

Stormwater Management Plan
Greg Lauer Subdivision
City of Kaukauna
Outagamie County, Wisconsin

May 5, 2025



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M&E Project No. 1-0290-003

**Stormwater Management Plan
Greg Lauer Subdivision
City of Kaukauna, Outagamie County, Wisconsin**

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Section 1:

Applications & Obtained Permits

Section 2:

Narrative Stormwater Management Plan

**Stormwater Management Plan
Greg Lauer Subdivision
City of Kaukauna, Outagamie County, Wisconsin**

Section 1 Project Overview

1.1 Project Description

Developer Greg Lauer is proposing building a new street in the city of Kaukauna. It will consist of a short street with a cul-de-sac, curb and gutter, and a sidewalk. This street will provide access to four newly created lots. All the lots are very hilly and make stormwater management difficult. All the existing runoff flows down into a natural trench that flows into a nearby river.

A new biofilter installed on a nearby empty lot will provide some quantity and quality control for the street and sidewalk. There is 15,500 sq. ft. of street pavement and 2,720 sq. ft. of sidewalk that will flow into the proposed biofilter.

1.2 Objectives and Requirements

State: A WDNR stormwater permit is not required for this project because land disturbance is less than 1 acre.

County: The City of Kaukauna has adopted and enforces a storm water management ordinance; therefore, the Outagamie County Storm water ordinance does not apply.

Municipal: The City of Kaukauna has adopted storm water management under the code of ordinance, Chapter 22 Stormwater Management. For a post-construction site with 20,000 square feet or greater of impervious surface disturbance, the City of Kaukauna requires peak flow shaving for the 1-year, 2-year, 10-year, and 100-year storms to achieve site discharge equal to that prior to construction. Sites are also required to achieve 80% TSS reduction and 60% TP reduction for sites in the Kankapot Creek watershed. Due to site constraints, these goals were not met but are very close to being met. The proposed treatment system provides treatment to the maximum extent practicable.

1.3 Approach Methodology

As required by the WDNR, the method outlined by U.S. Department of Agriculture (USDA) Soil Conservation Services (SCS) Technical Release 55 (TR-55) "Urban Hydrology for Small Watersheds" was used to estimate the amount of runoff that would be generated at the proposed site. In doing so, the HydroCAD Version 10.20-5b computer model was used to generate runoff results. The runoff calculations were completed to ensure the proposed stormwater device functions safely.

The City of Kaukauna requires the analysis of the 1-year, 2-year, 10-year, and 100-year events.

Table 1.1 Rainfall Data				
Storm Frequency	1-year	2-year	10-year	100-year
24-hr Rainfall Depth (in.)	2.11	2.42	3.48	5.62

The rainfall information above for the 1-year, 2-year, 10-year, and 100-year, Atlas 14, 24-hour storms were obtained from the City of Kaukauna Stormwater Management Ordinance.

Section 2 Existing Site Description

2.1 Existing Site Conditions

The current site consists of a flatter area at the top and steep slopes to the south and west. The entire area is wooded. All the runoff flows down the steep slopes and into a wetland area that is connected to Kankapot Creek. Due to the high slopes present on the site, areas for a treatment system were limited.

2.2 Soil Types

Bc (Bellevue silt loam, 0-2% slopes): The Bc soil type is deep, moderately well drained in stratified loamy alluvium. Infiltration rates are moderately high (0.20 in/hr to 0.60 in/hr). Depth to water table is 24 to 48 inches and the available water supply is high. Hydrologic soil type C.

WnB (Winneconne silty clay loam, 2-6% slopes): The WnB soil type is deep, well drained in calcareous clayey lacustrine deposits. Infiltration rates are very low (0.00 in/hr). Depth to water table is 60 to 80 inches and the available water supply is moderate. Hydrologic soil type D.

2.3 Legal Description

The site is located north of CTH CE, east of Kankapot Creek, south and west of Peters Road. This project is located on a 17.45-acre parcel in the City of Kaukauna, Outagamie County, Wisconsin. The legal description of the parcel is as follows:

PRT LOT 1 CSM 3921 LESS CSM 7178 & 7177

2.4 Depth to Groundwater

The depth to groundwater varies both seasonally and annually. For soils on this site, groundwater depth varies from 24 to 80 inches per the USGS soil report.

2.5 Wetlands

WDNR Surface Water Data Viewer shows one mapped wetland and no indicator soils

located within the parcel.

Section 3 Pre-Development Runoff

3.1 Land Cover

The site currently consists of full wooded cover.

3.2 Pre-Development Runoff Modeling

As the site is currently all wooded, a wooded curve number was used. The existing site was modeled as one subbasin. The maximum curve number for woodland was taken from the Kaukauna Stormwater Ordinance.

- ❖ **Subbasin 1S (Pre-development)** models all runoff for the expected area of disturbance for the new road section.

Table 3.1 displays the time of concentration, runoff curve number (RCN), and total drainage area for this subbasin.

Table 3.1: Pre-Development Subbasin Data

Subbasin	Time of Concentration (min)	Composite RCN	Total Drainage Area (ac.)
1S (Pre-Development)	21.9	77	0.803

The Pre-Development subbasin delineation and time of concentration flow path is shown in the Pre-Development Runoff Analysis (Section 3) of this report.

Pre-Development results were then calculated using the HydroCAD 10.20 modeling software. The associated hydrographs and model run statistics are available in the Pre-Development section (Section 3) of this Storm Water Management Report. Results are shown in Table 3.2.

Table 3.2: Pre-Development Peak Runoff Results

Frequency	yr.	1	2	10	100
Rainfall, P (24-hr.)	in.	2.11	2.42	3.48	5.62
Subbasin 1S	cfs	0.33	0.47	1.03	2.33

Section 4 Post-Development Runoff

4.1 Land Cover

The proposed land development consists of a short street with a cul-de-sac, curb and gutter, and a sidewalk. The remaining area is grass landscaping. Future driveways and roof areas are not modeled. As the site had high slopes, the area that the biofilter will be built is the only reasonable location to build the device. It will still provide treatment for the road to the maximum extent practicable.

4.2 Post-Development Runoff Modeling

For the proposed condition, the site was modelled as one subbasin. The entire area drains down the hill into Kankapot Creek, either directly or through the outflow from the biofilter.

- ❖ **Subbasin 2S (Pavement)** models all runoff for the for the new road section, sidewalk, and surrounding grassy areas.

Table 4.1 provides the time of concentration, RCN value, and acreage for this subbasin. The storm water control devices are described in the next section.

Table 4.1: Post-Development Subbasin Data

Subbasin	Time of Concentration (min)	Composite RCN	Total Drainage Area (ac.)
2S (Post Uncapt.)	6.0*	91	0.803

*TR-55 required minimum.

The Post-Development basin delineation and time of concentration flow path is shown in the Post-Development Runoff Analysis in Section 4 of this report. Weighted average RCN values were referenced from the internal tables provided through the HydroCAD 10.20 modeling software.

4.3 Proposed Treatment

To meet the peak flow and total suspended solids (TSS) requirements of the City of Manitowoc ordinance, Chapter 28 Stormwater Management and WDNR NR 151, a biofilter will be installed. The biofilter will be constructed in accordance with WDNR Technical Standard 1004.

Biofilter Device (1P)

This device will treat captured flows from the proposed building addition and redeveloped parking lot.

- o Soil Interface Elevation (bottom of device) = 716.50'
- o Top of Underdrain Stone = 718.00'
- o Ground Surface of Device (Top of Eng. Media) = 721.00'
- o 3" of Surface Mulch = 721.25'
- o Active Device Area = 1,943 square feet
- o Top of Detention Area = 2,996 square feet
- o Spillway Invert = 722.00'
- o 6.0" PVC Perforated Underdrain Pipe w/ rock fill at Invert = 716.92'
- o 24" Diameter Drop Inlet Catch Basin Rim = 721.67'

Storm water outlet flows will be conveyed via a 12" pipe south into the existing gully, which flows into the wetlands and into Kankapot Creek.

4.4 Post-Development Runoff Results

Table 4.2 provides the runoff results from HydroCAD for the proposed biofilter. Table 4.3 provides the total peak discharge from the site of the combined captured and uncaptured hydrographs. The post flow for the 100-year storm is slightly higher than the pre-flow, but this level of flow reduction is the maximum extent practicable.

Table 4.2: Elevation and Peak Flow Results

Storm Event	1-yr	2-yr	10-yr	100-yr
Post-Construction	2.20	2.40	3.70	5.00
Biofilter (1P)				
Peak Discharge into Device (cfs)	1.57	1.90	3.03	5.31
Peak Discharge from Device (cfs)	0.29	0.33	0.40	2.48
Peak Storm Water Elevation (ft)	719.12	719.69	721.23	721.88
Storage Provided (cubic feet)	1,507	1,869	3,218	4,992

Table 4.3: Total Combined Peak Flow Results Comparison (Pre and Post)

Storm Event	1-yr	2-yr	10-yr	100-yr
Pre-Development	(cfs)	(cfs)	(cfs)	(cfs)
Total	0.33	0.47	1.03	2.33
Post-Construction	(cfs)	(cfs)	(cfs)	(cfs)
Total	0.29	0.33	0.40	2.48

Section 5 WinSLAMM Analysis

The water quality target from the City of Kaukauna ordinance, Chapter 22 Stormwater Management is to achieve 80% TSS reduction and 60% TP reduction for sites in the Kankapot Creek watershed. The WinSLAMM version 10.5 modeling program was used to predict pollutant removal. The goal of 80% TSS removal is not quite accomplished, but this level of treatment is the maximum extent practicable.

Table 5.1 WinSLAMM Analysis

Pollutant	Pollutant Load Without Controls (lbs)	Pollutant Load with Controls (lbs)	Reduction	Area Modeled (acres)
Total Suspended Solids	435.0	89.52	79.42%	0.803
Total Phosphorus	1.316	0.4551	65.42%	0.803

Section 6 Infiltration Analysis

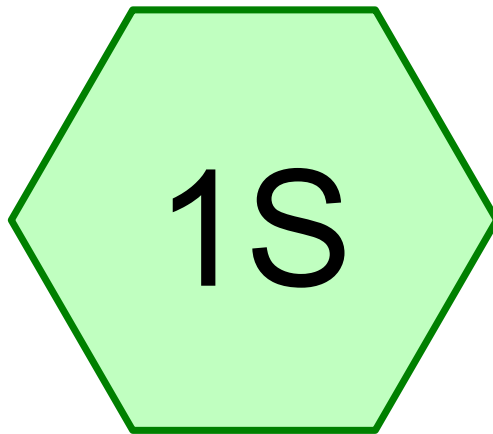
Previously, soil analysis was done to the south for a previous project. Native clay soils were found in this area, and therefore no infiltration is modeled or expected for this biofilter. The biofilter will not need a clay liner installed as the native clay soils will act as the liner for this biofilter.

Section 7 Long Term Management Practices

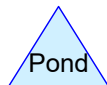
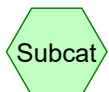
Proper maintenance is essential in sustaining the efficient, safe operation and longevity of the proposed best management practice (BMP). Debris and litter should be removed and properly disposed of monthly to maintain treatment device design and aesthetic appearance. At a minimum, the grass should be mowed to a height of 6 inches once a summer and all undesirable woody vegetation should be removed each year. Vegetation should be inspected for the presence of invasive species such as Reed Canary Grass. If invasive species are incurred, a qualified individual should be contacted to investigate any possible problems. All slopes, inlets and outlets should be inspected for erosion on a bi-annual basis and after large storm events. Any erosion should be repaired using topsoil, seed, fertilizer, and mulch. An erosion mat may also be used if additional protection is needed. The underdrain cleanout should be inspected biannually and used to clear out the under drain if water is not drawing down within 72 hours after a rainfall event.

Section 3:

Pre-Development Runoff Analysis



Pre-development



Routing Diagram for 1-0290-003 HydroCAD
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1-0290-003 HydroCAD

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.803	77	Woods, HSG D, Ch 22 7(c)(2)(A)(b) (1S)

1-0290-003 HydroCAD

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MSE 24-hr 4 1-Year Rainfall=2.11"

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Summary for Subcatchment 1S: Pre-development

Runoff = 0.33 cfs @ 12.38 hrs, Volume= 0.034 af, Depth> 0.51"
Routed to nonexistent node 4L

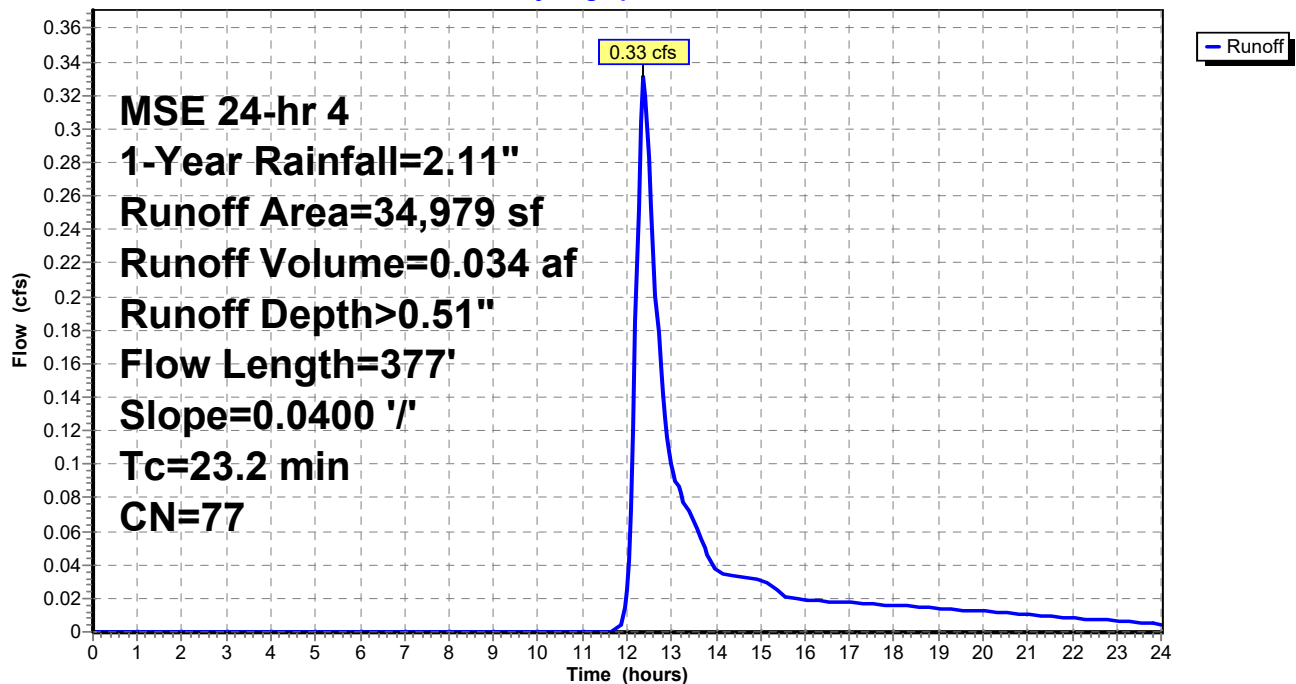
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1-Year Rainfall=2.11"

Area (sf)	CN	Description
* 34,979	77	Woods, HSG D, Ch 22 7(c)(2)(A)(b)
34,979		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.45"
4.6	277	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
23.2	377	Total			

Subcatchment 1S: Pre-development

Hydrograph



1-0290-003 HydroCAD

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MSE 24-hr 4 2-Year Rainfall=2.42"

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Summary for Subcatchment 1S: Pre-development

Runoff = 0.47 cfs @ 12.37 hrs, Volume= 0.046 af, Depth> 0.69"
Routed to nonexistent node 4L

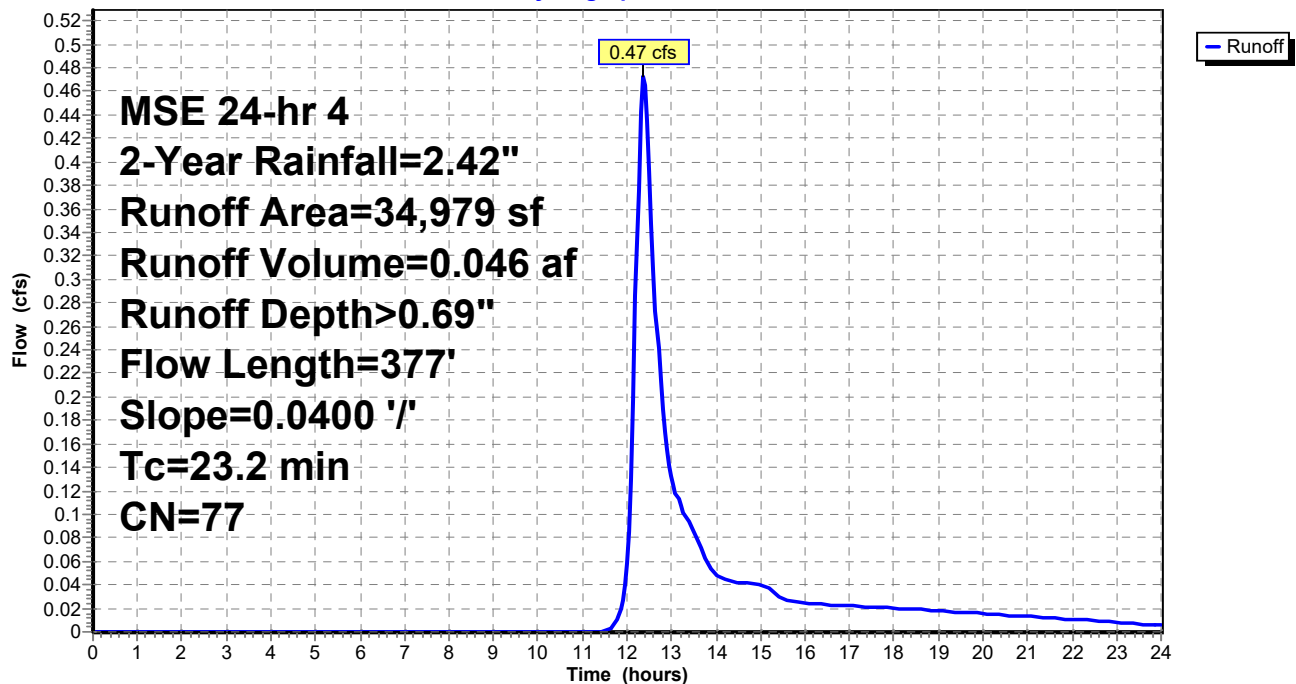
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.42"

Area (sf)	CN	Description
* 34,979	77	Woods, HSG D, Ch 22 7(c)(2)(A)(b)
34,979		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.45"
4.6	277	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
23.2	377	Total			

Subcatchment 1S: Pre-development

Hydrograph



1-0290-003 HydroCAD

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MSE 24-hr 4 10-Year Rainfall=3.48"

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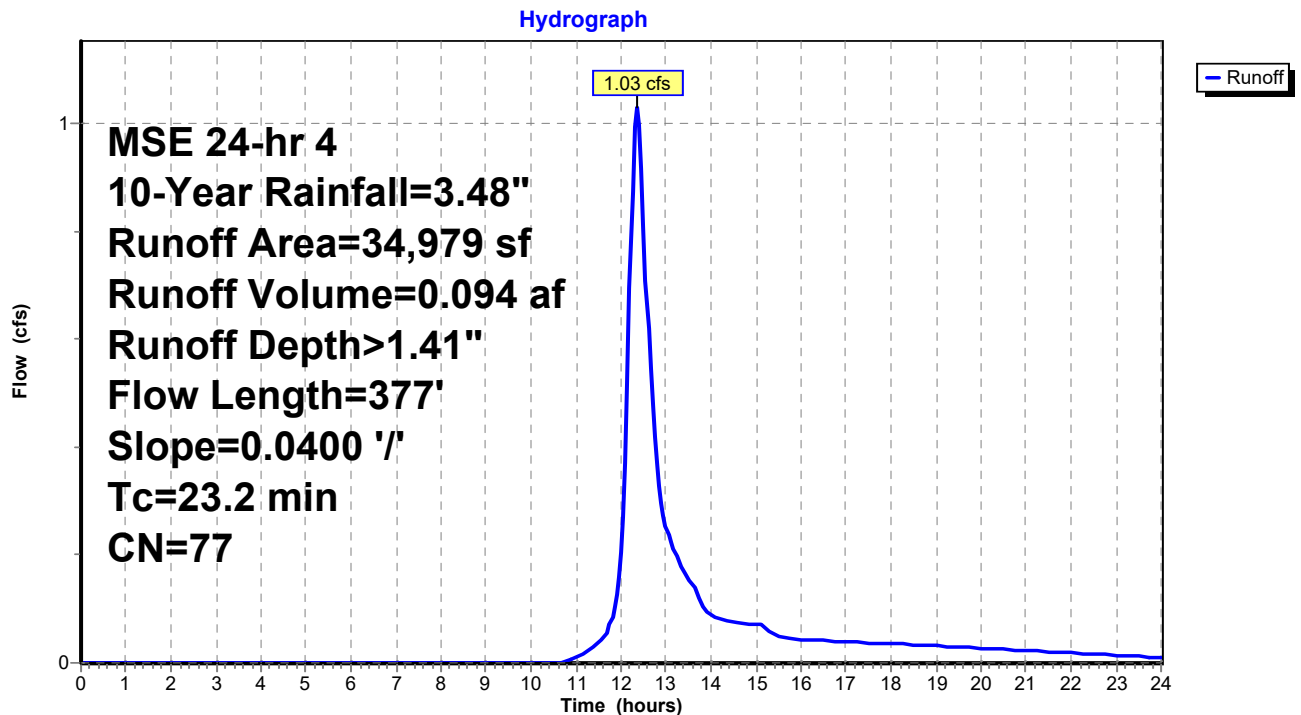
Summary for Subcatchment 1S: Pre-development

Runoff = 1.03 cfs @ 12.35 hrs, Volume= 0.094 af, Depth> 1.41"
Routed to nonexistent node 4L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=3.48"

Area (sf)	CN	Description
* 34,979	77	Woods, HSG D, Ch 22 7(c)(2)(A)(b)
34,979		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.45"
4.6	277	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
23.2	377	Total			

Subcatchment 1S: Pre-development

1-0290-003 HydroCAD

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MSE 24-hr 4 100-Year Rainfall=5.62"

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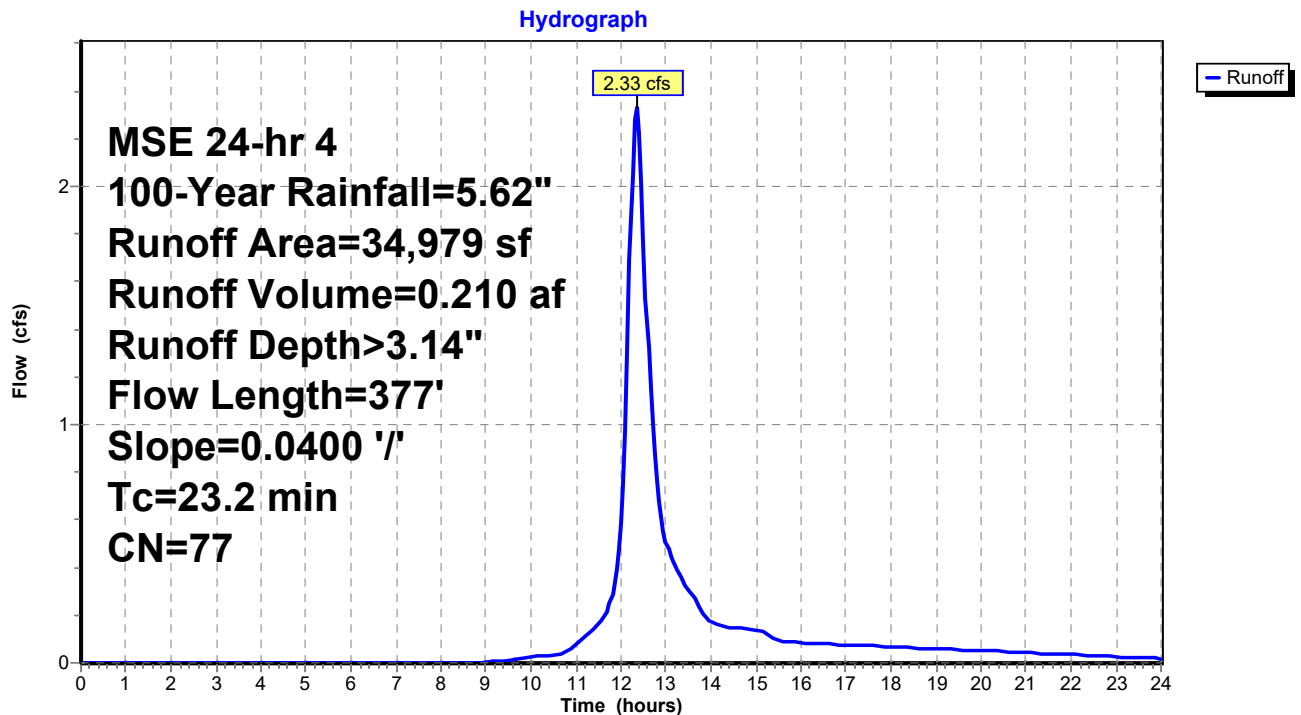
Summary for Subcatchment 1S: Pre-development

Runoff = 2.33 cfs @ 12.34 hrs, Volume= 0.210 af, Depth> 3.14"
Routed to nonexistent node 4L

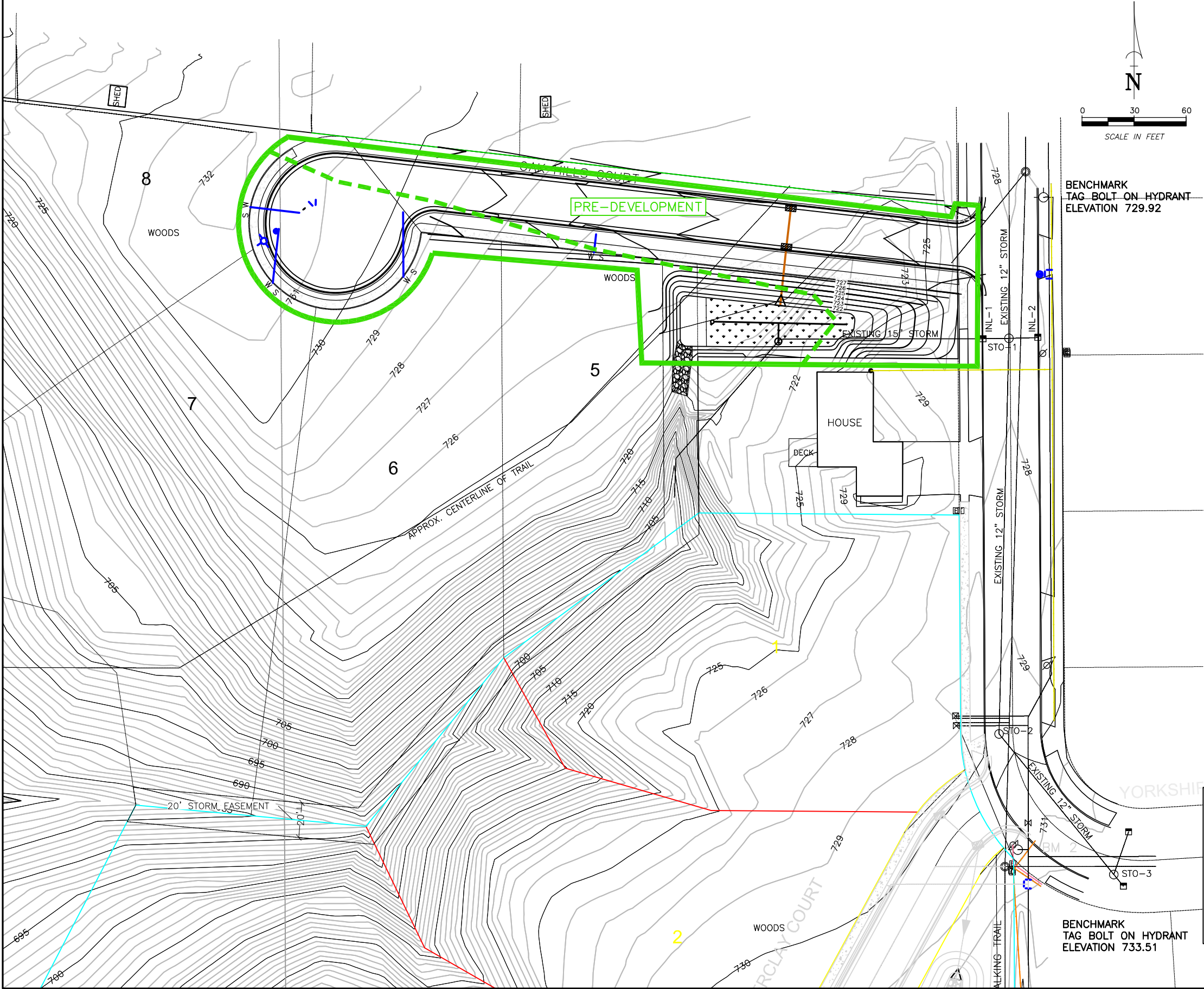
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=5.62"

Area (sf)	CN	Description
* 34,979	77	Woods, HSG D, Ch 22 7(c)(2)(A)(b)
34,979		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.45"
4.6	277	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
23.2	377	Total			

Subcatchment 1S: Pre-development

PRE-DEVELOPMENT



SUBBASIN BOUNDARY
TIME OF CONCENTRATION
FLOW PATH
PRE-DEVELOPMENT
AREA = 0.803 ACRES
TOC = 23.2 MINUTES
CN = 77

TOPOGRAPHIC LEGEND		
1" x 18" IRON PIPE SET 1-1/4" x 30" REBAR SET CHISELED "X" SET 3/4" REBAR FOUND 1" IRON PIPE FOUND 1-1/4" REBAR FOUND 2" IRON PIPE FOUND CHISELED "X" FOUND GOVERNMENT CORNER RECORDED AS CONTOUR W/ ELEVATION SOIL BORING INFILTRATION SOIL BORING TOPSOIL DEPTH CONIFEROUS TREE	DECIDUOUS TREE EXIST. WOODS LINE MAPPED WETLANDS OVERHEAD POWER LINES UNDERGROUND ELECTRIC UNDERGROUND TELEPHONE UNDERGROUND GAS UNDERGROUND CABLE TV EXIST. FENCE LINE SIGN EXIST. HYDRANT POWER POLE GUY LIGHT POLE TELEPHONE PEDESTAL	ELECTRIC PEDESTAL CABLE PEDESTAL WATER VALVE GAS VALVE WATER STOP BOX EXIST. STORM MANHOLE STORM INLET YARD DRAIN EXIST. SANITARY MANHOLE EXIST. SAN. SEWER EXIST. STO. SEWER EXIST. WATER MAIN EXIST. SPOT ELEVATION FIRST FLOOR = 800.00

NOT FOR CONSTRUCTION

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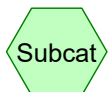
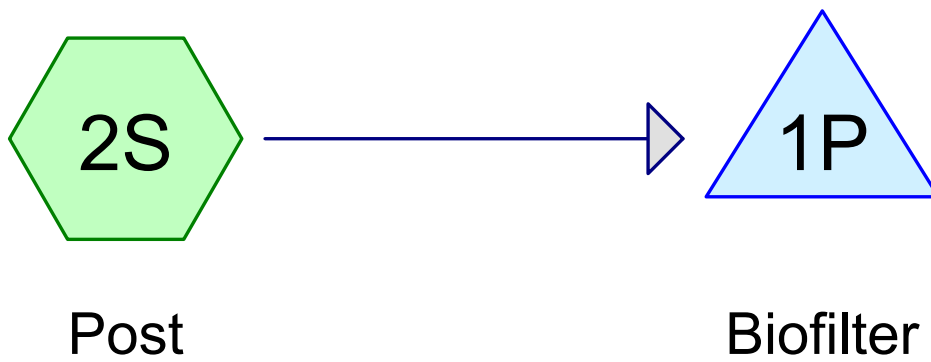
PRE-DEVELOPMENT
GREG LAUER SUBDIVISION
CITY OF KAUKAUNA, OUTAGAMIE COUNTY, WISCONSIN

SCALE	DATE
BAR SCALE	3/27/2025
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Section 4:

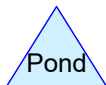
Post-Development Runoff Analysis



Subcat



Reach



Pond



Link

Routing Diagram for 1-0290-003 HydroCAD

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.316	80	>75% Grass cover, Good, HSG D (2S)
0.069	100	Biofilter (2S)
0.356	98	Pavement (2S)
0.062	98	Sidewalk (2S)

1-0290-003 HydroCAD

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MSE 24-hr 4 1-Year Rainfall=2.11"

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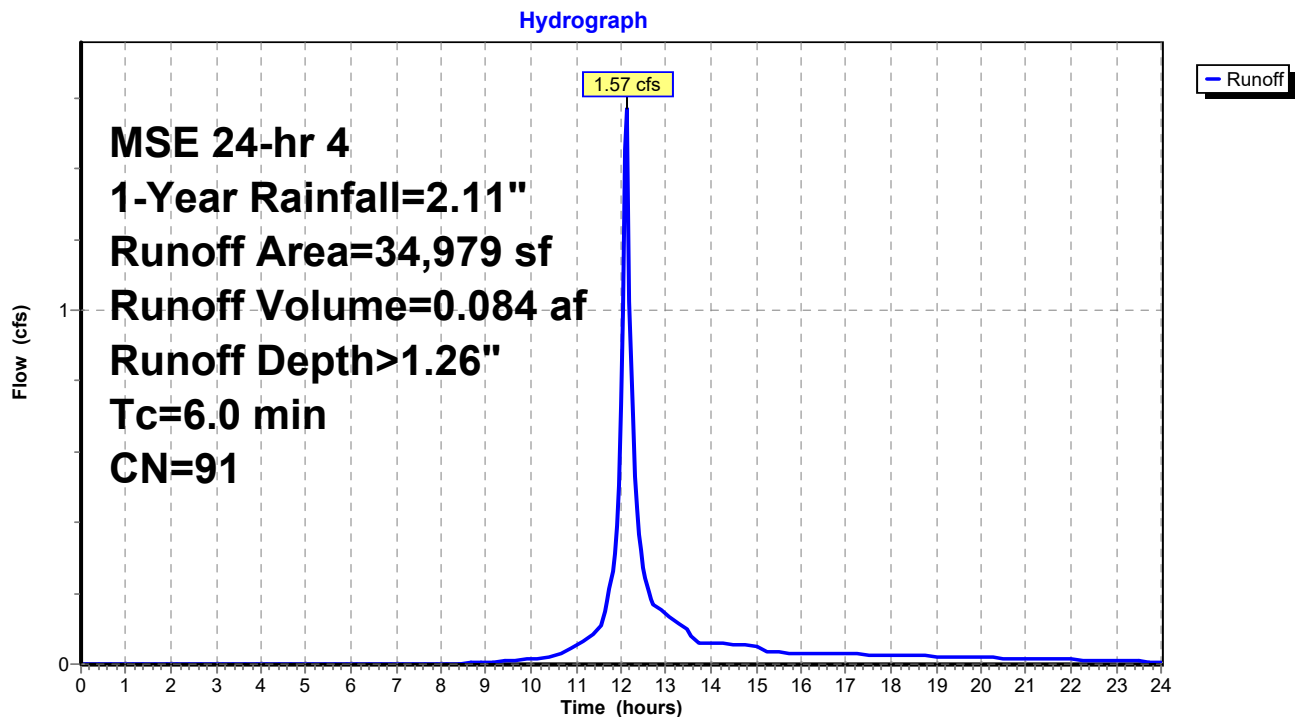
Summary for Subcatchment 2S: Post

Runoff = 1.57 cfs @ 12.13 hrs, Volume= 0.084 af, Depth> 1.26"
Routed to Pond 1P : Biofilter

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1-Year Rainfall=2.11"

	Area (sf)	CN	Description
*	15,507	98	Pavement
*	2,701	98	Sidewalk
*	3,006	100	Biofilter
	13,765	80	>75% Grass cover, Good, HSG D
	34,979	91	Weighted Average
	13,765		39.35% Pervious Area
	21,214		60.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55

Subcatchment 2S: Post

1-0290-003 HydroCAD

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MSE 24-hr 4 1-Year Rainfall=2.11"

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Summary for Pond 1P: Biofilter

Inflow Area = 0.803 ac, 60.65% Impervious, Inflow Depth > 1.26" for 1-Year event
 Inflow = 1.57 cfs @ 12.13 hrs, Volume= 0.084 af
 Outflow = 0.29 cfs @ 12.48 hrs, Volume= 0.079 af, Atten= 81%, Lag= 20.9 min
 Primary = 0.29 cfs @ 12.48 hrs, Volume= 0.079 af
 Routed to nonexistent node 5L
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to nonexistent node 5L

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 719.12' @ 12.48 hrs Surf.Area= 1,943 sf Storage= 1,507 cf

Plug-Flow detention time= 87.9 min calculated for 0.079 af (93% of inflow)
 Center-of-Mass det. time= 54.8 min (861.7 - 806.9)

Volume	Invert	Avail.Storage	Storage Description
#1	716.50'	9,081 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.50	1,943	0.0	0	0
718.00	1,943	27.0	787	787
721.00	1,943	33.0	1,924	2,710
721.25	2,513	100.0	557	3,267
722.00	2,996	100.0	2,066	5,333
723.00	4,500	100.0	3,748	9,081

Device	Routing	Invert	Outlet Devices
#1	Primary	716.50'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 716.50' / 706.00' S= 0.5250 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	716.92'	3.5" Round Dewatering Orifice L= 50.0' Ke= 0.100 Inlet / Outlet Invert= 716.92' / 716.42' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.07 sf
#3	Device 1	721.67'	24.0" Horiz. Drop grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	722.00'	10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

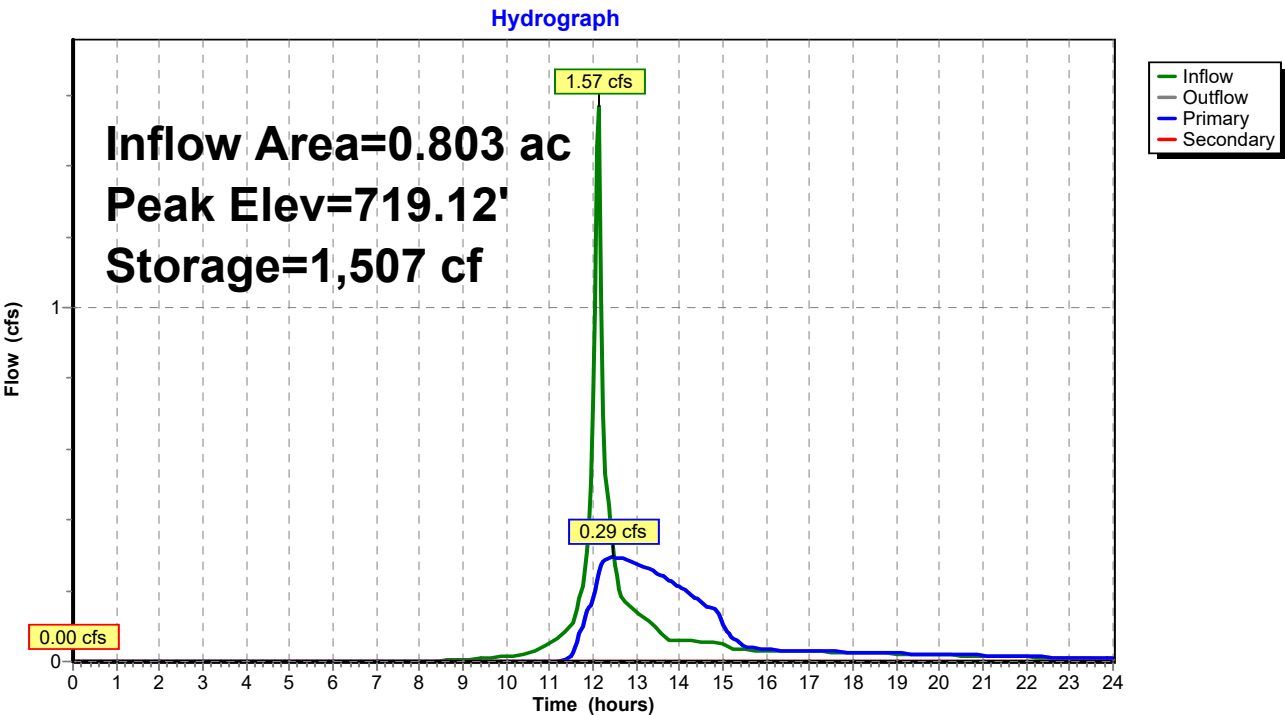
Primary OutFlow Max=0.29 cfs @ 12.48 hrs HW=719.12' (Free Discharge)

↑ **1=Culvert** (Passes 0.29 cfs of 5.51 cfs potential flow)
 ↑ **2=Dewatering Orifice** (Barrel Controls 0.29 cfs @ 4.40 fps)
 ↑ **3=Drop grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=716.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Biofilter



1-0290-003 HydroCAD

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MSE 24-hr 4 2-Year Rainfall=2.42"

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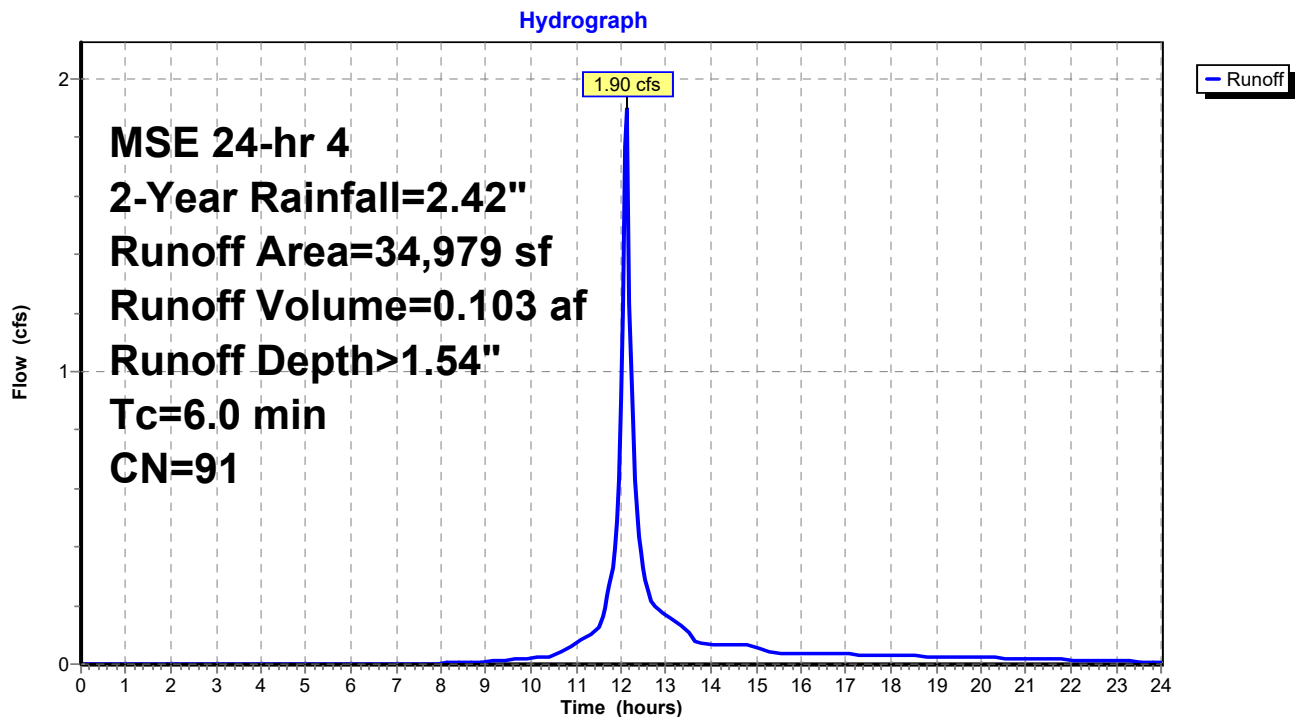
Summary for Subcatchment 2S: Post

Runoff = 1.90 cfs @ 12.13 hrs, Volume= 0.103 af, Depth> 1.54"
Routed to Pond 1P : Biofilter

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.42"

	Area (sf)	CN	Description
*	15,507	98	Pavement
*	2,701	98	Sidewalk
*	3,006	100	Biofilter
	13,765	80	>75% Grass cover, Good, HSG D
	34,979	91	Weighted Average
	13,765		39.35% Pervious Area
	21,214		60.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55

Subcatchment 2S: Post

1-0290-003 HydroCAD

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MSE 24-hr 4 2-Year Rainfall=2.42"

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Summary for Pond 1P: Biofilter

Inflow Area = 0.803 ac, 60.65% Impervious, Inflow Depth > 1.54" for 2-Year event
 Inflow = 1.90 cfs @ 12.13 hrs, Volume= 0.103 af
 Outflow = 0.33 cfs @ 12.50 hrs, Volume= 0.097 af, Atten= 83%, Lag= 22.4 min
 Primary = 0.33 cfs @ 12.50 hrs, Volume= 0.097 af
 Routed to nonexistent node 5L
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to nonexistent node 5L

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 719.69' @ 12.50 hrs Surf.Area= 1,943 sf Storage= 1,869 cf

Plug-Flow detention time= 88.4 min calculated for 0.097 af (94% of inflow)
 Center-of-Mass det. time= 60.1 min (862.4 - 802.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	716.50'	9,081 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.50	1,943	0.0	0	0
718.00	1,943	27.0	787	787
721.00	1,943	33.0	1,924	2,710
721.25	2,513	100.0	557	3,267
722.00	2,996	100.0	2,066	5,333
723.00	4,500	100.0	3,748	9,081

Device	Routing	Invert	Outlet Devices
#1	Primary	716.50'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 716.50' / 706.00' S= 0.5250 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	716.92'	3.5" Round Dewatering Orifice L= 50.0' Ke= 0.100 Inlet / Outlet Invert= 716.92' / 716.42' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.07 sf
#3	Device 1	721.67'	24.0" Horiz. Drop grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	722.00'	10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

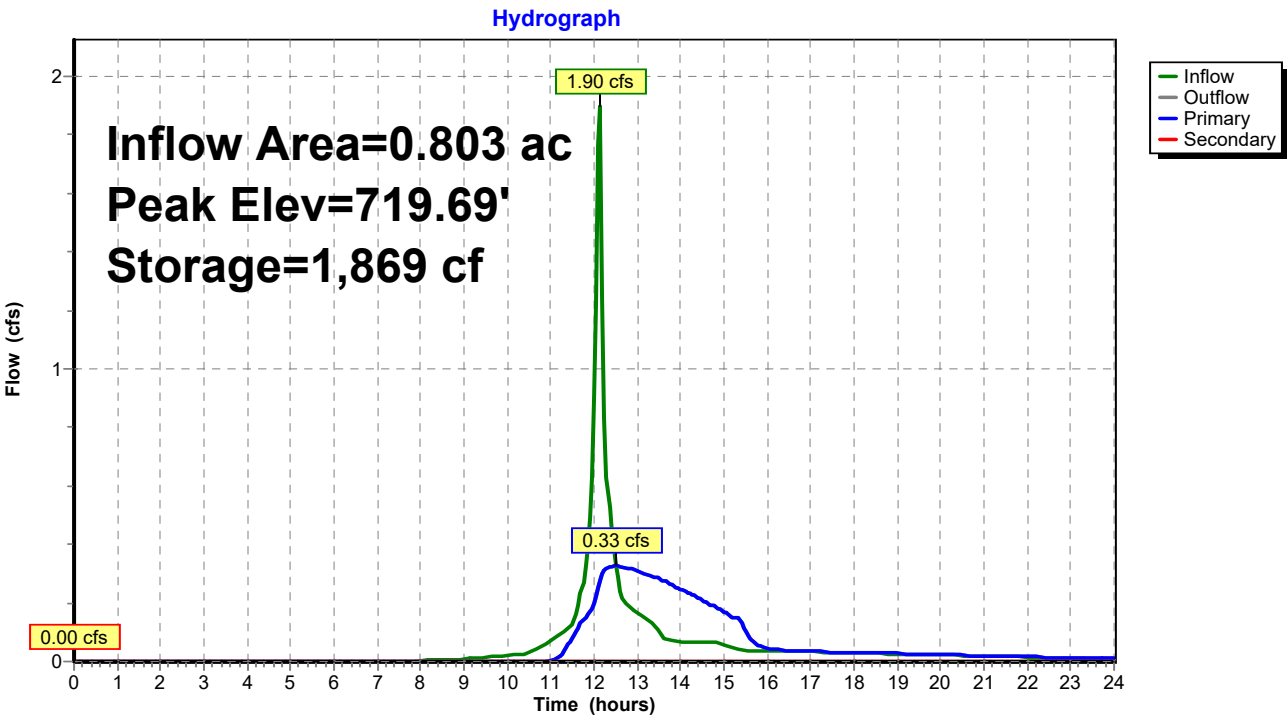
Primary OutFlow Max=0.33 cfs @ 12.50 hrs HW=719.69' (Free Discharge)

↑ **1=Culvert** (Passes 0.33 cfs of 6.20 cfs potential flow)
 ↑ **2=Dewatering Orifice** (Barrel Controls 0.33 cfs @ 4.89 fps)
 ↑ **3=Drop grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=716.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Biofilter



1-0290-003 HydroCAD

Prepared by Martenson & Eisele, Inc

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MSE 24-hr 4 10-Year Rainfall=3.48"

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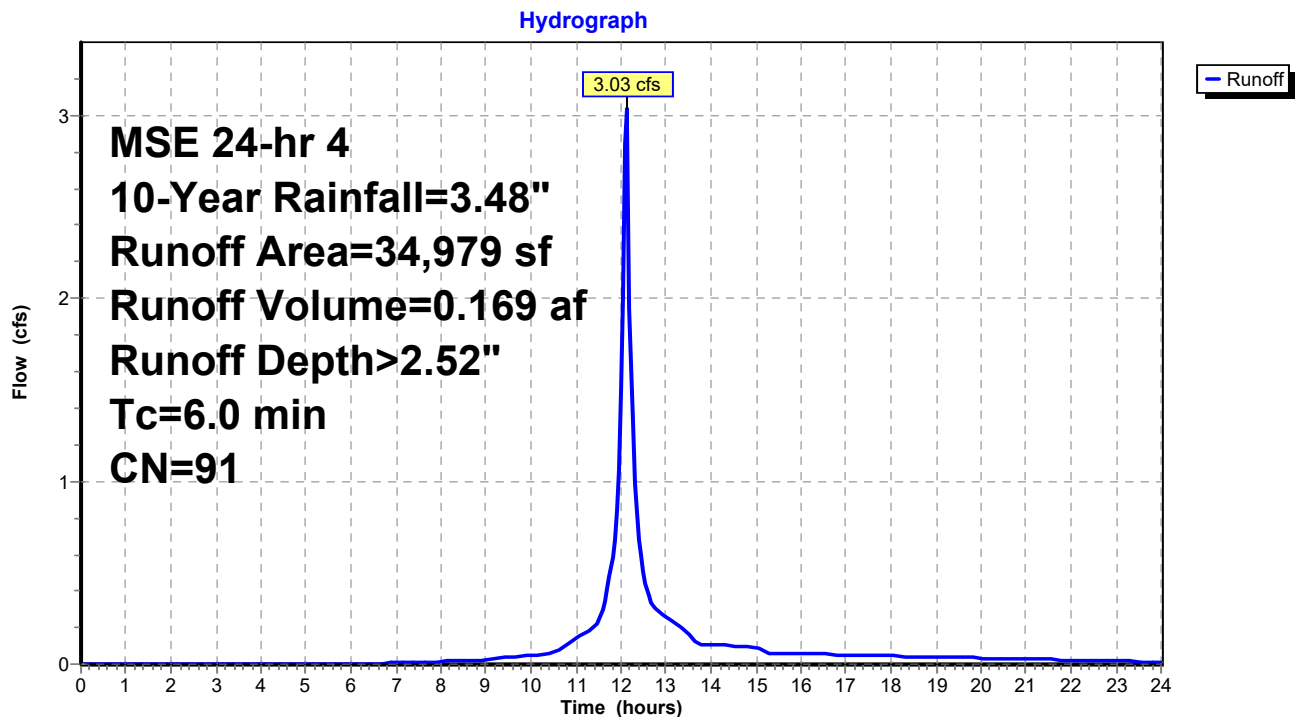
Summary for Subcatchment 2S: Post

Runoff = 3.03 cfs @ 12.13 hrs, Volume= 0.169 af, Depth> 2.52"
Routed to Pond 1P : Biofilter

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=3.48"

	Area (sf)	CN	Description
*	15,507	98	Pavement
*	2,701	98	Sidewalk
*	3,006	100	Biofilter
	13,765	80	>75% Grass cover, Good, HSG D
	34,979	91	Weighted Average
	13,765		39.35% Pervious Area
	21,214		60.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55

Subcatchment 2S: Post

Summary for Pond 1P: Biofilter

Inflow Area = 0.803 ac, 60.65% Impervious, Inflow Depth > 2.52" for 10-Year event
 Inflow = 3.03 cfs @ 12.13 hrs, Volume= 0.169 af
 Outflow = 0.40 cfs @ 12.58 hrs, Volume= 0.163 af, Atten= 87%, Lag= 27.0 min
 Primary = 0.40 cfs @ 12.58 hrs, Volume= 0.163 af
 Routed to nonexistent node 5L
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to nonexistent node 5L

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 721.23' @ 12.58 hrs Surf.Area= 2,467 sf Storage= 3,218 cf

Plug-Flow detention time= 98.4 min calculated for 0.163 af (96% of inflow)
 Center-of-Mass det. time= 79.2 min (869.8 - 790.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	716.50'	9,081 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.50	1,943	0.0	0	0
718.00	1,943	27.0	787	787
721.00	1,943	33.0	1,924	2,710
721.25	2,513	100.0	557	3,267
722.00	2,996	100.0	2,066	5,333
723.00	4,500	100.0	3,748	9,081

Device	Routing	Invert	Outlet Devices
#1	Primary	716.50'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 716.50' / 706.00' S= 0.5250 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	716.92'	3.5" Round Dewatering Orifice L= 50.0' Ke= 0.100 Inlet / Outlet Invert= 716.92' / 716.42' S= 0.0100 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.07 sf
#3	Device 1	721.67'	24.0" Horiz. Drop grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	722.00'	10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.40 cfs @ 12.58 hrs HW=721.23' (Free Discharge)

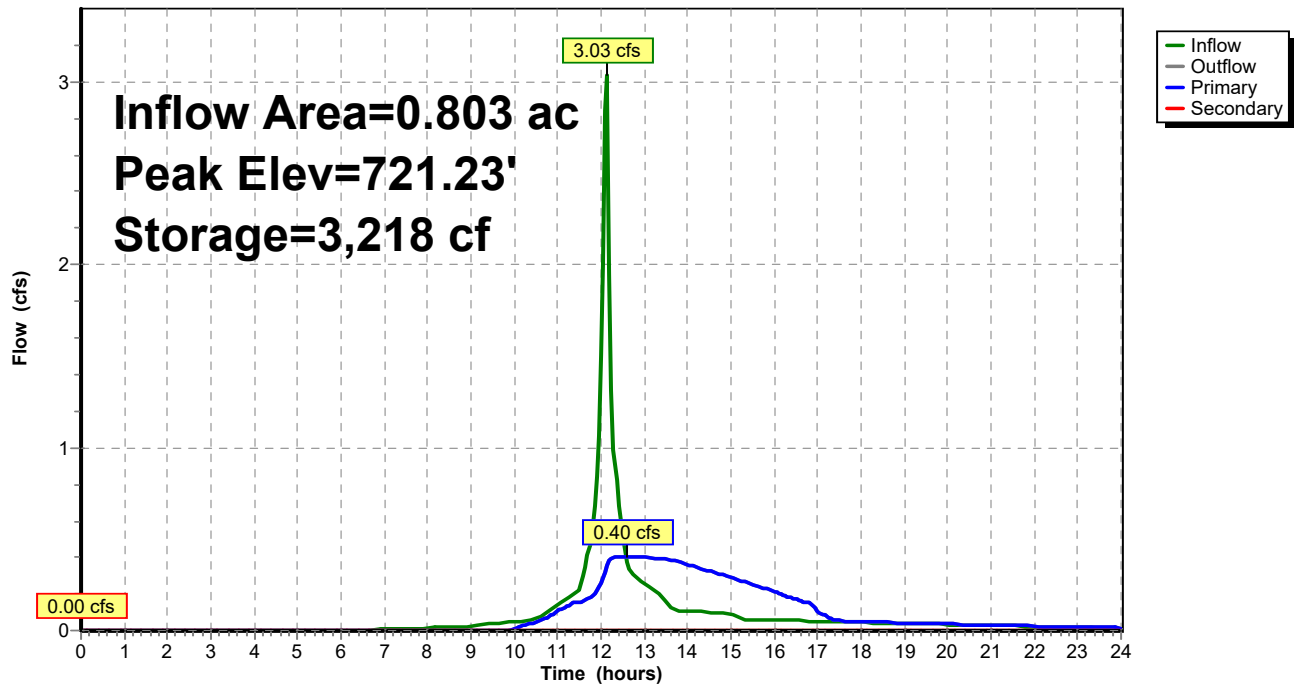
- ↑ **1=Culvert** (Passes 0.40 cfs of 7.78 cfs potential flow)
- ↑ **2=Dewatering Orifice** (Barrel Controls 0.40 cfs @ 6.03 fps)
- ↑ **3=Drop grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=716.50' (Free Discharge)

- ↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Biofilter

Hydrograph



1-0290-003 HydroCAD

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MSE 24-hr 4 100-Year Rainfall=5.62"

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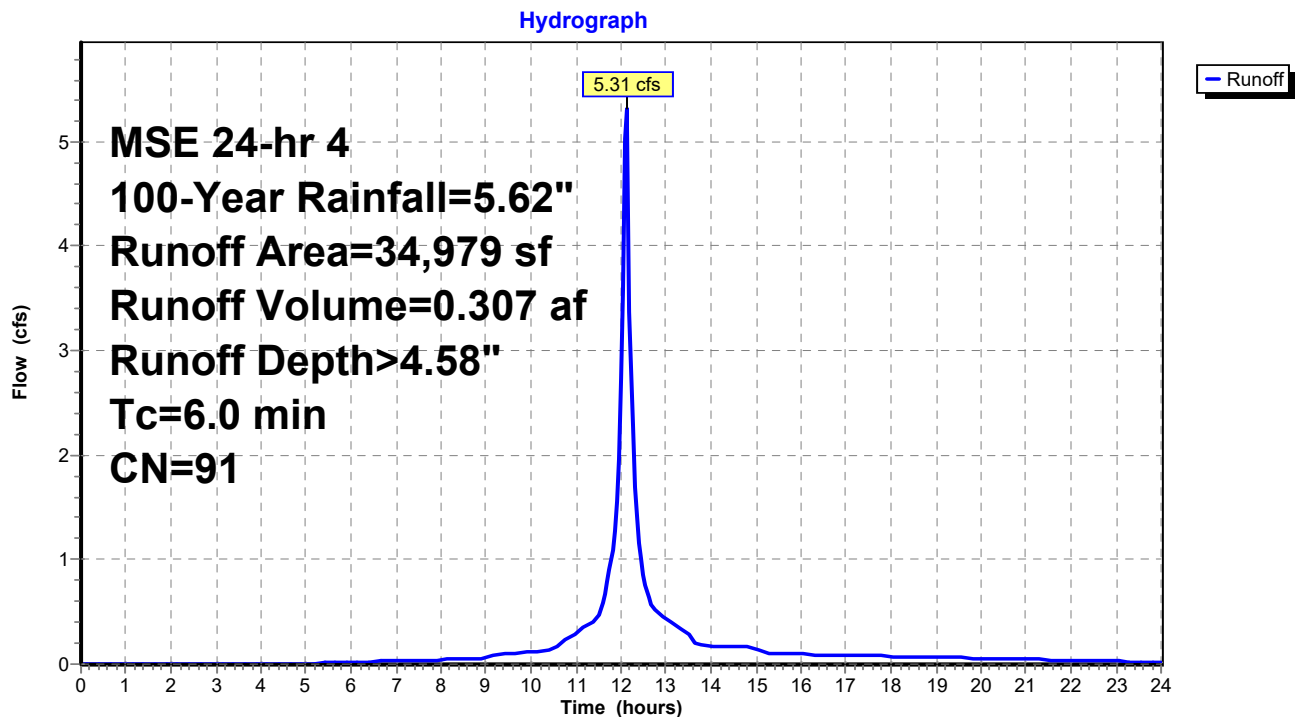
Summary for Subcatchment 2S: Post

Runoff = 5.31 cfs @ 12.13 hrs, Volume= 0.307 af, Depth> 4.58"
Routed to Pond 1P : Biofilter

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=5.62"

	Area (sf)	CN	Description
*	15,507	98	Pavement
*	2,701	98	Sidewalk
*	3,006	100	Biofilter
	13,765	80	>75% Grass cover, Good, HSG D
	34,979	91	Weighted Average
	13,765		39.35% Pervious Area
	21,214		60.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55

Subcatchment 2S: Post

Summary for Pond 1P: Biofilter

Inflow Area = 0.803 ac, 60.65% Impervious, Inflow Depth > 4.58" for 100-Year event
 Inflow = 5.31 cfs @ 12.13 hrs, Volume= 0.307 af
 Outflow = 2.48 cfs @ 12.26 hrs, Volume= 0.301 af, Atten= 53%, Lag= 7.7 min
 Primary = 2.48 cfs @ 12.26 hrs, Volume= 0.301 af
 Routed to nonexistent node 5L
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to nonexistent node 5L

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 721.88' @ 12.26 hrs Surf.Area= 2,922 sf Storage= 4,992 cf

Plug-Flow detention time= 96.8 min calculated for 0.301 af (98% of inflow)
 Center-of-Mass det. time= 85.0 min (861.8 - 776.8)

Volume	Invert	Avail.Storage	Storage Description	
#1	716.50'	9,081 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.50	1,943	0.0	0	0
718.00	1,943	27.0	787	787
721.00	1,943	33.0	1,924	2,710
721.25	2,513	100.0	557	3,267
722.00	2,996	100.0	2,066	5,333
723.00	4,500	100.0	3,748	9,081

Device	Routing	Invert	Outlet Devices
#1	Primary	716.50'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 716.50' / 706.00' S= 0.5250 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	716.92'	3.5" Round Dewatering Orifice L= 50.0' Ke= 0.100 Inlet / Outlet Invert= 716.92' / 716.42' S= 0.0100 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.07 sf
#3	Device 1	721.67'	24.0" Horiz. Drop grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	722.00'	10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

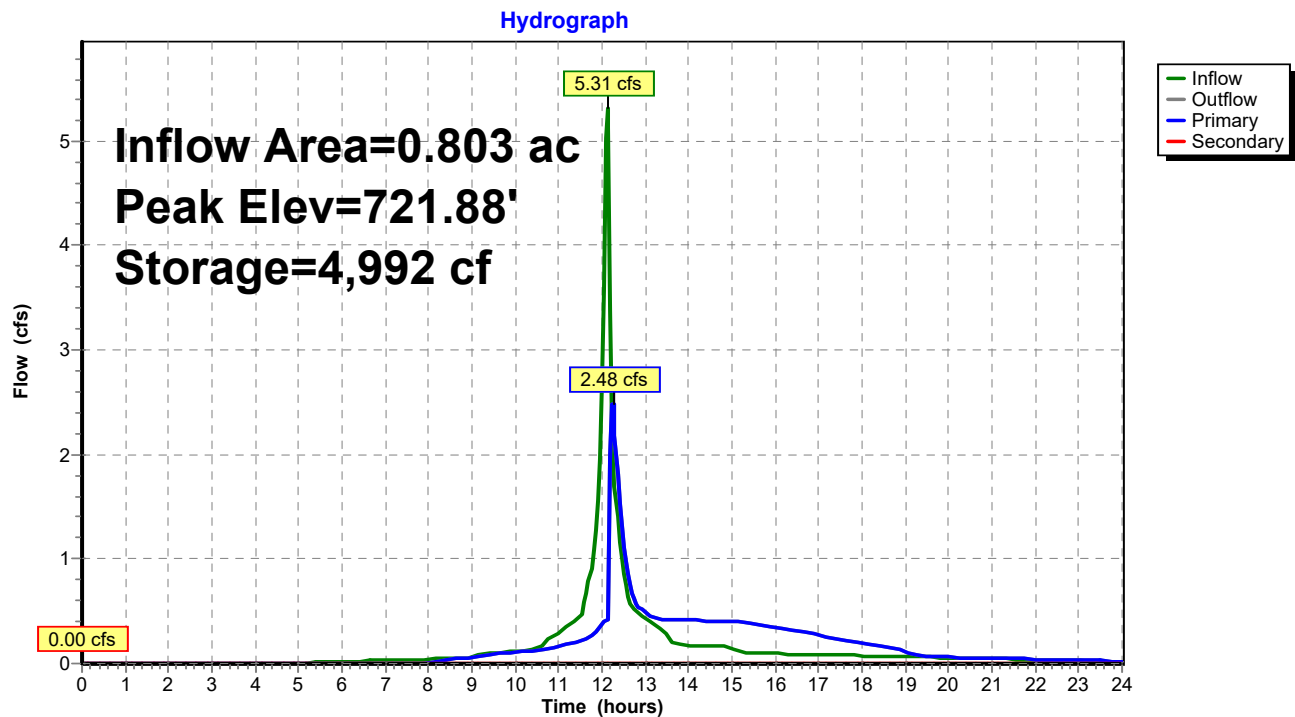
Primary OutFlow Max=2.43 cfs @ 12.26 hrs HW=721.88' (Free Discharge)

- ↑ **1=Culvert** (Passes 2.43 cfs of 8.36 cfs potential flow)
- ↑ **2=Dewatering Orifice** (Barrel Controls 0.43 cfs @ 6.45 fps)
- ↑ **3=Drop grate** (Weir Controls 2.00 cfs @ 1.50 fps)

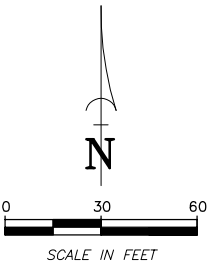
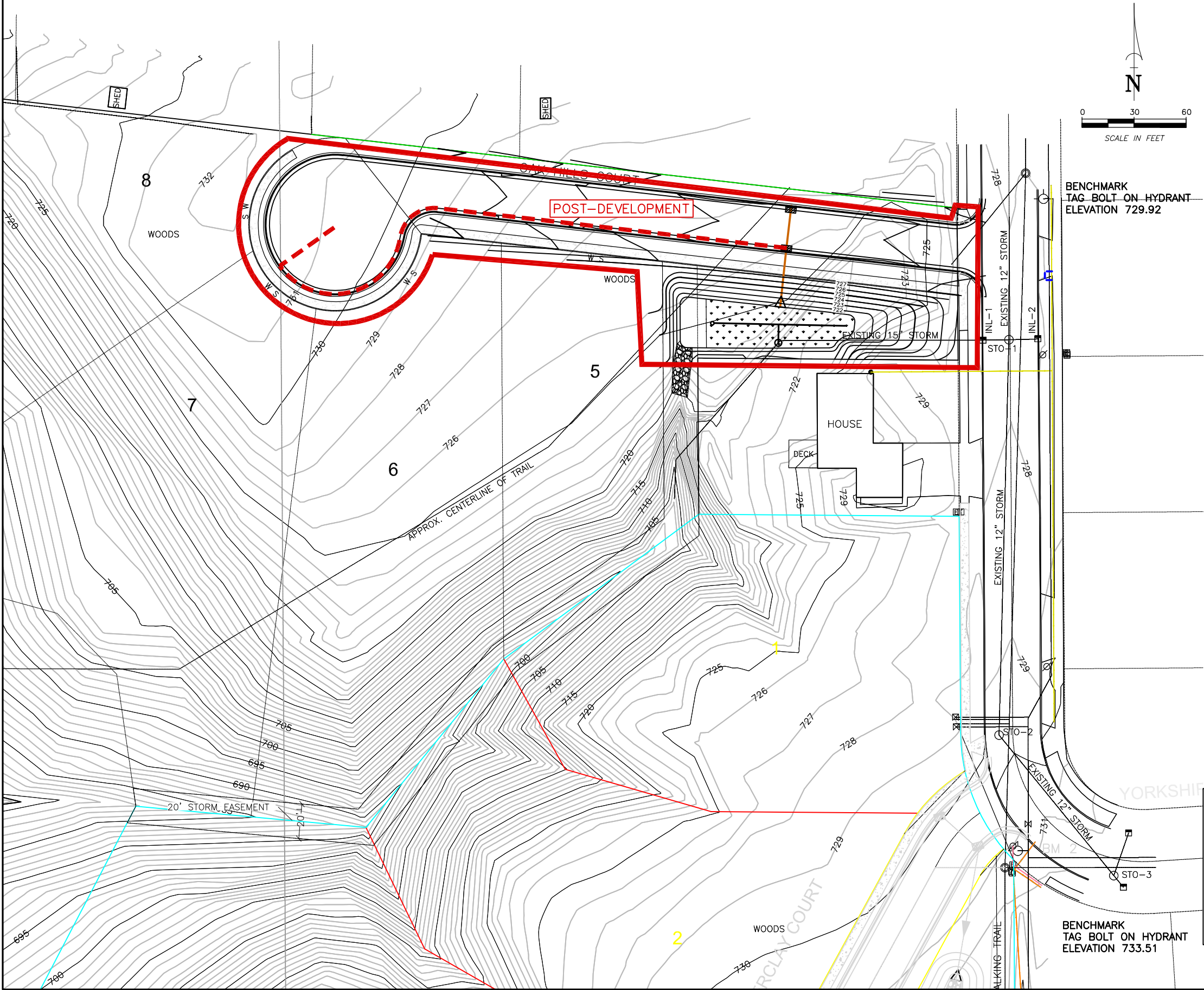
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=716.50' (Free Discharge)

- ↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Biofilter



POST-DEVELOPMENT



SUBBASIN BOUNDARY
TIME OF CONCENTRATION
FLOW PATH

POST UNCAPTURED
AREA = 0.803 ACRES
TOC = 6.0 MINUTES*
CN = 91

*TR-55 MINIMUM

1" x 18" IRON PIPE SET 1-1/4" x 30" REBAR SET CHISELED "X" SET 3/4" REBAR FOUND 1" IRON PIPE FOUND 1-1/4" REBAR FOUND 2" IRON PIPE FOUND CHISELED "X" FOUND GOVERNMENT CORNER RECORDED AS CONTOUR W/ ELEVATION SOIL BORING INFILTRATION SOIL BORING TOPSOIL DEPTH CONIFEROUS TREE	DECIDUOUS TREE EXIST. WOODS LINE MAPPED WETLANDS OVERHEAD POWER LINES UNDERGROUND ELECTRIC UNDERGROUND TELEPHONE UNDERGROUND GAS UNDERGROUND CABLE TV EXIST. FENCE LINE SIGN EXIST. HYDRANT POWER POLE GUY LIGHT POLE TELEPHONE PEDESTAL	ELECTRIC PEDESTAL CABLE PEDESTAL WATER VALVE GAS VALVE WATER STOP BOX EXIST. STORM MANHOLE STORM INLET YARD DRAIN EXIST. SANITARY MANHOLE EXIST. SAN. SEWER EXIST. STO. SEWER EXIST. WATER MAIN EXIST. SPOT ELEVATION FIRST FLOOR = 800.00
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NOT FOR CONSTRUCTION

Martenson & Eisele, Inc.

Planning
Environmental
Surveying
Engineering
Architecture

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920.731.0381 1.800.236.0381

DRAWN BY	RPP	DATE	NO.	FIELDWORK	JFS	APPROVED	JUR	REVISION

POST-DEVELOPMENT

GREG LAUER SUBDIVISION

CITY OF KAUKAUNA, OUTAGAMIE COUNTY, WISCONSIN

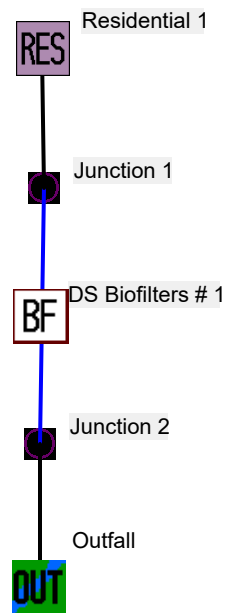
SCALE	DATE
BAR SCALE	3/27/2025
COMPUTER FILE	
Civil3D\Eng11-0290-003de.dwg	

DRAWING NO.

C3.1

Section 5:

Water Quality Analysis/WinSLAMM



Data file name: Q:\1-0290-003 Lauer peters road kaukauna\WinSLAMM\1-0290-003 Model.mdb
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Green Bay WI 1969.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppd
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/02/69 Study period ending date: 12/28/69
Start of Winter Season: 11/25 End of Winter Season: 03/29
Date: 05-05-2025 Time: 13:19:12
Site information:

LU# 1 - Residential: Residential 1 Total area (ac): 0.803
31 - Sidewalks 1: 0.062 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.356 ac. Smooth Street Length = 0.113 mi Street Width = 25.99115 ft Street Edges = 2
Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.316 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.069 ac. PSD File: Source Area PSD File:

Control Practice 1: Biofilter CP# 1 (DS) - DS Biofilters # 1

1. Top area (square feet) = 2996
2. Bottom area (square feet) = 1943
3. Depth (ft): 6.5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 1.5
10. Porosity of rock filled volume = 0.6
11. Engineered soil infiltration rate: 3.7
12. Engineered soil depth (ft) = 3
13. Engineered soil porosity = 0.6
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil
 Sand 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 5.5

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 2
2. Stand pipe height above datum (ft): 5

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.29
2. Invert elevation above datum (ft): 0.42
3. Number of underdrain outlets: 1

Outlet type: Evapotranspiration

Month Number	Month	Evapotranspiration (in/day)	Evaporation (in/day)
1	January	.01	.
2	February	.02	.
3	March	.05	.
4	April	.14	.
5	May	.16	.
6	June	.24	.
7	July	.25	.
8	August	.16	.
9	September	.13	.
10	October	.06	.
11	November	.02	.
12	December	.01	.

1. Saturated Soil Moisture Content: 0.6
2. Soil Field Moisture Capacity (% of Soil Dry Weight): 0.2
3. Permanent Wilting Point (% of Soil Dry Weight): 0.08
4. Supplemental Irrigation Used= False
- 4a. Fraction of available capacity when irrigation starts = 0
- 4b. Fraction of available capacity when irrigation stops = 0
- 5a. First area of biofilter that is vegetated (fraction): 1
- 5b. Second area of biofilter that is vegetated (fraction): 0
- 5c. Third area of biofilter that is vegetated (fraction): 0
- 5d. Fourth area of biofilter that is vegetated (fraction): 0
- 6a. First plant type: 4
- 6b. Second plant type: 0
- 6c. Third plant type: 0
- 6d. Fourth plant type: 0
- 7a. First root depth (ft): 1
- 7b. Second root depth (ft): 0
- 7c. Third root depth (ft): 0
- 7d. Fourth root depth (ft): 0
- 8a. First ET adjustment factor for actual crop (decimal): 0.65
- 8b. Second ET adjustment factor for actual crop (decimal): 0
- 8c. Third ET adjustment factor for actual crop (decimal): 0
- 8e. Fourth ET adjustment factor for actual crop (decimal): 0

Data file name: Q:\1-0290-003 Lauer peters road kaukauna\WinSLAMM\1-0290-003 Model.mdb
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Green Bay WI 1969.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/02/69 Study period ending date: 12/28/69
Start of Winter Season: 11/25 End of Winter Season: 03/29
Model Run Start Date: 01/02/69 Model Run End Date: 12/28/69
Date of run: 05-05-2025 Time of run: 13:20:44
Total Area Modeled (acres): 0.803
Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	34638	-	201.2	435.0	-
Outfall Total with Controls:	30466	12.04%	47.07	89.52	79.42%
Annualized Total After Outfall Controls:	30889			90.77	

Pollutant	Conc. No Controls	Conc. With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units	Percent Reduction
Particulate Solids	201.2	47.07	mg/L	435.0	89.52	lbs	79.42 %
Total Phosphorus	0.6086	0.2393	mg/L	1.316	0.4551	lbs	65.42 %

Biofilter # 1: Never. Percent Solids Reduction due to Engineered Media Not Used

Section 6: Erosion Control Plan

CONSTRUCTION SITE EROSION CONTROL PLAN

Project: St Francis of Assisi Parish, City of Manitowoc, Manitowoc County

Project Number: 1-1961-001

Date: March 18, 2025

Prepared By: Richard Perschon, E.I.T.

Site Description and Nature of the Construction Activity:

Developer Greg Lauer is proposing building a new street in the city of Kaukauna. It will consist of a short street with a cul-de-sac, curb and gutter, and a sidewalk. This street will provide access to four newly created lots. All the lots are very hilly and make stormwater management difficult. All the existing runoff flows down into a natural trench that flows into a nearby river.

A new biofilter installed on a nearby empty lot will provide some quantity and quality control for the street and sidewalk. There is 15,500 sq. ft. of street pavement and 2,720 sq. ft. of sidewalk that will flow into the proposed biofilter.

The current site consists of a flatter area at the top and steep slopes to the south and west. The entire area is wooded. All the runoff flows down the steep slopes and into a wetland area that is connected to Kankapot Creek.

The site is located north of CTH CE, east of Kankapot Creek, south and west of Peters Road. This project is located on a 17.45-acre parcel in the City of Kaukauna, Outagamie County, Wisconsin. The legal description of the parcel is as follows:

PRT LOT 1 CSM 3921 LESS CSM 7178 & 7177

(The sequence of major soil disturbing activities is on the following page.)

Sequence of Major Soil Disturbing Activities: This sequence is approximate. Construction items listed may be done concurrently.

Construction Date	Construction Item
July 2025	1. Pre-Construction Meeting
July 2025	2. Installation of Silt Fence
July 2025	3. Installation of Rock Tracking Pad
July 2025	4. Installation of Inlet Protection
July 2025	5. Tree Removal, Grubbing, and Topsoil Stripping
August 2025	6. Install Biofilter and Additional Inlet Protection
August 2025	7. Install Sanitary and Water Mains
August 2025	8. Rough Grading
August 2025	9. Base Course Placement & Fine Grading
September 2025	10. Paving of Roadway
September 2025	11. Provide Restoration for All Disturbed Areas
November 2025	12. Removal of Temporary Erosion Control Measures
Ongoing	13. Maintenance Plan

Estimate of total site area and total area of site that is expected to be disturbed during construction:

Approximately 0.95 acres are expected to be disturbed to subgrade (soil exposed) during construction.

Site Characteristics:

The current site consists of a flatter area at the top and steep slopes to the south and west. The entire area is wooded. All the runoff flows down the steep slopes and into a wetland area that is connected to Kankapot Creek.

Existing soil data:

Bc (Bellevue silt loam, 0-2% slopes): The Bc soil type is deep, moderately well drained in stratified loamy alluvium. Infiltration rates are moderately high (0.20 in/hr to 0.60 in/hr). Depth to water table is 24 to 48 inches and the available water supply is high. Hydrologic soil type C.

WnB (Winneconne silty clay loam, 2-6% slopes): The WnB soil type is deep, well drained in calcareous clayey lacustrine deposits. Infiltration rates are very low (0.00 in/hr). Depth to water table is 60 to 80 inches and the available water supply is moderate. Hydrologic soil type D.

Name of immediate named receiving water from the United States Geological Service 7.5 minute series topographic maps or other appropriate sources.

All water from this site will flow into Kankapot Creek. This creek discharges north into the Fox River.

The sequences of major activities which disturb soils for major portions of the site are:

1. Pre-Construction Meeting

The Contractor will call a pre-construction conference with the Owner, Owner's representative, and appropriate municipal officials to coordinate the schedule and activities.

Erosion barriers must be installed before any work begins, as per the erosion control plan, to prevent sediment from leaving the site. These barriers include buffer zones, soil stabilization, silt fences, sandbag culvert checks, and straw bale barriers, as shown on the plan. Remaining vegetation will filter much of the disturbed area. Any sediment leaving the site due to the Contractor's negligence, including mud tracked by construction vehicles, must be cleaned up daily. Topsoil piles left inactive for 7 or more days must be seeded, mulched, and surrounded by silt fences or other approved BMPs. All BMPs must remain in place and be maintained until final stabilization is achieved.

2. Installation of Silt Fence

Silt fences must be installed before land disturbance begins and maintained until disturbed upslope areas are stabilized by permanent BMPs. Installation must follow WDNR technical standard 1056, including specifications for shape, height, support, attaching, entrenching, fabric, spacing, and maintenance. Silt fences must be WisDOT approved with upper cord reinforcement.

3. Installation of Rock Tracking Drive

The Contractor shall construct and maintain two gravel entrances to control sediment tracking, constructed per WDNR code 1057. These entrances must be maintained throughout construction. The temporary stone tracking pad shall be placed as shown on the erosion control plan. Sediment must not be tracked over non-construction areas.

4. Installation of Inlet Protection

Inlet protection shall be installed on existing storm sewer inlets. Inlet protection shall be installed per WDNR code 1060. Type of inlet protection should match inlet casting as indicated on the plan sheets. The contractor is responsible for changing inlet protection if they become damaged.

5. Tree Removal, Grubbing, and Topsoil Stripping

Before constructing sewers and water mains, the driveway to be constructed must be cleared of trees and vegetation, and the topsoil stripped and stockpiled for later restoration. Erosion barriers must be installed before any work begins, as per the erosion control plan, to prevent sediment from leaving the site. These barriers include buffer zones, soil stabilization, silt fences, sandbag culvert checks, and straw bale barriers, as shown on the plan. Remaining vegetation will filter much of the disturbed area.

Any sediment leaving the site due to the Contractor's negligence, including mud tracked by construction vehicles, must be cleaned up daily. Topsoil piles left inactive for 7 or more days must be seeded, mulched, and surrounded by silt fences or other approved BMPs. All BMPs must remain in place and be maintained until final stabilization is achieved.

6. Install Biofilter and Additional Inlet Protection

The biofilter will be constructed according to WDNR Technical Standard 1004 and applicable state and local specifications. Any sediment leaving the site due to the Contractor's negligence, including mud tracked by construction vehicles, must be cleaned up promptly. Trench dewatering, if necessary, must follow DNR Technical Standard 1061.

Inlet protection shall be installed on the new storm sewer inlets. Inlet protection shall be installed per WDNR code 1060. Type of inlet protection should match inlet casting as indicated on the plan sheets. The contractor is responsible for changing inlet protection if they become damaged.

7. Install Sanitary and Water Mains

Sewer and structure/pipe installation will follow state and local specifications. Any sediment leaving the site due to the Contractor's negligence, including mud tracked by construction vehicles, must be cleaned up promptly. Trench dewatering, if necessary, must follow DNR Technical Standard 1061.

8. Rough grading

The exiting clayey soils shall be graded in preparation for base course addition. Excess dust must be controlled per WDNR Technical Standard 1068.

9. Base Course Placement & Fine Grading

The road area will be graveled per the typical cross-section. Excess dust must be controlled per WDNR Technical Standard 1068. Any sediment leaving the site due to the Contractor's negligence, including mud tracked by construction vehicles, must be cleaned up daily.

10. Paving of Roadway

The road will be paved per the typical cross-section.

11. Provide Restoration for All Disturbed Areas

The contractor must seed, fertilize, and mulch grassed and landscaped areas within 7 days, as shown on the plans. After vegetation stabilizes, all temporary silt fences must be removed. Permanent seeding must be completed by September 15th, with grass and legume mixtures seeded before July 15th. Mulch must be anchored in place by an approved method (crimping, tackifier, etc.). Dormant seeding is prohibited from September 15th to November 15th and on slopes greater than 6% or near streams, lakes, or channels. Dormant seeded areas will be re-seeded as necessary for dense coverage. All seeding must follow WDNR Technical Standards 1058 and 1059.

12. Remove Temporary Erosion Control After Grass is Established

Once vegetation stabilizes, the contractor must remove all temporary erosion control measures.

13. Maintenance Plan

The contractor must designate an individual responsible for the maintenance plan and maintain all BMPs on site. The permit and Erosion Control and Storm Water Management Plan must be kept on site. Inspections are required weekly and within 24 hours after a ½" rainfall or any land disturbance activities. The responsible person must maintain BMPs and inspection reports, keeping all reports on site in a disclosed location. Ultimately, the owner is responsible for ensuring BMPs are maintained, and inspections are performed.

The site will be protected from erosion by the following practices:

Throughout the duration of the project any sediment found to have left the site due to Contractor's negligence, including tracking of mud from construction vehicles, shall be promptly cleaned up by the **Contractor**.

1. Silt Fence: Install silt fence at all locations as shown on the plans. Fence shall be installed prior to any soil disturbance, including clearing and grubbing of trees. Silt fence shall be WisDOT approved for use on silty soils and installed in accordance with WDNR Technical Standard 1056. Silt fence shall have upper cord reinforcement.
2. Stone Tracking Pad: Stone tracking pads shall be constructed per WDNR Technical Standard 1057 at each construction entrance/exit to the development. Tracking pads shall be a minimum of 12" thick and 50' long constructed of 3"-6" washed/clear crushed aggregate. Flushing of sediment into storm inlets or road ditches is not permitted.
3. Stockpiling: Stockpile locations shall be approved by the project engineer in writing prior to placement. The following provisions shall be followed for all stockpiles:
 - a. All storage piles shall be placed a minimum of 25 feet from a protected inlet or drainage ditches. Planned inlets must be taken into consideration when placing stockpiles.
 - b. Stockpiles shall be stabilized by temporary seeding/mulching immediately following placement if they are to be existence for 7 days or more. Stockpiles expected to be in place for more than 1 year shall be seeded with a permanent seed mix.
 - c. Silt fence shall be placed on the down slope side of all piles as directed by the project engineer.
 - d. Any disturbed soil remaining after removal of stockpiles shall be permanently seeded/mulched.
4. Temporary Seeding: Sediment basins, soil stockpiles and all other areas out of the day-to-day construction area that are disturbed and to be left inactive for more than 7 days shall be temporarily seeded and mulched. Temporary seeding and mulching shall be per WDNR Technical Standards 1059 and 1058.
5. Erosion Control Mat: Install and maintain erosion control mat at locations shown on the Erosion Control Plan or as the Engineer/Erosion Control Inspector directs. Erosion control mat placed outside of channel areas shall be WisDOT Type I, Class

A. These erosion control mats shall be installed per WDNR Technical Standard 1052. Erosion control mat located within channel areas shall be WisDOT Type I, Class B unless otherwise stated on the Erosion Control Plan or by the Project Engineer. These erosion control mats shall be installed per WDNR Technical Standard 1053.

6. Inlet Protection: All inlets shall be protected throughout the project. See WDNR Code 1060 for product requirements.

Sediment barriers may need to be removed and reinstalled throughout construction to accommodate machinery, etc. When barriers are removed, they shall be reinstalled as soon as construction in that area allows, but in no case shall an inlet be left unprotected at the end of the workday. Protection shall remain in place until the adjacent areas are stabilized with established vegetation.

Note: Any pumping of water from the site at any time shall be done in accordance with WDNR Technical Standard 1061 and require the use of silt bags or alternate methods to prevent silt from leaving the site. Pumping shall be done from the surface down.

General Notes:

1. All waste and unused construction materials shall be properly disposed of and not allowed to be carried by runoff into the storm sewer system.
2. If dewatering is needed, the Contractor shall perform dewatering in accordance with WDNR Technical Standard 1061 and direct the water to a protected inlet, sedimentation areas, or use other measures which the Erosion Control Inspector approves.
3. All off-site sediment deposits occurring as a result of a storm event shall be cleaned up by the end of the next workday. All off-site sediment deposits as a result of construction activities shall be cleaned up by the end of that workday.
4. All activities shall be conducted in a logical sequence to minimize the area of bare soil exposed at any one time.
5. Disturbed soil outside of the day-to-day construction areas shall be stabilized by mulching, temporary seeding, sodding, covering with tarps, chemical tackifiers or equivalent control measures approved by the Erosion Control Inspector.
6. The Contractor shall be responsible for installation, maintenance, and removal of all erosion control devices that he installs and also assumes responsibility for maintenance of erosion control devices already in place.
7. The Contractor shall repair any siltation or erosion damage to adjoining surfaces and drainage ways resulting from land disturbing activities.
8. The Contractor shall allow the Engineer and Erosion Control Inspector to enter the site for the purpose of inspecting for compliance with the erosion control ordinance or for performing any work necessary to bring the site into compliance with the ordinance.
9. The Erosion Control Inspector may order land-disturbing activity halted if the erosion control plan is not being implemented in a good faith manner. After the Contractor

has been notified of noncompliance, the Erosion Control Inspector may take whatever steps are necessary to enforce the plan, including but not limited to, having the Contractor make corrections or engaging other contractors. The cost of such work by other contractors, plus interest, may be assessed against the Contractor.

Erosion Control Plan Inspection and Monitoring Requirements:

Copies of the Construction Site Erosion Control Plan and General Storm Water Discharge Permit shall be kept on site.

Erosion and sediment control practices shall be inspected weekly, and within 24 hours following a rainfall of 0.5 inches or greater. The contractor is responsible for inspection reporting required by the Town of Lawrence and the Wisconsin Department of Natural Resources.

An erosion and sediment control practice inspection log shall be maintained. Log shall note the time, date and location of inspection, the phase of construction at the site, person doing the inspection, assessment of control practices, and description of erosion and sediment control measures or maintenance done in response to inspection.

Involved Parties:

The contractor will be responsible for weekly and rain event site inspections and reports. This report and associated Erosion Control Plan were prepared by Martenson & Eisele, Inc. The contacts are as follows:

Developer/Owner/Applicant	City of Kaukauna
Greg Lauer	Director of Public Works / City Engineer
W1470 Peters Road	John Neumeier.
Kaukauna, WI 54130	144 W 2nd Street
(920) 475-8071	Kaukauna, WI 54130
Engineer	Contractor
Martenson & Eisele, Inc.	TBD
Jack Richeson, P.E.	
1377 Midway Road	
Menasha, WI 54952	
(920) 731-0381	



Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Version 2.1 (12-05-2024)



YEAR 1

Developer:

Greg Lauer

Project:

Greg Lauer Subdivision

Date:

05/05/25

County:

Outagamie

Version 2.1

Activity (1)	Begin Date (2)	End Date (3)	Period % R (4)	Annual R Factor (5)	Sub Soil Texture (6)	Soil Erodibility K Factor (7)	Slope (%) (8)	Slope Length (ft) (9)	LS Factor (10)	Land Cover C Factor (11)	Soil loss A (tons/acre) (12)	SDF (13)	Sediment Control Practice (14)	Sediment Discharge (t/ac) (15)
Bare Ground	07/01/25	10/01/25	51.3%	100	Clay	0.32	2.8%	367	0.40	1.00	6.5	0.862	Silt Fence	3.4
End	10/01/25	-----	-----	-----	-----	-----	2.8%	367	0.40	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.8%	367	0.40	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.8%	367	0.40	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.8%	367	0.40	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.8%	0	-----	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	0.0%	0	-----	-----	-----	0.000		0.0
TOTAL											6.5		TOTAL	3.4
													% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.

The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.

For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

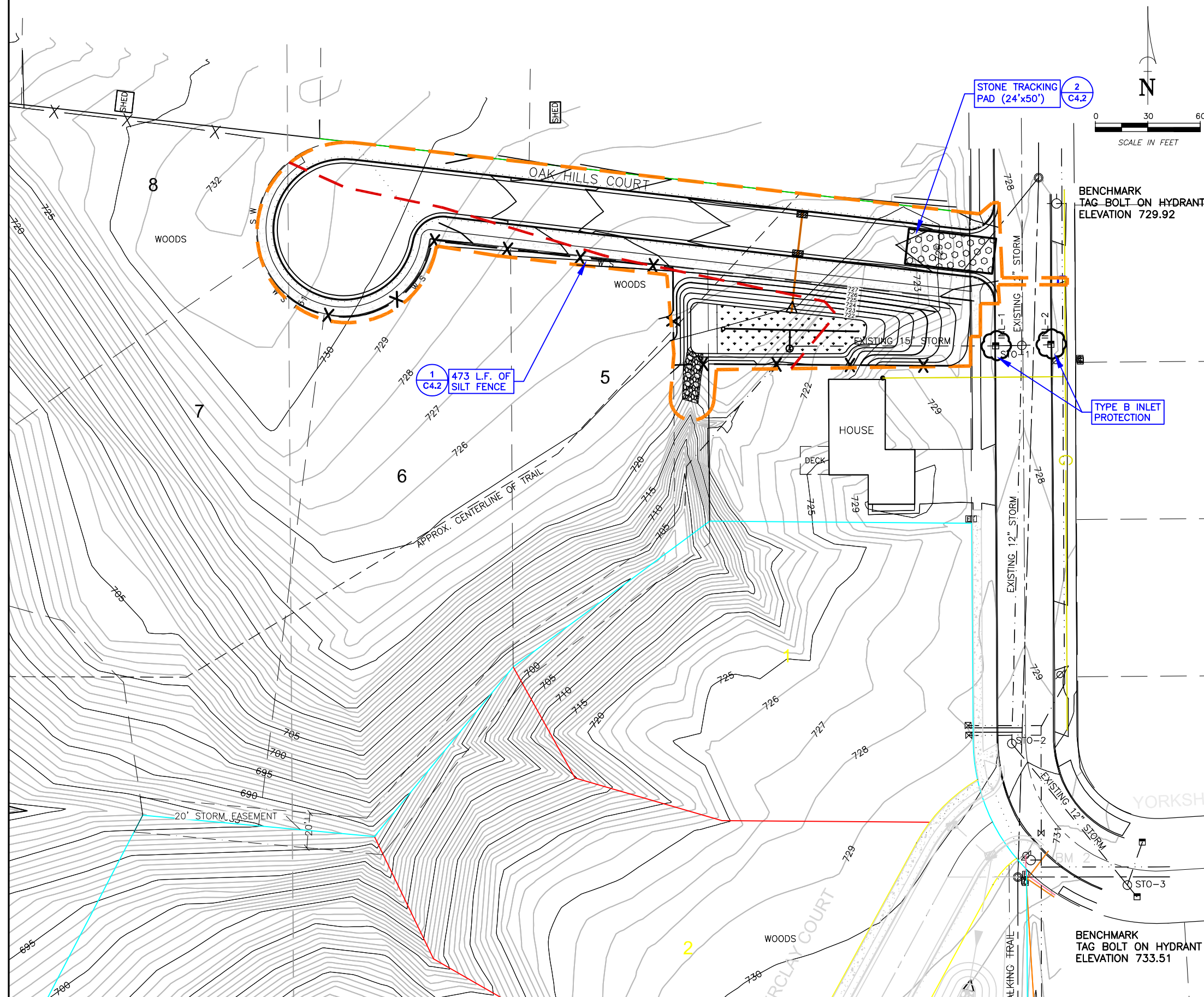
Recommended Permanent Seeding Dates:

4/15-6/1 and 8/1-8/21 Turf, introduced grasses and legumes
Thaw-6/30 Native Grasses, forbs, and legumes

Designed By:

Date

USLE



BENCHMARK
TAG BOLT ON HYDRANT
ELEVATION 729.92

PROJECT DISTURBED AREA = 0.95 ACRES
PATH 1: Topsoil Stripping and Initial Site Grading
367' @ 2.8% avg. slope
Clay
Silt Fence

WDNR USLE Tool Output: 3.4 tons/ac/yr

EROSION CONTROL PLAN KEY LEGEND

	1	SILT FENCE	
	2	TRACKING PROTECTION	
	3	INLET PROTECTION TYPES A,B,C, & D	
	4	INLET PROTECTION TYPE D-M	
	5	INLET PROTECTION TYPE D-HR	
	6	SANDBAG CULVERT PIPE DITCH CHECK	
	7	DEWATERING DETAIL	
	8	TEMPORARY CONCRETE WASHOUT	
	9	EROSION CONTROL MAT DETAIL (CLASS1, TYPE A)	
	10	EROSION CONTROL MAT DETAIL (CLASS1, TYPE B)	
	11	12" SEDIMENT LOG INLET PROTECTION	
	12	SEDIMENT LOG CHANNEL DITCH CHECK	

TOPOGRAPHIC LEGEND

	DECIDUOUS TREE
	EXIST. WOODS LINE
	MAPPED WETLANDS
	OVERHEAD POWER LINES
	UNDERGROUND ELECTRIC
	UNDERGROUND TELEPHONE
	UNDERGROUND GAS
	UNDERGROUND CABLE TV
	EXIST. FENCE LINE
	SIGN
	EXIST. HYDRANT
	POWER POLE
	GUY
	LIGHT POLE
	TELEPHONE PEDESTAL

	ELECTRIC PEDESTAL
	CABLE PEDESTAL
	WATER VALVE
	GAS VALVE
	WATER STOP BOX
	EXIST. STORM MANHOLE
	STORM INLET
	YARD DRAIN
	EXIST. SANITARY MANHOLE
	EXIST. SAN. SEWER
	EXIST. STO. SEWER
	EXIST. WATER MAIN
	EXIST. SPOT ELEVATION
	FIRST FLOOR = 800.00

	1" x 18" IRON PIPE SET
	1-1/4" x 30" REBAR SET
	CHISELED "X" SET
	3/4" REBAR FOUND
	1" REBAR FOUND
	1-1/4" REBAR FOUND
	2" PIPE FOUND
	CHISELED "X" FOUND
	GOVERNMENT CORNER
	RECORDED AS
	CONTOUR W/ ELEVATION
	SOIL BORING
	INFILTRATION SOIL BORING
	TOP SOIL DEPTH
	CONIFEROUS TREE

NOT FOR CONSTRUCTION

Martenson & Eisele, Inc.

 1377 Midway Road
 Menasha, WI 54952
www.martenson-eisele.com
info@martenson-eisele.com
 920.731.0381 1.800.236.0381
 Planning
 Environmental
 Surveying
 Engineering
 Architecture

[illegible]

USLE
GREG LAUER SUBDIVISION
CITY OF KAUKAUNA, OUTAGAMIE COUNTY, WISCONSIN

SCALE	DATE
BAR SCALE	3/27/2025
COMPUTER FILE	
Civil3D\Engl1-0290-003de.dwg	
DRAWING NO.	
C3.1	

Section 7: Appendix A



Legend: (some map layers may not be displayed)

- Rivers and Streams
- - - Intermittent Streams
- 24K Intermittent Streams
- 24K Streams and Rivers
- City or Village
- County Boundaries
- County and Local Roads
- County HWY
- Local Road
- Railroads
- Latest Leaf On Imagery

Notes:



Map: 0 550 1,100 Feet
0 160 320 Meters

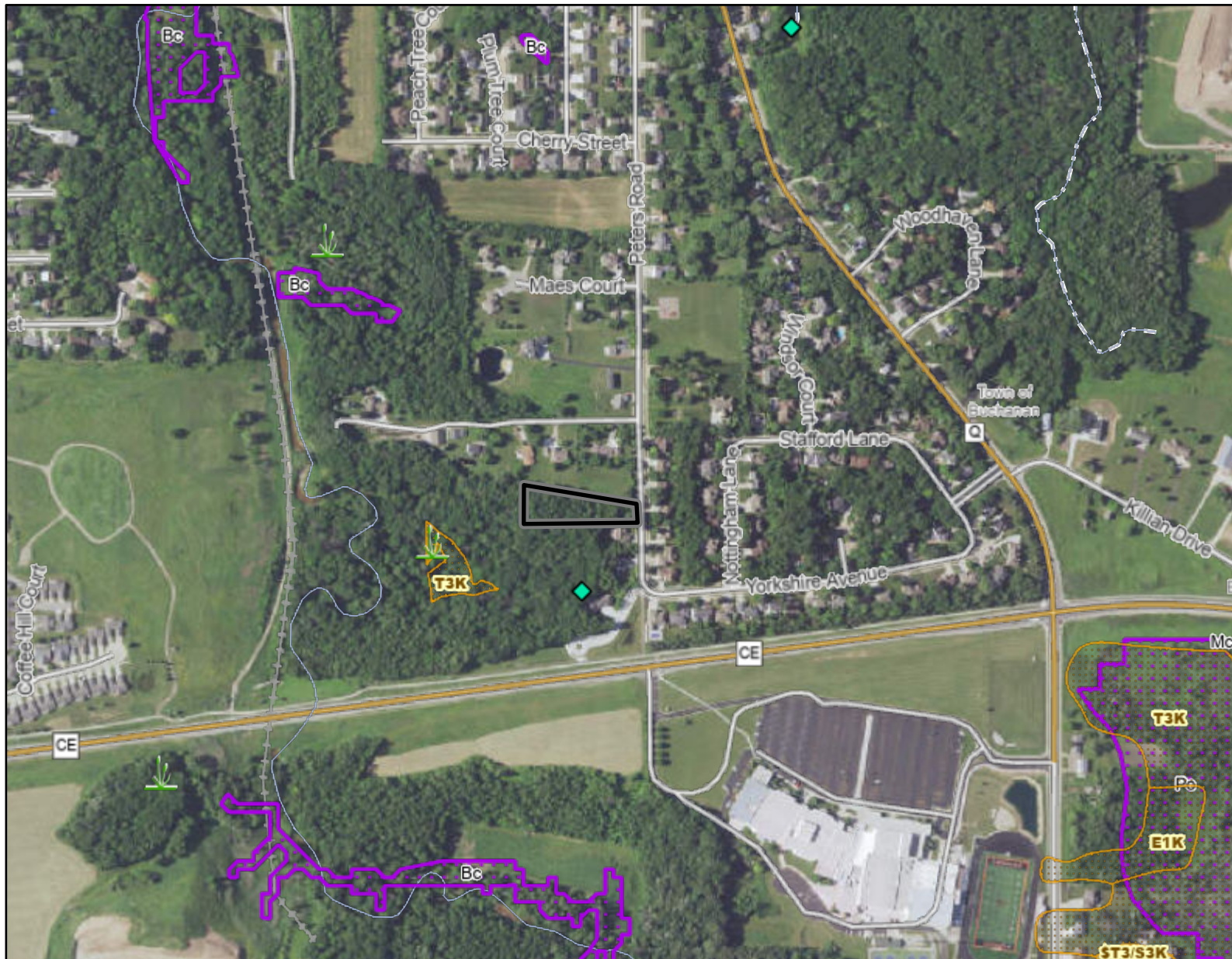
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Latest Leaf On: , Cities, Roads & Boundaries: , Surface Water (Cached): WiDNR, USGS, and other data

Map projection: NAD 1983 HARN Wisconsin TM

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Legend: (some map layers may not be displayed)

- Wetland Identifications and Confirmations

Wetland Class Points

- Wetland too small to delineate

Wetland Class Areas

Filled Areas

- Y
- Wetland Indicators

- Rivers and Streams

- Intermittent Streams

- 24K Intermittent Streams

- 24K Streams and Rivers

- City or Village

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- County HWY

- Local Road

- Railroads

- Latest Leaf On Imagery

Notes:



Map: 0 550 1,100 Feet
0 160 320 Meters

Service Layer Credits:

Wetland Indicators & Soils: Surface Water Data Viewer Team, Latest Leaf On: , Wisconsin Wetland Inventory NWI (Dynamic): Calvin Lawrence, Dennis Weise, Nina Rihn, Cities, Roads & Boundaries: , Surface Water (Cached): WiDNR, USGS, and other data

Map projection: NAD 1983 HARN Wisconsin TM

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Legend: (some map layers may not be displayed)

Dams

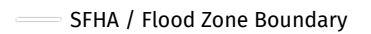


Dam

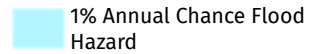


FIRM Panels

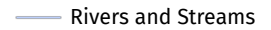
Flood Hazard Boundaries



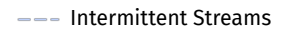
Flood Hazard Zones



1% Annual Chance Flood Hazard

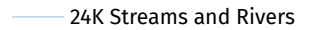


Rivers and Streams



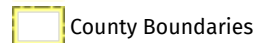
Intermittent Streams

24K Intermittent Streams



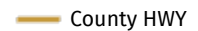
24K Streams and Rivers

City or Village



County Boundaries

County and Local Roads



County HWY



Local Road



Railroads

Latest Leaf On Imagery

Notes:



Map: 0 550 1,100 Feet
0 160 320 Meters

Service Layer Credits:

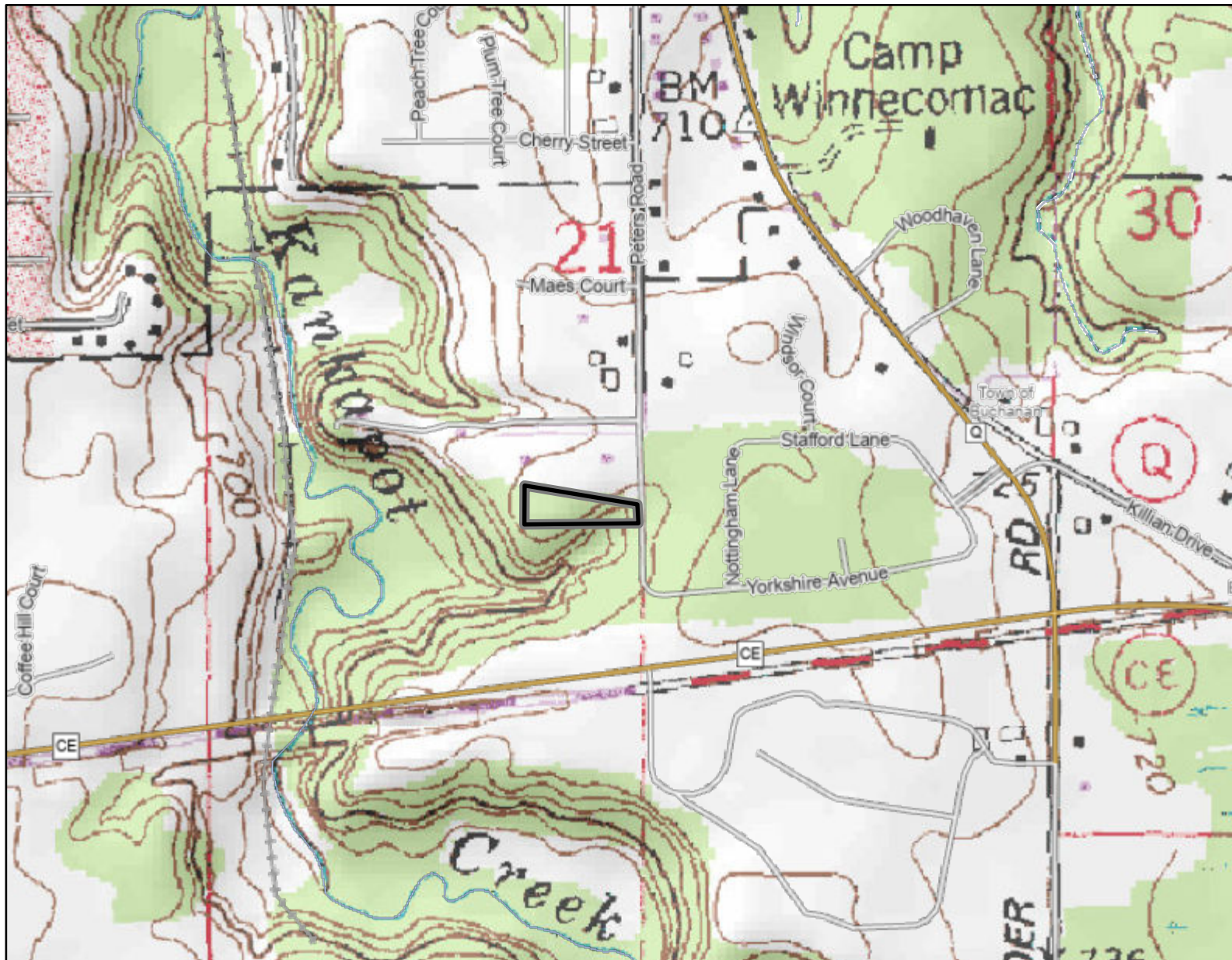
Latest Leaf On: , Paper FIRMS: Federal Emergency Management Agency, Wisconsin Department of Natural Resources, Cities, Roads & Boundaries: , Digital FEMA Floodplains (National Flood Hazard Layer): , Surface Water (Cached): WiDNR, USGS, and other data

Map projection: NAD 1983 HARN Wisconsin TM

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Legend: (some map layers may not be displayed)

- Rivers and Streams
- - - Intermittent Streams
- 24K Intermittent Streams
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- County HWY
- Local Road
- Railroads

Notes:



Map: 0 550 1,100 Feet
0 160 320 Meters

Service Layer Credits:
Cities, Roads & Boundaries: , Topographic Maps: , Surface Water (Cached): WiDNR, USGS, and other data

Map projection: NAD 1983 HARN Wisconsin TM

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