRUCTURES CONSISTING OF A STRAW BALE BARRIER WITH GRAVEL BACKFILL. THE LENGTH AND WIDTH OF THESE STRUCTURES SHALL BE AS DETERMINED BY THE CONTRACTOR TO FACILITATE THE PARTICULAR EQUIPMENT USED. THESE STRUCTURES SHALL BE CONSTRUCTED ON LEVEL GROUND AT LEAST 100' FROM THE NEAREST WATERCOURSE, DRAINAGE SWALE OR INLET. AT NO TIME SHALL THE STRUCTURE BE ALLOWED TO BE MORE THAN 50% FULL. THE CONTRACTOR SHALL MAINTAIN THESE PONDS UNTIL ALL CONCRETE PLACEMENT IS COMPLETE FOR THE PROJECT.

2. THE INTENT OF THESE STRUCTURES IS TO COLLECT ALL CONCRETE WASH OUT WATER AND ALLOW IT TO DRY TO A SOLID MATERIAL. AFTER DRYING, THE SOLID MATERIAL CAN BE REMOVED WITH A LOADER OR EXCAVATOR FOR PROPER DISPOSAL. WASH OUT WILL NOT BE PERMITTED IN ANY OTHER AREAS.

3. USE THE MINIMUM AMOUNT OF WATER TO WASH THE VEHICLES AND EQUIPMENT. NEVER DISPOSE OF WASH OUT INTO THE STREET, STORM INLET, DRAINAGE SWALE OR WATERCOURSE. DISPOSE OF SMALL AMOUNTS OF EXCESS DRY CONCRETE, GROUT AND MORTAR IN THE TRASH. ANY SOAPS THAT ARE UTILIZED SHALL BE PHOSPHATE-FREE AND BIODEGRADABLE.

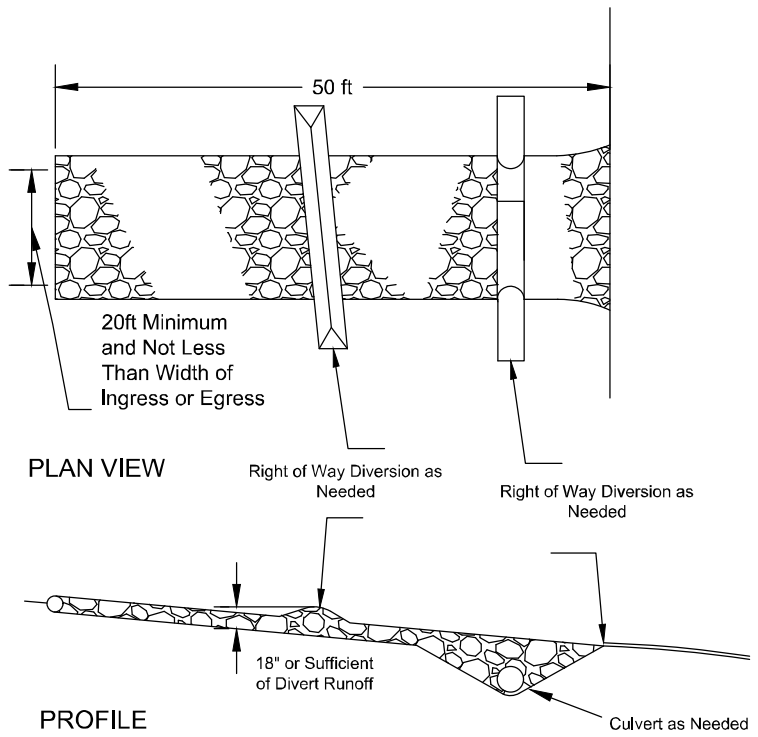
4. ADDITIONAL CONCRETE CLEAN-OUT STRUCTURES SHALL BE CONSTRUCTED WITHIN THE SPECIFIED AREA AS NEEDED BASED UPON THE VOLUME OF WASH OUT GENERATED DAILY.

ROCK CONSTRUCTION ENTRANCE

DESCRIPTION

A CONSTRUCTION ENTRANCE IS A STABILIZED PAD OF STONE UNDERLAIN WITH GEOTEXTILE AND IS USED TO REDUCE THE AMOUNT OF MUD TRACKED OFF-SITE WITH CONSTRUCTION TRAFFIC. LOCATED AT POINTS OF INGRESS/EGRESS, THE PRACTICE IS USED TO REDUCE THE AMOUNT OF MUD TRACKED OFF-SITE WITH CONSTRUCTION TRAFFIC.

SPECIFICATIONS FOR CONSTRUCTION ENTRANCE



1. STONE SIZE - THE ROCK SHALL BE 3" COARSE AGGREGATE, OR EQUIVALENT, SPREAD EVENLY 6" THICK.
2. LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 50 FT.
3. THICKNESS - THE STONE LAYER SHALL BE AT LEAST 6 INCHES THICK.
4. WIDTH - THE ENTRANCE SHALL BE AT LEAST 20 FEET WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. GEOTEXTILE - A NONWOVEN GEOTEXTILE SHALL BE LAID OVER THE ENTIRE AREA, PRIOR TO PLACING STONE.
6. TIMING - THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SOON AS IS PRACTICABLE BEFORE MAJOR GRADING ACTIVITIES.
7. CULVERT - A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OR TO PREVENT RUNOFF FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
8. WATER BAR - A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
9. MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
10. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION-SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
11. REMOVAL - THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.

COMPOST FILTER SOCK

1. THE CONTRACTOR SHALL FURNISH, INSTALL, AND MAINTAIN COMPOST FILTER SOCK THROUGHOUT THE CONSTRUCTION PERIOD.
2. MATERIALS - COMPOST USED FOR FILTER SOCKS SHALL BE WEED, PATHOGEN AND INSECT FREE AND FREE OF ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH. THEY SHALL BE DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER AND CONSIST OF A PARTICLES RANGING FROM 3/8" TO 2".
3. FILTER SOCKS SHALL BE 3 OR 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" KNITTED MESH NETTING MATERIAL, FILLED WITH COMPOST PASSING THE ABOVE SPECIFICATIONS FOR COMPOST PRODUCTS.

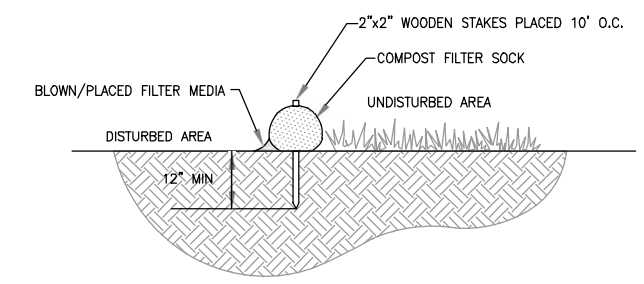
INSTALLATION:

1. FILTER SOCKS WILL BE PLACED ON A LEVEL LINE ACROSS SLOPES, GENERALLY PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREA. ON SLOPES APPROACHING 2:1, ADDITIONAL SOCKS SHALL BE PROVIDED AT THE TOP AND AS NEEDED MID-SLOPE.
2. FILTER SOCKS INTENDED TO BE LEFT AS A PERMANENT FILTER OR PART OF THE NATURAL LANDSCAPE, SHALL BE SEEDED AT THE TIME OF INSTALLATION FOR ESTABLISHMENT OF PERMANENT VEGETATION.
3. FILTER SOCKS ARE NOT TO BE USED IN CONCENTRATED FLOW SITUATIONS OR IN RUNOFF CHANNELS.

MAINTENANCE:

4. ROUTINELY INSPECT FILTER SOCKS AFTER EACH SIGNIFICANT RAIN, MAINTAINING FILTER SOCKS IN A FUNCTIONAL CONDITION AT ALL TIMES.
5. REMOVE SEDIMENTS COLLECTED AT THE BASE OF THE FILTER SOCKS WHEN THEY REACH 1/3 OF THE EXPOSED HEIGHT OF THE PRACTICE.
6. WHERE THE FILTER SOCK DETERIORATES OR FAILS, IT WILL BE REPAIRED OR REPLACED WITH A MORE EFFECTIVE ALTERNATIVE.
7. REMOVAL - FILTER SOCKS WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED IN SUCH AS WAY AS TO FACILITATE AND NOT OBSTRUCT SEEDINGS.

SPECIFICATIONS FOR COMPOST FILTER SOCK



ELEVATION VIEW

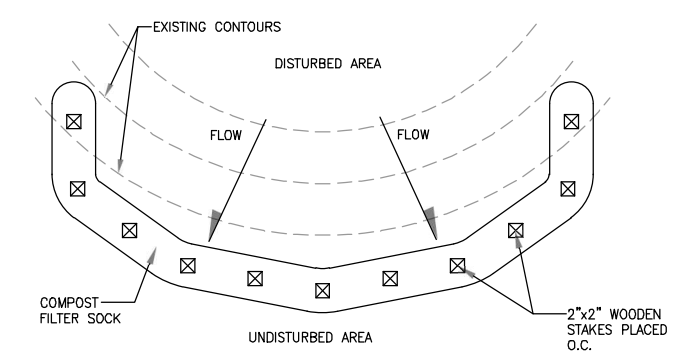


TABLE 4.1
Compost Sock Fabric Minimum Specifications

Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
Material Characteristics	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
Sock Diameters	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years
Two-ply systems					
Inner Containment Netting			HDPE biaxial net Continuously wound Fusion-welded junctures 3/4" X 3/4" Max. aperture size		
Outer Filtration Mesh			Composite Polypropylene Fabric (Woven layer and non-woven fleece mechanically fused via needle punch) 3/16" Max. aperture size		
Sock fabrics composed of burlap may be used on projects lasting 6 months or less.					

Filtrexx & JMD

COMPOST SOCK FABRIC MINIMUM SPECIFICATIONS
N.T.S.

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Rev.	Date	Description	By	Chk

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NOTES AND DETAILS

DISCIPLINE NO. C10

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV. 0

SCALE N.T.S. | DESIGNED BY WS | PROJECT NUMBER 0764026 | SHEET NO. C10.02

DATE DRAWN 05/26/2026 | DRAWN BY JB

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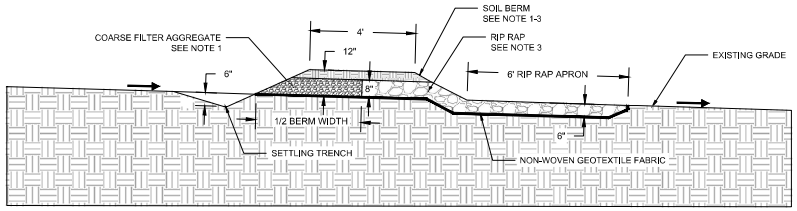
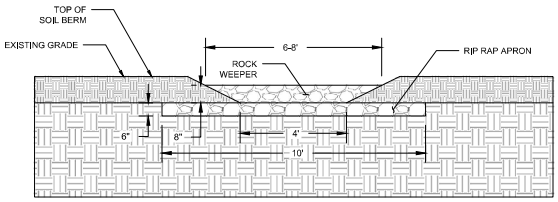


FILTRATION BERM - FRONT VIEW



FILTRATION BERM - SIDE VIEW

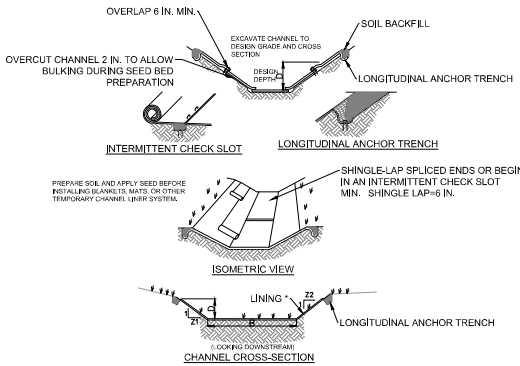
NOTES:

1. FILTRATION BERM SHALL HAVE A CONSISTENT SHAPE THROUGHOUT.
2. COARSE FILTER AGGREGATE SHALL BE 1" ROCK CONSISTING OF NATURALLY OCCURRING UNIFORMLY BLENDED MINERAL MATERIALS WITH NO MORE THAN 20% PASSING THE NO. 200 SEIVE AND CONTAINING NO TOPSOIL, ORGANICS, OR SEVERELY WEATHERED ROCK.
3. RIP RAP SHALL HAVE A D50 = 6" AND SHALL BE FREE OF SOIL AND OTHER DEBRIS AND CONSIST OF STONED WITH AT LEAST ONE FRACTURED FACE WHOSE WIDTHS ARE NOT LESS THAN 30% OF THE LENGTH OF EACH STONE.

MAINTENANCE:

4. ROUTINELY INSPECT FILTRATION BERM AFTER EACH SIGNIFICANT RAIN.
5. REPAIR DAMAGED AREAS WITHIN 24 HOURS. IF PORTIONS OF THE BERM OUTSIDE OF THE ROCK FILTERS ARE BREACHED, THE BERM SHALL BE EXPANDED OR ENLARGED UNTIL BREACHING IS PREVENTED.

1 / C10.03 — FILTRATION BERM
N.T.S.



* SEE MANUFACTURER'S LINING INSTALLATION DETAIL FOR STAPLE PATTERNS, VEGETATIVE STABILIZATION FOR SOIL AMENDMENTS, SEED MIXTURES AND MULCHING INFORMATION.
**AMENDED SOILS SPECIFICATIONS TO BE DETERMINED IN THE FINAL PLANS.

NOTES

ANCHOR TRENCHES SHALL BE INSTALLED AT BEGINNING AND END OF CHANNEL IN THE SAME MANNER AS LONGITUDINAL ANCHOR TRENCHES.

CHANNEL DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. CHANNEL SHALL BE CLEANED WHENEVER TOTAL CHANNEL DEPTH IS REDUCED BY 25% AT ANY LOCATION.

SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO CHANNEL WITHOUT FURTHER DAMAGE. DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF DISCOVERY.

NO MORE THAN ONE THIRD OF THE SHOOT (GRASS LEAF) SHALL BE REMOVED IN ANY MOWING. GRASS HEIGHT SHALL BE MAINTAINED BETWEEN 2 AND 3 INCHES UNLESS OTHERWISE SPECIFIED. EXCESS VEGETATION SHALL BE REMOVED FROM PERMANENT CHANNELS TO ENSURE SUFFICIENT CHANNEL CAPACITY.

CONSTRUCTION SEQUENCE

1. BEGIN VEGETATED SWALE CONSTRUCTION ONLY WHEN THE UPGRADIENT TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ARE IN PLACE. VEGETATED SWALES SHOULD BE CONSTRUCTED AND STABILIZED EARLY IN THE CONSTRUCTION SCHEDULE, PREFERABLY BEFORE MASS EARTHWORK AND PAVING INCREASE THE RATE AND VOLUME OF RUNOFF.
2. ROUGH GRADE THE VEGETATED SWALE. EQUIPMENT SHALL AVOID EXCESSIVE COMPACTION AND/OR LAND DISTURBANCE. EXCAVATING EQUIPMENT SHOULD OPERATE FROM THE SIDE OF THE SWALE AND NEVER ON THE BOTTOM. IF EXCAVATION LEADS TO SUBSTANTIAL COMPACTION OF THE SUBGRADE (WHERE AN INFILTRATION TRENCH IS NOT PROPOSED), 18 INCHES SHALL BE REMOVED AND REPLACED WITH A BLEND OF TOPSOIL AND SAND TO PROMOTE INFILTRATION AND BIOLOGICAL GROWTH. AT THE VERY LEAST, TOPSOIL SHALL BE THOROUGHLY DEEP PLOWED INTO THE SUBGRADE IN ORDER TO PENETRATE THE COMPACTED ZONE AND PROMOTE AERATION AND THE FORMATION OF MACROPORES. FOLLOWING THIS, THE AREA SHOULD BE DISKED PRIOR TO FINAL GRADING OF TOPSOIL.
3. CONSTRUCT CHECK DAMS, IF REQUIRED.
4. FINE GRADE THE VEGETATED SWALE. ACCURATE GRADING IS CRUCIAL FOR SWALES. EVEN THE SMALLEST NONCONFORMITIES MAY COMPROMISE FLOW CONDITIONS.
5. SEED, VEGETATE AND INSTALL PROTECTIVE LINING AS PER APPROVED PLANS AND ACCORDING TO FINAL PLANTING LIST. PLANT THE SWALE AT A TIME OF THE YEAR WHEN SUCCESSFUL ESTABLISHMENT WITHOUT IRRIGATION IS MOST LIKELY. HOWEVER, TEMPORARY IRRIGATION MAY BE NEEDED IN PERIODS OF LITTLE RAIN OR DROUGHT. VEGETATION SHOULD BE ESTABLISHED AS SOON AS POSSIBLE TO PREVENT EROSION AND SCOUR.
6. ONCE ALL TRIBUTARY AREAS ARE SUFFICIENTLY STABILIZED, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROLS. IT IS VERY IMPORTANT THAT THE SWALE BE STABILIZED BEFORE RECEIVING UPLAND STORMWATER FLOW.
7. FOLLOW MAINTENANCE GUIDELINES, AS DISCUSSED BELOW.

NOTE: IF A VEGETATED SWALE IS USED FOR RUNOFF CONVEYANCE DURING CONSTRUCTION, IT SHOULD BE REGRADED AND RESEEDED IMMEDIATELY AFTER CONSTRUCTION AND STABILIZATION HAS OCCURRED. ANY DAMAGED AREAS SHOULD BE FULLY RESTORED TO PROVIDE FUTURE FUNCTIONALITY OF THE SWALE.

2 / C10.03 — VEGETATED SWALE
N.T.S.

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

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NOTES AND DETAILS

DESCRIPTION NO.: C10

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV.: 0

SCALE	DESIGNED BY	PROJECT NUMBER	SHEET NO.
N.T.S.	WS	0764026	C10.03
DATE DRAWN	DRAWN BY		
05/26/2026	JB		

Environmental Resources Management, Inc.

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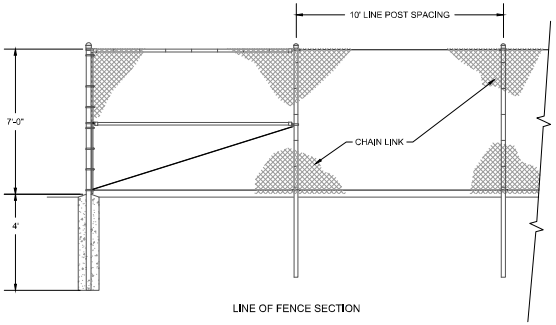
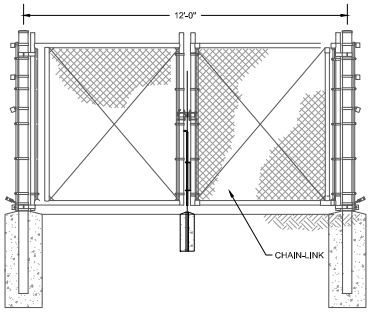


LINE OF FENCE SECTION

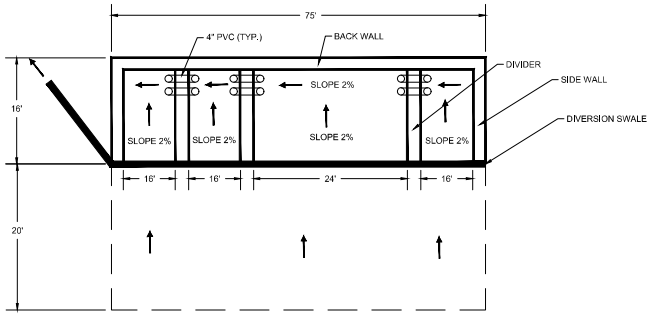


12' DOUBLE GATE SECTION

NOTES:

1. FABRIC SHALL BE 84" 9 GA. BLACK VINYL CHAIN LINK (1 ¾ KK).
2. INSTALL BRACE ASSEMBLY AS REQUIRED AT CORNER, CHANGE IN DIRECTION, OR APPROXIMATELY EVERY 1,500 LF.
3. CONCRETE POST FOOTINGS SHALL BE FOUR TIMES THE DIAMETER OF THE POST AND SHALL HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI MIN.
4. INSTALL FENCING WITHIN THE LIMITS OF APPROVED CLEARING. PERFORM NO ADDITIONAL CLEARING TO ACCOMMODATE FENCE INSTALLATION.
5. FENCE POSTS TO AVOID EXISTING DRAINTILES TO THE MAXIMUM EXTENT PRACTICABLE.

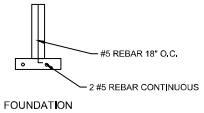
1 / C10.04 CHAIN LINK FENCE
N.T.S.



PLAN VIEW

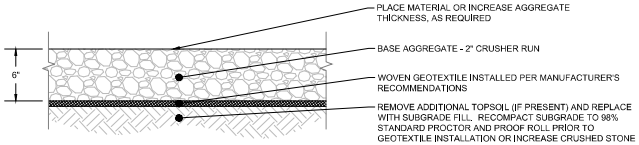
NOTES:

1. WALL DIMENSIONS SHALL BE:
   8" THICK SIDE WALLS
   10" THICK BACK WALL
   4' HIGH DIVIDERS/SIDE WALLS
   8' HIGH BACK WALL



FOUNDATION

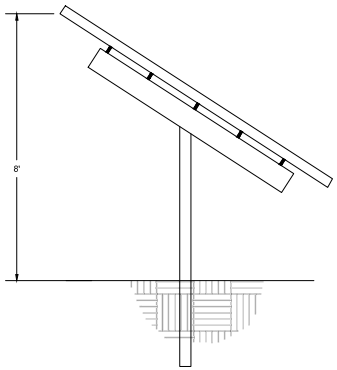
2 / C10.04 AGGREGATE CONTAINMENT
N.T.S.



NOTES:

1. FINAL GRAVEL ACCESS ROAD DESIGN TO BE APPROVED BY GEOTECHNICAL ENGINEER.

3 / C10.04 GRAVEL ACCESS ROAD
N.T.S.



NOTES:

1. SOLAR PANELS TO BE INSTALLED PER THE MANUFACTURER SPECIFICATIONS.
2. SOLAR PANELS TO HAVE A MAXIMUM HEIGHT OF 8 FT.

4 / C10.04 SOLAR PANEL
N.T.S.

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

NOTES AND DETAILS

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

SCALE	N.T.S.	DESIGNED BY	WS	PROJECT NUMBER	0764026
DATE DRAWN	05/26/2026	DRAWN BY	JB		

DESCRIPTION NO.: C10
REV.: 0
SHEET NO.: C10.04

Environmental Resources Management, Inc.

FILE PATH: C:\Users\jbeeks2\ERM\DocHive - 0276620041\03-CenterPoint Energy Environmental Support (Client) - Mankato Hydrogen Plant_CAD\CUP1-04-C_Notes and Details.dwg ACTIES-1, PRINTED ON 4/14/2026 BY Jessica Bee



Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Site	+	0.5 fc	5.7 fc	0.0 fc	N/A	N/A

Schedule

Symbol	Label	Image	QTY	Catalog Number	Description	Lamp	Number Lamps	Lumens per Lamp	LLF	Wattage	Polar Plot
	A		5	WPX0 LED ALO 1650LM SWW2 4000K MVOLT	WPX0 LED, 1650 Lumen setting, 4000K Setting, 120-277V		1	1645	0.93	12.4511	Max: 752cd

PHOTOMETRICS PLAN LEGEND

- Gas — EXISTING GAS LINE
- UFO — EXISTING FIBER OPTIC CABLE
- 12"ST — EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- UE — EXISTING UNDERGROUND ELECTRIC

NOTES:

1. PHOTOMETRICS PLAN SHOWN IS FROM MUSKA COMPANIES DATED JANUARY 13, 2026.

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

PHOTOMETRICS PLAN

DISCIPLINE NO. C7

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV. 0

SCALE	DESIGNED BY	PROJECT NUMBER	SHEET NO.
1" = 60'	WS	0764026	C7.01
DATE DRAWN: 05/26/2026	DRAWN BY: JB		

Environmental Resources Management, Inc.

FILE PATH: C:\Users\jessica.bat\OneDrive - ERM\0764159 CenterPoint Energy Environmental Support (Client) - Mankato Hydrogen Plant_CAD\CUP\09_Photometrics Plan.dwg PHOTOMETRICS PLAN, PRINTED ON 5/18/2026 BY: Jessica Bat

CENTERPOINT ENERGY - MANKATO GREEN HYDROGEN

MANKATO, MN

SITE MAP



CONTACTS

OWNER:

CENTERPOINT ENERGY - MANKATO
2400 N RIVERFRONT DR, MANKATO, MN 56001
Contact: DENNIS DAAS
Phone: (651) 270-0050

ARCHITECT:

BLOOM HAY DOBBS
ADDRESS: 2324 UNIVERSITY AVE W. SUITE 200
ST. PAUL, MN 55114
PH: (612)338 - 4590

GENERAL CONTRACTOR

LARSON BUILDING INC.
(763) 634-5600
CONTACT:IAN ALVIANI

DRAWING INDEX

GENERAL INFORMATION

G000 TITLE SHEET - GENERAL INFORMATION

ARCHITECTURAL

A210 FLOOR PLAN AND ROOF PLAN
A500 BUILDING ELEVATIONS

ARCHITECTURAL ABBREVIATIONS

ABV	ABOVE	E	EAST	LAV	LAVATORY	RO(H)	ROUGH OPENING
ACP	ACOUSTICAL PANEL	EA	EACH	LT	LIGHT		HEIGHT
ACT	ACOUSTICAL CEILING TILE	ELEC	ELECTRIC(AL)	LWC	LIGHT WEIGHT CONCRETE	RO(W)	ROUGH OPENING
ADJ	ADJUSTABLE	ELEV	ELEVATION	LVT	LUXURAL VINYL TILE		WIDTH
ADJ	ADJACENT	EMER	EMERGENCY			RWL	RAIN WATER LEADER
AFF	ABOVE FINISH FLOOR	ENC	ENCLOSE(URE)	MAS	MASONRY		
AHJ	AUTHORITIES HAVING JURISDICTION	EQ	EQUAL	MATL	MATERIAL	S	SOUTH
		EQUIP	EQUIPMENT	MAX	MAXIMUM	SCHED	SCHEDULE
ALT	ALTERNATIVE	EST	ESTIMATED	MC	METAL CHANNEL	SF	SQUARE FOOT
ALUM	ALUMINUM	ETC	ETCETERA	MDF	MEDIUM DENSITY FIBERBOARD	SHT	SHEET
ANOD	ANODIZED	EWC	ELEC WATER COOLER			SIM	SIMILAR
AP	ACCESS PANEL	EXH	EXHAUST	MECH	MECHANICAL	SIM REV	SIMILAR REVERSED
APPROX	APPROXIMATE(LY)	EXIST	EXISTING	MED	MEDIUM	SLNT	SEALANT
ARCH	ARCHITECT(URAL)	EXPN JT	EXPANSION JOINT	MFR	MANUFACTURER	SPEC	SPECIFICATION(S)
AUTO	AUTOMATIC	EXP	EXPANSION	MIC	MICROWAVE	SQ	SQUARE
		EXT	EXTERIOR	MIN	MINIMUM	SS	STAINLESS STEEL
BD	BOARD			MIR	MIRROR	STD	STANDARD
BIT	BITUMINOUS	FAF	FLUID APPLIED FLOOR	MISC	MISCELLANEOUS	STL	STL
BLDG	BUILDING	FB	FACE BRICK	MO	MASONRY OPENING	STOR	STORAGE
BLK	BLOCK	FD	FLOOR DRAIN			SUSP	SUSPENDED
BLKG	BLOCKING	FE	FIRE EXTINGUISHER	MP	METAL PANEL	SYST	SYSTEM
B.O.	BOTTOM OF	FFE	FINISHED FLOOR ELEVATION	MR	MOISTURE RESISTENT		
BRG	BEARING			MTD	MOUNTED	TBD	TO BE DETERMINED
BSMT	BASEMENT	FIN	FINISH(ED)	MTL	METAL	T.O.	TOP OF
BTM	BOTTOM	FLR	FLOOR(ING)	MULL	MULLION	TPD	TOILET PAPER DISPENSER
BTWN	BETWEEN	FND	FOUNDATION			TPTN	TOILET PARTITION
		FOS	FACE OF STEEL	N	NORTH	TRTD	TREATED
CABT	CABINET	FR	FRAME	NIC	NOT IN CONTRACT	TYP	TYPICAL
CEM	CEMENT(ITOUS)	FTG	FOOTING	NOM	NOMINAL		
CER	CERAMIC	FV	FIELD VERIFY	NRC	NOISE REDUCTION COEFFICIENT	UNO	UNLESS NOTED OTHERWISE
CG	CORNER GUARD			NTS	NOT TO SCALE		
CJ	CONTROL JOINT	GA	GAUGE			VB	VINYL BASE
CL	CENTER LINE	GALV	GALVANIZED	OA	OVERALL	VCT	VINYL COMPOSITION
CLG	CEILING	GB	GRAB BAR	OC	ON CENTER	TILE	
CPT	CARPET	GC	GENERAL CONTRACTOR	OD	OUTSIDE DIAMETER	VER	VERIFY
CMU	CONCRETE MASONRY UNIT	GL	GLASS	OPG	OPENING	VERT	VERTICAL
COL	COLUMN	GYP	GYPSUM	OVHD	OVERHEAD	VEST	VESTIBULE
CONC	CONCRETE	GYP BD	GYPSUM BOARD			VR	VAPOR RETARDER
CONF	CONFERENCE	HD	HEAD	PLAM	PLASTIC LAMINATE		
CONST	CONSTRUCTION	HDR	HEADER	PLYWD	PLYWOOD	W	WEST
CONT	CONTINUOUS	HM	HOLLOW METAL	PNL	PANEL	W/	WITH
CONTR	CONTRACTOR	HOR	HORIZONTAL	PR	PAIR	W/O	WITHOUT
CORR	CORRIDOR	HSS	HOLLOW STEEL SECTION	PRTN	PARTITION	WC	WATER CLOSET
		HT	HEIGHT	PT	PAINT	WD	WOOD
DETL	DETAIL	HTG	HEATING			WDW	WINDOW
DF	DRINKING FOUNTAIN	HVAC	HEATING/AIR CONDITIONING	RAD	RADIUS	WF	WIDE FLANGE
DIA	DIAMETER			RD	ROOF DRAIN	WP	WORK POINT
DIAG	DIAGONAL			REF	REFERENCE	WWF	WELDED WIRE FABRIC
DIM	DIMENSION	ID	INSIDE DIAMETER	REINF	REINFORCE(D)		
DISP	DISPENSER	INT	INTERIOR	REQD	REQUIRED		
DS	DOWNSPOUT	INSUL	INSULATE(ION)	RES	RESISTIVE		
DT	DRAIN TILE			REV	REVERSE		
DW	DISHWASHER	JC	JANITOR'S CLOSET	RF	ROOF		
DWG	DRAWING	JT	JOINT	RM	ROOM		
DWR	DRAWER			RO	ROUGH OPENING		

MATERIALS

- BATT INSULATION
- BRICK
- CAST STONE
- CONCRETE
- CONCRETE MASONRY UNIT
- EARTH
- EXISTING MATERIAL
- GRAVEL BED
- PLASTER
- RIGID INSULATION
- STEEL
- STONE
- WOOD

GENERAL SYMBOLS

DRAWING SHEET NUMBERS

DISCIPLINE — DRAWING SERIES
A101
DRAWING NUMBER

COLUMN GRID LINES

REFERENCE TO DETAIL

DETAIL — DETAIL / DRAWING NUMBER — ELEVATION
SHEET NO.

ROOM IDENTIFICATION

ROOM NAME — ROOM NAME
100 — ROOM NUMBER

DOOR IDENTIFICATION

EXISTING — NEW

LINE TYPES

1' - 3 1/2" — DIMENSION LINE
NOTE LEADER
MATCH LINE
CENTER LINE OR FINISH FLOOR LINE
BROKEN LINE, LINE ABOVE OR BELOW SOFFITS, N.I.C. ITEMS
REVISION: CLOUD AROUND MOST RECENT REVISION MADE

PARTITION SYMBOLS

PARTITION TYPE
NEW PARTITION
EXISTING WALL TO REMAIN
EXISTING WALL TO BE DEMOLISHED

NOTATION SYMBOLS

KEYNOTE TAG
EGRESS OCCUPANT LOAD

BLOOM HAY DOBBS

MIDTOWN COMMONS
2324 UNIVERSITY AVE W, SUITE 200, ST. PAUL, MN 55114
PH. 612.338.4590

CENTERPOINT ENERGY - MANKATO
2400 N RIVERFRONT DR, MANKATO, MN 56001
CONTACT: DENNIS DAAS
PHONE: (651) 270-0050

CONSULTANT

PROJECT NAME: CENTERPOINT ENERGY - MANKATO GREEN HYDROGEN
PROJECT NUMBER: 18009.008
DATE: 03/27/2026

REVISIONS

NUMBER	DESCRIPTION	DATE

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 ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME

SIGNATURE

LICENSE NO.

03/27/2026
DATE

DRAFT
FOR DISCUSSION ONLY

Not For Construction

SHEET TITLE:

TITLE SHEET - GENERAL INFORMATION

SHEET NUMBER:

G000

3/27/2026 3:27:26 PM © 2026 BLOOM HAY DOBBS. CONFIDENTIAL.

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BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit: City of Mankato	**County:** Blue Earth
Applicant Name: CenterPoint Energy Natural Gas Operations	**Applicant Representative:** Nicole Johnson, ERM
Project Name: Mankato Hydrogen Energy Plant Project	**LGU Project No. (if any):** WTLD-0010-25
Date Complete Application Received by LGU: October 22, 2025	
Date of LGU Decision: December 10, 2025	
Date this Notice was sent: December 10, 2025	

WCA Decision Type - check all that apply

☒ Wetland Boundary/Type ☐ Sequencing ☐ Replacement Plan ☐ Bank Plan (not credit purchase)
☐ Exemption ☒ No-Loss (8420.0415)
MN Rules 8420.0420 Part: ☒ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H
Subpart: ☐ 4 ☐ 5 ☐ 7 ☐ 9
MN Statutes 103G.2241
Subdivision: : ☐ 1 ☐ 2 ☐ 6 ☐ 9

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits - Number of Credits: ☐ Bank Credits – Number of Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☒ Approve ☐ Approve w/Conditions ☐ Deny ☐ No TEP Recommendation

LGU Decision

☐ Approved with Conditions (specify below)[1] ☒ Approved[1] ☐ Denied
List Conditions:

Decision-Maker for this Application: ☐ Staff ☐ Governing Board/Council ☒ Other: Staff in consultation with the TEP

Decision is valid for: ☒ 5 years (default) ☐ Other (specify):

[1] *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision[1].

☐ Attachment(s) (specify):
☒ Summary: The City of Mankato TEP reviewed the request for delineation concurrence and a no-loss at their meeting on November 19, 2025, when a site visit was conducted. The initial delineation report contained only 2 wetlands, however during the site visit it was determined that there was an additional wetland located in the southwest corner of the subject site. On December 5, 2025 updated delineation information depicting the additional wetland was submitted. Based on this revised submission, the City of Mankato, in conjunction with the TEP, find concurrence that there are three wetlands on the subject site. Wetland wbea001e, a Type 3 wetland is .37 acres and is located adjacent to the southern boundary of the property. Wetland wbea002e, a Type 3 wetland, is .02 acres and is located centrally on the site adjacent to an existing parking lot. Wetland wbea003s, the wetland added based on the TEP inspection, is a Type 6 wetland consisting of .35 acres. The applicant has also requested a no-loss under Minnesota Rule 8420.0415 Subpart a, "an activity that will not impact a wetland." The applicant's submission information demonstrates a "Solar array" location that is outside of any of the three wetland areas, and the narrative provided indicates that there will be no activity in the wetland areas. Therefore, the LGU finds that the no-loss request achieves the applicable criteria.

[1] *Findings must consider any TEP recommendations.*

Attached Project Documents

☒ Site Location Map ☐ Project Plan(s)/Descriptions/Reports (specify):

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☒ Yes[1] ☐ No

[1] *If yes, all appeals must first be considered via the local appeals process.*

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Within 45 days of the decision an application for appeal must be filed with the Board of Adjustments and Appeals, address as follows: Board of Adjustments and Appeals, attention: Zoning Administrator, 10 Civic Center Plaza, PO Box 3368, Mankato, MN 56002-3368.

Notice Distribution (include name)

Required on all notices:

☒ SWCD TEP Member: Jake Fritz, via email jake.fritz@blueearthswcd.org	☒ BWSR TEP Member: Alyssa Core, Alyssa.core@state.mn.us
☒ LGU TEP Member (if different than LGU contact):	Cory Bienfang, cbienfang@mankatomn.gov
☒ DNR Representative:	Erynn Jenzen via email erynn.jenzen@state.mn.us
☐ Watershed District or Watershed Mgmt. Org.:	

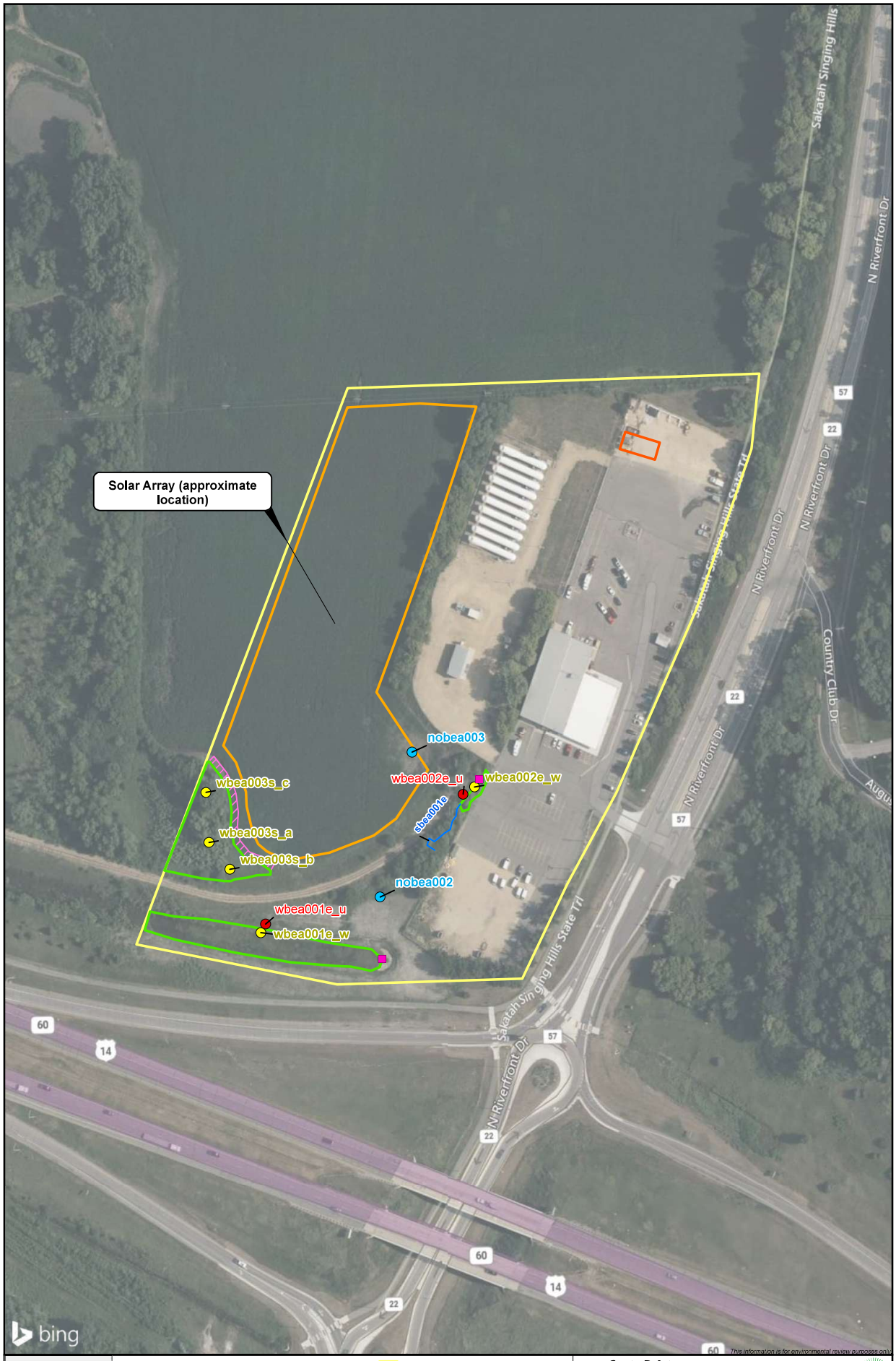
☐ Applicant:	☒ Agent/Consultant: Nicole Johnson, ERM

Optional or As Applicable:

☒ Corps of Engineers: David Studenski via email: david.a.studenski@usace.army.mil
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):
☐ Members of the Public (notice only): ☐ Other:

Signature: *Mark Konz via electronic signature* *By Molly Westman*	**Date:** December 10, 2025

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.



CenterPoint Energy

Figure 6
Field Survey Data Map
Mankato Hydrogen Energy Plant Project
Mankato, Blue Earth County, Minnesota

ERM

FILE: M:\US\Projects\A-C\CenterPoint\Minnesota\2025\09\Special_CPE_Mankato_Hydrogen_Energy_Plant_SWPPP_CPE_Mankato_Hydrogen_Energy_Plant_SWPPP.aprx | REVISED: 12/04/2025 | SCALE: 1:1,800 when printed at 11x17 | DRAWN BY: DK

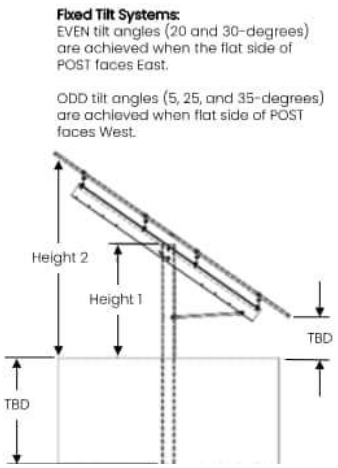
Muska Electric Solar Decommissioning Narrative

2400 North Riverfront Drive Mankato,, MN 56001

System Shutdown: PV System will need to be shut down and locked off at the point of interconnection. Electrician will need to verify voltage is absent and all solar components are safe for removal.

Module Removal: Solar array may safely be stripped of DC/ free air conductors once the system is locked off and deemed safe to work on. All conductors may be recycled to offset the cost of removal. Modules will then need to be unbolted, palletized, and staged for pickup for a silica/ PV recycling service.

Racking Removal: The steel racking system supporting the modules may be unbolted or cut. All components may be recycled. The vertical posts/ 'c-channel' will be removed by a fence post puller (hydraulic attachment for bobcat). All posts are to be driven, not encased in footings.



- Post Driven: Average embedment depth = 6.5 feet to 8.5 feet.
- Concrete Footer: Average is 24-inch OD x 6.0 feet to 7.0 feet deep.
- Concrete Ballast Block: Typical size 120-inch L x 30-inch W x 12-inch H.

NOTE: EVEN tilt angles (20 and 30-degrees) are achieved when the flat side of POST faces East. And ODD tilt angels (5, 25, and 35-degrees) are achieved when flat side of POST faces West.

Inverters: Inverters may be removed manually. Racking support and shade cover components may be recycled. Inverters will need to be disposed of through an electronics recycling center.

Switchgear and Feeders (AC Component): These components may be able to remain if the landowner intends to install an updated PV system at the time of decommissioning. AC Feeders may be tested for damage, and switchgear may be re-certified for use. If they are to be removed, feeders will need to be pulled free with assistance from a motorized tugger. Conductors may be recycled to offset the costs. Underground conduits will need to be unearthed and disposed of with the use of an excavator. The switchgear may be removed with a telehandler and sent to a refurbish center that will strip the switchgear of salvageable items. Concrete will need to be demolished, and shipped to a crusher site.

Site Restoration: There are no underground components within the boundary of the array. Once the array has been removed, the site may be mowed, plowed, & seeded at the expense of others. These actions may not be needed as the site owner/ developer has plans for native plantings incorporated into their development strategy.

Sincerely,

Muska Electric Company

Michael Ahmann

Michael Ahmann

Project Manager

6/15/2026

Muska Electric Solar Decommissioning Estimate

Site Address: 2400 N Riverfront Drive Mankato, MN 56001

Array Infrastructure	**Labor Costs**	**Fees**
Modules (2,102)	$20,000.00	
Cable Support System (600ft)	$6,000.00	
Racking Supports (24 rows)	$19,500	
Vertical Pilings (337)	$10,000	
Electrical Equipment		
Inverters (8)	$1,500	$500
Feeder Conductors	$5,000	
Switchgear	$2,500	
Recycling/ Disposal		
Modules (2,102)		$5,000
DC Wire		*No Charge*
AC Feeder Conductors		*No Charge*
Gear		*No Charge*
Total Costs	$70,000.00	

Sincerely,

Muska Electric Company

Michael Ahmann

Michael Ahmann
{Project Manager, Estimator}

MEMO

TO	File
COMPANY	Centerpoint Energy Minnesota Gas
FROM	Macy Hanson
DATE	January 7, 2026
SUBJECT	National Register of Historic Places Review Mankato Hydrogen Energy Plant Project Mankato, Blue Earth County, Minnesota

CenterPoint Energy Minnesota Gas (CenterPoint) is proposing a project within Mankato, Blue Earth County, Minnesota, referred to as the Mankato Hydrogen Energy Plant Project (Project). The Project is anticipated to disturb approximately 3.2 acres of land.

The proposed Project is entirely located within previously disturbed areas. No new access roads will be constructed as part of the Project.

Environmental Resources Management (ERM), on behalf of CenterPoint, reviewed the National Park Service's (NPS') National Register of Historic Places (NRHP) to identify any significant cultural resources that may be listed on the NRHP within the project area. There are no NRHP-listed properties within the proposed project area. The closest NRHP-listed property (Stewart, William E., House) is situated approximately 1.65 miles Southwest of the proposed project area. As a result, CenterPoint's proposed Project will not have any direct effect on this historic property. Additionally, the Project will have no effects on any historic properties, as it is located within a previously disturbed area, approximately 1.65 miles Northeast of, and without any direct line of sight to the nearest historic property.

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Centerpoint Solar Glare Study Summary

Component Data (pages#3-32): **Input** data for the array and nearby 'receptors' that have been identified (*coordinates & elevations*). Output data of glare projections for each receptor location.

Receptors: The study of the solar array to be installed highlighted (9) potential locations for potential glare. These locations are defined as 'receptors' and named (*Eastbound Hwy, Northbound Exit Ramp, Westbound Exit Ramp, Westbound Highway, FP 1, FP 2, OP 1, OP 2, OP*). These receptors are defined and highlighted on map from pg5- pg10.

Statement of Results: Page 11&12 displays the results for the annual amount of glare (*both 'green' and 'yellow' as defined on page 53*) projected for each receptor site in regards to the solar array. The results for each receptor site is broken down on pages 13-18. Pages 19-52 show the results for glare in regards to the building and tanks at the site (*not required to be reviewed, simply for comparison of glare caused by existing structures*).

***Muska Statement*:** Yellow Glare to be made aware of occurs in receptor sites (*eastbound hwy, west bound entrance ramp, westbound hwy*). The maximum reported yellow glare for any of these sites is limited to 1,725 minutes per year. This glare is expected to be present from April-September annually; resulting in a window of roughly 10 minutes per day for potential glare. No yellow glare detected for the flight paths (*FP1, FP2*). The OP receptor location results are of no concern as they pose no effect on traffic or neighbors.

Sincerely,
Muska Electric Company
Michael Ahmann
Project Manager & Estimator

FORGESOLAR GLARE ANALYSIS

Project: **Centerpoint (Muska)**
Site configuration: **Centerpoint Ground Mount-temp-1**
Calculated via ForgeSolar Radiometric Physics Engine v3.1.2

Client: Muska Electric

Created 10 Apr, 2026
Updated 10 Apr, 2026
Time-step 1 minute
Timezone offset UTC-6
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 1 MW to 5 MW
Site ID 175642.28976

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad



Summary of Results

Glare with potential for temporary after-image predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	20.0	180.0	7,253	120.9	7,932	132.2	-

Vertical Surface	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Building	46,138	769.0	0	0.0
Tanks	18,316	305.3	0	0.0

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	4,215	70.2	1,232	20.5
Northbound Exit Ramp	19,889	331.5	0	0.0
West Bound Entrance Ramp	20,644	344.1	1,370	22.8
Westbound Hwy	4,376	72.9	1,725	28.8
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	1,164	19.4	2,208	36.8
OP 2	16,638	277.3	563	9.4

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 3	4,781	79.7	834	13.9

Component Data

PV Arrays

Name: PV array 1
Axis tracking: Fixed (no rotation)
Tilt: 20.0°
Orientation: 180.0°
Rated power: -
Panel material: Smooth glass with AR coating



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	44.190575	-93.983609	836.70	2.00	838.70
2	44.192036	-93.982746	842.45	2.00	844.45
3	44.192025	-93.982129	844.98	2.00	846.98
4	44.190875	-93.982740	843.07	2.00	845.07
5	44.190590	-93.982386	842.83	2.00	844.83
6	44.190328	-93.982842	837.15	2.00	839.15
7	44.190355	-93.983577	835.78	2.00	837.78

Vertical Surfaces

Name: Building
Material profile: >
Lower edge height: 0 ft
Upper edge height: 30 ft
Surface glare contribution: evaluate single side

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.190721	-93.981673	851.12
2	44.190563	-93.981160	854.59
3	44.190830	-93.981010	856.53
4	44.190900	-93.981227	854.70
5	44.191017	-93.981163	855.48
6	44.191107	-93.981455	852.15
7	44.190721	-93.981673	851.12

Name: Tanks
Material profile: >
Lower edge height: 15 ft
Upper edge height: 32 ft
Surface glare contribution: evaluate single side

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.191482	-93.982015	849.56
2	44.191385	-93.981706	850.73
3	44.191797	-93.981460	849.87
4	44.191889	-93.981773	848.12
5	44.191482	-93.982015	849.56

Route Receptors

Name: Eastbound Hwy
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	44.189684	-93.986985	832.63	5.00	837.63
2	44.187323	-93.978069	907.92	5.00	912.92

Name: Northbound Exit Ramp
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	44.188000	-93.978649	892.90	5.00	897.90
2	44.188727	-93.980306	863.84	5.00	868.84
3	44.188992	-93.981218	846.25	5.00	851.25
4	44.189304	-93.981336	849.11	5.00	854.11
5	44.189761	-93.981068	849.06	5.00	854.06
6	44.190188	-93.980607	858.91	5.00	863.91
7	44.191323	-93.979791	879.92	5.00	884.92
8	44.191985	-93.979523	885.30	5.00	890.30

Name: West Bound Entrance Ramp
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	44.192531	-93.979453	887.85	5.00	892.85
2	44.191569	-93.979877	880.35	5.00	885.35
3	44.190627	-93.980505	861.17	5.00	866.17
4	44.189657	-93.981288	848.42	5.00	853.42
5	44.189373	-93.981760	848.14	5.00	853.14
6	44.189342	-93.982608	848.54	5.00	853.54
7	44.189381	-93.983536	840.13	5.00	845.13
8	44.189573	-93.985193	835.55	5.00	840.55
9	44.189846	-93.986320	834.47	5.00	839.47

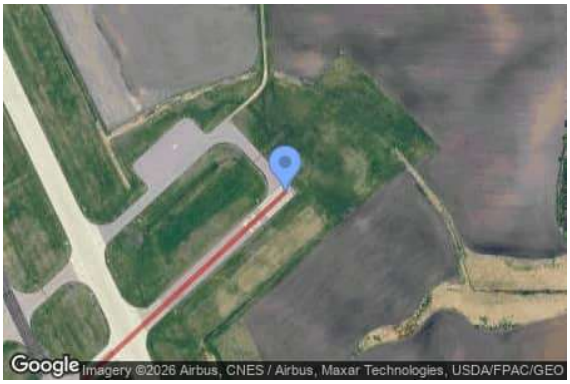
Name: Westbound Hwy
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	44.187592	-93.978091	906.92	5.00	911.92
2	44.189900	-93.986867	832.08	5.00	837.08

Flight Path Receptors

Name: FP 1
Description:
Threshold height: 50 ft
Direction: 46.9°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	44.222743	-93.913877	1018.25	50.00	1068.25
Two-mile	44.202991	-93.943375	993.58	628.09	1621.68

Name: FP 2
Description:
Threshold height: 50 ft
Direction: 154.7°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	44.216884	-93.913877	1015.33	50.00	1065.33
Two-mile	44.243023	-93.931137	993.14	625.62	1618.76

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	44.190225	-93.981860	851.74	6.00
OP 2	2	44.190594	-93.981396	853.71	6.00
OP 3	3	44.191725	-93.980908	856.24	6.00

Obstruction Components

Name: Blvd Trees 1
Top height: 35.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.191791	-93.979974	876.56
2	44.191674	-93.980051	874.56

Name: Blvd Trees 2
Top height: 35.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.191362	-93.980242	868.97
2	44.191243	-93.980338	864.61

Name: Blvd Trees 3
Top height: 35.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.190960	-93.980515	863.98
2	44.190576	-93.980843	855.82

Name: Field Trees SW
Top height: 45.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.190504	-93.983841	834.68
2	44.190209	-93.983766	833.68

Name: Field Trees W
Top height: 32.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.191915	-93.984399	831.90
2	44.190681	-93.984410	833.86

Name: Lot Trees
Top height: 35.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.191217	-93.981486	851.62
2	44.190656	-93.981806	850.48

Name: Lot Trees SE
Top height: 30.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	44.189679	-93.982219	848.15
2	44.189634	-93.981777	852.54
3	44.189978	-93.981393	854.64

Glare Analysis Results

Summary of Results

Glare with potential for temporary after-image predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	20.0	180.0	7,253	120.9	7,932	132.2	-

Vertical Surface	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Building	46,138	769.0	0	0.0
Tanks	18,316	305.3	0	0.0

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	4,215	70.2	1,232	20.5
Northbound Exit Ramp	19,889	331.5	0	0.0
West Bound Entrance Ramp	20,644	344.1	1,370	22.8
Westbound Hwy	4,376	72.9	1,725	28.8
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	1,164	19.4	2,208	36.8
OP 2	16,638	277.3	563	9.4
OP 3	4,781	79.7	834	13.9

PV: PV array 1 potential temporary after-image

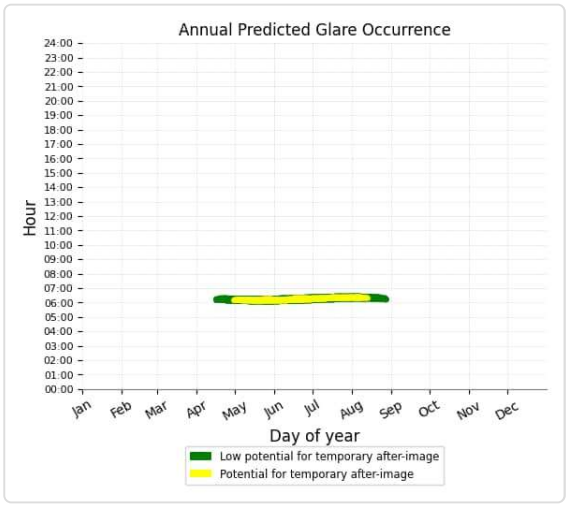
Receptor results ordered by category of glare

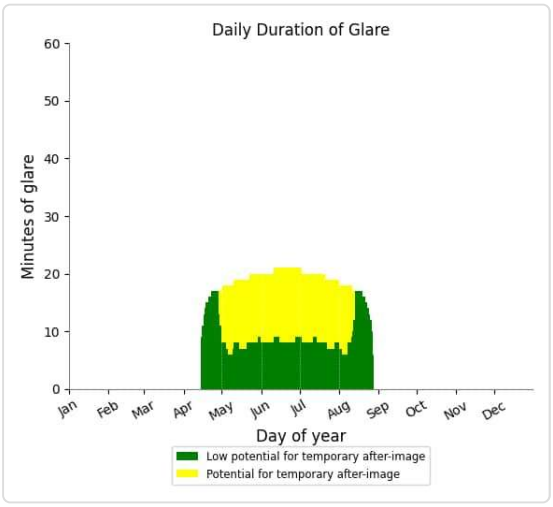
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	1,284	21.4	1,232	20.5
West Bound Entrance Ramp	1,132	18.9	1,370	22.8
Westbound Hwy	1,242	20.7	1,725	28.8
Northbound Exit Ramp	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	1,164	19.4	2,208	36.8
OP 2	1,111	18.5	563	9.4
OP 3	1,320	22.0	834	13.9

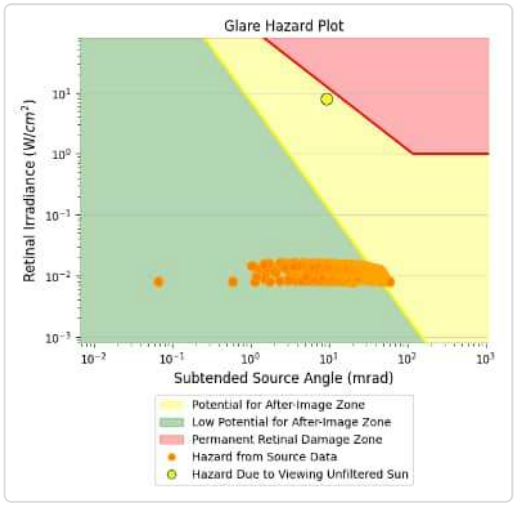
PV array 1 and Route: Eastbound Hwy

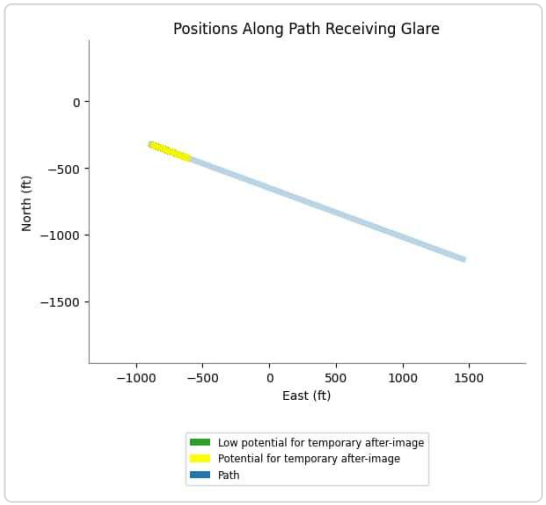
Yellow glare: 1,232 min.

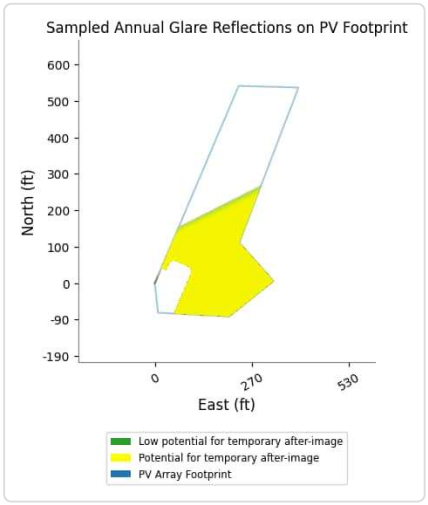
Green glare: 1,284 min.







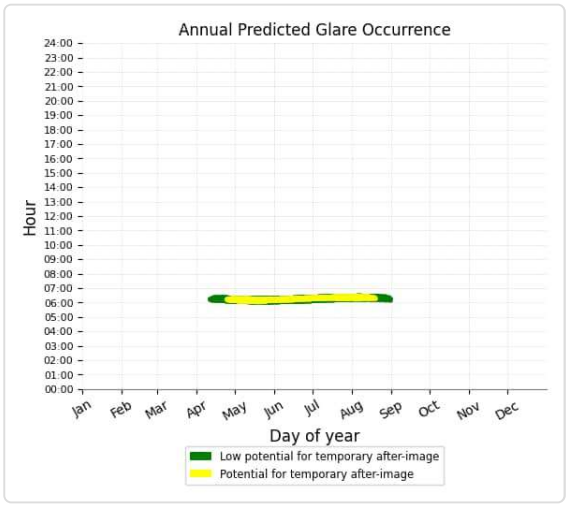


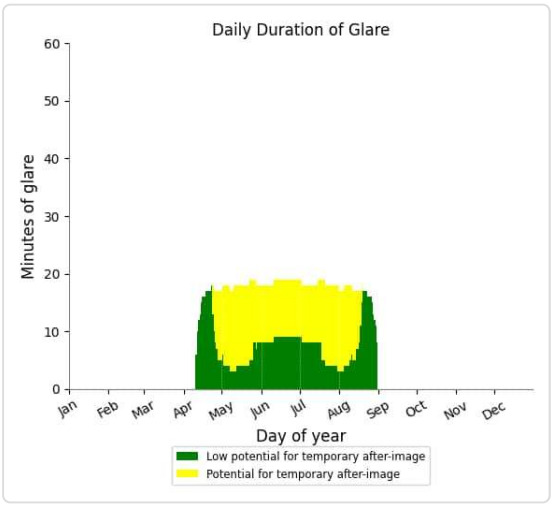


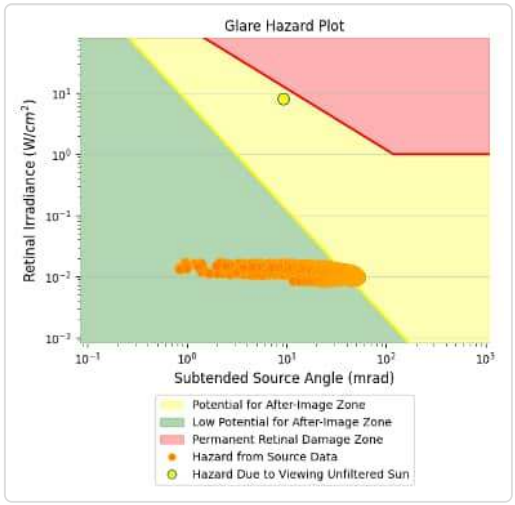
PV array 1 and Route: West Bound Entrance Ramp

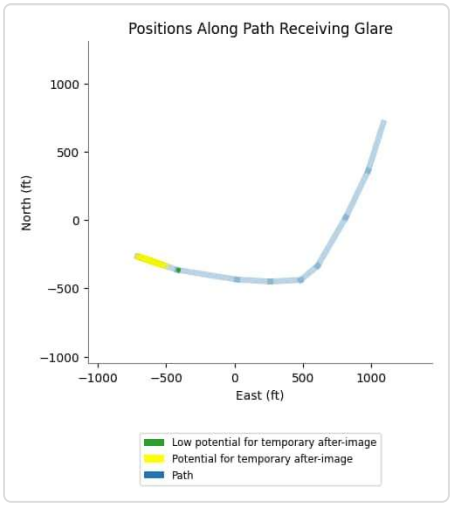
Yellow glare: 1,370 min.

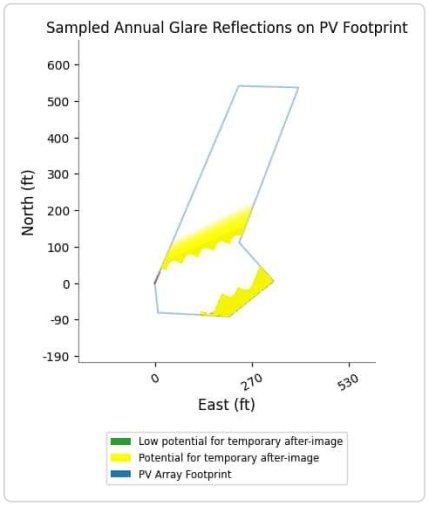
Green glare: 1,132 min.







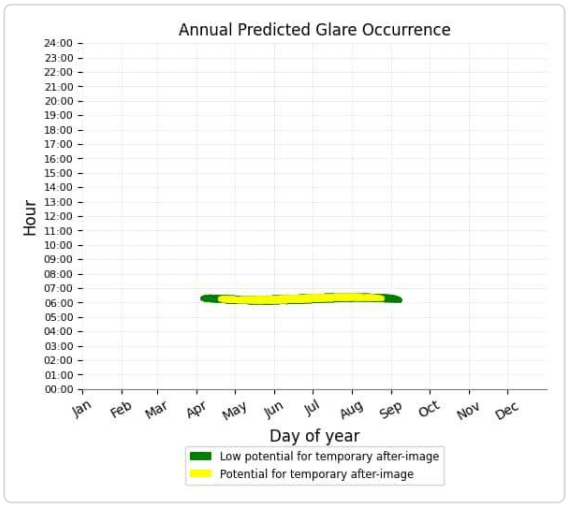


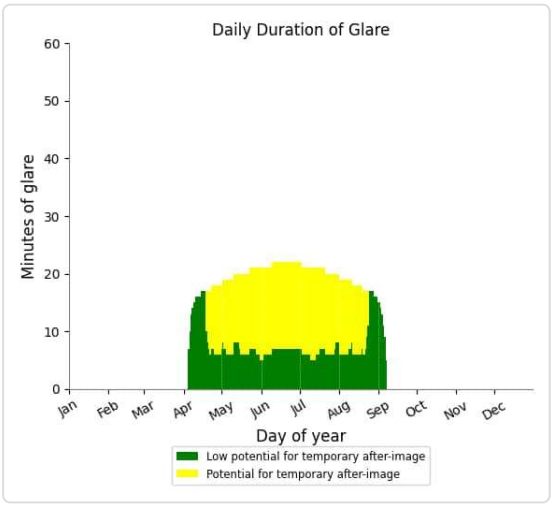


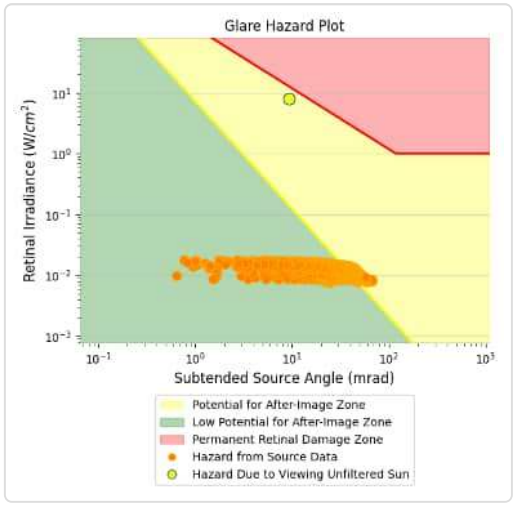
PV array 1 and Route: Westbound Hwy

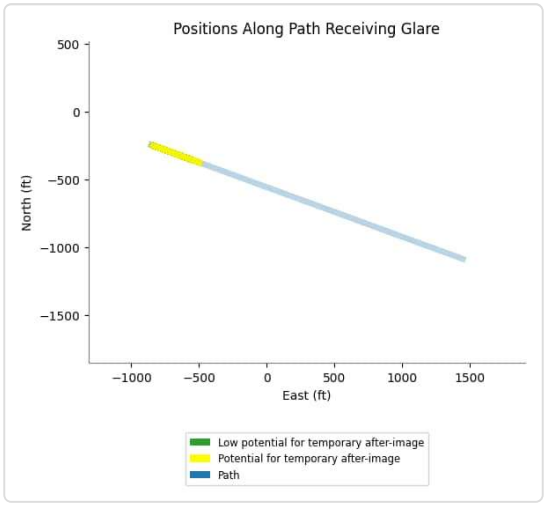
Yellow glare: 1,725 min.

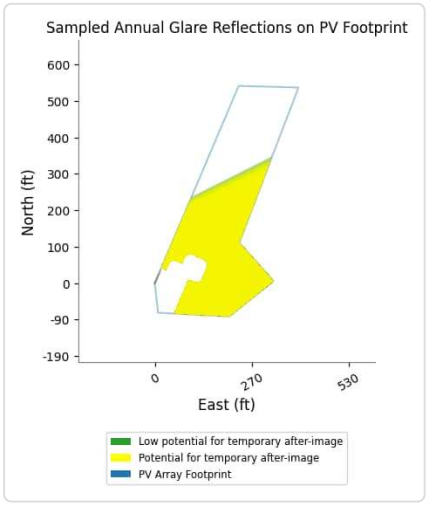
Green glare: 1,242 min.











PV array 1 and Route: Northbound Exit Ramp

No glare found

PV array 1 and FP: FP 1

No glare found

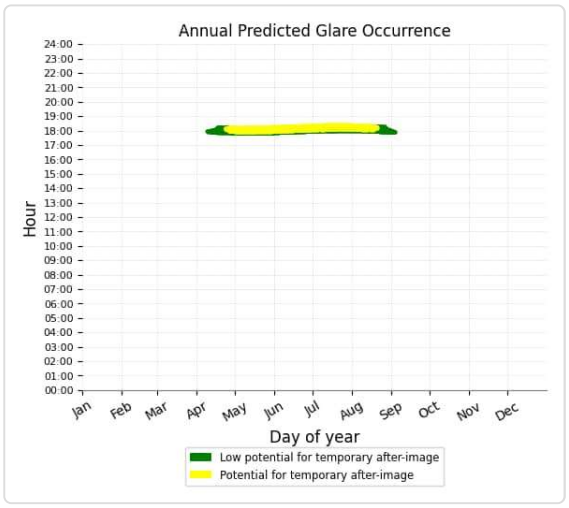
PV array 1 and FP: FP 2

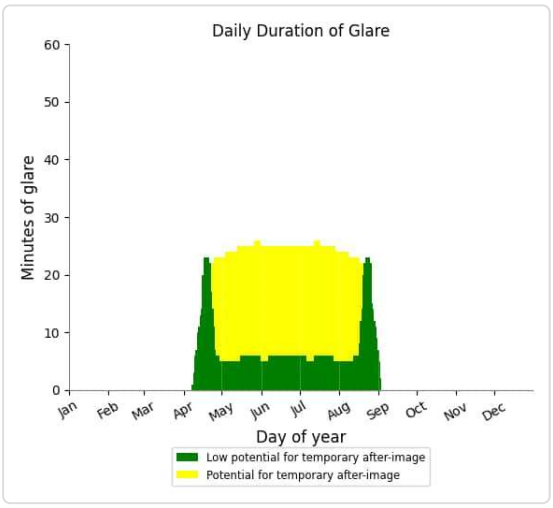
No glare found

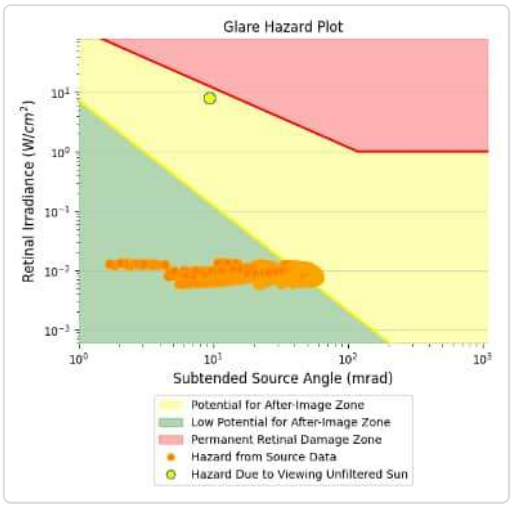
PV array 1 and OP 1

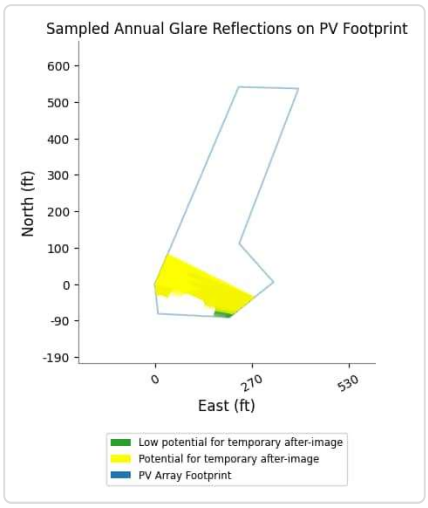
Yellow glare: 2,208 min.

Green glare: 1,164 min.





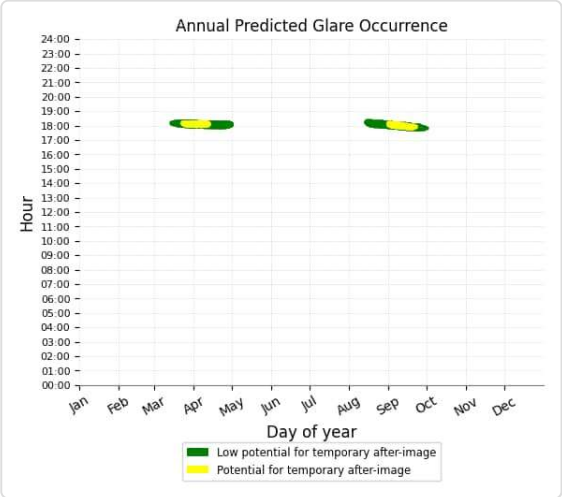


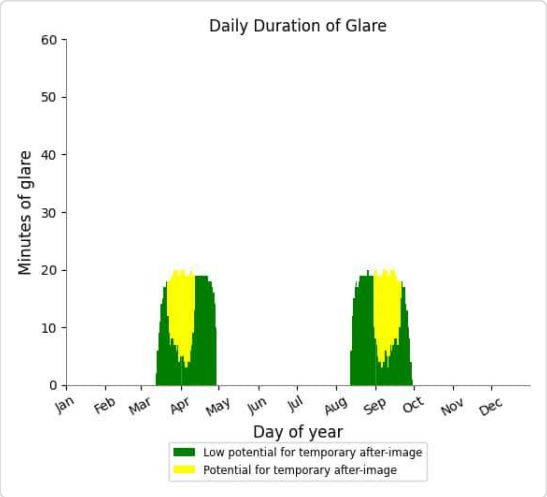


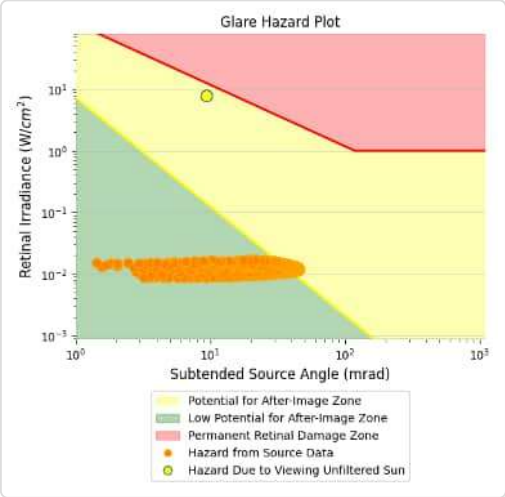
PV array 1 and OP 2

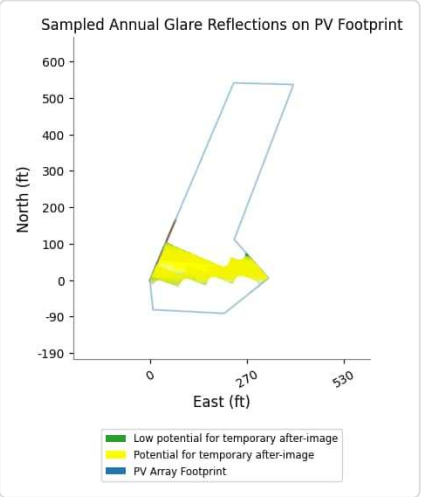
Yellow glare: 563 min.

Green glare: 1,111 min.





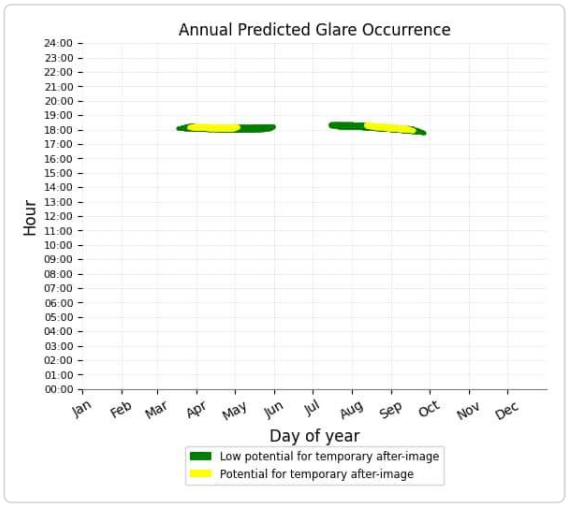


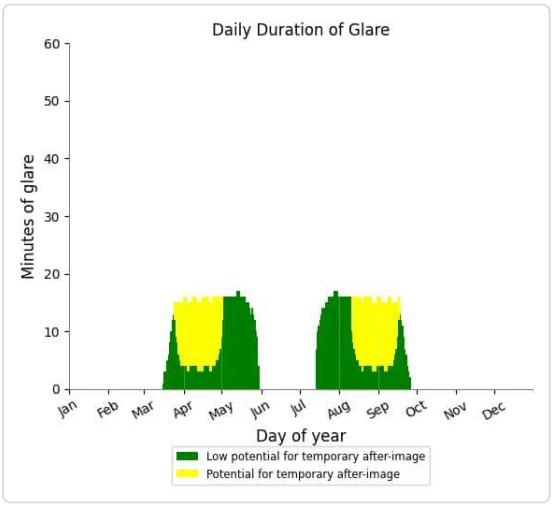


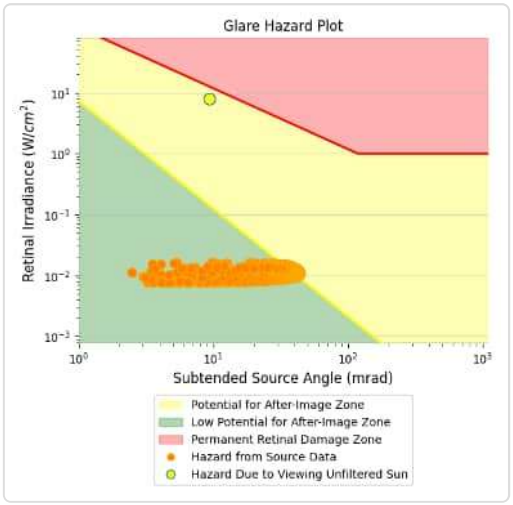
PV array 1 and OP 3

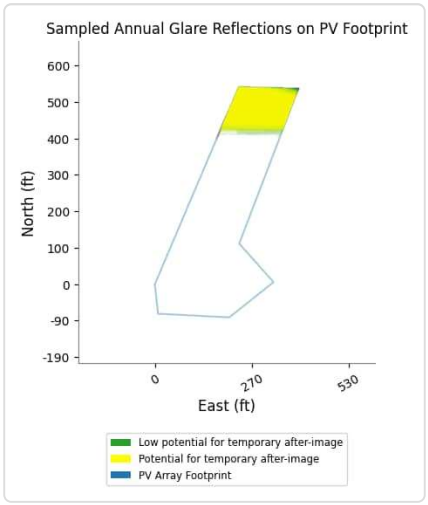
Yellow glare: 834 min.

Green glare: 1,320 min.









VS: Building

VS Face: 1-2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	0	0.0	0	0.0
Northbound Exit Ramp	0	0.0	0	0.0
West Bound Entrance Ramp	0	0.0	0	0.0
Westbound Hwy	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

Eastbound Hwy

Receptor type: Route
No glare found

Northbound Exit Ramp

Receptor type: Route
No glare found

West Bound Entrance Ramp

Receptor type: Route
No glare found

Westbound Hwy

Receptor type: Route
No glare found

FP 1

Receptor type: 2-mile Flight Path
No glare found

FP 2

Receptor type: 2-mile Flight Path
No glare found

OP 1

Receptor type: Observation Point
No glare found

OP 2

Receptor type: Observation Point
No glare found

OP 3

Receptor type: Observation Point
No glare found

VS Face: 2-3 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	0	0.0	0	0.0
Northbound Exit Ramp	0	0.0	0	0.0
West Bound Entrance Ramp	0	0.0	0	0.0
Westbound Hwy	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

Eastbound Hwy

Receptor type: Route
No glare found

Northbound Exit Ramp

Receptor type: Route
No glare found

West Bound Entrance Ramp

Receptor type: Route
No glare found

Westbound Hwy

Receptor type: Route
No glare found

FP 1

Receptor type: 2-mile Flight Path
No glare found

FP 2

Receptor type: 2-mile Flight Path
No glare found

OP 1

Receptor type: Observation Point
No glare found

OP 2

Receptor type: Observation Point
No glare found

OP 3

Receptor type: Observation Point
No glare found

VS Face: 3-4 low potential for temporary after-image

Receptor results ordered by category of glare

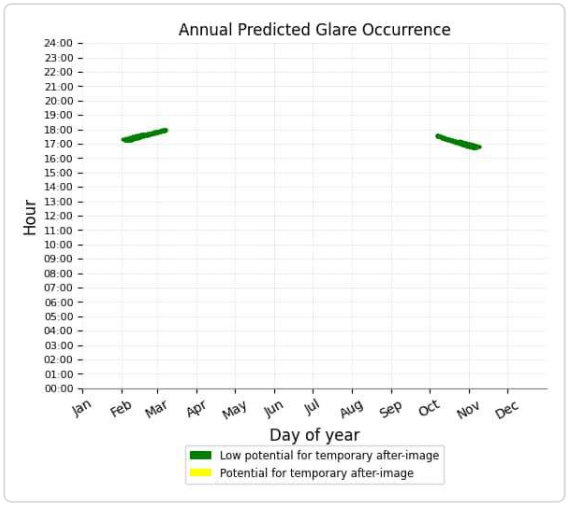
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	507	8.4	0	0.0
Northbound Exit Ramp	5,934	98.9	0	0.0
West Bound Entrance Ramp	6,819	113.7	0	0.0
Westbound Hwy	540	9.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

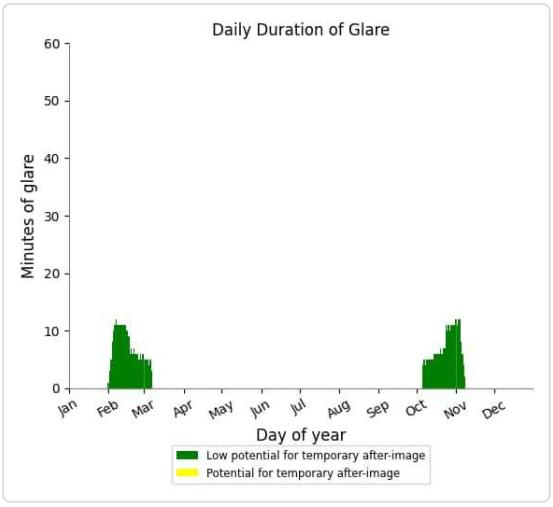
Eastbound Hwy

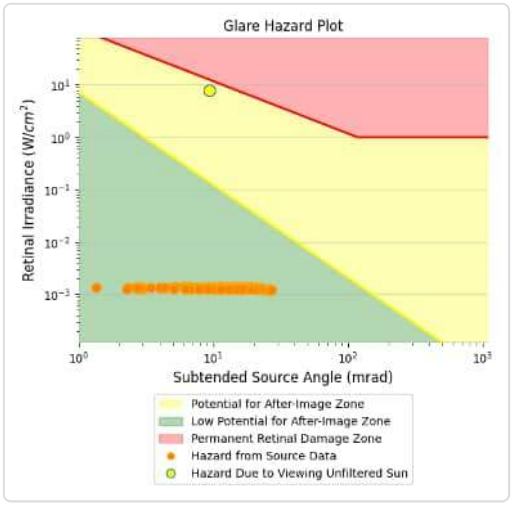
Receptor type: Route

0 minutes of yellow glare

507 minutes of green glare





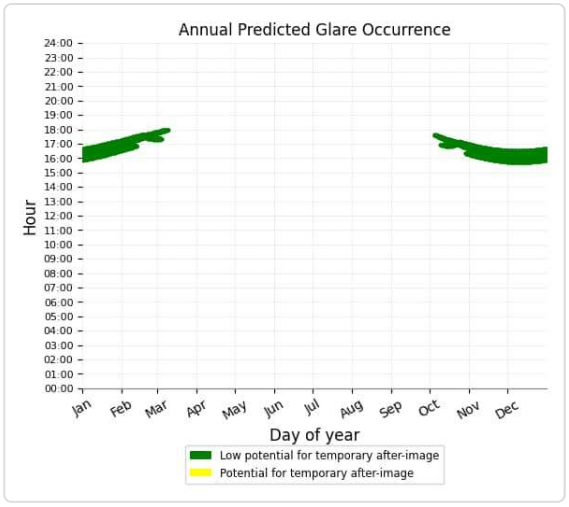


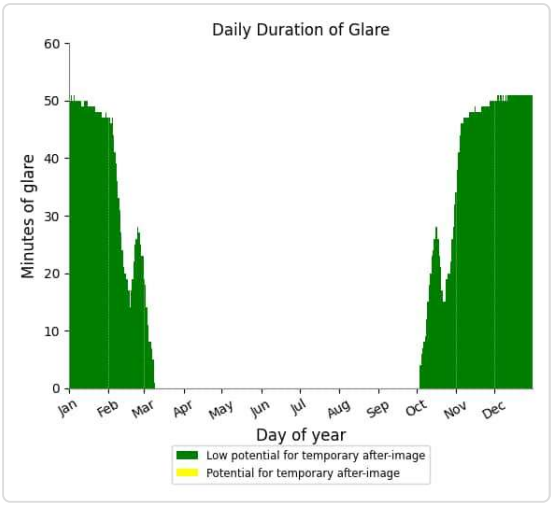
Northbound Exit Ramp

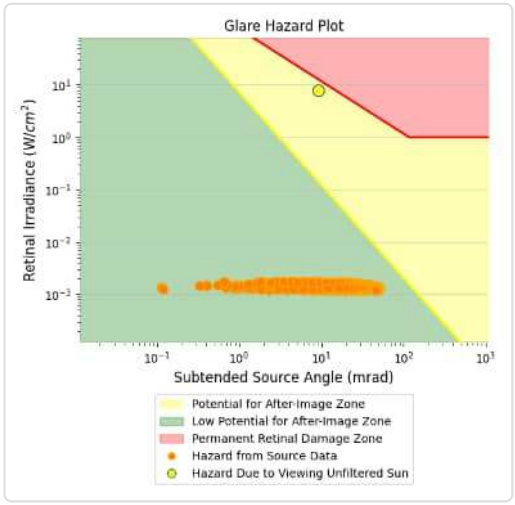
Receptor type: Route

0 minutes of yellow glare

5,934 minutes of green glare





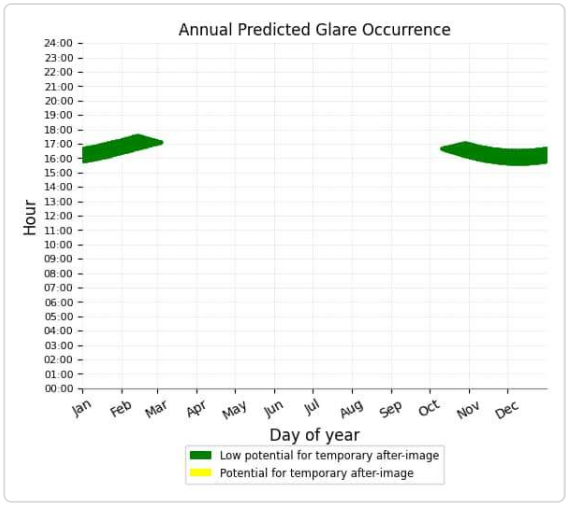


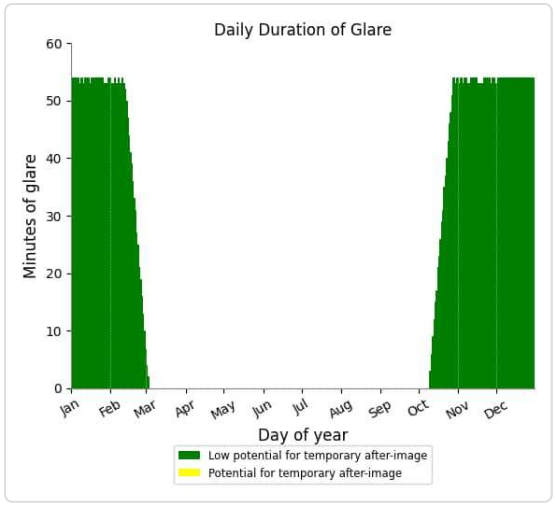
West Bound Entrance Ramp

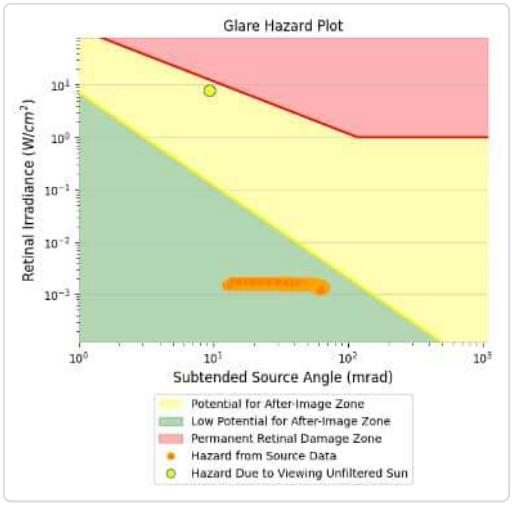
Receptor type: Route

0 minutes of yellow glare

6,819 minutes of green glare





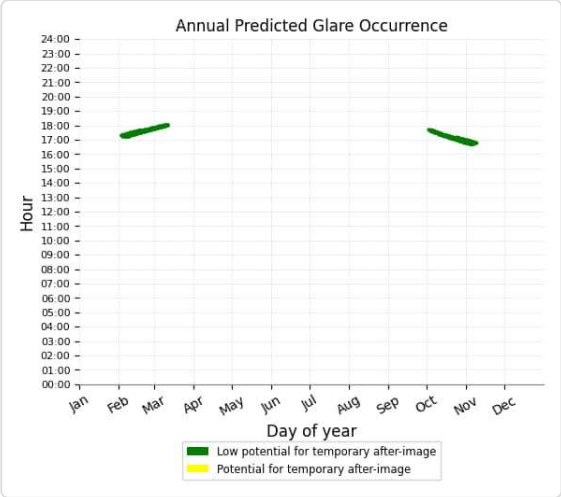


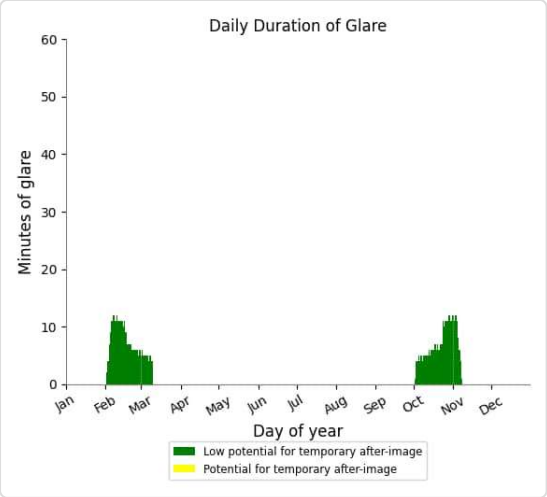
Westbound Hwy

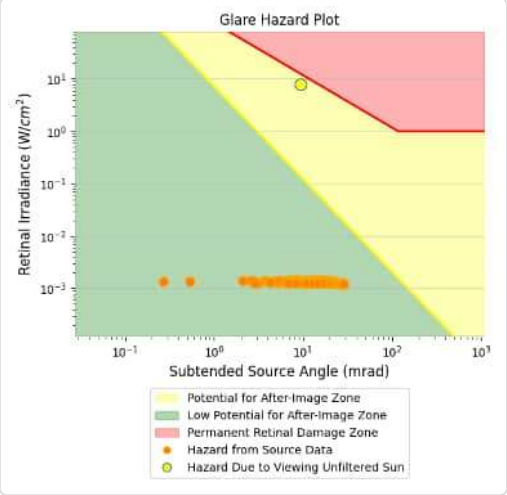
Receptor type: Route

0 minutes of yellow glare

540 minutes of green glare







FP 1

Receptor type: 2-mile Flight Path

No glare found

FP 2

Receptor type: 2-mile Flight Path

No glare found

OP 1

Receptor type: Observation Point

No glare found

OP 2

Receptor type: Observation Point

No glare found

OP 3

Receptor type: Observation Point

No glare found

VS Face: 4-5 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	0	0.0	0	0.0
Northbound Exit Ramp	0	0.0	0	0.0
West Bound Entrance Ramp	0	0.0	0	0.0
Westbound Hwy	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

Eastbound Hwy

Receptor type: Route
No glare found

Northbound Exit Ramp

Receptor type: Route
No glare found

West Bound Entrance Ramp

Receptor type: Route
No glare found

Westbound Hwy

Receptor type: Route
No glare found

FP 1

Receptor type: 2-mile Flight Path
No glare found

FP 2

Receptor type: 2-mile Flight Path
No glare found

OP 1

Receptor type: Observation Point
No glare found

OP 2

Receptor type: Observation Point
No glare found

OP 3

Receptor type: Observation Point
No glare found

VS Face: 5-6 low potential for temporary after-image

Receptor results ordered by category of glare

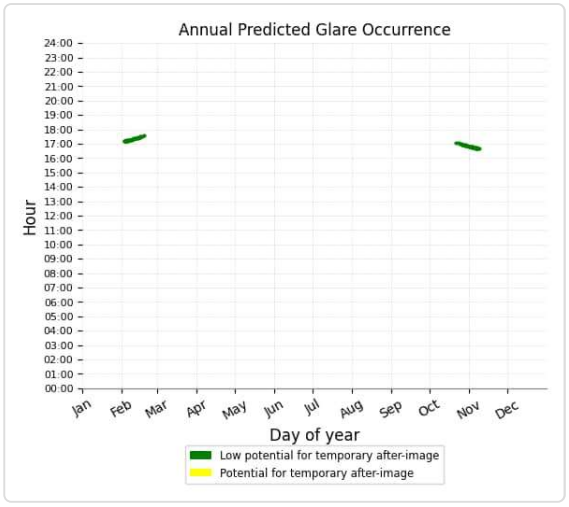
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	74	1.2	0	0.0
Northbound Exit Ramp	3,655	60.9	0	0.0
West Bound Entrance Ramp	4,141	69.0	0	0.0
Westbound Hwy	80	1.3	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 2	1,640	27.3	0	0.0
OP 1	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

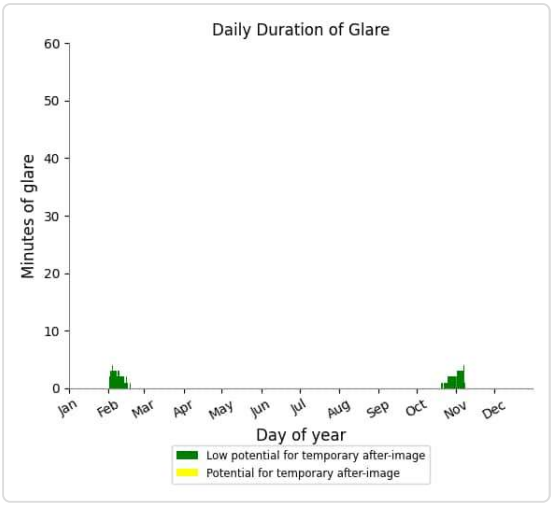
Eastbound Hwy

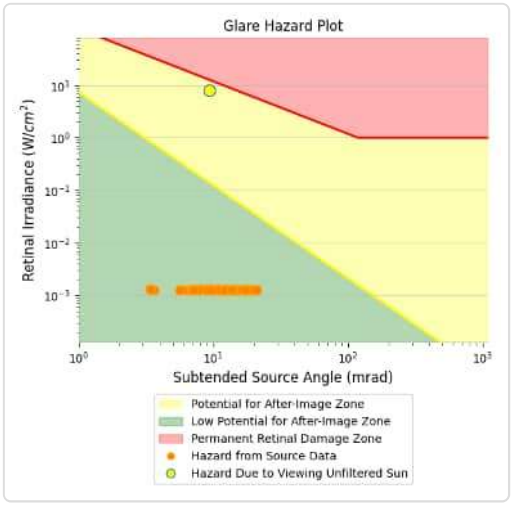
Receptor type: Route

0 minutes of yellow glare

74 minutes of green glare





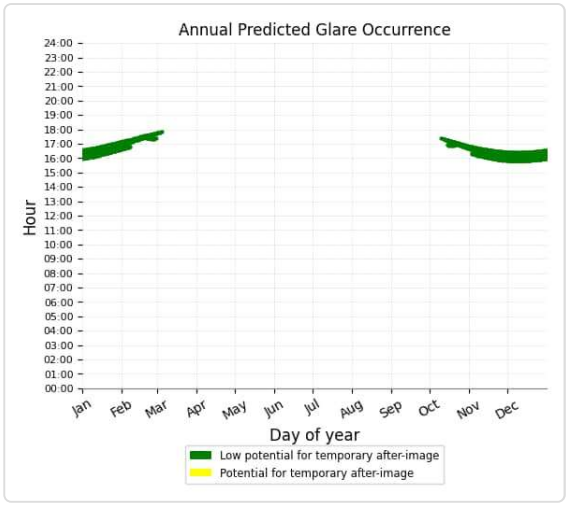


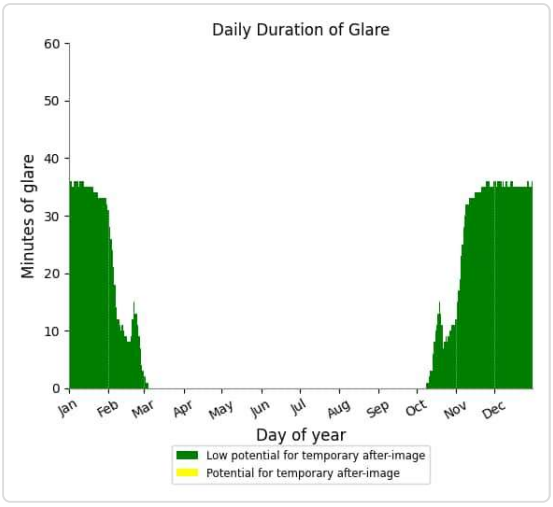
Northbound Exit Ramp

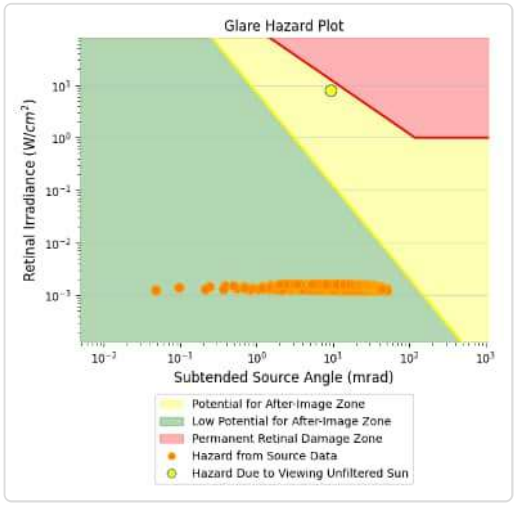
Receptor type: Route

0 minutes of yellow glare

3,655 minutes of green glare





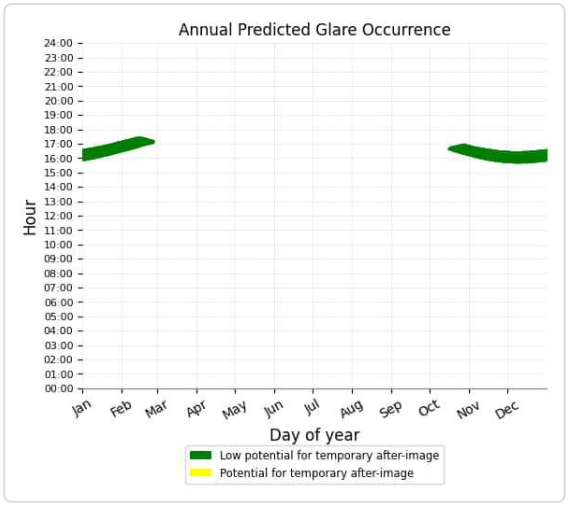


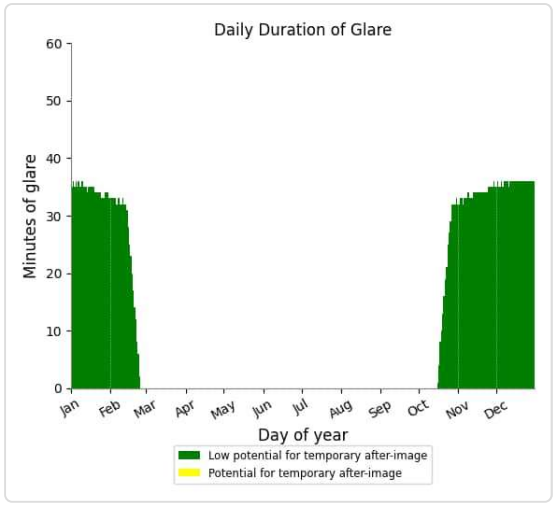
West Bound Entrance Ramp

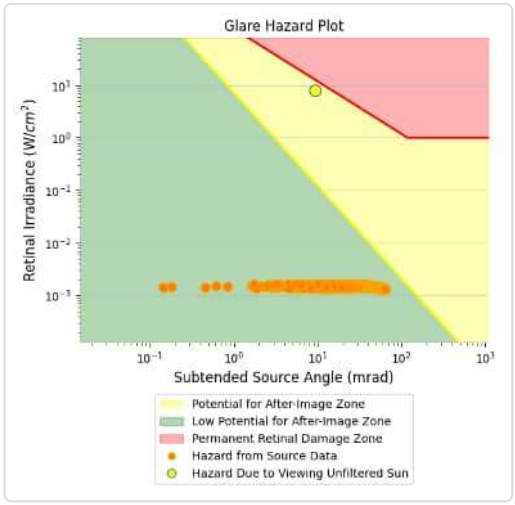
Receptor type: Route

0 minutes of yellow glare

4,141 minutes of green glare





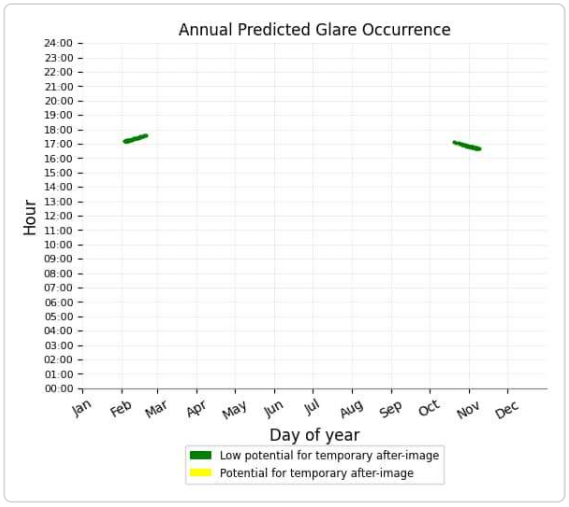


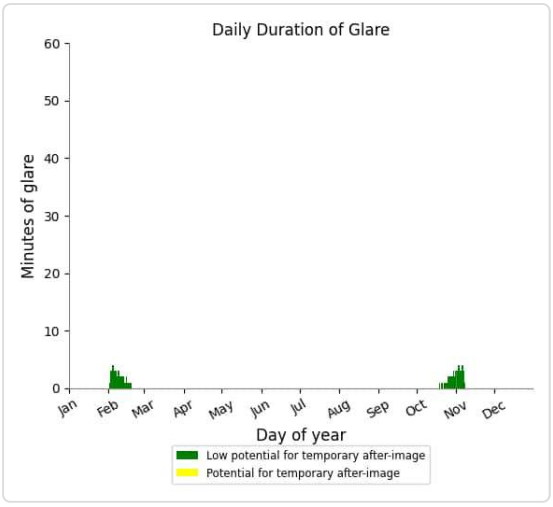
Westbound Hwy

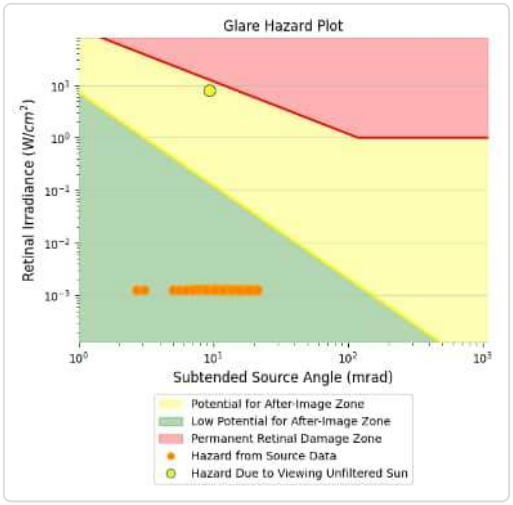
Receptor type: Route

0 minutes of yellow glare

80 minutes of green glare







FP 1

Receptor type: 2-mile Flight Path

No glare found

FP 2

Receptor type: 2-mile Flight Path

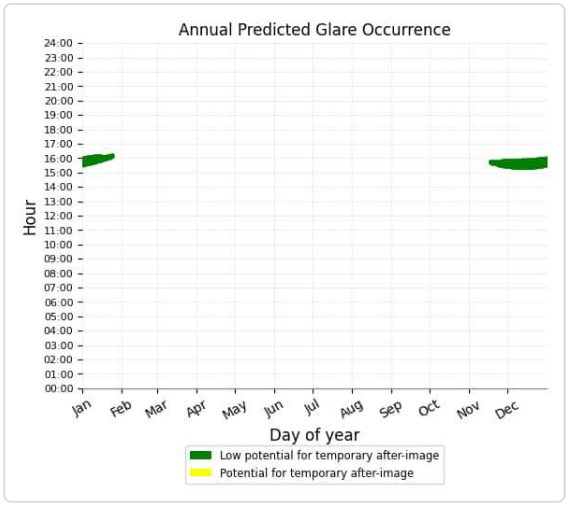
No glare found

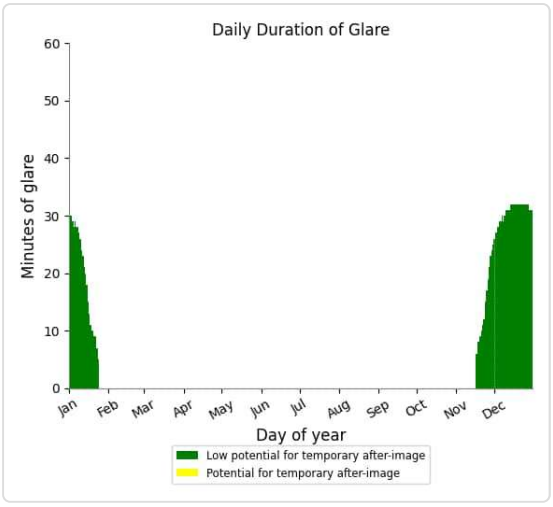
OP 2

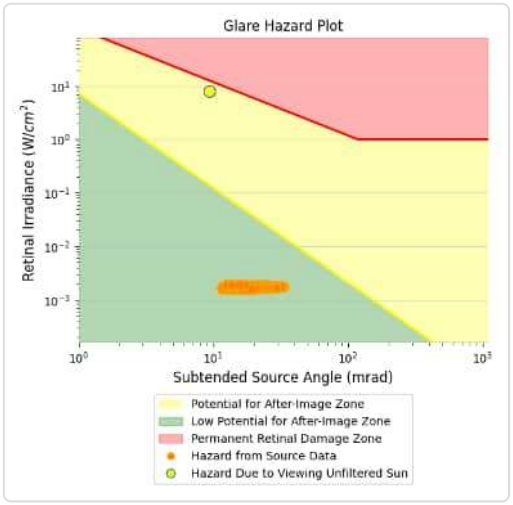
Receptor type: Observation Point

0 minutes of yellow glare

1,640 minutes of green glare







OP 1

Receptor type: Observation Point

No glare found

OP 3

Receptor type: Observation Point

No glare found

VS Face: 6-7 low potential for temporary after-image

Receptor results ordered by category of glare

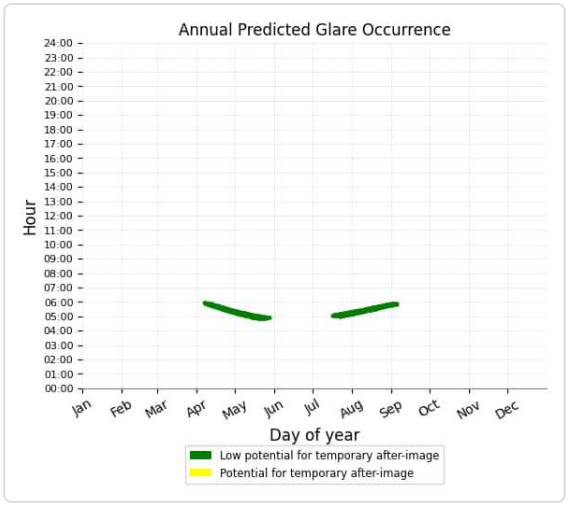
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	895	14.9	0	0.0
Northbound Exit Ramp	4,371	72.8	0	0.0
West Bound Entrance Ramp	2,951	49.2	0	0.0
Westbound Hwy	954	15.9	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 2	13,577	226.3	0	0.0
OP 1	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

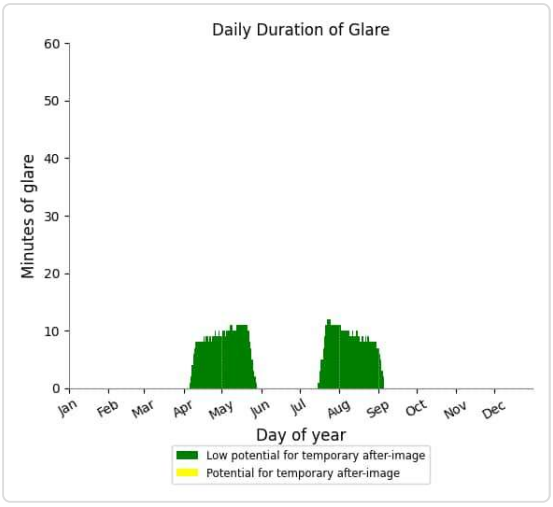
Eastbound Hwy

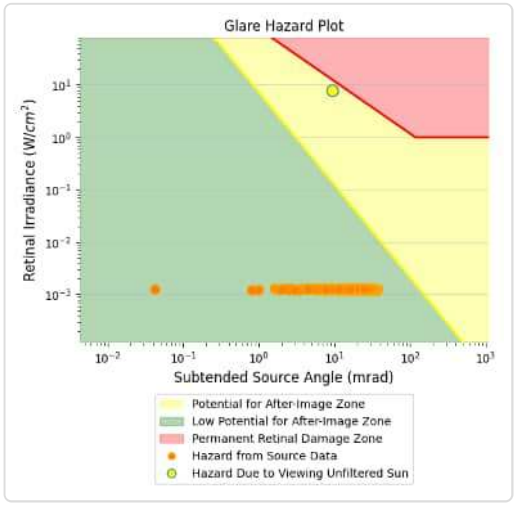
Receptor type: Route

0 minutes of yellow glare

895 minutes of green glare





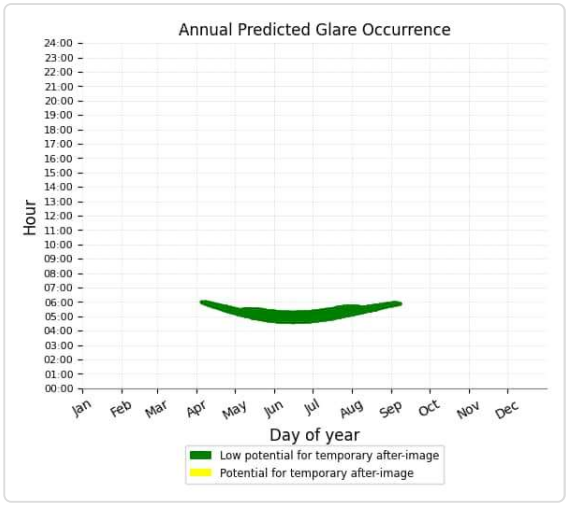


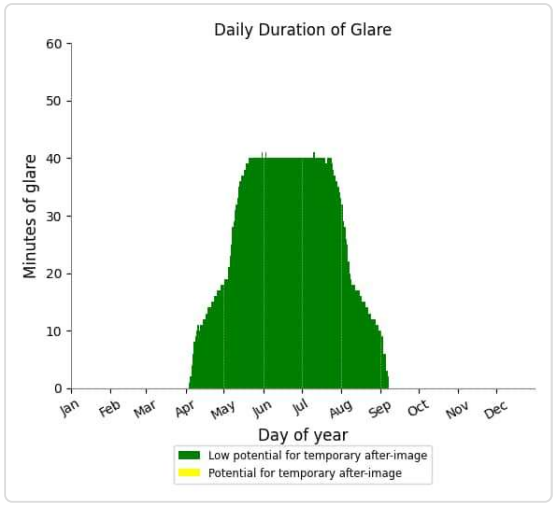
Northbound Exit Ramp

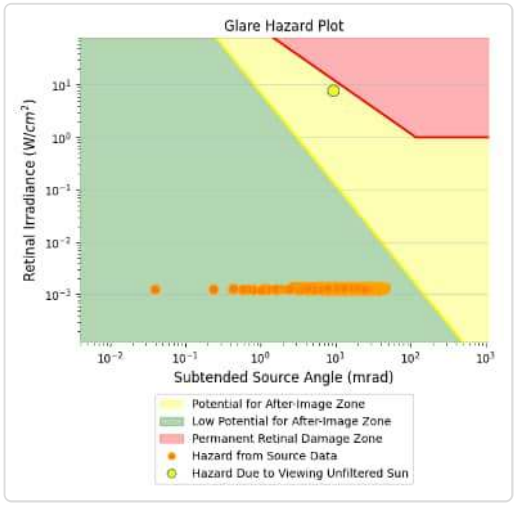
Receptor type: Route

0 minutes of yellow glare

4,371 minutes of green glare





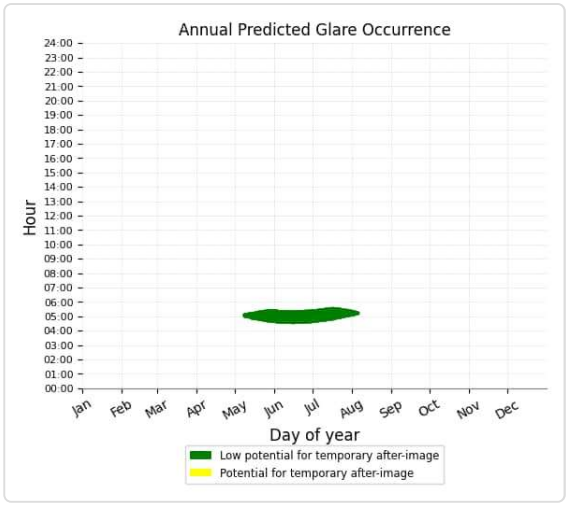


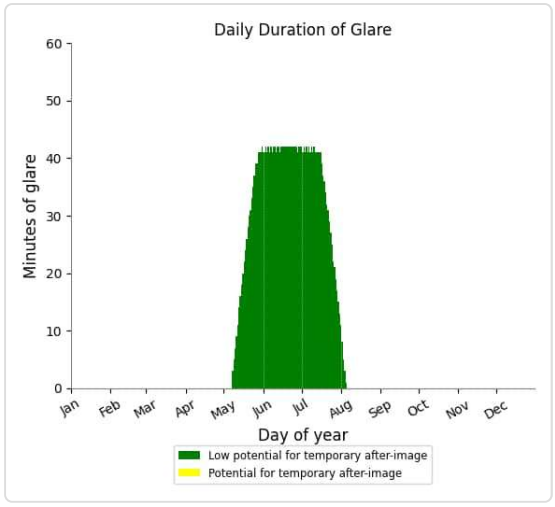
West Bound Entrance Ramp

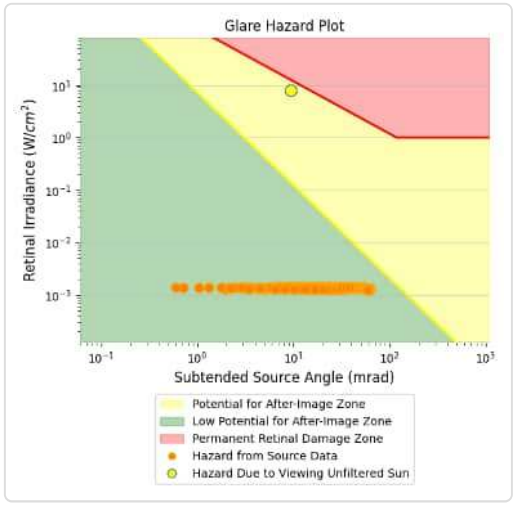
Receptor type: Route

0 minutes of yellow glare

2,951 minutes of green glare





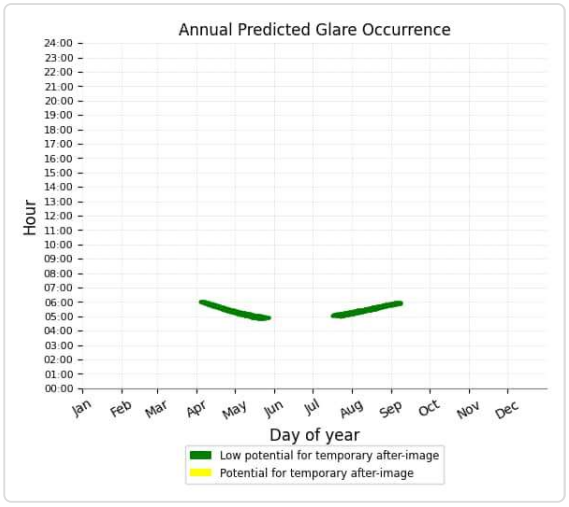


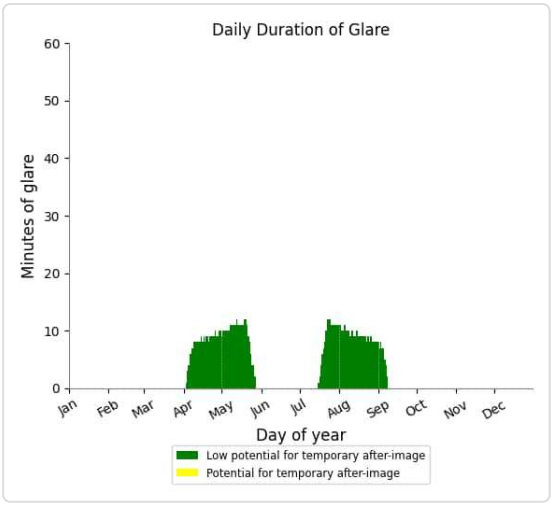
Westbound Hwy

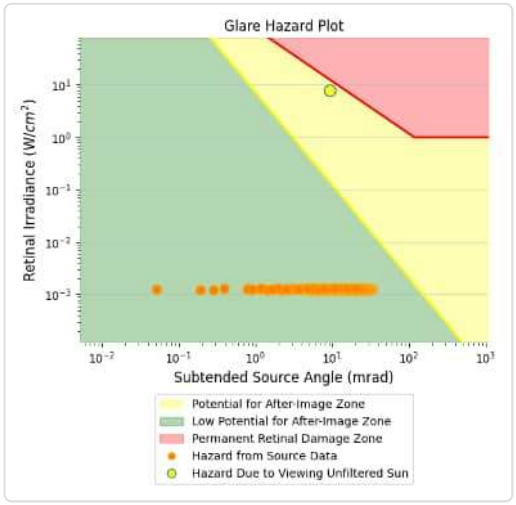
Receptor type: Route

0 minutes of yellow glare

954 minutes of green glare







FP 1

Receptor type: 2-mile Flight Path

No glare found

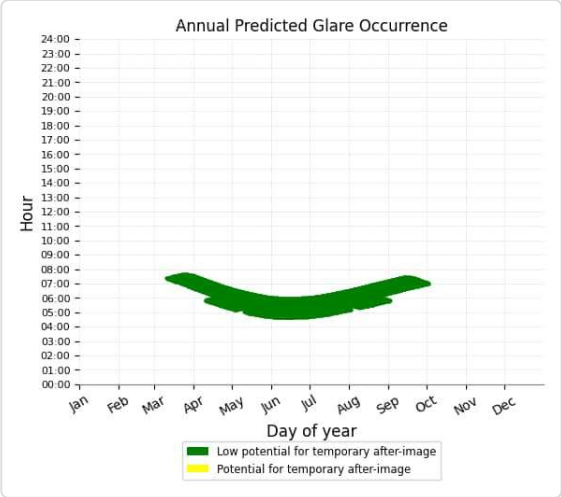
FP 2

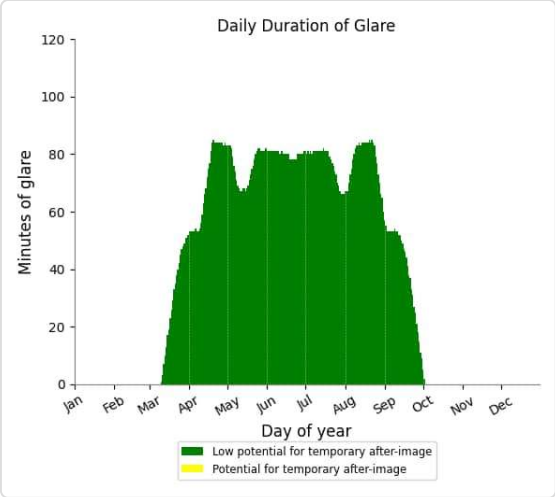
Receptor type: 2-mile Flight Path

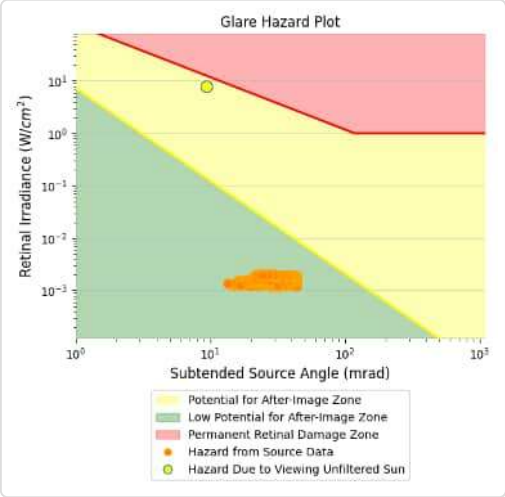
No glare found

OP 2

Receptor type: Observation Point
0 minutes of yellow glare
13,577 minutes of green glare







OP 1

Receptor type: Observation Point
No glare found

OP 3

Receptor type: Observation Point
No glare found

VS: Tanks

VS Face: 1-2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	0	0.0	0	0.0
Northbound Exit Ramp	0	0.0	0	0.0
West Bound Entrance Ramp	0	0.0	0	0.0
Westbound Hwy	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

Eastbound Hwy

Receptor type: Route
No glare found

Northbound Exit Ramp

Receptor type: Route
No glare found

West Bound Entrance Ramp

Receptor type: Route
No glare found

Westbound Hwy

Receptor type: Route
No glare found

FP 1

Receptor type: 2-mile Flight Path
No glare found

FP 2

Receptor type: 2-mile Flight Path
No glare found

OP 1

Receptor type: Observation Point
No glare found

OP 2

Receptor type: Observation Point
No glare found

OP 3

Receptor type: Observation Point
No glare found

VS Face: 2-3 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	0	0.0	0	0.0
Northbound Exit Ramp	0	0.0	0	0.0
West Bound Entrance Ramp	0	0.0	0	0.0
Westbound Hwy	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

Eastbound Hwy

Receptor type: Route
No glare found

Northbound Exit Ramp

Receptor type: Route
No glare found

West Bound Entrance Ramp

Receptor type: Route
No glare found

Westbound Hwy

Receptor type: Route
No glare found

FP 1

Receptor type: 2-mile Flight Path
No glare found

FP 2

Receptor type: 2-mile Flight Path
No glare found

OP 1

Receptor type: Observation Point
No glare found

OP 2

Receptor type: Observation Point
No glare found

OP 3

Receptor type: Observation Point
No glare found

VS Face: 3-4 low potential for temporary after-image

Receptor results ordered by category of glare

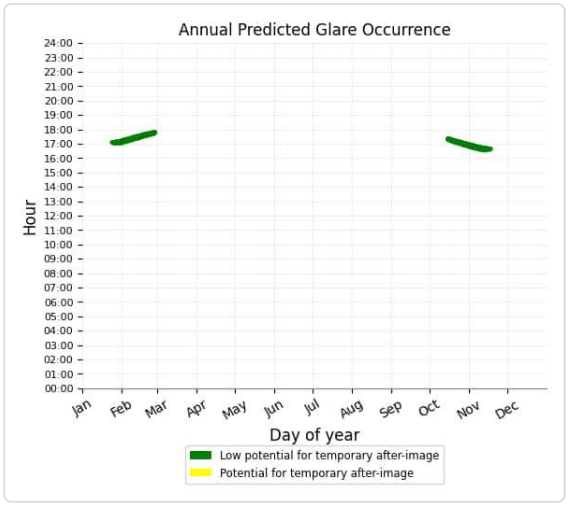
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	680	11.3	0	0.0
Northbound Exit Ramp	3,501	58.4	0	0.0
West Bound Entrance Ramp	3,129	52.1	0	0.0
Westbound Hwy	727	12.1	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 2	310	5.2	0	0.0
OP 1	0	0.0	0	0.0
OP 3	0	0.0	0	0.0

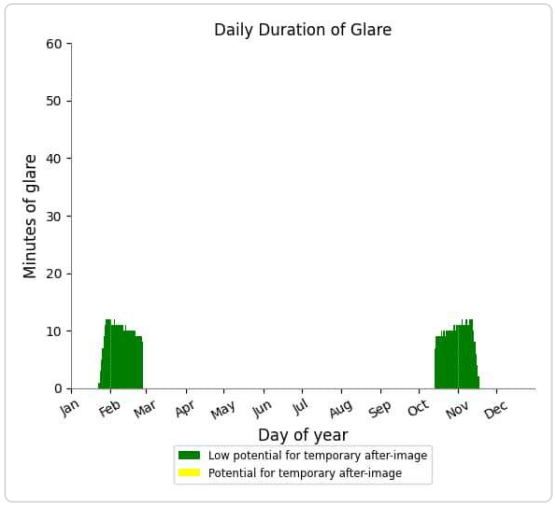
Eastbound Hwy

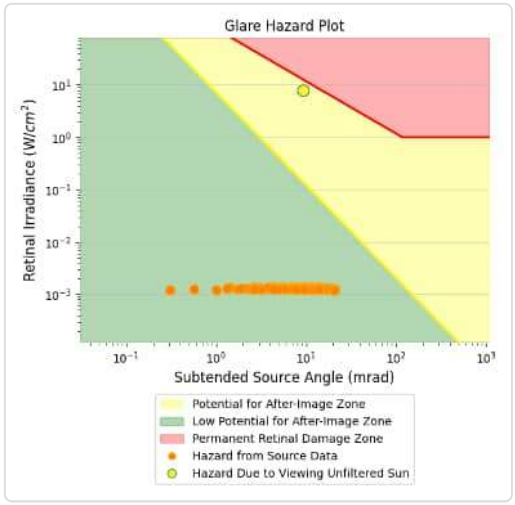
Receptor type: Route

0 minutes of yellow glare

680 minutes of green glare





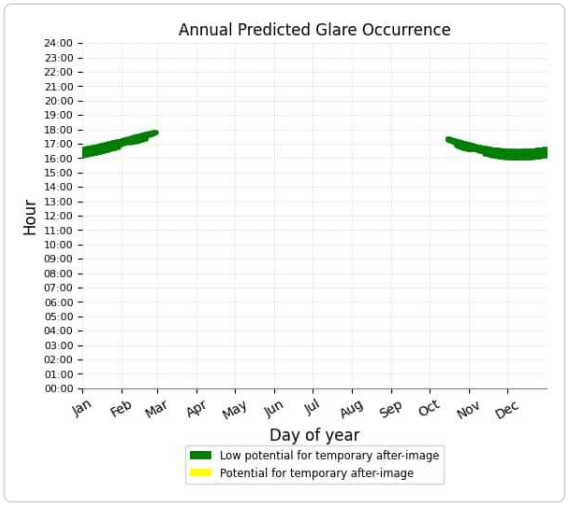


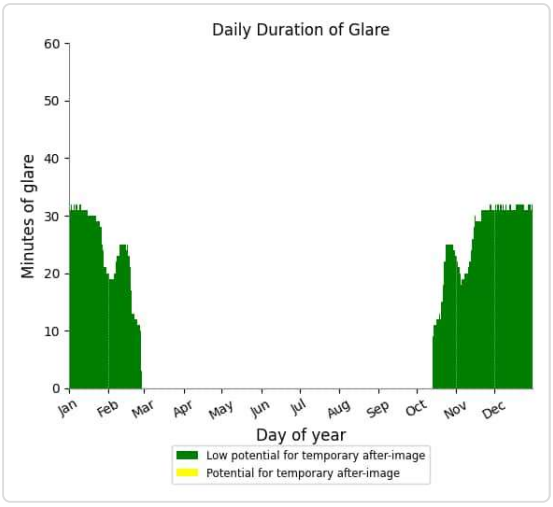
Northbound Exit Ramp

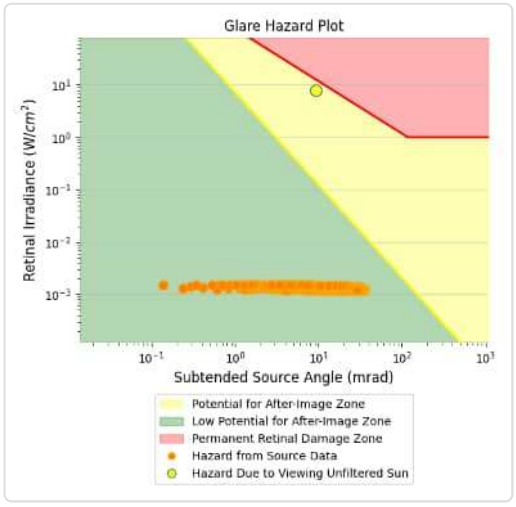
Receptor type: Route

0 minutes of yellow glare

3,501 minutes of green glare





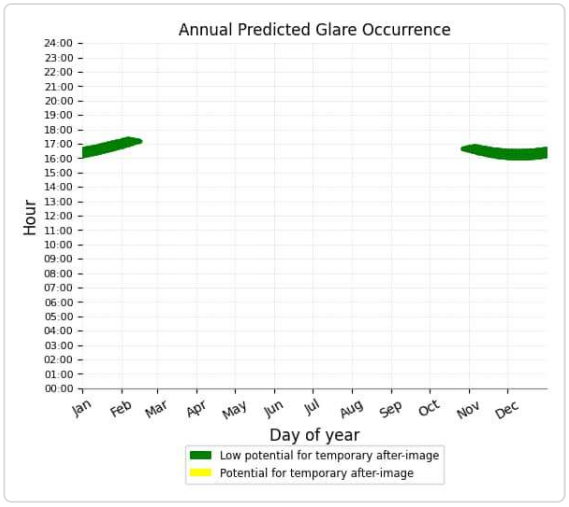


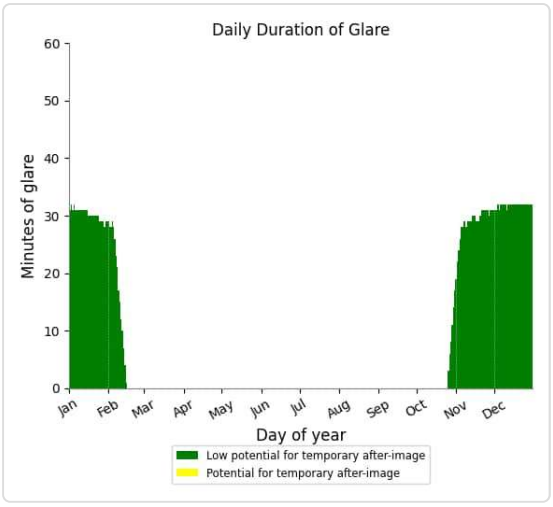
West Bound Entrance Ramp

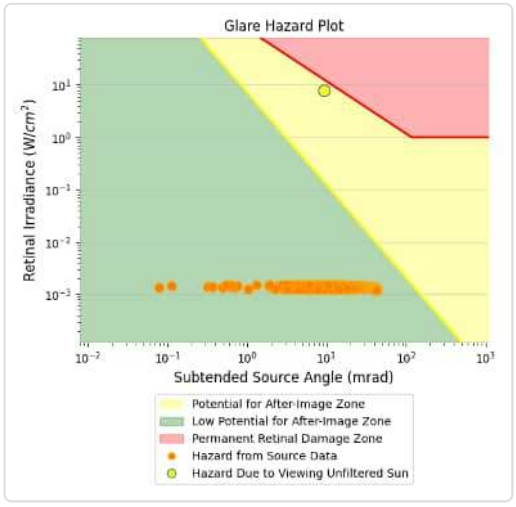
Receptor type: Route

0 minutes of yellow glare

3,129 minutes of green glare





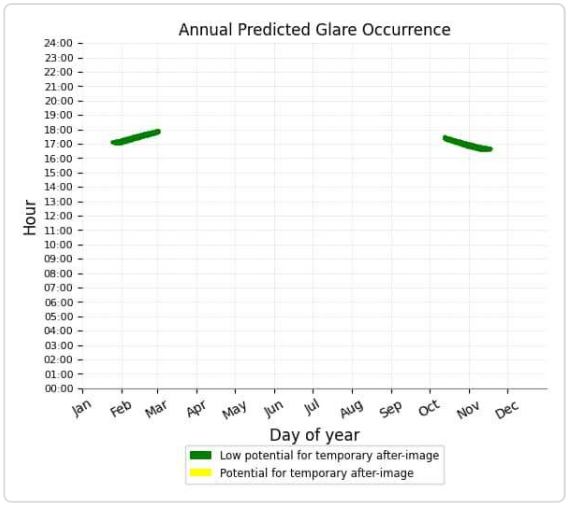


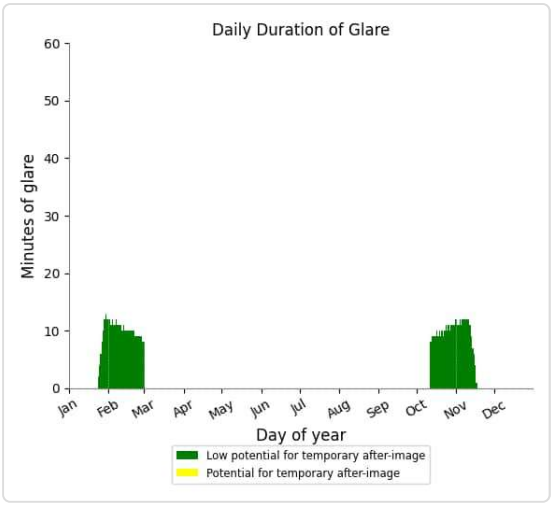
Westbound Hwy

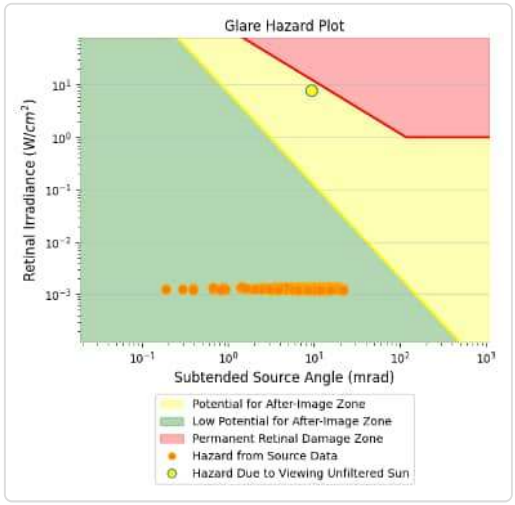
Receptor type: Route

0 minutes of yellow glare

727 minutes of green glare







FP 1

Receptor type: 2-mile Flight Path

No glare found

FP 2

Receptor type: 2-mile Flight Path

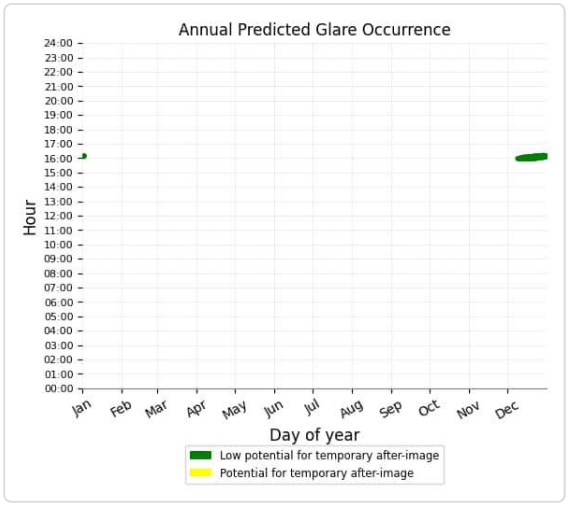
No glare found

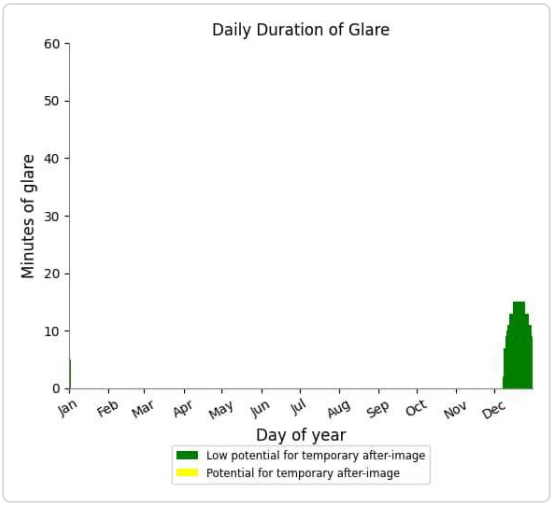
OP 2

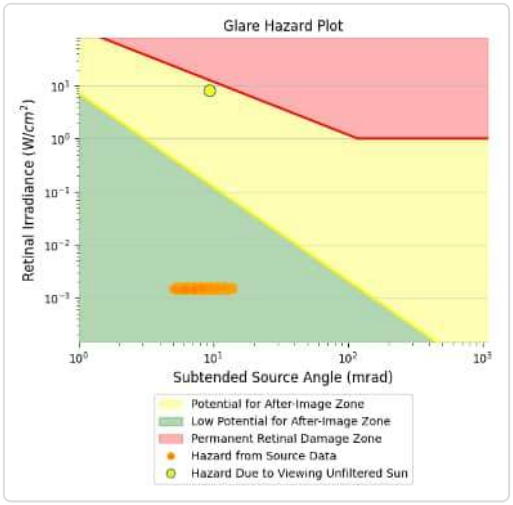
Receptor type: Observation Point

0 minutes of yellow glare

310 minutes of green glare







OP 1

Receptor type: Observation Point

No glare found

OP 3

Receptor type: Observation Point

No glare found

VS Face: 4-5 low potential for temporary after-image

Receptor results ordered by category of glare

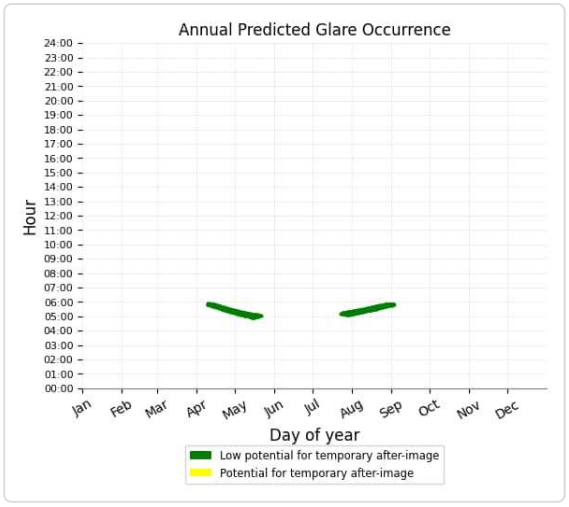
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Eastbound Hwy	775	12.9	0	0.0
Northbound Exit Ramp	2,428	40.5	0	0.0
West Bound Entrance Ramp	2,472	41.2	0	0.0
Westbound Hwy	833	13.9	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 3	3,461	57.7	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0

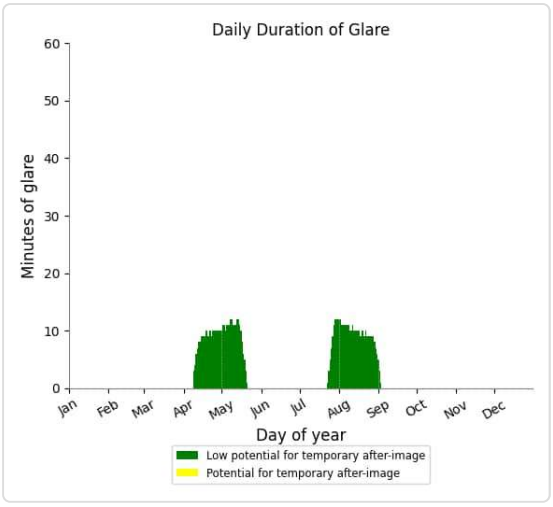
Eastbound Hwy

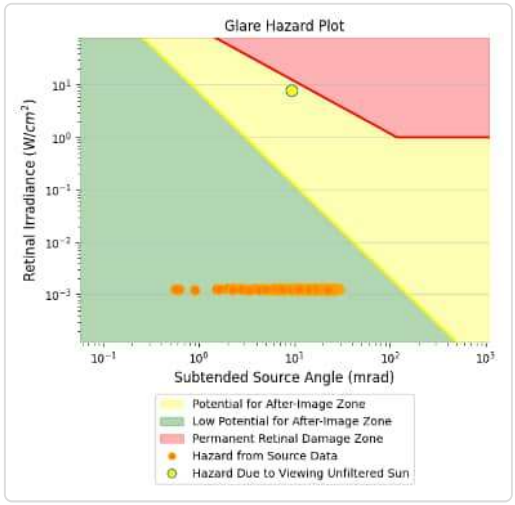
Receptor type: Route

0 minutes of yellow glare

775 minutes of green glare





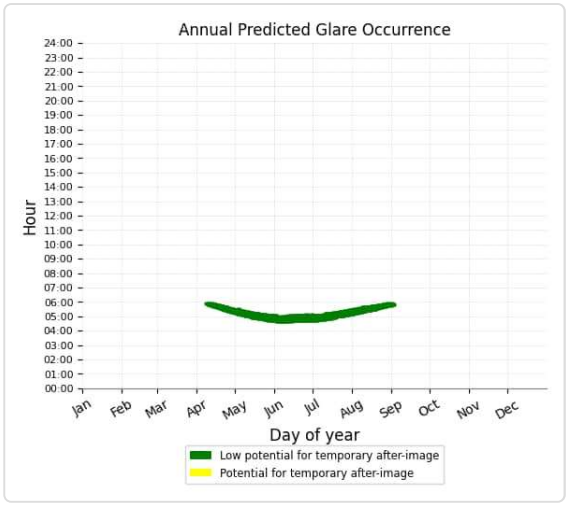


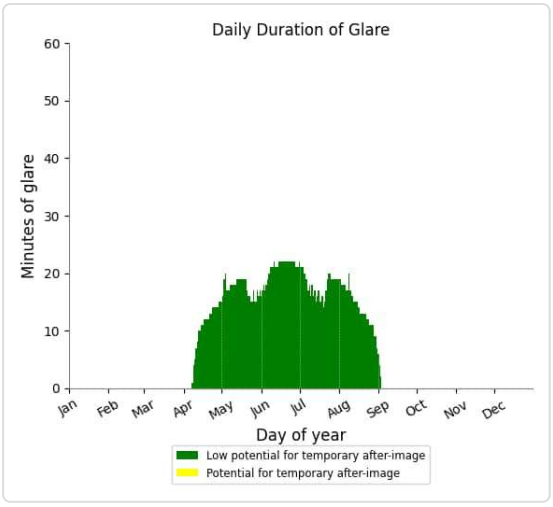
Northbound Exit Ramp

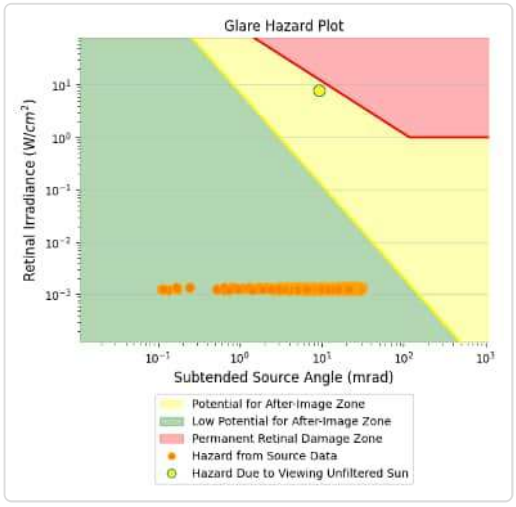
Receptor type: Route

0 minutes of yellow glare

2,428 minutes of green glare





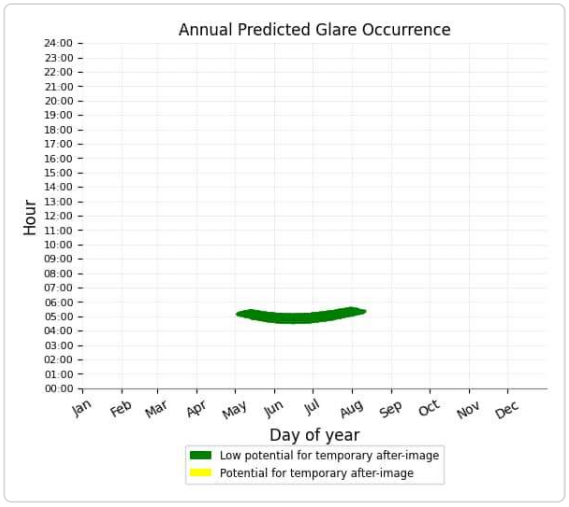


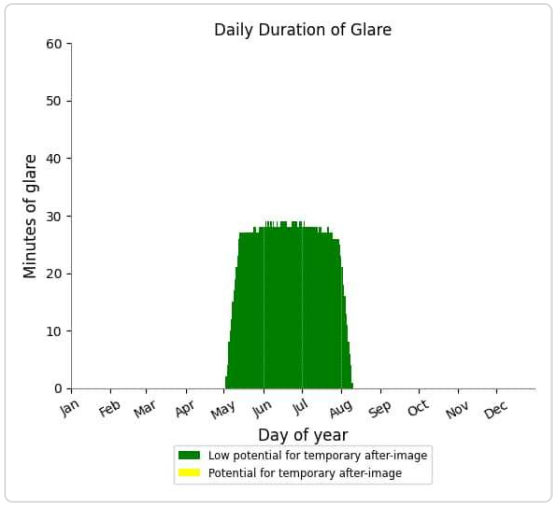
West Bound Entrance Ramp

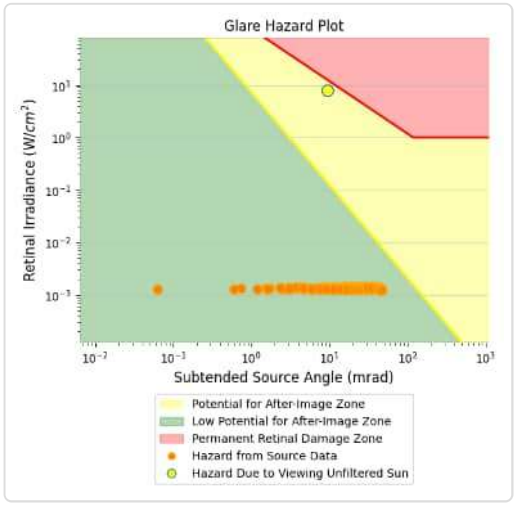
Receptor type: Route

0 minutes of yellow glare

2,472 minutes of green glare





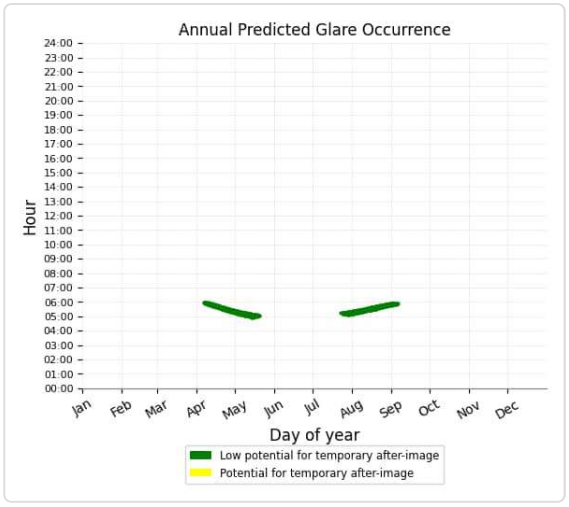


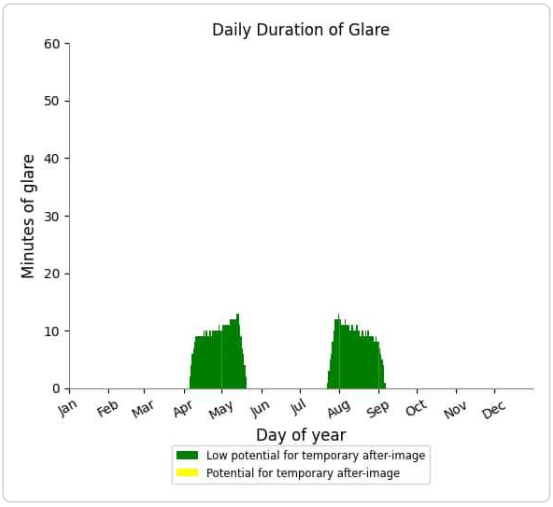
Westbound Hwy

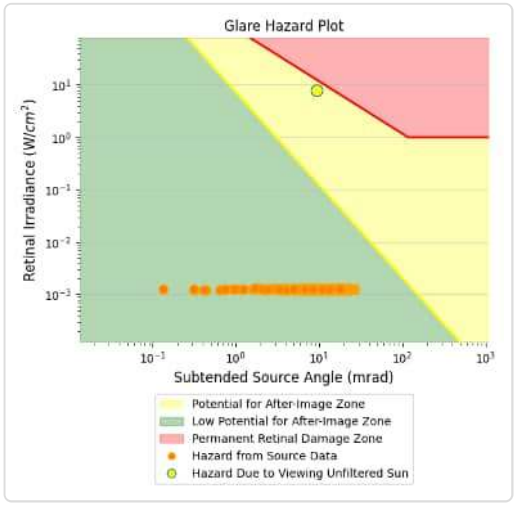
Receptor type: Route

0 minutes of yellow glare

833 minutes of green glare







FP 1

Receptor type: 2-mile Flight Path

No glare found

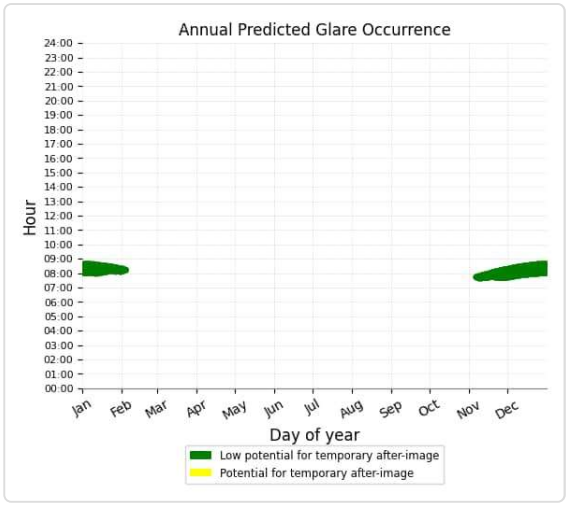
FP 2

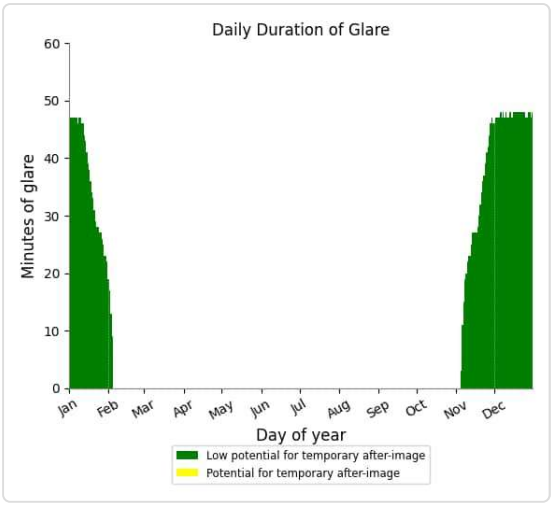
Receptor type: 2-mile Flight Path

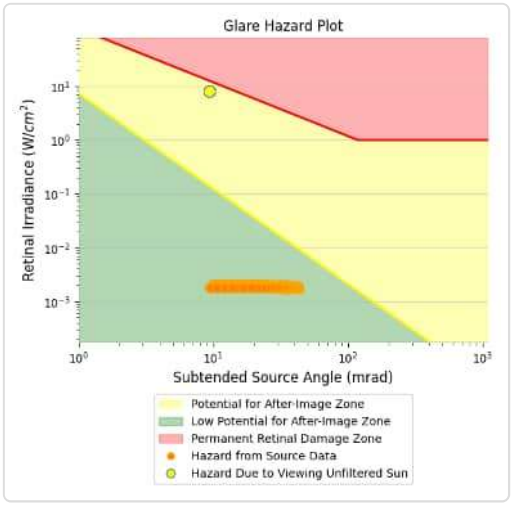
No glare found

OP 3

Receptor type: Observation Point
0 minutes of yellow glare
3,461 minutes of green glare







OP 1

Receptor type: Observation Point
No glare found

OP 2

Receptor type: Observation Point
No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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This analysis was conducted using the best available radiometric modeling at the time of generation. Future updates to the modeling methodology may yield different results.


Map
Satellite
Map labels
Map terrain
Mode: Vertical Surface
Vertices: 5 (max 20)
Committed length (ft): 504
Segment length (ft): -
Total length (ft): -
PV
VS
OP
2-Mile FP
Route
OB
West Bound Entran...
PV array 1
Field Trees W
Tanks
Lot Trees
Blvd Trees 1
Blvd Trees 2
Blvd Trees 3
Building
Field Trees SW
Lot Trees SE
Google

OE/AAA Pre-screening Results

Thu Apr 16 2026 15:13:06 GMT-0500 (Central Daylight Time)

Structure: Solar Panel

Latitude	Longitude	Height	Site Elevation	AMSL
44.190328	-93.982842	10	838	848
44.19355	-93.983577	10	827	837
44.192036	-93.982746	10	835	845
44.192025	-93.982129	10	840	850

Based on the information you provided, you are not required to file notice with the FAA.



CenterPoint Energy Mankato Hydrogen Energy Plant

Pre-Construction Acoustical Assessment

PREPARED FOR

DATE
19 MAY 2026

REFERENCE
0812942



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ACRONYMS AND ABBREVIATIONS

dBA	A-weighted decibels
EEI	Edison Electric Institute
ERM	Environmental Resources Management, Inc.
ISO	International Organization for Standardization
L_{10}	Noise level exceeded 10 percent of the time
L_{50}	Noise level exceeded 50 percent of the time
L_{eq}	Time-equivalent sound pressure levels (L_{eq})
MN	Minnesota
MPCA	Minnesota Pollution Control Agency
MW	Megawatts
NAC	Noise Area Classification

1. INTRODUCTION

1.1 Scope of Report

On behalf of CenterPoint Energy (Client), Environmental Resources Management, Inc. (ERM) completed a pre-construction noise assessment for the installation of a green hydrogen production and storage facility at their existing site located at 2400 North Riverfront Drive in Mankato, Minnesota 56001. The proposed facility is referred to as the Mankato Hydrogen Energy Plant Project (Project). The proposed Project will include a hydrogen plant that uses renewable energy from a 1 MW on-site solar panel array to split water into hydrogen and oxygen. The hydrogen will be blended at low concentrations into the existing natural gas distribution system. A solar panel array will consist of approximately 2,120 590W panels on roughly 3 acres of land within the restored prairie located west of the current facility. The hydrogen production and storage facility will be installed within an existing gravel area located east of the existing on-site propane tanks.

The primary noise generating sources associated with the Project are the solar inverter adjacent to the solar array, and the dry cooler, gas reducing station, and oxygen exhaust vent associated with the hydrogen plant. Figure 1 in Section 2.1 presents the location of the Project sources in relation to the surrounding properties.

ERM completed an acoustical analysis to evaluate whether the contribution of operational noise from the Project would comply with the State of Minnesota's Administrative Rule 7030 which governs allowable noise levels. This report presents the results of ERM's acoustical analysis.

1.2 General Information on Noise

Sound is a sequence of waves of pressure that propagate through compressible media such as air or water. When sound becomes excessive, annoying, or unwanted, it is often referred to as noise. The sound power level is the total acoustic power produced by a piece of equipment. Alternatively, the sound pressure level is the magnitude of the sound pressure wave produced by a noise source at a given distance.

Noise is typically measured on the A-weighted scale (dBA). The A-weighting scale has been shown to provide a good correlation with the human response to sound and is the most widely used descriptor for community noise assessments (Harris, 1991). The faintest sound that can be heard by a healthy ear is about 0 dBA, while an uncomfortably loud sound is about 120 dBA. In order to provide a frame of reference, some common sound levels are listed below.

- Pile Driver at 100 feet 90 to 100 dBA
- Chainsaw at 30 feet 90 dBA
- Truck at 100 feet 85 dBA
- Noisy Urban Environment 75 dBA

- Lawn Mower at 100 feet 65 dBA
- Average Speech 60 dBA
- Average Office 50 dBA
- Rural Residential During the Day 40 dBA
- Quiet Suburban nighttime 35 dBA
- Soft Whisper at 15 feet 30 dBA

2. NOISE REGULATIONS

2.1 Minnesota Noise Regulations

The Minnesota Pollution Control Agency (MPCA) enforces Minnesota's noise standards, which are known as MN Administrative Rule 7030. Minnesota's primary noise limits vary for different "noise area classifications" (NACs) based on the land use. The limits consider the "L_{10}" and "L_{50}", which are noise levels that are exceeded for 10 percent and 50 percent of the time in a one-hour period, respectively. In general, the L_{50} is roughly equivalent to the more commonly used L_{eq} (time equivalent sound level), which is the energy average of all the sounds that are present.

For residential locations (NAC 1), the limits are L_{10} = 65 dBA and L_{50} = 60 dBA during the daytime (7:00 a.m. – 10:00 p.m.) and L_{10} = 55 dBA and L_{50} = 50 dBA during the nighttime (10:00 p.m. – 7:00 a.m.). This means that during a one-hour period of monitoring, daytime noise levels generated by the Project cannot exceed 65 dBA for more than 10 percent of the time (six minutes) and cannot exceed 60 dBA for more than 50 percent of the time (30 minutes).

For recreational locations (NAC 2), the limits are L_{10} = 70 dBA and L_{50} = 65 dBA during both the daytime and nighttime hours. This means that during a one-hour period, Project noise levels cannot exceed 70 dBA for more than 10 percent of the time (six minutes) and cannot exceed 65 dBA for more than 50 percent of the time (30 minutes).

A summary of the noise rules based on noise area classification is shown in table 1.

Table 1. Summary of Noise Rules based on Noise Area Classification

Noise Area Classification	Daytime		Nighttime	
	L_{10}	L_{50}	L_{10}	L_{50}
1 (Residences, religious activities, camping areas, hospitals, hotels, schools)	65	60	55	50
2 (Retail, businesses, recreational activities, transit terminals)	70	65	70	65
3 (Manufacturing, fairgrounds, agriculture)	80	75	80	75

2.1.1 Project-Specific Noise Area Classifications

The Project is located within an industrial zoning district, which qualifies as NAC 3. The nearest NAC 1 boundary is a residential parcel located on the east side of North Riverfront Drive, south of Augusta Drive, denoted "RES1". The nearest recreational area NAC 2 boundary is a golf course on the east side of North Riverfront Drive, north of Augusta Drive, denoted "REC1". The locations of RES1 and REC1 and their distances to the Project noise sources are shown in Figure 1.

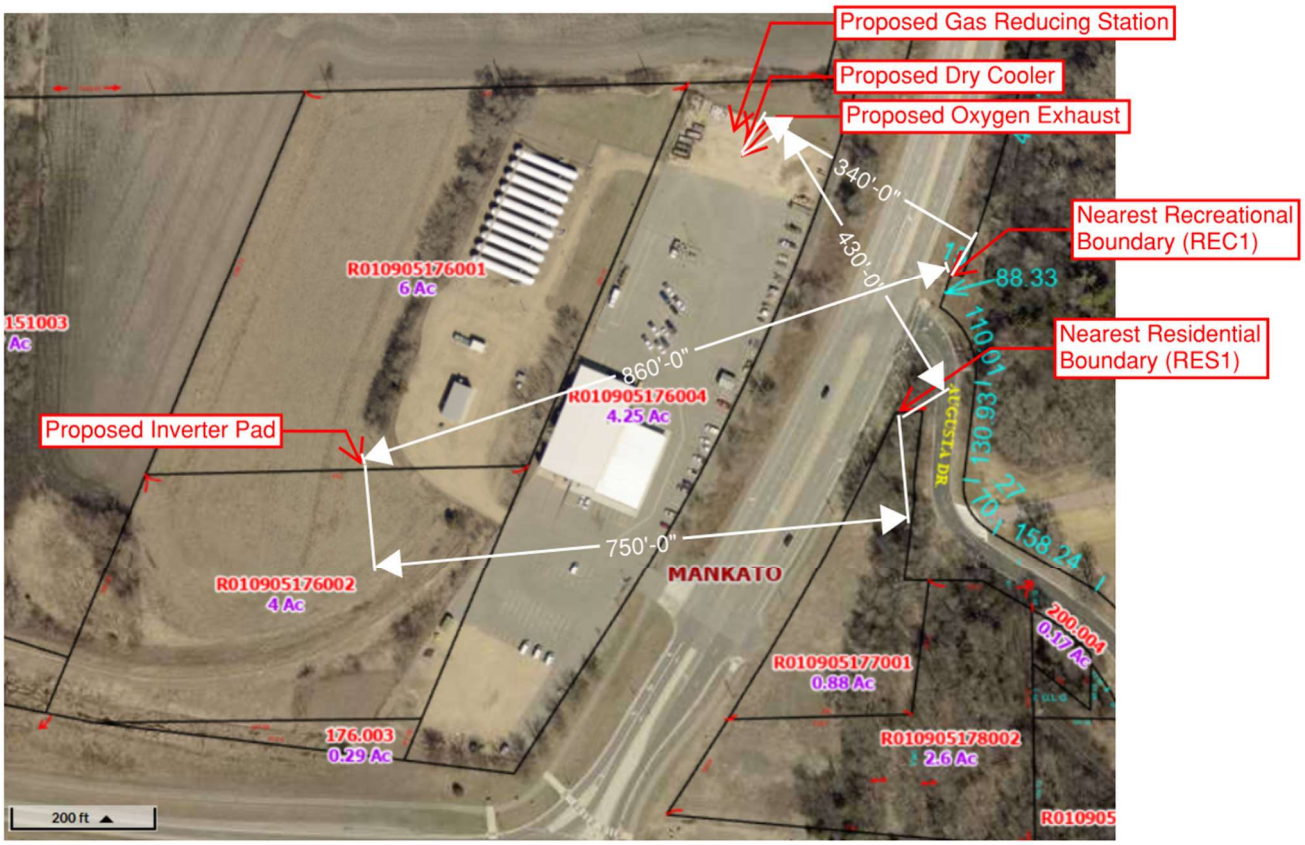

Figure 1. Nearest Noise Area Classification locations to Project Noise Sources

2.2 City of Mankato Noise Regulations

The City of Mankato's noise ordinance is within their "nuisances" section of their city ordinances. This section mainly deals with noise nuisances as they relate to motor vehicles, hobby crafts, etc. The ordinance does not contain any numerical noise limits, nor any objective criteria for what noise constitutes a "nuisance".

3. REDUCING STATION NOISE LEVELS

Manufacturer-provided noise emissions data for the reducing station were not available. ERM staff therefore mobilized to CenterPoint Energy's existing Minneapolis hydrogen plant on April 30, 2026 to measure the noise levels for that facility's existing reducing station. Sound pressure levels were measured using a Casella CEL-633 hand-held analyzer (Serial Number 2031901) equipped with a microphone windscreen. Field calibration was performed before and after monitoring using a Casella CEL Acoustics Type 1 calibrator. The sound measurement equipment included current certificates of calibration from the manufacturer. Sound measurements were recorded at 1-minute intervals at locations around the reducing station. A-weighted time-equivalent sound pressure levels (L_{eq}) were measured on slow response with the sound level meter set at a height of approximately 4 feet above ground level (the same height as the valves on the reducing station). During the measurement periods, field personnel recorded meteorological data (wind speed and direction, temperature, relative humidity, barometric pressure, and sky condition), and the predominant audible noise sources. No precipitation occurred during the measurement periods.

Eleven measurements were taken around the reducing station, at distances ranging from 4-18.5 feet. Measured sound pressure levels ranged from 69.8-85.3 dBA. The measured sound pressure levels were converted into sound power levels by considering the dimensions of the reducing station valves and the distances at which the measurements were obtained. The associated calculated sound power levels range from 90.4-98.8 dBA. A summary of the noise measurement and sound power calculation results is shown in Table 2.

Table 2. Reducing Station Noise Emission Data

Location	X distance (feet)	Y distance (feet)	Measured Sound Pressure Level[a] (dBA)	Calculated Sound Power Level[a] (dBA)
1	4	0	84.8	94.5
2	4	3.5	85.3	97.5
3	0	7.5	82.4	97.6
4	4	3.5	83.5	95.7
5	4	0	83.1	92.8
6	4	3.5	79.3	91.5
7	0	7.5	75.2	90.4
8	4	3.5	78.9	91.1
9	0	18.5	69.8	92.8
10	15	0	76.7	97.9
11	0	18.5	75.8	98.8 [b]

[a.] The sound power level is the total acoustic power produced by a piece of equipment; the sound pressure level is the magnitude of the sound pressure wave produced by a noise source at a given distance.
[b.] To be conservative, ERM attributed the highest calculated sound power level of 98.8 dBA to the reducing station.

4. ACOUSTICAL ANALYSIS

4.1 Methodology

Noise emissions data for the remaining sources were obtained from potential equipment vendors and from CenterPoint Energy. ERM completed spreadsheet calculations for each of the proposed sources to predict noise levels that will be generated during Project operation. The calculations accounted for spreading losses and atmospheric effects, but did not account for shielding from barriers or buildings, shielding from topography. No credit was taken for existing foliage or vegetation. These assumptions are conservative in nature and yield predictions that are likely higher than actual noise levels.

A summary of the equipment sources included in the noise assessment is provided in Table 3, along with the noise emissions data and the data source for each. Only continuous noise sources were considered in the calculations; intermittent noise sources, such as safety alarms, backup generators, and emergency vents are not included in the calculations.

Table 3. Equipment Source Listing and Noise Emission Data

Source	Number of Each	Noise Emissions Data		Data Source
		Sound Pressure Level [a]	Sound Power Level [a]	
Dry Cooler	1 set of 8	Rated at 64 dBA at 33 feet [b]	92.4	Kelvion [c]
Reducing Station	1	Measured at 75.8 dBA at 18.5 feet [d]	98.8	ERM
Oxygen Exhaust	1	Rated at 60 dBA at 3 feet	60.0	CenterPoint [e]
Solar Inverters	1	62.5 dBA at 33 feet	90.9	Sungrow [f]

[a.] The sound power level is the total acoustic power produced by a piece of equipment; the sound pressure level is the magnitude of the sound pressure wave produced by a noise source at a given distance.

[b.] Dry cooler emissions data for when it is operating at full load, which would only occur on very hot days.

[c.] Kelvion Model ULV-LA204K6X-091Z090 Dry Cooler Datasheet

[d.] ERM measured sound levels of the reducing station at the existing Minneapolis Hydrogen Plant, as detailed in Section 3. To be conservative, ERM attributed the highest calculated sound power level of 98.8 dBA to the Mankato reducing station.

[e.] From CenterPoint Energy, based on manufacturer's information.

[f.] Although the exact model of inverter is not known at this point, Sungrow is a typical inverter used in utility-scale solar projects. Sungrow Model SG4400UD Inverter Noise Test Report TR_20231130.

4.2 Predicted Noise Levels

The calculations allowed for the quantification of noise levels from each source, based on the sound characteristics (overall level, frequency data etc.). Individual spreadsheet calculations were

conducted for each source, and the results logarithmically added for the RES 1 and REC 1 locations to arrive at a total noise contribution from the Project at each location. The calculations were conducted for all sources operating simultaneously at or near full load conditions, and assumed 24-hour operation, with the exception of the solar inverters, which would only be operational during daytime hours.

The predicted noise contribution of each predominant noise source, the combined noise level for all sources attributed to the Project, and the associated Minnesota Standard are presented in Table 4.

Table 4. Predicted Noise Levels at nearest NAC points

Location	Time	Dry Cooler [a]	Reducing Station [b]	O2 exhaust	Inverter [c]	Sum	MPCA Standard [d]
REC1 (NAC1)	Day	40.7	46.9	8.3	32.0	47.9	65
	Night	40.7	46.9	8.3	0.0	47.8	65
RES1 (NAC2)	Day	40.5	46.7	8.1	32.2	47.8	60
	Night	40.5	46.7	8.1	0.0	47.6	50

[a.] Conservatively assumes Dry Cooler is operating at full load, which would only occur on very hot days.
[b.] ERM measured sound levels of the reducing station at the existing Minneapolis Hydrogen Plant, as detailed in Section 3. To be conservative, ERM attributed the highest sound power level of 98.8 dBA to the reducing station.
[c.] Assumes solar inverters only operate during daytime hours.
[b.] Corresponds to the L_{50} Noise Standard

As provided in Table 4, expected Project noise levels at full load conditions are shown to be in compliance with the MN noise standard for daytime and nighttime hours at both receiver locations.

5. CONCLUSION

This report presents the results of the acoustical assessment ERM conducted for the CenterPoint Mankato Hydrogen Plant Project in Mankato, Minnesota. The assessment included detailed noise calculations of the major facility noise generating equipment operating under full-load conditions and a comparison to the noise regulations within the State of Minnesota Administrative Rules.

The operational noise assessment revealed that Project-generated noise levels are expected to be in compliance with the applicable noise regulations. Operational Project noise levels were shown to be less than 50 dBA at the nearest residential and recreational property lines for both daytime and nighttime hours. The noise calculations did not include factors such as the barrier effect of existing

buildings and equipment, the screening effect of vegetation, or changes in topography, resulting in a conservative assessment.

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Drainage Report

Centerpoint Energy Minnesota Gas

PREPARED FOR
Centerpoint Energy Minnesota Gas

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Acronyms and abbreviations

BMP	Best Management Practice
CAD	Computer-aided design
CF	Cubic feet
CFS	Cubic feet per second
CN	Curve number
DA	Drainage Area
EGLE	Michigan Department of Environment, Great Lakes, and Energy
FEMA	Federal Emergency Management Agency
HSG	Hydrologic soil group
LOI	Line of interest
min	minutes
MPCA	Minnesota Pollution Control Agency
MW	megawatt
NRCS	Natural Resources Conservation Service
PCSM	Post Construction Stormwater Management
SCS	Soil Conservation Service (NRCS)
TR-20	Technical Release 20
TR-55	Technical Release 55
USDA	United States Department of Agriculture
USGS	United States Geological Survey

1. INTRODUCTION

CenterPoint Energy Minnesota Gas (CenterPoint)(Applicant) is proposing to construct Mankato Hydrogen Energy Plant Project (Project), a 1-megawatt (MW) hydrogen plant and a 1 MW on-site solar panel array in the City of Mankato, Blue Earth County, Minnesota. The Project area is owned by CenterPoint and is situated on an approximately 14.83-acre parcel (Project Area) also owned by CenterPoint. Once developed, the property will be used for hydrogen energy production and storage. The disturbed acreage is approximately 4.04 acres and includes the development of a solar array farm, solar equipment areas, hydrogen plant equipment, hydrogen plant buildings, access roads, stormwater management facilities, utilities, and other site amenities.

The majority of the existing site is already developed for CenterPoint's existing facilities. The solar panel array will be installed within the restored prairie located west of the current facility, and the hydrogen production and storage facility will be installed within an existing developed gravel area located east of the existing on-site propane tanks. Access to the site is off of State Highway 14.

2. EXISTING CONDITIONS

The property is located north off of State Highway 14 approximately 0.35 miles north of the intersection with State Highway 14 and Good Counsel Drive and 0.10 miles south of the intersection with State Highway 14 and Augusta Drive. The property is located within city limits of the City of Mankato. All existing topographic information for the project area and immediate surrounding areas has been provided in the Plans Issued for Conditional Use Permitting. The existing site consists of developed area for CenterPoint's existing facilities and restored prairie area located west of the current facility. The proposed construction of the solar arrays is located on the restored prairie area and consists of one drainage area that drains to a line of interest (LOI) offsite (LOI 1), see **Enclosure 1**. The LOI ultimately drains to the Minnesota River. During construction, Erosion and Sediment (E&S) Best Management Practices (BMPs), such as compost filter socks, temporary check dams, and rock construction entrances, shall be installed in order to reduce suspended solids released from the site.

3. DESIGN BASIS AND ASSUMPTIONS

The site's drainage characteristics were modeled for existing and developed conditions in accordance with the Minnesota Stormwater Manual and Mankato Grading Manual that defines Mankato City's standards and specifications for stormwater management practices implemented during land development. The runoff analysis calculations and watershed routing calculations were performed using the SCS TR-20 method in HydroCAD 10.20-7a. This computer program requires the application of several assumptions to some of the input data. These assumptions consist of variables as applied to the pre- and post-development flow paths, soil conditions, above-site drainage areas, and ground cover conditions. This section discusses this input data, and the assumptions utilized.

3.1 ORDINANCE REGULATIONS

This Stormwater Management Plan was designed to be consistent with the Minnesota Stormwater Manual and Mankato City Grading Manual which meet permit obligations with the Minnesota Pollution Control Agency (MPCA). The Mankato City Grading Manual requirements include reducing the peak flow from pre- to post- condition for the 2-, 10-, 100- and back-to-back 10-year 24-hour storm events and treating the volume of runoff for the first 1.1 inches of runoff from all new impervious surfaces. The first 1.1 inches of runoff from impervious surfaces can be treated by routing 100 percent of the runoff volume from new impervious surfaces through a filtration practice where infiltration is not feasible. The Minnesota Stormwater Manual requirements include treating the volume of the first 1.0 inches of runoff from impervious surfaces and allows for the pervious are between solar panels to count towards that treatment. To comply with the Mankato City stormwater requirements and receive credits for the pervious area between the solar panels, a 10% increase in volume is added to the required treatment volume calculated from the solar array area utilizing the Minnesota Stormwater Manual Solar Panel Volume Calculator.

Analysis of the 2-, 10-, 100-, and back-to-back 10-year storm events are included to comply with these requirements. Rate and volume calculations are included in **Appendix B and Appendix C,** respectively.

The rainfall depths for each storm event are shown in **Table 1**. Storms follow the MSE 3 MN NOAA 14 rainfall distribution.

TABLE 1 RAINFALL DATA

Storm	P (in)
2-year	2.92
10-year	4.38
100-year	7.41

Source: MSE 3 MN NOAA Atlas 14

3.2 SITE SOILS

The soils within the project area were listed as hydrologic soil group (HSG) type ‘B’, HSG type ‘C’, and HSG type ‘D’ (see description below).

Group B soils have a moderate infiltration rate when thoroughly wet. These consist chiefly of soils moderately deep to deep, well-drained soils. These soils have a moderate rate of water transmission.

Group C soils have 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 have a very slow infiltration rate when thoroughly wet. These consist chiefly of soils having high clay content and high runoff potential when wet. These soils have a very slow rate of water transmission.

Site soils information was taken from the United States Department of Agriculture – Natural Resources Conservation Service (USDA – NRCS) website. The soil classification and type located on the property are summarized in **Table 2**.

TABLE 2 SOIL CLASSIFICATION

Symbol	Series Name/Slope	HSG	Hydric?	Prime Farmland
18	Comfrey clay loam	B/D	Yes	Yes, if not flooded
35	Blue Earth mucky silt loam, 0 to 1 percent slopes	B/D	Yes	No
85	Calco silty clay loam, 0 to 2 percent slopes, occasionally flooded	C/D	Yes	Yes, if not flooded
94B	Terril loam, 2 to 6 percent slopes	B	No	Yes
1039	Urban land, 0 to 2 percent slopes	-	No	-

Source: USDA NRCS Custom Soil Resource Report for Blue Earth County, Minnesota

A geotechnical investigation was performed by Braun Interec Corporation dated June 9, 2015. This investigation consisted of three soil boring located on the existing gravel area on site. Existing soils below the gravel were determined to chiefly consist of sandy lean clay which typically corresponds with HSG type 'C' or type 'D' and having slow infiltration rates. Due to the existing soils on site found during the geotechnical investigation, the site has been modeled as HSG type 'D' and infiltration is not proposed.

The approximate soil boundaries are shown on the Soils Map which is provided in **Appendix A**. The contractor should analyze the soils utilized during the construction process. Caution should be exercised in areas of poor soils. A qualified geotechnical engineer should be consulted during construction when unsuitable conditions occur. The recommended foundation design based on the soil findings shall supersede the USDA soil limitations listed above. The contractor should ensure that soils are not cut steeper than the design slopes and that fills are compacted in accordance with the site geotechnical report. Immediate seeding and mulching of disturbed areas will aid in soil stabilization and reduce soil erosion once vegetation is established.

3.3 ASSUMPTIONS

To model the pre-developed and post-developed runoff characteristics, several assumptions were made as follows:

- Acreage measurements (as applied to drainage areas and areas of ground cover) were determined by computer-aided drafting (CAD) and are approximated based on the accuracy of the site mapping and the resulting interpolation of ground slopes, ground cover, and drainage patterns.

- The LOI for the pre- and post-developed drainage areas was assumed to be located at approximately the same study point.
- The varying pre-development ground cover areas for prairie, woods, and gravel land coverage were estimated from survey, aerial imagery, the United States Geological Survey (USGS) National Landcover Database, and from site observation.
- In accordance with TR-55 requirements, pre-development Curve Number (CN) values for Meadow, Woods, and gravel land cover with Type 'D' soils are 78, 77, and 98, respectively. CN values used for post-development Meadow, Woods, gravel land cover, and disconnected impervious with Type 'D' soils are 78, 77, 98, and 98, respectively.

Other assumptions used in the calculations are discussed in the applicable sections of the report.

4. PRE-DEVELOPED HYDROLOGY

The existing site contains one drainage area (DA-1) that drains to a LOI offsite (LOI 1), as shown in **Enclosure 1**. The LOI ultimately drains to the Minnesota River.

Land cover is based on information from survey, aerial imagery, the USGS National Landcover Database, and site observation. Land cover, hydrologic soil group, and curve number information for pre-development conditions within the drainage area are summarized in **Table 3**. The pre-development drainage area curve number was weighted as shown in **Appendix B**.

TABLE 3 DA-1 PRE-DEVELOPMENT CONDITIONS

Land Cover	Area (acres)	HSG	CN
Meadow	14.47	D	78
Woods (Good)	5.43	D	77
Connected Impervious	2.47	D	98
Total/Weighted CN	22.37		80

The pre-development drainage areas and time of concentration paths are shown on the enclosed Pre-Development Drainage Area Map.

5. POST-DEVELOPMENT HYDROLOGY

The proposed site contains one drainage area (DA-1) that drains to a LOI offsite (LOI 1), as shown in **Enclosure 2**. The LOI ultimately drains to the Minnesota River.

The post-development drainage area has been broken down into two sub-drainage areas, DA-1A and DA-1B. DA-1 increases in curve number from pre- to post- condition and includes a vegetated swale and filtration berm. The filtration berm has been designed to filter the volume from all new impervious areas, calculated in accordance with the Mankato Grading Manual and MPCA Solar Site Guidance. DA-1B decreases in curve number from pre- to post- conditions and contains undetained areas. DA-1 drains to a localized low area offsite. The post-development drainage

areas and time of concentration paths are shown on the enclosed Post-Development Drainage Area Map.

Land cover, hydrologic soil group, and curve number information for post-development conditions are summarized in **Tables 4-5**.

TABLE 4 DA-1A POST-DEVELOPMENT CONDITIONS

Land Cover	Area (acres)	HSG	CN
Meadow	2.43	D	78
Connected Impervious	1.60	D	98
Disconnected Impervious	1.30	D	98
Total/Weighted CN	5.33		89

TABLE 5 DA-1B POST-DEVELOPMENT CONDITIONS

Land Cover	Area (acres)	HSG	CN
Meadow	10.71	D	78
Woods (Good)	5.43	D	77
Connected Impervious	0.90	D	98
Total/Weighted CN	17.04		79

5.1 PEAK FLOW SUMMARY

The pre- and post-development runoff at the LOI were determined using the SCS TR-20 method in HydroCAD. The runoff rate for the site was reduced from pre- to post-development conditions for the 2-, 10-, 100-, and back-to-back 10-year 24-hours storm events, in accordance with the City of Mankato Grading Manual, because of the use of peak flow reduction BMPs. Peak flow reduction BMPs include a vegetated swale. A summary of the discharges is as follows and demonstrates the decrease in the overall peak flow from the existing condition to developed condition. Calculations for pre- and post-developed conditions are included in **Appendix B**.

Pre- and post-development runoff rates in cubic feet per second (cfs) for the LOI are summarized in **Table 6.**

TABLE 6 PEAK FLOW RATES PRE- AND POST-DEVELOPMENT

Storm Event	Drainage Area 1		
	Pre-Development (cfs)	Post-Development (cfs)	Net Change (cfs)
2-year, 24-hr	34.28	31.14	-3.14

10-year, 24-hr	68.77	62.20	-6.57
Back-to-back 10-year, 24-hr	97.95	87.42	-10.53
100-year, 24-hr	145.65	132.28	-13.37

5.2 VOLUME SUMMARY

According to the Mankato City Garding Manual, the required treatment volume, which can be infiltrated or filtrated, is the first 1.1-inch of runoff from all new impervious surfaces. Additionally, the MPCA Solar Stormwater Guidance is used to calculate the required treatment volume for the solar array area. The MPCA Solar Stormwater Guidance requires solar arrays to be considered new disconnected impervious and allows for volume reduction to be applied from the previous areas between solar arrays. As such, the treatment volume requirement is a combination of these two calculations. The volume treatment requirement is met through the use of a filtration berm sized to filter the required volume. Calculations for pre- and post-developed conditions are included in **Appendix B**. Treatment volumes in cubic feet (cf) for the LOI are summarized in **Table 7.**

TABLE 7 TREATMENT VOLUME REQUIREMENT

LOI	Treatment Volume Requirement (cf)	Filtration Berm Volume (cf)
LOI-1	5,684	5,684

6. POST CONSTRUCTION STORMWATER MANAGEMENT

The post construction stormwater management design and the overall site development was conceptualized to preserve the integrity of the receiving streams while maintaining and protecting the physical, biological, and chemical qualities of the receiving surface waters.

Physical properties, or rate and volume, will be managed by demonstrating a decrease in peak rate and filtering the required volume.

Biological properties, or thermal impacts are discussed in greater detail in Section 6.2.

6.1 PROPOSED BMP'S

6.1.1 FILTRATION BERM

A filtration berm with conveyance via sheet flow and vegetated swale is proposed in DA-1. The filtration berm is sized to filter the required volume, according to the Mankato City Grading Manual and the MPCA Solar Stormwater Guidance. The site had a geotechnical testing performed by Braun Interec Corporation on May 4, 2015 which showed the site consists of mostly clayey soils, and as such infiltration of the required treatment volume is not feasible. The entire required treatment volume will be filtered through a filtration berm.

Please refer to **Appendix C** for the required filtration berm volume calculations.

6.2 POTENTIAL THERMAL IMPACTS TO SURFACE WATERS

The majority of stormwater flowing across gravel surfaces will enter a vegetated swale prior to discharging to a filtration berm, which will filter the water before discharging downstream and eventually flowing to the Minnesota River.

6.3 CONCLUSION

If the plan is implemented as described, impacts to the biological, chemical, and physical properties of downstream surface waters will be mitigated.

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APPENDIX A – SOILS REPORT

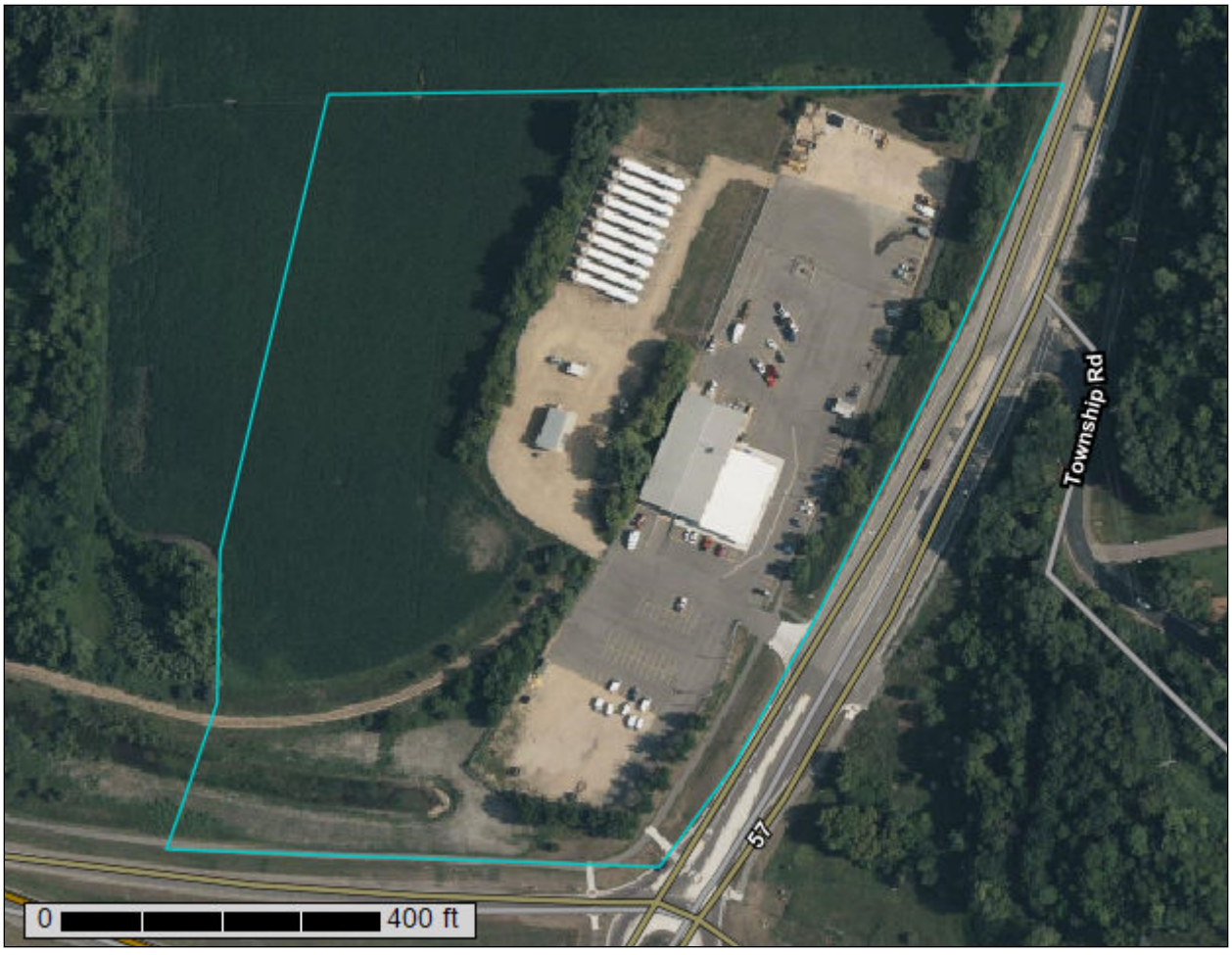
United States Department of Agriculture

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 Blue Earth County, Minnesota



April 1, 2026

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.

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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.

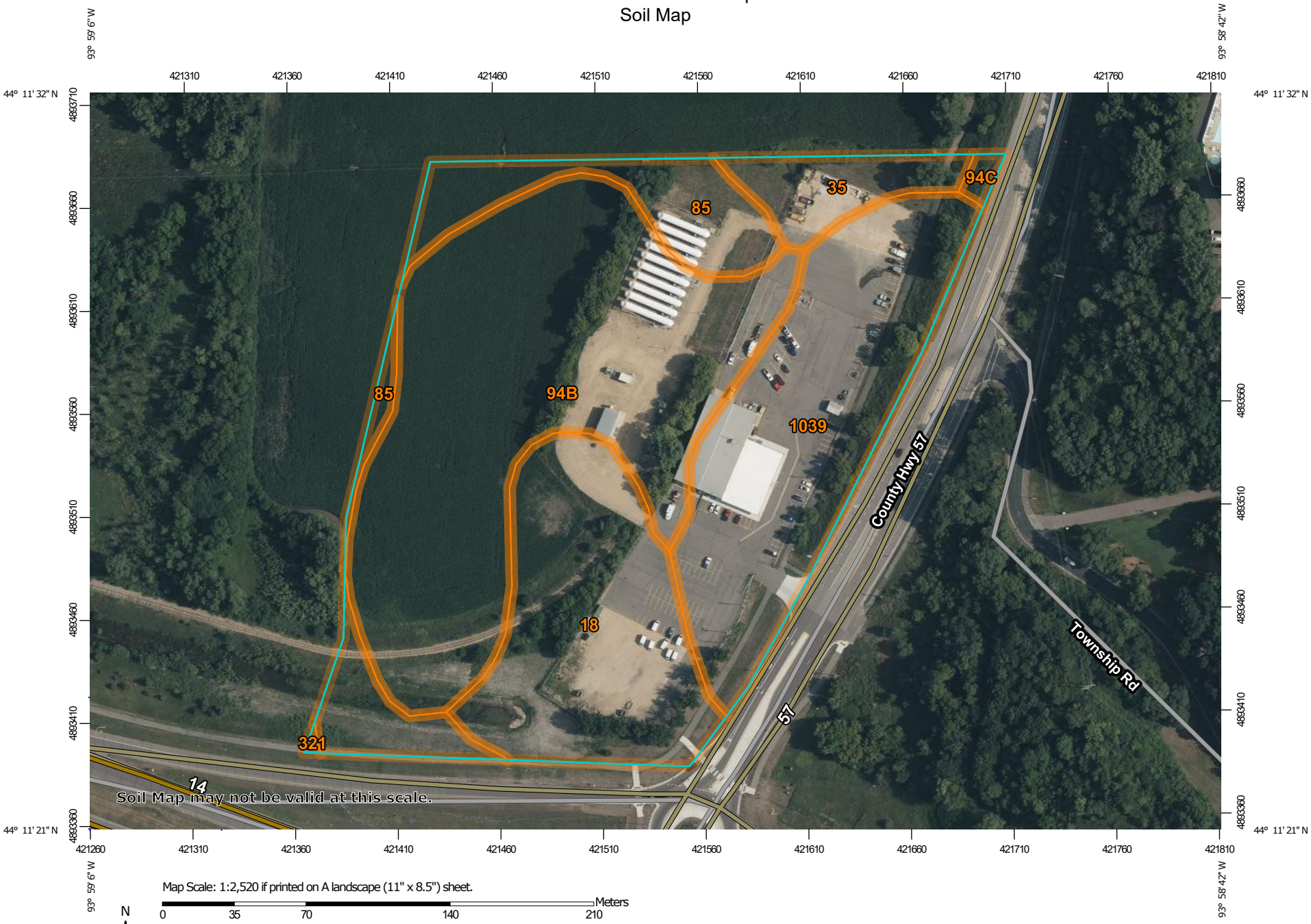
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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.

Custom Soil Resource Report
Soil Map



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.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Blue Earth County, Minnesota
Survey Area Data: Version 23, Sep 9, 2025

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

Date(s) aerial images were photographed: Jul 2, 2023—Aug 8, 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
18	Comfrey clay loam	3.4	19.2%
35	Blue Earth mucky silt loam, 0 to 1 percent slopes	0.8	4.4%
85	Calco silty clay loam, 0 to 2 percent slopes, occasionaly flooded	2.0	11.4%
94B	Terril loam, 2 to 6 percent slopes	7.2	40.8%
94C	Terril loam, 6 to 15 percent slopes	0.1	0.5%
321	Tilfer silty clay loam	0.0	0.1%
1039	Urban land, 0 to 2 percent slopes	4.1	23.6%
Totals for Area of Interest		**17.6**	**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.

Blue Earth County, Minnesota

18—Comfrey clay loam

Map Unit Setting

National map unit symbol: f96x
Elevation: 700 to 1,570 feet
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 155 to 200 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Comfrey, occasionally flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Comfrey, Occasionally Flooded

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy alluvium

Typical profile

Ap - 0 to 9 inches: clay loam
A - 9 to 34 inches: loam
C - 34 to 60 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 to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 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: B/D
Ecological site: F103XY033MN - Wet Floodplains
Forage suitability group: Level Swale, Neutral (G103XS001MN)
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Minor Components

Calco

Percent of map unit: 5 percent

Landform: Flood plains
Hydric soil rating: Yes

Chaska

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

35—Blue Earth mucky silt loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2vvf5
Landscape: Till plains
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

Blue earth and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blue Earth

Setting

Landscape: Till plains
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coprogenic material over till

Typical profile

Lpco - 0 to 10 inches: mucky silt loam
Lco - 10 to 68 inches: mucky silt loam
2Cg - 68 to 79 inches: silty 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 high to high (0.20 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: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: R103XY018MN - Shallow Lakes
Forage suitability group: Ponded If Not Drained (G103XS013MN)
Other vegetative classification: Ponded If Not Drained (G103XS013MN)
Hydric soil rating: Yes

Minor Components

Canisteo

Percent of map unit: 10 percent
Landscape: Till plains
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

Harps

Percent of map unit: 4 percent
Landscape: Till plains
Landform: Rims on depressions
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R103XY009MN - Calcareous Rim Prairies
Other vegetative classification: Level Swale, Calcareous (G103XS009MN)
Hydric soil rating: Yes

Lemond

Percent of map unit: 1 percent
Landscape: Till plains
Landform: Outwash plains, Terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R103XY007MN - Sandy Wet Prairies
Other vegetative classification: Level Swale, Calcareous (G103XS009MN)
Hydric soil rating: Yes

85—Calco silty clay loam, 0 to 2 percent slopes, occasionaly flooded

Map Unit Setting

National map unit symbol: 2wd8d
Landscape: River valleys
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 protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Calco, occasionally flooded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calco, Occasionally Flooded

Setting

Landscape: River valleys
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 10 inches: silty clay loam
A - 10 to 45 inches: silty clay loam
Bg - 45 to 55 inches: silty clay loam
Cg - 55 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: Occasional
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: Very high (about 12.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F103XY033MN - Wet Floodplains
Forage suitability group: Level Swale, Calcareous (G103XS009MN)
Other vegetative classification: Level Swale, Calcareous (G103XS009MN)
Hydric soil rating: Yes

Minor Components

Colo, occasionally flooded

Percent of map unit: 10 percent
Landscape: River valleys
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F103XY033MN - Wet Floodplains
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: Yes

Spillville, occasionally flooded
Percent of map unit: 5 percent
Landscape: River valleys
Landform: Flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F103XY032MN - Loamy Floodplains
Other vegetative classification: Level Swale, Neutral (G103XS001MN)
Hydric soil rating: No

94B—Terril loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2tsjq
Landscape: Till plains
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
Terril and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Terril

Setting
Landscape: Till plains
Landform: Ground moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Colluvium

Typical profile
Ap - 0 to 9 inches: loam
A - 9 to 34 inches: loam
Bw - 34 to 52 inches: loam
C - 52 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 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: R103XY011MN - Footslope/Drainageway Prairies
Forage suitability group: Sloping Upland, Neutral (G103XS002MN)
Other vegetative classification: Sloping Upland, Neutral (G103XS002MN)
Hydric soil rating: No

Minor Components

Delft

Percent of map unit: 8 percent
Landscape: Till plains
Landform: Swales on ground moraines
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R103XY001MN - Loamy Wet Prairies
Other vegetative classification: Level Swale, Calcareous (G103XS009MN)
Hydric soil rating: Yes

Storden, moderately eroded

Percent of map unit: 7 percent
Landscape: Till plains
Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: R103XY002MN - Calcareous Upland Prairies
Other vegetative classification: Sloping Upland, Calcareous (G103XS010MN)
Hydric soil rating: No

Clarion

Percent of map unit: 5 percent
Landscape: Till plains
Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R103XY004MN - Loamy Upland Prairies
Other vegetative classification: Sloping Upland, Neutral (G103XS002MN)
Hydric soil rating: No

94C—Terril loam, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: f99k
Elevation: 700 to 1,570 feet
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 155 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Terril and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Terril

Setting

Landform: Hills on moraines
Landform position (two-dimensional): Footslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-loamy colluvium

Typical profile

Ap,A - 0 to 21 inches: loam
Bw - 21 to 49 inches: loam
C - 49 to 60 inches: loam

Properties and qualities

Slope: 6 to 15 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 (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R103XY011MN - Footslope/Drainageway Prairies
Forage suitability group: Sloping Upland, Neutral (G103XS002MN)
Other vegetative classification: Sloping Upland, Neutral (G103XS002MN)
Hydric soil rating: No

Minor Components

Hamel
Percent of map unit: 5 percent
Landform: Drainageways
Hydric soil rating: Yes

Le sueur
Percent of map unit: 2 percent
Landform: Rises
Hydric soil rating: No

Webster
Percent of map unit: 2 percent
Landform: Drainageways
Hydric soil rating: Yes

Nicollet
Percent of map unit: 1 percent
Landform: Rises
Hydric soil rating: No

321—Tilfer silty clay loam

Map Unit Setting
National map unit symbol: f97v
Elevation: 700 to 1,570 feet
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 155 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition
Tilfer and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tilfer

Setting
Landform: Flats on benches
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty lacustrine deposits over limestone bedrock

Typical profile
Ap,A - 0 to 22 inches: silty clay loam
Bg - 22 to 31 inches: silty clay loam
Cg - 31 to 33 inches: channers
2R - 33 to 35 inches: bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R103XY010MN - Bedrock Controlled Wet Prairies
Forage suitability group: Ponded If Not Drained (G103XS013MN)
Other vegetative classification: Ponded If Not Drained (G103XS013MN)
Hydric soil rating: Yes

Minor Components

Joliet

Percent of map unit: 10 percent
Landform: Outwash plains
Hydric soil rating: Yes

1039—Urban land, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: f964
Elevation: 700 to 1,570 feet
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 155 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear

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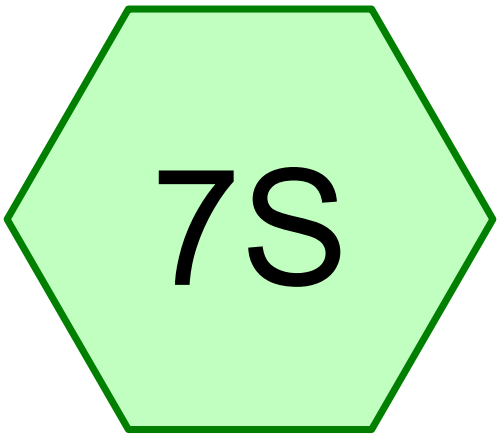
APPENDIX B – RATE REDUCTION CALCULATIONS



DA-1 PRE

Subcat Reach Pond Link

Routing Diagram for Pre Workup_v2
Prepared by ERM, Printed 6/11/2026
HydroCAD® 10.20-8a s/n 02264 © 2025 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NRCS2-Rain.txt" for 510 MN Blue Earth
Rainfall events imported from "NRCS2-Rain.txt" for 510 MN Blue Earth

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	MSE 24-hr	3	Default	24.00	1	2.92	2
2	10-Year	MSE 24-hr	3	Default	24.00	1	4.38	2
3	100-Year	MSE 24-hr	3	Default	24.00	1	7.41	2
4	10-Year Back to Back	MSE 24-hr	3	Default	24.00	2	4.38	2

Summary for Subcatchment 7S: DA-1 PRE

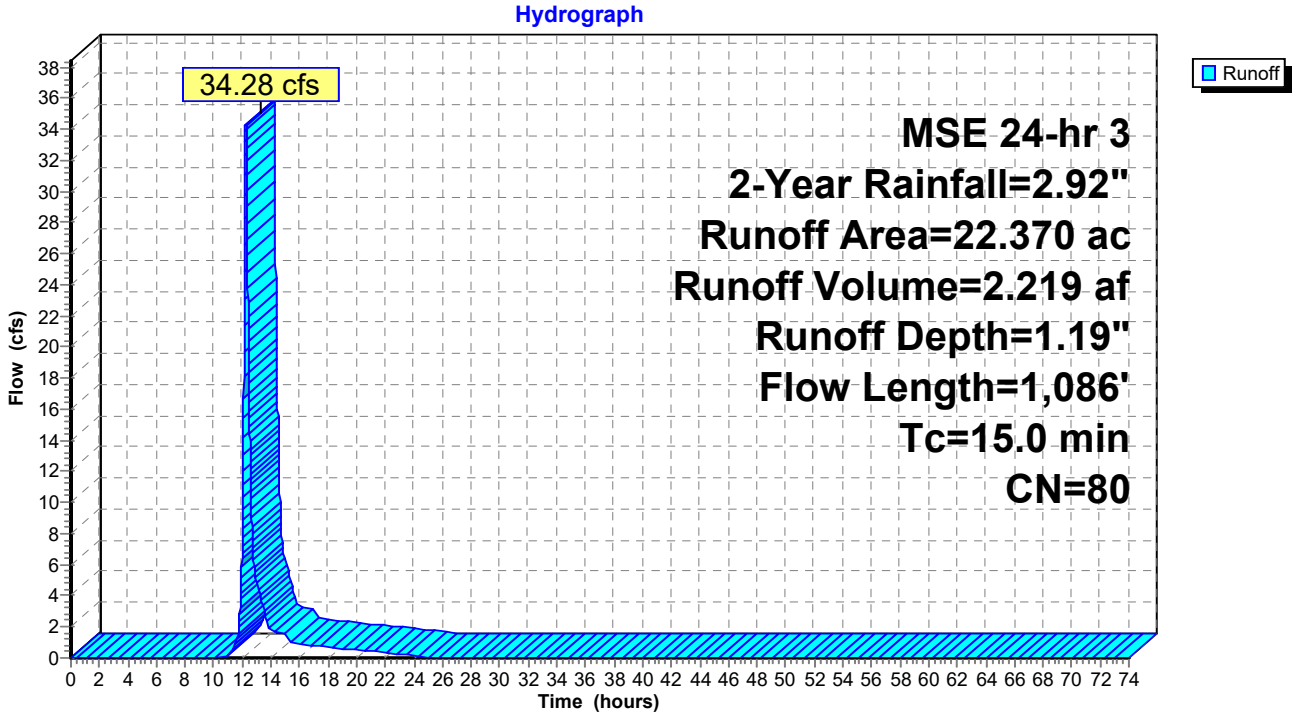
Runoff = 34.28 cfs @ 12.24 hrs, Volume= 2.219 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.92"

	Area (ac)	CN	Description
	14.470	78	Meadow, non-grazed, HSG D
*	2.470	98	Impervious
	5.430	77	Woods, Good, HSG D
	22.370	80	Weighted Average
	19.900		88.96% Pervious Area
	2.470		11.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
1.1	111	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.0	875	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	1,086	Total			

Subcatchment 7S: DA-1 PRE



Summary for Subcatchment 7S: DA-1 PRE

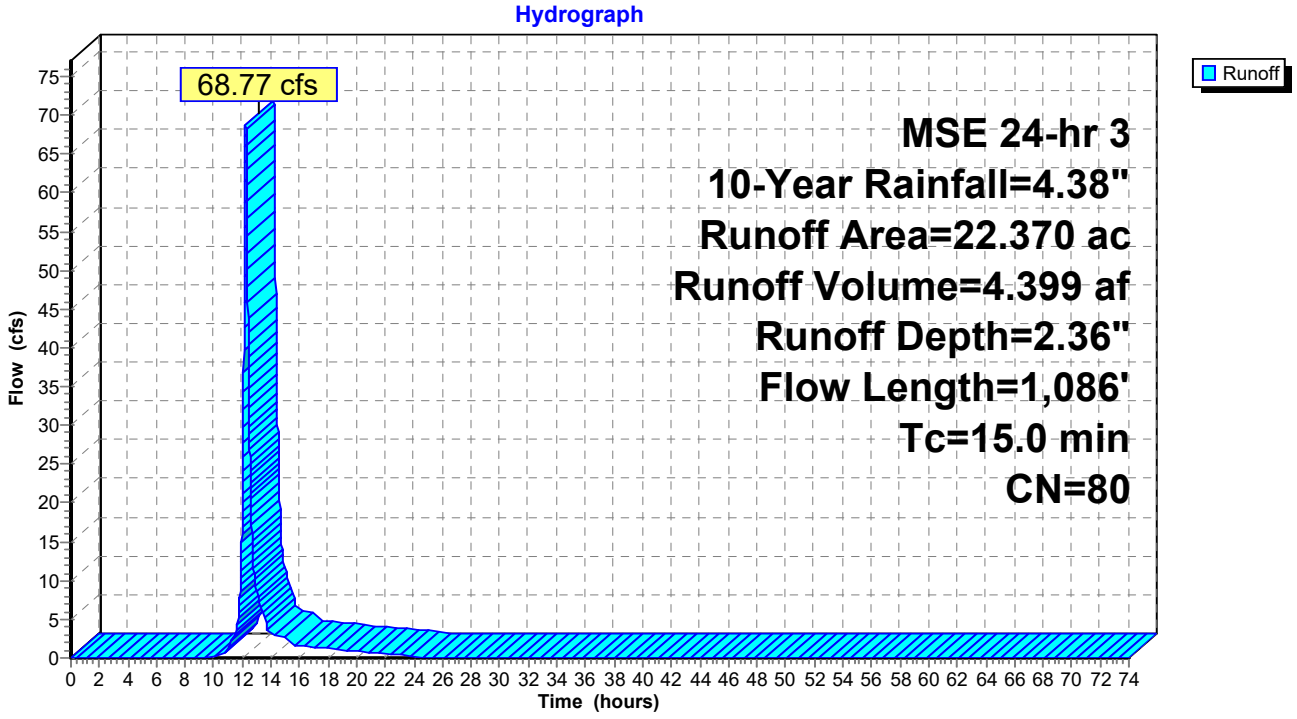
Runoff = 68.77 cfs @ 12.23 hrs, Volume= 4.399 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.38"

	Area (ac)	CN	Description
	14.470	78	Meadow, non-grazed, HSG D
*	2.470	98	Impervious
	5.430	77	Woods, Good, HSG D
	22.370	80	Weighted Average
	19.900		88.96% Pervious Area
	2.470		11.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
1.1	111	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.0	875	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	1,086	Total			

Subcatchment 7S: DA-1 PRE



Summary for Subcatchment 7S: DA-1 PRE

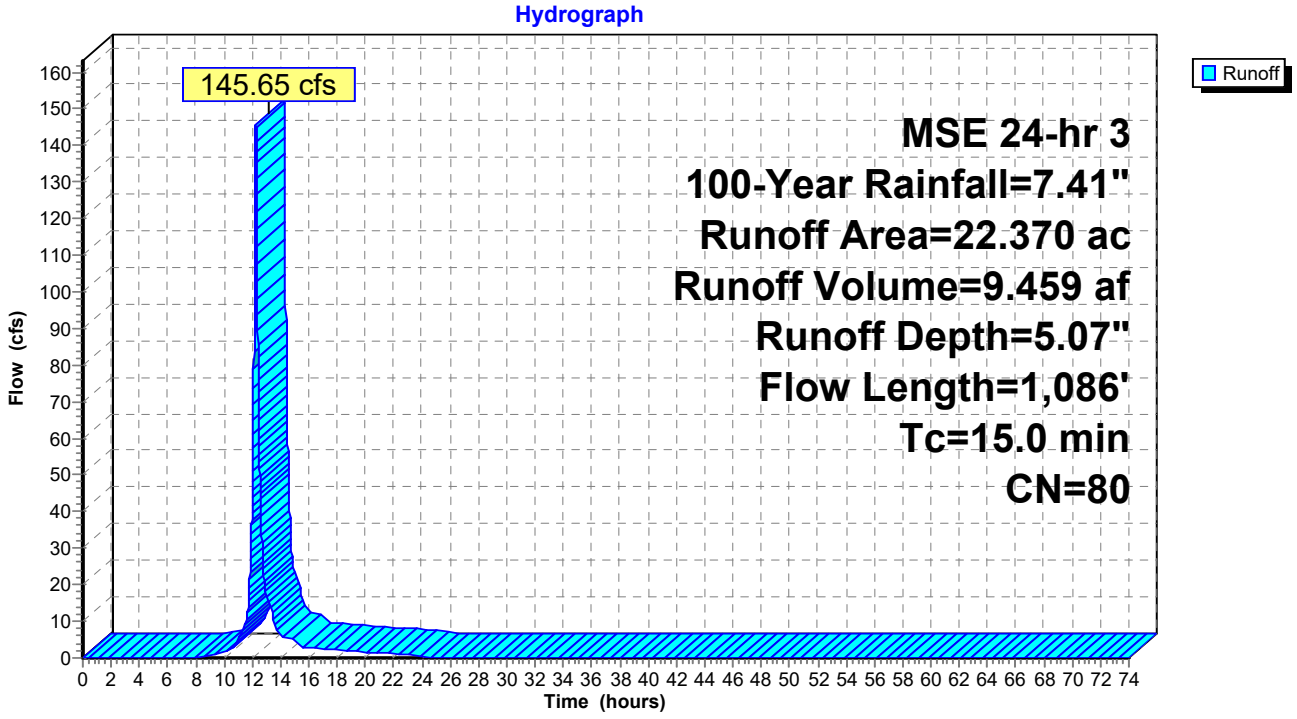
Runoff = 145.65 cfs @ 12.23 hrs, Volume= 9.459 af, Depth= 5.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.41"

	Area (ac)	CN	Description
	14.470	78	Meadow, non-grazed, HSG D
*	2.470	98	Impervious
	5.430	77	Woods, Good, HSG D
	22.370	80	Weighted Average
	19.900		88.96% Pervious Area
	2.470		11.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
1.1	111	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.0	875	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	1,086	Total			

Subcatchment 7S: DA-1 PRE



Summary for Subcatchment 7S: DA-1 PRE

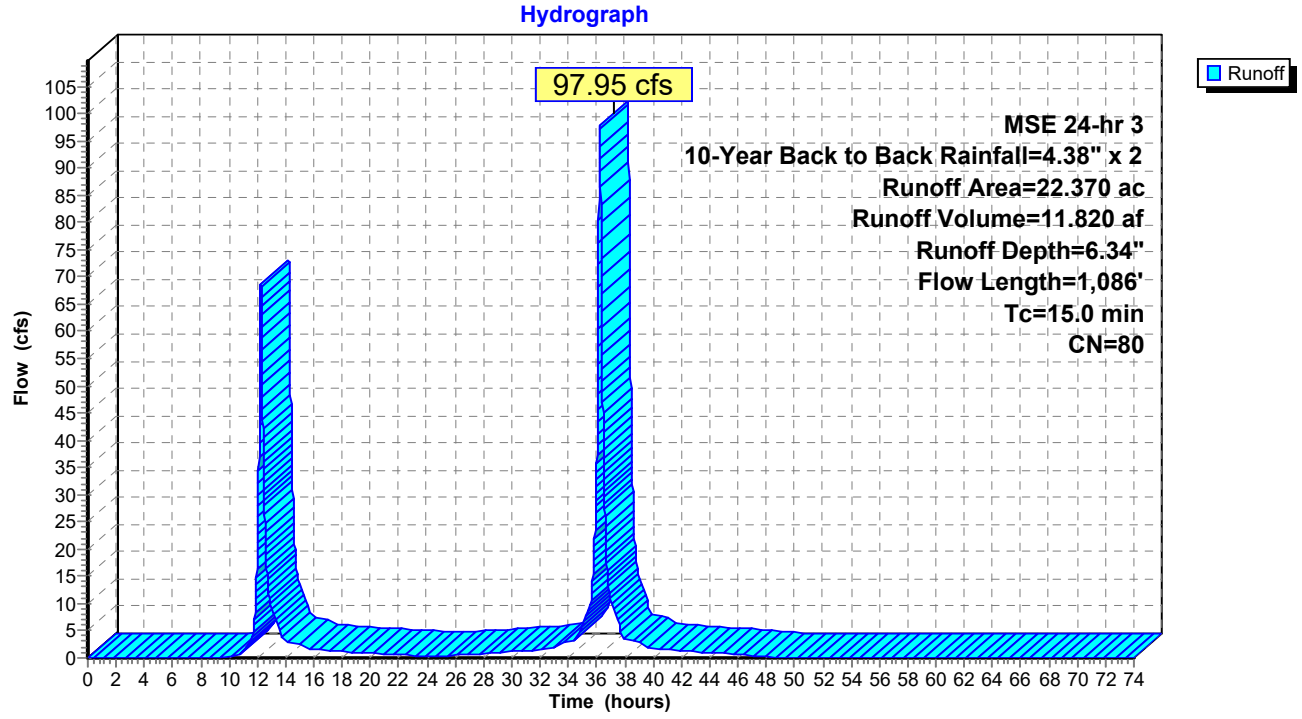
Runoff = 97.95 cfs @ 36.22 hrs, Volume= 11.820 af, Depth= 6.34"

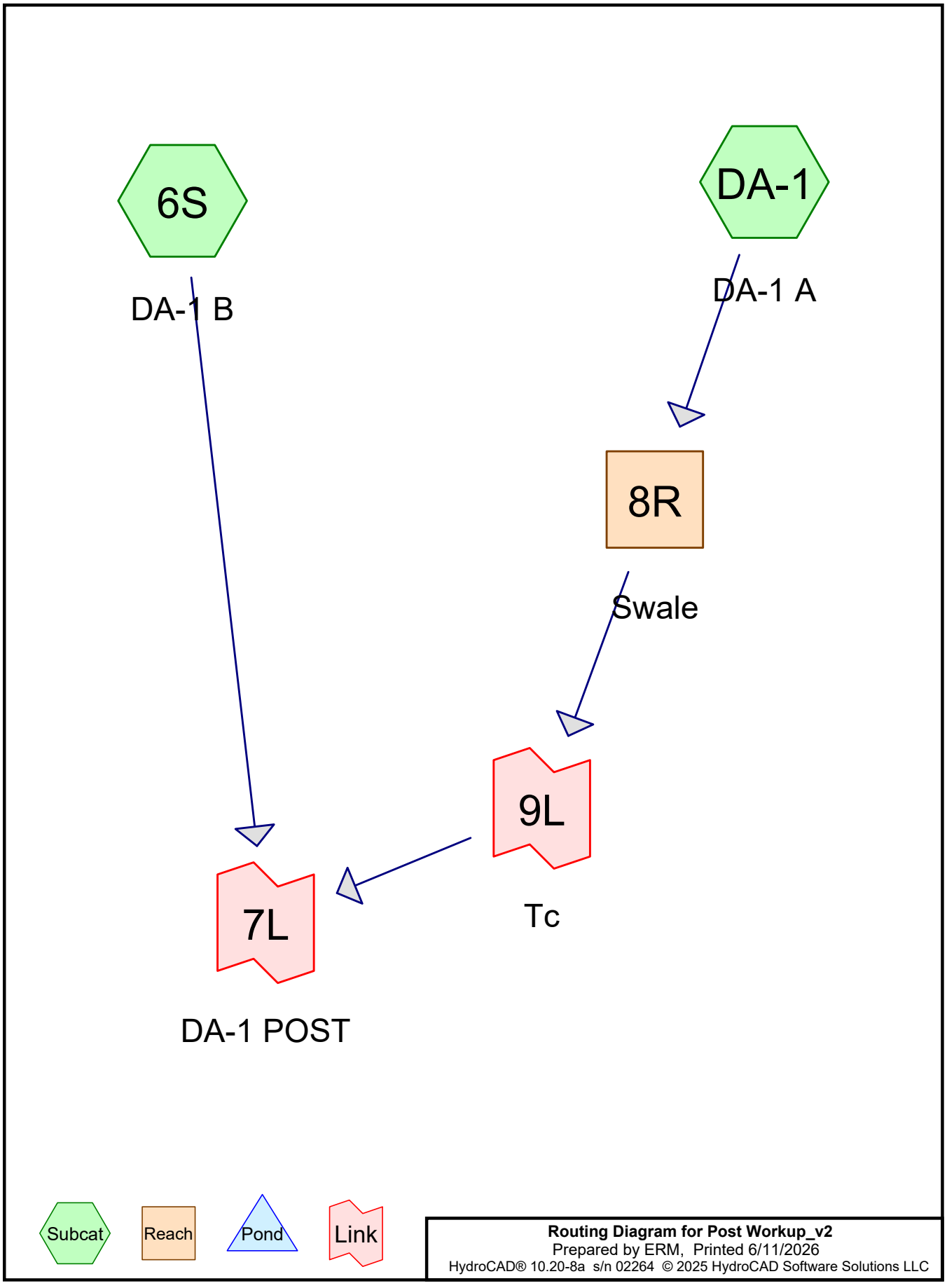
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Back to Back Rainfall=4.38" x 2

	Area (ac)	CN	Description
	14.470	78	Meadow, non-grazed, HSG D
*	2.470	98	Impervious
	5.430	77	Woods, Good, HSG D
	22.370	80	Weighted Average
	19.900		88.96% Pervious Area
	2.470		11.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
1.1	111	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.0	875	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	1,086	Total			

Subcatchment 7S: DA-1 PRE





Routing Diagram for Post Workup_v2
Prepared by ERM, Printed 6/11/2026
HydroCAD® 10.20-8a s/n 02264 © 2025 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NRCS2-Rain.txt" for 510 MN Blue Earth
Rainfall events imported from "NRCS2-Rain.txt" for 510 MN Blue Earth

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	MSE 24-hr	3	Default	24.00	1	2.92	2
2	10-Year	MSE 24-hr	3	Default	24.00	1	4.38	2
3	100-Year	MSE 24-hr	3	Default	24.00	1	7.41	2
4	10-Year Back to Back	MSE 24-hr	3	Default	24.00	2	4.38	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.300	98	Disconnected Impervious, HSG D (DA-1)
2.500	98	Impervious (6S, DA-1)
13.140	78	Meadow, non-grazed, HSG D (6S, DA-1)
5.430	77	Woods, Good, HSG D (6S)
22.370	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
19.870	HSG D	6S, DA-1
2.500	Other	6S, DA-1
22.370		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	1.300	0.000	1.300	Disconnected Impervious	DA-1
0.000	0.000	0.000	0.000	2.500	2.500	Impervious	6S, DA-1
0.000	0.000	0.000	13.140	0.000	13.140	Meadow, non-grazed	6S, DA-1
0.000	0.000	0.000	5.430	0.000	5.430	Woods, Good	6S
0.000	**0.000**	**0.000**	**19.870**	**2.500**	**22.370**	**TOTAL AREA**	

Time span=0.00-74.00 hrs, dt=0.01 hrs, 7401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment6S: DA-1 B Runoff Area=17.040 ac 5.28% Impervious Runoff Depth=1.13"
Flow Length=1,086' Tc=15.0 min CN=79 Runoff=24.68 cfs 1.605 af

SubcatchmentDA-1: DA-1 A Runoff Area=5.330 ac 54.41% Impervious Runoff Depth=1.83"
Flow Length=433' Tc=9.1 min CN=89 Runoff=15.56 cfs 0.812 af

Reach 8R: Swale Avg. Flow Depth=0.51' Max Vel=2.97 fps Inflow=15.56 cfs 0.812 af
n=0.020 L=520.0' S=0.0048 '/' Capacity=47.71 cfs Outflow=14.59 cfs 0.812 af

Link 7L: DA-1 POST Inflow=31.14 cfs 2.417 af
Primary=31.14 cfs 2.417 af

Link 9L: Tc delayed by 9.5 min Inflow=14.59 cfs 0.812 af
Primary=14.58 cfs 0.812 af

Total Runoff Area = 22.370 ac Runoff Volume = 2.417 af Average Runoff Depth = 1.30"
83.01% Pervious = 18.570 ac 16.99% Impervious = 3.800 ac

Summary for Subcatchment 6S: DA-1 B

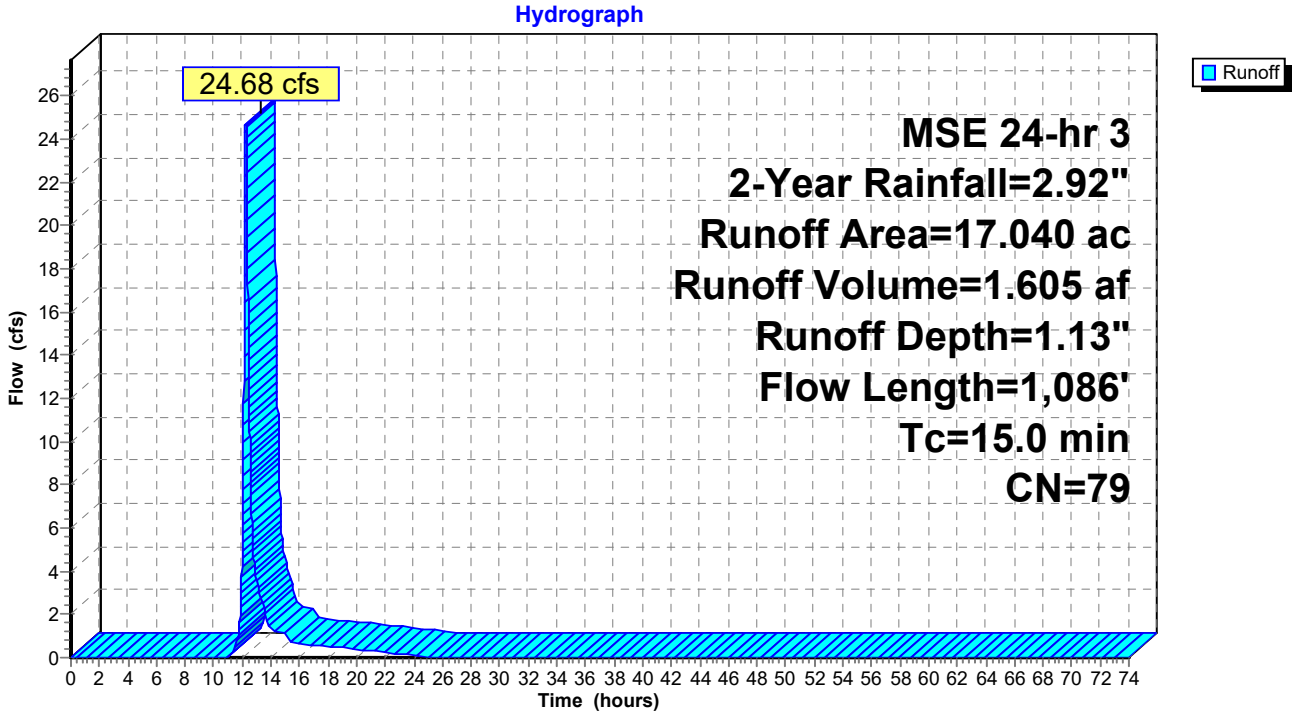
Runoff = 24.68 cfs @ 12.24 hrs, Volume= 1.605 af, Depth= 1.13"
Routed to Link 7L : DA-1 POST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.92"

	Area (ac)	CN	Description
	10.710	78	Meadow, non-grazed, HSG D
*	0.900	98	Impervious
	5.430	77	Woods, Good, HSG D
	17.040	79	Weighted Average
	16.140		94.72% Pervious Area
	0.900		5.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
1.1	111	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.0	875	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	1,086	Total			

Subcatchment 6S: DA-1 B



Summary for Subcatchment DA-1: DA-1 A

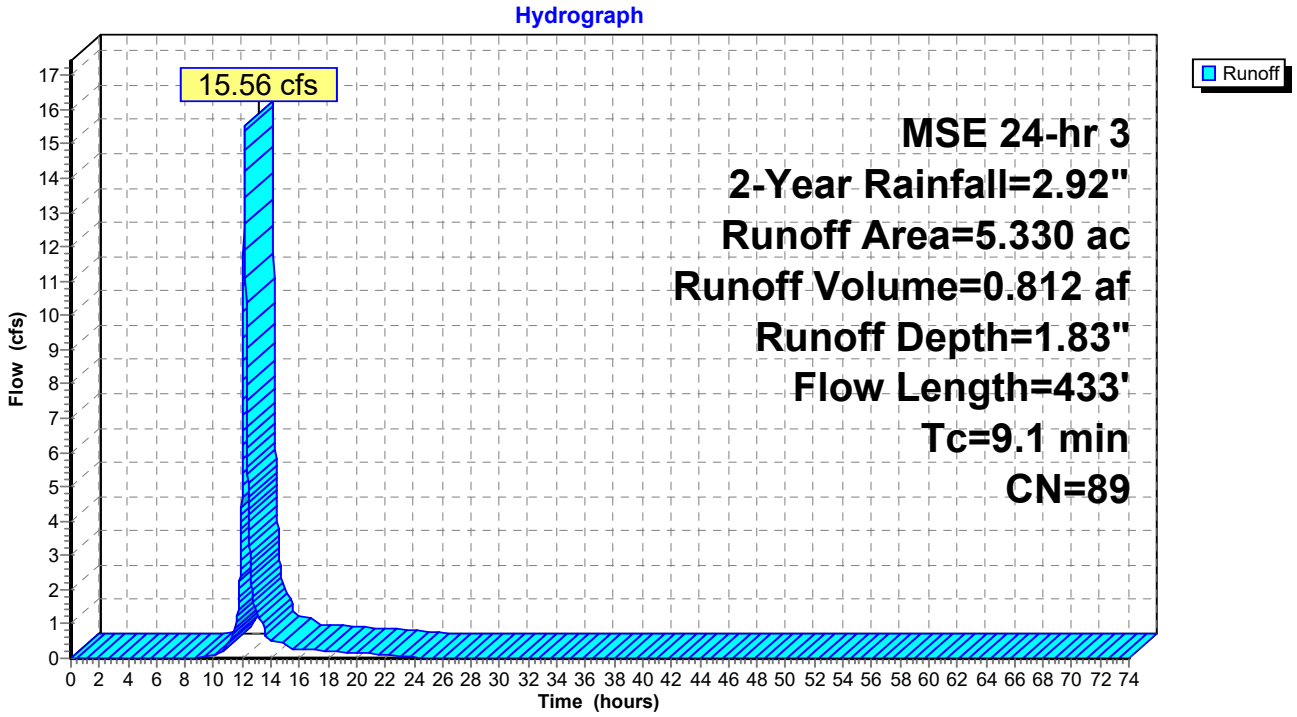
Runoff = 15.56 cfs @ 12.16 hrs, Volume= 0.812 af, Depth= 1.83"
Routed to Reach 8R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.92"

	Area (ac)	CN	Description
	2.430	78	Meadow, non-grazed, HSG D
*	1.600	98	Impervious
*	1.300	98	Disconnected Impervious, HSG D
	5.330	89	Weighted Average
	2.430		45.59% Pervious Area
	2.900		54.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	59	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.37"
0.7	41	0.0200	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
0.7	102	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	231	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	433	Total			

Subcatchment DA-1: DA-1 A



Summary for Reach 8R: Swale

Inflow Area = 5.330 ac, 54.41% Impervious, Inflow Depth = 1.83" for 2-Year event
Inflow = 15.56 cfs @ 12.16 hrs, Volume= 0.812 af
Outflow = 14.59 cfs @ 12.24 hrs, Volume= 0.812 af, Atten= 6%, Lag= 4.7 min
Routed to Link 9L : Tc

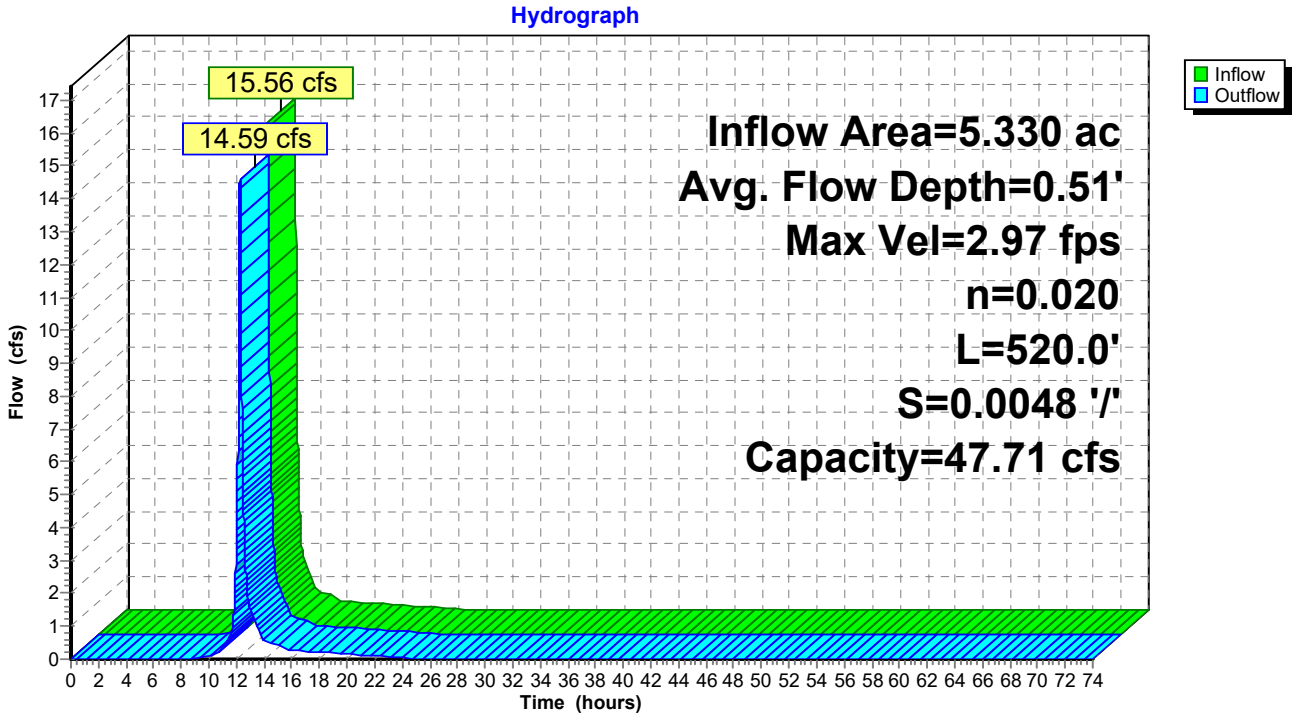
Routing by Stor-Ind+Trans method, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.97 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 14.3 min

Peak Storage= 2,552 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.51' , Surface Width= 11.09'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 47.71 cfs

8.00' x 1.00' deep channel, n= 0.020
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 520.0' Slope= 0.0048 '/'
Inlet Invert= 835.52', Outlet Invert= 833.00'



‡

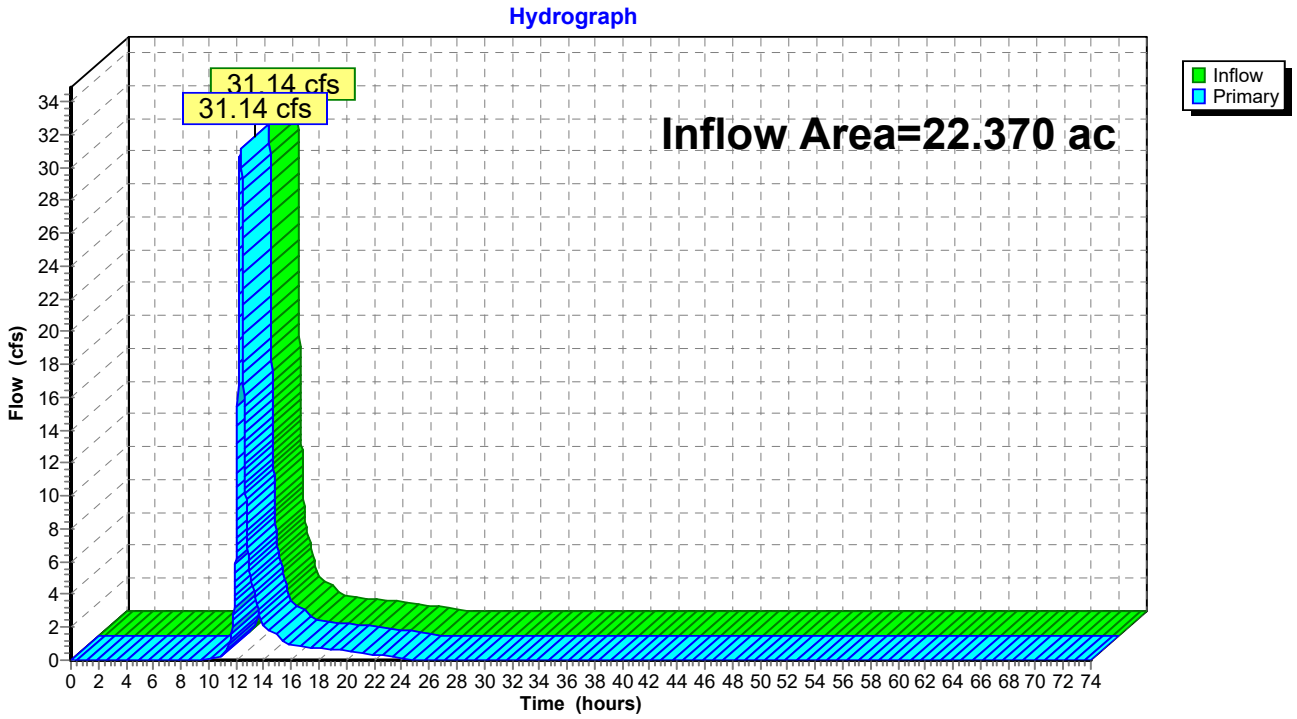


Summary for Link 7L: DA-1 POST

Inflow Area = 22.370 ac, 16.99% Impervious, Inflow Depth = 1.30" for 2-Year event
Inflow = 31.14 cfs @ 12.35 hrs, Volume= 2.417 af
Primary = 31.14 cfs @ 12.35 hrs, Volume= 2.417 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs

Link 7L: DA-1 POST

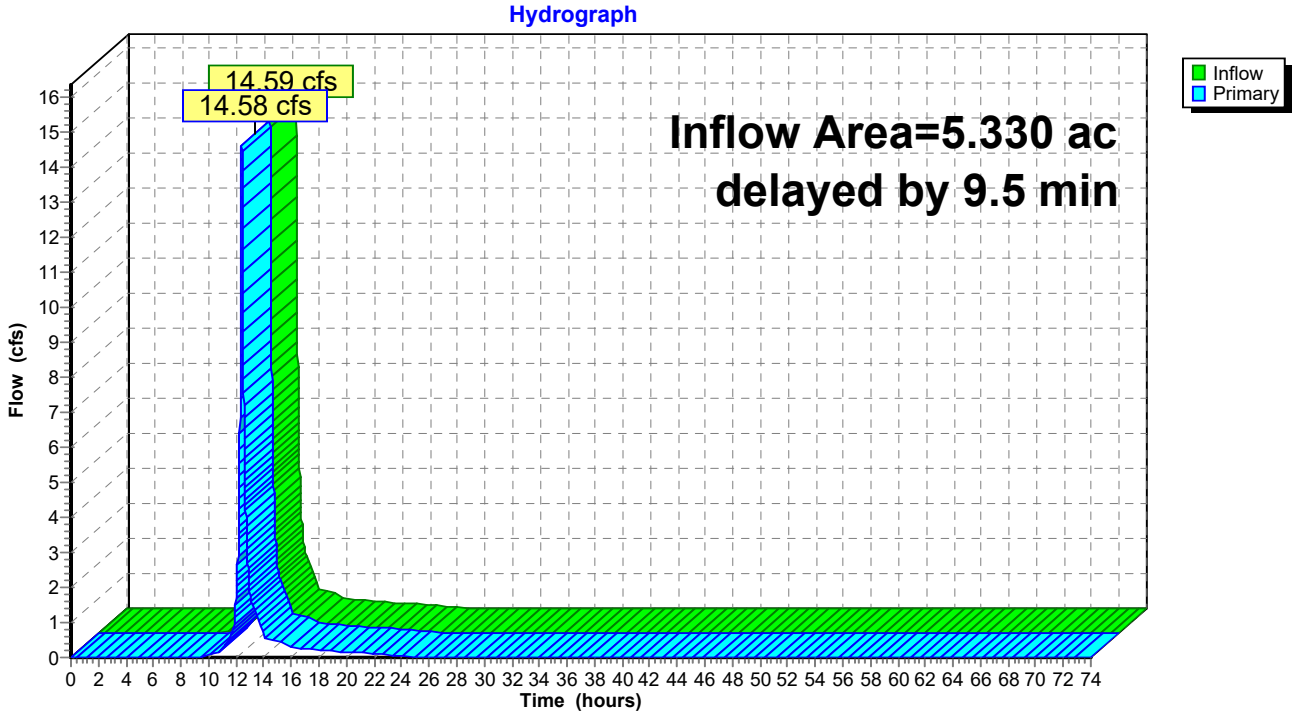


Summary for Link 9L: Tc

Inflow Area = 5.330 ac, 54.41% Impervious, Inflow Depth = 1.83" for 2-Year event
Inflow = 14.59 cfs @ 12.24 hrs, Volume= 0.812 af
Primary = 14.58 cfs @ 12.40 hrs, Volume= 0.812 af, Atten= 0%, Lag= 9.5 min
Routed to Link 7L : DA-1 POST

Primary outflow = Inflow delayed by 9.5 min, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs

Link 9L: Tc



Time span=0.00-74.00 hrs, dt=0.01 hrs, 7401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment6S: DA-1 B Runoff Area=17.040 ac 5.28% Impervious Runoff Depth=2.28"
Flow Length=1,086' Tc=15.0 min CN=79 Runoff=50.53 cfs 3.232 af

SubcatchmentDA-1: DA-1 A Runoff Area=5.330 ac 54.41% Impervious Runoff Depth=3.18"
Flow Length=433' Tc=9.1 min CN=89 Runoff=26.42 cfs 1.413 af

Reach 8R: Swale Avg. Flow Depth=0.70' Max Vel=3.55 fps Inflow=26.42 cfs 1.413 af
n=0.020 L=520.0' S=0.0048 '/' Capacity=47.71 cfs Outflow=25.19 cfs 1.413 af

Link 7L: DA-1 POST Inflow=62.20 cfs 4.645 af
Primary=62.20 cfs 4.645 af

Link 9L: Tc delayed by 9.5 min Inflow=25.19 cfs 1.413 af
Primary=25.16 cfs 1.413 af

Total Runoff Area = 22.370 ac Runoff Volume = 4.645 af Average Runoff Depth = 2.49"
83.01% Pervious = 18.570 ac 16.99% Impervious = 3.800 ac

Summary for Subcatchment 6S: DA-1 B

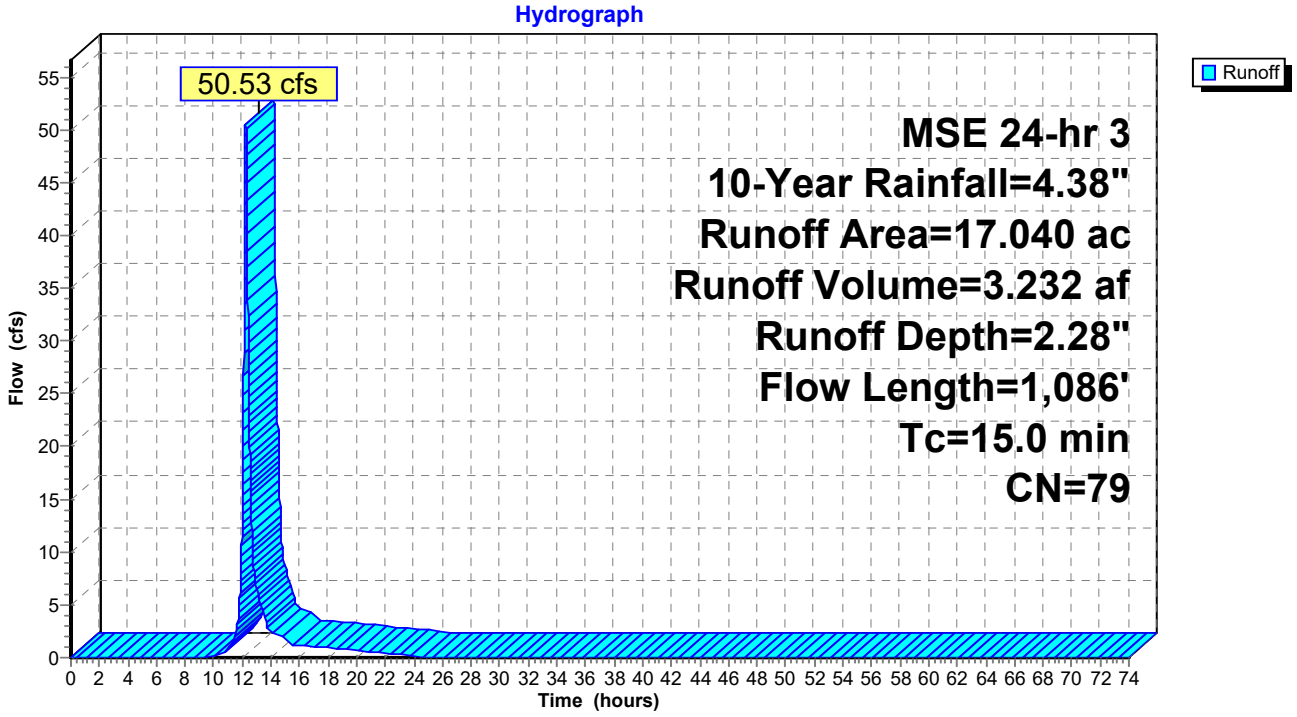
Runoff = 50.53 cfs @ 12.23 hrs, Volume= 3.232 af, Depth= 2.28"
Routed to Link 7L : DA-1 POST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.38"

	Area (ac)	CN	Description
	10.710	78	Meadow, non-grazed, HSG D
*	0.900	98	Impervious
	5.430	77	Woods, Good, HSG D
	17.040	79	Weighted Average
	16.140		94.72% Pervious Area
	0.900		5.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
1.1	111	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.0	875	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	1,086	Total			

Subcatchment 6S: DA-1 B



Summary for Subcatchment DA-1: DA-1 A

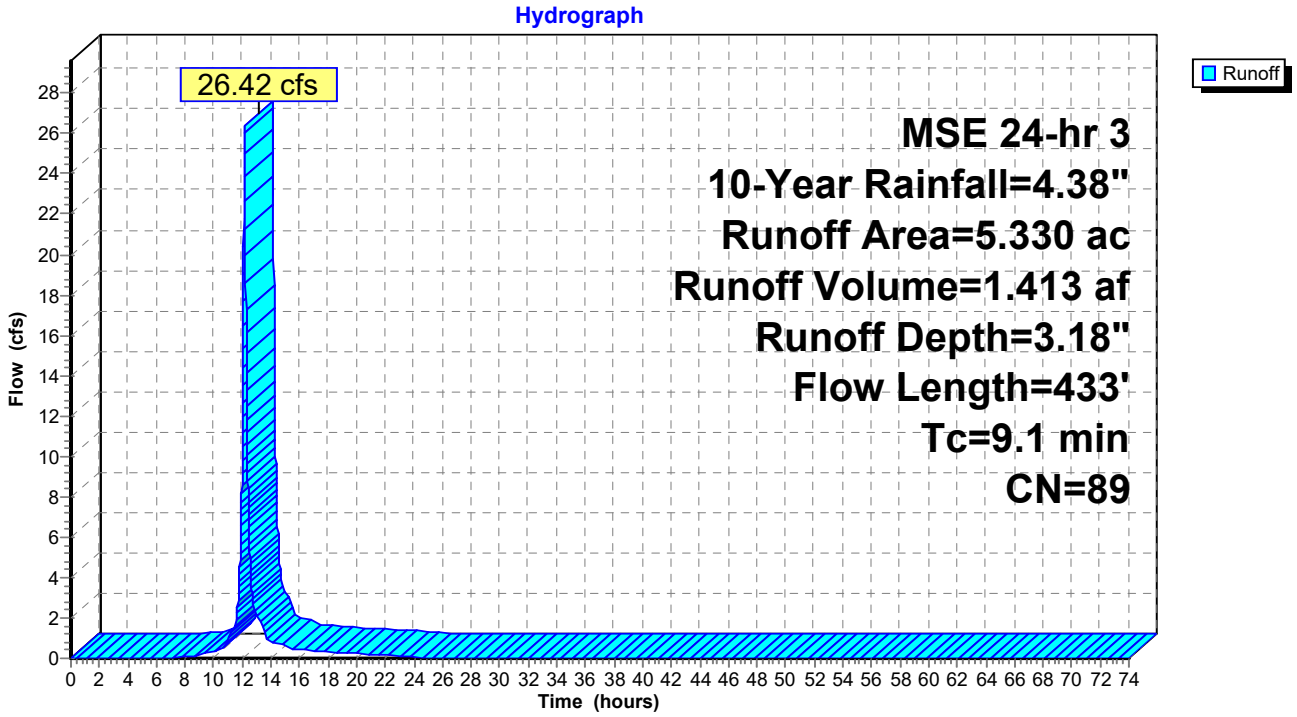
Runoff = 26.42 cfs @ 12.16 hrs, Volume= 1.413 af, Depth= 3.18"
Routed to Reach 8R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.38"

	Area (ac)	CN	Description
	2.430	78	Meadow, non-grazed, HSG D
*	1.600	98	Impervious
*	1.300	98	Disconnected Impervious, HSG D
	5.330	89	Weighted Average
	2.430		45.59% Pervious Area
	2.900		54.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	59	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.37"
0.7	41	0.0200	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
0.7	102	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	231	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	433	Total			

Subcatchment DA-1: DA-1 A



Summary for Reach 8R: Swale

Inflow Area = 5.330 ac, 54.41% Impervious, Inflow Depth = 3.18" for 10-Year event
Inflow = 26.42 cfs @ 12.16 hrs, Volume= 1.413 af
Outflow = 25.19 cfs @ 12.23 hrs, Volume= 1.413 af, Atten= 5%, Lag= 3.9 min
Routed to Link 9L : Tc

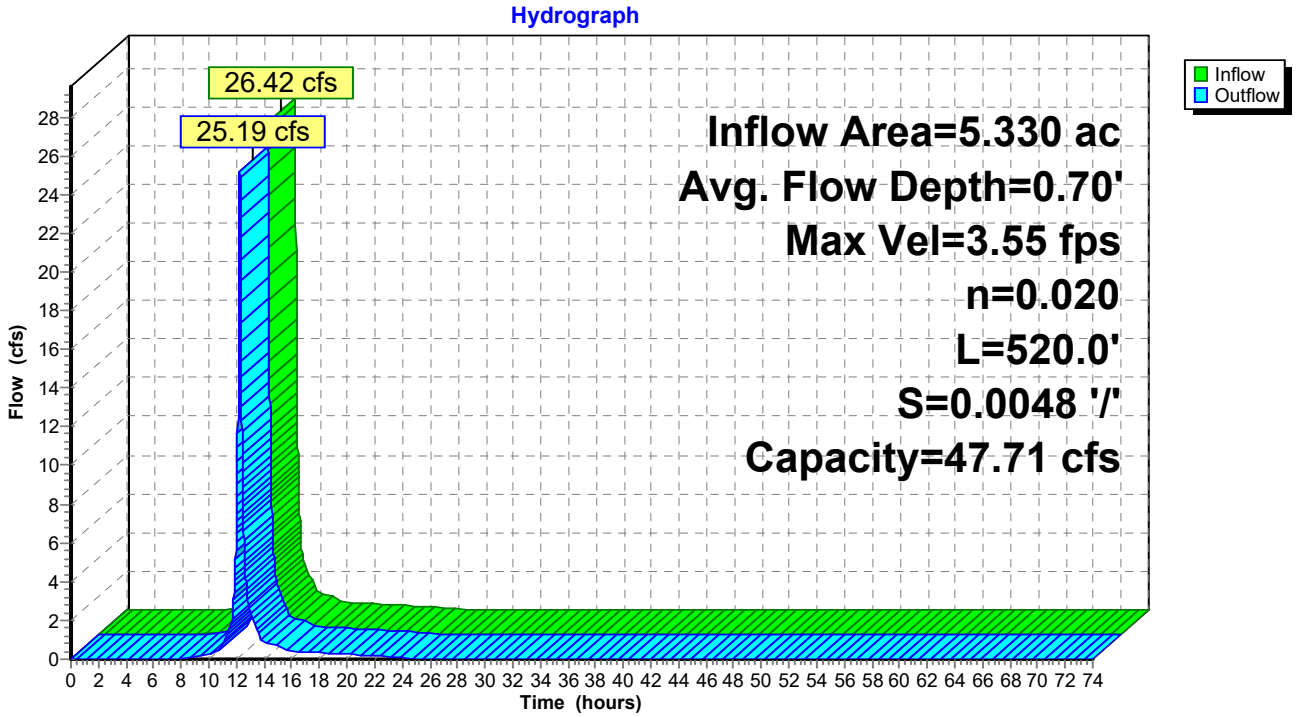
Routing by Stor-Ind+Trans method, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.55 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.71 fps, Avg. Travel Time= 12.3 min

Peak Storage= 3,685 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.70' , Surface Width= 12.21'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 47.71 cfs

8.00' x 1.00' deep channel, n= 0.020
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 520.0' Slope= 0.0048 '/'
Inlet Invert= 835.52', Outlet Invert= 833.00'



‡

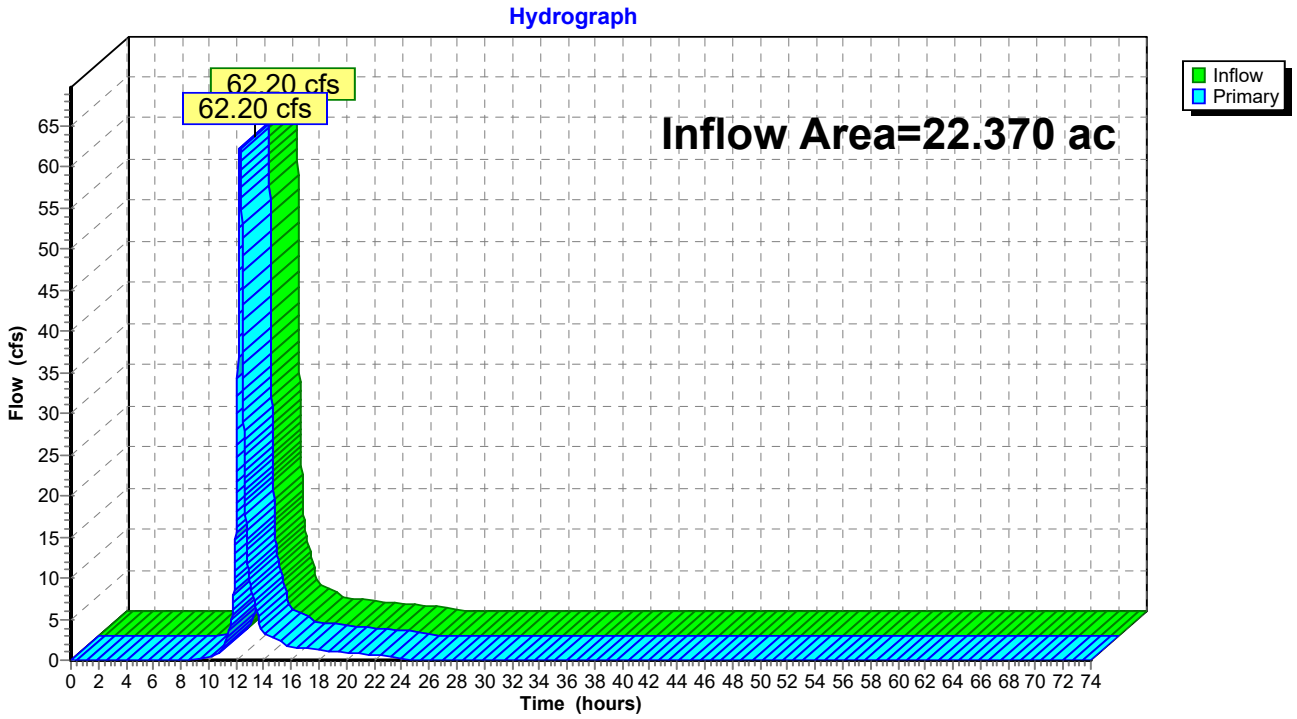


Summary for Link 7L: DA-1 POST

Inflow Area = 22.370 ac, 16.99% Impervious, Inflow Depth = 2.49" for 10-Year event
Inflow = 62.20 cfs @ 12.27 hrs, Volume= 4.645 af
Primary = 62.20 cfs @ 12.27 hrs, Volume= 4.645 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs

Link 7L: DA-1 POST

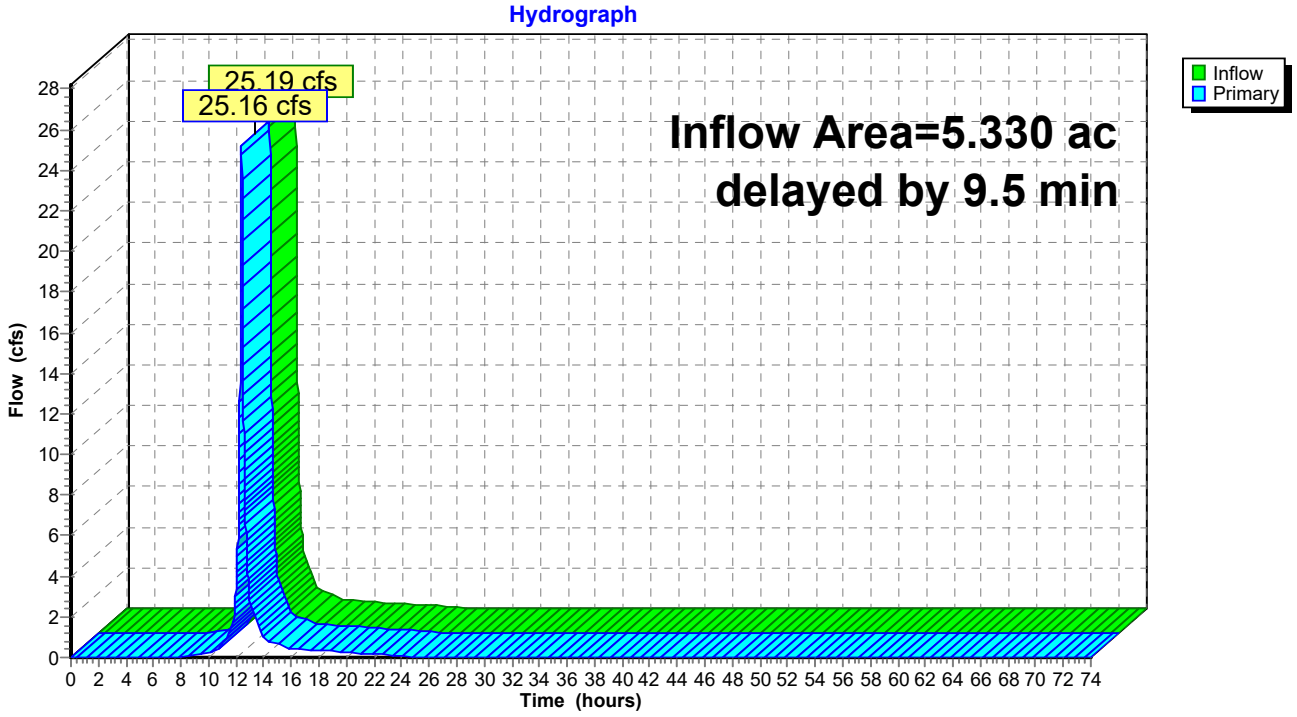


Summary for Link 9L: Tc

Inflow Area = 5.330 ac, 54.41% Impervious, Inflow Depth = 3.18" for 10-Year event
Inflow = 25.19 cfs @ 12.23 hrs, Volume= 1.413 af
Primary = 25.16 cfs @ 12.39 hrs, Volume= 1.413 af, Atten= 0%, Lag= 9.5 min
Routed to Link 7L : DA-1 POST

Primary outflow = Inflow delayed by 9.5 min, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs

Link 9L: Tc



Time span=0.00-74.00 hrs, dt=0.01 hrs, 7401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment6S: DA-1 B Runoff Area=17.040 ac 5.28% Impervious Runoff Depth=4.96"
Flow Length=1,086' Tc=15.0 min CN=79 Runoff=108.79 cfs 7.045 af

SubcatchmentDA-1: DA-1 A Runoff Area=5.330 ac 54.41% Impervious Runoff Depth=6.11"
Flow Length=433' Tc=9.1 min CN=89 Runoff=48.82 cfs 2.713 af

Reach 8R: Swale Avg. Flow Depth=0.99' Max Vel=4.32 fps Inflow=48.82 cfs 2.713 af
n=0.020 L=520.0' S=0.0048 '/' Capacity=47.71 cfs Outflow=47.08 cfs 2.713 af

Link 7L: DA-1 POST Inflow=132.28 cfs 9.758 af
Primary=132.28 cfs 9.758 af

Link 9L: Tc delayed by 9.5 min Inflow=47.08 cfs 2.713 af
Primary=47.04 cfs 2.713 af

Total Runoff Area = 22.370 ac Runoff Volume = 9.758 af Average Runoff Depth = 5.23"
83.01% Pervious = 18.570 ac 16.99% Impervious = 3.800 ac

Summary for Subcatchment 6S: DA-1 B

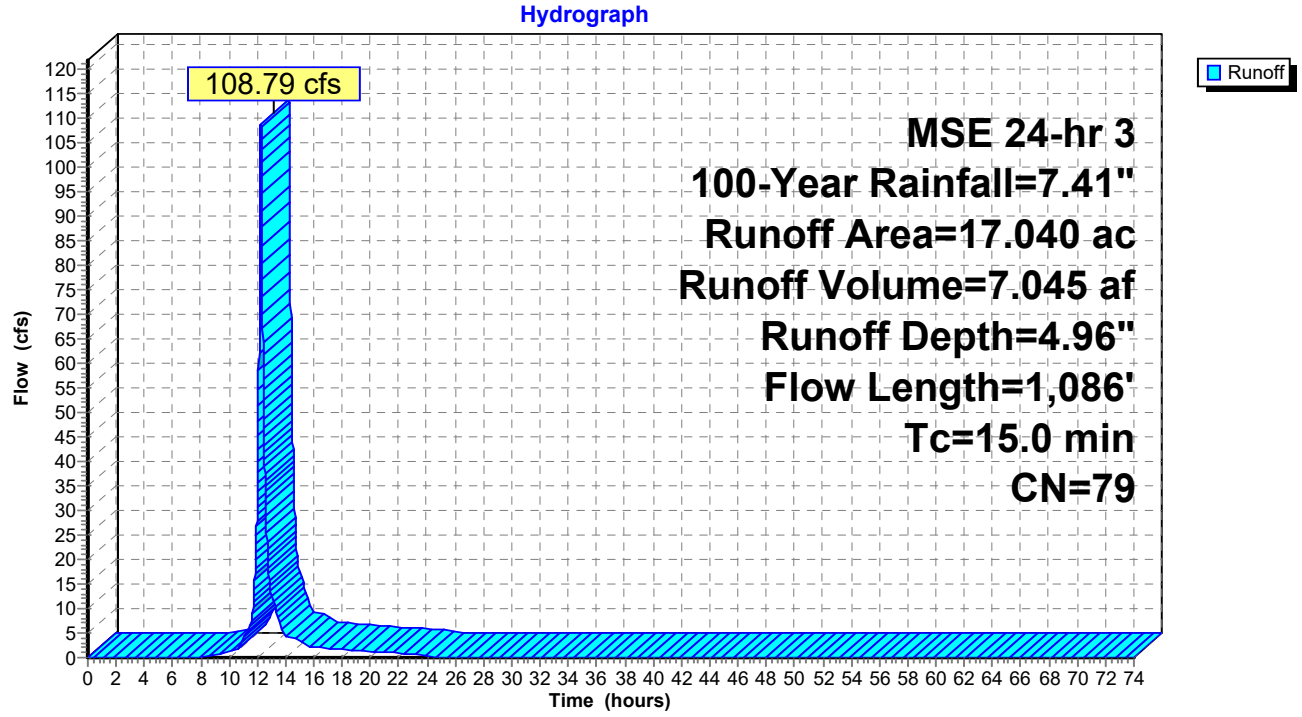
Runoff = 108.79 cfs @ 12.23 hrs, Volume= 7.045 af, Depth= 4.96"
Routed to Link 7L : DA-1 POST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.41"

	Area (ac)	CN	Description
	10.710	78	Meadow, non-grazed, HSG D
*	0.900	98	Impervious
	5.430	77	Woods, Good, HSG D
	17.040	79	Weighted Average
	16.140		94.72% Pervious Area
	0.900		5.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
1.1	111	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.0	875	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	1,086	Total			

Subcatchment 6S: DA-1 B



Summary for Subcatchment DA-1: DA-1 A

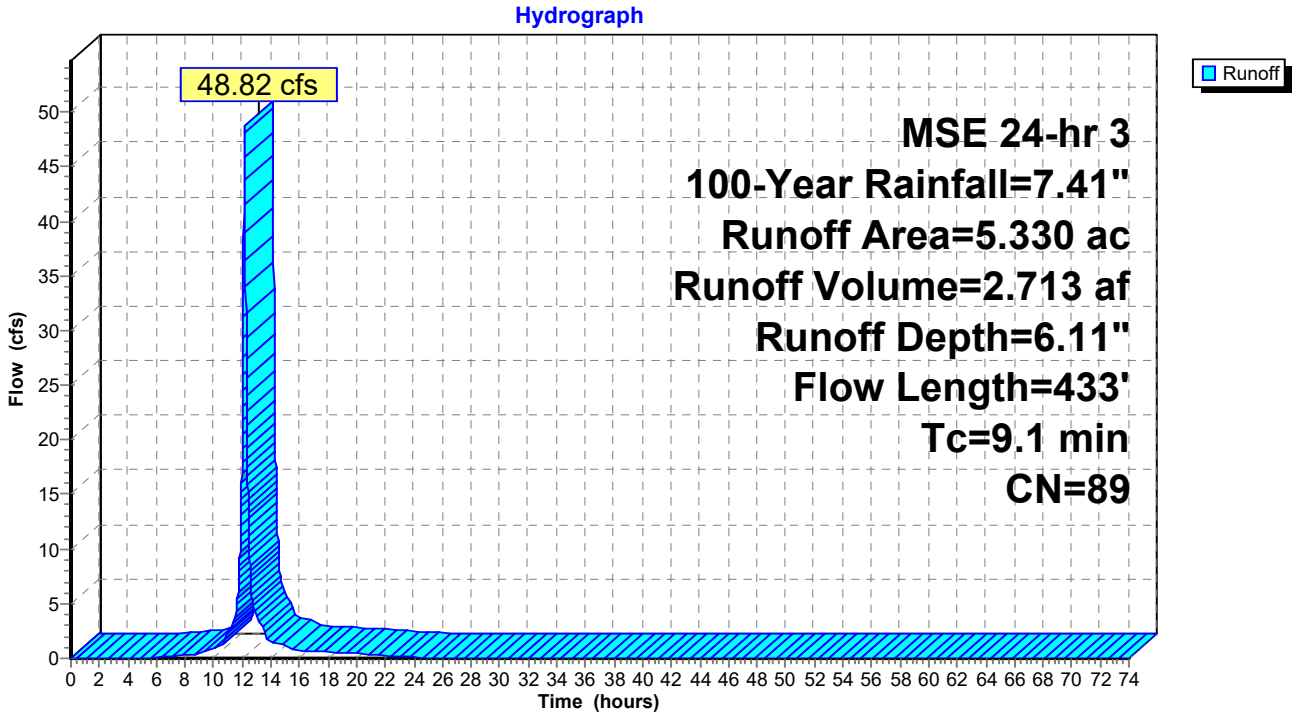
Runoff = 48.82 cfs @ 12.16 hrs, Volume= 2.713 af, Depth= 6.11"
Routed to Reach 8R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.41"

	Area (ac)	CN	Description
	2.430	78	Meadow, non-grazed, HSG D
*	1.600	98	Impervious
*	1.300	98	Disconnected Impervious, HSG D
	5.330	89	Weighted Average
	2.430		45.59% Pervious Area
	2.900		54.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	59	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.37"
0.7	41	0.0200	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
0.7	102	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	231	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	433	Total			

Subcatchment DA-1: DA-1 A



Summary for Reach 8R: Swale

[55] Hint: Peak inflow is 102% of Manning's capacity

Inflow Area = 5.330 ac, 54.41% Impervious, Inflow Depth = 6.11" for 100-Year event
Inflow = 48.82 cfs @ 12.16 hrs, Volume= 2.713 af
Outflow = 47.08 cfs @ 12.22 hrs, Volume= 2.713 af, Atten= 4%, Lag= 3.3 min
Routed to Link 9L : Tc

Routing by Stor-Ind+Trans method, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.32 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 10.0 min

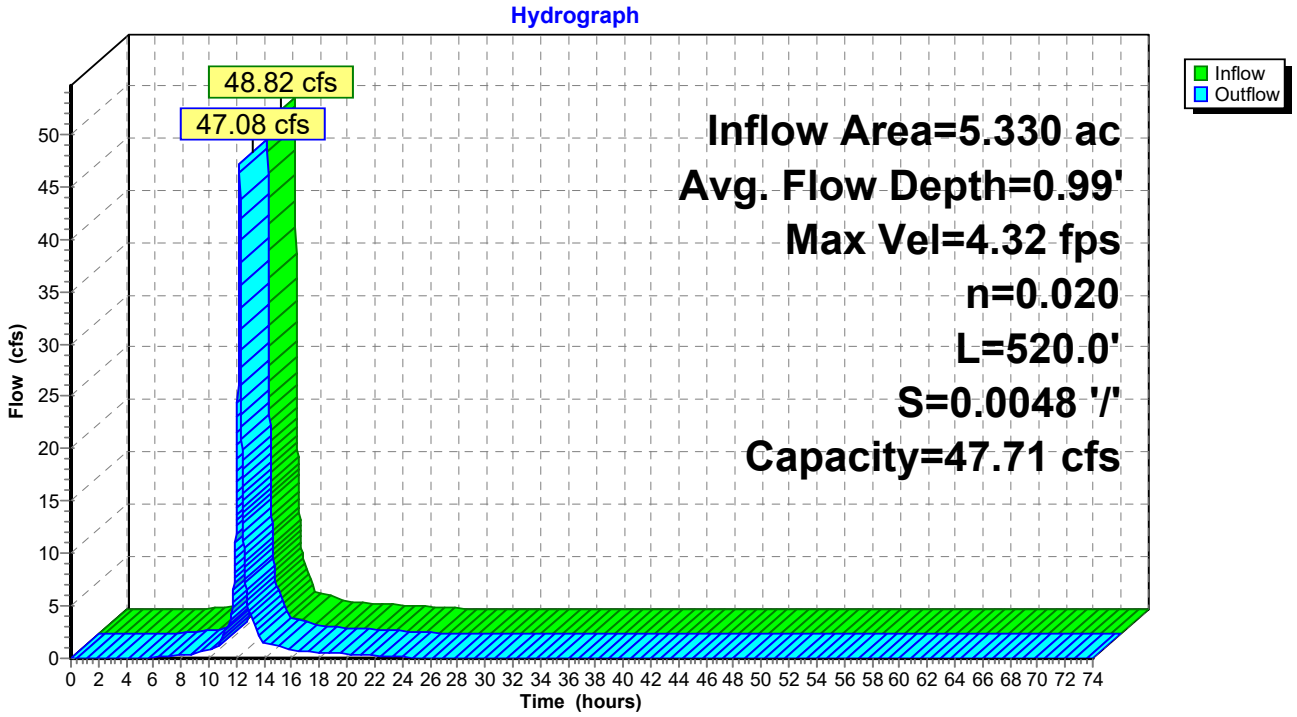
Peak Storage= 5,674 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.99' , Surface Width= 13.96'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 47.71 cfs

8.00' x 1.00' deep channel, n= 0.020
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 520.0' Slope= 0.0048 '/'
Inlet Invert= 835.52', Outlet Invert= 833.00'



‡

Reach 8R: Swale

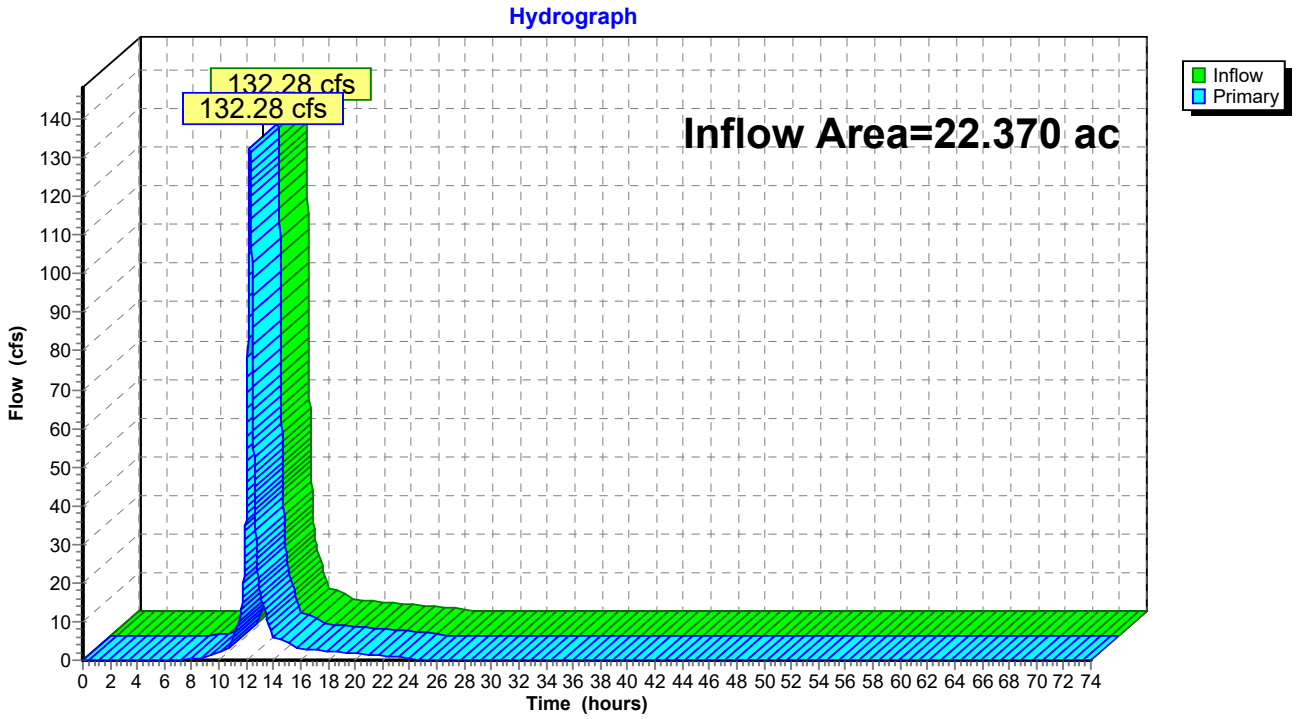


Summary for Link 7L: DA-1 POST

Inflow Area = 22.370 ac, 16.99% Impervious, Inflow Depth = 5.23" for 100-Year event
Inflow = 132.28 cfs @ 12.25 hrs, Volume= 9.758 af
Primary = 132.28 cfs @ 12.25 hrs, Volume= 9.758 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs

Link 7L: DA-1 POST

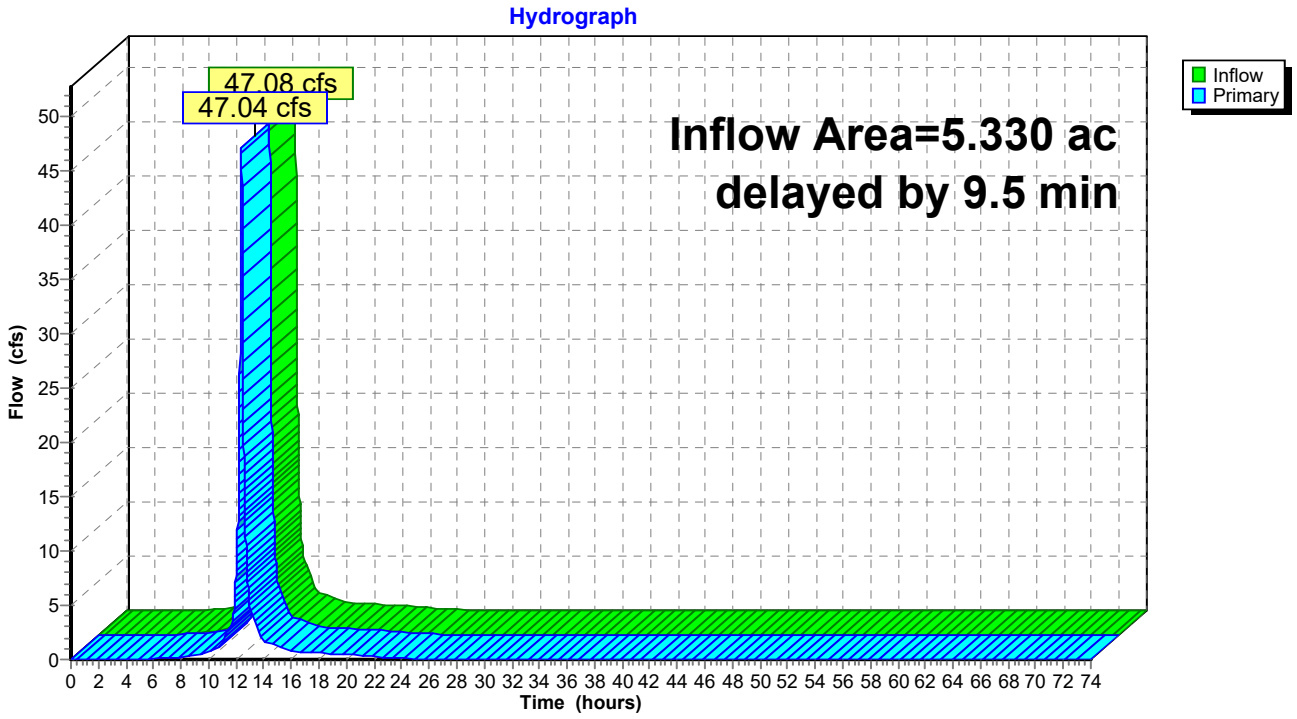


Summary for Link 9L: Tc

Inflow Area = 5.330 ac, 54.41% Impervious, Inflow Depth = 6.11" for 100-Year event
Inflow = 47.08 cfs @ 12.22 hrs, Volume= 2.713 af
Primary = 47.04 cfs @ 12.37 hrs, Volume= 2.713 af, Atten= 0%, Lag= 9.5 min
Routed to Link 7L : DA-1 POST

Primary outflow = Inflow delayed by 9.5 min, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs

Link 9L: Tc



Time span=0.00-74.00 hrs, dt=0.01 hrs, 7401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment6S: DA-1 B Runoff Area=17.040 ac 5.28% Impervious Runoff Depth=6.22"
Flow Length=1,086' Tc=15.0 min CN=79 Runoff=73.93 cfs 8.831 af

SubcatchmentDA-1: DA-1 A Runoff Area=5.330 ac 54.41% Impervious Runoff Depth=7.43"
Flow Length=433' Tc=9.1 min CN=89 Runoff=30.19 cfs 3.302 af

Reach 8R: Swale Avg. Flow Depth=0.76' Max Vel=3.71 fps Inflow=30.19 cfs 3.302 af
n=0.020 L=520.0' S=0.0048 '/' Capacity=47.71 cfs Outflow=28.92 cfs 3.302 af

Link 7L: DA-1 POST Inflow=87.42 cfs 12.133 af
Primary=87.42 cfs 12.133 af

Link 9L: Tc delayed by 9.5 min Inflow=28.92 cfs 3.302 af
Primary=28.89 cfs 3.302 af

Total Runoff Area = 22.370 ac Runoff Volume = 12.133 af Average Runoff Depth = 6.51"
83.01% Pervious = 18.570 ac 16.99% Impervious = 3.800 ac

Summary for Subcatchment 6S: DA-1 B

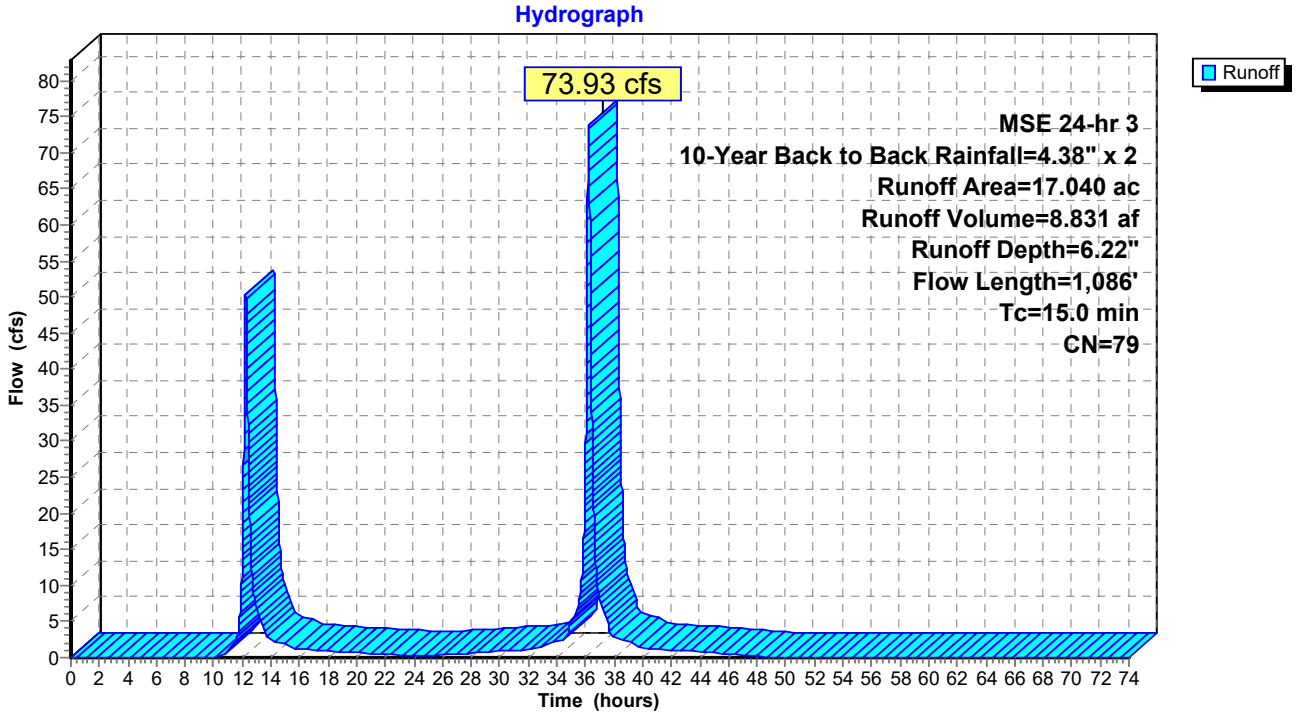
Runoff = 73.93 cfs @ 36.22 hrs, Volume= 8.831 af, Depth= 6.22"
Routed to Link 7L : DA-1 POST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Back to Back Rainfall=4.38" x 2

	Area (ac)	CN	Description
	10.710	78	Meadow, non-grazed, HSG D
*	0.900	98	Impervious
	5.430	77	Woods, Good, HSG D
	17.040	79	Weighted Average
	16.140		94.72% Pervious Area
	0.900		5.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
1.1	111	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.0	875	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	1,086	Total			

Subcatchment 6S: DA-1 B



Summary for Subcatchment DA-1: DA-1 A

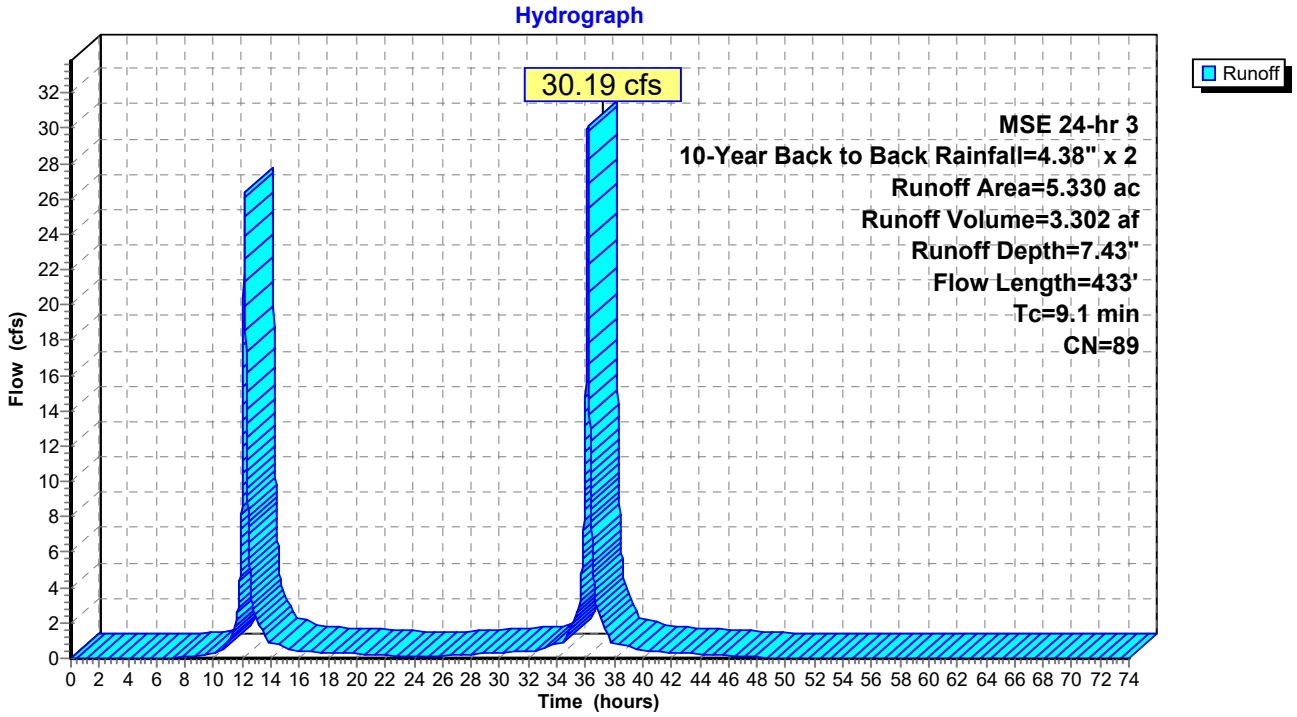
Runoff = 30.19 cfs @ 36.16 hrs, Volume= 3.302 af, Depth= 7.43"
Routed to Reach 8R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Back to Back Rainfall=4.38" x 2

	Area (ac)	CN	Description
	2.430	78	Meadow, non-grazed, HSG D
*	1.600	98	Impervious
*	1.300	98	Disconnected Impervious, HSG D
	5.330	89	Weighted Average
	2.430		45.59% Pervious Area
	2.900		54.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	59	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.37"
0.7	41	0.0200	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.37"
0.7	102	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	231	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	433	Total			

Subcatchment DA-1: DA-1 A



Summary for Reach 8R: Swale

Inflow Area = 5.330 ac, 54.41% Impervious, Inflow Depth = 7.43" for 10-Year Back to Back event
Inflow = 30.19 cfs @ 36.16 hrs, Volume= 3.302 af
Outflow = 28.92 cfs @ 36.22 hrs, Volume= 3.302 af, Atten= 4%, Lag= 3.7 min
Routed to Link 9L : Tc

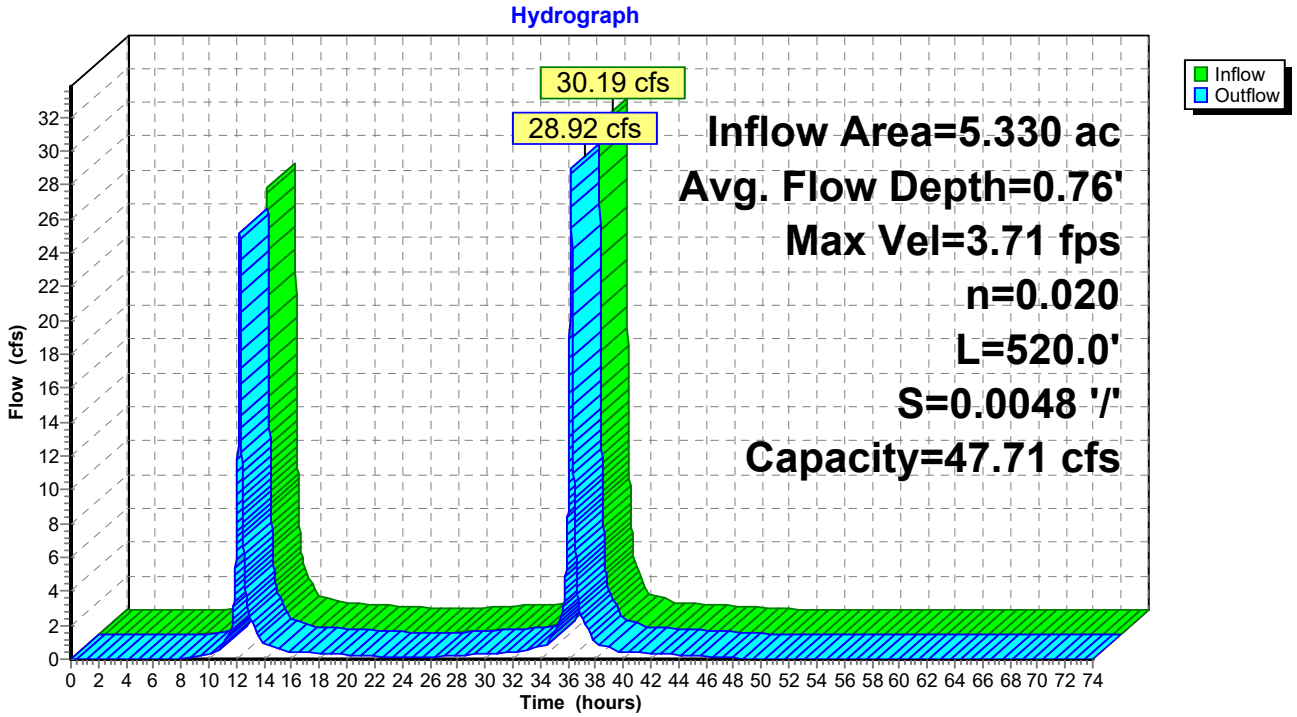
Routing by Stor-Ind+Trans method, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.71 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 11.1 min

Peak Storage= 4,050 cf @ 36.18 hrs
Average Depth at Peak Storage= 0.76' , Surface Width= 12.55'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 47.71 cfs

8.00' x 1.00' deep channel, n= 0.020
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 520.0' Slope= 0.0048 '/'
Inlet Invert= 835.52', Outlet Invert= 833.00'



‡

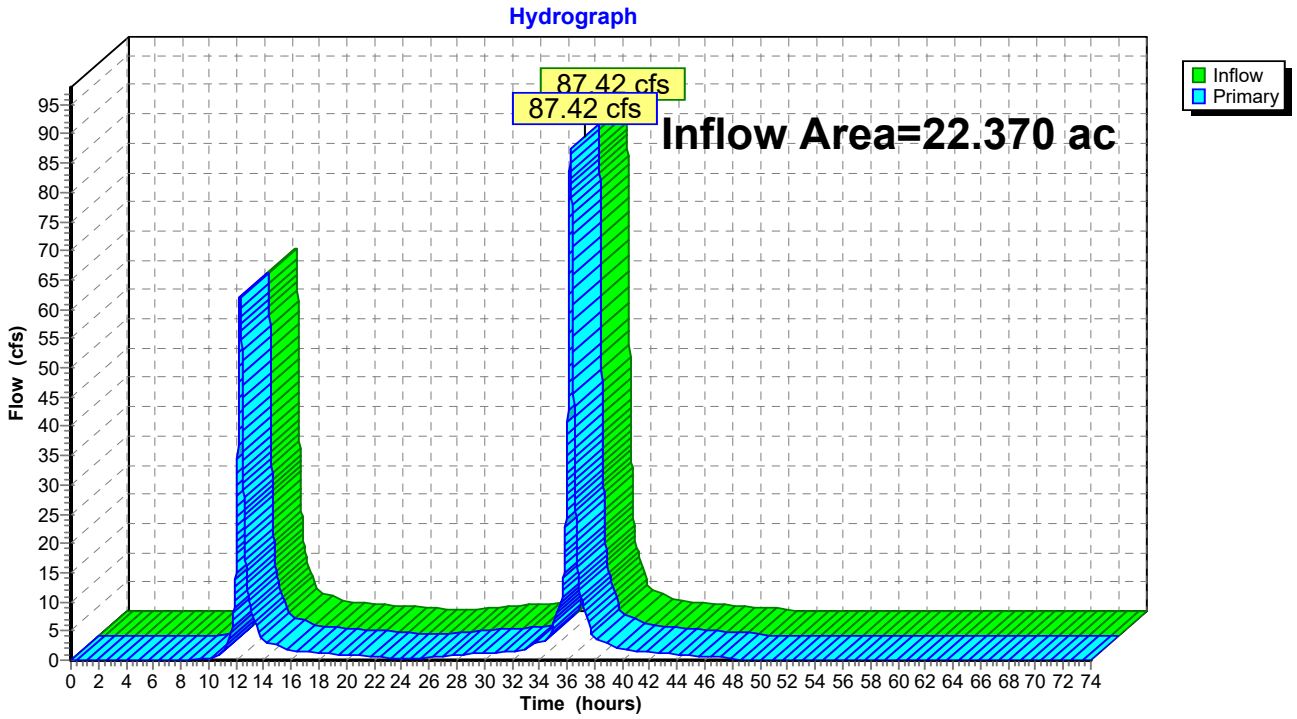


Summary for Link 7L: DA-1 POST

Inflow Area = 22.370 ac, 16.99% Impervious, Inflow Depth = 6.51" for 10-Year Back to Back event
Inflow = 87.42 cfs @ 36.25 hrs, Volume= 12.133 af
Primary = 87.42 cfs @ 36.25 hrs, Volume= 12.133 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs

Link 7L: DA-1 POST

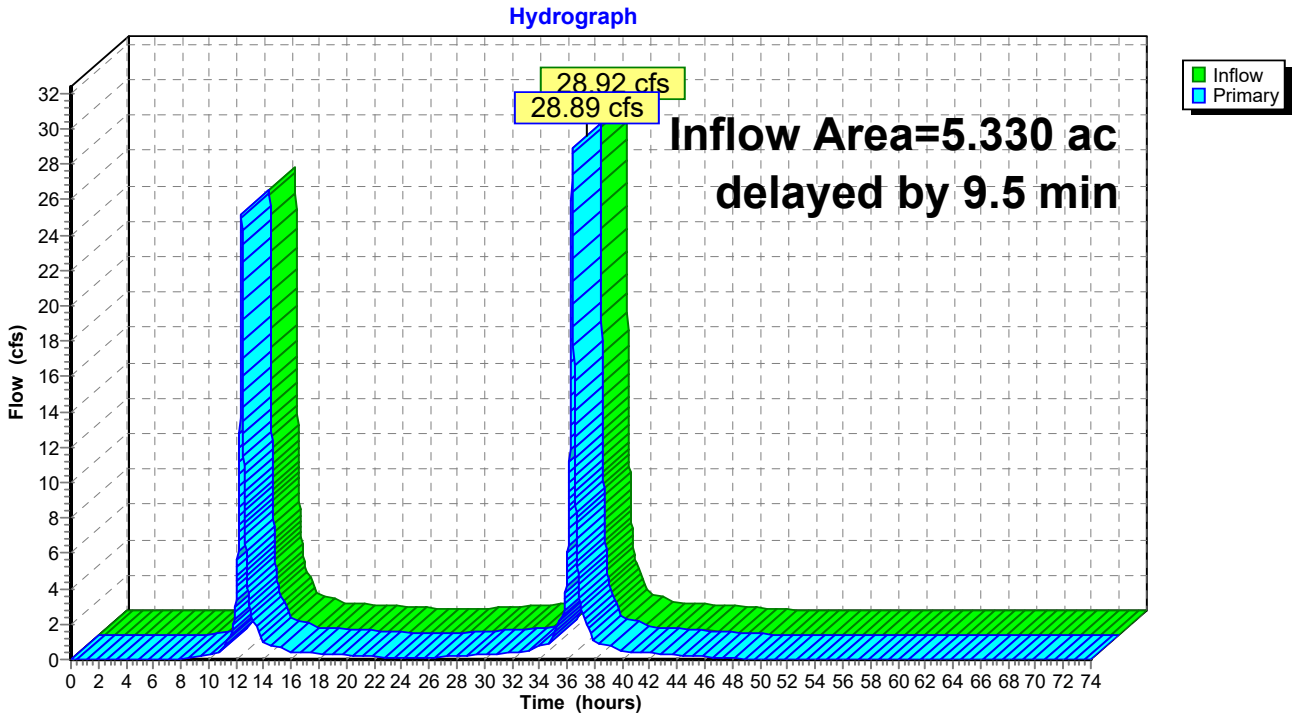


Summary for Link 9L: Tc

Inflow Area = 5.330 ac, 54.41% Impervious, Inflow Depth = 7.43" for 10-Year Back to Back event
Inflow = 28.92 cfs @ 36.22 hrs, Volume= 3.302 af
Primary = 28.89 cfs @ 36.38 hrs, Volume= 3.302 af, Atten= 0%, Lag= 9.5 min
Routed to Link 7L : DA-1 POST

Primary outflow = Inflow delayed by 9.5 min, Time Span= 0.00-74.00 hrs, dt= 0.01 hrs

Link 9L: Tc



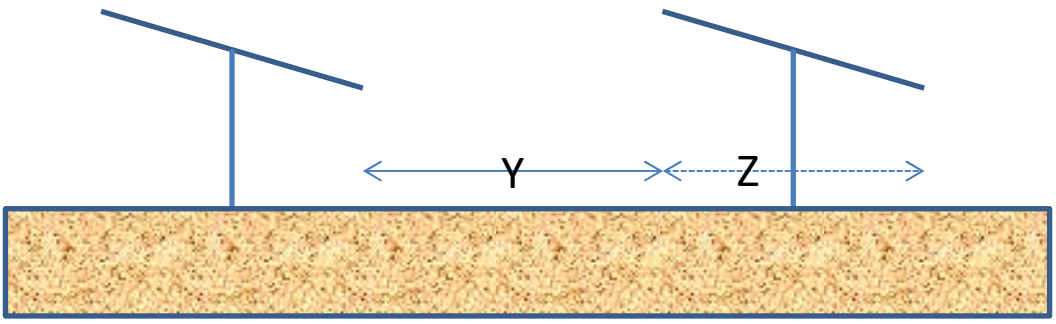
APPENDIX C – VOLUME CALCULATIONS

This spreadsheet makes calculations for an individual solar panel.

Enter values in blue cells		
Soil	D	
I/P ratio	0.570	
Term	**Value**	**Units**
Pervious area	87.56	square feet
Impervious area (area of solar panel)	49.93	square feet
Runoff depth from pervious areas	7.20	inches
Redirected runoff depth from solar panel (called average annual runoff depth)	9.28	inches
Runoff depth from solar panel	22.50	inches
Performance goal	1.00	inches
SUMMARY		
Pre-disconnection		
Runoff from impervious	94	ft3
Runoff from pervious	53	ft3
Total runoff	146	ft3
Post-disconnection		
Total runoff	106	ft3
Total runoff reduced	40	ft3
Runoff from pervious	53	ft3
Runoff from impervious	54	ft3
Adjusted impervious	28.688	square feet
Performance Goal Summary		
Performance goal	**4.16**	ft3
BMP volume credit ($BMP_{volume\ credit}$)	**1.77**	ft3
% of performance goal achieved	**42.5**	%
Remaining water quality volume to be treated (per panel)	**2.39**	ft3

Pervious area = (Y + Z) * W; where W is the width of the solar panel and Z is the average horizontal distance

Impervious area = Z * W; where W is the width of the solar panel and Z is the average horizontal distance of



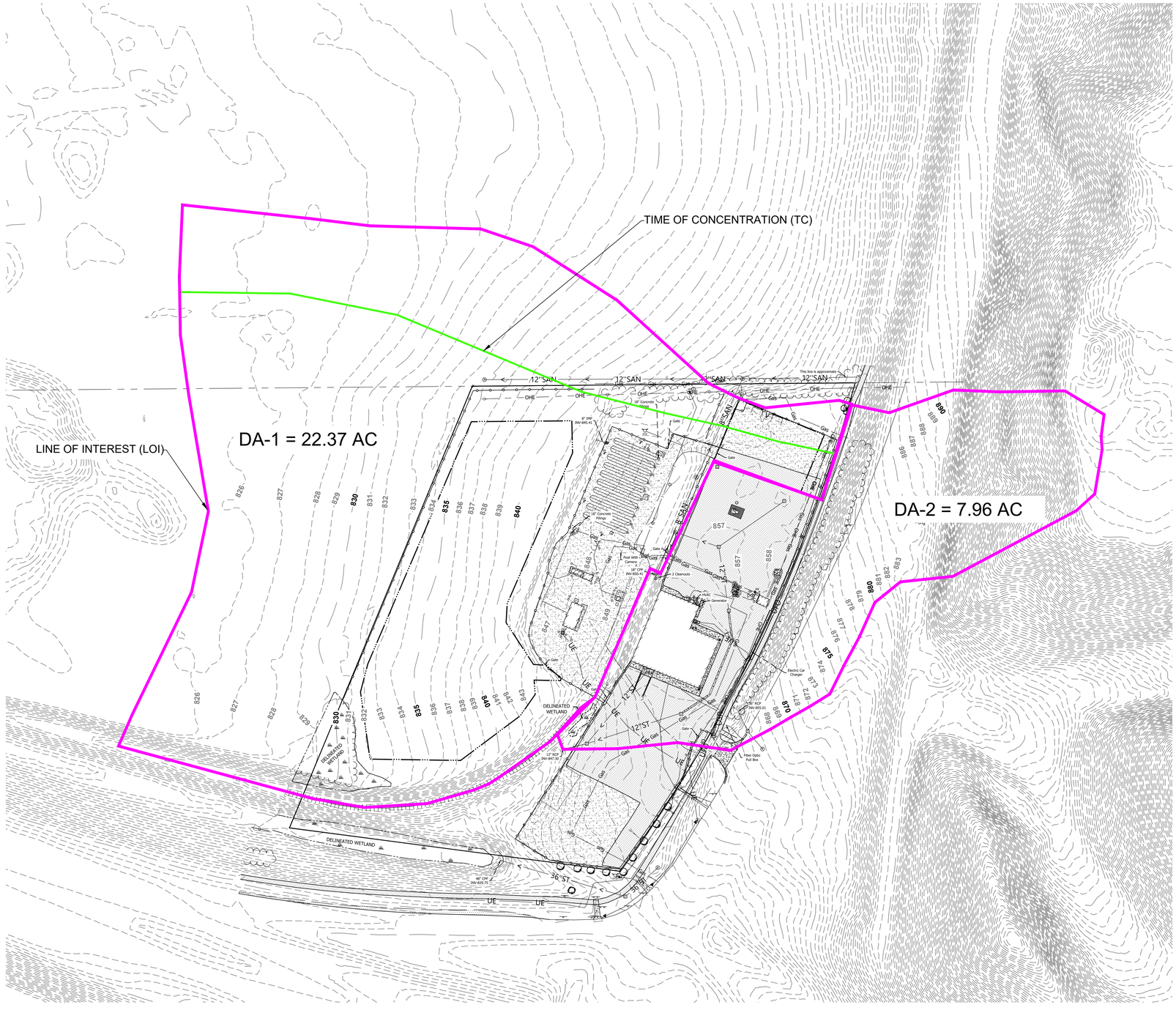
Impervious Area Calculation

Impervious Area	1093	sf
Runnoff Depth	1.1	in
Treatment Volume	100.19	cf

Total Treatment Volume Requirement

Solar Panel Treatment Volume	5066.8	cf
Other Impervious Area Treatment Volume	100.19	cf
Total	5167	cf
110% Total	**5684**	**cf**

ENCLOSURE 1 – EXISTING DRAINAGE AREA MAP



N

SCALE 1" = 100'

0 100 2 300 FEET

DRAINAGE AREA MAP LEGEND

- PROPERTY BOUNDARY LINE
- ZONING SETBACKS
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- Gas — EXISTING GAS LINE
- UFO — EXISTING FIBER OPTIC CABLE
- 12"ST — EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- OHW — EXISTING TRANSMISSION LINE
- UE — EXISTING UNDERGROUND ELECTRIC
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED SOLAR PANEL ARRAYS
- PROPOSED FILTRATION BERM
- PROPOSED LIMIT OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION

NOTES:

1. ESTIMATED TOTAL AREA OF DISTURBANCE: 4.17 ACRES
2. DA-2 DOES NOT PROPOSE A CHANGE IN LAND COVER. AS SUCH, DA-2 IS NOT INCLUDED IN THE STORMWATER CALCULATIONS. DA-2 IS SHOWN ON THE DRAINAGE AREA MAP TO REPRESENT DRAINAGE ON-SITE.

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

EXISTING CONDITIONS
DRAINAGE AREA MAP

DISCIPLINE NO.: EX.

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

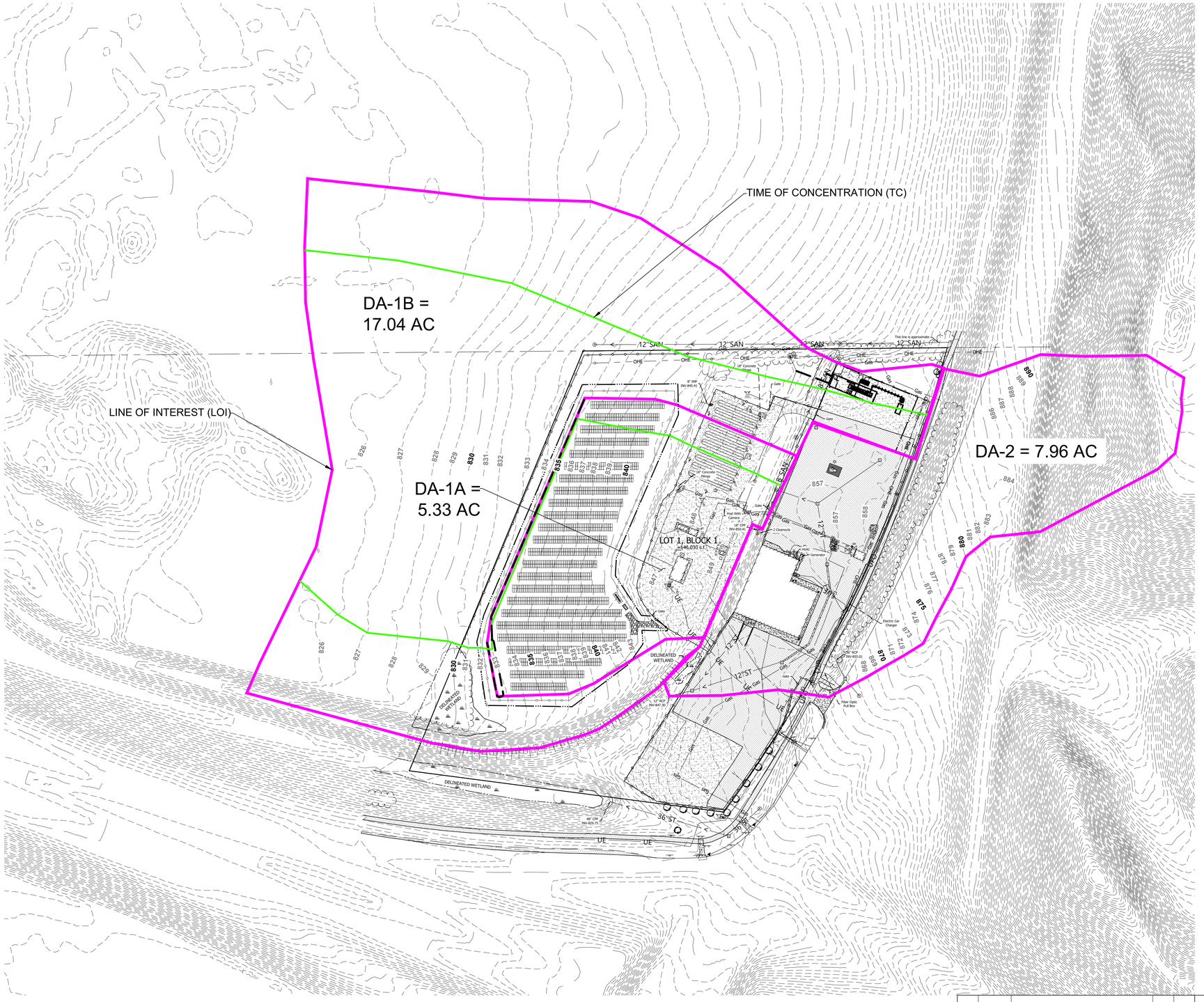
REV.: 0

SCALE	DESIGNED BY	PROJECT NUMBER	SHEET NO.
1"=100'	WS	0764026	A
DATE DRAWN: 05/26/2026	DRAWN BY: JB		

Environmental Resources Management, Inc.

FILE PATH: C:\Users\jessica.blair\OneDrive - ERM\0764159 CenterPoint Energy Environmental Support (Client) - Mankato Hydrogen Plant_CAD\CUP\Exhibits\Drainage Area Maps.dwg EXISTING CONDITIONS DA MAP. PRINTED ON 4/15/2026 BY Jessica Blair

ENCLOSURE 2 – PROPOSED DRAINAGE AREA MAP



SCALE 1" = 100'

0 100 2 300 FEET

DRAINAGE AREA MAP LEGEND

- PROPERTY BOUNDARY LINE
- ZONING SETBACKS
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE
- EXISTING WETLAND
- EXISTING TREE LINE
- EXISTING TREE
- Gas — EXISTING GAS LINE
- UFO — EXISTING FIBER OPTIC CABLE
- 12"ST — EXISTING SEWER LINE
- EXISTING MANHOLE
- EXISTING CULVERT
- EXISTING CONTOURS
- EXISTING UTILITY POLE
- OHW — EXISTING TRANSMISSION LINE
- UE — EXISTING UNDERGROUND ELECTRIC
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED SOLAR PANEL ARRAYS
- PROPOSED FILTRATION BERM
- PROPOSED LIMIT OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION

NOTES:

1. ESTIMATED TOTAL AREA OF DISTURBANCE: 4.17 ACRES
2. DA-2 DOES NOT PROPOSE A CHANGE IN LAND COVER. AS SUCH, DA-2 IS NOT INCLUDED IN THE STORMWATER CALCULATIONS. DA-2 IS SHOWN ON THE DRAINAGE AREA MAP TO REPRESENT DRAINAGE ON-SITE.

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Rev.	Date	Description	By	Chk

ERM

PROPOSED CONDITIONS
DRAINAGE AREA MAP

DISCIPLINE NO. EX.

MANKATO HYDROGEN ENERGY PLANT PROJECT
CENTERPOINT ENERGY
MANKATO, BLUE EARTH COUNTY, MN

REV. 0

SCALE	DESIGNED BY	PROJECT NUMBER	SHEET NO.
1"=100'	WS	0764026	B
DATE DRAWN 05/26/2026	DRAWN BY JB		

Environmental Resources Management, Inc.

FILE PATH: C:\Users\jessica.bial\OneDrive - ERM\0064199 CenterPoint Energy Environmental Support (Client) - Mankato Hydrogen Plant_CAD\CUP\Exhibits\Drainage Area Maps.dwg PROPOSED CONDITIONS DA MAP PRINTED ON 4/15/2026 BY Jessica Bial

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229 S 9th St
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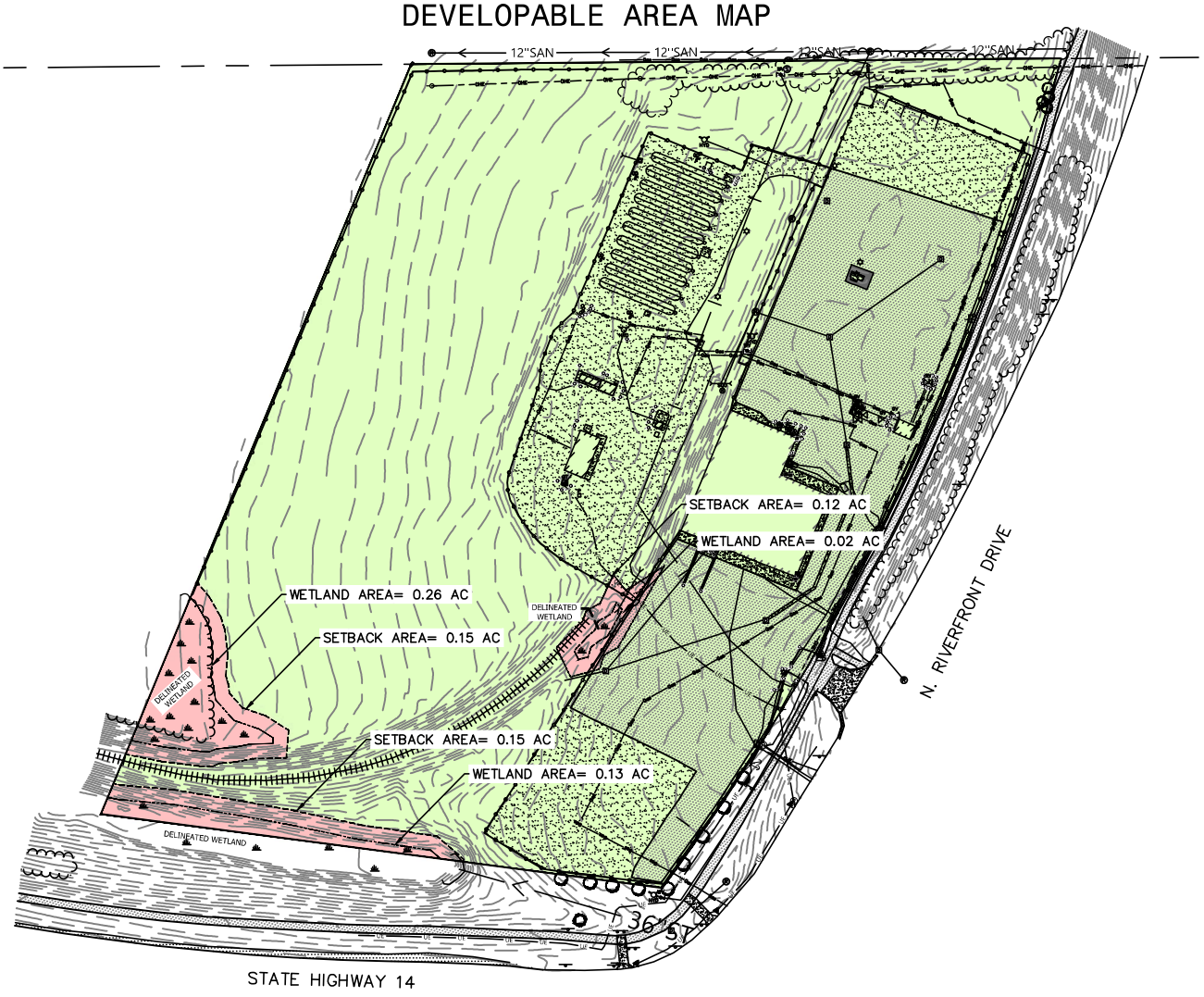
DEVELOPABLE AREA MAP



SCALE 1" = 200'

0 200 400 600 FEET

NOTE:
TOTAL DEVELOPABLE AREA = 14.00 AC
TOTAL NON-DEVELOPABLE AREA = 0.83 AC

LEGEND

- PROPERTY BOUNDARY LINE
- EXISTING WETLAND
- EXISTING WETLAND 16.5' SETBACK
- NON-DEVELOPABLE AREA
- DEVELOPABLE AREA

N

ERM

MANKATO HYDROGEN ENERGY PLANT CENTERPOINT ENERGY MANKATO, BLUE EARTH COUNTY, MN			REV. 0
SCALE 1" = 200'	DESIGNED BY JB	PROJECT NUMBER 0764026	SHEET NO. EX.
DATE DRAWN 06/15/2026	DRAWN BY JB		
Environmental Resources Management			

FILE PATH: C:\Users\jessica.blat\OneDrive - ERM\0644159 CenterPoint Energy Environmental Support (Client) - Mankato Hydrogen Plant_CAD\CUP\Exhibits\Developable Area Map.dwg LAYOUT1, PRINTED ON 6/11/2026 BY Jessica Blat

June 15, 2026

Bennett Hanson
City of Mankato
10 Civic Center Plaza
Mankato, Minnesota 56002-3368

Subject: CUP Application – Response to Comments
CenterPoint Energy Minnesota Gas
Mankato Hydrogen Energy Plant Project

Dear Bennett:

Please find below our responses to the Site Plan and Traffic Advisory Committee comments received on June 10, 2026 for the CenterPoint Energy Minnesota Gas (CenterPoint) Mankato Hydrogen Energy Plant Project (Project).

CY29-26 Request of ERM on behalf of CenterPoint Energy, the property owner, for a final plat review of Centerpoint Energy Mankato First Addition, and for a conditional use permit to allow for a hydrogen facility that uses energy from a 1 megawatt on-site solar panel array on a property zoned M-2, Heavy Industrial. The subject property is described as part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, a tract of land located in the South Half of the Northwest Quarter of Section 5, Township 108 North, Range 26 West; AND, part of a parcel lying within the Southeast Quarter of the Northwest Quarter, Section 5, Township 108 North, Range 26 West, all located in the City of Mankato, Blue Earth County (2400 N. Riverfront Drive, BE County PID's R010905176004, R010905176003, R010905176002, R010905176001).

a. *Comment: If not already done, the applicant shall log into the online portal and make notification payment.*

Response: All notification payments and outstanding fees to date have been paid through the online portal.

b. *Comment: Applicant shall be aware that the approved conditions of the Preliminary Plat shall remain relevant and binding for the proposed project.*

Response: CenterPoint acknowledges this requirement and will comply with the conditions of the approved Preliminary Plat.

c. *Comment: Applicant shall provide a breakdown of developable and non-developable areas of the subject property to City staff so that payment in lieu of parkland dedication may be calculated based on recent amendments to City ordinances. Payment in lieu parkland dedication will be required prior to affixing signatures to the final plat.*

Response: Refer to the Developable Area Map (enclosed). Wetland and wetland setback areas have been designated as non-developable areas. Based on our calculations, the following was determined:

Total Developable Area = 14.0 Acres
Total Non-Developable Area = 0.83 Acres

Additionally, CenterPoint acknowledges that payment in lieu parkland dedication will be required prior to affixing signatures to the final plat.

d. *Comment: Applicant shall address any glare-related concerns and shall make any necessary modifications to the proposed solar array in order to mitigate the proposed glare conditions.*

Response: CenterPoint Energy acknowledges this requirement and will ensure that glare-related concerns are addressed. Muska Electric has prepared a supplement to the CenterPoint Solar Glare Study (enclosed).

e. *Comment: Wetlands and their respective buffer areas on the subject property shall be property signed per City of Mankato Standards prior to commencing work on site. BMPs shall be installed.*

Response: CenterPoint acknowledges this requirement and added a corresponding note to Sheet C8.01 of the CUP Civil Plans (enclosed).

f. *Comment: The applicant shall request and participate in a pre-construction meeting with the property owner, the contractor and City staff, after all BMP's have been installed, but prior to any work occurring on the site.*

Response: CenterPoint acknowledges this requirement for a pre-construction meeting and added a corresponding note to Sheet C8.01 of the CUP Civil Plans (enclosed).

g. *Comment: The applicant shall ensure that a sufficient and perpetual access easement is in place with the adjacent property owner to ensure continued private access from N. Riverfront Drive to the adjacent western property. The applicant shall provide easement documentation for any private easements recorded or to be recorded on the subject property.*

Response: Documentation for all private easements on the subject property was previously provided in Appendix B of the CUP application. CenterPoint is coordinating with the adjacent property owner to ensure continued private access to the adjacent western property.

h. *Comment: Code-compliant landscaping and ground cover shall be installed prior to completion and operation of the solar array.*

Response: CenterPoint acknowledges this requirement and will ensure that landscaping and ground cover will be installed in compliance with Mankato City Code prior to completion and operation of the solar array.

i. *Comment: All mechanical equipment shall be screened from rights of way and residential uses and zones.*

Response: CenterPoint acknowledges this requirement for mechanical equipment and added a screening fence east of the proposed fan on Sheet C4.02 of the CUP Civil Plans (enclosed).

j. *Comment: A fence permit shall be applied for and issued prior to installation of any fencing associated with the project.*

Response: CenterPoint acknowledges this requirement for a fence permit.

k. *Comment: Applicant shall provide engineered decommissioning plan for the solar array to City staff for review and approval. The decommissioning must include complete removal of the system including all footings and foundations to their full depth.*

Response: An engineered decommissioning plan for the solar array has been prepared (enclosed), which includes complete removal of the solar array and all associated racking supports and vertical pilings.

l. *Comment: Within one year of any termination of use of the proposed facility for energy generation, the property owner and applicant shall be responsible for dismantling and removing all equipment on site and restoring the property to its pre-existing condition per the terms of the decommissioning plan. The decommissioning plan shall include the removal of all poles, wire, conduit, etc. in their entirety and the site will be restored to pre-development conditions.*

Response: CenterPoint agrees to dismantle and remove all equipment and restore the site to pre-development conditions within one year of facility closure, in accordance with the approved decommissioning plan.

m. *Comment: The applicant shall submit a perpetual, irrevocable bond, letter of credit, or designated escrow account to the City of Mankato in the amount of a stamped, certified, Minnesota Engineer's removal cost estimate prior to issuance of a building permit. The security shall be in effect through the reclamation of the site.*

Response: CenterPoint agrees to provide a perpetual, irrevocable bond, letter of credit, or escrow account to the City of Mankato, based on a certified engineer's removal cost estimate, prior to issuance of a building permit, to be maintained through site reclamation.

n. *Comment: The bond amount shall be reevaluated every 5 years, and may result in an increase or decrease in the bond amount. The applicant is responsible for coordinating said requirement and submitting the required data. The final reevaluation shall occur not more than 1 year prior to decommissioning the site. The engineering costs and estimates for the reevaluation are to be paid by the applicant.*

Response: CenterPoint agrees to reevaluate the bond amount every five years (with a final review within one year of decommissioning), coordinate and submit required documentation, and bear all associated engineering costs.

o. *Comment: Water service connection type shall be noted on the plan sheet C9.02. Cut in mechanical joint fitting connection or wet tap.*

Response: Note added to Sheet C9.02 of the CUP Civil Plans (enclosed) for mechanical joint fitting or approved alternate.

p. *Comment: 6" Gate valve shall be added to proposed water service.*

Response: Note added to Sheet C9.02 of the CUP Civil Plans (enclosed) for proposed 6" gate valve at water service.

q. *Comment: Tracer wires shall be installed on water service per Minnesota Rural Water Association specification.*

Response: Note added to Sheet C9.02 of the CUP Civil Plans (enclosed) for tracer wires on proposed water service.

r. *Comment: Applicant shall update modeling to a type 3 rainfall distribution.*

Response: The Drainage Report (enclosed) was updated using the MSE 3 MN distribution for NOAA 14 per Section 3.2.1 of the City of Mankato Grading Manual.

s. *Comment: Applicant shall be aware that the MPCA Solar Panel Calculator is for an individual solar panel only. Please update to follow guidance on MPCA website.*

Response: The calculations in the Drainage Report (enclosed) were updated per MPCA guidance.

t. *Comment: Applicant shall update Redirected Runoff Depth from solar panel to reflect interpolation of the values shown between 1 and 2, which will increase the total runoff from each panel.*

Response: The calculations in the Drainage Report (enclosed) were updated per MPCA guidance.

u. *Comment: Applicant shall list assumptions and dimensions of the solar panels utilized to derive data in the MPCA calculator.*

Response: Sheet C10.04 solar panel detail in the CUP Civil Plans (enclosed) was updated with dimensions reflected in the updated stormwater solar calculations.

v. *Comment: The applicant will be required to pay SAC & WAC connection charges based on the City of Mankato assessment policy and fee schedule.*

Response: CenterPoint acknowledges this requirement and will pay the applicable SAC and WAC connection charges based on the City of Mankato assessment policy and fee schedule.

w. *Comment: Applicant shall complete MPCA Industrial pretreatment discharge to a municipal wastewater treatment facility application (wq-wwprm7-23) Wastewater permit forms | Minnesota Pollution Control Agency.*

Response: CenterPoint acknowledges this requirement and will complete the required application to obtain Industrial Pretreatment Discharge authorization from MPCA and City of Mankato.

Blue Earth County Comments:

x. *Comment: Applicant shall coordinate with adjacent property owner (to the west & north) to ensure access rights through the property.*

Response: Access rights currently exist under previously provided agreements. CenterPoint is coordinating with the adjacent property owners to ensure continued access rights through the property.

y. *Comment: Applicant shall be aware that the access Blue Earth County provided to the adjacent agricultural property off of CSAH 57 (to the north), is dedicated strictly for farm access and will not be utilized for any future development access.*

Response: CenterPoint acknowledges this comment.

MnDOT Comments:

z. *Comment: Applicant shall verify coordination with MnDOT's Office of Aeronautics based on the findings of the glare study for the solar array. This is due to the presence of "flight path" receptors that are at the Mankato Regional Airport.*

Response: CenterPoint is in contact with MnDOT's planning staff and coordinating with Rylan Juran with MnDOT's Office of Aeronautics regarding the glare study for the solar array.

aa. *Comment: Due to the presence of Hwy 14 receptors, the applicant shall be aware that the MnDOT Traffic Engineer will review the glare study and may provide comments to the applicant that shall be addressed.*

Response: CenterPoint is in contact with MnDOT's planning staff and coordinating with MnDOT's District 7 Traffic Engineer Scott Thompson regarding comments on the glare study for the solar array.

If you have any questions or require additional information, please contact me at (612) 280-1295, or Wayne Sicora at Environmental Resources Management (ERM), CenterPoint's consultant for this Project, at (612) 597-4574.

Sincerely,

Andrew Rockwell, Plant Manager
CenterPoint Energy Minnesota Gas

Cc: Micheal Fogarty, CenterPoint
Colton Peshek, CenterPoint
Dennis Daas, CenterPoint
Wayne Sicora PE, ERM

Enclosures:
Solar Glare Study Supplement_2026-06-15
Developable Area Map
CUP Civil Plans_2026-06-15
Solar Decommissioning Plan and Estimate
Drainage Report_2026-06-15

Site Plan and Traffic Advisory Review Committee **1. 5.**

Meeting Date: 07/07/2026

Title

CY34-26

Request of Rice Companies, on behalf of the owner Kohlmeyer Hagen Law, for a certificate of design compliance for a new, approximately 9,360 square foot structure to be located in the Highway Gateway Overlay District. The subject property is described as Lot 1, Block 1, Alexia Subdivision (Blue Earth County PID R010909126033).

Applicant

The applicant is Rice Companies, with permission of the property owner Kohlmeyer Hagen Law.

Request

The applicant is requesting review for a Certificate of Design Compliance in the Highway Gateway Overlay district.

Location

The property is addressed as 184 St. Andrews Dr.

Existing Land Use

The property is currently vacant and ready for development.

Zoning

The property is zoned B-3, Highway Business District.

Environmentally Sensitive Areas

There are no known environmentally sensitive areas on the parcel.

Public Utilities

The property is not currently served by public infrastructure. The property owner will be responsible for making connections to the mains located in St. Andrews Dr.

City Code

The City Code pertaining to the B-3, Highway Business District may be viewed at the following link:

https://library.municode.com/mn/mankato/codes/code_of_ordinances?nodeId=PTIICOOR_CH10LAUSDE_ARTVCODI_DIV8HIBUDI

Review

The applicant has requested a certificate of design compliance for the construction of a new, approximately 9,300 square foot structure, in the Highway Gateway Overlay district.

The site will be accessed from St. Andrews Drive by a temporary driveway.

The applicant is proposing a new, one-story structure that has floor plans showing offices, paralegal spaces, conference rooms, restrooms, a break room, wellness area, and a reception area. A vestibule, accessed through a shared entrance, is also identified to serve a future tenant space.

Exterior finishes include a mix of Vetter stone, metal channel siding, metal awnings, and aluminum storefronts and windows. Colors have been identified as earth tones.

Landscaping is shown around the site to provide the necessary tree plantings. Refuse is planned to be kept inside. Lighting will need to conform to city standards.

Attachments

General Location Map
Aerial Plan
Site Plan
Architectural Plans
Exterior Elevations

General Location Map



Date: June 2026

Author:

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N

Aerial Map



Date: June 2026

Author:

This information is to be used for reference purposes only. The City of Mankato does not guarantee accuracy of the material contained herein and is not responsible for misuse or misinterpretation.

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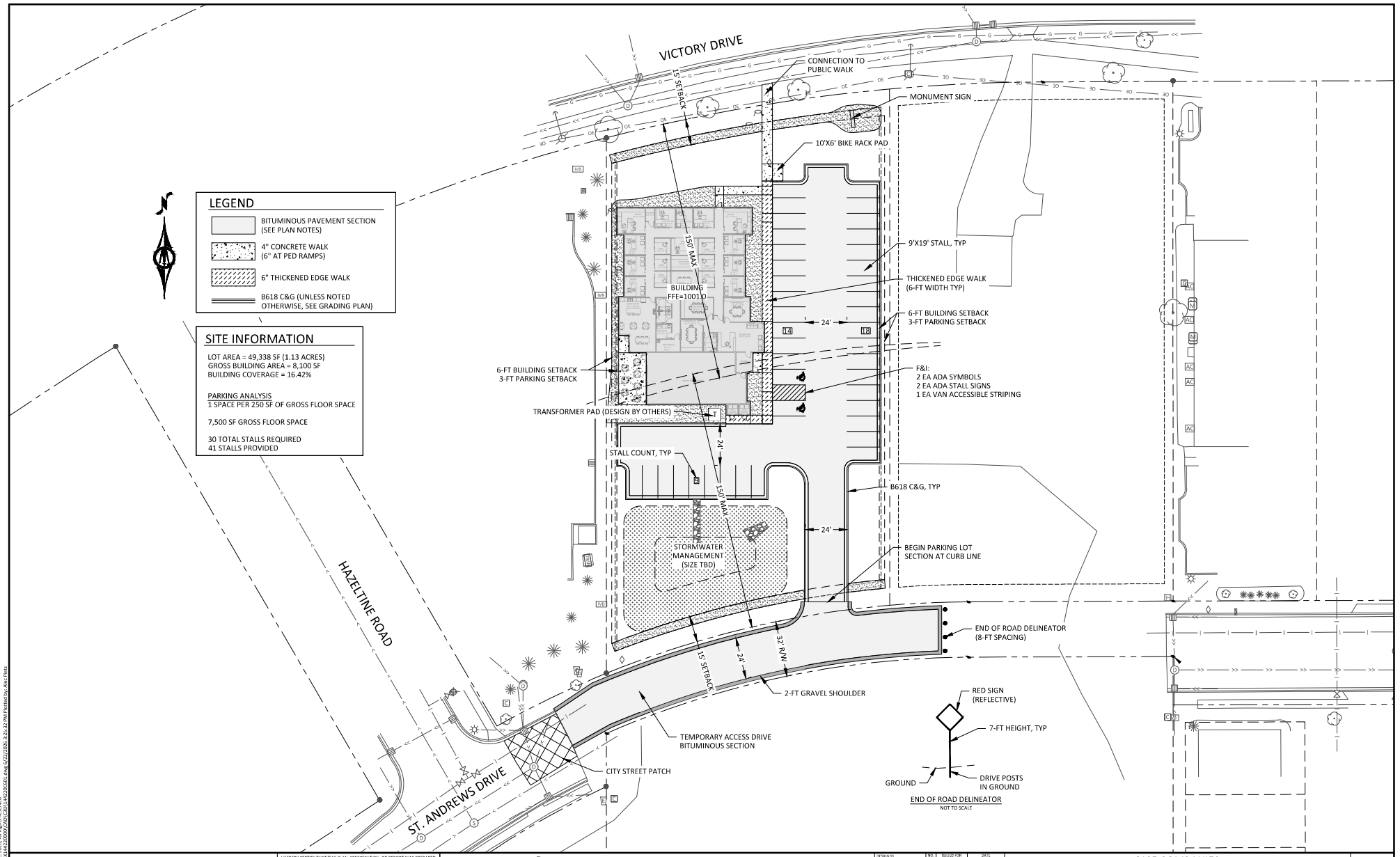

LEGEND

- BITUMINOUS PAVEMENT SECTION (SEE PLAN NOTES)
- 4" CONCRETE WALK (6" AT PED RAMPS)
- 6" THICKENED EDGE WALK
- B618 C&G (UNLESS NOTED OTHERWISE, SEE GRADING PLAN)

SITE INFORMATION

LOT AREA = 49,338 SF (1.13 ACRES)
GROSS BUILDING AREA = 8,100 SF
BUILDING COVERAGE = 16.42%

PARKING ANALYSIS
1 SPACE PER 250 SF OF GROSS FLOOR SPACE

7,500 SF GROSS FLOOR SPACE

30 TOTAL STALLS REQUIRED
41 STALLS PROVIDED

HORZ. 0 25 50
SCALE FEET

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.

NOT FOR CONSTRUCTION

ALEC W. PIETZ, P.E.
LIC. NO. 59617 DATE XX/XX/XXXX

BOLTON & MENK

1960 PREMIER DRIVE
MANKATO, MN 56001
Phone: (507) 625-4171
Email: Mankato@bolton-menk.com
www.bolton-menk.com

DESIGNED AWP	NO.	ISSUED FOR	DATE
DRAWN AWP			
CHECKED AWP			
CLIENT PROJ. NO. 26X.144220			

RICE COMPANIES
KOHLMEYER HAGEN LAW OFFICE
PRELIMINARY SITE PLAN

SHEET C6.01

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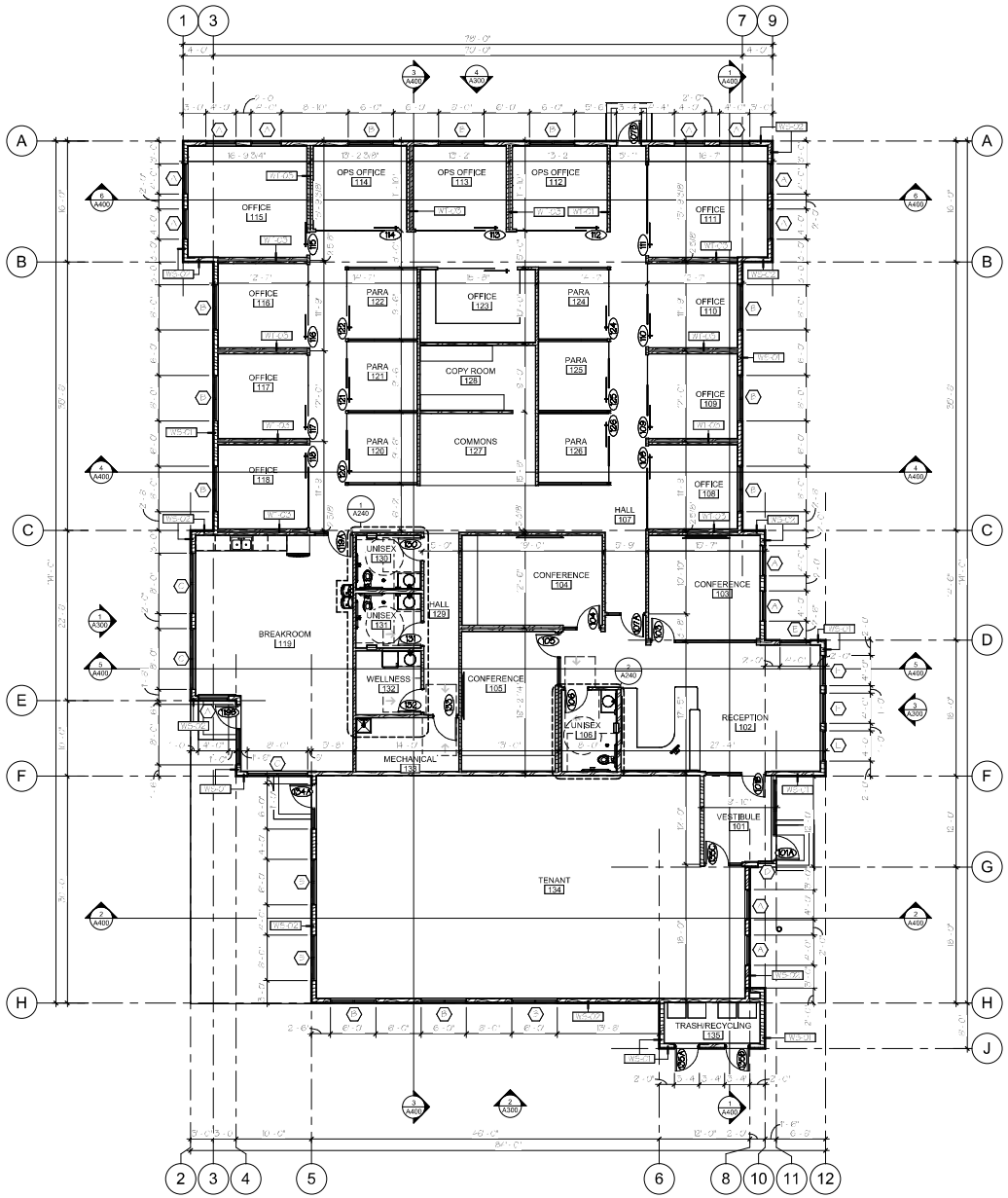

1 **FLOOR PLAN**
1/8" = 1'-0"

RICE COMPANIES
320.252.0454 | RICECOMPANIES.COM
SAUK RAPIDS MN | GLENCOE MN
MANKATO MN | FARGO ND | CEDAR FALLS IA
SIOUX FALLS SD | APPLETON WI

NOT FOR CONSTRUCTION

KOHLMEYER HAGEN LAW
NEW OFFICE BUILDING
MANKATO, MN

REVISIONS	
NUMBER	DATE

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FLOOR PLAN

A201

DL/JRG | 06.22.26

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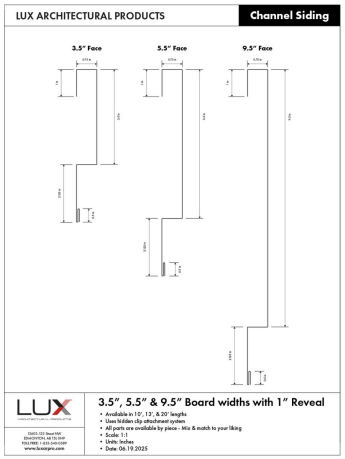
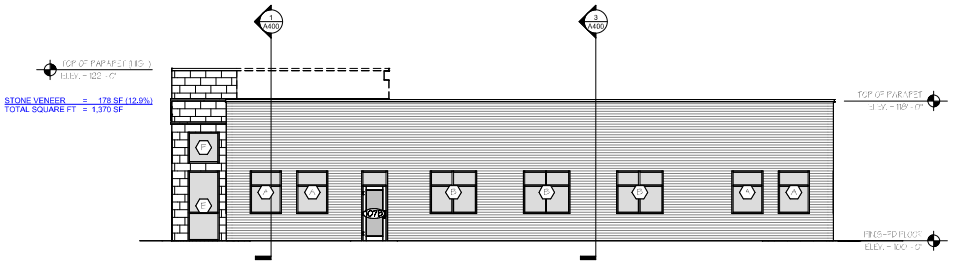
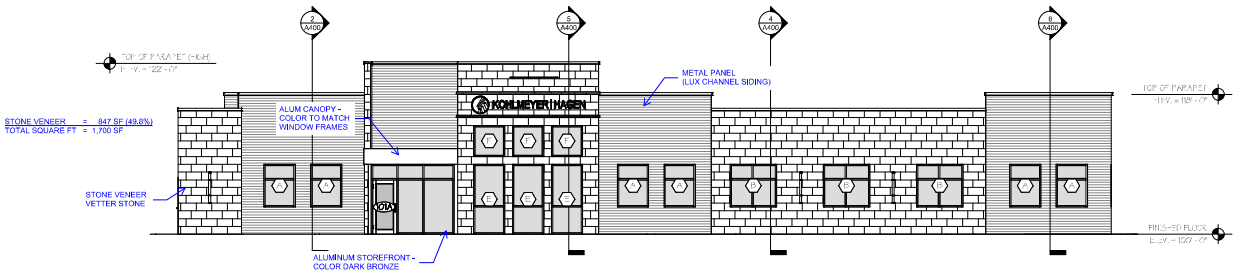
LUX CHANNEL SIDING -
(PROFILE ONLY - COLOR CHAMPAGNE WAVE)

STONE VENEER - VETTER STONE SILVER SHADOW -3 HEIGHT PATTERN

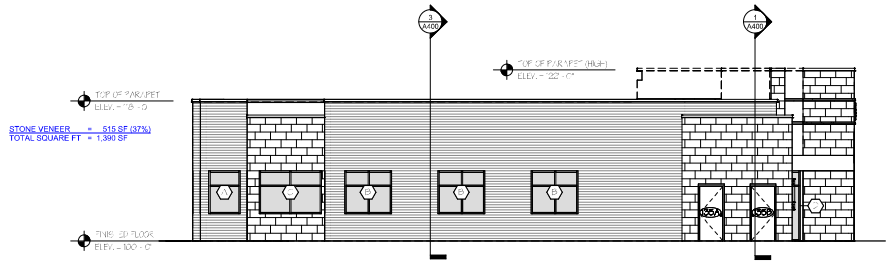




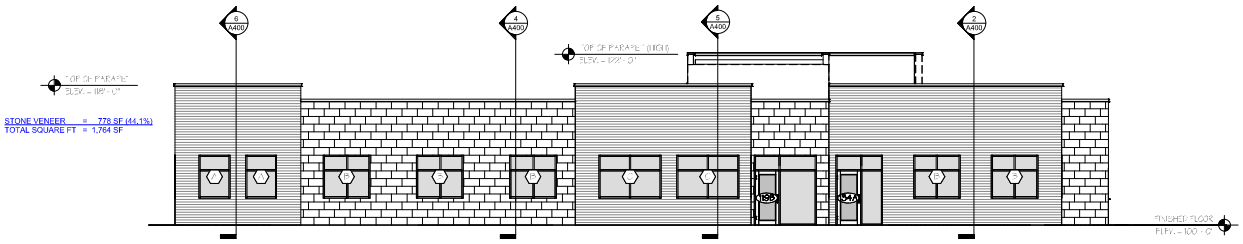
4 NORTH ELEVATION
1/8" = 1'-0"



3 EAST ELEVATION
1/8" = 1'-0"



2 SOUTH ELEVATION
1/8" = 1'-0"



1 WEST ELEVATION
1/8" = 1'-0"

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KOHLMEYER HAGEN LAW
NEW OFFICE BUILDING
MANKATO, MN

REVISIONS
NUMBER | DATE

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EXTERIOR ELEVATIONS

A300

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Site Plan and Traffic Advisory Review Committee **1. 6.**

Meeting Date: 07/07/2026

Title

CYV05-26

Request of Brian and Tricia Sarff for a variance from Chapter 10, Article II, Division 3, Sec.10-97 of the Mankato City Code to decrease the front yard setback from thirty feet (30') to zero feet (0') in the R-1, one-family dwelling, zoning district. The variance is being requested in order to allow for the construction of an accessory structure. The property is described as the east 120' of Ridgewood Street lying north of Lot 28, Sunset View Addition, and lying south of Lot 97 and Vacated Alley, Oak Knoll, according to the plats on files and record with the Blue Earth County Recorder (405 Ridgewood Street).

Applicant

The applicants are the property owners, Brian and Tricia Sarff.

Request

The applicant is requesting a variance to reduce the front yard setback.

Location

The property is located at 405 Ridgewood Street and is legally described as the east 120' of Ridgewood Street lying north of Lot 28, Sunset View Addition, and lying south of Lot 97 and Vacated Alley, Oak Knoll, according to the plats on files and record with the Blue Earth County Recorder.

Existing Land Use

The property is a one-family dwelling.

Zoning

The property is zoned R-1, one-family dwelling district.

Environmentally Sensitive Areas

There are ravines/bluffs around the subject property.

Public Utilities

The site is served by public utilities.

Review

Brian and Tricia Sarff are seeking a variance from Chapter 10, Article II, Division 3, Sec.10-97 of the Mankato City Code to decrease the front yard setback from thirty feet (30') to zero feet (0') in the R-1, one-family dwelling, zoning district. The property is located at 405 Ridgewood Street and is legally described as the east 120' of Ridgewood Street, lying north of Lot 28, Sunset View Addition, and lying south of Lot 97 and Vacated Alley, Oak Knoll, according to the plats on files and record with the Blue Earth County Recorder.

Mankato City Code requires that all lots provide setbacks from the property line to any structures, including a setback of an accessory shed structure. The required setbacks are determined based on the zoning district. The subject property is zoned R-1, one-family dwelling zoning district, and the proposed use is an approximately 12' X 16' accessory shed. The applicant is seeking a variance to reduce the required front yard setback from thirty feet (30) to zero feet (0).

The lot is bordered on the north by a platted, unimproved street. A water line is currently located within the right of way. As proposed, the proposed accessory shed is located over the property line and encroaching into the unimproved right-of-way area. The applicant is also seeking a license to encroach for the portion of the shed located on the public area.

Attachments

General Location Map

Aerial Plan

Site Plan

General Location Map



Date: May 2026

Author:

This information is to be used for reference purposes only. The City of Mankato does not guarantee accuracy of the material contained herein and is not responsible for misuse or misinterpretation.

N

Aerial Map

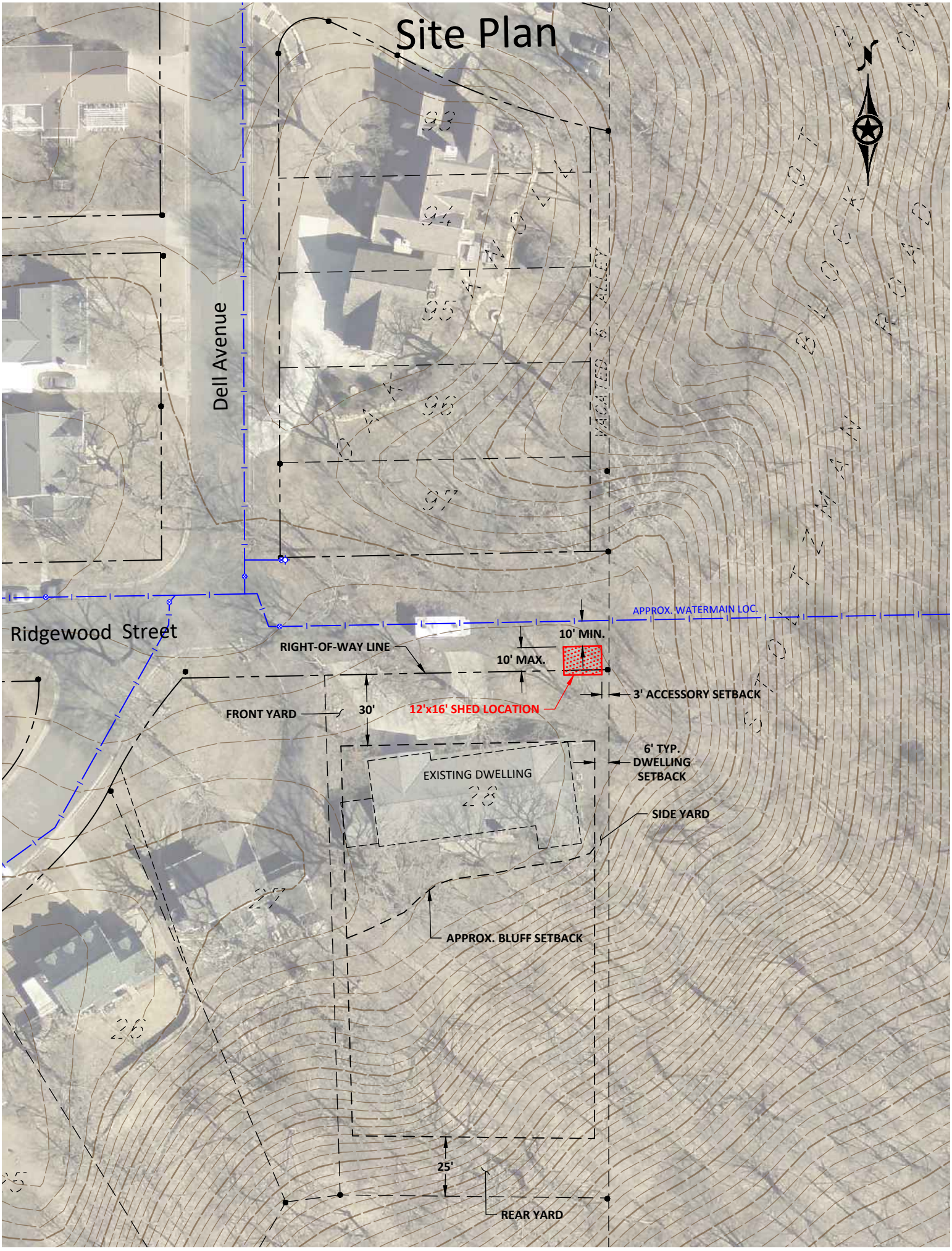


Date: May 2026

Author:

This information is to be used for reference purposes only. The City of Mankato does not guarantee accuracy of the material contained herein and is not responsible for misuse or misinterpretation.

N


Site Plan
Dell Avenue
ALLEY
Ridgewood Street
APPROX. WATERMAIN LOC.
RIGHT-OF-WAY LINE
10' MIN.
10' MAX.
3' ACCESSORY SETBACK
FRONT YARD
30'
12'x16' SHED LOCATION
EXISTING DWELLING
6' TYP. DWELLING SETBACK
SIDE YARD
APPROX. BLUFF SETBACK
25'
REAR YARD

Site Plan and Traffic Advisory Review Committee **1. 7.**

Meeting Date: 07/07/2026

Title

CYV06-26

Request of Web Construction, on behalf of the property owner, Dustin Lee, for a variance from Chapter 10, Article V, Division 6, Sec. 10-584 of the Mankato City Code to decrease the front yard setback from the code required fifteen feet (15') to twelve feet (12') and to decrease the corner side yard from the code required seven feet, six inches (7'6") to zero feet (0') in the B-1, Community Business, zoning district. The variance is being requested in order to allow for an updated façade with new finishes and a new exit door and related foundation. The property is described as Lots 1-A and 1-B, Block 1, Elks Subdivision, Mankato, Blue Earth County (1028 N Riverfront Drive).

Applicant

The applicant is Web Construction on behalf of the property owner Dustin Lee.

Request

The applicant is requesting a variance to decrease the front yard setback from fifteen feet to twelve feet and to decrease the corner side yard from the code required seven feet, six inches to zero feet.

Location

The property is addressed as 1028 N. Riverfront Dr.

Existing Land Use

The property currently has an existing structure that serves as the location for Papa George Restaurant and a future office tenant.

Zoning

The property is zoned B-1, Community Business District.

Environmentally Sensitive Areas

There are no known environmentally sensitive areas on the property.

Public Utilities

The property is currently served by public infrastructure.

City Code

The city code pertaining to the B-1, Community Business District may be viewed at the following link:

https://library.municode.com/mn/mankato/codes/code_of_ordinances?nodeId=PTIICOOR_CH10LAUSDE_ARTVCODI_DIV6COBUDI

Review

The applicant is requesting a variance from Chapter 10 of the Mankato City Code to decrease the front yard setback from the code required fifteen feet to twelve feet and to decrease the corner side yard from the code required seven feet, six inches to zero feet in the B-1, Community Business, zoning district.

The variance is being requested in order to allow for an updated façade with new finishes and a new exit door and related stoop.

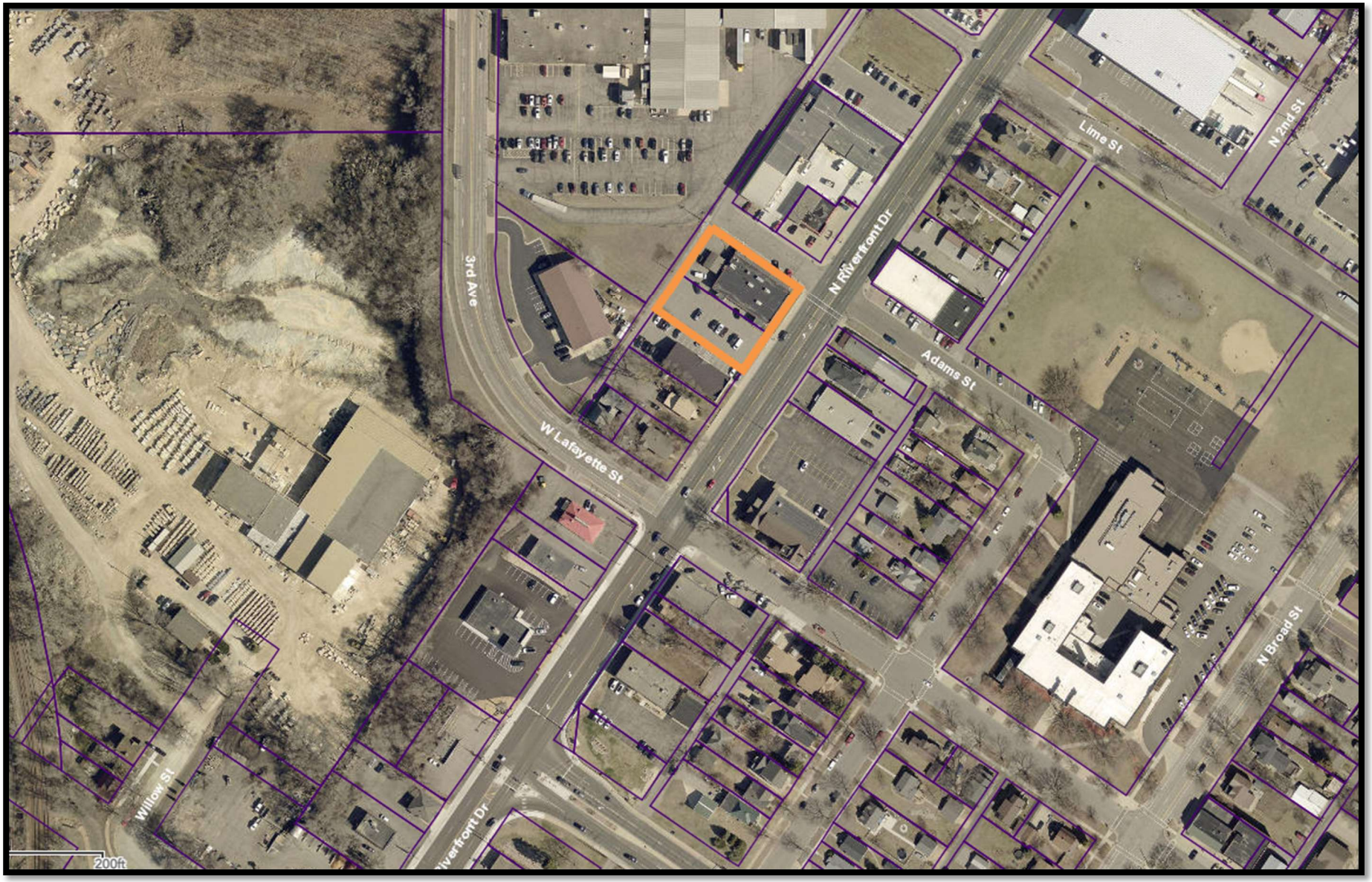
Attachments

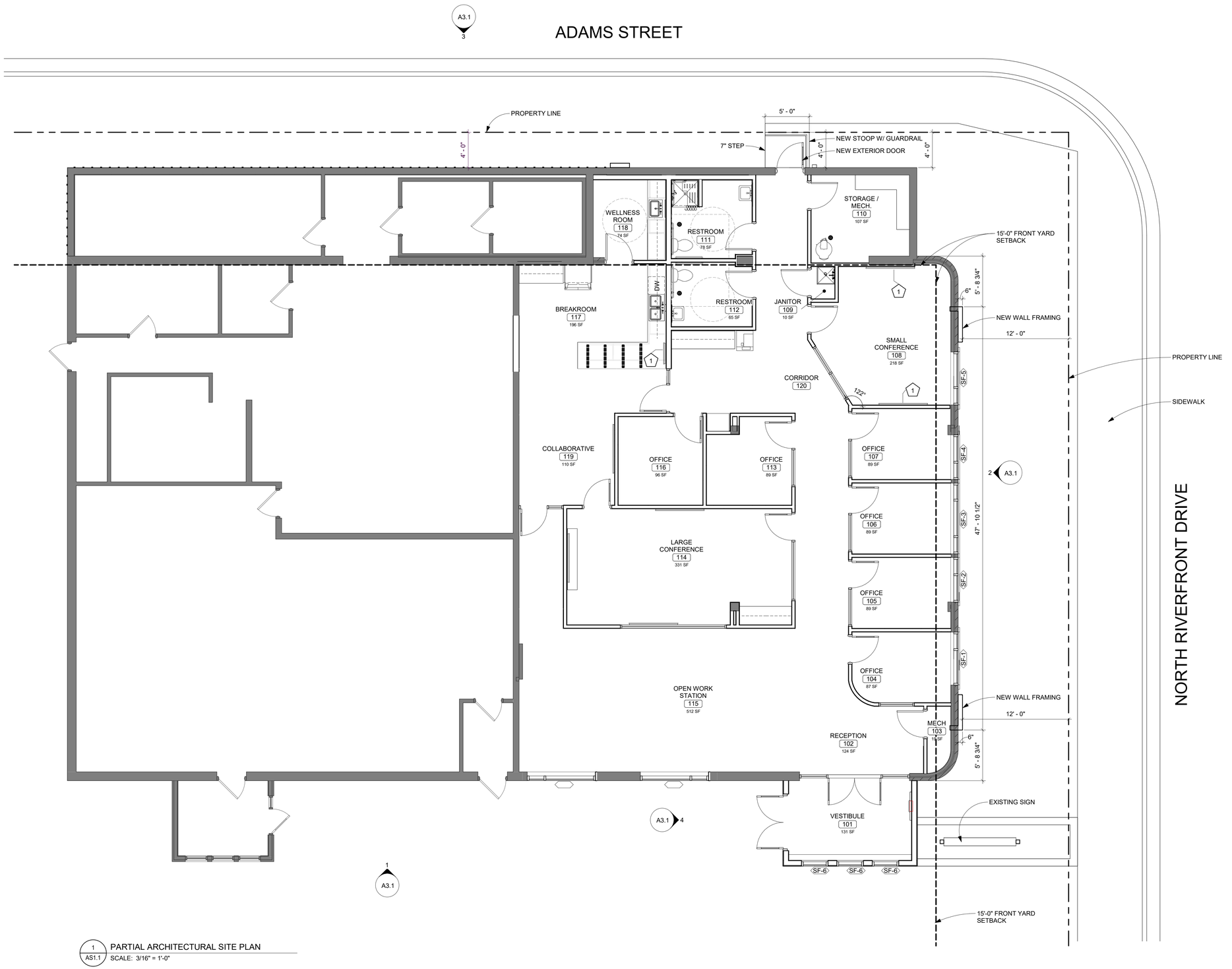
General Location Map
Aerial Plan
Variance Narrative

General Location Map



Aerial Location Map





NORTH RIVERFRONT DRIVE

1 / AS1.1 PARTIAL ARCHITECTURAL SITE PLAN
SCALE: 3/16" = 1'-0"

6/23/2026 10:56:35 AM

ARCHITECT OF RECORD
oha
ARCHITECTURE + DESIGN
OHARCHITECTS.COM
330 Stadium Road, Suite 202, Mankato, MN 56001
T: 507.385.1158

CONSULTANT

PRELIMINARY NOT FOR CONSTRUCTION

1028 NORTH RIVERFRONT DR

MANKATO, MN

REVISIONS XX

PROJECT #	25-033MK
DATE	06.23.26
DRAWN BY	DM, DGH
CHECKED BY	DGH

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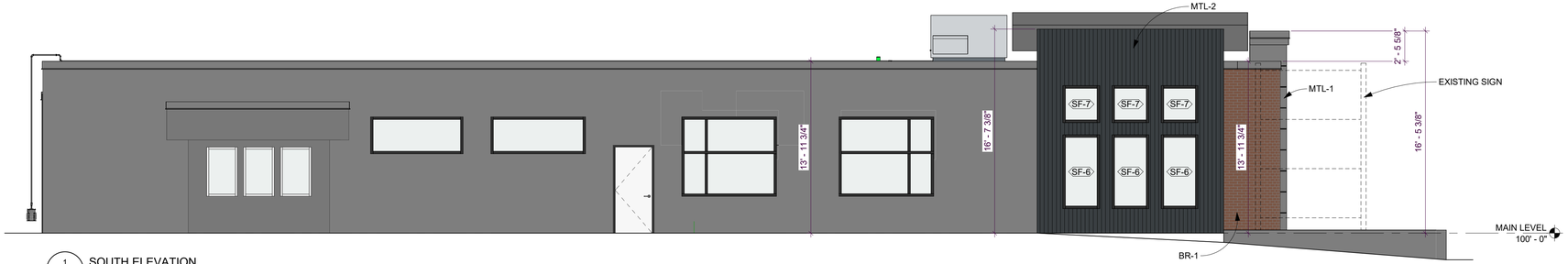
SHEET TITLE

ARCHITECTURAL SITE PLAN

SHEET

AS1.1

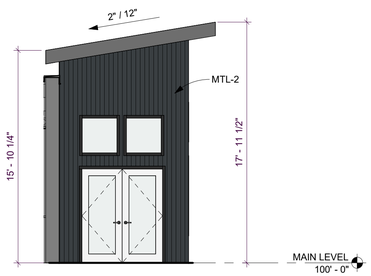
NORTH



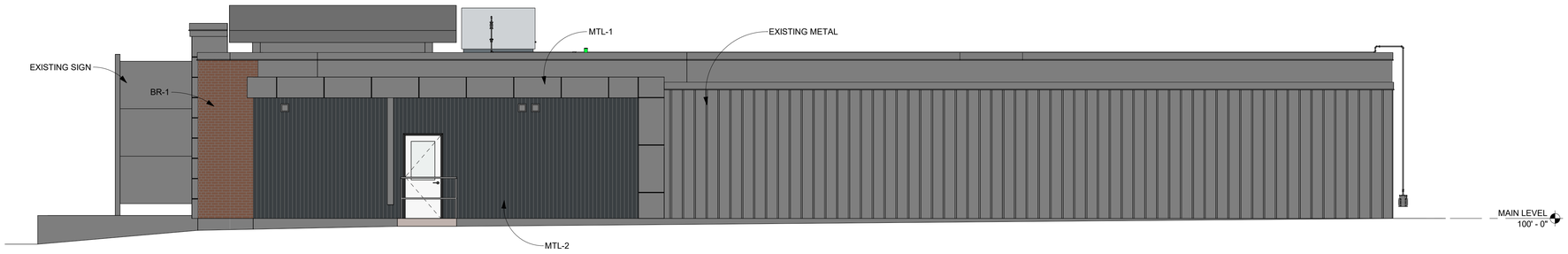
1 A3.1 SOUTH ELEVATION
SCALE: 3/16" = 1'-0"



2 A3.1 EAST ELEVATION
SCALE: 3/16" = 1'-0"



4 A3.1 WEST ELEVATION
SCALE: 3/16" = 1'-0"



3 A3.1 NORTH ELEVATION
SCALE: 3/16" = 1'-0"

EXTERIOR FINISH LEGEND

MARK	MFR	MODEL	COLOR	COMMENTS
BRICK STAIN				
BR-1				EXISTING BRICK - STAIN
PAINT				
PNT-1				
PNT-2				
PREFINISHED METAL				
MTL-1	MAC METAL ARCHITECTURAL	POLYMAC		
MTL-2	MAC METAL ARCHITECTURAL	HARRYWOOD PLUS		
MTL-3				PRE-FINISHED METAL PARAPET CAP
ROOFING				
RF-1				
RF-2				

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oha
ARCHITECTURE + DESIGN
OHARCHITECTS.COM
330 Stadium Road, Suite 202, Mankato, MN 56001
T: 507.385.1158

CONSULTANT

PRELIMINARY NOT FOR CONSTRUCTION

1028 NORTH RIVERFRONT DR

MANKATO, MN

REVISIONS XX

PROJECT # 25-033MK
DATE 06.23.26
DRAWN BY DM
CHECKED BY DGH

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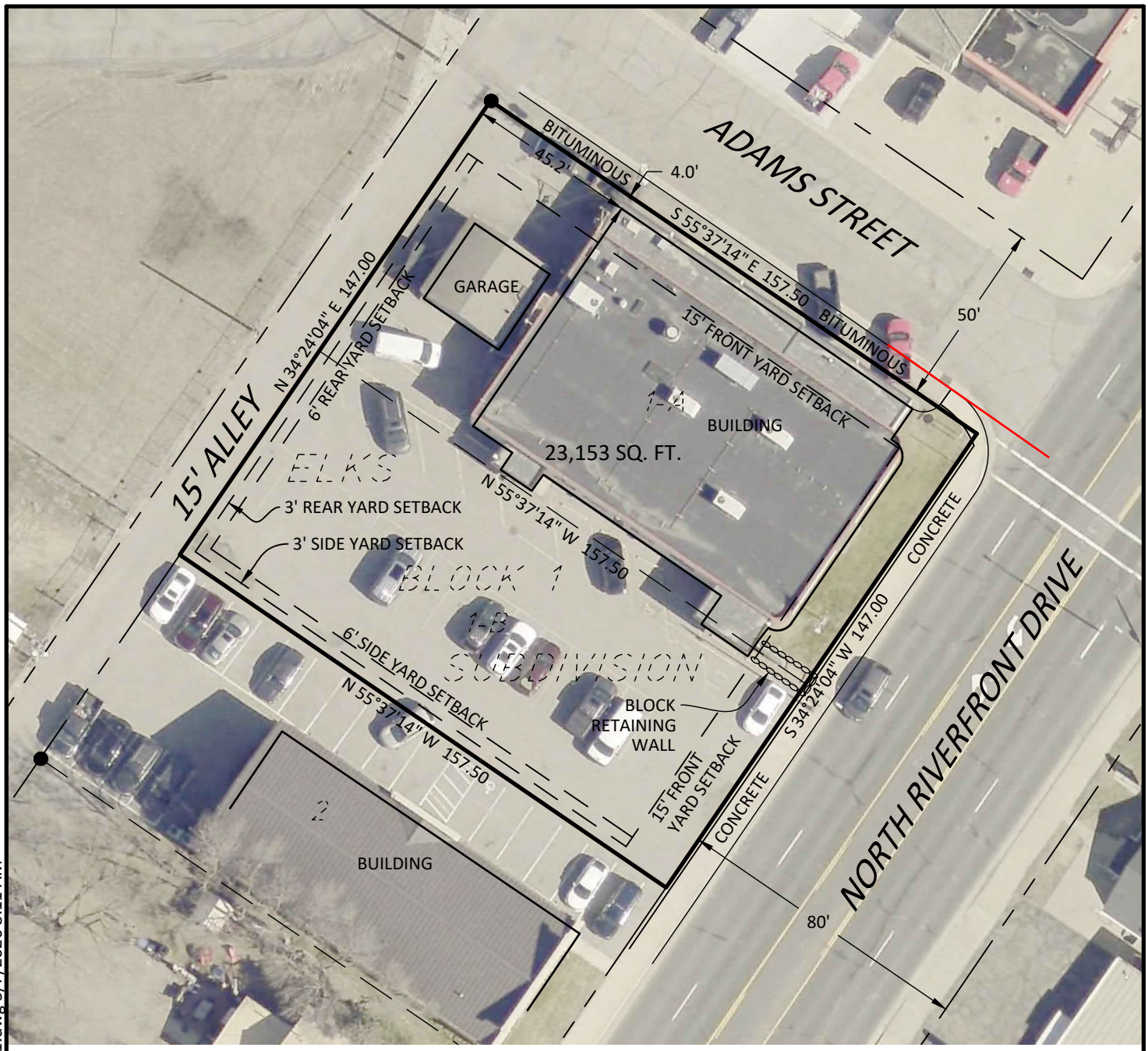
SHEET TITLE

EXTERIOR ELEVATIONS

SHEET

A3.1

6/23/2026 10:49:22 AM



PROPERTY ZONED B-1

B-1 - COMMUNITY BUSINESS DISTRICT
SETBACK REQUIREMENTS - MANKATO

BUILDING SETBACKS (PRIMARY STRUCTURE)

FRONT - 15' IMPERVIOUS PARKING OR STORAGE SURFACE/PORTION OF BUILDING
SIDE - 3' IMPERVIOUS PARKING OR STORAGE SURFACE
SIDE - 6' PORTION OF BUILDING
REAR - 3' IMPERVIOUS PARKING OR STORAGE SURFACE
REAR - 6' PORTION OF BUILDING
MINIMUM LOT AREA = 7,000 SQUARE FEET
MINIMUM STREET FRONTAGE = 100 FEET
MAXIMUM GROUND COVERAGE = 50 PERCENT
MAXIMUM BUILDING HEIGHT = 35 FEET

LEGEND

- ○ 3/4" IRON PIPE MONUMENT SET MARKED BY LIC. NO. XXXXXX
- ● MONUMENT FOUND

Horizontal Datum: Blue Earth County Coordinate System (1996 Adj.)

0 40
SCALE IN FEET

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SITE PLAN
MANKATO, MINNESOTA

LOTS 1-A & 1-B, BLOCK 1 ELKS SUBDIVISION,
MANKATO, BLUE EARTH COUNTY, MINNESOTA

FOR: WEB CONSTRUCTION

BOLTON & MENK
1960 Premier Drive
Mankato, MN 56001
Phone: (507) 625-4171

SDB143554H | JOB NUMBER: 26X.143554.000 | FIELD BOOK: | DRAWN BY: CDT

H:\WEB_PR\26X143554000\CAD\C3D\143554_V_PROP_1.dwg 5/7/2026 8:11 AM

1.0 S7-T108N-R26W-(13,14)

Site Plan and Traffic Advisory Review Committee **1. 8.**

Meeting Date: 07/07/2026

Title

*****SITE PLAN AND TRAFFIC ADVISORY COMMITTEE REVIEW ONLY. Request of Web Construction for the review of an addition to the existing truck and rail car wash facility.**

Applicant

Web Construction, with permission of the owner, CHS, is the applicant.

Request

The applicant is requesting a Site Plan review.

Location

The property is located at 430 Poplar Street.

Zoning

The subject site is zoned M-1, Light Industrial.

Review

Web Construction has requested the review of an addition to the existing truck and rail car wash facility. The subject site is located at 430 Poplar.

The site plan shows a structure addition to the eastern side of the existing truck wash facility. The structure is approximately 77' X 45' and will house an additional wash bay. The provided description states the work will include, "addition to the existing rail car and truck wash facility to accommodate one additional rail car and one truck. Additional locker room, break room, office and meeting room facility".

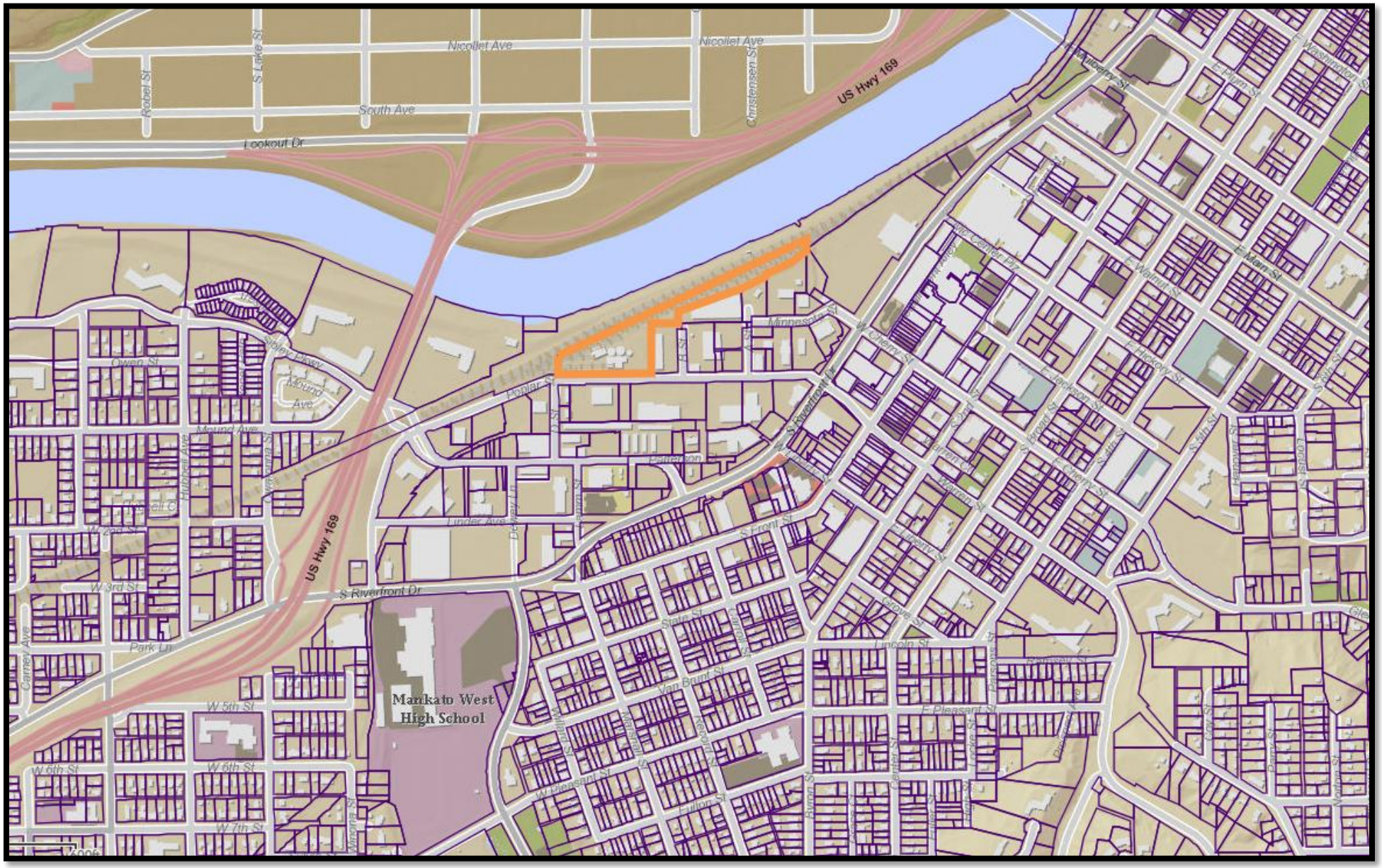
Attachments

General Location Map

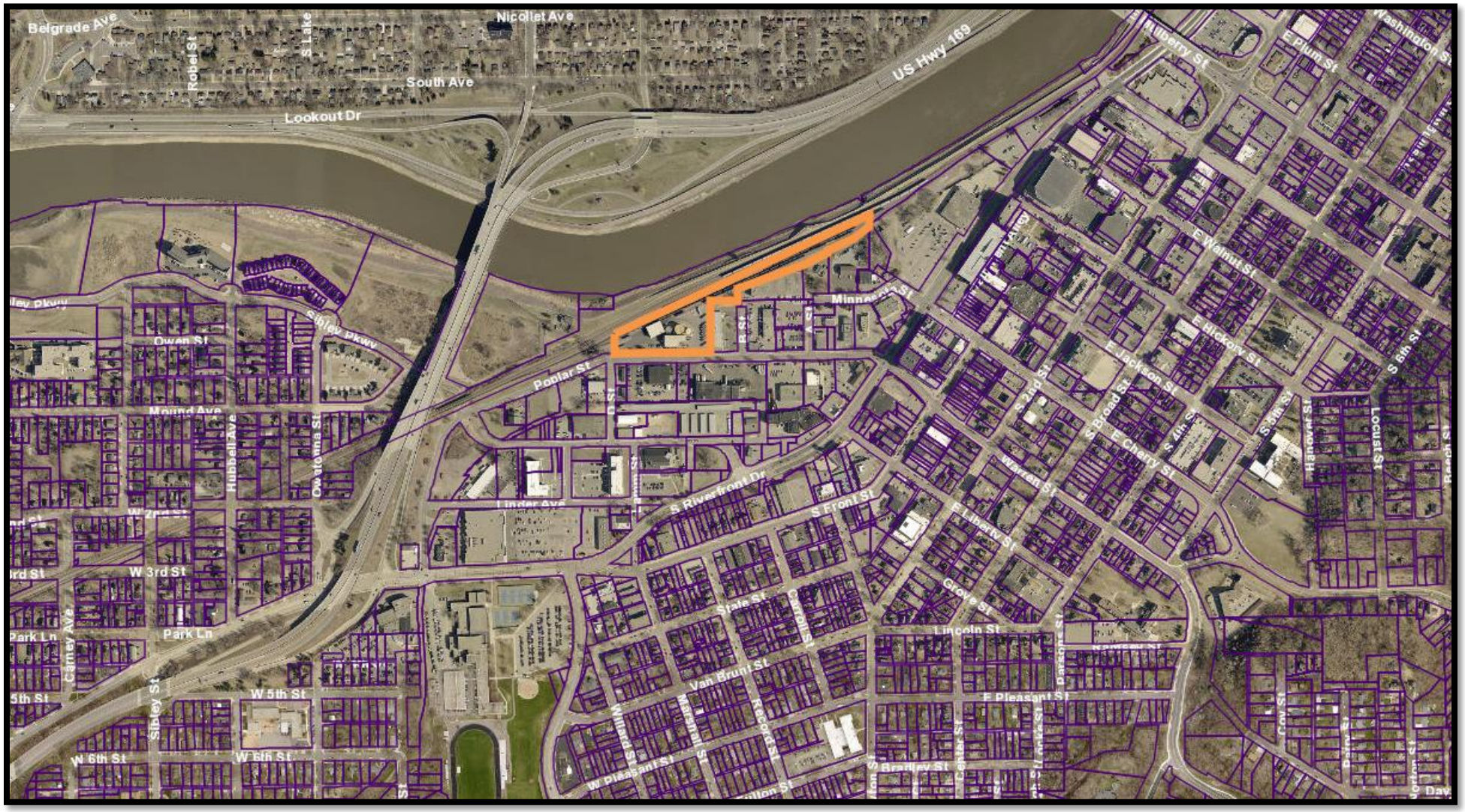
Aerial Plan

Civil Plans

General Location Map



Aerial Location Map



CHS, INC.

CONSTRUCTION PLANS FOR

RAIL & TRUCK WASH FACILITY ADDITION

SITE GRADING, UTILITIES, PAVEMENT CONSTRUCTION

JUNE 2026

MAP OF THE
CITY OF MANKATO
BLUE EARTH COUNTY, MN



0 400 800
SCALE FEET

SHEET NUMBER	SHEET TITLE
GENERAL	
G0.01	TITLE SHEET
G0.02	LEGEND
CIVIL	
C0.01	EXISTING CONDITIONS & REMOVAL PLAN
C1.01 - C1.03	CONSTRUCTION DETAILS
C2.01 - C2.02	GRADING & DRAINAGE PLAN
C3.01	SITE PLAN

THIS PLAN SET CONTAINS 9 SHEETS.

NOTE: EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY GOPHER STATE ONE CALL, 1-800-252-1166 OR 651-454-0002.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D UNLESS OTHERWISE NOTED. THIS UTILITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-22, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

DISCLAIMER:
THE OWNER HAS REQUESTED THAT BOLTON & MENK UTILIZE SITE AND TOPOGRAPHY LINEWORK PROVIDED BY OTHERS. THIS LINEWORK IS A COMBINATION OF EXISTING AND PROPOSED FEATURES. ALL PROPOSED WORK FROM A VERTICAL AND HORIZONTAL STANDPOINT SHALL BE FIELD VERIFIED PRIOR TO INSTALLATION. CONTRACTORS ARE ENCOURAGED TO FIELD FIT AS NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS.

PROJECT DATUM: BLUE EARTH COUNTY
HORIZONTAL: 2011 COUNTY COORDINATES
VERTICAL: NAVD 1988

RECORD DRAWING INFORMATION
OBSERVER:
CONTRACTOR:
DATE:

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H:\CHSINC_PR\26X.143815000\CAD\C3D\143815G001.dwg 6/19/2026 8:28:05 AM Plotted by: Alec Pietz

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.

NOT FOR CONSTRUCTION

ALEC W. PIETZ, P.E.
LIC. NO. 59617 DATE XX/XX/XXXX

BOLTON & MENK
1960 PREMIER DRIVE
MANKATO, MN 56001
Phone: (507) 625-4171
Email: Mankato@bolton-menk.com
www.bolton-menk.com

DESIGNED	NO.	ISSUED FOR	DATE
AWP			
DRAWN			
AWP			
CHECKED			
AWP			
CLIENT PROJ. NO.			
26X.143815			

CHS, INC.
RAIL & TRUCK WASH FACILITY ADDITION
TITLE SHEET

SHEET
G0.01

EXISTING TOPOGRAPHIC SYMBOLS

- ACCESS GRATE
- AIR CONDITION UNIT
- ANTENNA
- AUTO SPRINKLER CONNECTION
- BARRICADE PERMANENT
- BASKETBALL POST
- BENCH
- BIRD FEEDER
- BOLLARD
- BUSH
- CATCH BASIN RECTANGULAR CASTING
- CATCH BASIN CIRCULAR CASTING
- CURB STOP
- CLEAN OUT
- CULVERT END
- DRINKING FOUNTAIN
- DOWN SPOUT
- FILL PIPE
- FIRE HYDRANT
- FLAG POLE
- FLARED END / APRON
- FUEL PUMP
- GRILL
- GUY WIRE ANCHOR
- HANDHOLE
- HANDICAP SPACE
- IRRIGATION SPRINKLER HEAD
- IRRIGATION VALVE BOX
- LIFT STATION CONTROL PANEL
- LIFT STATION
- LIGHT ON POLE
- LIGHT-GROUND
- MAILBOX
- MANHOLE-COMMUNICATION
- MANHOLE-ELECTRIC
- MANHOLE-GAS
- MANHOLE-HEAT
- MANHOLE-SANITARY SEWER
- MANHOLE-STORM SEWER
- MANHOLE-UTILITY
- MANHOLE-WATER
- METER
- ORDER MICROPHONE
- PARKING METER
- PAVEMENT MARKING
- PEDESTAL-COMMUNICATION
- PEDESTAL-ELECTRIC
- PEDESTRIAN PUSH BUTTON
- PICNIC TABLE
- POLE-UTILITY
- POLE-BRACE
- POST
- RAILROAD SIGNAL POLE
- REGULATION STATION GAS
- SATELLITE DISH
- SIGN NON TRAFFIC
- SIGN TRAFFIC
- SIGNAL CONTROL CABINET
- SOIL BORING
- SIREN
- TELEPHONE BOOTH
- TILE INLET
- TILE OUTLET
- TILE RISER
- TRANSFORMER-ELECTRIC
- TREE-CONIFEROUS
- TREE-DEAD
- TREE-DECIDUOUS
- TREE STUMP
- TRAFFIC ARM BARRIER
- TRAFFIC SIGNAL
- TRASH CAN
- UTILITY MARKER
- VALVE
- VALVE POST INDICATOR
- VALVE VAULT
- VAULT
- VENT PIPE
- WATER SPIGOT
- WELL
- WETLAND DELINEATED MARKER
- WETLAND
- WET WELL
- YARD HYDRANT

PROPOSED TOPOGRAPHIC SYMBOLS

- CLEANOUT
- MANHOLE
- LIFT STATION
- STORM SEWER CIRCULAR CASTING
- STORM SEWER RECTANGULAR CASTING
- STORM SEWER FLARED END / APRON
- STORM SEWER OUTLET STRUCTURE
- STORM SEWER OVERFLOW STRUCTURE
- CURB BOX
- FIRE HYDRANT
- WATER VALVE
- WATER REDUCER
- WATER BEND
- WATER TEE
- WATER CROSS
- WATER SLEEVE
- WATER CAP / PLUG
- RIP RAP
- DRAINAGE FLOW
- TRAFFIC SIGNS

SURVEY SYMBOLS

- BENCHMARK LOCATION
- CONTROL POINT
- MONUMENT FOUND
- CAST IRON MONUMENT
- STONE MONUMENT

EXISTING TOPOGRAPHIC LINES

- RETAINING WALL
- FENCE
- FENCE-DECORATIVE
- GUARD RAIL
- TREE LINE
- BUSH LINE

SURVEY LINES

- CONTROLLED ACCESS
- BOUNDARY
- CENTERLINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING LOT LINE
- PROPOSED LOT LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- SETBACK LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- TEMPORARY EASEMENT

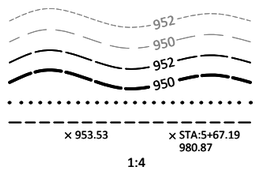
EXISTING UTILITY LINES

- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE

PROPOSED UTILITY LINES

- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE
- PIPE CASING
- TRENCHLESS PIPE (PLAN VIEW)
- TRENCHLESS PIPE (PROFILE VIEW)

GRADING INFORMATION



- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED GRADING LIMITS / SLOPE LIMITS
- PROJECT LIMITS
- PROPOSED SPOT ELEVATION
- RISE:RUN (SLOPE)

HATCH PATTERNS

- BITUMINOUS
- GRAVEL
- CONCRETE

EXISTING PRIVATE UTILITY LINES

NOTE:
EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY GOPHER STATE ONE CALL, 1-800-252-1166 OR 651-454-0002.

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- F F F F — UNDERGROUND FIBER OPTIC
- E E E E — UNDERGROUND ELECTRIC
- G G G G — UNDERGROUND GAS
- C C C C — UNDERGROUND COMMUNICATION
- OE OE OE OE — OVERHEAD ELECTRIC
- OC OC OC OC — OVERHEAD COMMUNICATION
- OU OU OU OU — OVERHEAD UTILITY

UTILITIES IDENTIFIED WITH A QUALITY LEVEL :

LINE TYPES FOLLOW THE FORMAT: UTILITY TYPE - QUALITY LEVEL
EXAMPLE: G-A G-A UNDERGROUND GAS, QUALITY LEVEL A
UTILITY QUALITY LEVEL (A,B,C,D) DEFINITIONS CAN BE FOUND IN CI/ASCE 38-02.

UTILITY QUALITY LEVELS:

QUALITY LEVEL D: PROVIDES THE MOST BASIC LEVEL OF INFORMATION. IT INVOLVES COLLECTING DATA FROM EXISTING UTILITY RECORDS. RECORDS MAY INCLUDE AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICES MAPS, EXISTING GEOGRAPHIC INFORMATION SYSTEM DATABASES, CONSTRUCTION PLANS, ETC.

QUALITY LEVEL C: INVOLVES SURVEYING VISIBLE SUBSURFACE UTILITY STRUCTURES SUCH AS MANHOLES, HAND-HOLES, UTILITY VALVES AND METERS, FIRE HYDRANTS, PEDESTALS AND UTILITY MARKERS, AND THEN CORRELATING THE INFORMATION WITH EXISTING UTILITY RECORDS TO CREATE COMPOSITE DRAWINGS. INCLUDES QUALITY LEVEL D ACTIVITIES.

QUALITY LEVEL B: INVOLVES DESIGNATING THE HORIZONTAL POSITION OF SUBSURFACE UTILITIES THROUGH SURFACE DETECTION METHODS AND COLLECTING THE INFORMATION THROUGH A SURVEY METHOD. INCLUDES QUALITY LEVEL C AND D TASKS.

QUALITY LEVEL A: PROVIDES THE HIGHEST LEVEL OF ACCURACY. IT INVOLVES LOCATING OR POTHOLING UTILITIES AS WELL AS ACTIVITIES IN QUALITY LEVELS B, C, AND D. THE LOCATED FACILITY INFORMATION IS SURVEYED AND MAPPED AND THE DATA PROVIDES PRECISE PLAN AND PROFILE INFORMATION.

ABBREVIATIONS

A	ALGEBRAIC DIFFERENCE	GRAV	GRAVEL	RSC	RIGID STEEL CONDUIT
ADJ	ADJUST	GU	GUTTER	RT	RIGHT
ALT	ALTERNATE	GV	GATE VALVE	SAN	SANITARY SEWER
B-B	BACK TO BACK	HDPE	HIGH DENSITY POLYETHYLENE	SCH	SCHEDULE
BIT	BITUMINOUS	HH	HANDHOLE	SERV	SERVICE
BLDG	BUILDING	HP	HIGH POINT	SHLD	SHOULDER
BMP	BEST MANAGEMENT PRACTICE	HWL	HIGH WATER LEVEL	STA	STATION
BR	BEGIN RADIUS	HYD	HYDRANT	STD	STANDARD
BV	BUTTERFLY VALVE	I	INVERT	STM	STORM SEWER
CB	CATCH BASIN	K	CURVE COEFFICIENT	TC	TOP OF CURB
C&G	CURB AND GUTTER	L	LENGTH	TE	TEMPORARY EASEMENT
CIP	CAST IRON PIPE	LO	LOWEST OPENING	TEMP	TEMPORARY
CIPP	CURED-IN-PLACE PIPE	LP	LOW POINT	TNH	TOP NUT HYDRANT
CL	CENTER LINE	LT	LEFT	TP	TOP OF PIPE
CL.	CLASS	MAX	MAXIMUM	TYP	TYPICAL
CLVT	CULVERT	MH	MANHOLE	VCP	VITRIFIED CLAY PIPE
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	VERT	VERTICAL
C.O.	CHANGE ORDER	MR	MID RADIUS	VPC	VERTICAL POINT OF CURVE
COMM	COMMUNICATION	NIC	NOT IN CONTRACT	VPI	VERTICAL POINT OF INTERSECTION
CON	CONCRETE	NMC	NON-METALLIC CONDUIT	VPT	VERTICAL POINT OF TANGENT
CSP	CORRUGATED STEEL PIPE	NTS	NOT TO SCALE	WM	WATERMAIN
DIA	DIAMETER	NWL	NORMAL WATER LEVEL		
DIP	DUCTILE IRON PIPE	OHW	ORDINARY HIGH WATER LEVEL		
DWY	DRIVEWAY	PC	POINT OF CURVE	AC	ACRES
E	EXTERNAL CURVE DISTANCE	PCC	POINT OF COMPOUND CURVE	CF	CUBIC FEET
ELEC	ELECTRIC	PE	PERMANENT EASEMENT	CV	COMPACTED VOLUME
ELEV	ELEVATION	PED	PEDESTRIAN, PEDESTAL	CY	CUBIC YARD
EOF	EMERGENCY OVERFLOW	PERF	PERFORATED PIPE	EA	EACH
ER	END RADIUS	PERM	PERMANENT	EV	EXCAVATED VOLUME
ESMT	EASEMENT	PI	POINT OF INTERSECTION	LB	POUND
EX	EXISTING	PL	PROPERTY LINE	LF	LINEAR FEET
FES	FLARED END SECTION	PRC	POINT OF REVERSE CURVE	LS	LUMP SUM
F-F	FACE TO FACE	PT	POINT OF TANGENT	LV	LOOSE VOLUME
FF	FINISHED FLOOR	PVC	POLYVINYL CHLORIDE PIPE	SF	SQUARE FEET
F&I	FURNISH AND INSTALL	PVMT	PAVEMENT	SV	STOCKPILE VOLUME
FM	FORCEMAIN	R	RADIUS	SY	SQUARE YARD
FO	FIBER OPTIC	R/W	RIGHT-OF-WAY		
F.O.	FIELD ORDER	RCP	REINFORCED CONCRETE PIPE		
GRAN	GRANULAR	RET	RETAINING		

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NOT FOR CONSTRUCTION

ALEC W. PIETZ, P.E.
LIC. NO. 59617 DATE XX/XX/XXXX

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MANKATO, MN 56001
Phone: (507) 625-4171
Email: Mankato@bolton-menk.com
www.bolton-menk.com

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CHECKED AWP			
CLIENT PROJ. NO. 26X.143815			

CHS, INC.
RAIL & TRUCK WASH FACILITY ADDITION
LEGEND

SHEET G0.02

REMOVE CURB & GUTTER

REMOVE STRUCTURAL APPROACH

REMOVE BITUMINOUS PAVEMENT. PROVIDE CLEAN SAWCUT ON ALL EDGES.

REMOVE FENCE AS NECESSARY

REMOVE BITUMINOUS PAVEMENT. PROVIDE CLEAN SAWCUT ON ALL EDGES.

REMOVE CURB AS NECESSARY FOR ROOF DRAIN CONNECTION

REMOVE CURB AS NECESSARY FOR ROOF DRAIN CONNECTION

SWITCH

TRENCH DRAIN

3'x3'x3' SUMP PIT

GARA

10"TF
10"T

HORZ. SCALE 0 25 50 FEET

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CHS, INC.

RAIL & TRUCK WASH FACILITY ADDITION

EXISTING CONDITIONS & REMOVAL PLAN

SHEET C0.01

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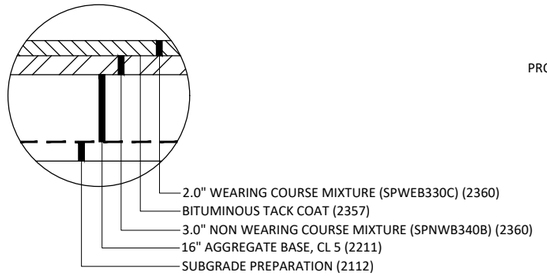
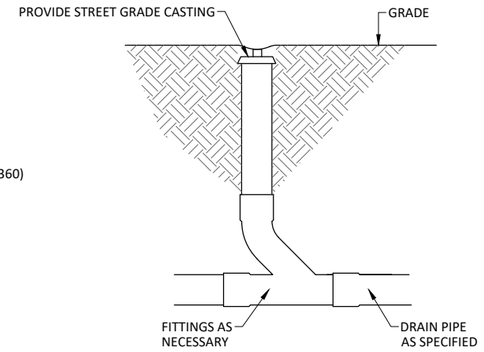
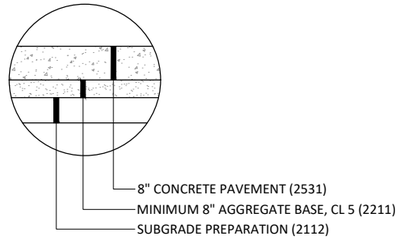


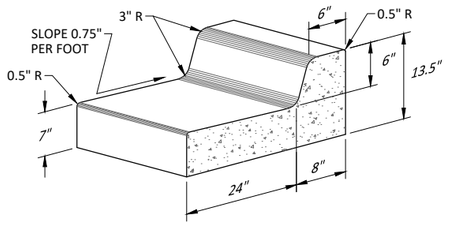
BITUMINOUS PAVEMENT SECTION
NOT TO SCALE



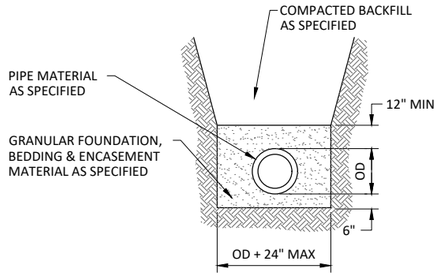
STORM SEWER CLEANOUT
NOT TO SCALE



8" CONCRETE APRON
NOT TO SCALE



CONCRETE CURB & GUTTER
DESIGN B624
NOT TO SCALE



NON-RIGID STORM SEWER TRENCH
NOT TO SCALE

NOTES:
- SEE VARIATIONS ON GRADING PLAN
- ALTER AS NECESSARY TO MATCH EXISTING CONDITIONS

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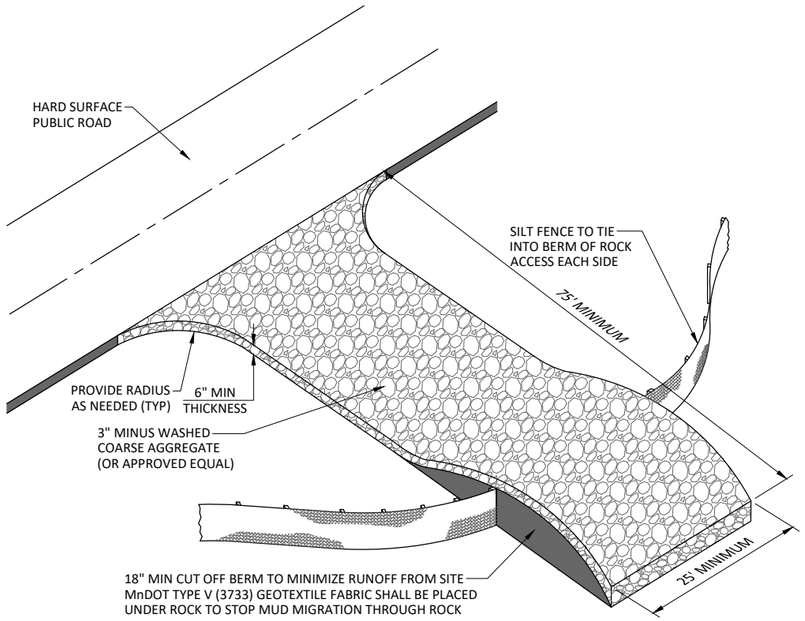
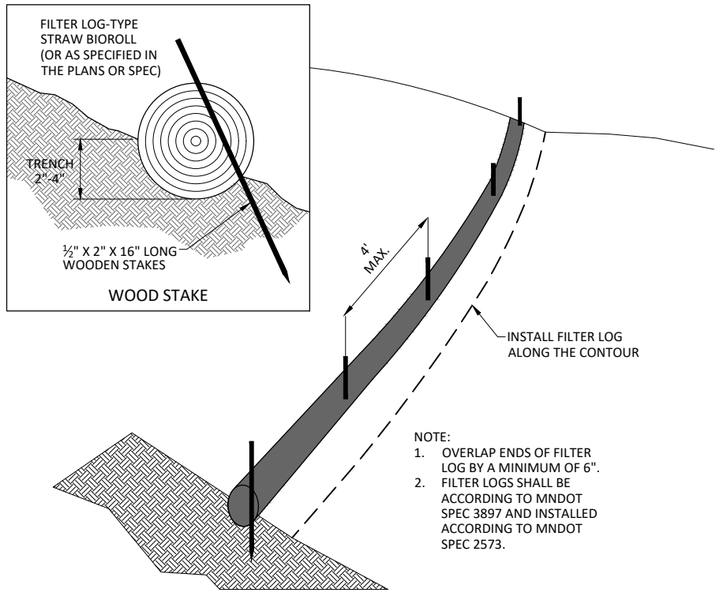
CHS, INC.
RAIL & TRUCK WASH FACILITY ADDITION
SURFACE AND UTILITY DETAILS

SHEET
C1.01



ROCK CONSTRUCTION ENTRANCE

NOT TO SCALE



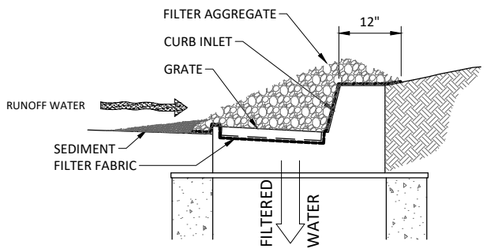
NOTE:
1. OVERLAP ENDS OF FILTER LOG BY A MINIMUM OF 6".
2. FILTER LOGS SHALL BE ACCORDING TO MNDOT SPEC 3897 AND INSTALLED ACCORDING TO MNDOT SPEC 2573.

PERIMETER PROTECTION-FILTER LOG

NOT TO SCALE

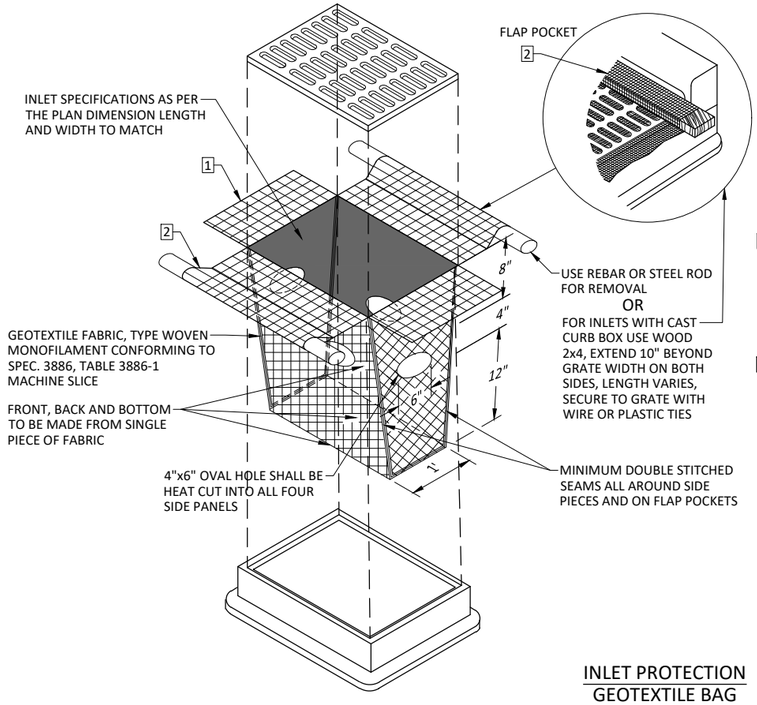
NOTES:

1. FILTER AGGREGATE TO BE 1 TO 2 INCH CLEAN ROCK
2. FILTER FABRIC SHALL MEET MnDOT SPECIFICATION 3733 GEOTEXTILE FABRIC TYPE II



INLET PROTECTION
FILTER AGGREGATE

NOT TO SCALE



NOTES:

[1] INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER. MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENTS EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED. WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL IN THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

[2] FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2x4.

INSTALLATION NOTES:

DO NOT INSTALL PROTECTION IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

INLET PROTECTION
GEOTEXTILE BAG

NOT TO SCALE

NOTE: DETAILS SHOWN ARE ACCEPTABLE PRACTICES OF EROSION & SEDIMENT CONTROL, ANY OR ALL MAY BE USED

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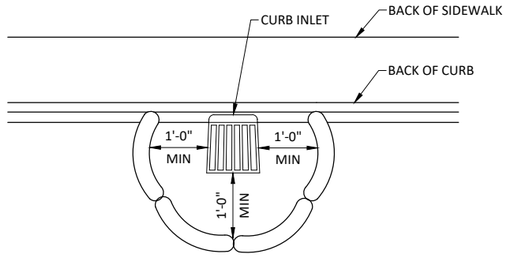
CHS, INC.

RAIL & TRUCK WASH FACILITY ADDITION

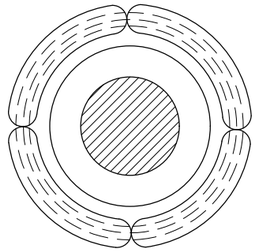
EROSION & SEDIMENT CONTROL DETAILS

SHEET C1.02



NOTE:
THIS INLET PROTECTION IS USED DURING ROUGH GRADING ONLY, USE BEFORE ROAD IS OPEN TO TRAFFIC OR IS PAVED

PAYMENT SHALL INCLUDE ALL MATERIALS, FILLING OF LOG, PLACEMENT, MAINTENANCE & REMOVAL;
80% OF BID PRICE SHALL BE PAID UPON PROPER PLACEMENT WITH THE FINAL 20% PAID UPON REMOVAL

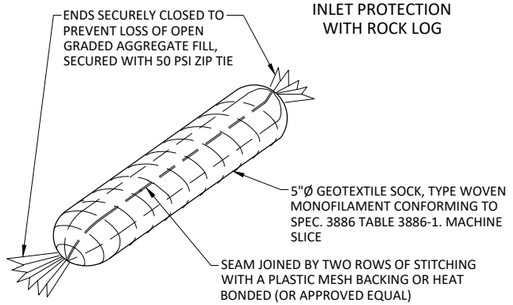


INLET PROTECTION
WITH ROCK LOG

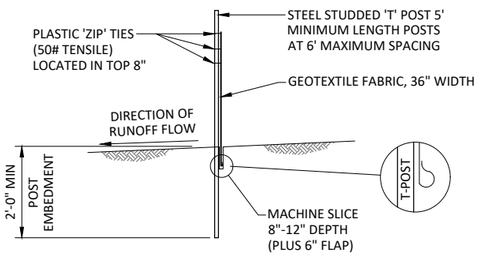
FILL ROCK LOG WITH 45 LBS. OF OPEN GRADED AGGREGATE CONSISTING OF SOUND, DURABLE PARTICLES OF CRUSHED QUARRY ROCK OR GRAVEL CONFORMING TO THE FOLLOWING GRADATION.

GRADATION	
SIEVE SIZE	PERCENT PASSING
1 1/2"	100
1"	95-100
3/4"	65-95
3/8"	30-65
NO 4	10-35
NO 10	3-20
NO 40	0-8
NO 200	0-3

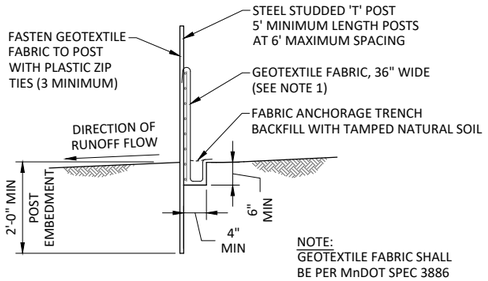
NOTE:
CRUSHED CONCRETE OR BITUMINOUS SHALL NOT BE USED FOR OPEN GRADED AGGREGATE.



INLET PROTECTION
ROCK BAG
NOT TO SCALE

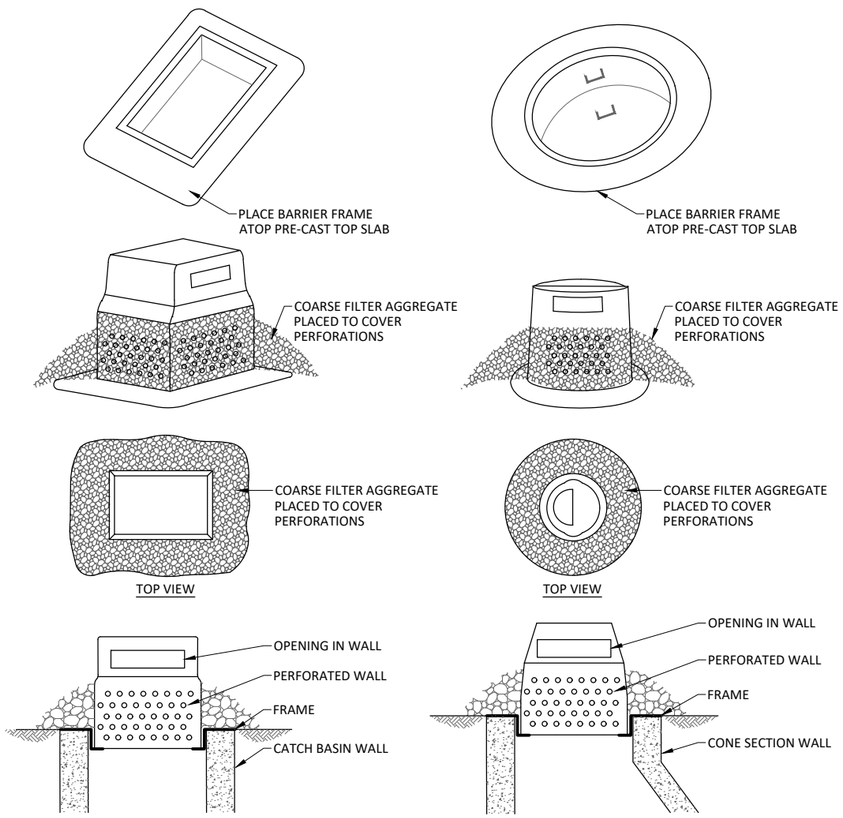


SILT FENCE - MACHINE SLICED
NOT TO SCALE



NOTE:
GEOTEXTILE FABRIC SHALL BE PER MnDOT SPEC 3886

SILT FENCE - HEAVY DUTY
NOT TO SCALE



INLET PROTECTION
PERFORATED WALL
NOT TO SCALE

NOTE: DETAILS SHOWN ARE ACCEPTABLE PRACTICES OF EROSION & SEDIMENT CONTROL, ANY OR ALL MAY BE USED

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CHS, INC.
RAIL & TRUCK WASH FACILITY ADDITION
EROSION & SEDIMENT CONTROL DETAILS

SHEET C1.03

LEGEND

C=	CONCRETE
ME=	MATCH EXISTING
GU=	GUTTER
0" TC=	0" TOP CURB
6" TC=	6" TOP CURB

NOTE:
FIELD VERIFY ALL ELEVATIONS FOR ACCURACY AND INTENDED DRAINAGE PATTERNS INCLUDING SURFACE AND UTILITY INSTALLATION

PROPOSED ADDITION
FFE=780.25
(MATCH EXISTING)

EXISTING BUILDING
FFE=780.25
(FIELD VERIFY)

C 80.25
6" TC 79.60
6" TC 80.68
0" TC 80.25
GU 80.25
1.83%
0.76%
C 80.12
GU 80.08
GU 80.25
6" TC 80.75
6" TC 80.49
6" TC 80.58

CLEANOUT
R=~780.0
I=~777.0

8" SDR 26 PVC ROOF DR
GRADE. MAINTAIN A M
FROM FINISHED GROUN
INVERTS ARE NOTED AT
3-FT FROM FI

CLEANOUT
R=~780.1
I=~777.1

PROVIDE CLEAN SAW CUT AND MATCH EXISTING GRADES FOR ALL PAVEMENT PATCHING. MODIFY LIMITS AS NECESSARY.

8" SDR 26 PVC ROOF DRAIN @ MIN 0.5% GRADE. MAINTAIN A MINIMUM OF 3-FT FROM FINISHED GROUND TO INVERT. ALL INVERTS ARE NOTED AT APPROXIMATELY 3-FT FROM FINISHED GROUND.

I=~773.2

CLEANOUT
R=~774.3
I=~771.3

CONNECT TO EXISTING STORM STRUCTURE
I=~771.0 (FIELD VERIFY)

LARGE COTTONWOOD

GAS

TRENCH DRAIN

3'x3'x3' SUMP PIT

779.854

HORZ. 0 15 30
SCALE FEET

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GRADING & DRAINAGE PLAN

SHEET
C2.01

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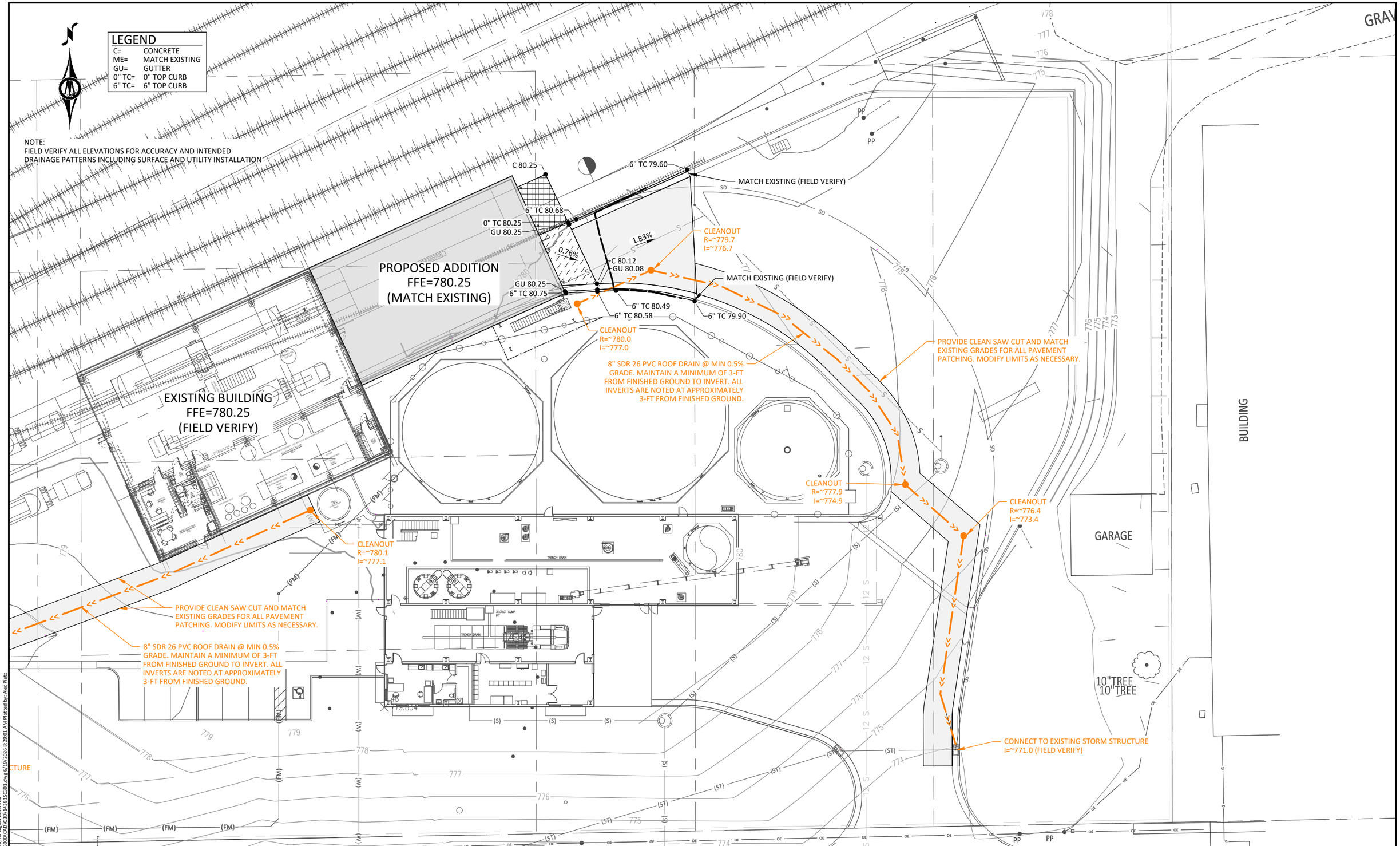

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HORZ. 0 15 30
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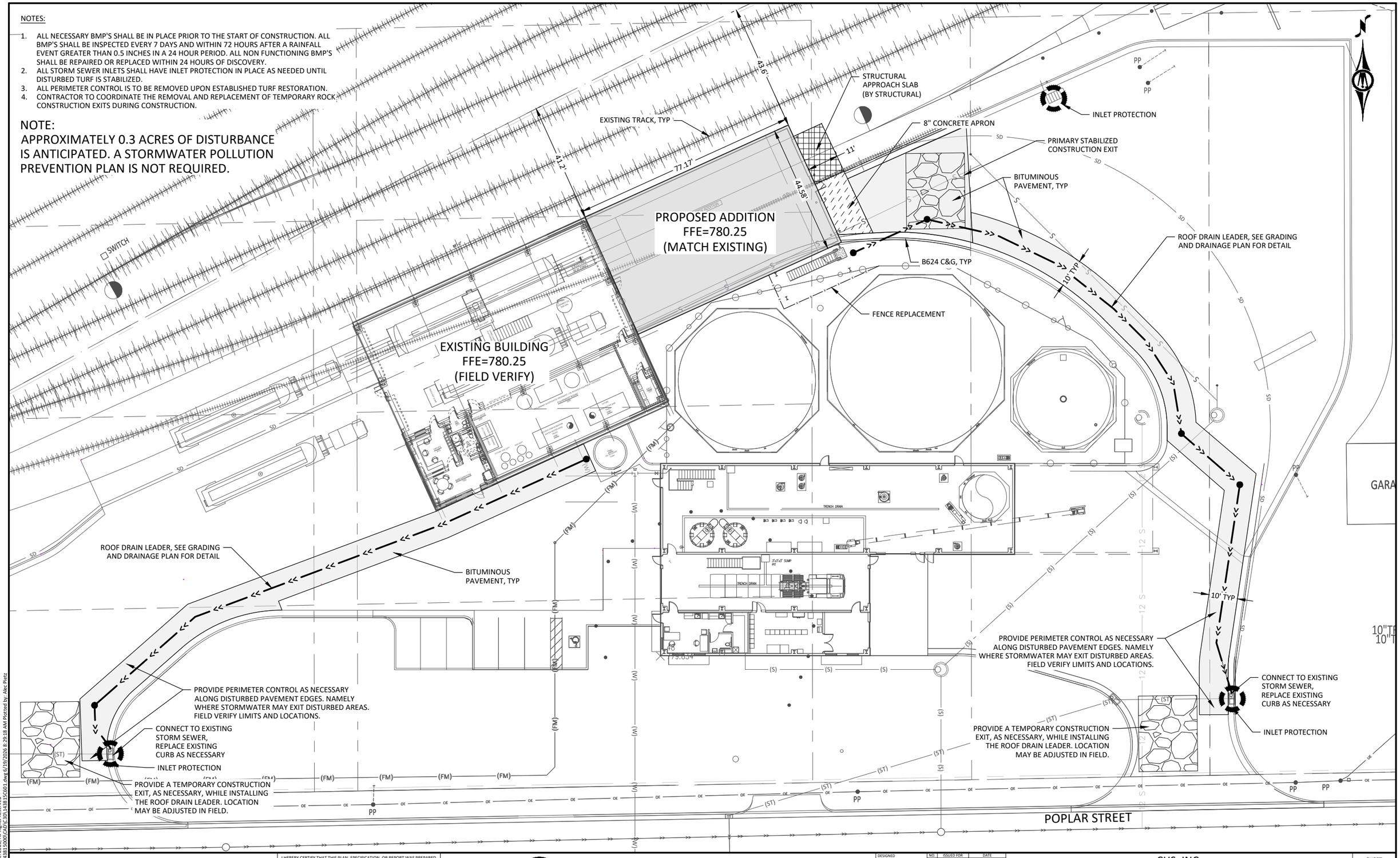
RAIL & TRUCK WASH FACILITY ADDITION
GRADING & DRAINAGE PLAN

SHEET
C2.02

NOTES:

1. ALL NECESSARY BMP'S SHALL BE IN PLACE PRIOR TO THE START OF CONSTRUCTION. ALL BMP'S SHALL BE INSPECTED EVERY 7 DAYS AND WITHIN 72 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN A 24 HOUR PERIOD. ALL NON FUNCTIONING BMP'S SHALL BE REPAIRED OR REPLACED WITHIN 24 HOURS OF DISCOVERY.
2. ALL STORM SEWER INLETS SHALL HAVE INLET PROTECTION IN PLACE AS NEEDED UNTIL DISTURBED TURF IS STABILIZED.
3. ALL PERIMETER CONTROL IS TO BE REMOVED UPON ESTABLISHED TURF RESTORATION.
4. CONTRACTOR TO COORDINATE THE REMOVAL AND REPLACEMENT OF TEMPORARY ROCK CONSTRUCTION EXITS DURING CONSTRUCTION.

NOTE:
APPROXIMATELY 0.3 ACRES OF DISTURBANCE IS ANTICIPATED. A STORMWATER POLLUTION PREVENTION PLAN IS NOT REQUIRED.



HORZ. SCALE 0 15 30 FEET

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CHS, INC.
RAIL & TRUCK WASH FACILITY ADDITION
SITE PLAN

SHEET C3.01

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