raSmith

CREATIVITY BEYOND ENGINEERING

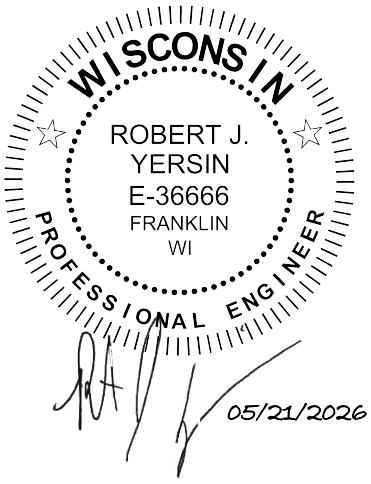
Storm Water Management Plan

For

Innio Building Addition
City of Waukesha, Wisconsin

raSmith Project No. 3250244

March 20, 2026
REV May 4, 2026
REV May 22, 2026



Storm Water Management Plan
For

Innio Building Addition
City of Waukesha, Wisconsin

Prepared by:

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raSmith
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INTRODUCTION

R.A. Smith, Inc. was retained to prepare a storm water management report for the proposed Innio building addition located at 1101 W. St. Paul Ave. in the City of Waukesha, WI. The site is further described as being part of the Northwest ¼ and the Southwest ¼ of the Southwest 1/4 of Section 3 and being part of the Southeast ¼ and the Southwest ¼ of the Southeast 1/4 of Section 4 and being part of the Northwest ¼ and the Northeast ¼ of the Northeast 1/4 of Section 9 Township 6 North, Range 19 East, in the City of Waukesha, Waukesha County, Wisconsin.

The hydrologic analysis ("Site") is approximately 5.64 acres with St. Paul Ave. to the North and the Wisconsin & Southern Railroad to the South. The proposed project consists of a proposed addition to the SW corner of the existing industrial building and new access road (replacing gravel) along the south end of the site. An additional "future" building addition (4,000 SF) has been shown at the NE corner of the existing R&D building. Due to the current site conditions, the proposed site is considered redevelopment.

Storm water discharge control for this site is regulated by the City of Waukesha and Wisconsin Administrative Codes NR 151. The most stringent of the codes, City of Waukesha, requires post-development peak discharge rates resulting from the 1-, 2-, 10-, 100-year, 24 hour storm events maintain the same rates as the pre-developed conditions, respectively. Additionally, the City of Waukesha and DNR Code requires the reduction in total suspended solids (TSS) by 40% from parking lots and roads for re-development. Finally, the City of Waukesha requires developments with >80% of connected imperviousness to infiltrate sufficient runoff volume so that the post-development infiltration volume has at least 60% of the pre-developed infiltration volume, based on the average annual rainfall.

Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. The Natural Resources Conservation Service (NRCS) has adopted a standard for classifying soils and their general characteristics relating to infiltration and runoff by classifying common soil textures into Hydrologic Soil Groups (HSG's). The HSG's are then used to determine runoff curve numbers (RCN). According to the Waukesha County GIS system, the site generally consists of Lu (Lupton Muck) type soils as the site sits next to the Fox River. It appears that the site was filled decades ago for the construction of the original Innio Development. Considering the highly compacted nature of this site, this hydrologic analysis used HSG C as a conservative approach. Based on the geotechnical evaluation, we believe this site is exempt from infiltration requirements. It appears there is high groundwater, contaminated soils, and soil classifications that all allow for the exemption. We have provided the geotechnical report in Appendix B of this report for verification.

In order to satisfy both City of Waukesha and WDNR stormwater management requirements, the Site will use Contech underground storage systems to achieve water quantity and water quality standards. The Contech systems will have an impermeable pond liner on top of the subgrade to prevent possible oversaturation of the subbase causing pavement and structural failure. The design intent of the storm water drainage for this site is to collect and direct the runoff to the proposed underground systems, which will temporarily detain the runoff and release the storm water volume generated at a controlled rate. In addition to controlling runoff rates, the detention facilities will reduce the TSS loads from parking lots and roads by 40% based on the average annual rainfall, as compared to no runoff management controls.

METHOD OF HYDROLOGIC ANALYSIS

A hydrologic analysis is required to determine peak storm water runoff from the subject property under existing and proposed conditions. The analysis was performed using the HydroCAD Version 10.10 hydrologic simulation computer model. The discharges were generated using the SCS Dimensionless Unit Hydrograph Method for a 24-hour duration storm. Model parameters include drainage area, SCS runoff curve number, average basin slope, hydraulic length, 24-hour precipitation (see Table 1) and time of concentration.

Table 1 – Design Storm Events
Chapter 32.11, Table 3 – Rainfall Depths

Frequency (years)	Duration (hours)	Rainfall Depth (inches)
1	24	2.40
2	24	2.70
10	24	3.81
100	24	6.18

The computer model used for water quality analysis is Source Loading and Management Model (SLAMM). SLAMM was adopted and calibrated by the Wisconsin Department of Natural Resources (WDNR). This model was originally developed to better understand the relationships between sources of urban runoff pollutants and runoff quality. Special emphasis has been placed on small storm hydrology and particulate wash-off, which are the most significant contributing factors to water quality.

EXISTING HYDROLOGY CONDITIONS

The storm water generated from the existing site drains offsite in two different directions. The majority of the storm water, Watershed E-1, drains via storm sewer and overland flow south to the Fox River. Watershed E-2 drains overland flow toward the west and ultimately to the Fox River.

The information provided in Table 2 summarizes the parameters and peak flows generated for the 1-, 2-, 10-, and 100-year, 24 hour storm event under the existing conditions. The existing peak discharge rates are used to determine the allowable site release rates generated for the proposed conditions.

Table 2 – Existing Runoff Release Rates

Watershed	Area (acres)	Composite RCN	Tc (minutes)	Peak Discharge (cfs)			
				1-yr	2-yr	10-yr	100-yr
E-1	5.52	96	6	18.49	21.07	30.50	50.39
E-2	0.12	74	6	0.12	0.16	0.33	0.75
E-TOTAL	**5.64**	**---**	**---**	**18.61**	**21.22**	**30.82**	**51.14**

PROPOSED HYDROLOGY CONDITIONS (BEFORE DETENTION)

The proposed site has been graded and designed to maintain existing drainage patters as much as possible. We are proposing two separate underground detention systems to meet water quality and quantity requirements. Watershed P-1, P-2, and P-3 will be routed via storm sewer to the west underground detention system. Watershed P-4, P-5, and P-6 will be routed via storm sewer to the east underground detention system. Watershed P-7 will drain off undetained. Two watersheds, Offsite 1 and Offisite 2 will drain to the west underground detention system. This system will be sized to take on the offsite flows but will not be included in the peak flow or TSS calculations.

The information provided in Table 3 summarizes the parameters and peak flows generated for the 1-, 2-, 10-, and 100-year, 24 hour storm under the proposed conditions, before detention.

Table 3 – Proposed Hydrology Summary (before detention)

Watershed	Area (acres)	Composite RCN	Tc (minutes)	Peak Discharge (cfs)			
				1-yr	2-yr	10-yr	100-yr
P-1	0.62	97	6	2.13	2.42	3.47	5.68
P-2	0.37	98	6	1.29	1.45	2.07	3.37
P-3	0.78	98	6	2.76	3.11	4.43	7.22
P-4	2.64	96	6	8.85	10.09	14.60	24.13
P-5	0.66	98	6	2.34	2.64	3.75	6.12
P-6	0.45	98	6	1.57	1.78	2.52	4.12
P-7	0.12	98	6	0.42	0.48	0.68	1.11
TOTAL (W/O DETENTION)	**5.64**	**---**	**---**	**19.36**	**21.96**	**31.52**	**51.74**

PROPOSED HYDROLOGY CONDITIONS (AFTER DETENTION)

We are proposing two separate underground detention systems to meet water quality and quantity requirements. Watershed P-1, P-2, and P-3 will be routed via storm sewer to the west underground detention system. Watershed P-4, P-5, and P-6 will be routed via storm sewer to the east underground detention system.

The information provided in Tables 4, 5 and 6 summarizes the parameters and peak flows generated for the 1-, 2-, 10-, and 100-year, 24 hour storm event under the proposed conditions, after detention.

Table 4 – UG Detention - West

Storm Event	Discharge (cfs)	Maximum Elevation	Maximum Storage (af)
1-Year	4.67	803.82	0.223
2-Year	5.63	803.92	0.227
10-Year	8.77	804.20	0.239
100-Year	14.01	804.82	0.264

Table 5 – UG Detention - East

Storm Event	Discharge (cfs)	Maximum Elevation	Maximum Storage (af)
1-Year	11.19	802.95	0.330
2-Year	12.82	803.06	0.337
10-Year	18.05	803.55	0.361
100-Year	32.90	804.61	0.400

Table 6 – Proposed Hydrology Summary (after detention)

Watershed	Area (acres)	Peak Discharge (cfs)			
		1-yr	2-yr	10-yr	100-yr
P-1, P-2, P-3	1.77	4.67	5.63	8.77	14.01
P-4, P-5, P-6	3.75	11.19	12.82	18.05	32.90
P-7	0.12	0.42	0.48	0.68	1.11
TOTAL	**5.64**	**16.14**	**18.83**	**27.41**	**47.78**

The information provided in Table 7 summarizes the peak flows generated for the 1-, 2-, 10-, and 100-year, 24 hour storm event for existing and proposed conditions, including the undetained areas.

Table 7 – Peak Discharge Summary

	1-Year (cfs)	2-Year (cfs)	10-Year (cfs)	100-Year (cfs)
Existing	18.61	21.22	30.82	51.14
Proposed	16.14	18.83	27.41	47.78

PROPOSED HYDROLOGY CONDITIONS (AFTER DETENTION WITH OFFSITE)

The information provided in Tables 8, 9, 10 and 11 summarizes the parameters and peak flows generated for the 1-, 2-, 10-, and 100-year, 24 hour storm event under the proposed conditions, after detention and with offsite flows.

Table 8 – Offsite Runoff Release Rates

Watershed	Area (acres)	Composite RCN	Tc (minutes)	Peak Discharge (cfs)			
				1-yr	2-yr	10-yr	100-yr
Offsite-1	0.74	95	6	2.41	2.75	4.03	6.72
Offsite-2	0.14	98	6	0.48	0.54	0.77	1.26
OFFSITE-TOTAL	**0.88**	**---**	**---**	**2.89**	**3.30**	**4.80**	**7.98**

Table 9 – UG Detention - West

Storm Event	Discharge (cfs)	Maximum Elevation	Maximum Storage (af)
1-Year	7.84	804.12	0.236
2-Year	9.05	804.22	0.240
10-Year	12.81	804.65	0.257
100-Year	21.19	805.91	0.296

Table 10 – UG Detention - East

Storm Event	Discharge (cfs)	Maximum Elevation	Maximum Storage (af)
1-Year	11.19	802.95	0.330
2-Year	12.82	803.06	0.337
10-Year	18.05	803.55	0.361
100-Year	32.90	804.61	0.400

Table 11 – Proposed Hydrology Summary (after detention with OFFSITE)

Watershed	Area (acres)	Peak Discharge (cfs)			
		1-yr	2-yr	10-yr	100-yr
P-1, P-2, P-3, Offsite 1, Offsite 2	2.65	7.84	9.05	12.81	21.19
P-4, P-5, P-6	3.75	11.19	12.82	18.05	32.90
P-7	0.12	0.42	0.48	0.68	1.11
TOTAL	**6.52**	**19.40**	**22.30**	**31.45**	**54.86**

STORM WATER QUALITY

City of Waukesha and DNR Code requires water quality best management practices to reduce the post-construction total suspended solids (TSS) load by 40% for parking lots and roads for re-development based on the average annual rainfall, as compared to no runoff management controls.

Water quality TSS reduction goals are met by directing on site drainage through the proposed storm sewer systems directed to the two, separate, underground Contech systems, where sediment gets trapped in the bottom of the tank.

The information provided in Table 12 show the SLAMM input data tributary to the tanks and also the undetained areas.

Table 12 – Proposed SLAMM Input

Source Area	P-1 (acres)	P-2 (acres)	P-3 (acres)	P-4 (acres)	P-5 (acres)	P-6 (acres)	P-7 (acres)	Total Area (acres)
Landscape	0.02	0.00	0.00	0.19	0.00	0.00	0.00	0.21
Pavement	0.51	0.37	0.00	2.28	0.00	0.00	0.12	3.28
Roof	0.09	0.00	0.78	0.17	0.66	0.45	0.00	2.15
TOTAL	**0.62**	**0.37**	**0.78**	**2.64**	**0.66**	**0.45**	**0.12**	**5.64**

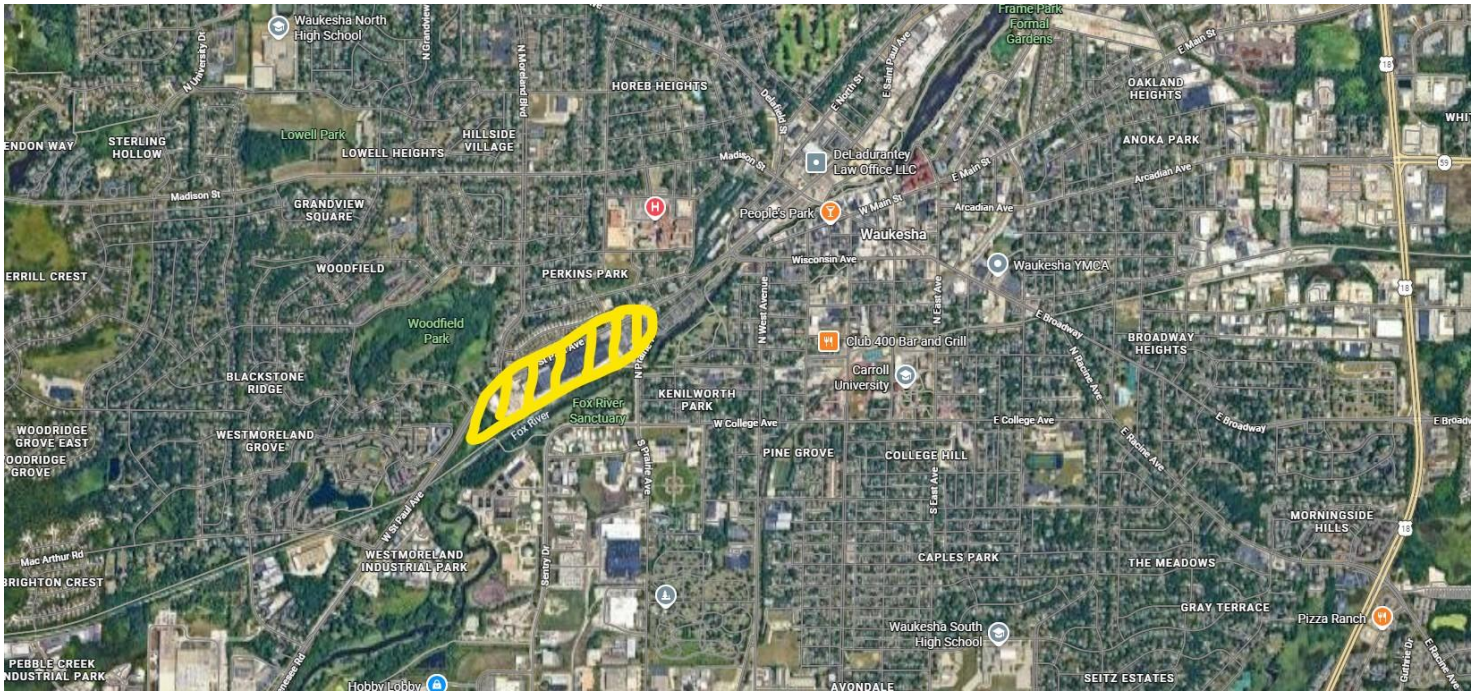
Table 13 – Proposed SLAMM Output

	Total Suspended Solids	Percent Reduction
Proposed Site w/o Controls	**5,428 lbs.**	
Proposed Site with Controls	**2,700 lbs.**	**50.26%**

SUMMARY

Storm water requirements are regulated by the City of Waukesha and The Department of Natural Resources NR151. R.A. Smith, Inc. has completed a storm water management analysis for this site, which meets the applicable regulating agencies requirements.

APPENDIX A
LOCATION MAP


Waukesha North High School
Frame Park Formal Gardens
HOREB HEIGHTS
OAKLAND HEIGHTS
STERLING HOLLOW
Lowell Park
LOWELL HEIGHTS
HILLSIDE VILLAGE
ANOKA PARK
DeLaduranty Law Office LLC
Madison St
GRANDVIEW SQUARE
People's Park
Waukesha
Arcadian Ave
WOODFIELD
PERKINS PARK
Waukesha YMCA
Wisconsin Ave
Woodfield Park
Club 400 Bar and Grill
BROADWAY HEIGHTS
BLACKSTONE RIDGE
Carroll University
KENILWORTH PARK
Fox River Sanctuary
Fox River
W College Ave
E College Ave
E Broadway
WOODRIDGE GROVE EAST
WESTMORELAND GROVE
PINE GROVE
COLLEGE HILL
MORNINGSIDE HILLS
Mac Arthur Rd
WESTMORELAND INDUSTRIAL PARK
CAPLES PARK
THE MEADOWS
BRIGHTON CREST
GRAY TERRACE
Pizza Ranch
Waukesha South High School
PEBBLE CREEK INDUSTRIAL PARK
Hobby Lobby
AVONDALE
SEITZ ESTATES

APPENDIX B
Waukesha GIS Soil Map
Geotechnical Report


KlA
HmC2
HmB
DOPP ST
BONNIE LN
HmD2
HoE3
LmB
ThB
Ph
Dopp Park
Glede Park
HmB2
CITY OF WAUKESHA
HmE2
HmC2
W SAINT PAUL AVE
Pa
HmD2
KeA
Woodfield Park
Pethesda Springs Park
Lu
HmC2
HmE2
KlA
HmD2
HIGHLAND DR
Ww
PtA
HmD2
Fox River Sanctuary
HAMILTON AVE
KlA
HmD2
HmB2
LyB2
W COLLEGE AVE
HmC2
HtA
HmC2
HmE2
PHILIP DR
MmA
Lu
LmB
CeB
WhA
HmD2
Lu
Saratoga Softball Complex
Oc
Ww
Oc
FoA
KeA
Oc
LmB
Ww

INNIO Project Green

Geotechnical Engineering Report

April 15, 2026 | Terracon Project No. 58265048

Waukesha, Wisconsin

Prepared for:

INNIO Waukesha Gas Engines Inc
1233 West Loop South, Suite 900
Houston, TX 77027

4900 S. Pennsylvania Ave, Ste 100
Cudahy, WI 53110-1347
P (414) 423-0255
terracon.com

April 15, 2026

INNIO Waukesha Gas Engines Inc
1233 West Loop South, Suite 900
Houston, TX 77027

Attn: Mr. Daanish Javed
P: (905) 414-3578
E: Daanish.Javed@innio.com

Re: Geotechnical Engineering Report
INNIO Project Green
1101 West St. Paul Ave
Waukesha, Wisconsin
Terracon Project No. 58265048

Dear Mr. Javed:

We have completed the scope of Geotechnical Engineering services for the referenced project in general accordance with the Agreement of services dated February 20, 2026. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

Abdelhady Deif, E.I.T
Field Engineer

Jeremy Thomas, PE
Senior Engineer

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Attachments

Exploration and Testing Procedures
Site Location and Exploration Plans
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Supporting Information

Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services for the construction of a new engine test lab building addition in Waukesha, Wisconsin. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Foundation design and construction
- Considerations related to construction adjacent to the existing building
- Floor slab design and construction
- Seismic considerations per IBC
- Design and construction of pavements
- Design and construction of stormwater management

The geotechnical engineering Scope of Services for this project included the advancement of test borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the **Site Location** and **Exploration Plan**, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs in the **Exploration Results** section.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An email request for proposal was provided by Riley Construction (Riley) on February 11, 2026. The email request contained a pdf outlining the scope of work prepared by Flad, information on expected loads was provided later.

Item	Description
Project Description	Based on the provided information, a new engine test lab building addition off the southwest corner of the existing engine assembly building on the INNIO/Waukesha Engines site is planned. The most recent existing buildings have traditional spread footing foundations. The new structure is primarily a one-story high bay building with some incidental interstitial mechanical & electrical equipment room spaces. The main test lab level of the building will match the existing assembly building's finished floor. A new underground stormwater facility is planned along the southwest side of the existing facility along with a new access road southeast of the existing facility.
Finished Floor Elevation (FFE)	It is understood that the finished floor elevation will match the existing assembly building's finished floor elevation at approximately 811 feet
Maximum Loads	Based on the preliminary loading information provided the loads will be as follows: ■ Columns: 360 kips ○ 140 kips (Dead Load) ○ 220 kips (Live Load) ■ Walls: 4 to 6 kips per linear foot (klf) ■ Slabs: 150 to 250 pounds per square foot (psf)
Grading/Slopes	Not provided but anticipated to be on the order of approximately 5 feet of cut and/or fill to be required to develop final grades, excluding remedial grading requirements. Final slopes are planned with a maximum height of 2 feet and an inclination of 3H:1V (Horizontal: Vertical) or flatter.
Below-Grade Structures	Not Anticipated
Free-Standing Retaining Walls	Not Anticipated
Pavements	A heavy-duty pavement based on 1,500 semi-trucks per year or 6 trucks per day is planned along the southeast side of the addition.
Building Code	2021 IBC.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at 1101 West St. Paul Ave in Waukesha, Wisconsin. Latitude/Longitude (approximate) 43.0048°, -88.2504° See **Site Location**
Existing Improvements	The area is an existing asphalt and concrete pavement
Existing Topography	Based on the map provided, the site ranges from an elevation of 801 to 816 feet.
Current Ground Cover	Asphalt and gravel fill.

Geotechnical Characterization

The following table lists the number and depth of borings performed.

Number of Borings	Approximate Boring Depth [1]	Location
12 (SB-1 to SB-12)	26 to 30[2]	Building Footprint
1 (SW-1)	15	Stormwater Management Area
1 (P-1)	15	Pavement Area

1. Feet below existing ground surface.
2. Borings SB-8, SB9, and SB-10 encountered auger refusal at depths shallower than 30 feet.

Subsurface Profile

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting, and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each

exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel, which can be found in the **Exploration Results** section of this report.

Model Layer	Layer Name	General Description
1	**Surface Layer**	2 to 6 inches of asphalt over 6 inches of aggregate base, or 6 to 7 inches of concrete over 4 inches of aggregate base. Gravel, crushed asphalt
2	**Existing Fill**	Fill consisting of black to rusty brown silty sand with trace gravel, or brown clayey sand with trace gravel and silt, with trace organic materials. Extended to depths of 3.5 to 23.5 feet.
3	**Native Cohesive Soil**	Gray and dark gray to black lean clay and organic lean clay with varying amounts of sand and gravel were encountered. The clay was medium stiff to hard in consistency, with hand penetrometer values ranging from 0.75 to over 4.5 tons per square foot (tsf). An odor was noted in this layer in multiple borings. Moisture contents ranged from about 7% to 64%.
4	**Native Non-Cohesive Soils**	Gravelly silt and sand with varying amounts of gravel and silt were encountered; possible cobbles were also noted. The soils were very loose to dense to very dense in condition, with N-values ranging from 3 to 64 bpf. An odor was noted in this layer in multiple borings. Moisture contents ranged from about 3% to 23%.

Our augers refused at depths shallower than the planned boring depth at borings SB-8, SB-9, and SB-10. Auger refusals varied from 23.6 feet to 28.6 feet below grade. The refusal materials are not known due to rock cores not being performed; however, shallow bedrock is known to be present in the area.

The geotechnical characterization forms the basis of our geotechnical evaluation of site preparation, foundation options and pavement options. As noted in **General Comments**, the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Conditions encountered at each boring location are indicated on the individual boring logs shown in the **Exploration Results** section and are attached to this report.

Stratification boundaries on the boring logs represent the approximate location of changes in native soil types; in situ, the transition between materials may be gradual.

Subsurface Water Conditions

The boreholes were observed during drilling and after completion for the presence and level of groundwater. Free water was observed at depths ranging from 6.0 to 18 feet below existing ground surface during drilling, and from 9.6 to 13.3 feet below existing ground surface at completion of drilling operations, or during the short period after removal of the augers and before backfilling.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

Geotechnical Overview

Existing fill soils were observed in all of the borings between the depths of 3.5 to 23.5 feet. Fill soils containing organic matter, various metals and VOCs were also detected in the soil cuttings. Due to the variability and organic material and contamination within the fill, it is not recommended that the fill be used in its current condition for foundation support. A typical system for improving existing fill soils so they can support shallow foundations is rammed aggregate piers (RAPs). Using RAPs would allow for a typical shallow footing design on top of the improved fill soils.

The RAPs would be installed through the fill and extend into the underlying native soils. Rammed aggregate piers are designed and installed by a specialty design-build contractor, who would also provide the allowable bearing pressure for foundation design. Based on our experience, this value typically ranges from 4,000 to 6,000 psf for the soil conditions observed at the site.

Support of pavements and floor slabs on or above existing fill materials is discussed in this report. However, even with the recommended construction procedures, an inherent risk remains for the owner that compressible fill or unsuitable material, within or buried by the fill, will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill but can be reduced by following the recommendations contained in this report. To take advantage of the cost benefit of not removing the entire amount of undocumented fill, the owner must be willing to accept the risk of increased differential performance which can result in increased cracking and

abrupt differential settlement. Should this risk be acceptable, pavements and floor slabs can be supported above the existing fill material.

RAP's should be considered for the support of the floor slab in areas where total and differential settlement cannot be tolerated. The design-build contractor can provide a ground improvement design to achieve the required floor slab performance.

The **Shallow Foundations** section addresses foundation support of structures. Structures can be supported on shallow foundations bearing on suitable native soils or newly compacted engineered fill.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, pavements, floor slabs, and utility trenches.

Site preparation is a vital part of the RAP process and should be discussed with the RAP contractor prior to bidding the work to earthwork contractors so that sequencing of the work can be established. There are typically two ways the RAPs are installed; prior to grade raised fill being installed and the other is after the grade raised fill is installed.

Site Preparation

Existing asphalt and concrete pavement, topsoil, trees including roots, vegetation, and any loose, soft, or otherwise unsuitable materials should be removed from proposed construction areas. Remnants of the former pavement should also be removed, including any utilities.

After an acceptable subgrade condition is achieved, the placement and compaction of new fills may begin, as appropriate. The placement and compaction of all base course and fill soils should be monitored by a representative of the geotechnical engineer. Fill and base course placement should be done in accordance with the recommendations presented later in this section.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements, or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements

Soil Type [1, 2]	USCS Classification	Acceptable Locations for Placement
Cohesive	CL [3], CL/ML [3] (LL ≤ 45 and PI ≤ 20)	Not native to the site, not recommended to be imported as structural fill
Granular	GW, GP, GM, GC SW, SP, SM, SC 5% to 15% passing #200 sieve	Mass grading and backfill for utilities and foundations. Can also be used below/adjacent to floor slabs and pavement
Granular	Crushed limestone or crushed concrete meeting WisDOT Section 305 for 1¼ dense graded base	Undercut areas below foundations. Aggregate base below slabs and pavements. Can also be used for utility and structural backfill

1. Structural fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to Terracon for evaluation prior to use on this site.
2. Any organic materials, rock fragments larger than 3 inches, and other unsuitable materials should be removed prior to use as structural fill.
3. Highly susceptible to frost; unstable when wet, are commonly used for pavement support with the knowledge that additional maintenance and/or shorter pavement life are likely.

Existing Fill

As noted in Geotechnical Characterization, all borings encountered previously placed fill to depths ranging from about 3.5 to 23.5 feet. We have no records to indicate the degree of control, and consequently, the fill is considered unreliable for support of foundation and floor slab loads. Support of pavements and floor slabs on or above existing fill soils is discussed in this report. However, even with the recommended construction procedures, inherent risk exists for the owner that compressible fill or unsuitable material, within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill

but can be reduced by following the recommendations contained in this report. maintenance of the pavements should be anticipated.

Some areas of the pavement and floor slab likely have tight tolerances for the total and differential settlement which they can accommodate. For these area, improving the in-place fill material with RAP's is recommended. Full removal of the deeper in-place fill materials is likely not feasible due to the extent of the excavation and the proximity to existing structures at the site. In addition, signs of environmental impact were observed in the fill materials which may require special handling and disposal at a landfill facility.

Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Description
Maximum Fill Lift Thickness	■ 9 inches or less in loose thickness when heavy, self-propelled compaction equipment is used ■ 4 inches in loose thickness when hand-guided equipment (i.e., a jumping jack or plate compactor) is used
Minimum Compaction Requirements [1, 2, 3]	■ Structural Fills: 95% of the maximum dry density as obtained by the modified Proctor (ASTM D1557) ■ General Fills: 90% of the maximum dry density as obtained by the modified Proctor (ASTM D1557)
Moisture Content Range [1]	■ within 2% below to 3% above the modified Proctor optimum moisture content at the time of placement and compaction ■ granular materials should be compacted within workable moisture levels

Item	Description

1. We recommend that structural fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
2. If the granular material is coarse sand, crushed limestone, or gravel, is of a uniform size, or has a low fines content, compaction should be observed to ensure that each lift is placed in the recommended thickness and compacted using proper equipment. The clean granular soils should be compacted to at least 65% of relative density until they are not observed to yield.
3. Specifically, moisture levels should be maintained to achieved compaction without bulking during placement or pumping when proofrolled.

Utility Trench Backfill

Any soft or unsuitable materials encountered at the bottom of utility trench excavations should be removed and replaced with structural fill or bedding material in accordance with the specifications for the utility be supported. This recommendation is particularly applicable to utility work requiring grade control and/or in areas where subsequent grade raising could cause settlement in the subgrade supporting the utility. Trench excavation should not be conducted below a downward 1.5 horizontal:1 vertical projection from existing foundations without engineering review of shoring requirements and geotechnical observation during construction.

On-site materials are considered suitable for backfill of utility and pipe trenches from 1 foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the gradation and expansion index requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

For low permeability subgrades, utility trenches are a common source of water infiltration and migration. Utility trenches penetrating beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. The trench should provide an effective trench plug that extends at least 5 feet from the face of the building exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If used, the clay trench plug material

should be placed and compacted to comply with the water content and compaction recommendations for structural fill stated previously in this report.

Utility Trench Backfill Material Requirements

Bedding sand should conform to the material requirements specified in the "Standard Specifications for Sewer and Water Construction in Wisconsin". The zone of compacted granular fill immediately around the pipe and bedding sand should extend laterally beyond the edges and above the pipe a minimum distance of one foot, and below the pipe one foot. General backfill is that fill placed outside the limits of existing pavements or other structures. Structural backfill is fill placed below pavements or other structures. The following are recommended for general and structural backfill placed above the bedding sand:

Soil Type [1]	USCS Classification	Recommended Use
Low Plasticity Cohesive	CL, CL/ML (LL ≤ 45 and PI ≤ 20)	General Backfill; Not recommended for Structural Backfill.
High Plasticity Cohesive	CH, MH, ML,	General Backfill; Not recommended for Structural Backfill.
Granular	GW, GP, GM, GC SW, SP, SM, SC with 5% to 15% passing #200 sieve	Can be used for General or Structural Backfill
Unsuitable	OL, OH, PT	Not recommended for General or Structural backfill

1. Structural backfill fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. If general backfill is frozen, it will settle in the future when it thaws. Determination if this is acceptable should be determined by the design engineer in order to specify if frozen soils are acceptable.

2. Structural locations include areas below buildings or pavements.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should

have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Terracon should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation, proofrolling, placement and compaction of controlled compacted fills, backfilling of excavations into the completed subgrade, and just prior to construction of building floor slabs.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, as well as other applicable codes, and in accordance with any applicable local, state, and federal safety regulations. The contractor should be aware that slope height, slope inclination, and excavation depth should in no instance exceed those specified by these safety regulations.

Construction Observation and Testing

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should be contacted to discuss mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Shallow Foundations

As noted in the **Geotechnical Characterization** Fill soils were encountered within all of the borings completed within the building extending to depths of about 3.5 to 23.5 feet

below existing grades; however deeper fill associated with the existing building may be encountered.

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for newly constructed shallow foundations. We do not recommend that the existing fill soils be used for support of foundations.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing pressure [1, 2]	4,000 to 6,000 psf (With Rammed Aggregate Piers Improvements)
Required Bearing Stratum [3]	Existing fill improved by rammed aggregate piers
Minimum Foundation Dimensions	Columns: 30 inches Strip Footings: 18 inches
Sliding Resistance	-0.58 ultimate coefficient of friction for foundations bearing on granular structural fill.
Minimum Embedment below Finished Grade [4]	Exterior footings for unheated buildings: 60 inches Exterior footings for heated buildings: 48 inches Interior footings in heated buildings: 18 inches
Estimated Total Settlement from Structural Loads [2]	Less than about 1 inch
Estimated Differential Settlement from Structural Loads [5]	Determined by the RAP design build contractor, but in our experience will be less than ¾ inch

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. These bearing pressures can be increased by 1/3 for transient loads unless those loads have been factored to account for transient conditions. Values assume that exterior grades are no steeper than 20% within 10 feet of structure.
2. Values provided are for maximum loads noted in **Project Description**.
3. Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the **Earthwork**.
4. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
5. Differential settlements are measured over a span of 50 feet.

Design Parameters – Overturning and Uplift Loads

Shallow foundations subjected to overturning loads should be proportioned such that the resultant eccentricity is maintained in the center-third of the foundation (e.g., e < b/6, where b is the foundation width). This requirement is intended to keep the entire foundation area in compression during the extreme lateral/overturning load event. Foundation oversizing may be required to satisfy this condition.

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils with consideration to the IBC basic load combinations.

Item	Description
Soil Moist Unit Weight	120 pcf
Soil Effective Unit Weight [1]	55 pcf
Soil weight included in uplift resistance	Soil included within the prism extending up from the top perimeter of the footing at an angle of 20 degrees from vertical to ground surface

1. Effective (or buoyant) unit weight should be used for soil above the foundation level and below a water level. The high groundwater level should be used in uplift design as applicable.

Construction Adjacent to the Existing Building

Differential settlement between the additions and the existing building is expected to approach the magnitude of the total settlement of the addition. Expansion joints should be provided between the existing building and the proposed addition to accommodate differential movements between the two structures. Underground piping between the two structures should be designed with flexible couplings and utility knockouts in foundation walls should be oversized so minor deflections in alignment do not result in breakage or distress. Care should be taken during excavation adjacent to existing foundations to avoid disturbing existing foundation bearing soils.

New footings should bear at or near the bearing elevation of immediately adjacent existing foundations. Depending upon their locations and current loads on the existing footings, footings for the new addition could cause settlement of adjacent walls. To reduce this concern and risk, clear distances at least equal to the new footing widths should be maintained between the addition's footings and footings supporting the existing building.

Foundations for the new structure, constructed in close proximity to the existing foundations can induce settlement in the existing structure. The maximum amount of additional settlement that could occur is equal to the maximum settlement of the

proposed foundations. To decrease the potential for settlement of the existing foundations, we recommend a minimum of 10 feet of lateral separation between the edges of the existing and proposed foundations. If this separation is not possible, additional settlement of the existing foundations should be anticipated.

Construction activities in close proximity to existing structures can cause vibration and settlement of the structure. We recommend an instrumentation and monitoring program is developed and implemented for the existing building which will establish the tolerable deflection and vibrations levels. The instrumentation and monitoring program should provide thresholds where work will be stopped, if exceeded, to prevent damage to the existing structure. Terracon can assist with the development and implementation of this monitoring program in collaboration with the building owner and structural engineer for the projects under a separate agreement.

Floor Slabs

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab. If the owner elects to construct any at-grade floor slabs on the existing fill, they have accepted the inherent risk that compressible fill or unsuitable material, within or buried by the fill may not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill but can be reduced by following the requirements and recommendations in the **Earthwork** section.

Floor Slab Design Parameters

Item	Description
Floor Slab Support [1]	Suitable existing fill that has prepared in accordance with the **Earthwork** section and tested/approved by Terracon or newly placed structural fill. Alternatively, the floor slab can be supported by the existing fill improved with RAP's
Estimated Modulus of Subgrade Reaction	60 pounds per square inch per inch (psi/in) for point loads where the slab is supported on unimproved existing fill 120 psi/in for point load where the slab is supported on improved fill. Final determination of the subgrade modulus should be made by the RAP design-build contractor.

Item	Description
Granular Leveling Course	A minimum 4 inches of well-graded crushed stone meeting WisDOT Section 310 for an open graded base course material compacted to non-yielding condition

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

Floor slab subgrade soils should be prepared as discussed in the **Earthwork** section of this report. On most project sites, site grading is generally accomplished early in the construction phase; however, as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, rainfall, etc. As a result, the floor slab subgrade may not be suitable for placement of the granular layer and concrete, and corrective measures will be required. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

Terracon should review the condition of the floor slab subgrades immediately prior to placement of the granular leveling course and construction of the slabs. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas containing backfilled

trenches. Areas where unsuitable conditions are located should be repaired by removing and replacing the affected material with properly

Seismic Considerations

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). During this geotechnical field investigation, soil borings were completed at the site to a maximum depth of about 20 feet. The soil conditions below this depth are anticipated to be similar to those encountered in the upper 20 feet based on our experience with the geology in the vicinity of the project site. Based on the soil conditions encountered and our experience with the geology in the vicinity of the project site, **Seismic Site Classification D** can be used for the design of the proposed structures. Additional deeper borings and/or a site-specific seismic evaluation using geophysical methods would be required to further define the seismic site class.

Frost Considerations

The soils on this site are frost susceptible, and water present or migrating beneath structures in non-climate-controlled areas can affect the performance of the slabs on-grade, and pavements. Exterior slabs should be anticipated to heave during winter months. If frost action needs to be eliminated in critical areas, we recommend the use of non-frost susceptible (NFS) fill or structural slabs (for instance, structural stoops in front of building doors). Placement of NFS material in large areas may not be feasible; however, the following recommendations are provided to help reduce potential frost heave:

- Provide surface drainage away from the building and slabs.
- Provide underdrains within NFS backfill to prevent the accumulation of water from surface infiltration
- Grade subgrades, so groundwater potentially perched in overlying more permeable subgrades and/or engineered-fills, slope toward a site drainage system.
- Place NFS fill as backfill beneath slabs and pavements critical to the project.
- Provide drainage within the NFS backfill to prevent the accumulation of water.
- Place a 3 horizontal to 1 vertical (3H:1V) transition zone between NFS fill and other soils.
- Place NFS materials in critical sidewalk areas.

As an alternative to extending NFS fill to the full frost depth, consideration can be made to placing extruded polystyrene or cellular concrete under a buffer of at least 2 feet of NFS material. Footings for heated structures should be 48 inches below perimeter grade and 60 inches below perimeter grade for unheated structures.

Pavements

General Pavement Comments

Estimates of minimum pavement thicknesses are provided for the traffic conditions. Site preparation is a critical aspect of pavement performance. The minimum pavement thicknesses are based on the subgrade being prepared as recommended in the **Earthwork** section.

There is often a time lapse between the end of grading operations and the commencement of paving. Subgrades prepared early in the construction process can become disturbed by construction traffic. Non-uniform subgrades often result in poor pavement performance and local failures relatively soon after pavements are constructed. Depending on the paving equipment used by the contractor, measures may be required to improve subgrade strength to greater depths for support of heavily loaded trucks. Improvements should be made as recommended in **Earthwork**.

Before paving, and were recommended by Terracon, pavement subgrades should be proofrolled in the presence of a Terracon representative. Proofrolling can be accomplished using a loaded tandem-axle dump truck with a gross weight of at least 25 tons, or similarly loaded equipment.

Designs for new pavement sections for this project have been based on the procedures outlined in the 1993 Guideline for Design of Pavement Structures by the American Association of State Highway and Transportation Officials (AASHTO-1993). Pavement design methods are intended to provide structural sections with adequate thickness over a particular subgrade such that wheel loads are reduced to a level the subgrade can support.

Pavement Section Thicknesses

All pavements should be designed for the types and volumes of traffic, subgrade, and drainage conditions that are anticipated. Terracon was not provided with anticipated traffic loading information; therefore, the traffic usage and loading should be provided to Terracon so that the thickness recommendations provided below can be verified prior to using them for final design.

The minimum thicknesses provided are based on 18-kip Equivalent Single Axle Load Applications ($ESAL_{18}$) over a 20-year design life, which are provided in the table below.

Traffic patterns and anticipated loading conditions are as follows:

Design Traffic		
Pavement Type	**Location**	**Flexible Design ESAL's Values**
Standard Duty	Passenger car parking areas	30,000
Heavy Duty	Trucks areas	90,000

The following pavement design parameters were used in our evaluation of estimating minimum pavement sections for the project.

Pavement Design Input		
Input Parameter	**Asphalt**	**Concrete**
Reliability	85%	85%
Initial Serviceability	4.2	4.5
Terminal Serviceability	2.0	2.0
Standard Deviation	0.45	0.35
Load Transfer	---	3.6
Drainage	1.0	1.0

Based upon the estimated design parameters listed above, we have developed recommended minimum pavement sections for Asphaltic Concrete (AC) and Portland Cement Concrete (PCC) pavements, where the subgrade appears firm under proofrolling at the time of construction. The recommended minimum pavement sections are provided in the following table. Greater pavement and/or base course thicknesses may be required for greater expected traffic loads and volumes, or if poorer subgrade conditions are encountered.

The following table provides our estimated minimum thickness of AC pavements.

Asphaltic Concrete (AC) Design

Layer	Thickness (inches)	
	Standard Duty Pavement	Heavy Duty Pavement
AC Surface [1]	2	2
AC Binder [2]	2	3
Aggregate Base [3]	8	12

1. Surface course, WisDOT Specifications for No. 4 (12.5 mm) Hot Mix Asphalt (HMA)
2. Binder course, WisDOT Specifications for No. 3 (19.0 mm) HMA
3. The base course aggregate beneath the new pavement should conform to the 1-1/4-inch Dense Graded Base listed in Section 305 of the WisDOT Standard Specifications (current edition)

The following table provides our estimated minimum thickness of PCC pavements.

Portland Cement Concrete (PCC) Design

Layer	Thickness (inches)	Thickness (inches)	
	Standard Duty Pavement	Heavy Duty Pavement [3]	Dumpster Pad [3]
PCC [1]	5	6	8
Aggregate Base [2]	6	6	6

1. Portland cement concrete pavements are recommended for roadways and areas subjected to repeated truck traffic, truck turning areas, and trash container pads. Trash container pads should be large enough to support the container and the tipping axle of the trash collection vehicle.
2. The base course aggregate beneath the new pavement should conform to the 1-1/4-inch Dense Graded Base listed in Section 305 of the WisDOT Standard Specifications (current edition).
3. PCC should be considered for areas of anticipated heavy traffic, fire trucks, delivery trucks, or concentrated loads (e.g., dumpster pads), and areas with repeated turning or maneuvering of heavy vehicles.

Pavement Drainage

The pavement sections provided above are based on no significant increase in the subgrade moisture contents. Paved areas should be sloped to provide rapid drainage of surface water and to drain water away from the pavement edges. Water should not be allowed to accumulate on or adjacent to the pavement, since this could saturate and soften the subgrade soils and subsequently accelerate pavement deterioration. Periodic maintenance of the pavements will be required. Cracks should be sealed, and areas exhibiting distress should be repaired

promptly to help prevent further deterioration. Even with periodic maintenance, some movement and related cracking may still occur, and repairs may be required.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic upkeep should be anticipated. Preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Pavement care consists of both localized (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Additional engineering consultation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur, and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.
- Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
- Install pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

Stormwater Management

It is our understanding that an underground stormwater detention structure is planned in the east portion of the site. The invert of the structure is proposed at elevation 797.25 feet. The seasonal high groundwater level for the area of the structure where the borings were conducted was observed at elevation 796 feet.

Stormwater management facilities are governed by the Wisconsin Department of Natural Resources Conservation Practice Standard 1002 (Site Evaluation for Storm Water

Infiltration). Based on the textural classification consisting of a design infiltration rate of 0.07 to 0.5 inches per hour (in/hr) were assigned to the soils observed within the borings per Table 2 of WDNR Standard 1002. Based on the planned invert of the retention structure and the seasonal high groundwater level, the site is exempt from infiltration.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials, or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface

water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth [1]	Location
12 (SB-1 to SB-12)	26 to 30[2]	Building Footprint
1 (SW-1)	15	Stormwater Management Area
1 (P-1)	15	Pavement Area

1. Feet below existing ground surface.
2. Borings SB-8, SB9, and SB-10 encountered auger refusal at depths shallower than 30 feet.

Boring Layout and Elevations: Terracon personnel laid out the borings based on the planned structure locations and the locations of existing utilities which are present at the site. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±20 feet) and using existing site features.

Subsurface Exploration Procedures: The borings were advanced their full depth using continuous flight hollow stem augers. Four samples were obtained in the upper 10 feet of each boring, and at 5-foot intervals thereafter to termination depths. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. Soil samples in stormwater area were collected at 2.5-foot intervals to the termination depth The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. The samples were placed in appropriate containers, taken to our laboratory for testing, and classified by the project engineer. In addition, we observed and recorded

subsurface water levels during drilling and after boring completion. The borings were backfilled with bentonite chips and auger cuttings after drilling.

Our exploration team prepared field boring logs as part of standard drilling operations. These logs include sampling depths, penetration distances, and other relevant sampling information, visual classifications of materials encountered during drilling, and our interpretation of subsurface conditions between samples. Report logs were prepared from the field logs and incorporated the project engineer's interpretation of the field logs and include modifications based on observations and laboratory tests of the samples in our laboratory.

Laboratory Testing

The samples were tested in the laboratory to measure their natural water content which are provided on the boring logs in **Exploration Results**. Laboratory testing to determine the organic content was also preformed. The samples were also classified in the laboratory based on visual observation, texture, and plasticity. The soil descriptions presented on the boring logs are in accordance with the General Notes and Unified Soil Classification System (USCS) included in **Supporting Information**. The estimated USCS group symbols for native soil samples are shown on the boring logs, and a brief description of the USCS is included in **Supporting Information**. Corrosion testing is in progress. Results and recommendations will be submitted under separate geotechnical memo upon completion.

During drilling operations at the site, an odor was noted at varying depths in a number of boring locations. Terracon collected a composite sample of the cuttings from the various borings and submitted the sample to an analytical lab to arrange for disposal of the soil cuttings. The test results from that sample are attached to this report for your reference.

Attachment

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location

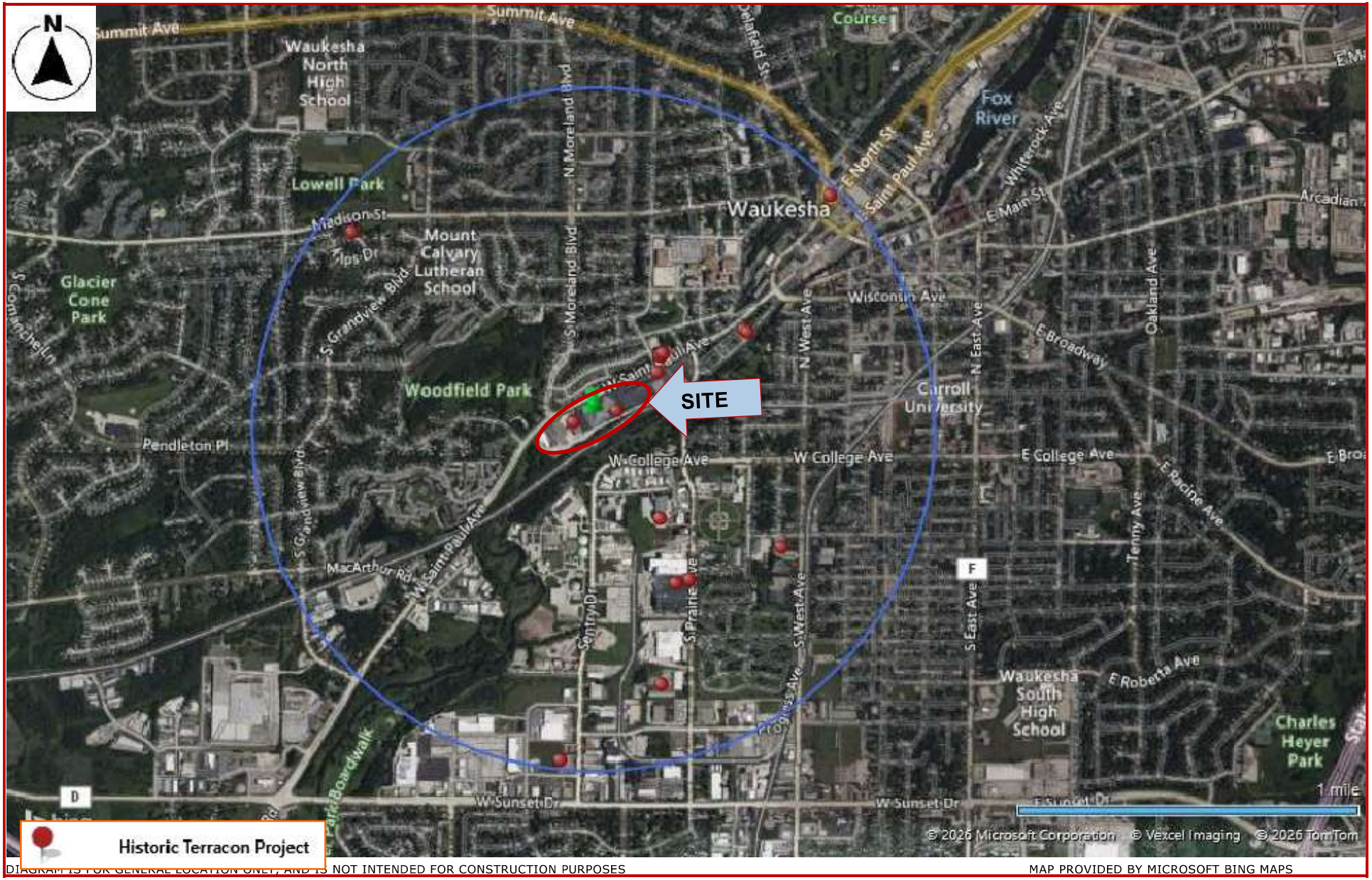


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan E-1 (Building and Stormwater Area)

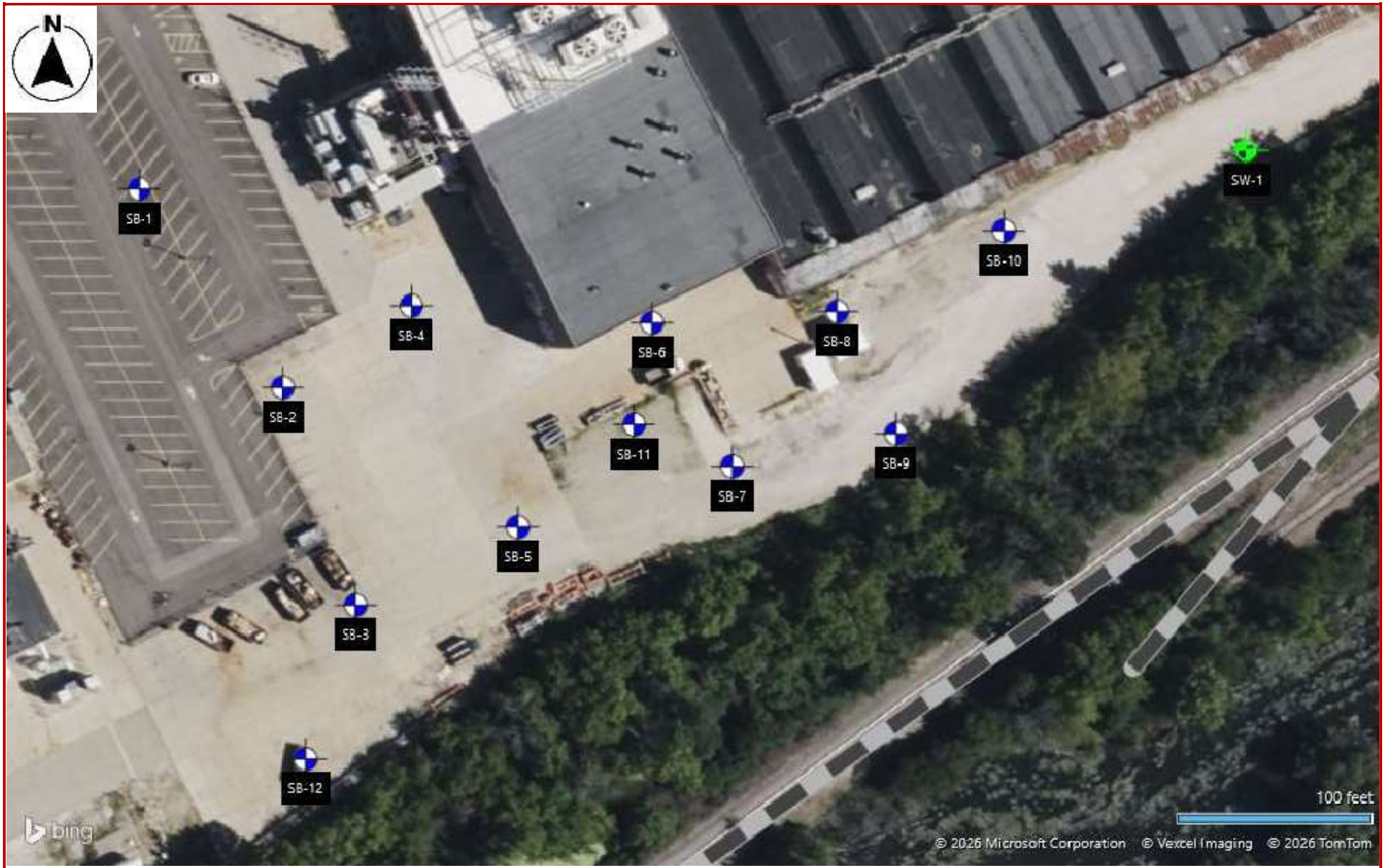
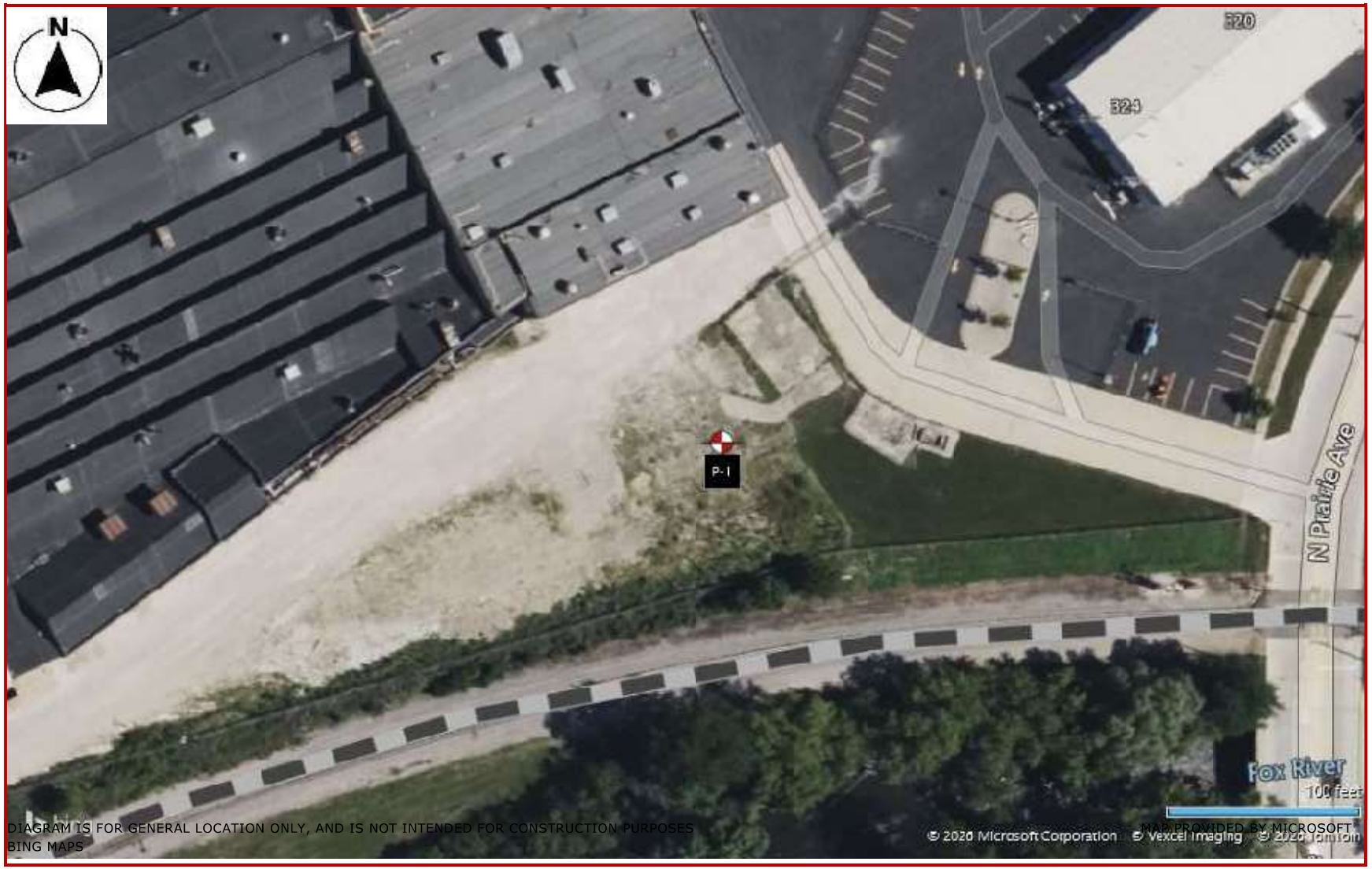


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan E-2 (Pavement Area)



Exploration and Laboratory Results

Contents:

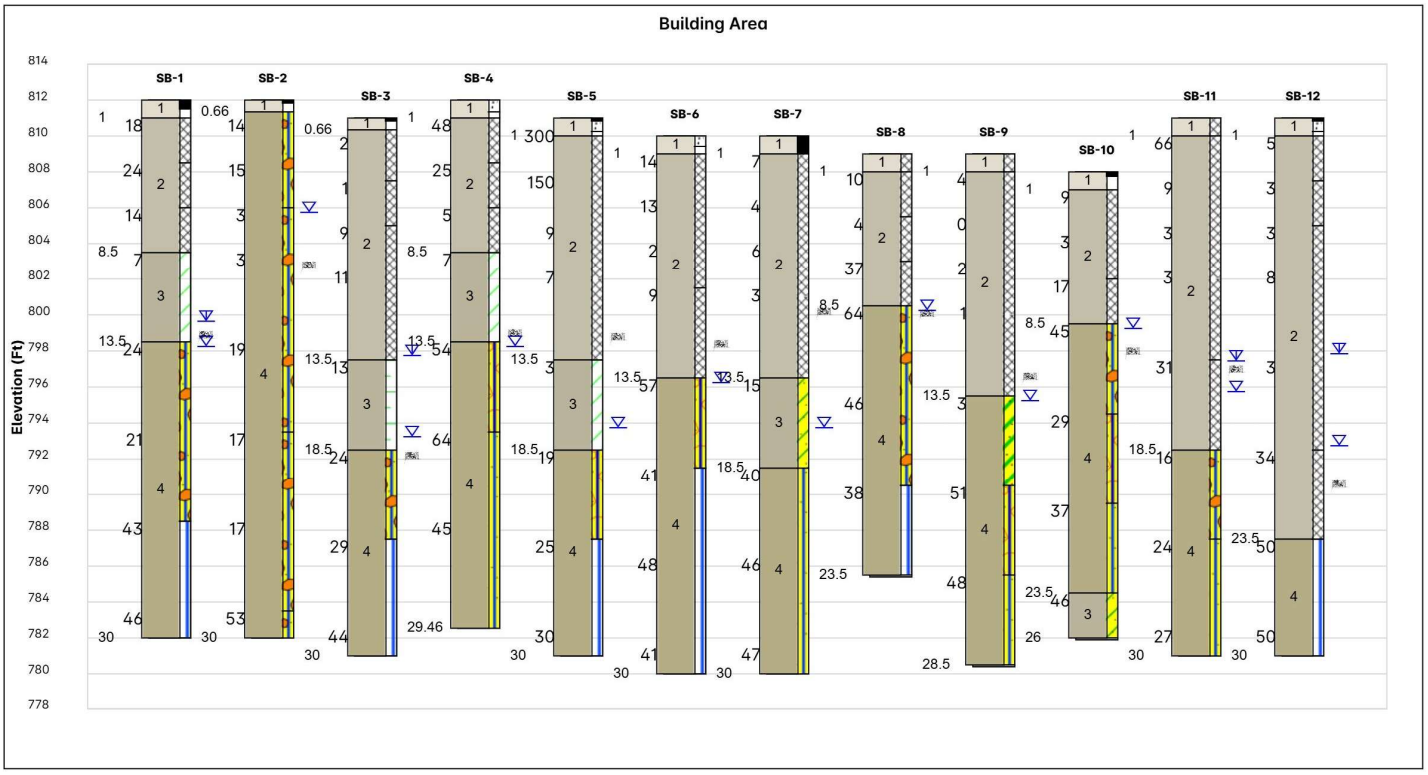
GeoModel
Boring Logs
Stormwater Form
Soil Cutting Analytical Results.

Note: All attachments are one page unless noted above.

Terracon Project No: 58265048
INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA

Terracon
4900 S Pennsylvania Ave, Ste 100
Cudahy, WI 53110-1347

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions

#	Layer Name	General Description
1	Surface Layer	2 to 7 inches of asphalt or concrete over 4 to 6 inches of base aggregate, or crushed asphalt/gravel pavement.
2	Existing Fill	Black to rusty brown silty sand or brown clayey sand with trace gravel, silt, and organics
3	Native Cohesive Soil	Gray and dark gray to black lean clay and organic lean clay with varying amounts of sand and gravel, medium stiff to hard.
4	Native Non-Cohesive Soils	Gravelly silt and sand with varying amounts of gravel and silt, moist to wet, very loose to dense to very

Legend

Asphalt, CONCRETE, Aggregate Base Course, Fill, Lean Clay, Silty Gravel with Sand, Poorly Graded Sand with Silt
Clayey Sand, Silty Sand, ARG, Silty Sand with Gravel, Sandy Lean Clay, Organic Lean Clay

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

First Water Observation
Second Water Observation
Third Water Observation

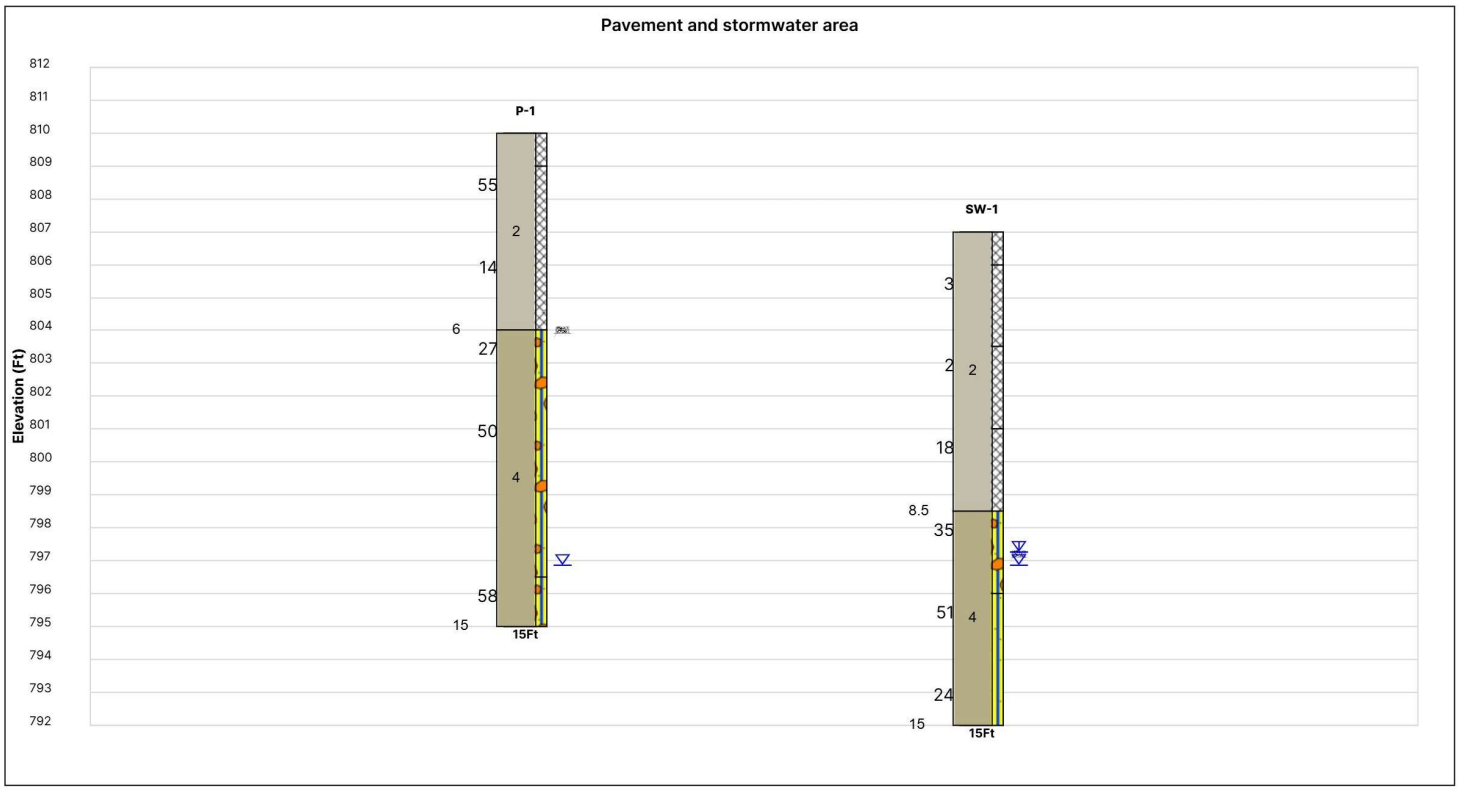
Notes:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below groundsurface.

Terracon Project No: 58265048
INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA

Terracon
4900 S Pennsylvania Ave, Ste 100
Cudahy, WI 53110-1347

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions

#	Layer Name	General Description
2	Existing Fill	Black to rusty brown silty sand or brown clayey sand with trace gravel, silt, and organics
4	Native Non-Cohesive Soils	Gravelly silt and sand with varying amounts of gravel and silt, moist to wet, very loose to dense to very

Legend	
Fill	Silty Sand with Gravel
Silty Sand	

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

First Water Observation
Second Water Observation
Third Water Observation

Notes:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below groundsurface.

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00414525° Longitude: -88.25080352°

BORING LOG NO. SB-1

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
812(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)	Organic Content (%)	Ash Content (%)
1		0.5	**ASPHALT,** 6" thick		812.0								
		1.0	**AGGREGATE BASE COURSE**		811.5								
2			**FILL- CLAYEY SAND,** trace gravel, medium grained sand, dark brown to brown, moist		811.0		14		4-8-10 N = 18	1.25	26		
		3.5	**FILL- GRAVEL,** with sand, coarse grained sand, light gray, moist, (crushed limestone)		808.5		0		10-17-7 N = 24				
		6.0	**FILL- SILTY SAND,** trace gravel, medium grained sand, black to brown, moist, possible foundry sand	5	806.0		18		5-7-7 N = 14		26		
		8.5			803.5								
3			**LEAN CLAY (CL),** trace sand, trace gravel, dark gray to black, medium stiff, trace organics	10			18		8-5-2 N = 7	.75	26	3.1	96.9
		13.5			798.5								
4			**SILTY SAND WITH GRAVEL (SM),** medium grained sand, gray to brown, wet, medium dense	15			6		20-13-11 N = 24		11		
				20			8		21-14-7 N = 21		7		
		23.5			788.5								
			POORLY GRADED SAND WITH SILT (SP-SM), trace gravel, medium grained sand, brown, wet, dense, odor noted	25			18		11-21-22 N = 43		11		
					782.0		18		19-24-22 N = 46		20		
			Boring Terminate at 30 Ft										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
- 13.5 Ft. While drilling
- 12.1 Ft. After completion of drilling
- 13.1 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/23/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.0038505° Longitude: -88.2506065°

BORING LOG NO. SB-2

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
812(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)
1		0.2								
		0.7	**ASPHALT,** 2" thick		812.0					
			AGGREGATE BASE COURSE, 6" thick		811.8					
4			**SILTY SAND WITH GRAVEL (SM),** medium grained sand, brown, moist, medium dense		811.3		18		10-8-6 N = 14	4
							18		8-9-6 N = 15	6
		6.0		5	806.0			▽		
			SILTY SAND WITH GRAVEL (SM), medium to coarse grained sand, brown, wet, very loose to medium dense				4		1-WoH-3 N = 3	9
							2	▽	WoH-1-2 N = 3	9
				10						
							19		7-4-15 N = 19	8
				15						
		18.5			793.5					
			SILTY SAND WITH GRAVEL (SM), medium grained sand, gray, wet, medium dense, odor smell				14		5-8-9 N = 17	11
				20						
							10		8-8-9 N = 17	7
				25						
		28.5			783.5					
			SILTY SAND WITH GRAVEL (SM), medium grained sand, light gray, wet, very dense, odor noted, trace weathered rocks		782.0		5		10-23-30 N = 53	12
			Boring Terminate at 30 Ft							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 6 Ft. While drilling
Groundwater not encountered upon completion
▽ 9.2 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/23/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00354578° Longitude: -88.25039673°

BORING LOG NO. SB-3

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
811(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)	Organic Content (%)	Ash Content (%)
1		0.2											
		0.7	**ASPHALT,** 2" thick		811.0								
			AGGREGATE BASE COURSE, 6" thick		810.8								
2			**FILL- SILTY SAND,** trace gravel, medium grained sand, black to dark gray, moist		810.3		14		3-1-1 N = 2		21		
		3.5	**FILL- SILTY SAND,** trace clay, medium grained sand, brown, wet		807.5		6		WoH-1-WoH N = 1		17		
		6.0	**FILL- SILTY SAND,** trace clay, medium grained sand, black and rusty brown, moist	5	805.0		18		7-6-3 N = 9		16		
							18		5-5-6 N = 11		11		
		13.5		10	797.5			▽					
3			**ORGANIC LEAN CLAY (OL),** trace sand, trace gravel, black to dark gray, stiff, odor noted	15			14		9-7-6 N = 13	1.25	54	36	64
		18.5			792.5			▽ ▨					
4			**SILTY SAND WITH GRAVEL (SM),** medium grained sand, brown, wet, medium dense	20			6		9-12-12 N = 24		12		
		23.5			787.5								
			POORLY GRADED SAND WITH SILT (SP-SM), trace gravel, medium grained sand, brown, wet, medium dense to dense, odor noted	25			28		9-14-15 N = 29		19		
					781.0		18		17-20-24 N = 44		12		
			Boring Terminate at 30 Ft										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 17.5 Ft. While drilling
▽ 13 Ft. After completion of drilling
▨ 18.8 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/23/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00396768° Longitude: -88.25028929°

BORING LOG NO. SB-4

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
812(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)	Organic Content (%)	Ash Content (%)
1		0.7	**CONCRETE,** 6" thick		812.0								
		1.0	**AGGREGATE BASE COURSE,** 4" thick		811.3								
2			**FILL- SILTY SAND,** trace gravel, medium grained sand, black, moist, trace organics, odor noted		811.0		8		8-24-24 N = 48		11	6.3	93.7
		3.5	**FILL- CLAYEY SAND,** trace gravel, medium grained sand, brown and gray, moist		808.5		18		12-14-11 N = 25		7		
		6.0	**FILL- SANDY LEAN CLAY,** trace gravel, gray to rusty brown, trace crushed concrete	5	806.0		12		1-1-4 N = 5	1.25	12		
		8.5	**LEAN CLAY (CL),** trace sand, trace gravel, dark gray, stiff		803.5		1.5		WoH-2-5 N = 7	1.25	24	2.4	97.6
3				10									
		13.5			798.5		16	▽	19-24-30 N = 54		5		
4			**SILTY GRAVEL WITH SAND (GM),** light gray, wet, very dense, strong odor	15									
		18.5			793.5		18		24-33-31 N = 64		10		
			SILTY SAND (SM), trace gravel, medium to coarse grained sand, brown, wet	20									
							12		20-24-21 N = 45		16		
				25									
					782.5				30-50/5.5''		10		
			Boring Terminate at 29.46 Ft										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 13.5 Ft. While drilling
Groundwater not encountered upon completion
13 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT
Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/24/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00365578° Longitude: -88.25008363°

BORING LOG NO. SB-5

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
811(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)	Organic Content (%)	Ash Content (%)
1		0.2	**ASPHALT,** 2" thick		811.0								
		0.8	**CONCRETE,** 7" concrete		810.8								
		1.0	**AGGREGATE BASE COURSE**		810.3		8		26-50/2" N = 300		16	12.5	87.5
2			**FILL- SILTY SAND WITH GRAVEL,** medium grained sand, black to rusty brown, moist, trace glass, possible foundry sand, with organics		810.0		10		5-50/4" N = 150		16	7	93
				5			16		2-6-3 N = 9		14		
							12		1-3-4 N = 7		10		
				10				CAVE					
		13.5			797.5								
3			**LEAN CLAY (CL),** trace sand, trace gravel, black, medium stiff, with organics				10		WoH-1-2 N = 3	0.5	64	5.2	94.8
				15				▽					
		18.5			792.5								
4			**SILTY GRAVEL WITH SAND (GM),** fine to medium grained sand, brown to dark brown, wet, medium dense				10		11-8-11 N = 19		14		
				20									
		23.5			787.5								
			POORLY GRADED SAND WITH SILT (SP-SM), trace gravel, medium to coarse grained sand, brown, wet, medium dense				18		11-15-10 N = 25		18		
				25									
					781.0		18		18-14-16 N = 30		18		
			Boring Terminate at 30 Ft										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 17 Ft. While drilling
Groundwater not encountered upon completion
CAVE 12.2 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/24/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00394377° Longitude: -88.24982493°

BORING LOG NO. SB-6

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
810(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)
1		0.6	**CONCRETE,** 7" thick		810.0						
		1.0	**AGGREGATE BASE COURSE**		809.4						
2			**FILL- SILTY SAND,** trace gravel, medium grained sand, black to rusty brown, moist		809.0		18		6-8-6 N = 14		9
							18		4-5-8 N = 13		6
				5			8		3-WoH-2 N = 2		9
		8.5			801.5						
			FILL- SANDY LEAN CLAY, trace gravel, gray and brown, odor noted				18		WoH-2-7 N = 9	2.25	27
				10				▽			
4		13.5			796.5						
			SILTY GRAVEL WITH SAND (GM), medium grained sand, light gray, wet, very dense, strong odor smell, crushed stone				16		25-30-27 N = 57		5
				15							
		18.5			791.5						
			POORLY GRADED SAND WITH SILT (SP-SM), trace gravel, medium to coarse grained sand, brown, wet, dense				18		21-23-18 N = 41		18
				20							
							6		17-22-26 N = 48		17
				25							
					780.0		18		14-20-21 N = 41		19
			Boring Terminate at 30 Ft								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 13.5 Ft. While drilling
Groundwater not encountered upon completion
11.6 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/24/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00374131° Longitude: -88.24967009°

BORING LOG NO. SB-7

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
810(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)
1		1.0	**ASPHALT,** crushed, 12" thick		810.0						
2		13.5	**FILL- SILTY SAND,** trace gravel, medium grained sand, black and rusty brown, moist, odor noted		809.0		16		2-3-4 N = 7		6
				5			8		3-2-2 N = 4		19
							4		2-3-3 N = 6		20
				10			2	CAV	1-1-2 N = 3		21
3		18.5	**SANDY LEAN CLAY (CL),** greenish gray and brown, stiff, strong odor		796.5		18		1-2-13 N = 15	1.25	35
4			**SILTY SAND (SM),** trace gravel, medium to coarse grained sand, brown, wet, dense	15	791.5		18		36-22-18 N = 40		10
				20			6		13-23-23 N = 46		8
				25	780.0		18		23-21-26 N = 47		14
			Boring Terminate at 30 Ft								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
16 Ft. While drilling
Groundwater not encountered upon completion
CAV 9.8 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/25/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00395972° Longitude: -88.24946787°

BORING LOG NO. SB-8

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
809(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)
1		1.0	**FILL-** crushed concrete and asphalt		809.0						
2		3.5	**FILL- SILTY SAND,** trace gravel, medium grained sand, brown and rusty brown, moist		808.0		12		3-6-4 N = 10		10
		6.0	**FILL- SANDY LEAN CLAY,** trace gravel, gray to dark gray, odor noted	5	805.5		5		6-2-2 N = 4	1.0	18
		8.5	**FILL- SILTY GRAVEL,** trace sand, coarse grained gravel, light brown, moist, (crushed stone)		803.0		4		4-20-17 N = 37		4
4		18.5	**SILTY SAND WITH GRAVEL (SM),** medium to coarse grained sand, light brown and gray, wet, dense to very dense	10	800.5		16	▽ 8.5 ▽ 8.9	13-22-42 N = 64		5
				15			14		19-24-22 N = 46		6
		23.5	**POORLY GRADED SAND WITH SILT (SP-SM),** trace gravel, coarse grained sand, brown, wet, dense	20	790.5		18		24-18-20 N = 38		17
			possible bedrock at 23.6		785.5 785.4		0		50/1"		

Boring Refusal at 23.6 Ft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 8.5 Ft. While drilling
Groundwater not encountered upon completion
▽ 8.9 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT
Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/25/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00378748° Longitude: -88.24935443°

BORING LOG NO. SB-9

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
809(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)
1		1.0	**FILL-** sand and gravel		809.0					
2		13.5	**FILL- SILTY SAND,** trace gravel, medium grained sand, moist, black to rusty brown		808.0		4		3-2-2 N = 4	15
				5			16		1-WoH-WoH N = 0	11
							18		1-1-1 N = 2	10
				10			18		1-1-WoH N = 1	9
								CAVE		
4		18.5	**CLAYEY SAND (SC),** trace gravel, fine to medium grained sand, dark gray to brown, wet, very loose, odor noted	15	795.5		14	▽	WoH-1-2 N = 3	23
		23.5	**SILTY GRAVEL WITH SAND (GM),** coarse grained gravel, light brown, wet, very dense	20	790.5		8		7-24-27 N = 51	9
		28.5	**SILTY SAND (SM),** trace gravel, medium grained sand, gray, wet, dense	25	785.5		3		31-28-20 N = 48	15
			possible bedrock at 28.6		780.5					
			Boring Refusal at 28.6 Ft		780.4					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 13.5 Ft. While drilling
Groundwater not encountered upon completion
CAVE 12.4 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT
Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/25/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00407373° Longitude: -88.24914609°

BORING LOG NO. SB-10

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
808(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)
1		0.3	**ASPHALT,** 3" thick		808.0						
		1.0	**AGGREGATE BASE COURSE**		807.8						
2			**FILL- SILTY SAND,** trace gravel, medium grained sand, black and rusty brown, moist		807.0		16		4-5-4 N = 9		8
							18		3-1-2 N = 3		14
				5							
		6.0			802.0						
			FILL- CLAYEY SAND WITH GRAVEL, medium to coarse grained sand, light brown, moist, trace crushed rock				10		1-2-15 N = 17		28
		8.5			799.5			▽			
4			**SILTY SAND WITH GRAVEL (SM),** medium grained sand, brown and gray, wet, dense, strong odor				18	▽ 10.1	14-21-24 N = 45		4
				10							
		13.5			794.5						
			SILTY GRAVEL WITH SAND (GM), brown, wet, medium dense, medium grained gravel, odor noted				12		14-15-14 N = 29		10
				15							
		18.5			789.5						
			SILTY SAND (SM), trace gravel, medium grained sand, brown, wet, dense, odor noted				18		12-16-21 N = 37		21
				20							
		23.5			784.5						
3			**SANDY LEAN CLAY (CL),** trace gravel, gray, hard, odor noted				18		31-24-22 N = 46	4.5+	7
				25							
		26.0			782.0						
			possible bedrock at 26.1		781.9		0		50/1.5"		16
			Boring Refusal at 26.1 Ft								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 8.5 Ft. While drilling
Groundwater not encountered upon completion
▽ 10 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/25/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.0038004° Longitude: -88.24985949°

BORING LOG NO. SB-11

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
811(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)
1		1.0	**FILL-** sand and gravel		811.0					
2			**FILL- SILTY SAND,** trace gravel, medium grained sand, moist, black and brown, possible foundry sand		810.0		12		7-34-32 N = 66	18
				5			18		4-6-3 N = 9	15
							18		3-2-1 N = 3	10
				10			18		2-2-1 N = 3	6
		13.5			797.5					
			FILL- SILTY GRAVEL, trace sand, light gray, odor noted	15			4		22-21-10 N = 31	
		18.5			792.5					
4			**SILTY SAND WITH GRAVEL (SM),** medium grained sand, gray, wet, medium dense, odor noted	20			12		5-5-11 N = 16	7
		23.5			787.5					
			SILTY SAND (SM), trace gravel, medium to coarse grained sand, brown, wet, medium dense, strong odor	25			18		8-10-14 N = 24	21
					781.0		14		12-12-15 N = 27	15
			Boring Terminate at 30 Ft							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
- 15 Ft. While drilling
- 13.3 Ft. After completion of drilling
- 14 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/26/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00332855° Longitude: -88.25049334°

BORING LOG NO. SB-12

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
811(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)	Organic Content (%)	Ash Content (%)
1		0.2	**ASPHALT,** 2" thick		811.0								
		0.8	**CONCRETE,** 7" thick		810.8								
		1.0	**AGGREGATE BASE COURSE**		810.3								
2			**FILL- SILTY SAND WITH GRAVEL,** medium grained sand, black, moist		810.0		2		5-2-3 N = 5		11	3.9	96.1
		3.5	**FILL- CLAYEY SAND,** trace gravel, medium grained sand, brown, wet to moist		807.5		14		WoH-2-1 N = 3		10		
		6.0	**FILL- SANDY LEAN CLAY,** trace gravel, dark gray to black	5	805.0		12		6-2-1 N = 3	1.5	11		
							18		5-5-3 N = 8	1.5	15	2.7	97.3
				10				▽					
							18		WoH-2-1 N = 3	1.0	23	5	95
				15				▽					
		18.5	**FILL- SANDY LEAN CLAY,** black and gray, trace rock and wood		792.5		12	▽	1-8-26 N = 34	1.25	67	14.3	85.7
				20									
		23.5			787.5								
4			**POORLY GRADED SAND WITH SILT (SP-SM),** trace gravel, medium grained sand, gray, wet, dense				18		18-22-28 N = 50		12		
				25									
					781.0				20-26-24 N = 50		7		
			Boring Terminate at 30 Ft										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
▽ 18 Ft. While drilling
▽ 12.9 Ft. After completion of drilling
20.4 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/24/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.00418689° Longitude: -88.24867629°

BORING LOG NO. SW-1

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
807(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)	Organic Content (%)	Ash Content (%)
2		1.0	**FILL- GRAVEL,** with sand, trace sand, medium grained sand, gray		807.0								
			FILL- SILTY SAND, trace gravel, medium grained sand, black, moist, possible foundry sand		806.0		16		1-2-1 N = 3		9	1.9	98.1
		3.5			803.5		6		5-1-1 N = 2	1.25	17	2.4	97.6
			FILL- SANDY LEAN CLAY, trace gravel, gray and brown, odor noted	5									
		6.0			801.0		12		4-6-12 N = 18	1.25	28	38.2	61.8
			FILL- SANDY ORGANIC LEAN CLAY, trace gravel, dark brown and brown										
		8.5			798.5		8		11-19-16 N = 35		5		
4			**SILTY SAND WITH GRAVEL (SM),** medium grained sand, brown and gray, moist, dense	10									
		11.0			796.0		16		14-24-27 N = 51		3		
			SILTY SAND (SM), rusty brown, moist, medium dense to very dense, trace cobbles, odor noted								7		
					792.0		18		9-13-11 N = 24				
			Boring Terminate at 15 Ft										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
- 10 Ft. While drilling
- 9.6 Ft. After completion of drilling
- 9.8 Ft. Cave In

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/24/2026

INNIO Project Green
1101 West St. Paul Ave, Waukesha, WI, 53188,USA
Terracon Project No. 58265048

Latitude: 43.0055057° Longitude: -88.24489068°

BORING LOG NO. P-1

Terracon
4900 S Pennsylvania Ave,
Ste 100 Cudahy, WI 53110-1347

Surface Elevation:
810(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf)	Water Content (%)	Organic Content (%)	Ash Content (%)
2		1.0	**FILL- GRAVEL,** with sand		810.0								
			FILL- SANDY LEAN CLAY, trace gravel, dark brown, trace organics		809.0		5		4-30-25 N = 55	2.0	12	3.6	96.4
							3		3-4-10 N = 14	dist.	8		
		6.0		5	804.0								
4			**SILTY SAND WITH GRAVEL (SM),** brown, moist, medium dense to very dense, trace clay and cobbles				3		16-17-10 N = 27		5		
							8		12-19-31 N = 50		5		
				10									
		13.5			796.5								
			SILTY SAND WITH GRAVEL (SM), rusty brown, wet, very dense		795.0		5		17-15-43 N = 58		10		
			Boring Terminate at 15 Ft										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations shown are interpreted from the provided topographic map.

Water Level Observations
13 Ft. While drilling
Groundwater not encountered upon completion
6 Ft. Cave In

Abandonment Method
Boring backfilled with soil cuttings and bentonite chips upon completion.

Equipment
Subcontractor-7822DT Geoprobe

Hammer Type
Automatic

Driller
Chris

Logged By
Abdel Deif

Start Date
03/24/2026

Wisconsin Department of Safety and Professional Services
Division of Industry Services
4822 Madison Yards Way
PO Box 7302
Madison, WI 53707

Phone: 608-266-2112
Web: http://dsps.wi.gov
Email: dsps@wisconsin.gov

Program: Plumbing
Web: https://dsps.wi.gov/Pages/Programs/Plumbing

Soil and Site Evaluation – Stormwater Infiltration

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m)]

Attach a complete site plan on paper not less than 8 ½ x 11 inches in size. Plan must include, but is not limited to: vertical and horizontal reference point (BM); direction and percent of slope; scale or dimensions; north arrow; and BM referenced to nearest road.

PLEASE PRINT ALL INFORMATION

COUNTY: Waukesha

PARCEL ID: WAKC1312951

PROPERTY OWNER: NNIO WAUK GAS ENGINES INC

PROPERTY OWNER'S MAILING ADDRESS: 1101 W ST PAUL AV

CITY, STATE, ZIP CODE: WAUKESHA, WI 53188

PHONE:

PROPERTY LOCATION

Govt. Lot ____, ____ ¼, ____ ¼, S ____, T ____N, R ____ W

Lot #, Block #, Subd. Name or CSM #: _____

Municipality: City of Waukesha

☑ City ☐ Village ☐ Town

Nearest Road: W ST PAUL AV

Drainage area _____ ☐sq. ft. ☐acres

Test site suitable for (check all that apply):

☐Site not suitable ☐Bioretention

☐Reuse ☐Subsurface Dispersal System

☐Irrigation ☐Other _____

HYDRAULIC APPLICATION TEST METHOD

☑ Morphological Evaluation

☐ Double Ring Infiltrometer

☐ Other: (specify)

_____

SOIL MOISTURE

Date of soil borings: 03/24/2026

USDA-NRCS WETS VALUE:

☐ Dry = 1

☑ Normal = 2

☐ Wet = 3

SW1 #OBS. ☐ Pit ☑ Boring Ground Surface Elevation 807 ft. Elevation of Limiting Factor 796 ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App. Rate Inches/Hr.
1	72	FILL								
2	74	10 YR 3/4	None	C	3, vco, abk	Fl	AB	0	95	0.07
3	132	10 YR 4/6	None	xgr LFS	0 sg	L	AB	40	15	0.5
4	180	10 YR 5/6	None	xgr LFS	0 sg	L	AB	40	12	0.5

Comments:
At 11 ft, water observed
Petroleum smelly soils @ 13.5 feet

____ #OBS. ☐ Pit ☐ Boring Ground Surface Elevation _____ ft. Elevation of Limiting Factor _____ ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App. Rate Inches/Hr.

Comments:

____ #OBS. ☐ Pit ☐ Boring Ground Surface Elevation _____ ft. Elevation of Limiting Factor _____ ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App. Rate Inches/Hr.

Comments:

Overall Site Comments:

Paul J Koszarek
Name (Please Print)

Signature

1263130
Credential Number

4900 S. Pennsylvania Ave, Suite 100, Cudahy, WI
Address

4-9-2026
Date Evaluation Conducted

262-332-3399
Phone Number

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

April 13, 2026

Jon Cone
Terracon, Inc. - Milwaukee
4900 S Pennsylvania Ave Ste100
Cudahy, WI 53110

RE: Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Dear Jon Cone:

Enclosed are the analytical results for sample(s) received by the laboratory on April 01, 2026. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brian Basten
brian.basten@pacelabs.com
(920)469-2436
Project Manager

Enclosures
cc:

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Illinois EPA Certification # 200050
Kentucky UST DEP Certification # 123059
Minnesota DOH Certification # 055-999-334
North Dakota DEQ Certification # R-150
South Carolina DES Certification # 83006001
USDA APHIS Foreign Soil Permit # 525-24-3-36355
Virginia VELAP Certification # 460263
Wisconsin DNR Certification # 405132750
Florida DOH Certification # E87948
ISO/IEC 17025 (A2LA) Certification # 6154.01
Louisiana DEQ Certification # 04168
New York DOH Certification # 12064
ISO/IEC 17025 (A2LA) Certification # 6154.01
Texas TCEQ Certification # T104704529
U.S. Fish & Wildlife Service Permit # 51774A
Wisconsin DATCP Certification # 444

REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40310342001	**COMP-1**	Solid	03/31/26 10:20	04/01/26 10:15

REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40310342001	**COMP-1**	EPA 6010D	MJB	7	PASI-G
		EPA 7471	MRP	1	PASI-G
		EPA 8270E	TPO	18	PASI-G
		EPA 8260	ALD	64	PASI-G
		ASTM D2974	SKW	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SUMMARY OF DETECTION

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40310342001	**COMP-1**					
EPA 6010D	Arsenic	8.6	mg/kg	2.7	04/07/26 19:26	
EPA 6010D	Barium	70.7	mg/kg	0.54	04/07/26 19:26	
EPA 6010D	Cadmium	0.16J	mg/kg	0.54	04/07/26 19:26	
EPA 6010D	Chromium	36.1	mg/kg	1.1	04/07/26 19:26	
EPA 6010D	Lead	33.4	mg/kg	2.2	04/07/26 19:26	
EPA 7471	Mercury	0.068	mg/kg	0.037	04/07/26 13:33	
EPA 8260	n-Butylbenzene	332	ug/kg	63.9	04/07/26 16:43	
EPA 8260	sec-Butylbenzene	243	ug/kg	63.9	04/07/26 16:43	
EPA 8260	Isopropylbenzene (Cumene)	44.6J	ug/kg	63.9	04/07/26 16:43	
EPA 8260	n-Propylbenzene	90.6	ug/kg	63.9	04/07/26 16:43	
ASTM D2974	Percent Moisture	12.2	%	0.10	04/01/26 14:59	

REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Method: **EPA 6010D**
Description: 6010D MET ICP
Client: Terracon, Inc. - Milwaukee
Date: April 13, 2026

General Information:
1 sample was analyzed for EPA 6010D by Pace Analytical Services Green Bay. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.
QC Batch: 533181
A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 40310453001
M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- MS (Lab ID: 3032872)
  - Barium

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Method: **EPA 7471**
Description: 7471 Mercury
Client: Terracon, Inc. - Milwaukee
Date: April 13, 2026

General Information:
1 sample was analyzed for EPA 7471 by Pace Analytical Services Green Bay. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Method: **EPA 8270E**
Description: 8270E MSSV FULL LIST MICROWAVE
Client: Terracon, Inc. - Milwaukee
Date: April 13, 2026

General Information:
1 sample was analyzed for EPA 8270E by Pace Analytical Services Green Bay. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Extracted Internal Standards:
All extracted internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.
QC Batch: 533152
L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
- LCS (Lab ID: 3032785)
  - Pentachlorophenol

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:
Analyte Comments:

QC Batch: 533152
D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- COMP-1 (Lab ID: 40310342001)
  - 1,4-Dichlorobenzene

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Method: **EPA 8260**
Description: 8260 MSV Med Level Normal List
Client: Terracon, Inc. - Milwaukee
Date: April 13, 2026

General Information:
1 sample was analyzed for EPA 8260 by Pace Analytical Services Green Bay. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 5035/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.
QC Batch: 533155
v1: The continuing calibration verification was above the method acceptance limit. Any detection for the analyte in the associated samples may have a high bias.
- LCS (Lab ID: 3032795)
  - Trichlorofluoromethane
  - Vinyl chloride

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Extracted Internal Standards:
All extracted internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Sample: COMP-1 **Lab ID: 40310342001** Collected: 03/31/26 10:20 Received: 04/01/26 10:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Green Bay								
Arsenic	**8.6**	mg/kg	2.7	1.6	1	04/07/26 10:39	04/07/26 19:26	7440-38-2	
Barium	**70.7**	mg/kg	0.54	0.16	1	04/07/26 10:39	04/07/26 19:26	7440-39-3	
Cadmium	**0.16J**	mg/kg	0.54	0.14	1	04/07/26 10:39	04/07/26 19:26	7440-43-9	
Chromium	**36.1**	mg/kg	1.1	0.30	1	04/07/26 10:39	04/07/26 19:26	7440-47-3	
Lead	**33.4**	mg/kg	2.2	0.65	1	04/07/26 10:39	04/07/26 19:26	7439-92-1	
Selenium	**<1.4**	mg/kg	4.3	1.4	1	04/07/26 10:39	04/07/26 19:26	7782-49-2	
Silver	**<0.33**	mg/kg	1.1	0.33	1	04/07/26 10:39	04/07/26 19:26	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471 Pace Analytical Services - Green Bay								
Mercury	**0.068**	mg/kg	0.037	0.022	1	04/06/26 13:31	04/07/26 13:33	7439-97-6	
8270E MSSV FULL LIST MICROWAVE	Analytical Method: EPA 8270E Preparation Method: EPA 3546 Pace Analytical Services - Green Bay								
1,4-Dichlorobenzene	**<130**	ug/kg	475	130	2.5	04/07/26 12:07	04/08/26 13:54	106-46-7	D3
2,4-Dinitrotoluene	**<239**	ug/kg	475	239	2.5	04/07/26 12:07	04/08/26 13:54	121-14-2	
Hexachloro-1,3-butadiene	**<121**	ug/kg	475	121	2.5	04/07/26 12:07	04/08/26 13:54	87-68-3	
Hexachlorobenzene	**<79.8**	ug/kg	475	79.8	2.5	04/07/26 12:07	04/08/26 13:54	118-74-1	
Hexachloroethane	**<75.9**	ug/kg	475	75.9	2.5	04/07/26 12:07	04/08/26 13:54	67-72-1	
2-Methylphenol(o-Cresol)	**<86.2**	ug/kg	475	86.2	2.5	04/07/26 12:07	04/08/26 13:54	95-48-7	
3&4-Methylphenol(m&p Cresol)	**<87.0**	ug/kg	475	87.0	2.5	04/07/26 12:07	04/08/26 13:54		
Nitrobenzene	**<96.2**	ug/kg	475	96.2	2.5	04/07/26 12:07	04/08/26 13:54	98-95-3	
Pentachlorophenol	**<234**	ug/kg	475	234	2.5	04/07/26 12:07	04/08/26 13:54	87-86-5	L2
Pyridine	**<76.4**	ug/kg	475	76.4	2.5	04/07/26 12:07	04/08/26 13:54	110-86-1	
2,4,5-Trichlorophenol	**<186**	ug/kg	475	186	2.5	04/07/26 12:07	04/08/26 13:54	95-95-4	
2,4,6-Trichlorophenol	**<187**	ug/kg	475	187	2.5	04/07/26 12:07	04/08/26 13:54	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	81	%	45-130		2.5	04/07/26 12:07	04/08/26 13:54	4165-60-0	
2-Fluorobiphenyl (S)	77	%	37-130		2.5	04/07/26 12:07	04/08/26 13:54	321-60-8	
Terphenyl-d14 (S)	94	%	51-130		2.5	04/07/26 12:07	04/08/26 13:54	1718-51-0	
Phenol-d6 (S)	77	%	39-130		2.5	04/07/26 12:07	04/08/26 13:54	13127-88-3	
2-Fluorophenol (S)	74	%	33-130		2.5	04/07/26 12:07	04/08/26 13:54	367-12-4	
2,4,6-Tribromophenol (S)	80	%	32-130		2.5	04/07/26 12:07	04/08/26 13:54	118-79-6	
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay								
Benzene	**<15.2**	ug/kg	25.6	15.2	1	04/07/26 07:24	04/07/26 16:43	71-43-2	
Bromobenzene	**<24.9**	ug/kg	63.9	24.9	1	04/07/26 07:24	04/07/26 16:43	108-86-1	
Bromochloromethane	**<17.5**	ug/kg	63.9	17.5	1	04/07/26 07:24	04/07/26 16:43	74-97-5	
Bromodichloromethane	**<15.2**	ug/kg	63.9	15.2	1	04/07/26 07:24	04/07/26 16:43	75-27-4	
Bromoform	**<281**	ug/kg	319	281	1	04/07/26 07:24	04/07/26 16:43	75-25-2	
Bromomethane	**<89.6**	ug/kg	319	89.6	1	04/07/26 07:24	04/07/26 16:43	74-83-9	
n-Butylbenzene	**332**	ug/kg	63.9	35.9	1	04/07/26 07:24	04/07/26 16:43	104-51-8	

REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

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ANALYTICAL RESULTS

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Sample: COMP-1 **Lab ID: 40310342001** Collected: 03/31/26 10:20 Received: 04/01/26 10:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay								
sec-Butylbenzene	**243**	ug/kg	63.9	26.3	1	04/07/26 07:24	04/07/26 16:43	135-98-8	
tert-Butylbenzene	**<20.1**	ug/kg	63.9	20.1	1	04/07/26 07:24	04/07/26 16:43	98-06-6	
Carbon tetrachloride	**<14.1**	ug/kg	63.9	14.1	1	04/07/26 07:24	04/07/26 16:43	56-23-5	
Chlorobenzene	**<7.7**	ug/kg	63.9	7.7	1	04/07/26 07:24	04/07/26 16:43	108-90-7	
Chloroethane	**<27.0**	ug/kg	319	27.0	1	04/07/26 07:24	04/07/26 16:43	75-00-3	
Chloroform	**<45.7**	ug/kg	319	45.7	1	04/07/26 07:24	04/07/26 16:43	67-66-3	
Chloromethane	**<24.3**	ug/kg	63.9	24.3	1	04/07/26 07:24	04/07/26 16:43	74-87-3	
2-Chlorotoluene	**<20.7**	ug/kg	63.9	20.7	1	04/07/26 07:24	04/07/26 16:43	95-49-8	
4-Chlorotoluene	**<24.3**	ug/kg	63.9	24.3	1	04/07/26 07:24	04/07/26 16:43	106-43-4	
1,2-Dibromo-3-chloropropane	**<49.6**	ug/kg	319	49.6	1	04/07/26 07:24	04/07/26 16:43	96-12-8	
Dibromochloromethane	**<218**	ug/kg	319	218	1	04/07/26 07:24	04/07/26 16:43	124-48-1	
1,2-Dibromoethane (EDB)	**<17.5**	ug/kg	63.9	17.5	1	04/07/26 07:24	04/07/26 16:43	106-93-4	
Dibromomethane	**<18.9**	ug/kg	63.9	18.9	1	04/07/26 07:24	04/07/26 16:43	74-95-3	
1,2-Dichlorobenzene	**<22.4**	ug/kg	63.9	22.4	1	04/07/26 07:24	04/07/26 16:43	95-50-1	
1,3-Dichlorobenzene	**<18.8**	ug/kg	63.9	18.8	1	04/07/26 07:24	04/07/26 16:43	541-73-1	
1,4-Dichlorobenzene	**<19.6**	ug/kg	63.9	19.6	1	04/07/26 07:24	04/07/26 16:43	106-46-7	
Dichlorodifluoromethane	**<27.5**	ug/kg	63.9	27.5	1	04/07/26 07:24	04/07/26 16:43	75-71-8	
1,1-Dichloroethane	**<16.4**	ug/kg	63.9	16.4	1	04/07/26 07:24	04/07/26 16:43	75-34-3	
1,2-Dichloroethane	**<14.7**	ug/kg	63.9	14.7	1	04/07/26 07:24	04/07/26 16:43	107-06-2	
1,1-Dichloroethene	**<21.2**	ug/kg	63.9	21.2	1	04/07/26 07:24	04/07/26 16:43	75-35-4	
cis-1,2-Dichloroethene	**<13.7**	ug/kg	63.9	13.7	1	04/07/26 07:24	04/07/26 16:43	156-59-2	
trans-1,2-Dichloroethene	**<14.0**	ug/kg	63.9	14.0	1	04/07/26 07:24	04/07/26 16:43	156-60-5	
1,2-Dichloropropane	**<15.2**	ug/kg	63.9	15.2	1	04/07/26 07:24	04/07/26 16:43	78-87-5	
1,3-Dichloropropane	**<13.9**	ug/kg	63.9	13.9	1	04/07/26 07:24	04/07/26 16:43	142-28-9	
2,2-Dichloropropane	**<17.2**	ug/kg	63.9	17.2	1	04/07/26 07:24	04/07/26 16:43	594-20-7	
1,1-Dichloropropene	**<20.7**	ug/kg	63.9	20.7	1	04/07/26 07:24	04/07/26 16:43	563-58-6	
cis-1,3-Dichloropropene	**<42.2**	ug/kg	319	42.2	1	04/07/26 07:24	04/07/26 16:43	10061-01-5	
trans-1,3-Dichloropropene	**<183**	ug/kg	319	183	1	04/07/26 07:24	04/07/26 16:43	10061-02-6	
Diisopropyl ether	**<15.8**	ug/kg	63.9	15.8	1	04/07/26 07:24	04/07/26 16:43	108-20-3	
Ethylbenzene	**<15.2**	ug/kg	63.9	15.2	1	04/07/26 07:24	04/07/26 16:43	100-41-4	
Hexachloro-1,3-butadiene	**<127**	ug/kg	319	127	1	04/07/26 07:24	04/07/26 16:43	87-68-3	
Isopropylbenzene (Cumene)	**44.6J**	ug/kg	63.9	21.8	1	04/07/26 07:24	04/07/26 16:43	98-82-8	
p-Isopropyltoluene	**<21.7**	ug/kg	63.9	21.7	1	04/07/26 07:24	04/07/26 16:43	99-87-6	
Methylene Chloride	**<17.8**	ug/kg	63.9	17.8	1	04/07/26 07:24	04/07/26 16:43	75-09-2	
Methyl-tert-butyl ether	**<18.8**	ug/kg	63.9	18.8	1	04/07/26 07:24	04/07/26 16:43	1634-04-4	
Naphthalene	**<26.9**	ug/kg	319	26.9	1	04/07/26 07:24	04/07/26 16:43	91-20-3	
n-Propylbenzene	**90.6**	ug/kg	63.9	20.9	1	04/07/26 07:24	04/07/26 16:43	103-65-1	
Styrene	**<16.4**	ug/kg	63.9	16.4	1	04/07/26 07:24	04/07/26 16:43	100-42-5	
1,1,1,2-Tetrachloroethane	**<15.3**	ug/kg	63.9	15.3	1	04/07/26 07:24	04/07/26 16:43	630-20-6	
1,1,2,2-Tetrachloroethane	**<23.1**	ug/kg	63.9	23.1	1	04/07/26 07:24	04/07/26 16:43	79-34-5	
Tetrachloroethene	**<24.8**	ug/kg	63.9	24.8	1	04/07/26 07:24	04/07/26 16:43	127-18-4	
Toluene	**<20.2**	ug/kg	63.9	20.2	1	04/07/26 07:24	04/07/26 16:43	108-88-3	
1,2,3-Trichlorobenzene	**<71.2**	ug/kg	319	71.2	1	04/07/26 07:24	04/07/26 16:43	87-61-6	

REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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(920)469-2436

ANALYTICAL RESULTS

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Sample: COMP-1 **Lab ID: 40310342001** Collected: 03/31/26 10:20 Received: 04/01/26 10:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B Pace Analytical Services - Green Bay								
1,2,4-Trichlorobenzene	**<52.6**	ug/kg	319	52.6	1	04/07/26 07:24	04/07/26 16:43	120-82-1	
1,1,1-Trichloroethane	**<16.4**	ug/kg	63.9	16.4	1	04/07/26 07:24	04/07/26 16:43	71-55-6	
1,1,2-Trichloroethane	**<23.3**	ug/kg	63.9	23.3	1	04/07/26 07:24	04/07/26 16:43	79-00-5	
Trichloroethene	**<23.9**	ug/kg	63.9	23.9	1	04/07/26 07:24	04/07/26 16:43	79-01-6	
Trichlorofluoromethane	**<18.5**	ug/kg	63.9	18.5	1	04/07/26 07:24	04/07/26 16:43	75-69-4	
1,2,3-Trichloropropane	**<31.0**	ug/kg	63.9	31.0	1	04/07/26 07:24	04/07/26 16:43	96-18-4	
1,2,4-Trimethylbenzene	**<19.0**	ug/kg	63.9	19.0	1	04/07/26 07:24	04/07/26 16:43	95-63-6	
1,3,5-Trimethylbenzene	**<20.6**	ug/kg	63.9	20.6	1	04/07/26 07:24	04/07/26 16:43	108-67-8	
Vinyl chloride	**<12.9**	ug/kg	63.9	12.9	1	04/07/26 07:24	04/07/26 16:43	75-01-4	
m&p-Xylene	**<36.7**	ug/kg	128	36.7	1	04/07/26 07:24	04/07/26 16:43	179601-23-1	
o-Xylene	**<20.8**	ug/kg	63.9	20.8	1	04/07/26 07:24	04/07/26 16:43	95-47-6	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	103	%	56-189		1	04/07/26 07:24	04/07/26 16:43	2199-69-1	
4-Bromofluorobenzene (S)	104	%	58-188		1	04/07/26 07:24	04/07/26 16:43	460-00-4	
Toluene-d8 (S)	107	%	70-172		1	04/07/26 07:24	04/07/26 16:43	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974 Pace Analytical Services - Green Bay								
Percent Moisture	**12.2**	%	0.10	0.10	1		04/01/26 14:59		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

QC Batch: 532840
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40310342001

METHOD BLANK: 3031276 Matrix: Solid

Associated Lab Samples: 40310342001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.033	04/07/26 12:38	

LABORATORY CONTROL SAMPLE: 3031277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.83	0.80	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3031289 3031290

Parameter	Units	40310128028 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury	mg/kg	<0.021	0.88	0.88	0.91	0.87	104	98	85-115	5	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

QC Batch: 533181
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40310342001

METHOD BLANK: 3032870 Matrix: Solid

Associated Lab Samples: 40310342001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<1.5	2.5	04/07/26 18:46	
Barium	mg/kg	<0.15	0.50	04/07/26 18:46	
Cadmium	mg/kg	<0.13	0.50	04/07/26 18:46	
Chromium	mg/kg	<0.28	1.0	04/07/26 18:46	
Lead	mg/kg	<0.60	2.0	04/07/26 18:46	
Selenium	mg/kg	<1.3	4.0	04/07/26 18:46	
Silver	mg/kg	<0.31	1.0	04/07/26 18:46	

LABORATORY CONTROL SAMPLE: 3032871

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	25	23.3	93	80-120	
Barium	mg/kg	25	24.6	98	80-120	
Cadmium	mg/kg	25	24.5	98	80-120	
Chromium	mg/kg	25	24.0	96	80-120	
Lead	mg/kg	25	24.9	100	80-120	
Selenium	mg/kg	25	23.0	92	80-120	
Silver	mg/kg	12.5	12.1	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3032872 3032873

Parameter	Units	40310453001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Arsenic	mg/kg	<1.6	26.7	26.7	26.0	25.5	93	91	75-125	2	20	
Barium	mg/kg	23.1	26.7	26.7	65.4	56.4	158	125	75-125	15	20	M0
Cadmium	mg/kg	<0.14	26.7	26.7	26.2	25.6	98	96	75-125	2	20	
Chromium	mg/kg	11.1	26.7	26.7	42.9	43.5	119	121	75-125	1	20	
Lead	mg/kg	3.9	26.7	26.7	29.3	29.2	95	95	75-125	0	20	
Selenium	mg/kg	<1.4	26.7	26.7	25.4	24.4	94	91	75-125	4	20	
Silver	mg/kg	<0.33	13.3	13.3	13.1	12.7	98	95	75-125	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

QC Batch: 533155
QC Batch Method: EPA 5035/5030B
Analysis Method: EPA 8260
Analysis Description: 8260 MSV Med Level Normal List
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40310342001

METHOD BLANK: 3032794
Matrix: Solid

Associated Lab Samples: 40310342001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	<12.0	50.0	04/07/26 10:57	
1,1,1-Trichloroethane	ug/kg	<12.8	50.0	04/07/26 10:57	
1,1,2,2-Tetrachloroethane	ug/kg	<18.1	50.0	04/07/26 10:57	
1,1,2-Trichloroethane	ug/kg	<18.2	50.0	04/07/26 10:57	
1,1-Dichloroethane	ug/kg	<12.8	50.0	04/07/26 10:57	
1,1-Dichloroethene	ug/kg	<16.6	50.0	04/07/26 10:57	
1,1-Dichloropropene	ug/kg	<16.2	50.0	04/07/26 10:57	
1,2,3-Trichlorobenzene	ug/kg	<55.7	250	04/07/26 10:57	
1,2,3-Trichloropropane	ug/kg	<24.3	50.0	04/07/26 10:57	
1,2,4-Trichlorobenzene	ug/kg	<41.2	250	04/07/26 10:57	
1,2,4-Trimethylbenzene	ug/kg	<14.9	50.0	04/07/26 10:57	
1,2-Dibromo-3-chloropropane	ug/kg	<38.8	250	04/07/26 10:57	
1,2-Dibromoethane (EDB)	ug/kg	<13.7	50.0	04/07/26 10:57	
1,2-Dichlorobenzene	ug/kg	<17.5	50.0	04/07/26 10:57	
1,2-Dichloroethane	ug/kg	<11.5	50.0	04/07/26 10:57	
1,2-Dichloropropane	ug/kg	<11.9	50.0	04/07/26 10:57	
1,3,5-Trimethylbenzene	ug/kg	<16.1	50.0	04/07/26 10:57	
1,3-Dichlorobenzene	ug/kg	<14.7	50.0	04/07/26 10:57	
1,3-Dichloropropane	ug/kg	<10.9	50.0	04/07/26 10:57	
1,4-Dichlorobenzene	ug/kg	<15.4	50.0	04/07/26 10:57	
2,2-Dichloropropane	ug/kg	<13.5	50.0	04/07/26 10:57	
2-Chlorotoluene	ug/kg	<16.2	50.0	04/07/26 10:57	
4-Chlorotoluene	ug/kg	<19.0	50.0	04/07/26 10:57	
Benzene	ug/kg	<11.9	20.0	04/07/26 10:57	
Bromobenzene	ug/kg	<19.5	50.0	04/07/26 10:57	
Bromochloromethane	ug/kg	<13.7	50.0	04/07/26 10:57	
Bromodichloromethane	ug/kg	<11.9	50.0	04/07/26 10:57	
Bromoform	ug/kg	<220	250	04/07/26 10:57	
Bromomethane	ug/kg	<70.1	250	04/07/26 10:57	
Carbon tetrachloride	ug/kg	<11.0	50.0	04/07/26 10:57	
Chlorobenzene	ug/kg	<6.0	50.0	04/07/26 10:57	
Chloroethane	ug/kg	<21.1	250	04/07/26 10:57	
Chloroform	ug/kg	<35.8	250	04/07/26 10:57	
Chloromethane	ug/kg	<19.0	50.0	04/07/26 10:57	
cis-1,2-Dichloroethene	ug/kg	<10.7	50.0	04/07/26 10:57	
cis-1,3-Dichloropropene	ug/kg	<33.0	250	04/07/26 10:57	
Dibromochloromethane	ug/kg	<171	250	04/07/26 10:57	

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REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

METHOD BLANK: 3032794 Matrix: Solid

Associated Lab Samples: 40310342001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromomethane	ug/kg	<14.8	50.0	04/07/26 10:57	
Dichlorodifluoromethane	ug/kg	<21.5	50.0	04/07/26 10:57	
Diisopropyl ether	ug/kg	<12.4	50.0	04/07/26 10:57	
Ethylbenzene	ug/kg	<11.9	50.0	04/07/26 10:57	
Hexachloro-1,3-butadiene	ug/kg	<99.4	250	04/07/26 10:57	
Isopropylbenzene (Cumene)	ug/kg	<17.1	50.0	04/07/26 10:57	
m&p-Xylene	ug/kg	<28.7	100	04/07/26 10:57	
Methyl-tert-butyl ether	ug/kg	<14.7	50.0	04/07/26 10:57	
Methylene Chloride	ug/kg	<13.9	50.0	04/07/26 10:57	
n-Butylbenzene	ug/kg	<28.1	50.0	04/07/26 10:57	
n-Propylbenzene	ug/kg	<16.3	50.0	04/07/26 10:57	
Naphthalene	ug/kg	<21.0	250	04/07/26 10:57	
o-Xylene	ug/kg	<16.3	50.0	04/07/26 10:57	
p-Isopropyltoluene	ug/kg	<17.0	50.0	04/07/26 10:57	
sec-Butylbenzene	ug/kg	<20.5	50.0	04/07/26 10:57	
Styrene	ug/kg	<12.8	50.0	04/07/26 10:57	
tert-Butylbenzene	ug/kg	<15.7	50.0	04/07/26 10:57	
Tetrachloroethene	ug/kg	<19.4	50.0	04/07/26 10:57	
Toluene	ug/kg	<15.8	50.0	04/07/26 10:57	
trans-1,2-Dichloroethene	ug/kg	<10.9	50.0	04/07/26 10:57	
trans-1,3-Dichloropropene	ug/kg	<143	250	04/07/26 10:57	
Trichloroethene	ug/kg	<18.7	50.0	04/07/26 10:57	
Trichlorofluoromethane	ug/kg	<14.5	50.0	04/07/26 10:57	
Vinyl chloride	ug/kg	<10.1	50.0	04/07/26 10:57	
1,2-Dichlorobenzene-d4 (S)	%	82	56-189	04/07/26 10:57	
4-Bromofluorobenzene (S)	%	76	58-188	04/07/26 10:57	
Toluene-d8 (S)	%	78	70-172	04/07/26 10:57	

LABORATORY CONTROL SAMPLE: 3032795

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/kg	2500	2650	106	70-130	
1,1,2,2-Tetrachloroethane	ug/kg	2500	2390	96	68-130	
1,1,2-Trichloroethane	ug/kg	2500	2320	93	70-130	
1,1-Dichloroethane	ug/kg	2500	2690	107	70-130	
1,1-Dichloroethene	ug/kg	2500	2650	106	70-130	
1,2,4-Trichlorobenzene	ug/kg	2500	2410	97	70-130	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1980	79	53-130	
1,2-Dibromoethane (EDB)	ug/kg	2500	2520	101	70-130	
1,2-Dichlorobenzene	ug/kg	2500	2490	100	70-130	
1,2-Dichloroethane	ug/kg	2500	2660	106	70-130	
1,2-Dichloropropane	ug/kg	2500	2420	97	70-130	

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REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

LABORATORY CONTROL SAMPLE: 3032795

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,3-Dichlorobenzene	ug/kg	2500	2530	101	70-130	
1,4-Dichlorobenzene	ug/kg	2500	2500	100	70-130	
Benzene	ug/kg	2500	2620	105	70-130	
Bromodichloromethane	ug/kg	2500	2490	99	70-130	
Bromoform	ug/kg	2500	2100	84	59-130	
Bromomethane	ug/kg	2500	2230	89	43-154	
Carbon tetrachloride	ug/kg	2500	2810	112	69-130	
Chlorobenzene	ug/kg	2500	2640	106	70-130	
Chloroethane	ug/kg	2500	2180	87	42-160	
Chloroform	ug/kg	2500	2530	101	70-130	
Chloromethane	ug/kg	2500	2110	85	48-137	
cis-1,2-Dichloroethene	ug/kg	2500	2540	101	70-130	
cis-1,3-Dichloropropene	ug/kg	2500	2370	95	70-130	
Dibromochloromethane	ug/kg	2500	2570	103	70-130	
Dichlorodifluoromethane	ug/kg	2500	1270	51	13-130	
Ethylbenzene	ug/kg	2500	2690	108	70-130	
Isopropylbenzene (Cumene)	ug/kg	2500	2750	110	70-130	
m&p-Xylene	ug/kg	5000	5210	104	70-130	
Methyl-tert-butyl ether	ug/kg	2500	2380	95	70-130	
Methylene Chloride	ug/kg	2500	2500	100	70-130	
o-Xylene	ug/kg	2500	2760	110	70-130	
Styrene	ug/kg	2500	2810	112	70-141	
Tetrachloroethene	ug/kg	2500	2580	103	70-130	
Toluene	ug/kg	2500	2580	103	70-130	
trans-1,2-Dichloroethene	ug/kg	2500	2580	103	70-130	
trans-1,3-Dichloropropene	ug/kg	2500	2150	86	67-130	
Trichloroethene	ug/kg	2500	2570	103	70-130	
Trichlorofluoromethane	ug/kg	2500	2980	119	60-130	v1
Vinyl chloride	ug/kg	2500	2440	98	51-130	v1
1,2-Dichlorobenzene-d4 (S)	%			81	56-189	
4-Bromofluorobenzene (S)	%			84	58-188	
Toluene-d8 (S)	%			82	70-172	

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Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

QC Batch: 533152
QC Batch Method: EPA 3546
Analysis Method: EPA 8270E
Analysis Description: 8270E Solid MSSV Microwave
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40310342001

METHOD BLANK: 3032784 Matrix: Solid

Associated Lab Samples: 40310342001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	ug/kg	<45.5	167	04/07/26 16:39	
2,4,5-Trichlorophenol	ug/kg	<65.3	167	04/07/26 16:39	
2,4,6-Trichlorophenol	ug/kg	<65.8	167	04/07/26 16:39	
2,4-Dinitrotoluene	ug/kg	<83.7	167	04/07/26 16:39	
2-Methylphenol(o-Cresol)	ug/kg	<30.3	167	04/07/26 16:39	
3&4-Methylphenol(m&p Cresol)	ug/kg	<30.5	167	04/07/26 16:39	
Hexachloro-1,3-butadiene	ug/kg	<42.4	167	04/07/26 16:39	
Hexachlorobenzene	ug/kg	<28.0	167	04/07/26 16:39	
Hexachloroethane	ug/kg	<26.7	167	04/07/26 16:39	
Nitrobenzene	ug/kg	<33.8	167	04/07/26 16:39	
Pentachlorophenol	ug/kg	<82.0	167	04/07/26 16:39	
Pyridine	ug/kg	<26.8	167	04/07/26 16:39	
2,4,6-Tribromophenol (S)	%	69	32-130	04/07/26 16:39	
2-Fluorobiphenyl (S)	%	70	37-130	04/07/26 16:39	
2-Fluorophenol (S)	%	56	33-130	04/07/26 16:39	
Nitrobenzene-d5 (S)	%	63	45-130	04/07/26 16:39	
Phenol-d6 (S)	%	58	39-130	04/07/26 16:39	
Terphenyl-d14 (S)	%	98	51-130	04/07/26 16:39	

LABORATORY CONTROL SAMPLE: 3032785

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/kg	1660	1040	63	61-130	
2,4,5-Trichlorophenol	ug/kg	1660	1210	73	64-130	
2,4,6-Trichlorophenol	ug/kg	1660	1140	69	66-130	
2,4-Dinitrotoluene	ug/kg	1660	1490	89	70-130	
2-Methylphenol(o-Cresol)	ug/kg	1660	1190	71	63-130	
3&4-Methylphenol(m&p Cresol)	ug/kg	1660	1150	69	68-130	
Hexachloro-1,3-butadiene	ug/kg	1660	1200	72	61-130	
Hexachlorobenzene	ug/kg	1660	1400	84	64-130	
Hexachloroethane	ug/kg	1660	1060	64	61-130	
Nitrobenzene	ug/kg	1660	1190	72	66-130	
Pentachlorophenol	ug/kg	1660	808	49	51-130	L2
Pyridine	ug/kg	1660	454	27	24-130	
2,4,6-Tribromophenol (S)	%			77	32-130	
2-Fluorobiphenyl (S)	%			75	37-130	
2-Fluorophenol (S)	%			57	33-130	

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Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

LABORATORY CONTROL SAMPLE: 3032785

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrobenzene-d5 (S)	%			68	45-130	
Phenol-d6 (S)	%			63	39-130	
Terphenyl-d14 (S)	%			87	51-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3032786 3032787

Parameter	Units	40310012001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dichlorobenzene	ug/kg	<0.052 mg/kg	1920	1920	1590	1530	83	80	44-130	4	36	
2,4,5-Trichlorophenol	ug/kg	<0.075 mg/kg	1920	1920	1510	1400	79	73	39-130	8	33	
2,4,6-Trichlorophenol	ug/kg	<0.076 mg/kg	1920	1920	1420	1320	74	69	36-130	8	39	
2,4-Dinitrotoluene	ug/kg	<0.097 mg/kg	1920	1920	1860	1850	97	96	30-135	1	28	
2-Methylphenol(o-Cresol)	ug/kg	<0.035 mg/kg	1920	1920	1710	1760	89	92	39-130	2	30	
3&4-Methylphenol(m&p Cresol)	ug/kg	<0.035 mg/kg	1920	1920	1640	1720	85	90	36-130	5	29	
Hexachloro-1,3-butadiene	ug/kg	<0.049 mg/kg	1920	1920	1770	1660	92	86	44-130	6	31	
Hexachlorobenzene	ug/kg	<0.032 mg/kg	1920	1920	1830	1690	95	88	35-136	8	26	
Hexachloroethane	ug/kg	<0.031 mg/kg	1920	1920	1530	1450	80	76	32-130	5	35	
Nitrobenzene	ug/kg	<0.039 mg/kg	1920	1920	1720	1610	90	84	44-130	7	30	
Pentachlorophenol	ug/kg	<0.095 mg/kg	1920	1920	509	374	27	20	10-130	31	41	
Pyridine	ug/kg	<30.9	1920	1920	1420	1310	74	68	23-130	8	49	
2,4,6-Tribromophenol (S)	%						86	78	32-130			
2-Fluorobiphenyl (S)	%						84	84	37-130			
2-Fluorophenol (S)	%						73	70	33-130			
Nitrobenzene-d5 (S)	%						84	79	45-130			
Phenol-d6 (S)	%						77	77	39-130			
Terphenyl-d14 (S)	%						91	95	51-130			

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REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

QC Batch: 532843
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40310342001

SAMPLE DUPLICATE: 3031288

Parameter	Units	40310337001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	22.0	22.1	0	10	

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REPORT OF LABORATORY ANALYSIS

Date: 04/13/2026 03:59 PM

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above LOD.
J - The reported result is an estimated value.
LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.
LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.
DL - Adjusted Method Detection Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Analyte was not detected and is reported as less than the LOD or as defined by the customer.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
v1	The continuing calibration verification was above the method acceptance limit. Any detection for the analyte in the associated samples may have a high bias.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 58265048 PROJECT GREEN INN10
Pace Project No.: 40310342

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40310342001	**COMP-1**	EPA 3050B	533181	EPA 6010D	533260
40310342001	**COMP-1**	EPA 7471	532840	EPA 7471	533145
40310342001	**COMP-1**	EPA 3546	533152	EPA 8270E	533216
40310342001	**COMP-1**	EPA 5035/5030B	533155	EPA 8260	533160
40310342001	**COMP-1**	ASTM D2974	532843		

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here: 40310342

ALL SHADED AREAS are for LAB USE ONLY

Company: Teracon	Billing Information: AP
Address: 4900 S. Pennsylvania Ave, Ste 100	
Report To: Jon Cone	Email To:
Copy To: Abdel Deif	Site Collection Info/Address:
Customer Project Name/Number: 58265048 Project Green INNO	State: WI County/City: Waukesha Time Zone Collected: [ ] PT [ ] MT [X] CT [ ] ET
Phone: / Email:	Site/Facility ID #:
Collected By (print): Jon Cone	Purchase Order #: / Quote #:
Collected By (signature):	Turnaround Date Required:
Sample Disposal: [X] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Compliance Monitoring? [ ] Yes [ ] No

DW PWS ID #: / DW Location Code:

Immediately Packed on Ice: [X] Yes [ ] No

Field Filtered (if applicable): [ ] Yes [X] No

Analysis:

Container Preservative Type **: 6 U C

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other

Analyses: VOC | SVOC | ICP/A Metal

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips:	
Sample pH Acceptable	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips:	

SCUS

Rave 4-1-20

LAB USE ONLY:
Lab Sample # / Comments:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	VOC	SVOC	ICP/A Metal							Lab Sample # / Comments
Comp-1	SL	Comp	3/31/26	1020				3	1	1	1							001

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) (Blue) Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y (N) N/A

Lab Tracking #: 2928560

Samples received via: FEDEX UPS Client (Courier) Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y (N) NA
Therm ID#: 149
Cooler 1 Temp Upon Receipt: 3-5 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 3.5 oC
Comments:

Relinquished by/Company: (Signature) Teracon	Date/Time: 3/31/26 1145	Received by/Company: (Signature) CS Logistics	Date/Time:
Relinquished by/Company: (Signature) CS Logistics 4-1-26	Date/Time: 1015	Received by/Company: (Signature) Ryan Van Eldt-Pace 4-1-26	Date/Time: 1015
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y (N) NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: 1 of: 1

40310342

Sample Preservation Receipt Form

Client Name: Terracon

Project # 40310342

All containers needing preservation have been checked and noted below: ☐Yes ☐No ☑N/A

Lab Lot# of pH paper:

Lab Std #ID of preservation (if pH adjusted):

Initial when completed:

Date/ Time:

Pace Lab #	Glass							Plastic						Vials						Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN 1	GN 2							
001																		1		1			1										2.5 / 5
002																																		2.5 / 5
003																																		2.5 / 5
004																																		2.5 / 5
005																																		2.5 / 5
006																																		2.5 / 5
007																																		2.5 / 5
008																																		2.5 / 5
009																																		2.5 / 5
010																																		2.5 / 5
011																																		2.5 / 5
012																																		2.5 / 5
013																																		2.5 / 5
014																																		2.5 / 5
015																																		2.5 / 5
016																																		2.5 / 5
017																																		2.5 / 5
018																																		2.5 / 5
019																																		2.5 / 5
020																																		2.5 / 5

None

04-01-26

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____

Headspace in VOA Vials (>6mm): ☐Yes ☐No ☑N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	VG9C	40 mL clear ascorbic w/ HCl	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG5U	100 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #: WO#: 40310342

40310342

Client Name: Terracon

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Purple Mountain ☐ Client ☐ Pace Other: _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____

Thermometer Used SR - 149 **Type of Ice:** (Wet) (Blue) Dry None ☑ Meltwater Only

Cooler Temperature Uncorr: 3.5 /Corr: 3.5

Temp Blank Present: ☐ yes ☑ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Person examining contents:
Date: 4-1-26 /Initials: Dave

Labeled By Initials: EC

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- DI VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☑No ☐N/A		8.
Correct Containers Used: Correct Type: Pace Green Bay, Pace IR, Non-Pace	☐Yes ☐No	9.
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: S	☑Yes ☐No ☐N/A	12.
Trip Blank Present:	☐Yes ☑No ☐N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logir

Page 2 of 2

Supporting Information

Contents:

General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

General Notes

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

Auger

Split Spoon

Shelby Tube


Macro Core

Ring Sampler

Rock Core

Grab Sample


No Recovery

WATER LEVEL


Water Initially Encountered


Water Level After a Specified Period of Time


Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Subsurface water level variations will occur over time. In low permeability soils, accurate determination of subsurface water levels is not possible with short term water level observations.

FIELD TESTS

(HP)	**Hand Penetrometer**
(T)	**Torvane**
(b/f)	**Standard Penetration Test (blows per foot)**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**
(DCP)	**Dynamic Cone Penetrometer**

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS

(More than 50% retained on No. 200 sieve)
Density determined by Standard Penetration Resistance

Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.
Very Loose	0 – 3
Loose	4 – 9
Medium Dense	10 – 29
Dense	30 – 50
Very Dense	> 50

CONSISTENCY OF FINE-GRAINED SOILS

(50% or more passing the No. 200 sieve)
Consistency determined by laboratory shear strength testing, field visual-manual procedures, or standard penetration resistance

Descriptive Term (Consistency)	Unconfined Compressive Strength, Qu, tsf	Standard Penetration or N-Value Blows/Ft.
Very Soft	Less than 0.25	0 – 1
Soft	0.25 to 0.50	2 – 4
Medium Stiff	0.50 to 1.00	4 – 8
Stiff	1.00 to 2.00	8 – 15
Very Stiff	2.00 to 4.00	15 – 30
Hard	> 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive term(s) of other constituents	Percent (%) of dry weight
Trace	< 15
With	15 – 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major component of sample	Particle size
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive term(s) of other constituents	Percent (%) of dry weight
Trace	< 5
With	5 – 12
Modifier	> 12

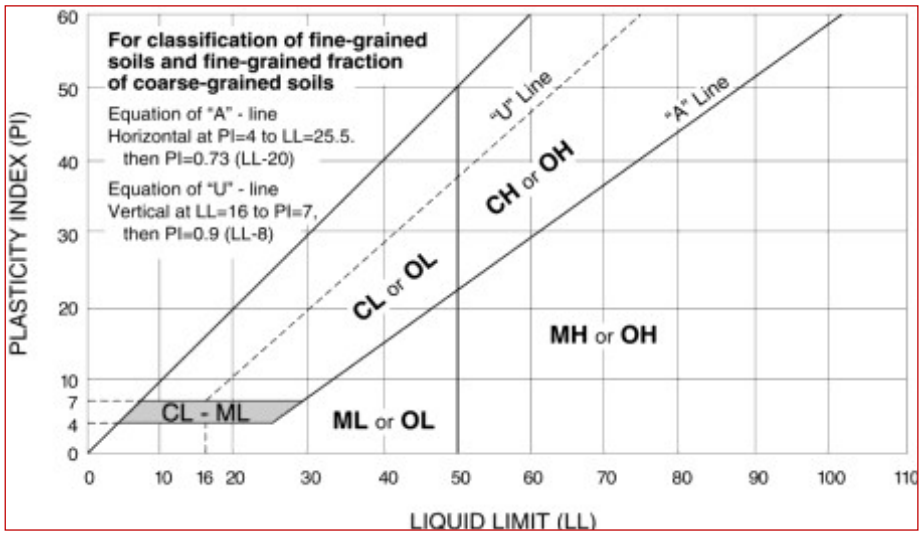
PLASTICITY DESCRIPTION

Term	Plasticity Index
Non plastic	0
Low	1 – 10
Medium	11 – 30
High	> 30

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

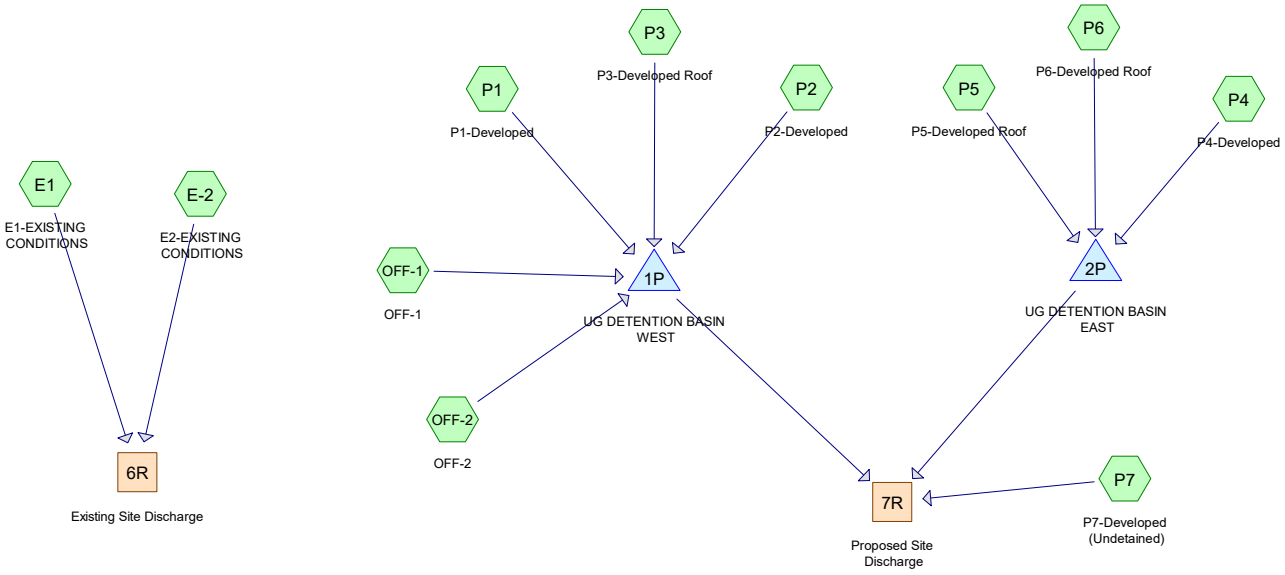
[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



APPENDIX C

Hydrology Calculations

(1-yr, 2-yr, 10-yr, 100-yr)



Subcat Reach Pond Link

Routing Diagram for Proposed Innio Addition
Prepared by RA Smith, Printed 5/1/2026

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-YR	MSE 24-hr	3	Default	24.00	1	2.40	2
2	2-YR	MSE 24-hr	3	Default	24.00	1	2.70	2
3	10-YR	MSE 24-hr	3	Default	24.00	1	3.81	2
4	100-YR	MSE 24-hr	3	Default	24.00	1	6.18	2

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-2: E2-EXISTING Runoff Area=5,247 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.12 cfs 0.006 af

Subcatchment E1: E1-EXISTING Runoff Area=240,453 sf 92.71% Impervious Runoff Depth=1.96"
Tc=6.0 min CN=96 Runoff=18.49 cfs 0.903 af

Subcatchment OFF-1: OFF-1 Runoff Area=32,281 sf 88.57% Impervious Runoff Depth=1.87"
Tc=6.0 min CN=95 Runoff=2.41 cfs 0.115 af

Subcatchment OFF-2: OFF-2 Runoff Area=5,960 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=0.48 cfs 0.025 af

Subcatchment P1: P1-Developed Runoff Area=26,968 sf 96.23% Impervious Runoff Depth=2.06"
Tc=6.0 min CN=97 Runoff=2.13 cfs 0.107 af

Subcatchment P2: P2-Developed Runoff Area=15,914 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=1.29 cfs 0.066 af

Subcatchment P3: P3-Developed Roof Runoff Area=34,096 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=2.76 cfs 0.142 af

Subcatchment P4: P4-Developed Runoff Area=115,120 sf 92.67% Impervious Runoff Depth=1.96"
Tc=6.0 min CN=96 Runoff=8.85 cfs 0.432 af

Subcatchment P5: P5-Developed Roof Runoff Area=28,905 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=2.34 cfs 0.120 af

Subcatchment P6: P6-Developed Roof Runoff Area=19,450 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=1.57 cfs 0.081 af

Subcatchment P7: P7-Developed Runoff Area=5,247 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=0.42 cfs 0.022 af

Reach 6R: Existing Site Discharge Inflow=18.61 cfs 0.909 af
Outflow=18.61 cfs 0.909 af

Reach 7R: Proposed Site Discharge Inflow=19.40 cfs 1.109 af
Outflow=19.40 cfs 1.109 af

Pond 1P: UG DETENTION BASIN WEST Peak Elev=804.12' Storage=0.236 af Inflow=9.06 cfs 0.454 af
Outflow=7.84 cfs 0.454 af

Pond 2P: UG DETENTION BASIN EAST Peak Elev=802.95' Storage=0.330 af Inflow=12.76 cfs 0.633 af
Outflow=11.19 cfs 0.633 af

Total Runoff Area = 12.159 ac Runoff Volume = 2.018 af Average Runoff Depth = 1.99"
6.78% Pervious = 0.825 ac 93.22% Impervious = 11.334 ac

Summary for Subcatchment E-2: E2-EXISTING CONDITIONS

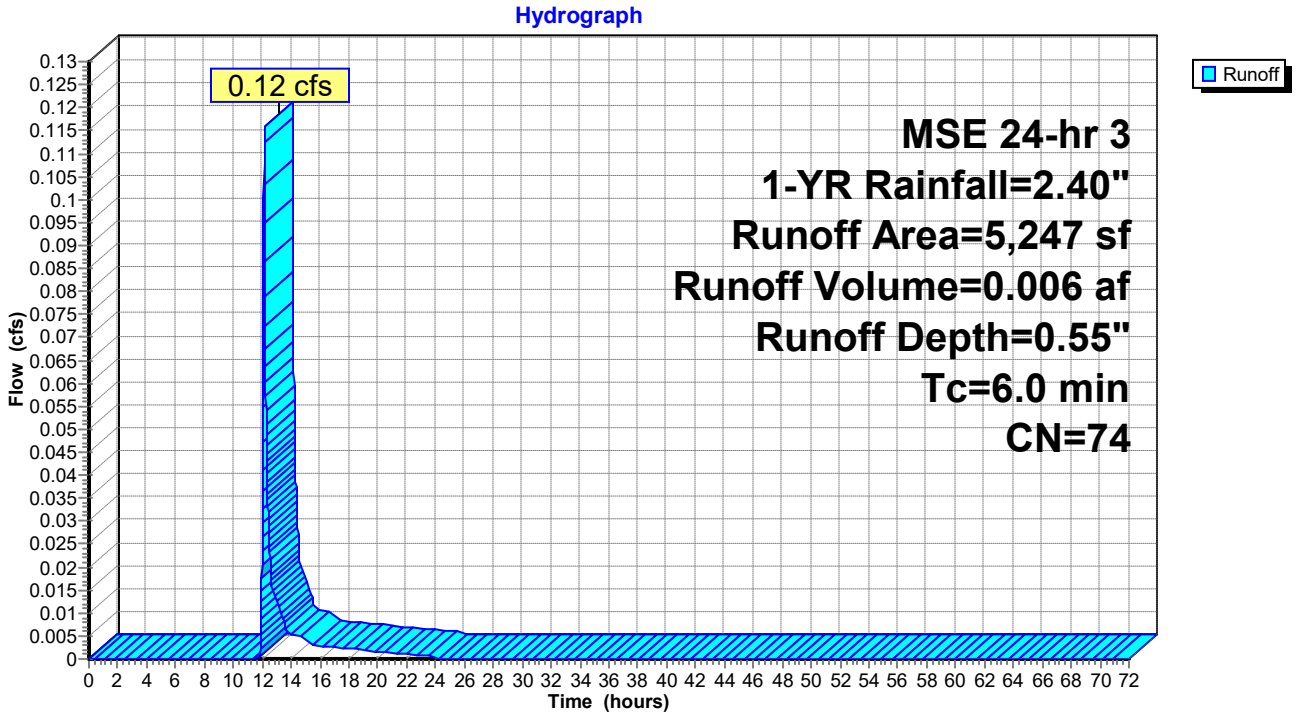
Runoff = 0.12 cfs @ 12.14 hrs, Volume= 0.006 af, Depth= 0.55"
Routed to Reach 6R : Existing Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

Area (sf)	CN	Description
5,247	74	>75% Grass cover, Good, HSG C
5,247		100.00% Pervious Area

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

Subcatchment E-2: E2-EXISTING CONDITIONS



Summary for Subcatchment E1: E1-EXISTING CONDITIONS

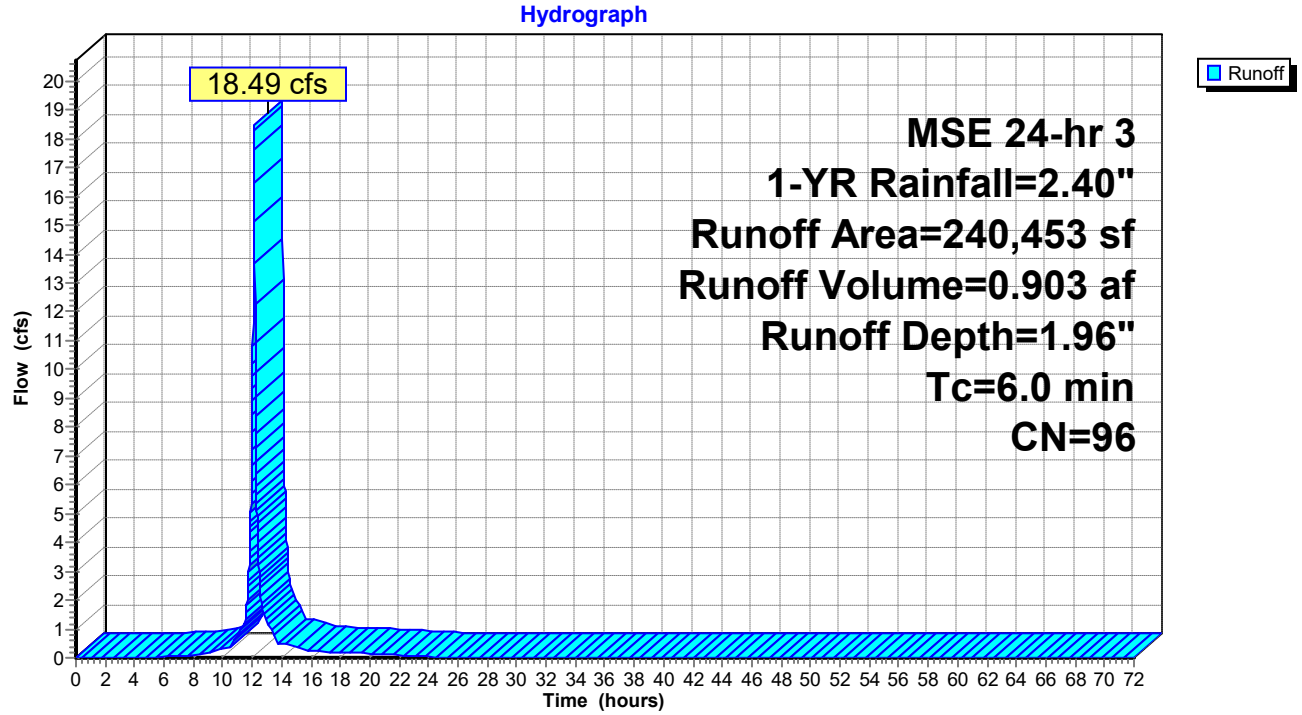
Runoff = 18.49 cfs @ 12.13 hrs, Volume= 0.903 af, Depth= 1.96"
Routed to Reach 6R : Existing Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	129,599	98	PAVEMENT
*	93,325	98	GRAVEL DRIVE
	17,529	74	>75% Grass cover, Good, HSG C
	240,453	96	Weighted Average
	17,529		7.29% Pervious Area
	222,924		92.71% Impervious Area

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

Subcatchment E1: E1-EXISTING CONDITIONS



Summary for Subcatchment OFF-1: OFF-1

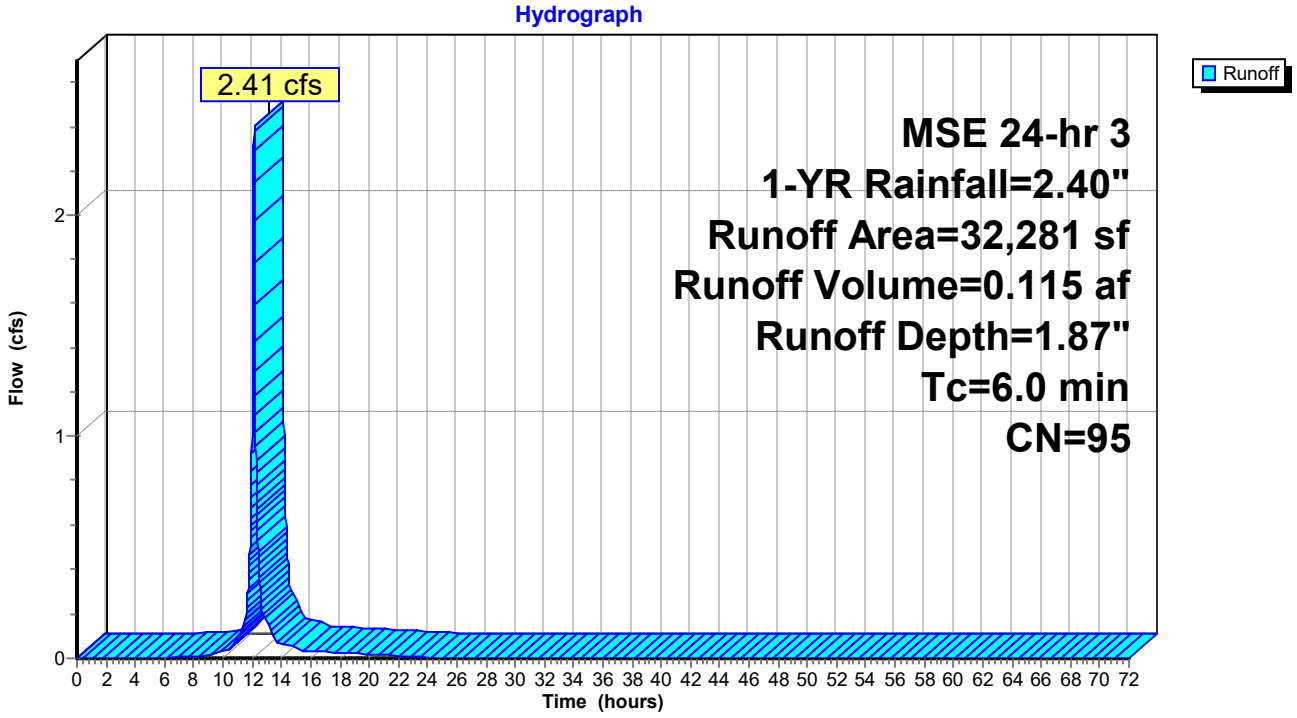
Runoff = 2.41 cfs @ 12.13 hrs, Volume= 0.115 af, Depth= 1.87"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	28,590	98	Paved Areas
	3,691	74	>75% Grass cover, Good, HSG C
	32,281	95	Weighted Average
	3,691		11.43% Pervious Area
	28,590		88.57% Impervious Area

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

Subcatchment OFF-1: OFF-1



Summary for Subcatchment OFF-2: OFF-2

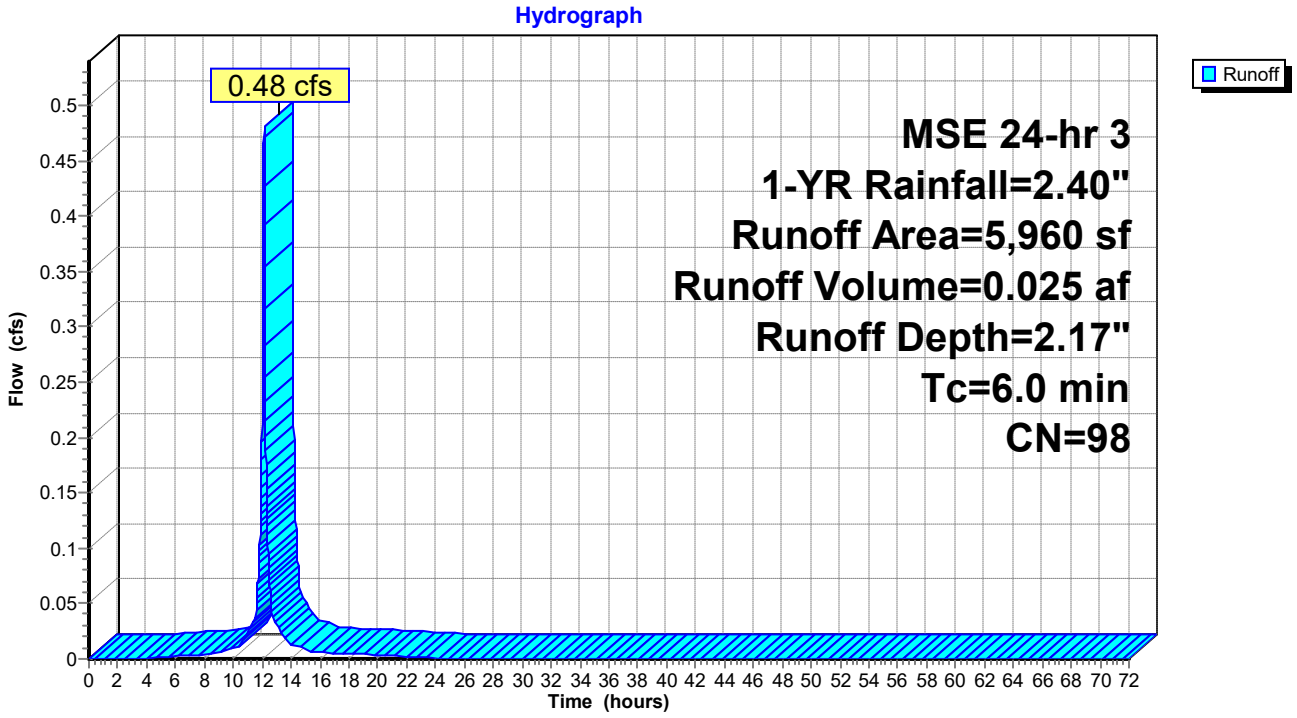
Runoff = 0.48 cfs @ 12.13 hrs, Volume= 0.025 af, Depth= 2.17"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	5,960	98	Paved Areas
	5,960		100.00% Impervious Area

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

Subcatchment OFF-2: OFF-2



Summary for Subcatchment P1: P1-Developed

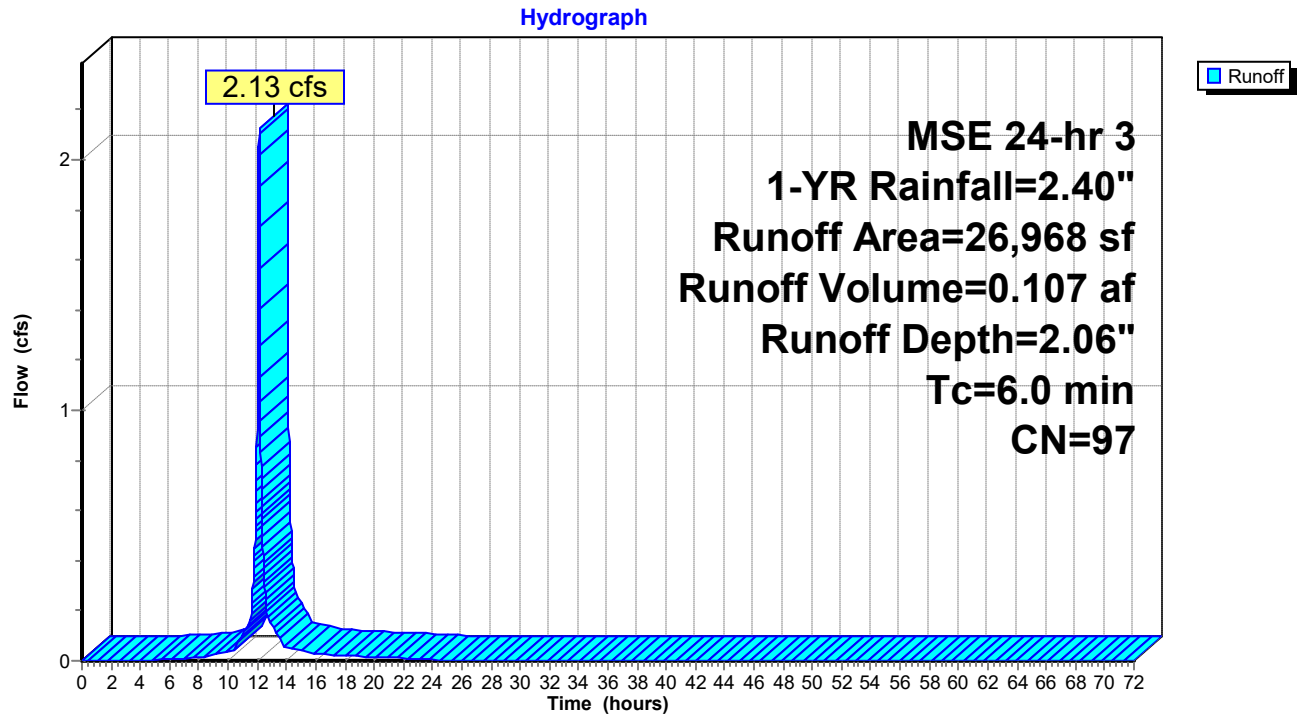
Runoff = 2.13 cfs @ 12.13 hrs, Volume= 0.107 af, Depth= 2.06"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	21,950	98	Paved Areas
	4,000	98	Roofs, HSG C
	1,018	74	>75% Grass cover, Good, HSG C
	26,968	97	Weighted Average
	1,018		3.77% Pervious Area
	25,950		96.23% Impervious Area

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

Subcatchment P1: P1-Developed



Summary for Subcatchment P2: P2-Developed

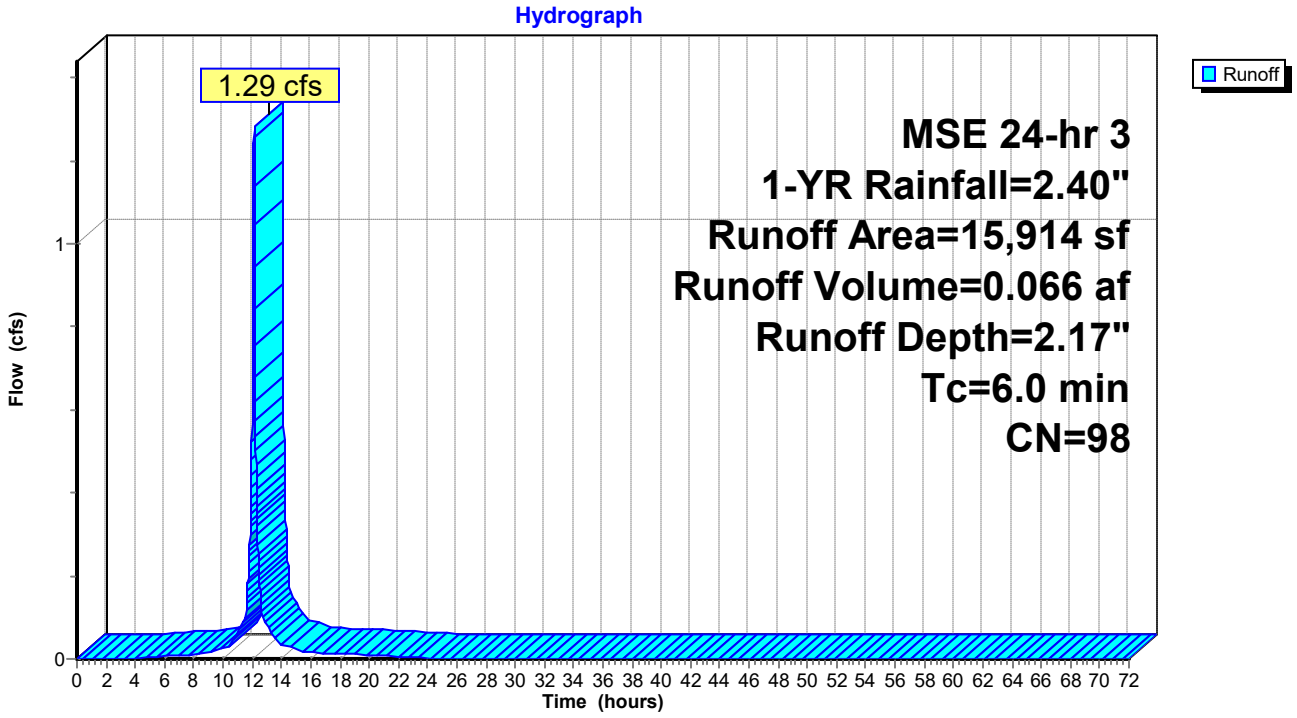
Runoff = 1.29 cfs @ 12.13 hrs, Volume= 0.066 af, Depth= 2.17"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	15,914	98	Paved Areas
	15,914		100.00% Impervious Area

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

Subcatchment P2: P2-Developed



Summary for Subcatchment P3: P3-Developed Roof

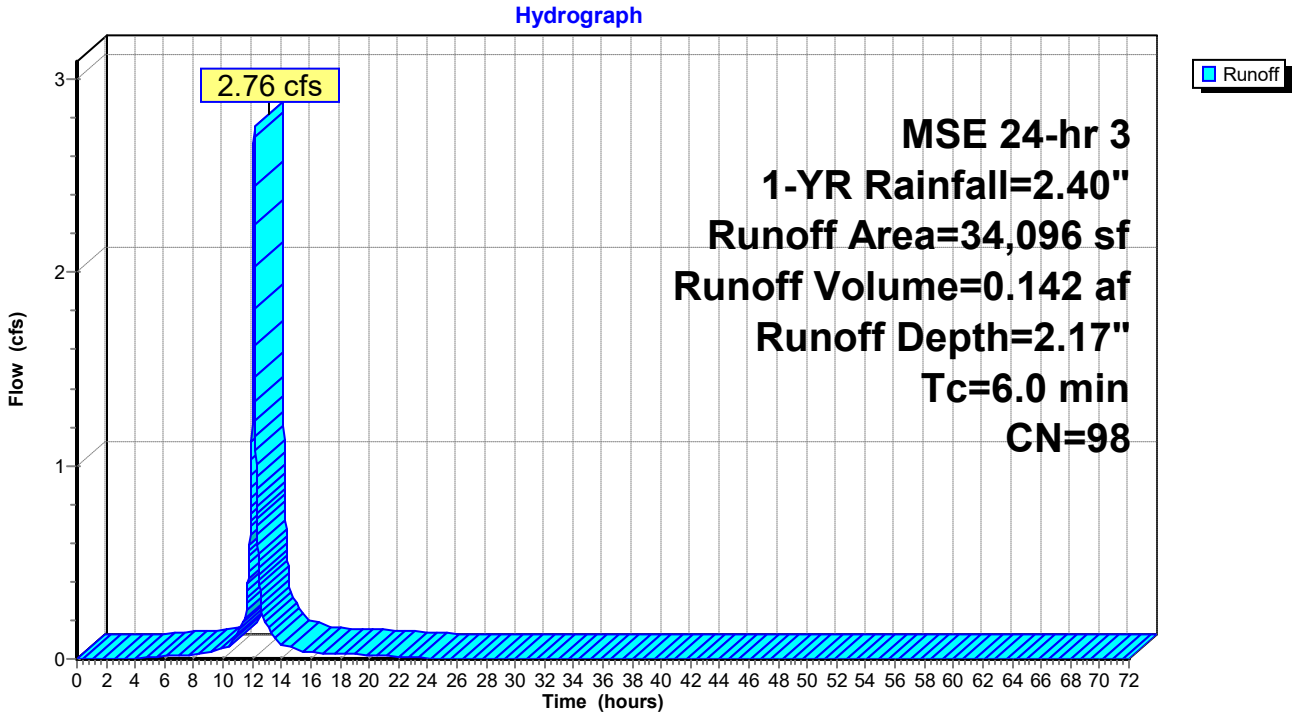
Runoff = 2.76 cfs @ 12.13 hrs, Volume= 0.142 af, Depth= 2.17"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	34,096	98	Roof
	34,096		100.00% Impervious Area

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

Subcatchment P3: P3-Developed Roof



Summary for Subcatchment P4: P4-Developed

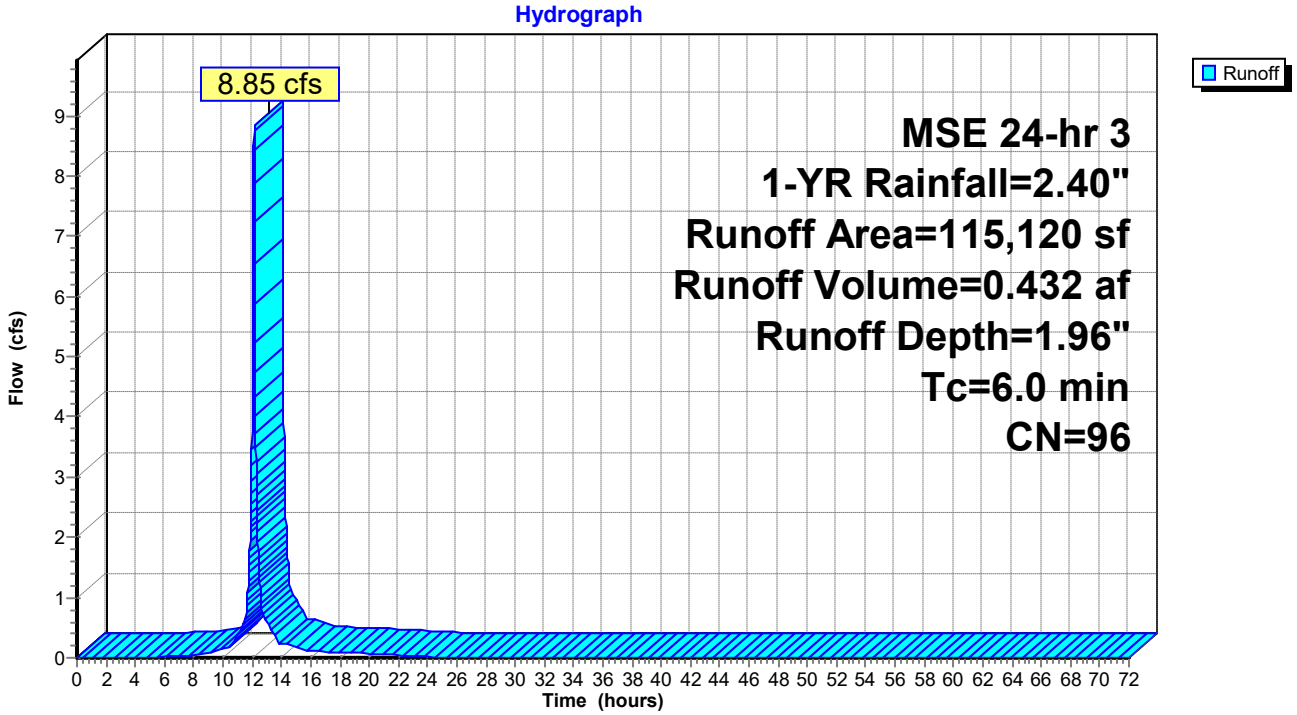
Runoff = 8.85 cfs @ 12.13 hrs, Volume= 0.432 af, Depth= 1.96"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	99,134	98	Paved Areas
*	7,553	98	Roof
	8,433	74	>75% Grass cover, Good, HSG C
	115,120	96	Weighted Average
	8,433		7.33% Pervious Area
	106,687		92.67% Impervious Area

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

Subcatchment P4: P4-Developed



Summary for Subcatchment P5: P5-Developed Roof

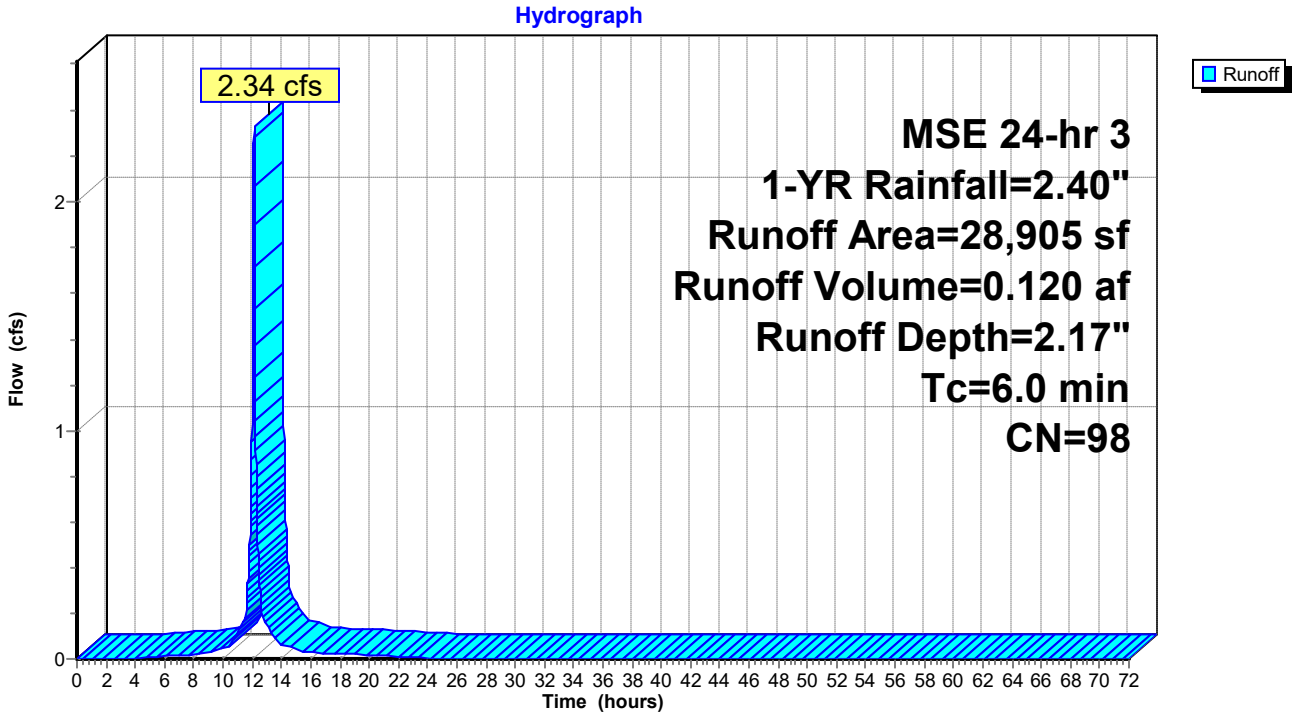
Runoff = 2.34 cfs @ 12.13 hrs, Volume= 0.120 af, Depth= 2.17"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	28,905	98	Roof
	28,905		100.00% Impervious Area

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

Subcatchment P5: P5-Developed Roof



Summary for Subcatchment P6: P6-Developed Roof

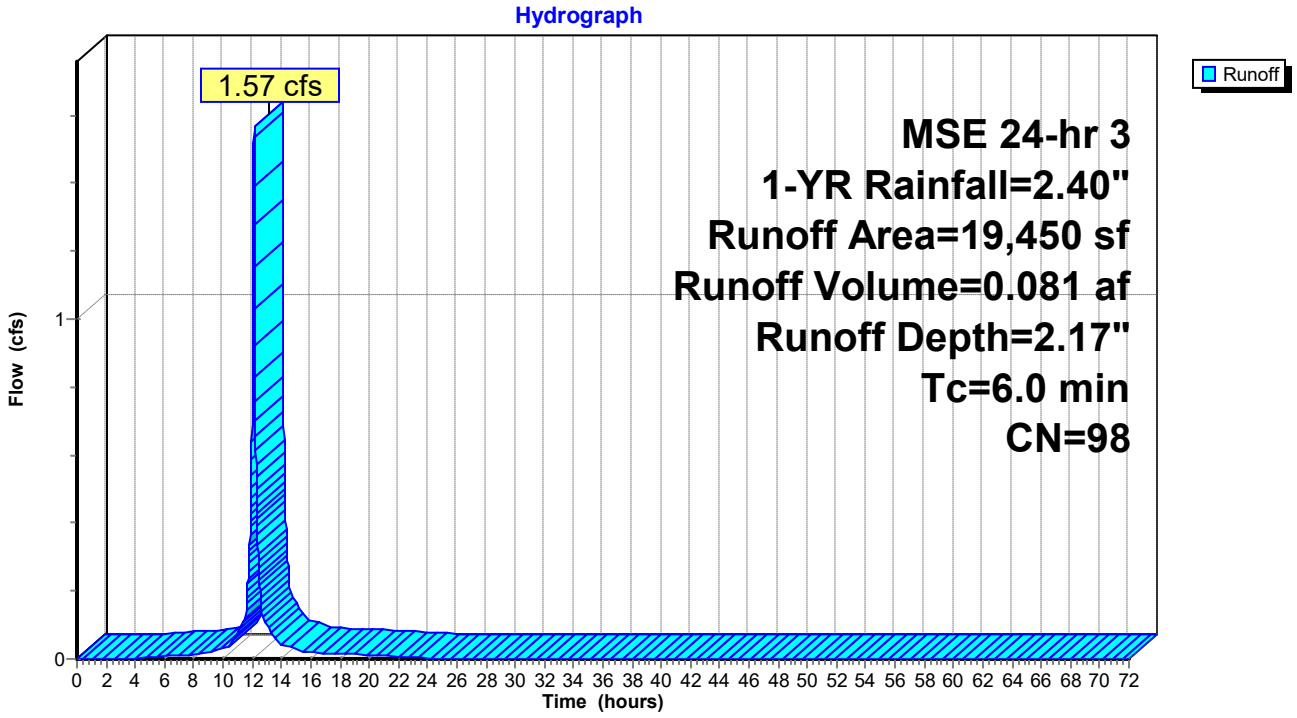
Runoff = 1.57 cfs @ 12.13 hrs, Volume= 0.081 af, Depth= 2.17"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	19,450	98	Roof
	19,450		100.00% Impervious Area

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

Subcatchment P6: P6-Developed Roof



Summary for Subcatchment P7: P7-Developed (Undetained)

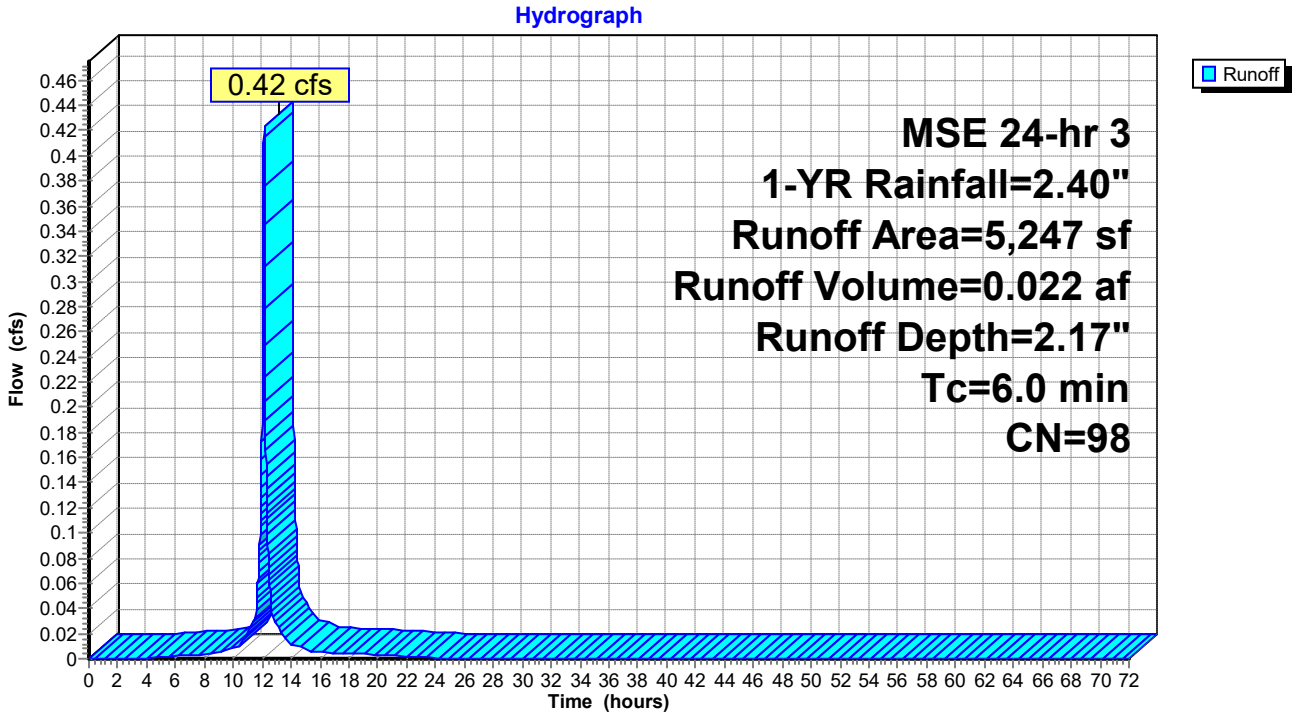
Runoff = 0.42 cfs @ 12.13 hrs, Volume= 0.022 af, Depth= 2.17"
Routed to Reach 7R : Proposed Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	0	74	Pervious Areas
*	5,247	98	Paved Areas
	5,247	98	Weighted Average
	5,247		100.00% Impervious Area

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

Subcatchment P7: P7-Developed (Undetained)

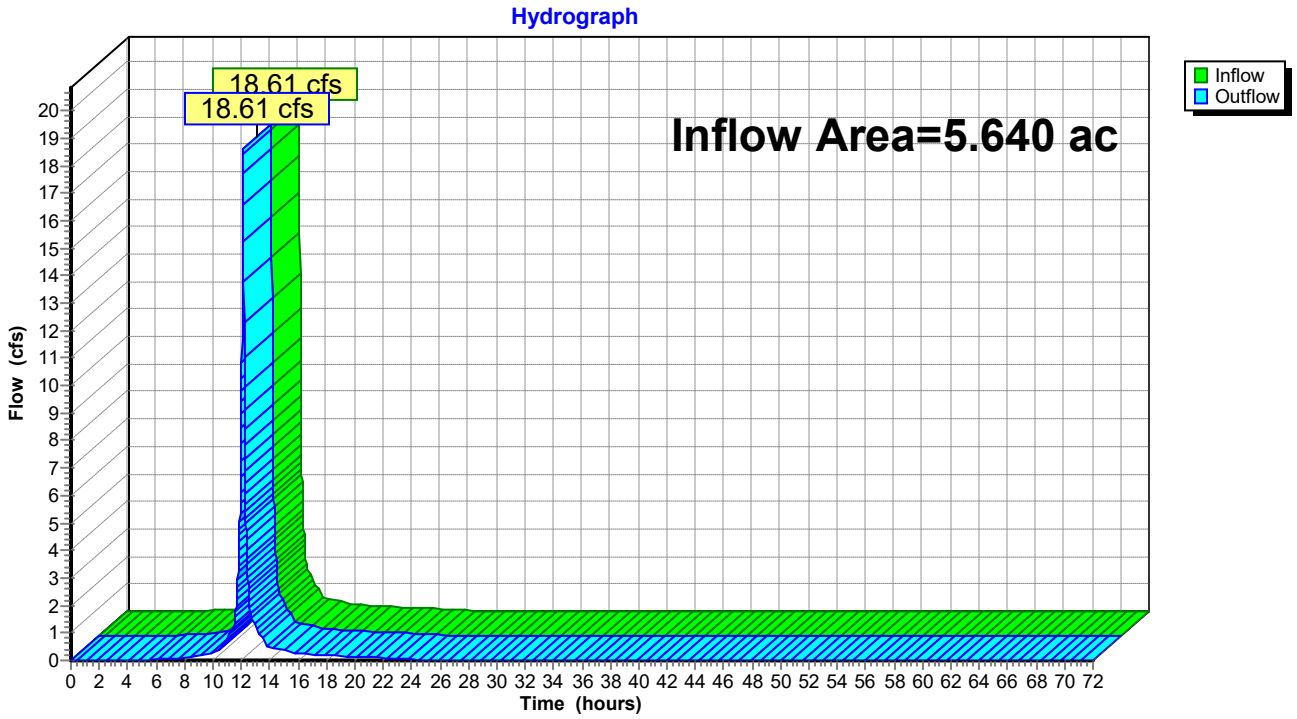


Summary for Reach 6R: Existing Site Discharge

Inflow Area = 5.640 ac, 90.73% Impervious, Inflow Depth = 1.93" for 1-YR event
Inflow = 18.61 cfs @ 12.13 hrs, Volume= 0.909 af
Outflow = 18.61 cfs @ 12.13 hrs, Volume= 0.909 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 6R: Existing Site Discharge

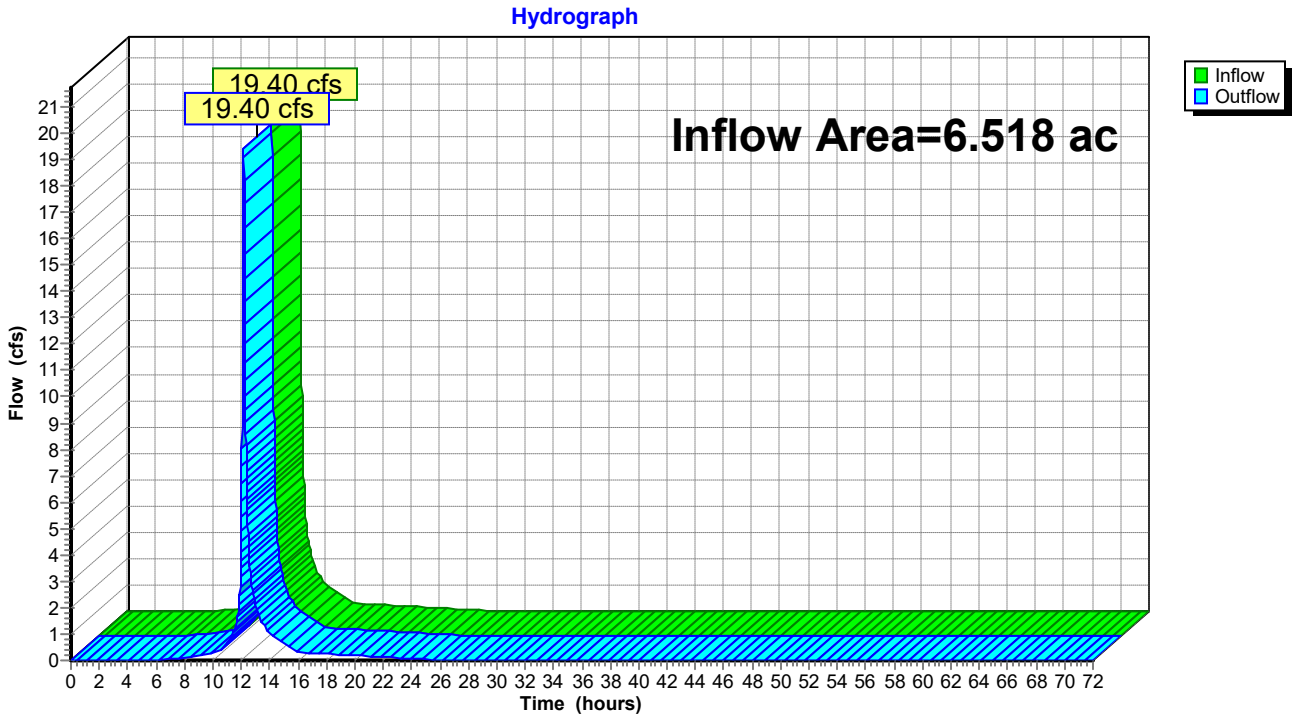


Summary for Reach 7R: Proposed Site Discharge

Inflow Area = 6.518 ac, 95.37% Impervious, Inflow Depth = 2.04" for 1-YR event
Inflow = 19.40 cfs @ 12.16 hrs, Volume= 1.109 af
Outflow = 19.40 cfs @ 12.16 hrs, Volume= 1.109 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 7R: Proposed Site Discharge



Summary for Pond 1P: UG DETENTION BASIN WEST

Inflow Area = 2.645 ac, 95.91% Impervious, Inflow Depth = 2.06" for 1-YR event
Inflow = 9.06 cfs @ 12.13 hrs, Volume= 0.454 af
Outflow = 7.84 cfs @ 12.16 hrs, Volume= 0.454 af, Atten= 13%, Lag= 2.0 min
Primary = 7.84 cfs @ 12.16 hrs, Volume= 0.454 af
Routed to Reach 7R : Proposed Site Discharge

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 802.25' Surf.Area= 0.048 ac Storage= 0.150 af
Peak Elev= 804.12' @ 12.16 hrs Surf.Area= 0.042 ac Storage= 0.236 af (0.086 af above start)

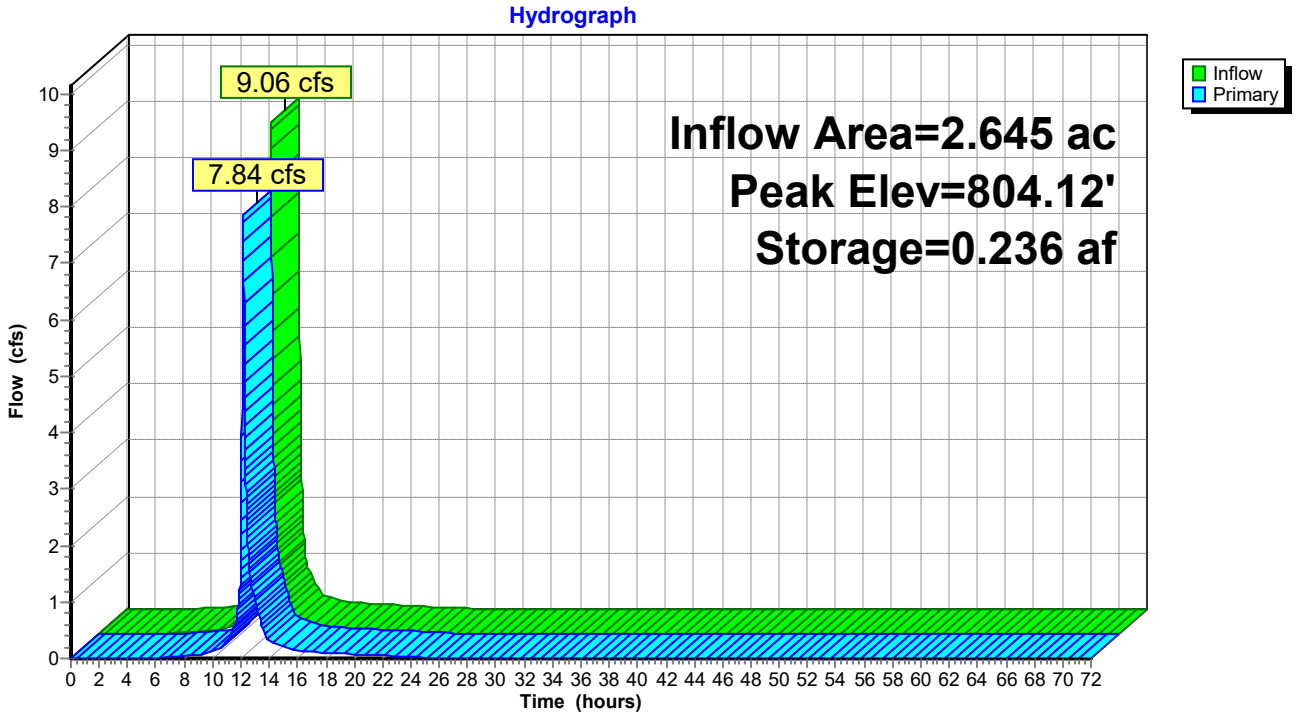
Plug-Flow detention time= 155.8 min calculated for 0.304 af (67% of inflow)
Center-of-Mass det. time= 30.1 min (794.0 - 764.0)

Volume	Invert	Avail.Storage	Storage Description
#1	798.25'	0.300 af	**96.0" Round CONTECH - WEST** L= 260.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	802.25'	**24.0" Round OUTLET PIPE** L= 26.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 802.25' / 802.00' S= 0.0096 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Device 1	802.25'	**8.0" Vert. 8" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	803.25'	**15.0" Vert. 2-15" Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	804.85'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=7.82 cfs @ 12.16 hrs HW=804.12' (Free Discharge)
└**1=OUTLET PIPE** (Passes 7.82 cfs of 10.17 cfs potential flow)
├**2=8" Orifice** (Orifice Controls 2.08 cfs @ 5.96 fps)
├**3=2-15" Orifice** (Orifice Controls 5.74 cfs @ 3.17 fps)
└**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: UG DETENTION BASIN WEST



Summary for Pond 2P: UG DETENTION BASIN EAST

Inflow Area = 3.753 ac, 94.84% Impervious, Inflow Depth = 2.02" for 1-YR event
Inflow = 12.76 cfs @ 12.13 hrs, Volume= 0.633 af
Outflow = 11.19 cfs @ 12.16 hrs, Volume= 0.633 af, Atten= 12%, Lag= 1.9 min
Primary = 11.19 cfs @ 12.16 hrs, Volume= 0.633 af
Routed to Reach 7R : Proposed Site Discharge

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 800.85' Surf.Area= 0.064 ac Storage= 0.202 af
Peak Elev= 802.95' @ 12.16 hrs Surf.Area= 0.055 ac Storage= 0.330 af (0.128 af above start)

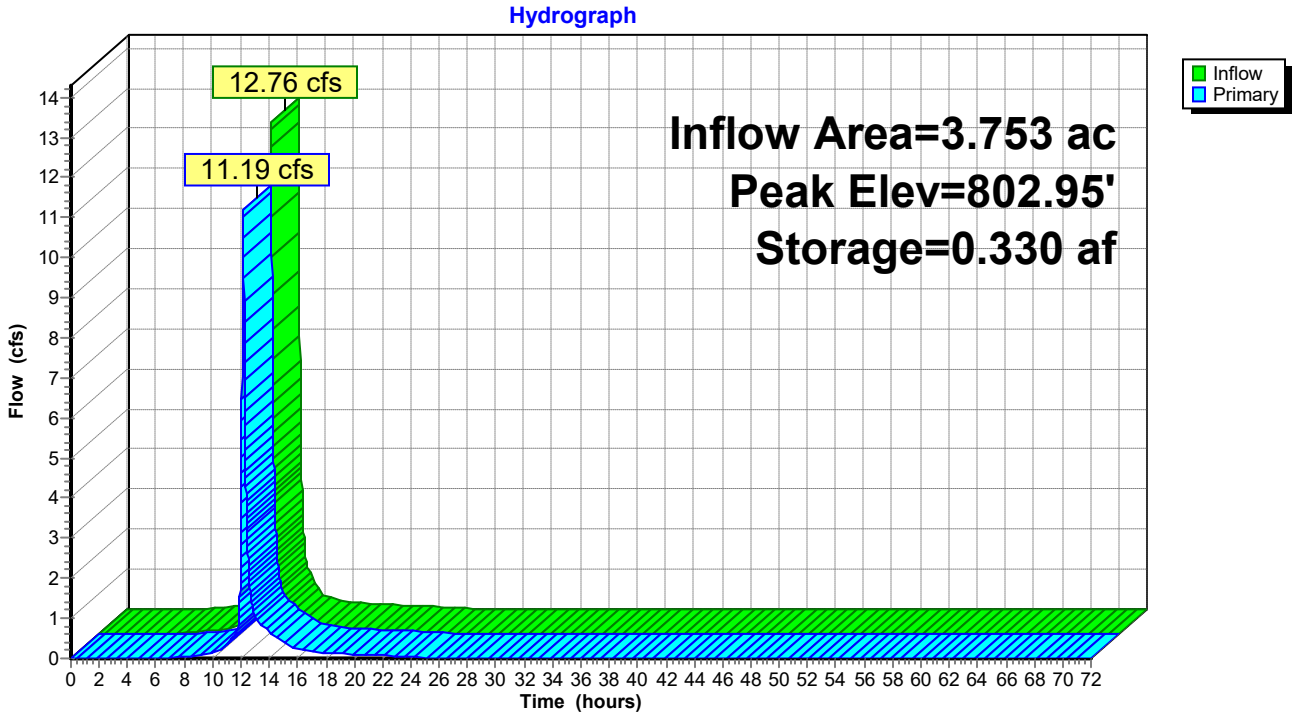
Plug-Flow detention time= 164.9 min calculated for 0.431 af (68% of inflow)
Center-of-Mass det. time= 40.8 min (807.8 - 767.0)

Volume	Invert	Avail.Storage	Storage Description
#1	796.85'	0.404 af	**96.0" Round 96" CONTECH EAST** L= 350.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	800.85'	**30.0" Round OUTLET PIPE** L= 40.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 800.85' / 800.70' S= 0.0037 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	800.85'	**6.0" Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	801.85'	**18.0" Vert. 2-18" Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	804.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=11.18 cfs @ 12.16 hrs HW=802.95' (Free Discharge)
└**1=OUTLET PIPE** (Passes 11.18 cfs of 15.29 cfs potential flow)
├**2=6" Orifice** (Orifice Controls 1.29 cfs @ 6.55 fps)
├**3=2-18" Orifice** (Orifice Controls 9.89 cfs @ 3.57 fps)
└**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: UG DETENTION BASIN EAST



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-2: E2-EXISTING Runoff Area=5,247 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.16 cfs 0.007 af

Subcatchment E1: E1-EXISTING Runoff Area=240,453 sf 92.71% Impervious Runoff Depth=2.26"
Tc=6.0 min CN=96 Runoff=21.07 cfs 1.038 af

Subcatchment OFF-1: OFF-1 Runoff Area=32,281 sf 88.57% Impervious Runoff Depth=2.16"
Tc=6.0 min CN=95 Runoff=2.75 cfs 0.133 af

Subcatchment OFF-2: OFF-2 Runoff Area=5,960 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=0.54 cfs 0.028 af

Subcatchment P1: P1-Developed Runoff Area=26,968 sf 96.23% Impervious Runoff Depth=2.36"
Tc=6.0 min CN=97 Runoff=2.42 cfs 0.122 af

Subcatchment P2: P2-Developed Runoff Area=15,914 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=1.45 cfs 0.075 af

Subcatchment P3: P3-Developed Roof Runoff Area=34,096 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=3.11 cfs 0.161 af

Subcatchment P4: P4-Developed Runoff Area=115,120 sf 92.67% Impervious Runoff Depth=2.26"
Tc=6.0 min CN=96 Runoff=10.09 cfs 0.497 af

Subcatchment P5: P5-Developed Roof Runoff Area=28,905 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=2.64 cfs 0.137 af

Subcatchment P6: P6-Developed Roof Runoff Area=19,450 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=1.78 cfs 0.092 af

Subcatchment P7: P7-Developed Runoff Area=5,247 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=0.48 cfs 0.025 af

Reach 6R: Existing Site Discharge Inflow=21.22 cfs 1.046 af
Outflow=21.22 cfs 1.046 af

Reach 7R: Proposed Site Discharge Inflow=22.30 cfs 1.270 af
Outflow=22.30 cfs 1.270 af

Pond 1P: UG DETENTION BASIN WEST Peak Elev=804.22' Storage=0.240 af Inflow=10.28 cfs 0.519 af
Outflow=9.05 cfs 0.519 af

Pond 2P: UG DETENTION BASIN EAST Peak Elev=803.06' Storage=0.337 af Inflow=14.50 cfs 0.726 af
Outflow=12.82 cfs 0.726 af

Total Runoff Area = 12.159 ac Runoff Volume = 2.315 af Average Runoff Depth = 2.29"
6.78% Pervious = 0.825 ac 93.22% Impervious = 11.334 ac

Summary for Subcatchment E-2: E2-EXISTING CONDITIONS

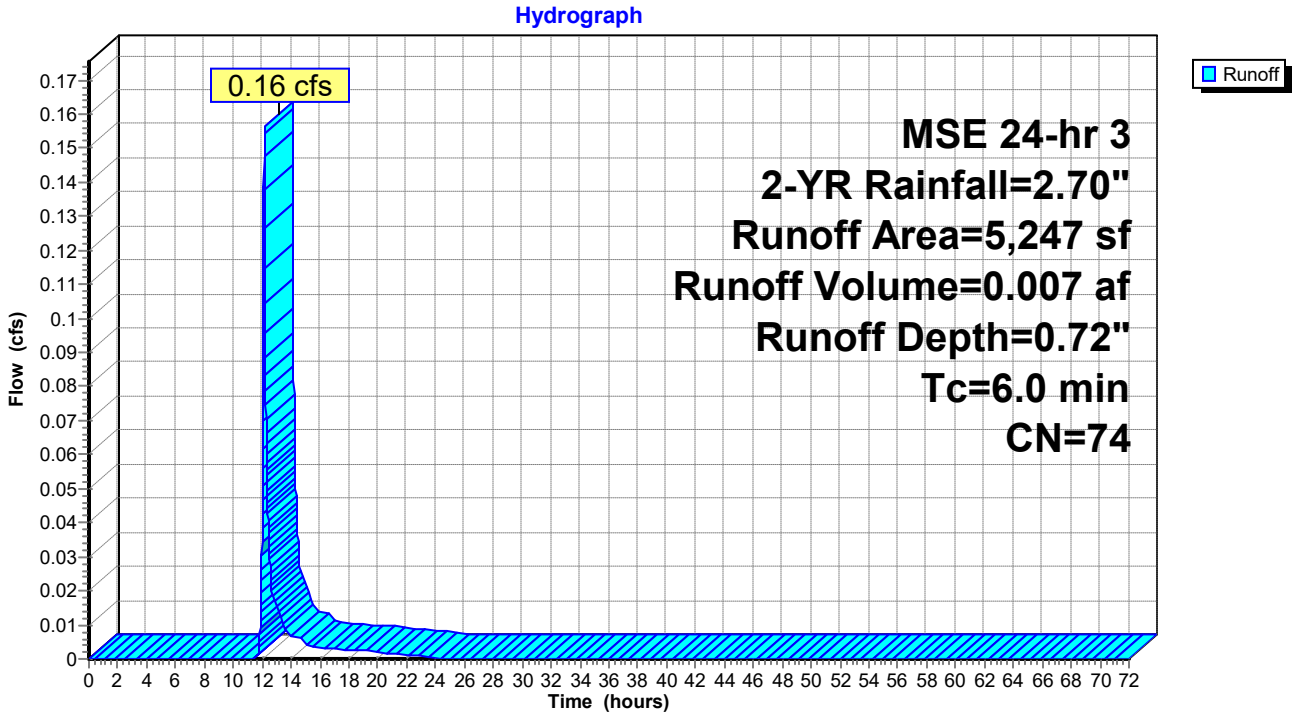
Runoff = 0.16 cfs @ 12.14 hrs, Volume= 0.007 af, Depth= 0.72"
Routed to Reach 6R : Existing Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

Area (sf)	CN	Description
5,247	74	>75% Grass cover, Good, HSG C
5,247		100.00% Pervious Area

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

Subcatchment E-2: E2-EXISTING CONDITIONS



Summary for Subcatchment E1: E1-EXISTING CONDITIONS

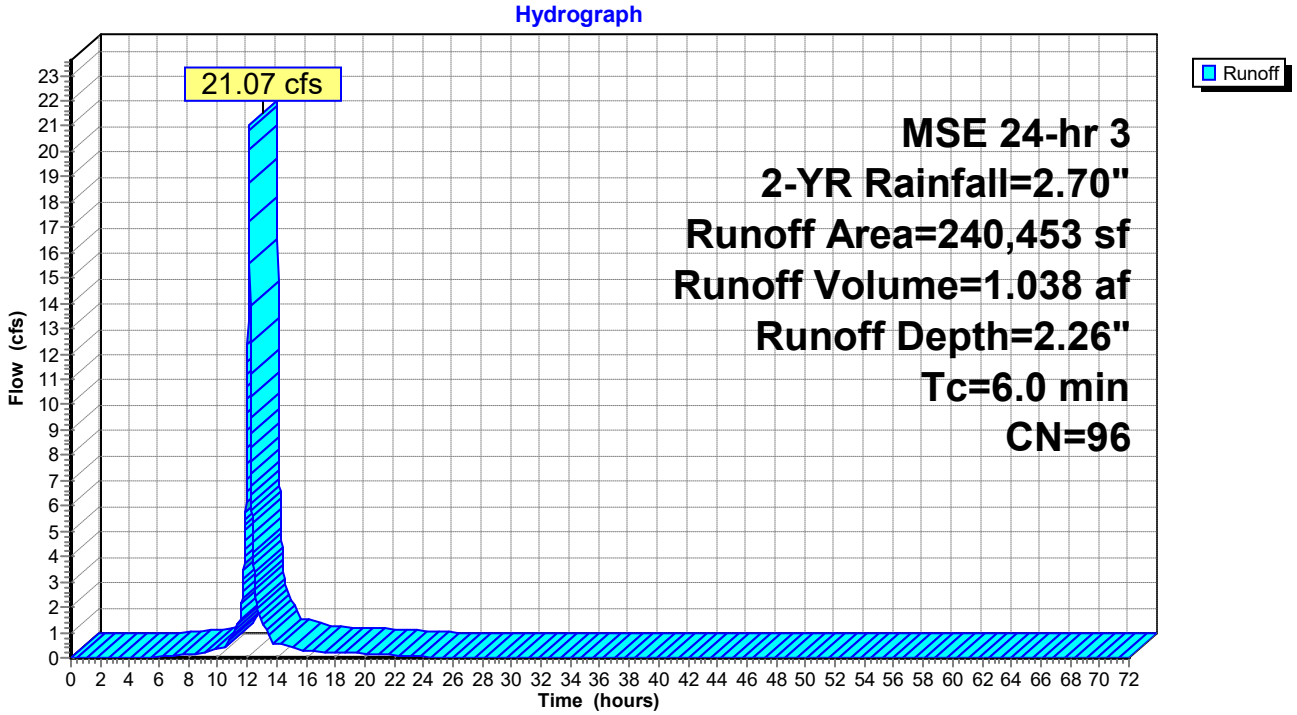
Runoff = 21.07 cfs @ 12.13 hrs, Volume= 1.038 af, Depth= 2.26"
Routed to Reach 6R : Existing Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	129,599	98	PAVEMENT
*	93,325	98	GRAVEL DRIVE
	17,529	74	>75% Grass cover, Good, HSG C
	240,453	96	Weighted Average
	17,529		7.29% Pervious Area
	222,924		92.71% Impervious Area

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

Subcatchment E1: E1-EXISTING CONDITIONS



Summary for Subcatchment OFF-1: OFF-1

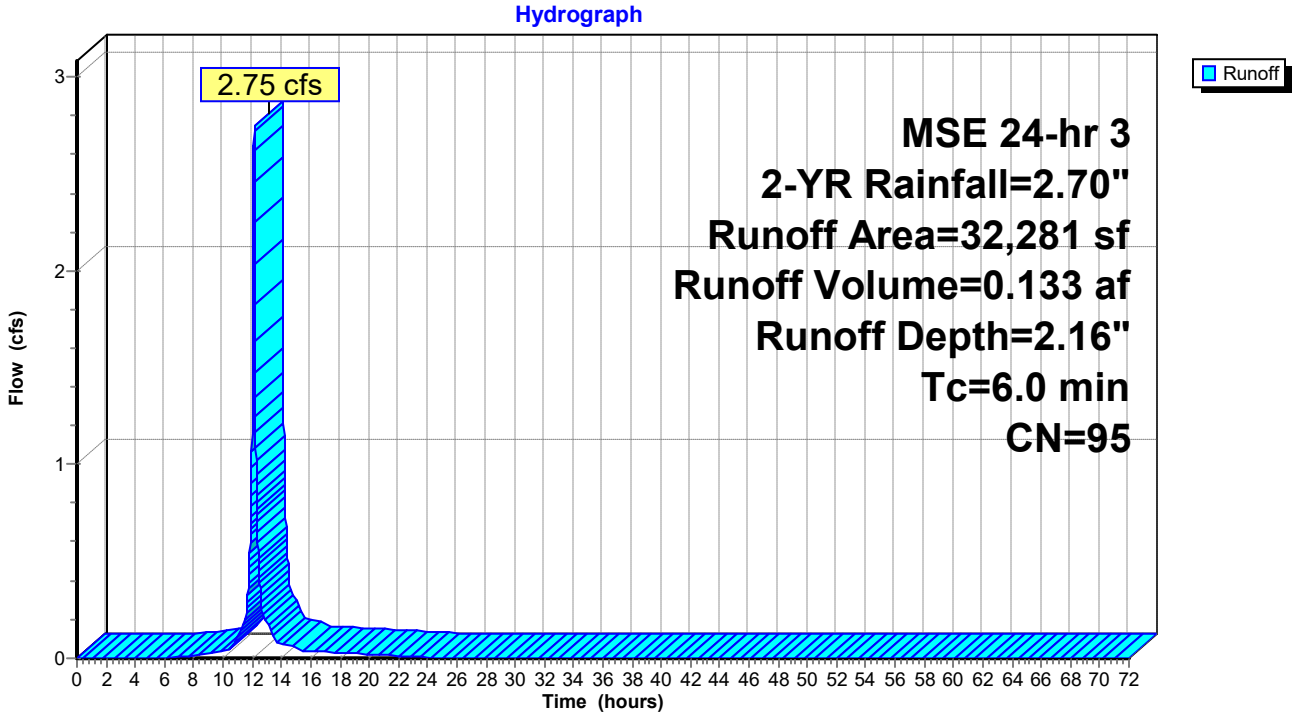
Runoff = 2.75 cfs @ 12.13 hrs, Volume= 0.133 af, Depth= 2.16"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	28,590	98	Paved Areas
	3,691	74	>75% Grass cover, Good, HSG C
	32,281	95	Weighted Average
	3,691		11.43% Pervious Area
	28,590		88.57% Impervious Area

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

Subcatchment OFF-1: OFF-1



Summary for Subcatchment OFF-2: OFF-2

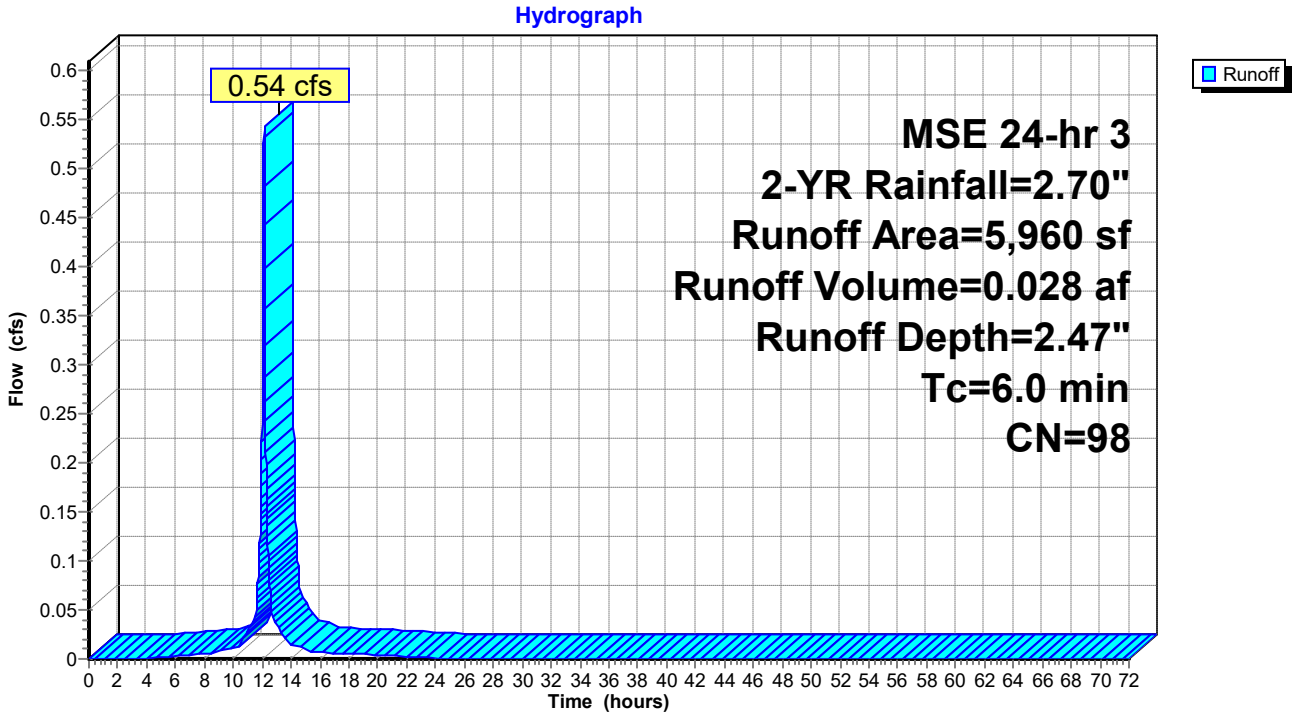
Runoff = 0.54 cfs @ 12.13 hrs, Volume= 0.028 af, Depth= 2.47"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	5,960	98	Paved Areas
	5,960		100.00% Impervious Area

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

Subcatchment OFF-2: OFF-2



Summary for Subcatchment P1: P1-Developed

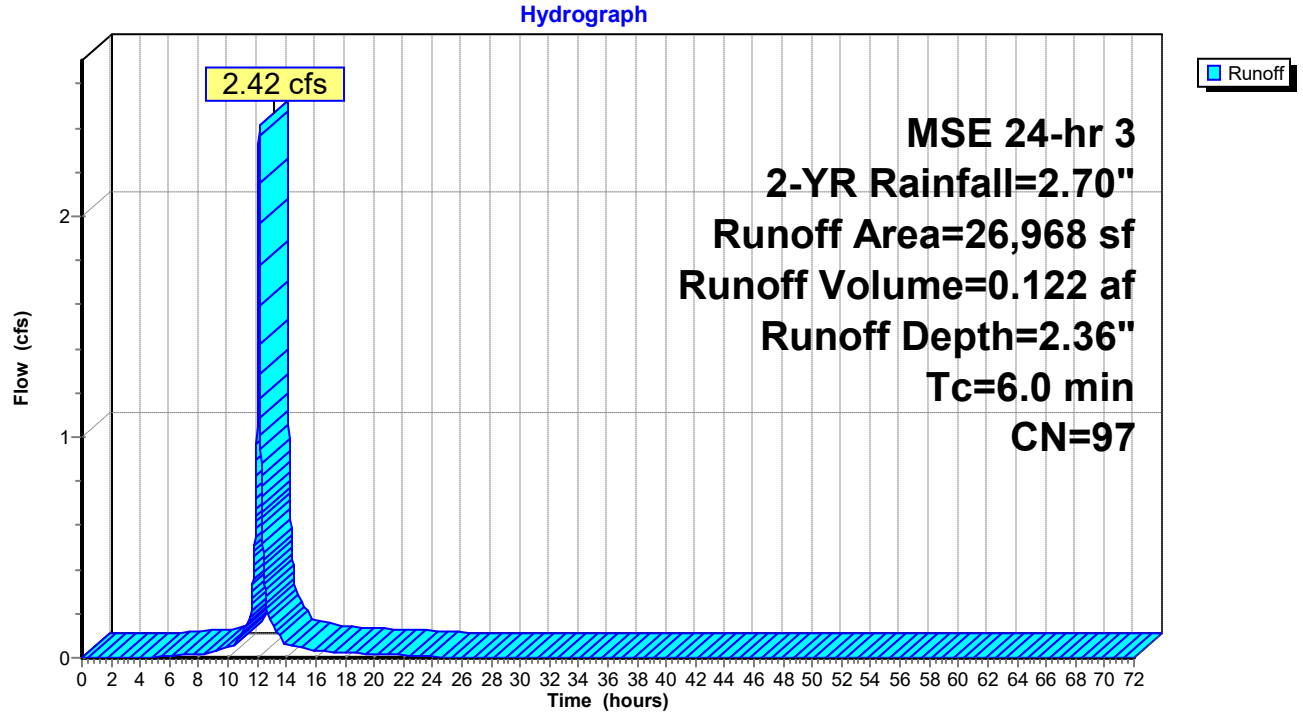
Runoff = 2.42 cfs @ 12.13 hrs, Volume= 0.122 af, Depth= 2.36"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	21,950	98	Paved Areas
	4,000	98	Roofs, HSG C
	1,018	74	>75% Grass cover, Good, HSG C
	26,968	97	Weighted Average
	1,018		3.77% Pervious Area
	25,950		96.23% Impervious Area

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

Subcatchment P1: P1-Developed



Summary for Subcatchment P2: P2-Developed

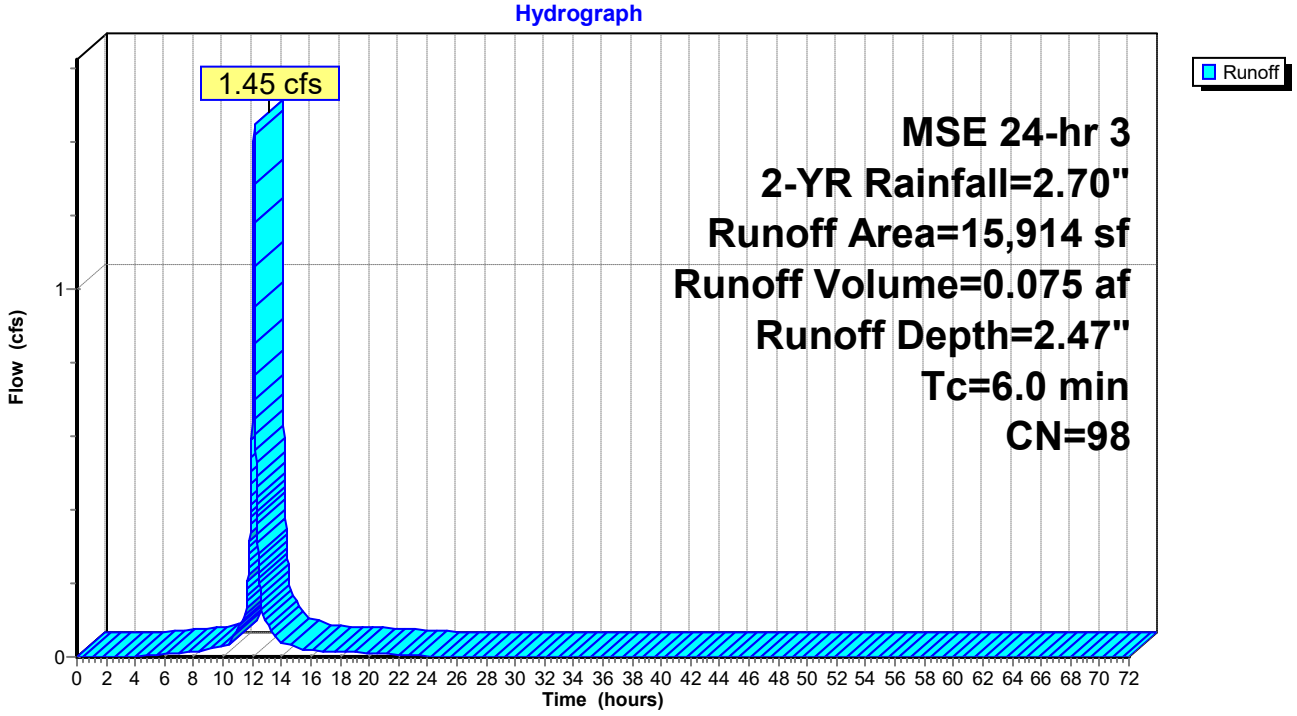
Runoff = 1.45 cfs @ 12.13 hrs, Volume= 0.075 af, Depth= 2.47"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	15,914	98	Paved Areas
	15,914		100.00% Impervious Area

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

Subcatchment P2: P2-Developed



Summary for Subcatchment P3: P3-Developed Roof

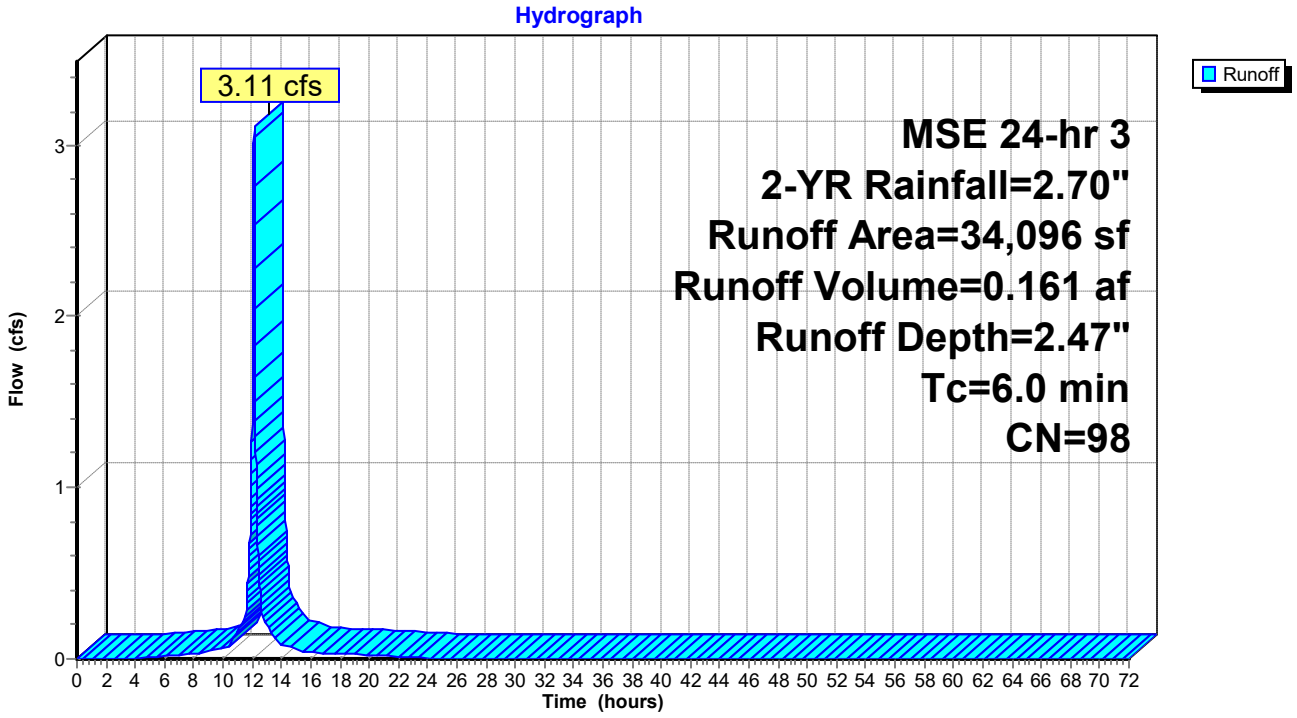
Runoff = 3.11 cfs @ 12.13 hrs, Volume= 0.161 af, Depth= 2.47"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	34,096	98	Roof
	34,096		100.00% Impervious Area

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

Subcatchment P3: P3-Developed Roof



Summary for Subcatchment P4: P4-Developed

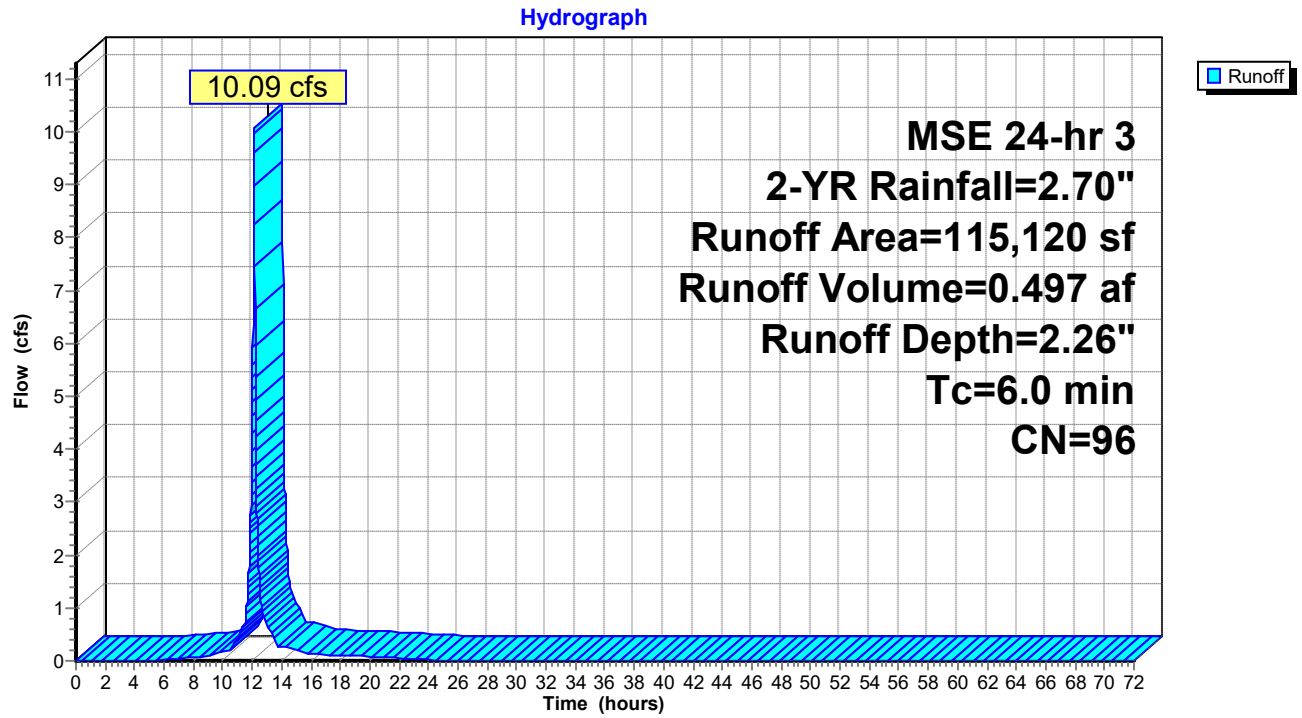
Runoff = 10.09 cfs @ 12.13 hrs, Volume= 0.497 af, Depth= 2.26"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	99,134	98	Paved Areas
*	7,553	98	Roof
	8,433	74	>75% Grass cover, Good, HSG C
	115,120	96	Weighted Average
	8,433		7.33% Pervious Area
	106,687		92.67% Impervious Area

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

Subcatchment P4: P4-Developed



Summary for Subcatchment P5: P5-Developed Roof

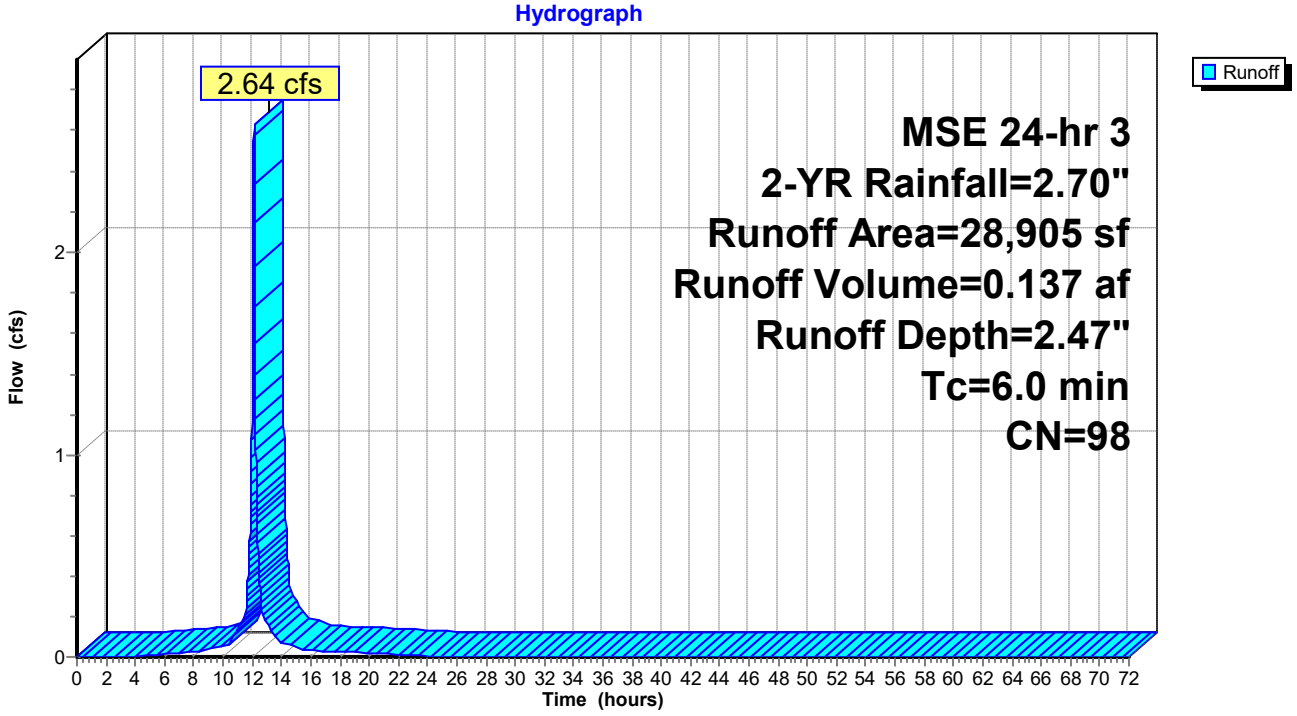
Runoff = 2.64 cfs @ 12.13 hrs, Volume= 0.137 af, Depth= 2.47"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	28,905	98	Roof
	28,905		100.00% Impervious Area

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

Subcatchment P5: P5-Developed Roof



Summary for Subcatchment P6: P6-Developed Roof

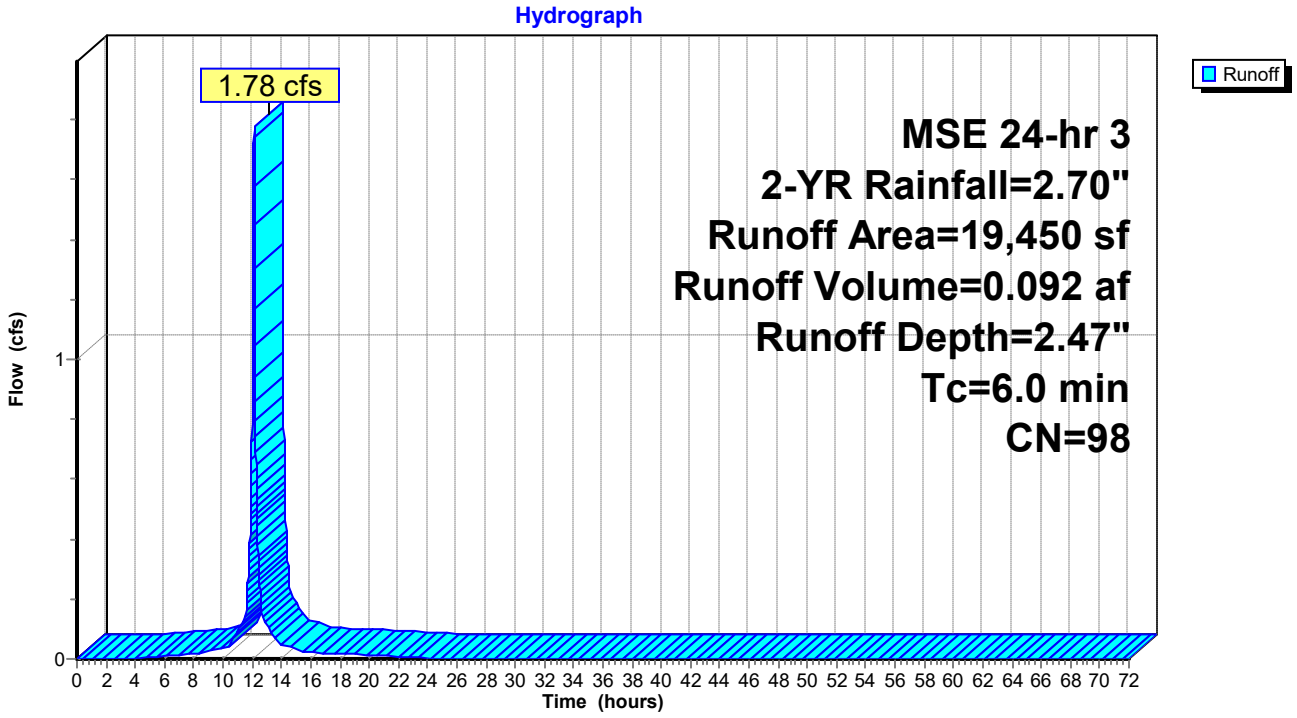
Runoff = 1.78 cfs @ 12.13 hrs, Volume= 0.092 af, Depth= 2.47"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	19,450	98	Roof
	19,450		100.00% Impervious Area

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

Subcatchment P6: P6-Developed Roof



Summary for Subcatchment P7: P7-Developed (Undetained)

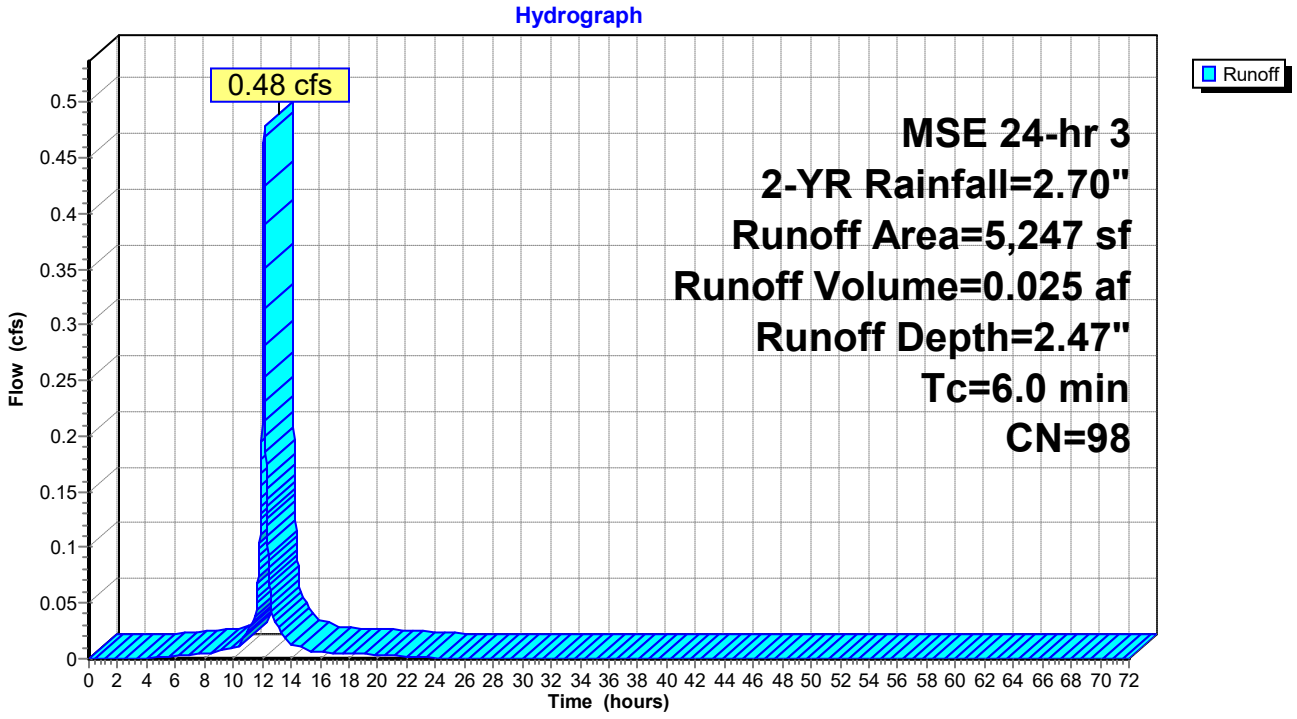
Runoff = 0.48 cfs @ 12.13 hrs, Volume= 0.025 af, Depth= 2.47"
Routed to Reach 7R : Proposed Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-YR Rainfall=2.70"

	Area (sf)	CN	Description
*	0	74	Pervious Areas
*	5,247	98	Paved Areas
	5,247	98	Weighted Average
	5,247		100.00% Impervious Area

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

Subcatchment P7: P7-Developed (Undetained)

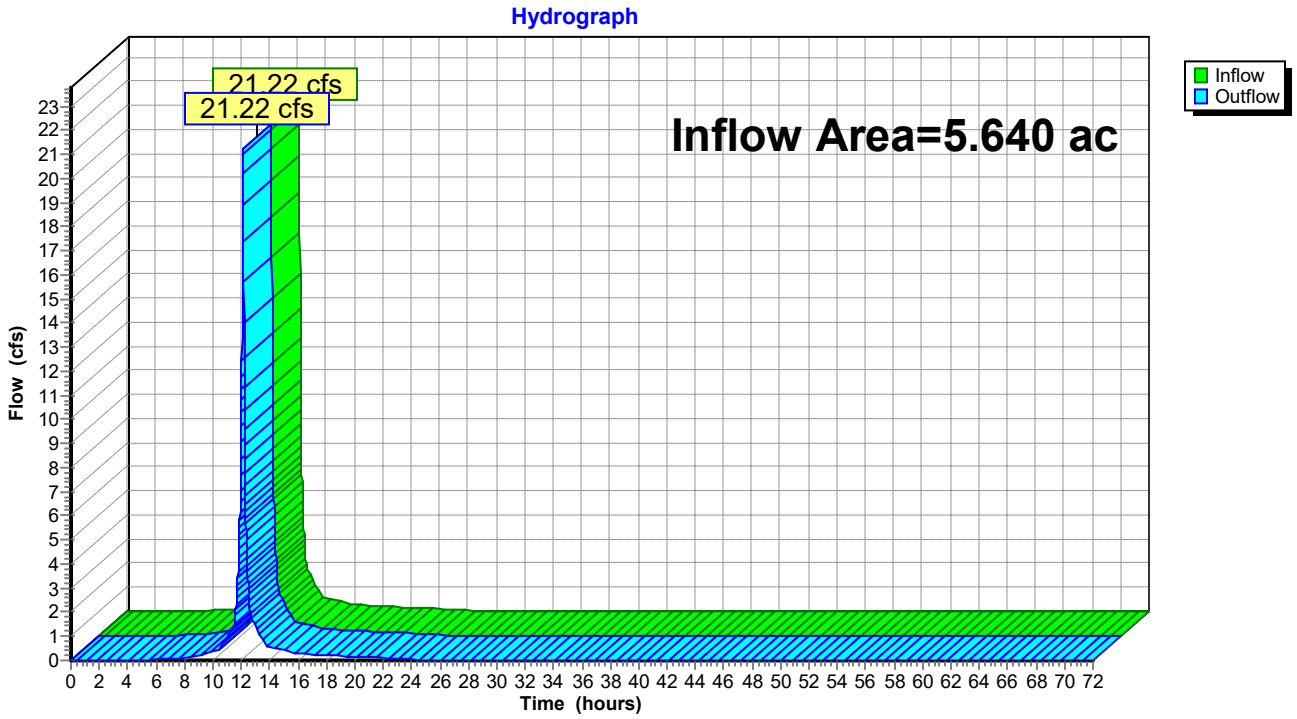


Summary for Reach 6R: Existing Site Discharge

Inflow Area = 5.640 ac, 90.73% Impervious, Inflow Depth = 2.22" for 2-YR event
Inflow = 21.22 cfs @ 12.13 hrs, Volume= 1.046 af
Outflow = 21.22 cfs @ 12.13 hrs, Volume= 1.046 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 6R: Existing Site Discharge

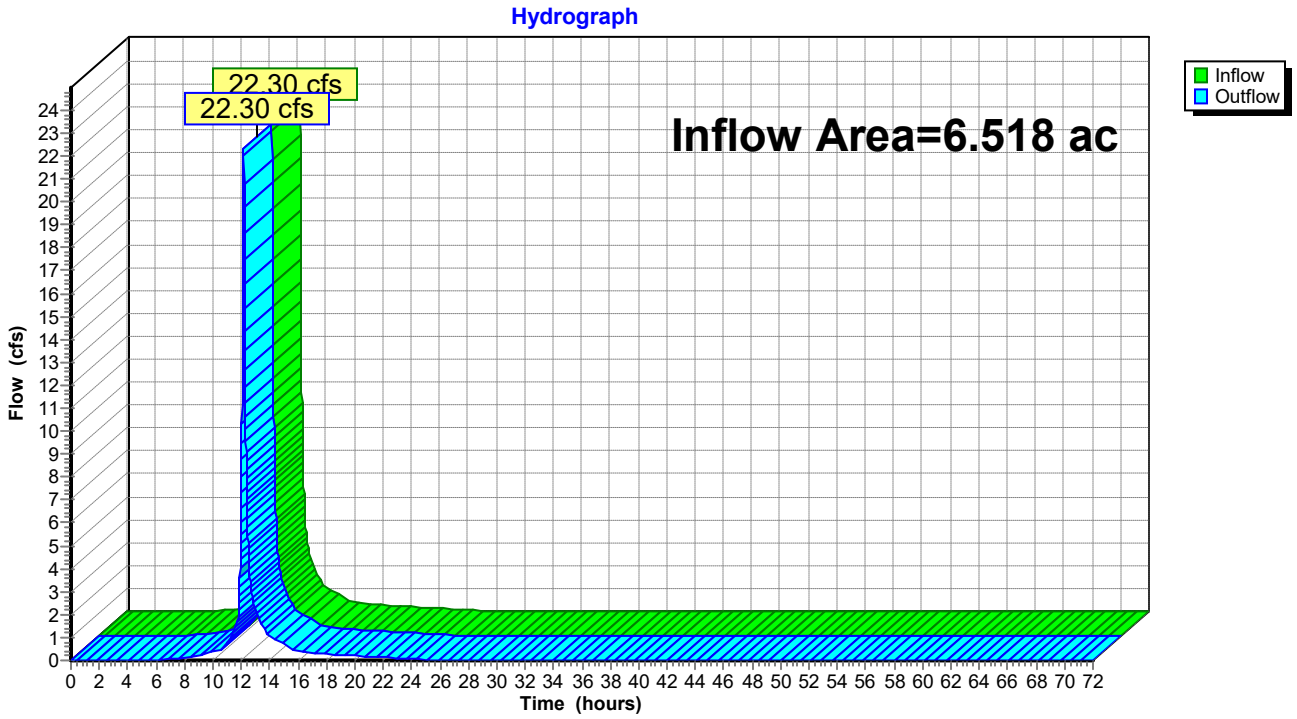


Summary for Reach 7R: Proposed Site Discharge

Inflow Area = 6.518 ac, 95.37% Impervious, Inflow Depth = 2.34" for 2-YR event
Inflow = 22.30 cfs @ 12.16 hrs, Volume= 1.270 af
Outflow = 22.30 cfs @ 12.16 hrs, Volume= 1.270 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 7R: Proposed Site Discharge



Summary for Pond 1P: UG DETENTION BASIN WEST

Inflow Area = 2.645 ac, 95.91% Impervious, Inflow Depth = 2.36" for 2-YR event
Inflow = 10.28 cfs @ 12.13 hrs, Volume= 0.519 af
Outflow = 9.05 cfs @ 12.16 hrs, Volume= 0.519 af, Atten= 12%, Lag= 1.9 min
Primary = 9.05 cfs @ 12.16 hrs, Volume= 0.519 af
Routed to Reach 7R : Proposed Site Discharge

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 802.25' Surf.Area= 0.048 ac Storage= 0.150 af
Peak Elev= 804.22' @ 12.16 hrs Surf.Area= 0.042 ac Storage= 0.240 af (0.090 af above start)

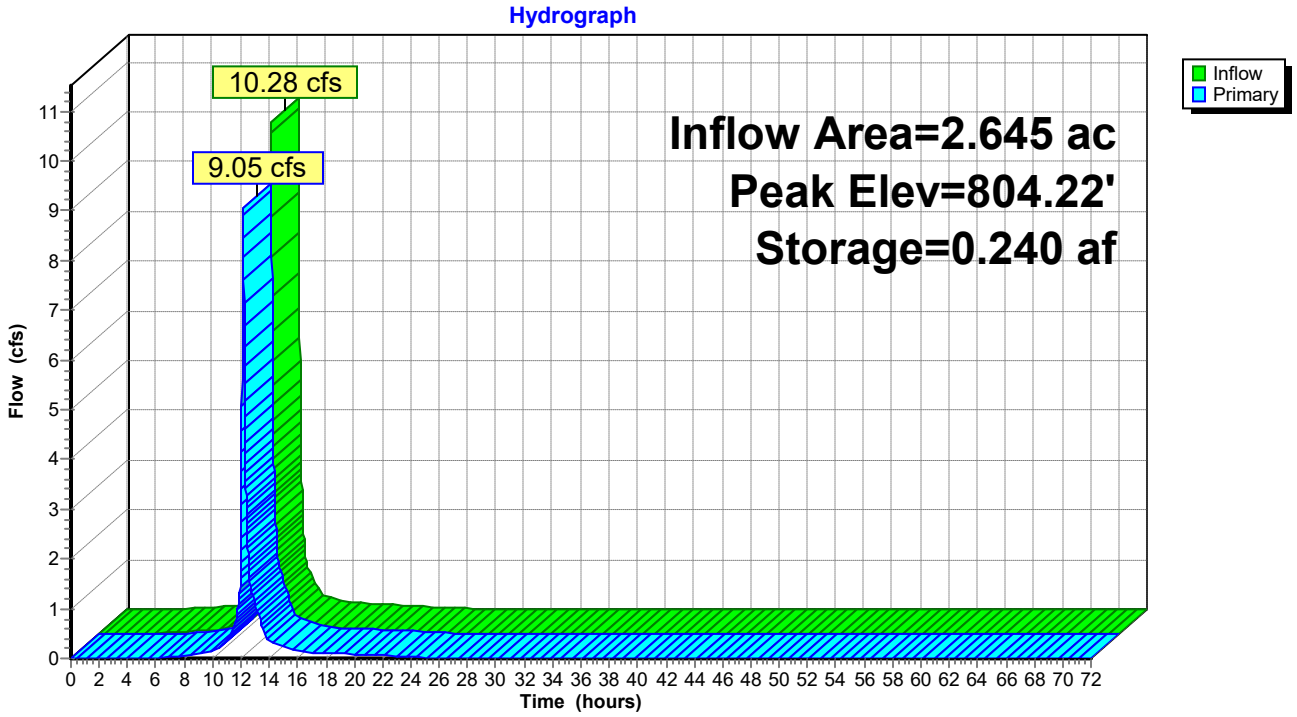
Plug-Flow detention time= 144.9 min calculated for 0.369 af (71% of inflow)
Center-of-Mass det. time= 28.4 min (790.0 - 761.6)

Volume	Invert	Avail.Storage	Storage Description
#1	798.25'	0.300 af	**96.0" Round CONTECH - WEST** L= 260.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	802.25'	**24.0" Round OUTLET PIPE** L= 26.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 802.25' / 802.00' S= 0.0096 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Device 1	802.25'	**8.0" Vert. 8" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	803.25'	**15.0" Vert. 2-15" Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	804.85'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=9.04 cfs @ 12.16 hrs HW=804.22' (Free Discharge)
└**1=OUTLET PIPE** (Passes 9.04 cfs of 11.05 cfs potential flow)
├**2=8" Orifice** (Orifice Controls 2.15 cfs @ 6.17 fps)
├**3=2-15" Orifice** (Orifice Controls 6.89 cfs @ 3.36 fps)
└**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: UG DETENTION BASIN WEST



Summary for Pond 2P: UG DETENTION BASIN EAST

Inflow Area = 3.753 ac, 94.84% Impervious, Inflow Depth = 2.32" for 2-YR event
Inflow = 14.50 cfs @ 12.13 hrs, Volume= 0.726 af
Outflow = 12.82 cfs @ 12.16 hrs, Volume= 0.726 af, Atten= 12%, Lag= 1.9 min
Primary = 12.82 cfs @ 12.16 hrs, Volume= 0.726 af
Routed to Reach 7R : Proposed Site Discharge

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 800.85' Surf.Area= 0.064 ac Storage= 0.202 af
Peak Elev= 803.06' @ 12.16 hrs Surf.Area= 0.054 ac Storage= 0.337 af (0.135 af above start)

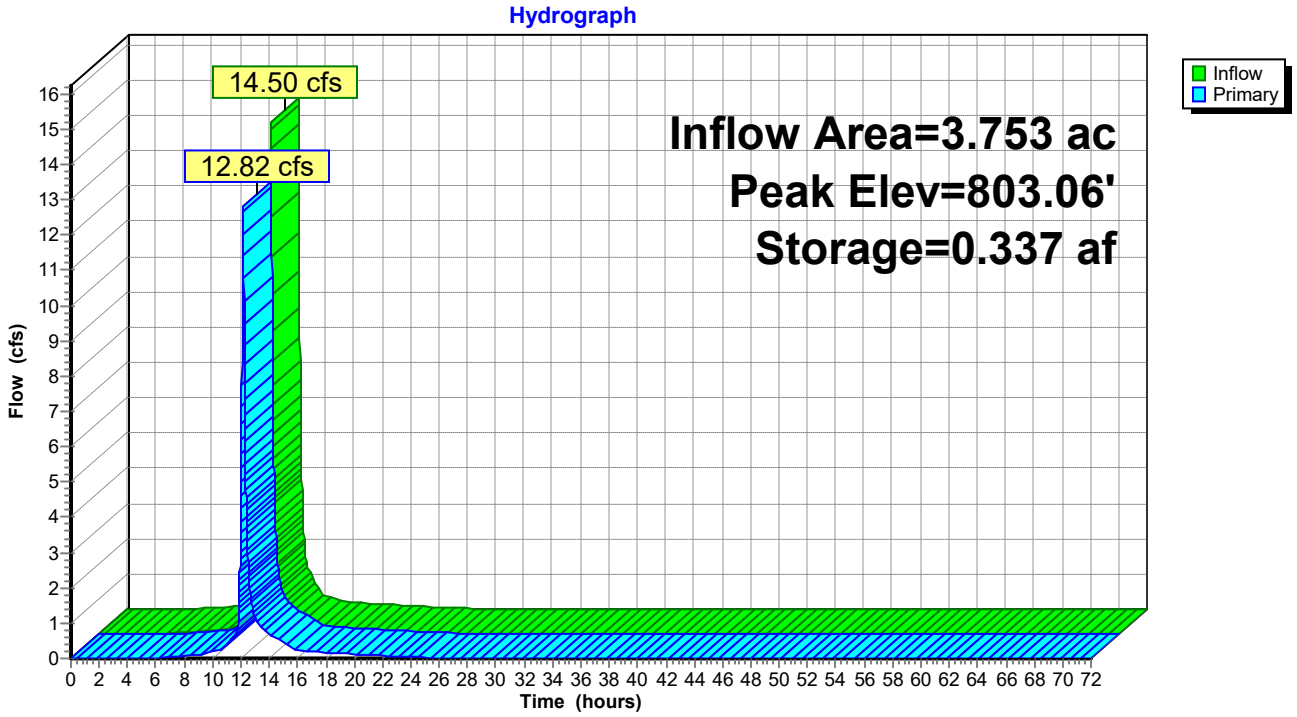
Plug-Flow detention time= 152.3 min calculated for 0.524 af (72% of inflow)
Center-of-Mass det. time= 38.5 min (803.0 - 764.5)

Volume	Invert	Avail.Storage	Storage Description
#1	796.85'	0.404 af	**96.0" Round 96" CONTECH EAST** L= 350.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	800.85'	**30.0" Round OUTLET PIPE** L= 40.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 800.85' / 800.70' S= 0.0037 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	800.85'	**6.0" Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	801.85'	**18.0" Vert. 2-18" Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	804.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=12.82 cfs @ 12.16 hrs HW=803.06' (Free Discharge)
└**1=OUTLET PIPE** (Passes 12.82 cfs of 16.65 cfs potential flow)
├**2=6" Orifice** (Orifice Controls 1.32 cfs @ 6.75 fps)
├**3=2-18" Orifice** (Orifice Controls 11.50 cfs @ 3.75 fps)
└**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: UG DETENTION BASIN EAST



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-2: E2-EXISTING Runoff Area=5,247 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.33 cfs 0.015 af

Subcatchment E1: E1-EXISTING Runoff Area=240,453 sf 92.71% Impervious Runoff Depth=3.35"
Tc=6.0 min CN=96 Runoff=30.50 cfs 1.542 af

Subcatchment OFF-1: OFF-1 Runoff Area=32,281 sf 88.57% Impervious Runoff Depth=3.24"
Tc=6.0 min CN=95 Runoff=4.03 cfs 0.200 af

Subcatchment OFF-2: OFF-2 Runoff Area=5,960 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=0.77 cfs 0.041 af

Subcatchment P1: P1-Developed Runoff Area=26,968 sf 96.23% Impervious Runoff Depth=3.46"
Tc=6.0 min CN=97 Runoff=3.47 cfs 0.179 af

Subcatchment P2: P2-Developed Runoff Area=15,914 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=2.07 cfs 0.109 af

Subcatchment P3: P3-Developed Roof Runoff Area=34,096 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=4.43 cfs 0.233 af

Subcatchment P4: P4-Developed Runoff Area=115,120 sf 92.67% Impervious Runoff Depth=3.35"
Tc=6.0 min CN=96 Runoff=14.60 cfs 0.738 af

Subcatchment P5: P5-Developed Roof Runoff Area=28,905 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=3.75 cfs 0.198 af

Subcatchment P6: P6-Developed Roof Runoff Area=19,450 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=2.52 cfs 0.133 af

Subcatchment P7: P7-Developed Runoff Area=5,247 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=0.68 cfs 0.036 af

Reach 6R: Existing Site Discharge Inflow=30.82 cfs 1.557 af
Outflow=30.82 cfs 1.557 af

Reach 7R: Proposed Site Discharge Inflow=31.45 cfs 1.867 af
Outflow=31.45 cfs 1.867 af

Pond 1P: UG DETENTION BASIN WEST Peak Elev=804.65' Storage=0.257 af Inflow=14.76 cfs 0.762 af
Outflow=12.81 cfs 0.762 af

Pond 2P: UG DETENTION BASIN EAST Peak Elev=803.55' Storage=0.361 af Inflow=20.88 cfs 1.069 af
Outflow=18.05 cfs 1.069 af

Total Runoff Area = 12.159 ac Runoff Volume = 3.423 af Average Runoff Depth = 3.38"
6.78% Pervious = 0.825 ac 93.22% Impervious = 11.334 ac

Summary for Subcatchment E-2: E2-EXISTING CONDITIONS

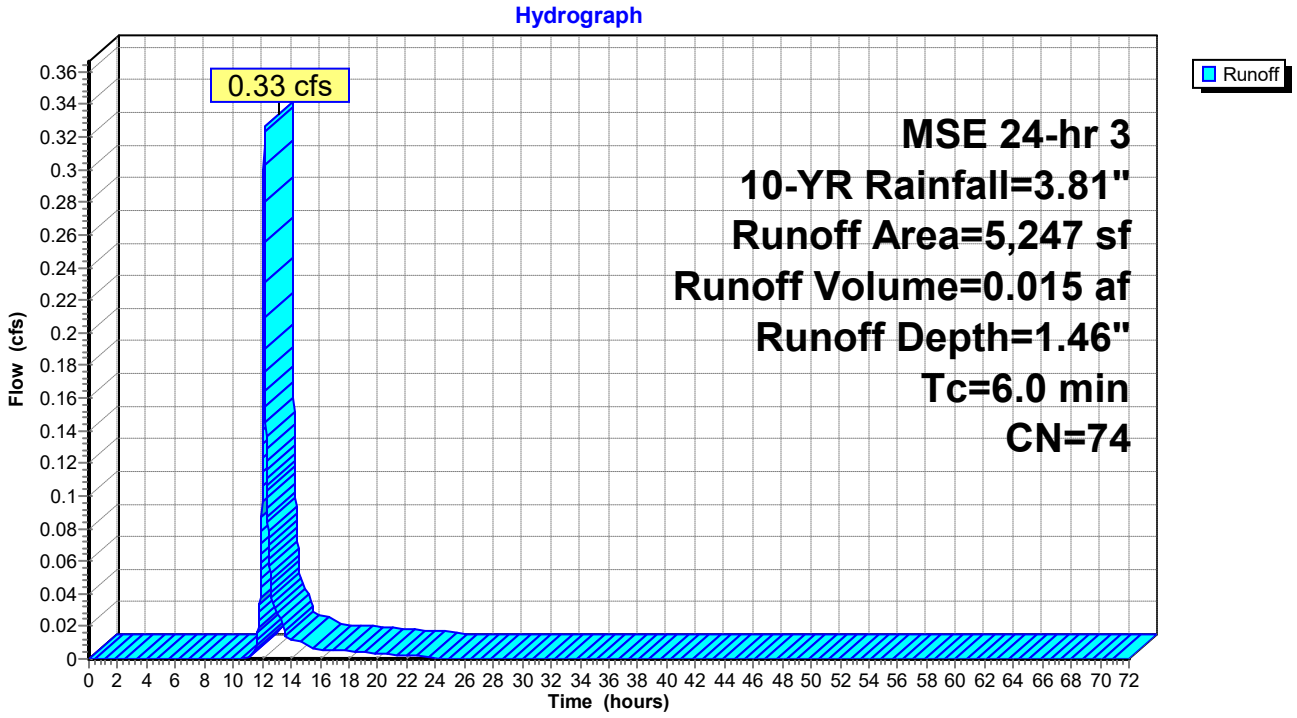
Runoff = 0.33 cfs @ 12.14 hrs, Volume= 0.015 af, Depth= 1.46"
Routed to Reach 6R : Existing Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

Area (sf)	CN	Description
5,247	74	>75% Grass cover, Good, HSG C
5,247		100.00% Pervious Area

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

Subcatchment E-2: E2-EXISTING CONDITIONS



Summary for Subcatchment E1: E1-EXISTING CONDITIONS

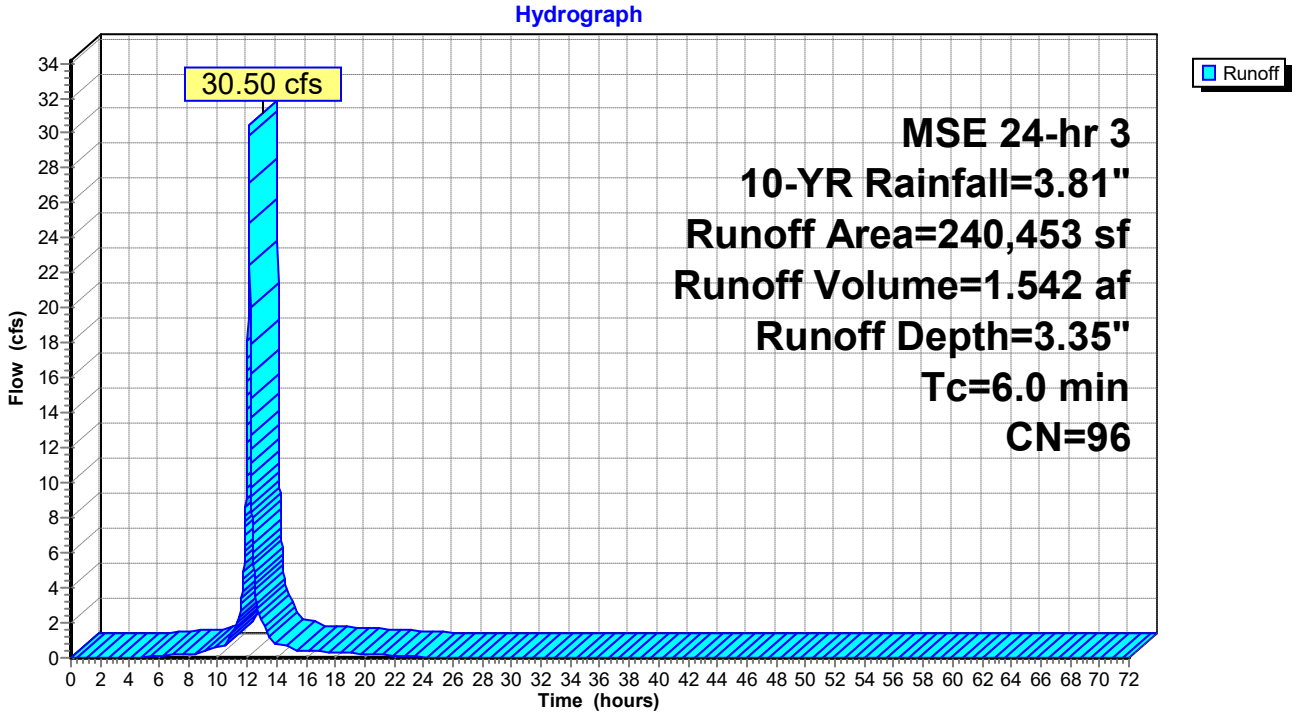
Runoff = 30.50 cfs @ 12.13 hrs, Volume= 1.542 af, Depth= 3.35"
Routed to Reach 6R : Existing Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	129,599	98	PAVEMENT
*	93,325	98	GRAVEL DRIVE
	17,529	74	>75% Grass cover, Good, HSG C
	240,453	96	Weighted Average
	17,529		7.29% Pervious Area
	222,924		92.71% Impervious Area

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

Subcatchment E1: E1-EXISTING CONDITIONS



Summary for Subcatchment OFF-1: OFF-1

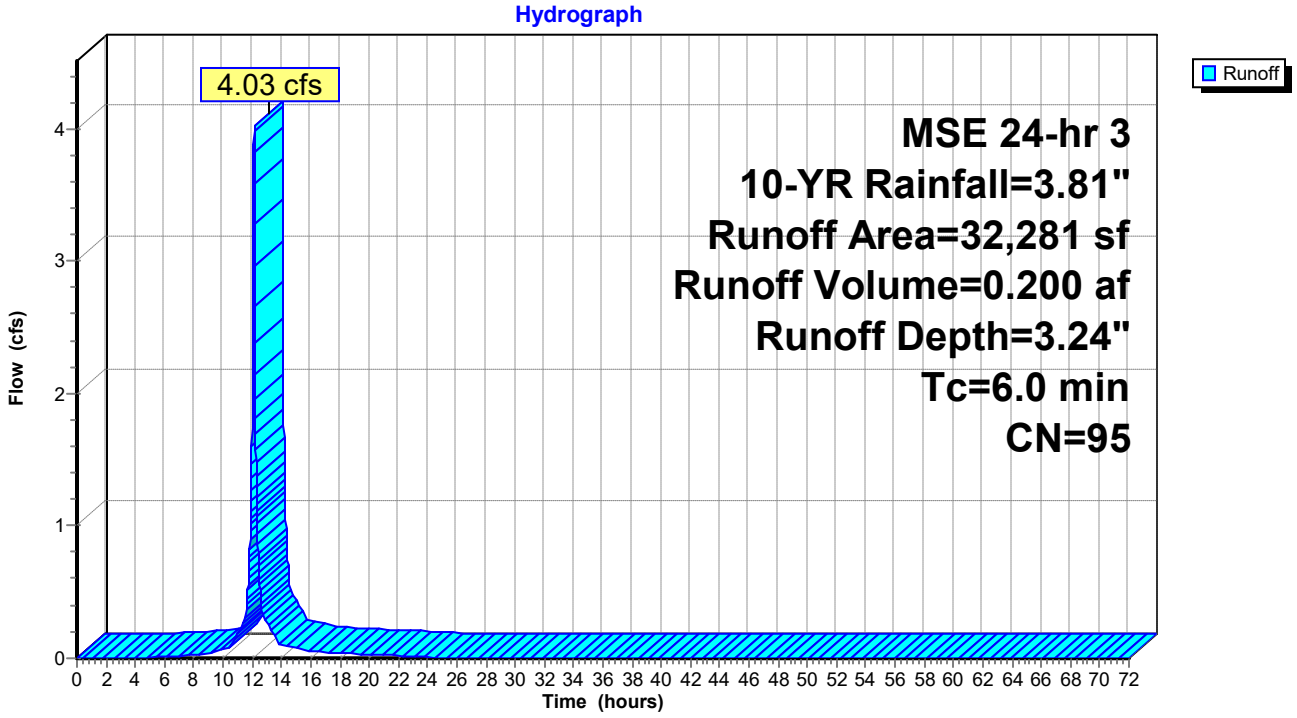
Runoff = 4.03 cfs @ 12.13 hrs, Volume= 0.200 af, Depth= 3.24"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	28,590	98	Paved Areas
	3,691	74	>75% Grass cover, Good, HSG C
	32,281	95	Weighted Average
	3,691		11.43% Pervious Area
	28,590		88.57% Impervious Area

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

Subcatchment OFF-1: OFF-1



Summary for Subcatchment OFF-2: OFF-2

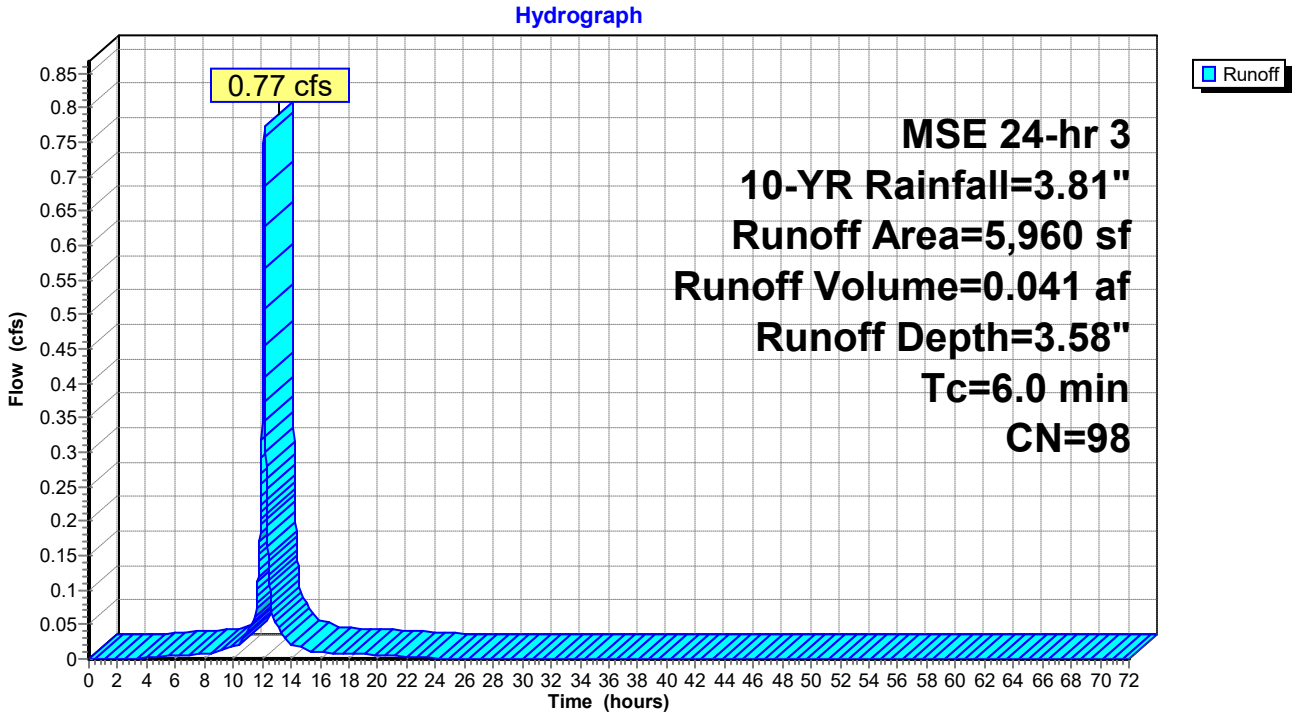
Runoff = 0.77 cfs @ 12.13 hrs, Volume= 0.041 af, Depth= 3.58"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	5,960	98	Paved Areas
	5,960		100.00% Impervious Area

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

Subcatchment OFF-2: OFF-2



Summary for Subcatchment P1: P1-Developed

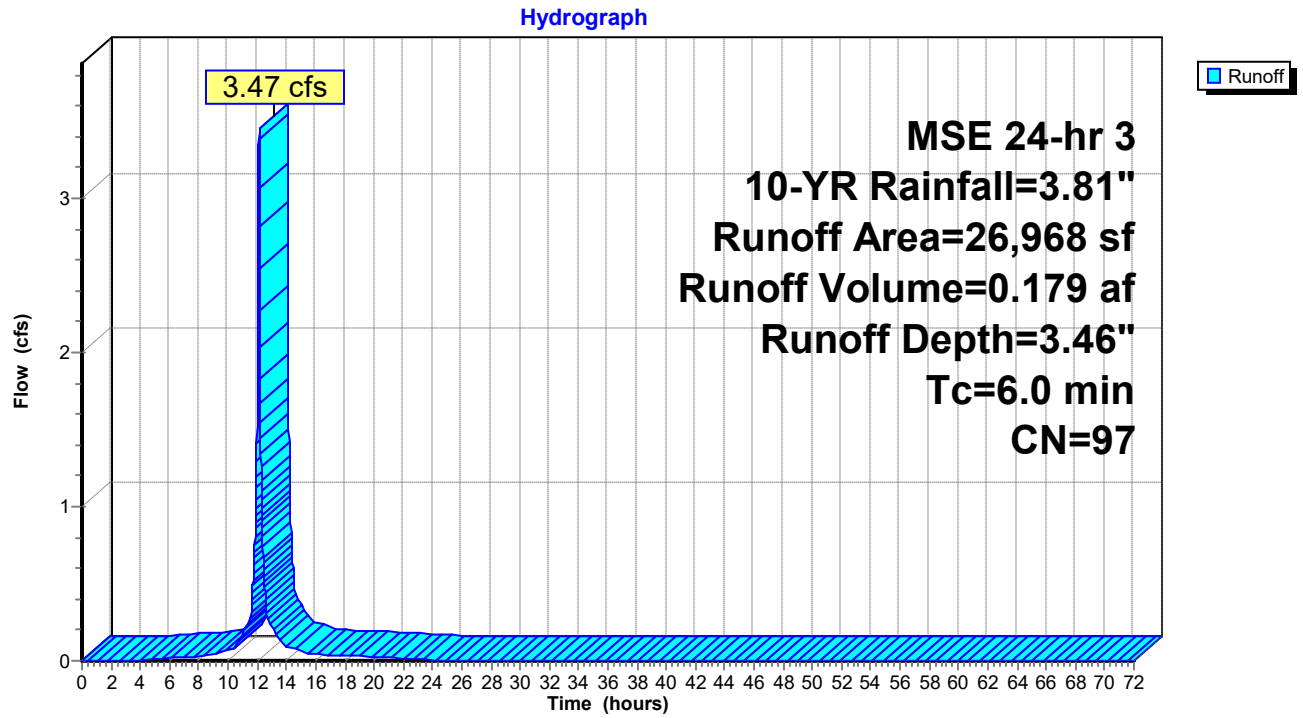
Runoff = 3.47 cfs @ 12.13 hrs, Volume= 0.179 af, Depth= 3.46"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	21,950	98	Paved Areas
	4,000	98	Roofs, HSG C
	1,018	74	>75% Grass cover, Good, HSG C
	26,968	97	Weighted Average
	1,018		3.77% Pervious Area
	25,950		96.23% Impervious Area

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

Subcatchment P1: P1-Developed



Summary for Subcatchment P2: P2-Developed

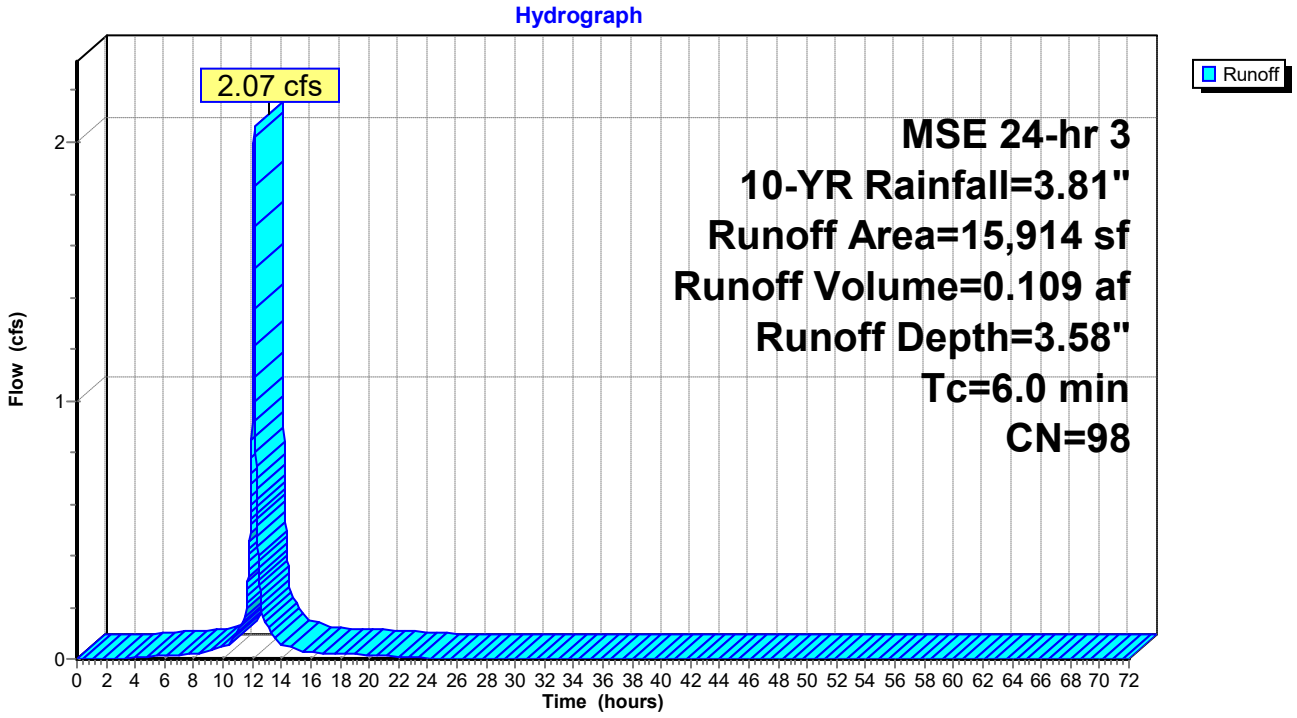
Runoff = 2.07 cfs @ 12.13 hrs, Volume= 0.109 af, Depth= 3.58"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	15,914	98	Paved Areas
	15,914		100.00% Impervious Area

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

Subcatchment P2: P2-Developed



Summary for Subcatchment P3: P3-Developed Roof

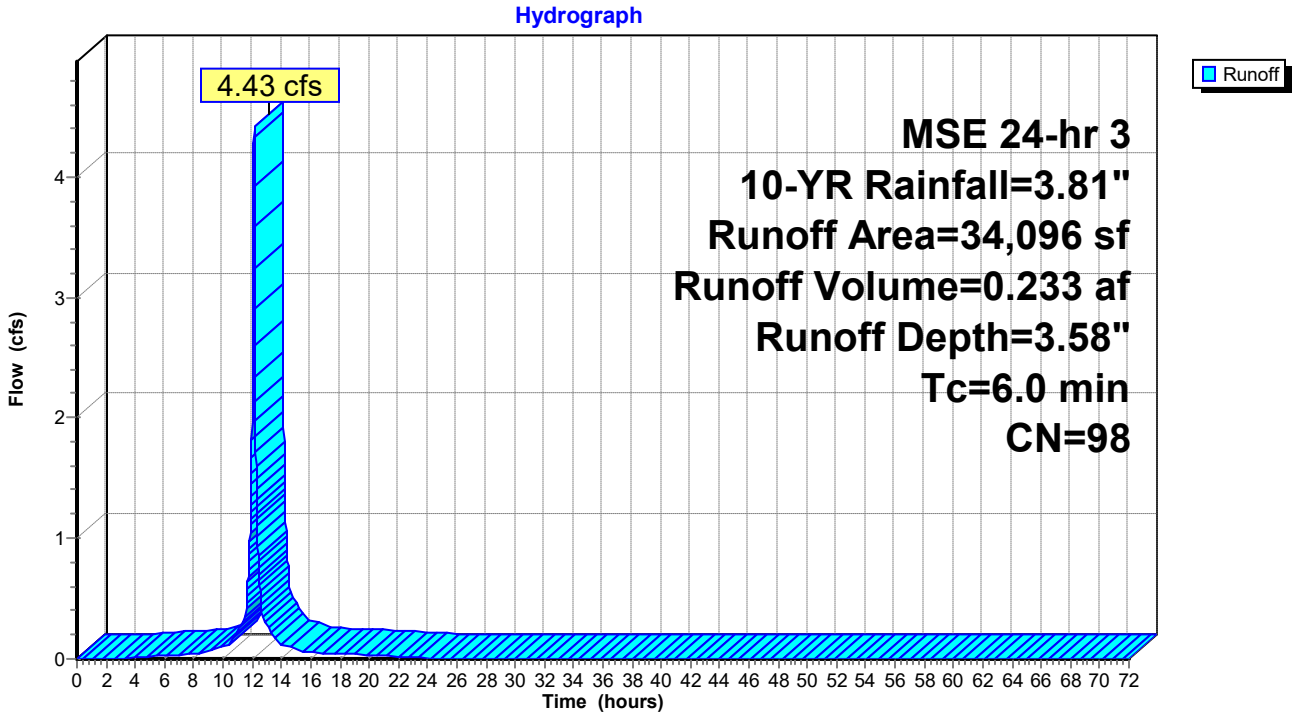
Runoff = 4.43 cfs @ 12.13 hrs, Volume= 0.233 af, Depth= 3.58"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	34,096	98	Roof
	34,096		100.00% Impervious Area

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

Subcatchment P3: P3-Developed Roof



Summary for Subcatchment P4: P4-Developed

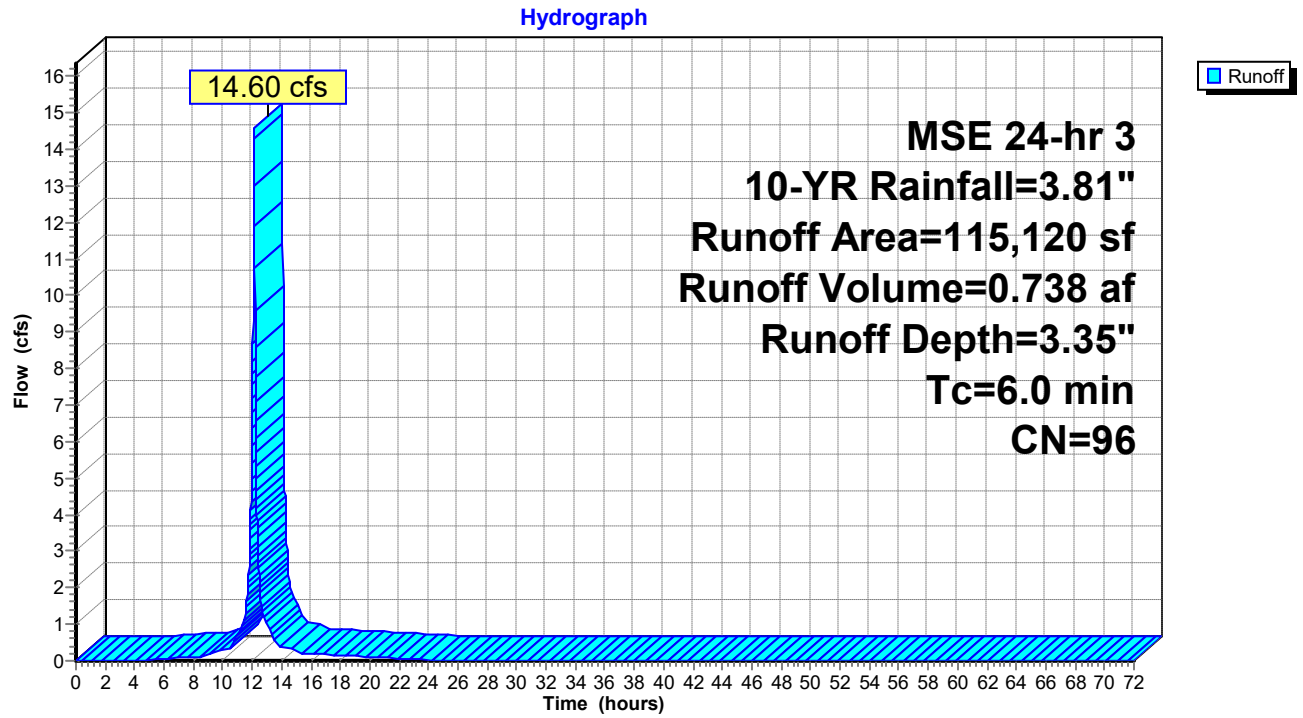
Runoff = 14.60 cfs @ 12.13 hrs, Volume= 0.738 af, Depth= 3.35"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	99,134	98	Paved Areas
*	7,553	98	Roof
	8,433	74	>75% Grass cover, Good, HSG C
	115,120	96	Weighted Average
	8,433		7.33% Pervious Area
	106,687		92.67% Impervious Area

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

Subcatchment P4: P4-Developed



Summary for Subcatchment P5: P5-Developed Roof

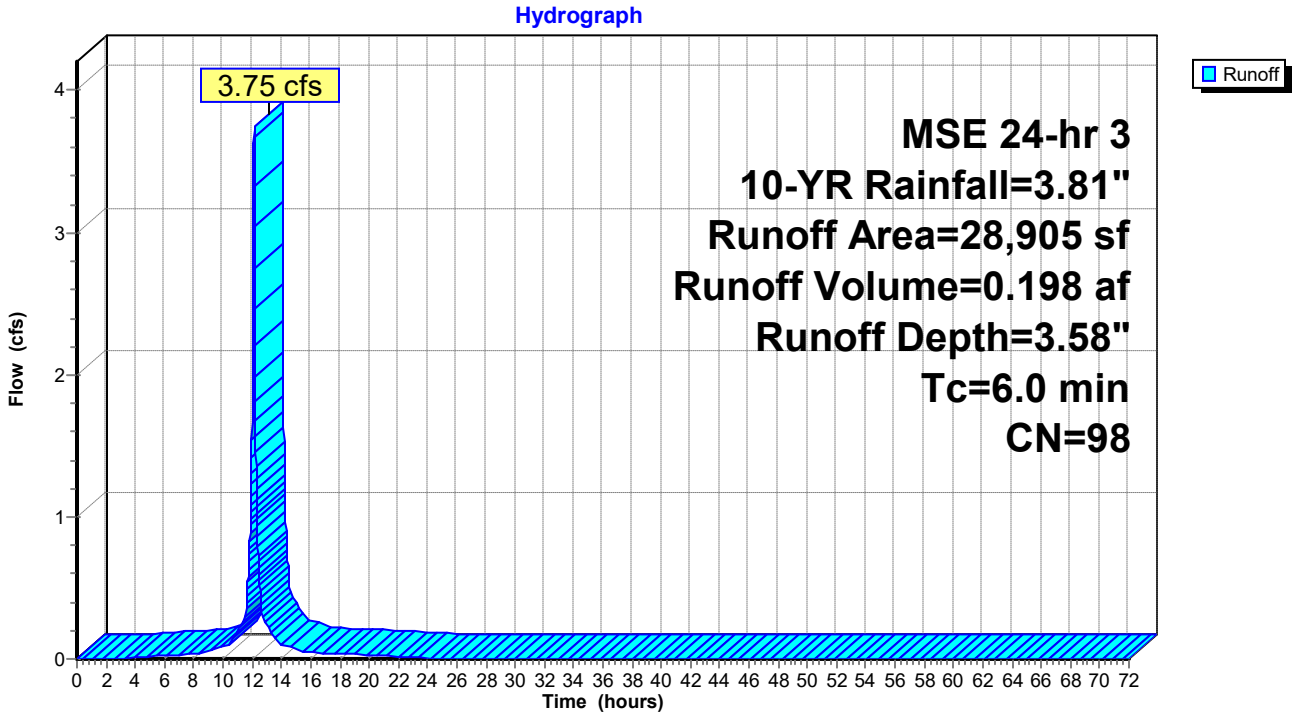
Runoff = 3.75 cfs @ 12.13 hrs, Volume= 0.198 af, Depth= 3.58"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	28,905	98	Roof
	28,905		100.00% Impervious Area

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

Subcatchment P5: P5-Developed Roof



Summary for Subcatchment P6: P6-Developed Roof

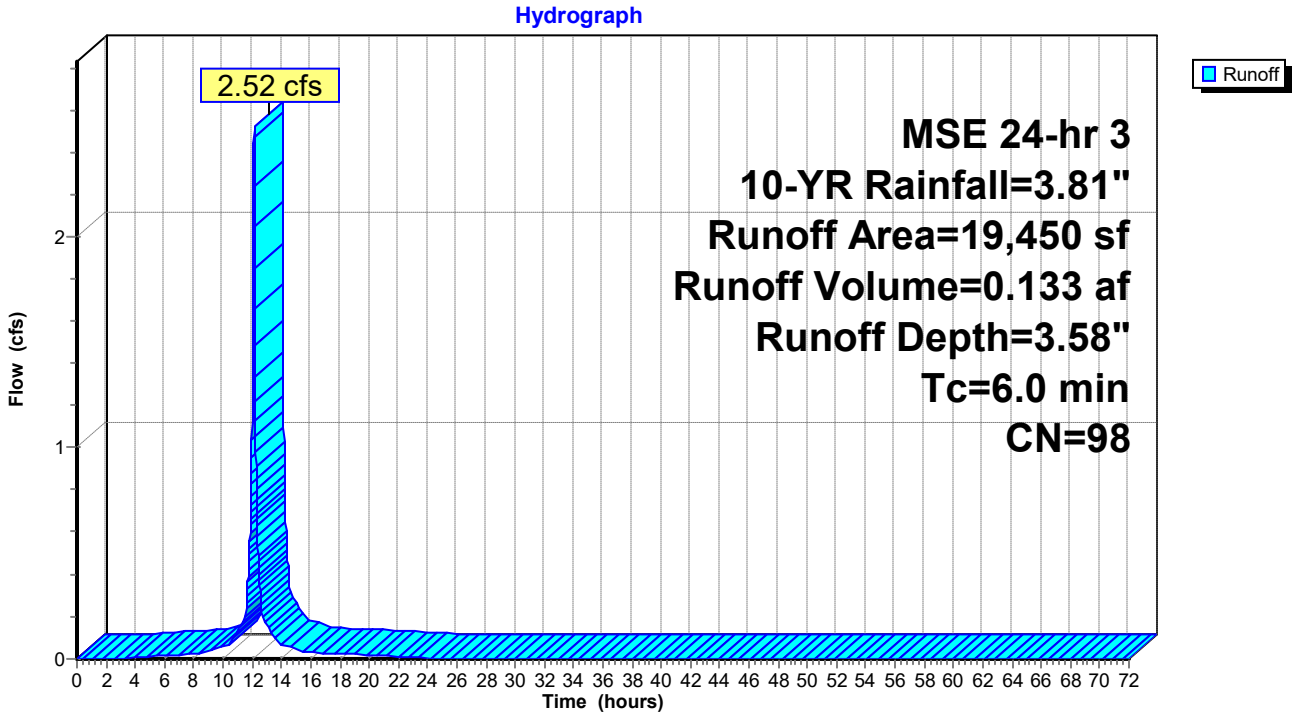
Runoff = 2.52 cfs @ 12.13 hrs, Volume= 0.133 af, Depth= 3.58"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	19,450	98	Roof
	19,450		100.00% Impervious Area

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

Subcatchment P6: P6-Developed Roof



Summary for Subcatchment P7: P7-Developed (Undetained)

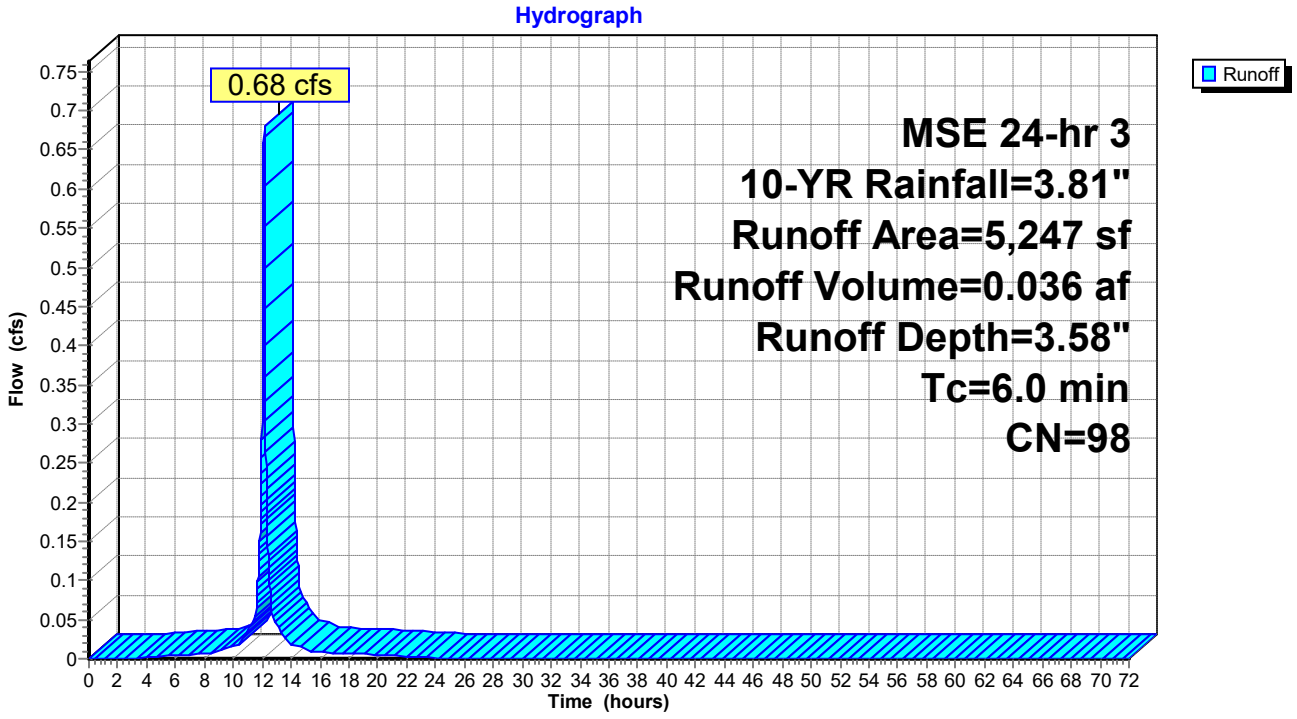
Runoff = 0.68 cfs @ 12.13 hrs, Volume= 0.036 af, Depth= 3.58"
Routed to Reach 7R : Proposed Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-YR Rainfall=3.81"

	Area (sf)	CN	Description
*	0	74	Pervious Areas
*	5,247	98	Paved Areas
	5,247	98	Weighted Average
	5,247		100.00% Impervious Area

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

Subcatchment P7: P7-Developed (Undetained)

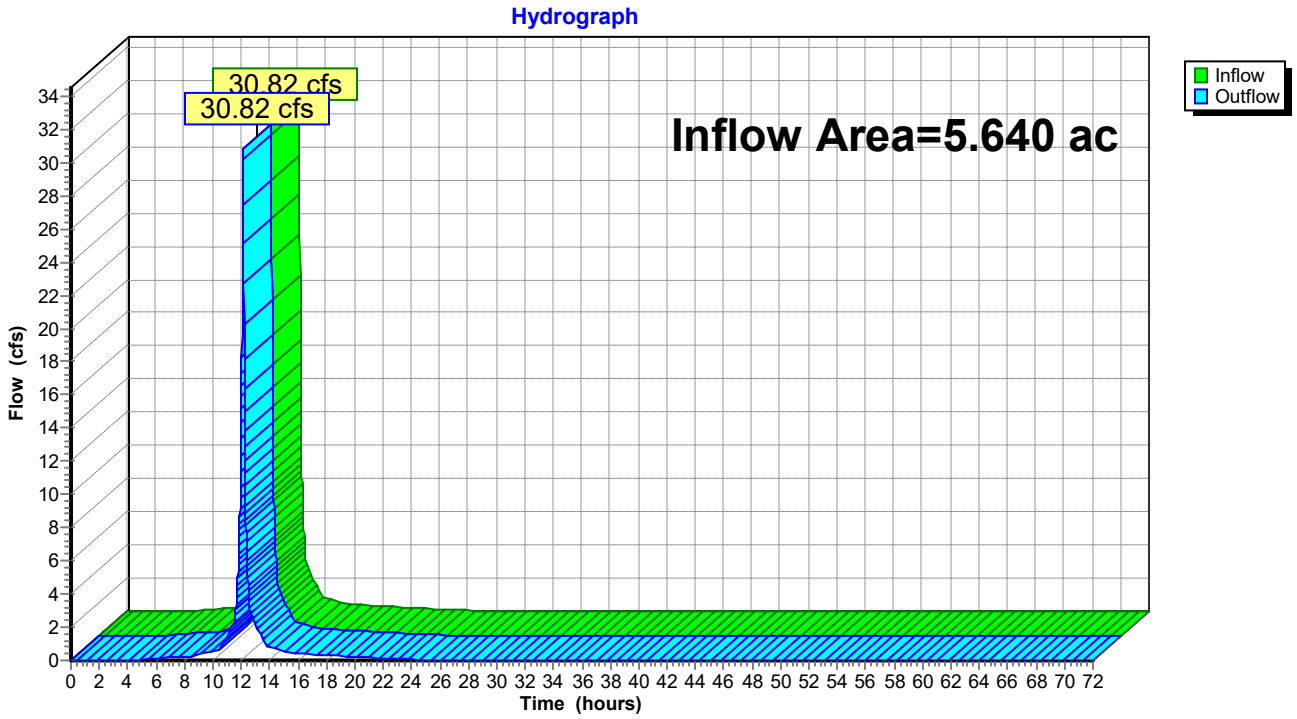


Summary for Reach 6R: Existing Site Discharge

Inflow Area = 5.640 ac, 90.73% Impervious, Inflow Depth = 3.31" for 10-YR event
Inflow = 30.82 cfs @ 12.13 hrs, Volume= 1.557 af
Outflow = 30.82 cfs @ 12.13 hrs, Volume= 1.557 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 6R: Existing Site Discharge

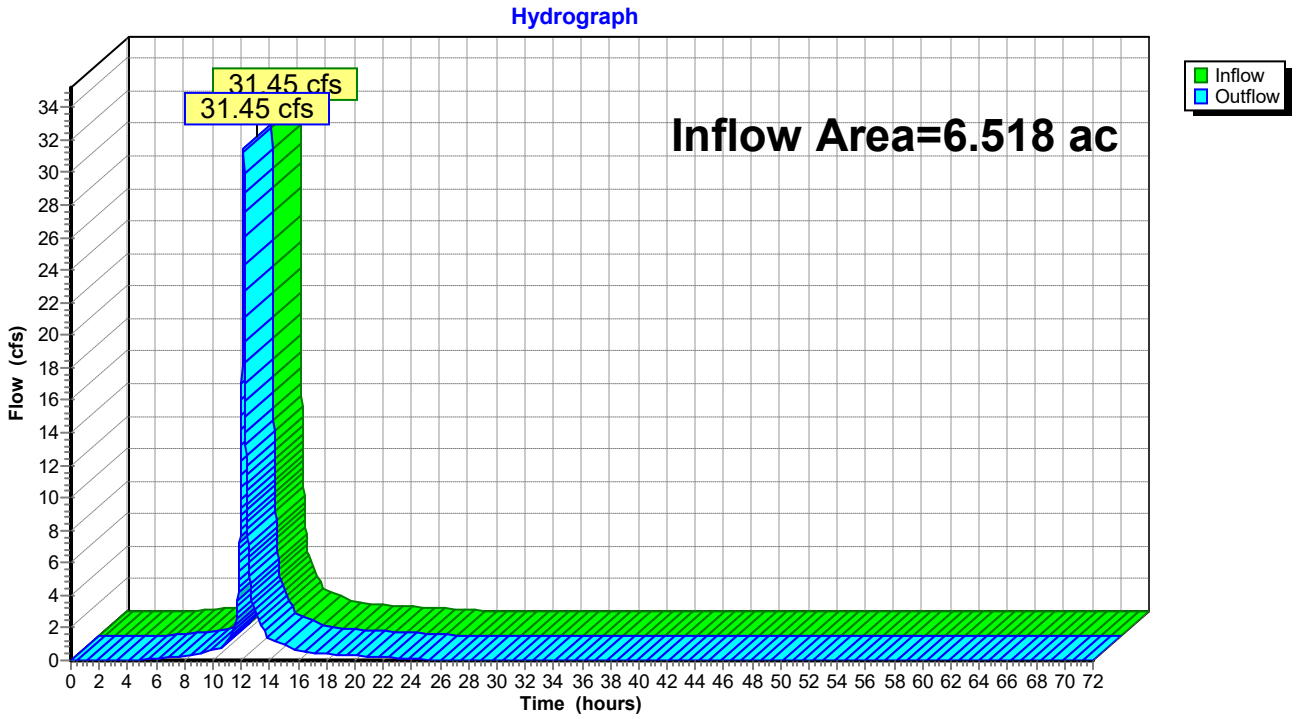


Summary for Reach 7R: Proposed Site Discharge

Inflow Area = 6.518 ac, 95.37% Impervious, Inflow Depth = 3.44" for 10-YR event
Inflow = 31.45 cfs @ 12.16 hrs, Volume= 1.867 af
Outflow = 31.45 cfs @ 12.16 hrs, Volume= 1.867 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 7R: Proposed Site Discharge



Summary for Pond 1P: UG DETENTION BASIN WEST

Inflow Area = 2.645 ac, 95.91% Impervious, Inflow Depth = 3.46" for 10-YR event
Inflow = 14.76 cfs @ 12.13 hrs, Volume= 0.762 af
Outflow = 12.81 cfs @ 12.16 hrs, Volume= 0.762 af, Atten= 13%, Lag= 2.0 min
Primary = 12.81 cfs @ 12.16 hrs, Volume= 0.762 af
Routed to Reach 7R : Proposed Site Discharge

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 802.25' Surf.Area= 0.048 ac Storage= 0.150 af
Peak Elev= 804.65' @ 12.16 hrs Surf.Area= 0.038 ac Storage= 0.257 af (0.107 af above start)

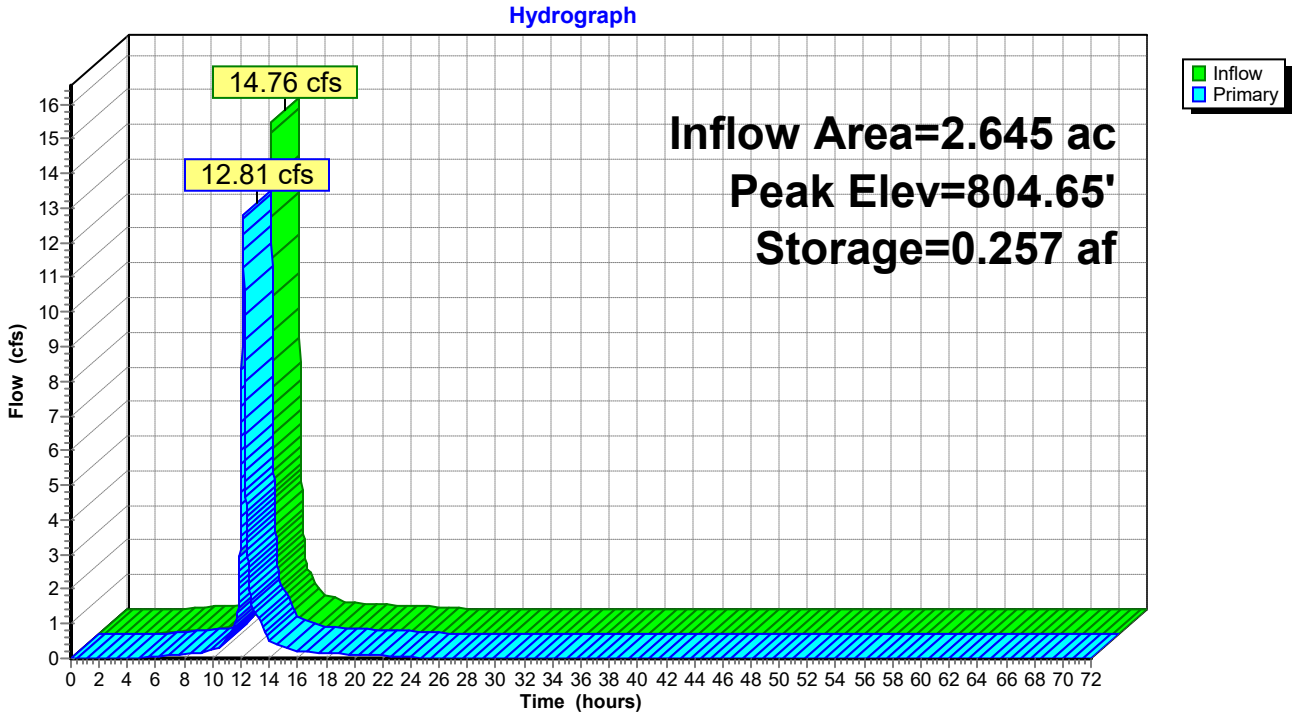
Plug-Flow detention time= 121.2 min calculated for 0.612 af (80% of inflow)
Center-of-Mass det. time= 24.2 min (779.5 - 755.3)

Volume	Invert	Avail.Storage	Storage Description
#1	798.25'	0.300 af	**96.0" Round CONTECH - WEST** L= 260.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	802.25'	**24.0" Round OUTLET PIPE** L= 26.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 802.25' / 802.00' S= 0.0096 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Device 1	802.25'	**8.0" Vert. 8" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	803.25'	**15.0" Vert. 2-15" Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	804.85'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=12.80 cfs @ 12.16 hrs HW=804.65' (Free Discharge)
└**1=OUTLET PIPE** (Passes 12.80 cfs of 14.06 cfs potential flow)
├**2=8" Orifice** (Orifice Controls 2.41 cfs @ 6.92 fps)
├**3=2-15" Orifice** (Orifice Controls 10.38 cfs @ 4.23 fps)
└**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: UG DETENTION BASIN WEST



Summary for Pond 2P: UG DETENTION BASIN EAST

Inflow Area = 3.753 ac, 94.84% Impervious, Inflow Depth = 3.42" for 10-YR event
Inflow = 20.88 cfs @ 12.13 hrs, Volume= 1.069 af
Outflow = 18.05 cfs @ 12.16 hrs, Volume= 1.069 af, Atten= 14%, Lag= 2.0 min
Primary = 18.05 cfs @ 12.16 hrs, Volume= 1.069 af
Routed to Reach 7R : Proposed Site Discharge

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 800.85' Surf.Area= 0.064 ac Storage= 0.202 af
Peak Elev= 803.55' @ 12.16 hrs Surf.Area= 0.047 ac Storage= 0.361 af (0.159 af above start)

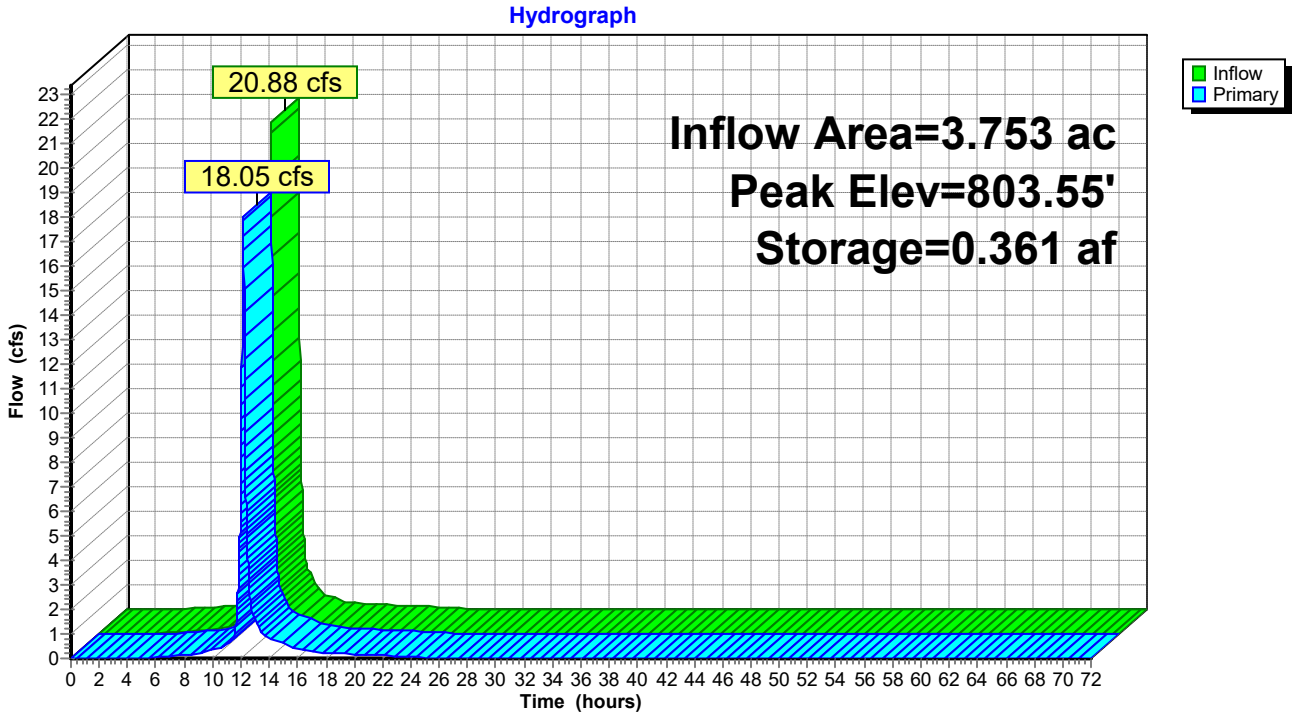
Plug-Flow detention time= 126.0 min calculated for 0.867 af (81% of inflow)
Center-of-Mass det. time= 32.7 min (790.5 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	796.85'	0.404 af	**96.0" Round 96" CONTECH EAST** L= 350.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	800.85'	**30.0" Round OUTLET PIPE** L= 40.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 800.85' / 800.70' S= 0.0037 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	800.85'	**6.0" Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	801.85'	**18.0" Vert. 2-18" Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	804.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=18.02 cfs @ 12.16 hrs HW=803.55' (Free Discharge)
└**1=OUTLET PIPE** (Passes 18.02 cfs of 22.22 cfs potential flow)
  ├**2=6" Orifice** (Orifice Controls 1.48 cfs @ 7.53 fps)
  ├**3=2-18" Orifice** (Orifice Controls 16.54 cfs @ 4.68 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: UG DETENTION BASIN EAST



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-2: E2-EXISTING Runoff Area=5,247 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=0.75 cfs 0.033 af

Subcatchment E1: E1-EXISTING Runoff Area=240,453 sf 92.71% Impervious Runoff Depth=5.71"
Tc=6.0 min CN=96 Runoff=50.39 cfs 2.625 af

Subcatchment OFF-1: OFF-1 Runoff Area=32,281 sf 88.57% Impervious Runoff Depth=5.59"
Tc=6.0 min CN=95 Runoff=6.72 cfs 0.345 af

Subcatchment OFF-2: OFF-2 Runoff Area=5,960 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=1.26 cfs 0.068 af

Subcatchment P1: P1-Developed Runoff Area=26,968 sf 96.23% Impervious Runoff Depth=5.82"
Tc=6.0 min CN=97 Runoff=5.68 cfs 0.300 af

Subcatchment P2: P2-Developed Runoff Area=15,914 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=3.37 cfs 0.181 af

Subcatchment P3: P3-Developed Roof Runoff Area=34,096 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=7.22 cfs 0.388 af

Subcatchment P4: P4-Developed Runoff Area=115,120 sf 92.67% Impervious Runoff Depth=5.71"
Tc=6.0 min CN=96 Runoff=24.13 cfs 1.257 af

Subcatchment P5: P5-Developed Roof Runoff Area=28,905 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=6.12 cfs 0.329 af

Subcatchment P6: P6-Developed Roof Runoff Area=19,450 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=4.12 cfs 0.221 af

Subcatchment P7: P7-Developed Runoff Area=5,247 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=1.11 cfs 0.060 af

Reach 6R: Existing Site Discharge Inflow=51.14 cfs 2.659 af
Outflow=51.14 cfs 2.659 af

Reach 7R: Proposed Site Discharge Inflow=54.86 cfs 3.148 af
Outflow=54.86 cfs 3.148 af

Pond 1P: UG DETENTION BASIN WEST Peak Elev=805.91' Storage=0.296 af Inflow=24.25 cfs 1.282 af
Outflow=21.19 cfs 1.282 af

Pond 2P: UG DETENTION BASIN EAST Peak Elev=804.61' Storage=0.400 af Inflow=34.36 cfs 1.806 af
Outflow=32.90 cfs 1.806 af

Total Runoff Area = 12.159 ac Runoff Volume = 5.807 af Average Runoff Depth = 5.73"
6.78% Pervious = 0.825 ac 93.22% Impervious = 11.334 ac

Summary for Subcatchment E-2: E2-EXISTING CONDITIONS

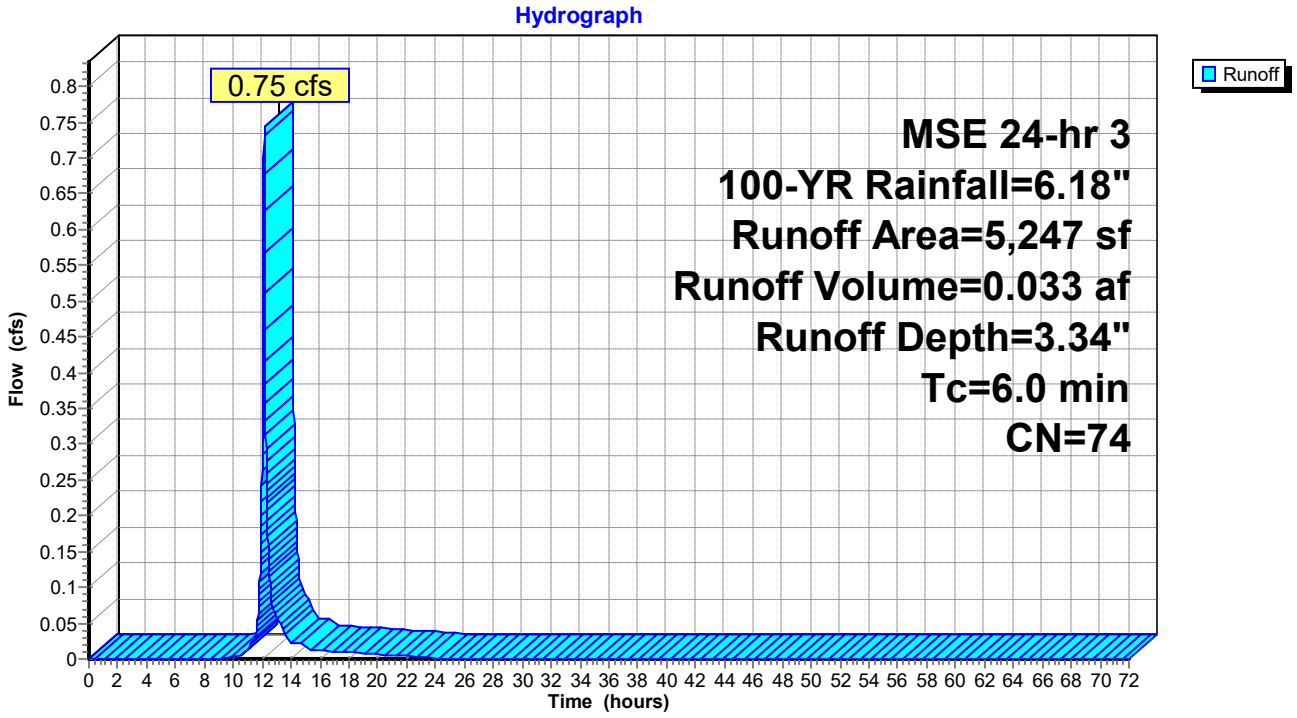
Runoff = 0.75 cfs @ 12.13 hrs, Volume= 0.033 af, Depth= 3.34"
Routed to Reach 6R : Existing Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

Area (sf)	CN	Description
5,247	74	>75% Grass cover, Good, HSG C
5,247		100.00% Pervious Area

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

Subcatchment E-2: E2-EXISTING CONDITIONS



Summary for Subcatchment E1: E1-EXISTING CONDITIONS

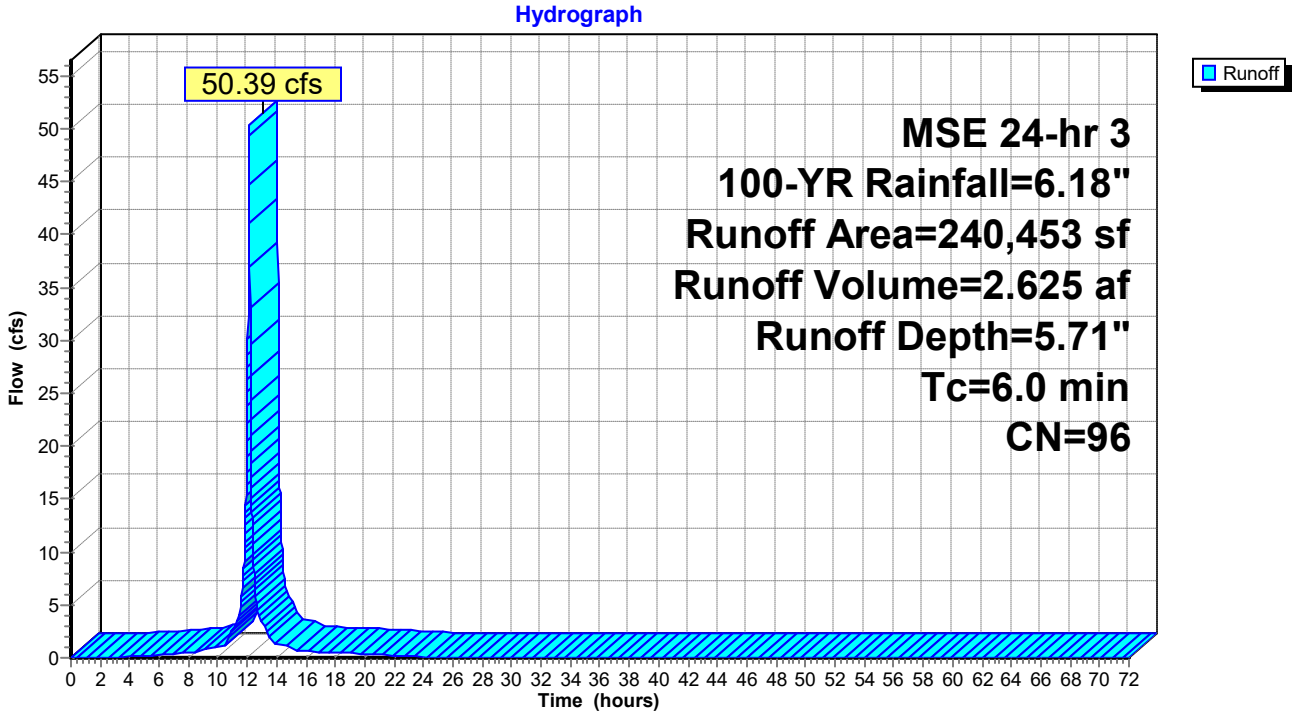
Runoff = 50.39 cfs @ 12.13 hrs, Volume= 2.625 af, Depth= 5.71"
Routed to Reach 6R : Existing Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	129,599	98	PAVEMENT
*	93,325	98	GRAVEL DRIVE
	17,529	74	>75% Grass cover, Good, HSG C
	240,453	96	Weighted Average
	17,529		7.29% Pervious Area
	222,924		92.71% Impervious Area

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

Subcatchment E1: E1-EXISTING CONDITIONS



Summary for Subcatchment OFF-1: OFF-1

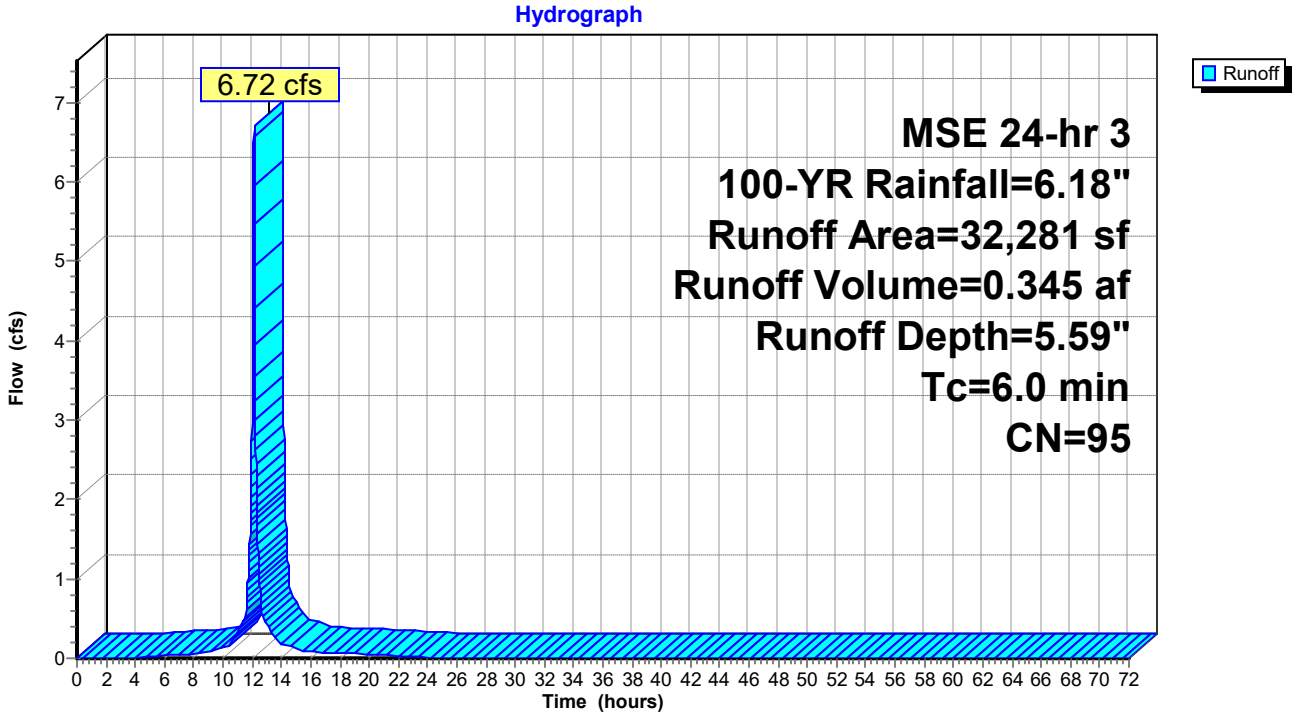
Runoff = 6.72 cfs @ 12.13 hrs, Volume= 0.345 af, Depth= 5.59"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	28,590	98	Paved Areas
	3,691	74	>75% Grass cover, Good, HSG C
	32,281	95	Weighted Average
	3,691		11.43% Pervious Area
	28,590		88.57% Impervious Area

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

Subcatchment OFF-1: OFF-1



Summary for Subcatchment OFF-2: OFF-2

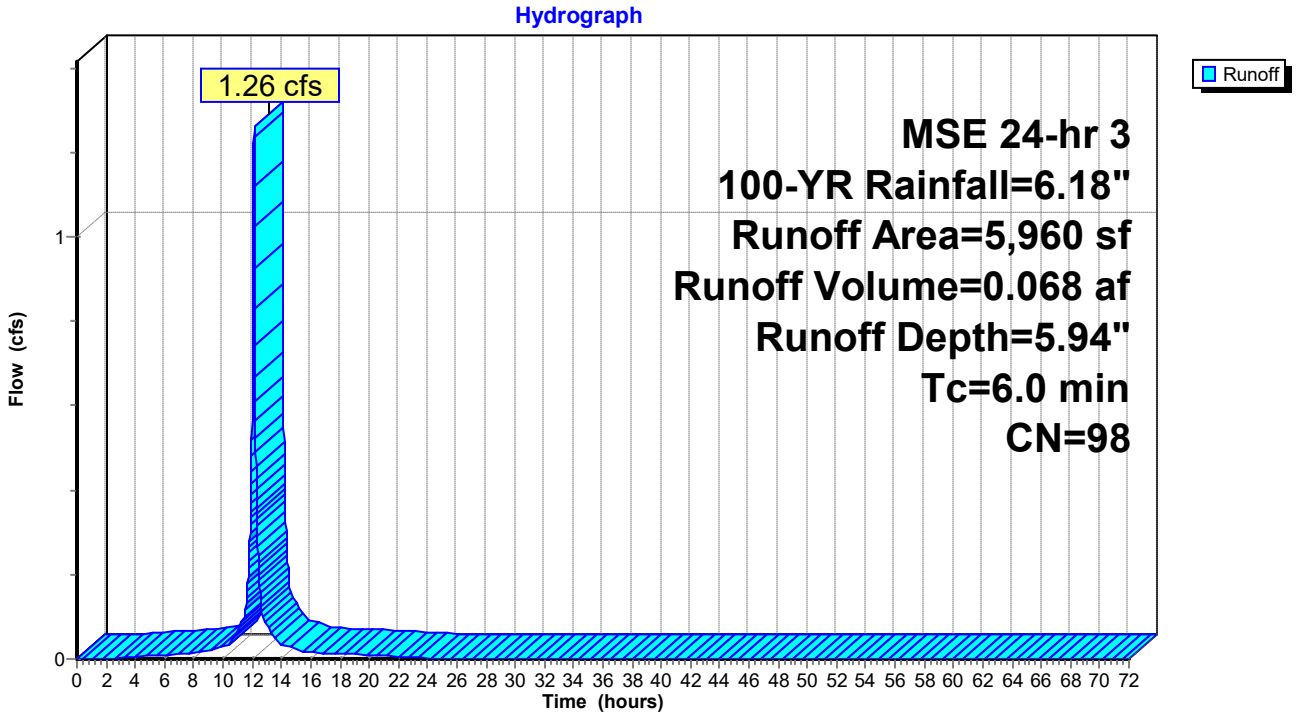
Runoff = 1.26 cfs @ 12.13 hrs, Volume= 0.068 af, Depth= 5.94"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	5,960	98	Paved Areas
	5,960		100.00% Impervious Area

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

Subcatchment OFF-2: OFF-2



Summary for Subcatchment P1: P1-Developed

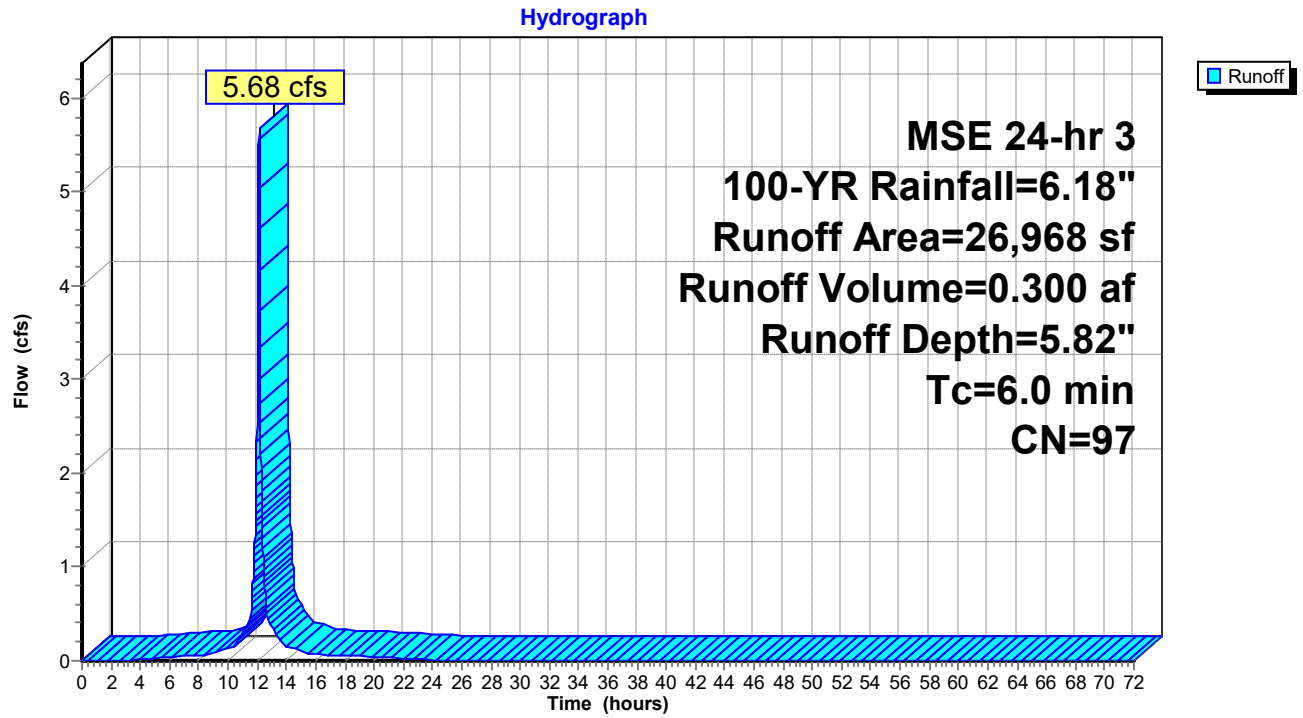
Runoff = 5.68 cfs @ 12.13 hrs, Volume= 0.300 af, Depth= 5.82"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	21,950	98	Paved Areas
	4,000	98	Roofs, HSG C
	1,018	74	>75% Grass cover, Good, HSG C
	26,968	97	Weighted Average
	1,018		3.77% Pervious Area
	25,950		96.23% Impervious Area

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

Subcatchment P1: P1-Developed



Summary for Subcatchment P2: P2-Developed

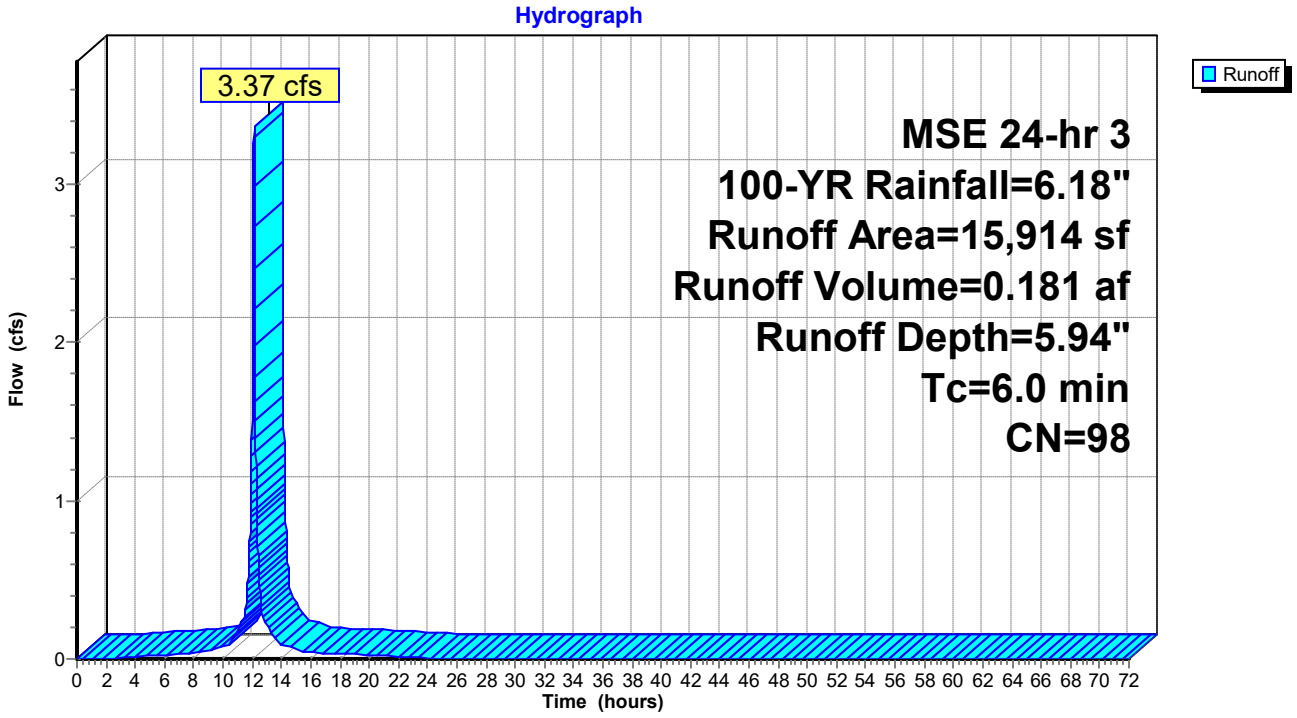
Runoff = 3.37 cfs @ 12.13 hrs, Volume= 0.181 af, Depth= 5.94"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	15,914	98	Paved Areas
	15,914		100.00% Impervious Area

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

Subcatchment P2: P2-Developed



Summary for Subcatchment P3: P3-Developed Roof

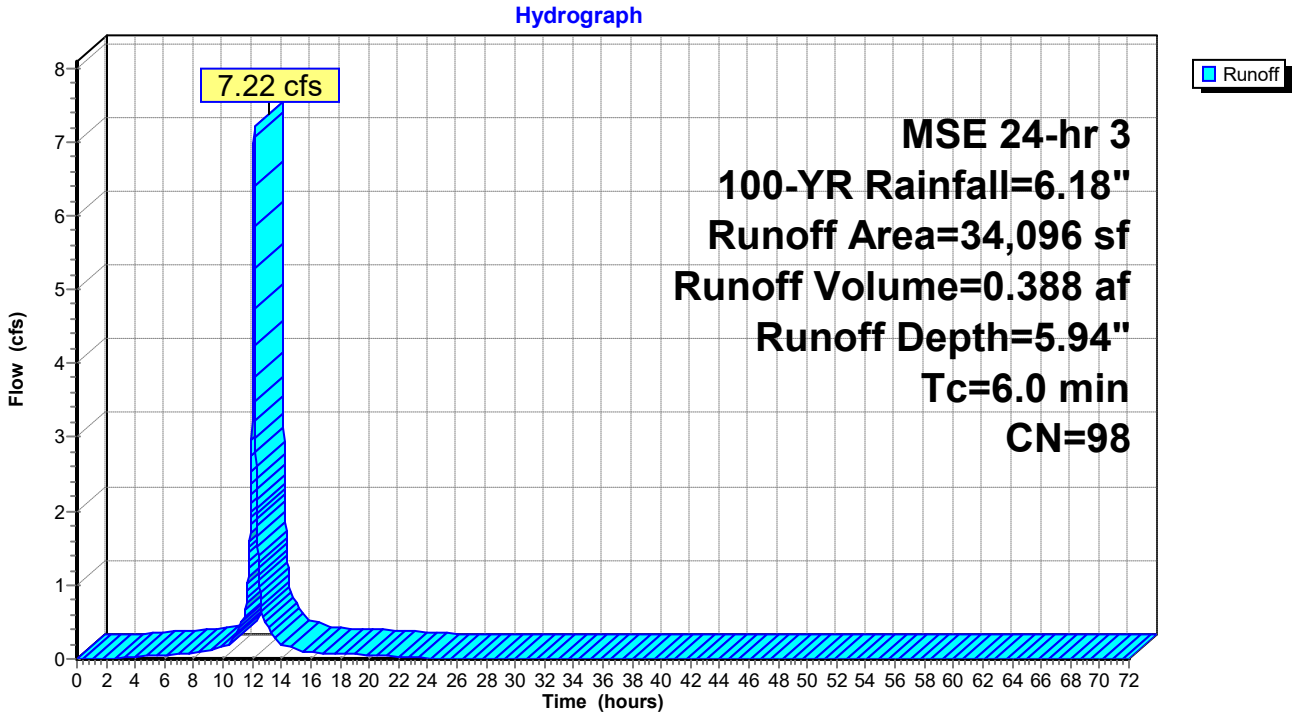
Runoff = 7.22 cfs @ 12.13 hrs, Volume= 0.388 af, Depth= 5.94"
Routed to Pond 1P : UG DETENTION BASIN WEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	34,096	98	Roof
	34,096		100.00% Impervious Area

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

Subcatchment P3: P3-Developed Roof



Summary for Subcatchment P4: P4-Developed

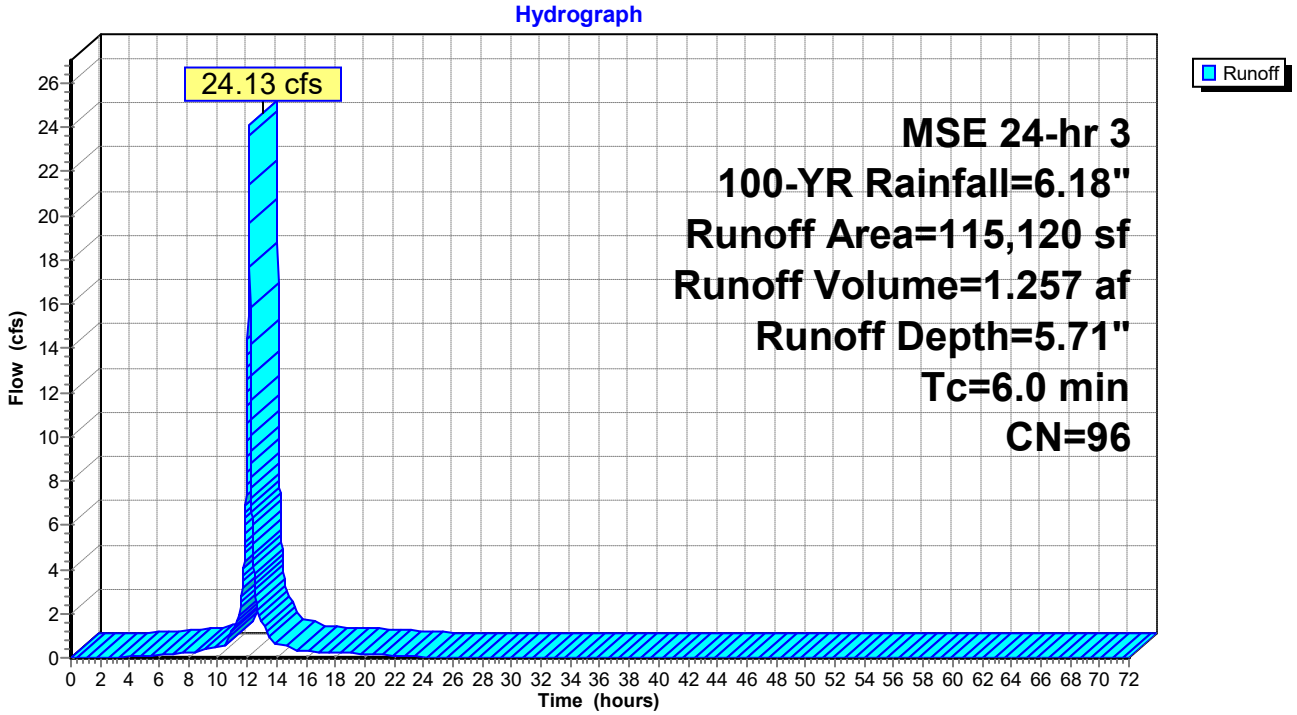
Runoff = 24.13 cfs @ 12.13 hrs, Volume= 1.257 af, Depth= 5.71"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	99,134	98	Paved Areas
*	7,553	98	Roof
	8,433	74	>75% Grass cover, Good, HSG C
	115,120	96	Weighted Average
	8,433		7.33% Pervious Area
	106,687		92.67% Impervious Area

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

Subcatchment P4: P4-Developed



Summary for Subcatchment P5: P5-Developed Roof

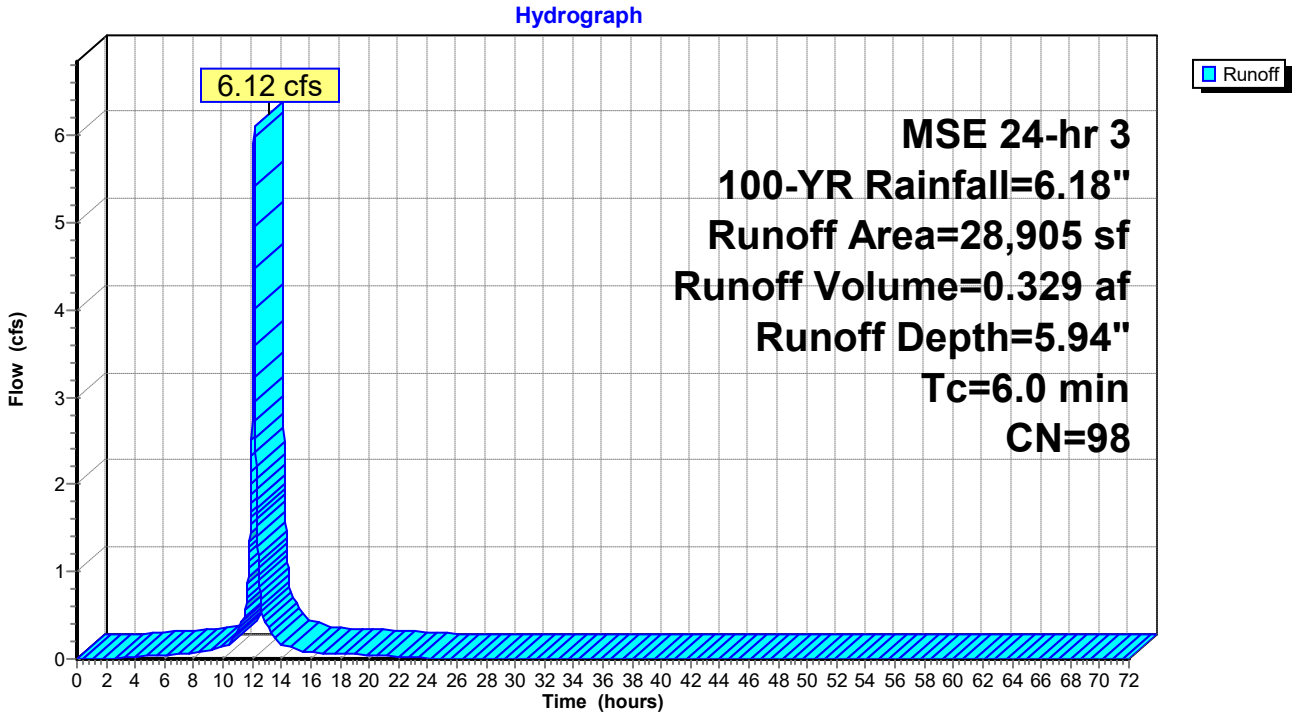
Runoff = 6.12 cfs @ 12.13 hrs, Volume= 0.329 af, Depth= 5.94"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	28,905	98	Roof
	28,905		100.00% Impervious Area

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

Subcatchment P5: P5-Developed Roof



Summary for Subcatchment P6: P6-Developed Roof

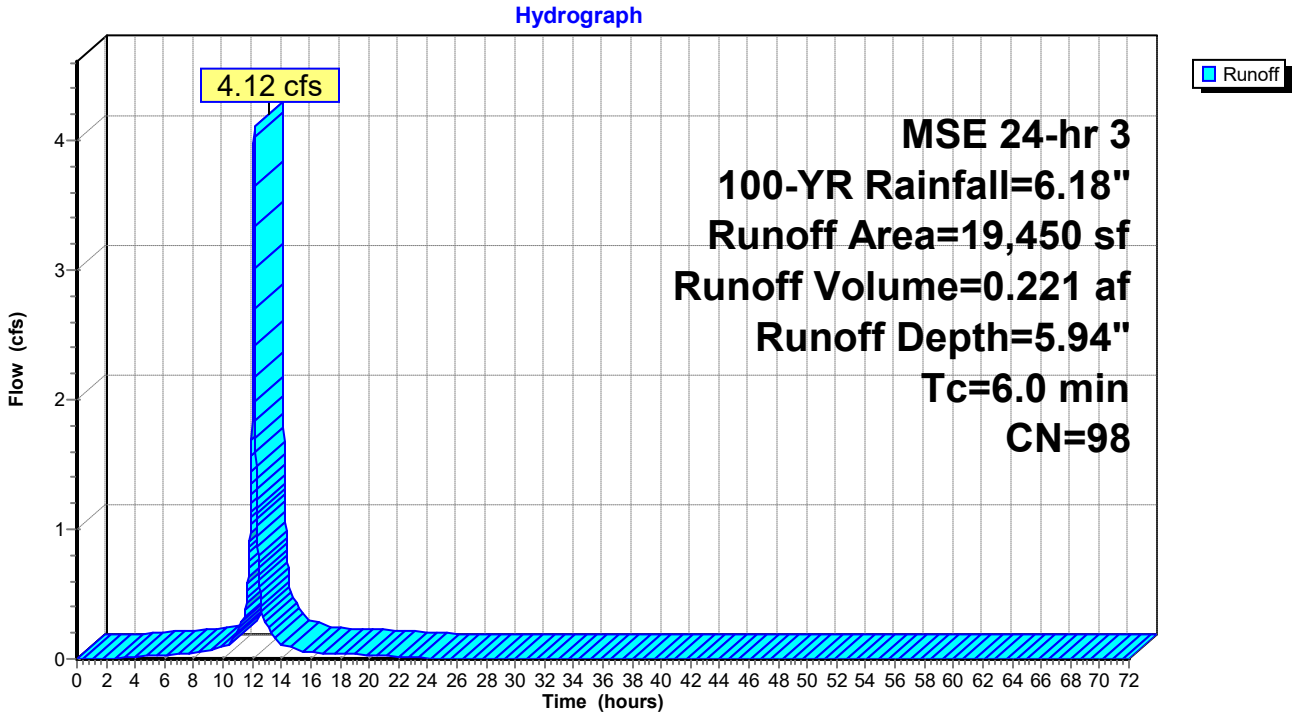
Runoff = 4.12 cfs @ 12.13 hrs, Volume= 0.221 af, Depth= 5.94"
Routed to Pond 2P : UG DETENTION BASIN EAST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	19,450	98	Roof
	19,450		100.00% Impervious Area

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

Subcatchment P6: P6-Developed Roof



Summary for Subcatchment P7: P7-Developed (Undetained)

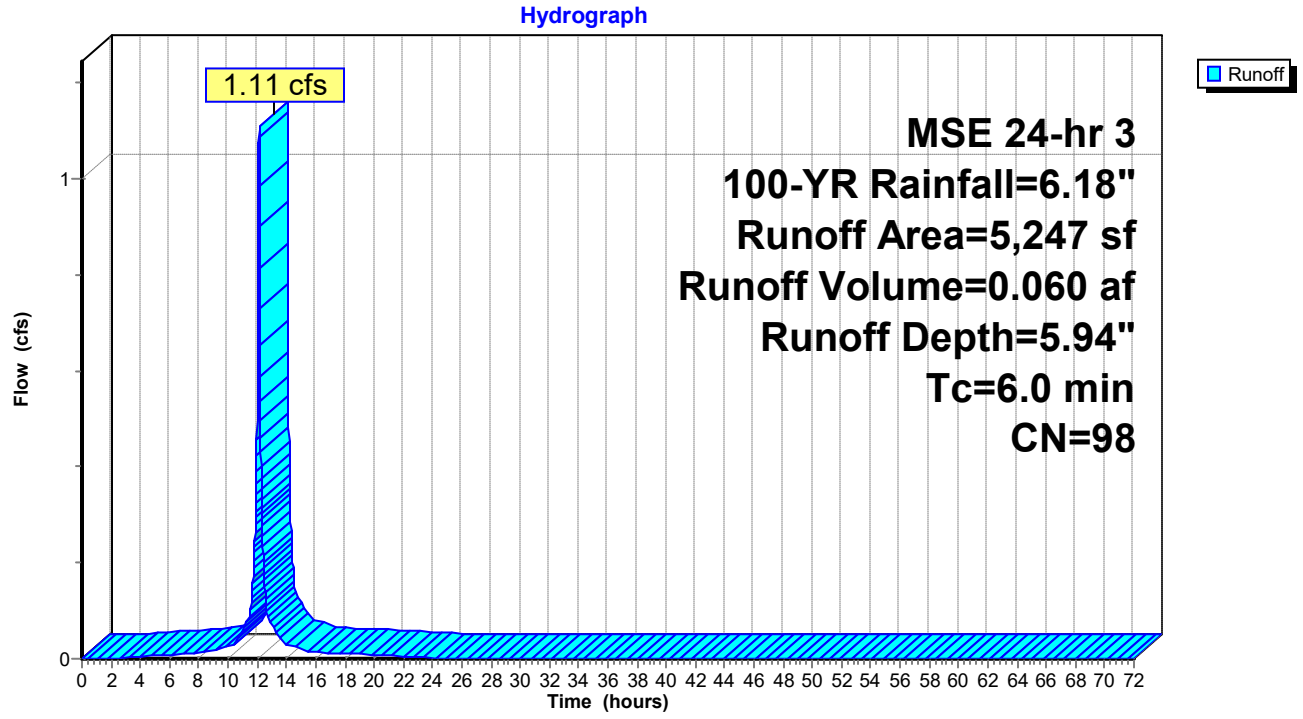
Runoff = 1.11 cfs @ 12.13 hrs, Volume= 0.060 af, Depth= 5.94"
Routed to Reach 7R : Proposed Site Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-YR Rainfall=6.18"

	Area (sf)	CN	Description
*	0	74	Pervious Areas
*	5,247	98	Paved Areas
	5,247	98	Weighted Average
	5,247		100.00% Impervious Area

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

Subcatchment P7: P7-Developed (Undetained)

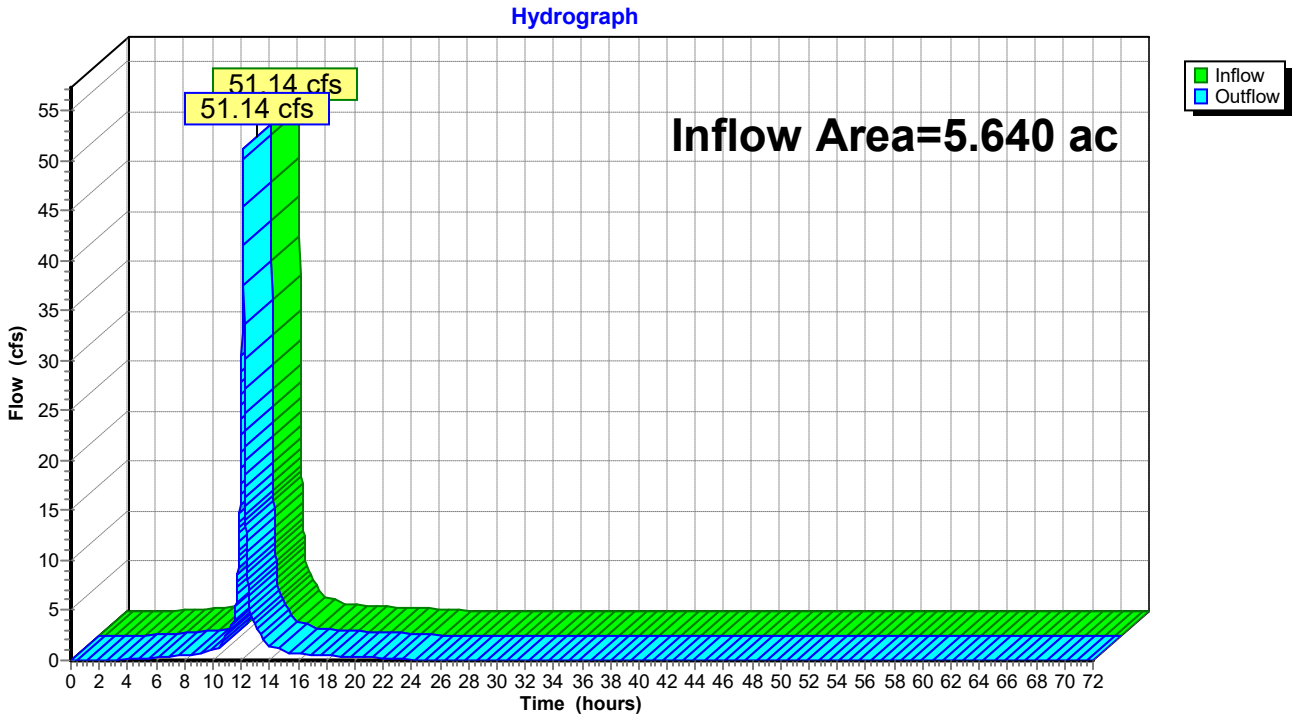


Summary for Reach 6R: Existing Site Discharge

Inflow Area = 5.640 ac, 90.73% Impervious, Inflow Depth = 5.66" for 100-YR event
Inflow = 51.14 cfs @ 12.13 hrs, Volume= 2.659 af
Outflow = 51.14 cfs @ 12.13 hrs, Volume= 2.659 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 6R: Existing Site Discharge

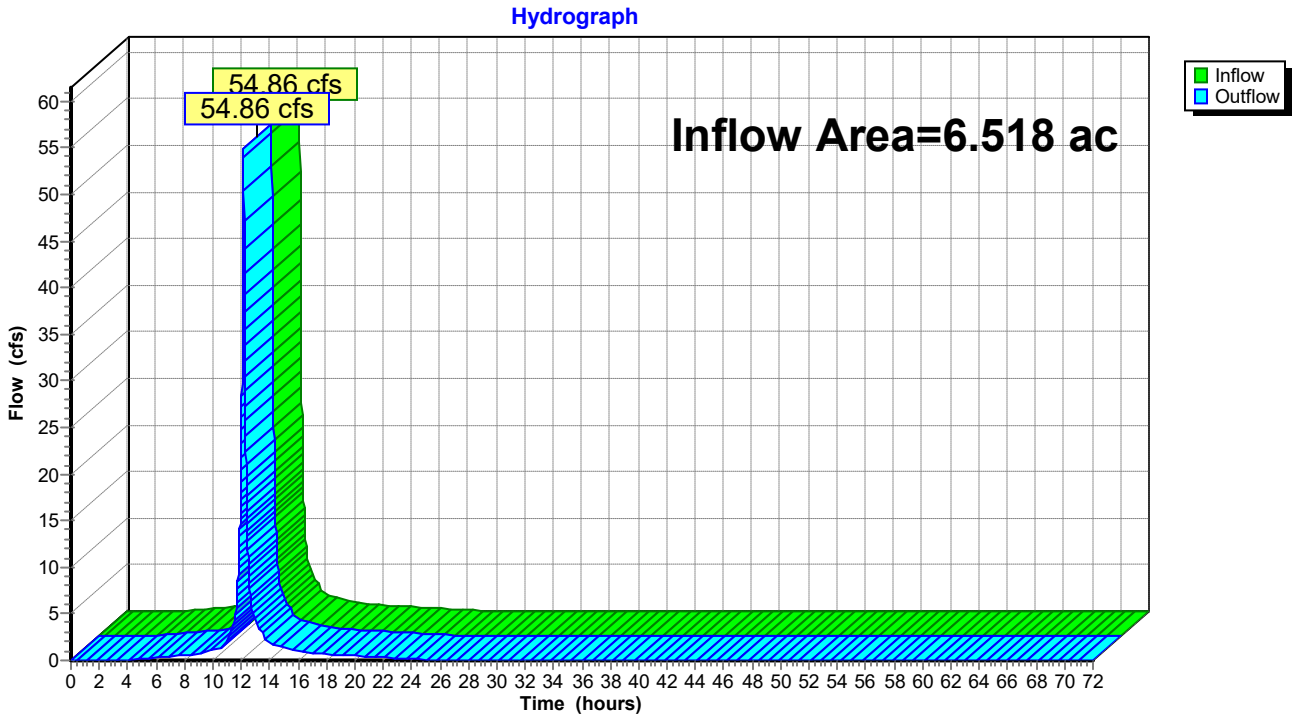


Summary for Reach 7R: Proposed Site Discharge

Inflow Area = 6.518 ac, 95.37% Impervious, Inflow Depth = 5.80" for 100-YR event
Inflow = 54.86 cfs @ 12.15 hrs, Volume= 3.148 af
Outflow = 54.86 cfs @ 12.15 hrs, Volume= 3.148 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 7R: Proposed Site Discharge



Summary for Pond 1P: UG DETENTION BASIN WEST

Inflow Area = 2.645 ac, 95.91% Impervious, Inflow Depth = 5.82" for 100-YR event
Inflow = 24.25 cfs @ 12.13 hrs, Volume= 1.282 af
Outflow = 21.19 cfs @ 12.16 hrs, Volume= 1.282 af, Atten= 13%, Lag= 2.0 min
Primary = 21.19 cfs @ 12.16 hrs, Volume= 1.282 af
Routed to Reach 7R : Proposed Site Discharge

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 802.25' Surf.Area= 0.048 ac Storage= 0.150 af
Peak Elev= 805.91' @ 12.16 hrs Surf.Area= 0.019 ac Storage= 0.296 af (0.146 af above start)

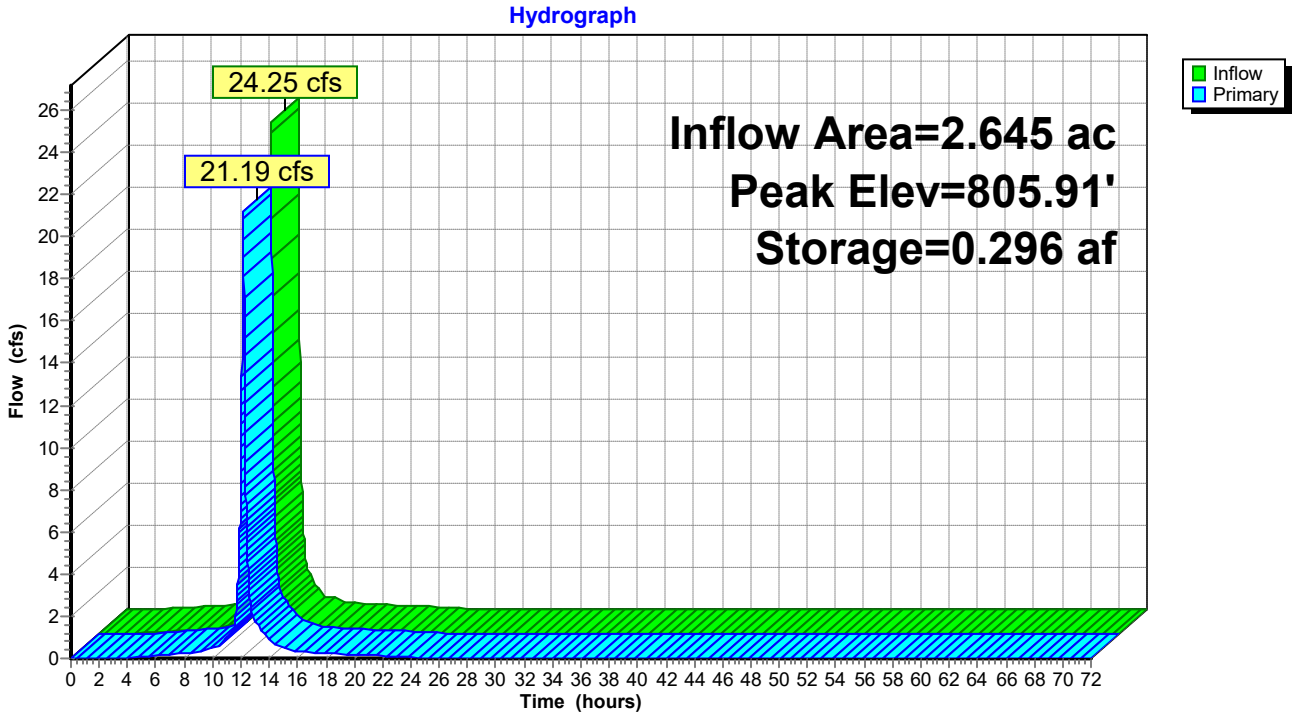
Plug-Flow detention time= 97.4 min calculated for 1.132 af (88% of inflow)
Center-of-Mass det. time= 19.6 min (767.2 - 747.7)

Volume	Invert	Avail.Storage	Storage Description
#1	798.25'	0.300 af	**96.0" Round CONTECH - WEST** L= 260.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	802.25'	**24.0" Round OUTLET PIPE** L= 26.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 802.25' / 802.00' S= 0.0096 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Device 1	802.25'	**8.0" Vert. 8" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	803.25'	**15.0" Vert. 2-15" Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	804.85'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=21.15 cfs @ 12.16 hrs HW=805.90' (Free Discharge)
└**1=OUTLET PIPE** (Barrel Controls 21.15 cfs @ 6.73 fps)
  ├**2=8" Orifice** (Passes < 3.06 cfs potential flow)
  ├**3=2-15" Orifice** (Passes < 16.82 cfs potential flow)
  └**4=Sharp-Crested Rectangular Weir** (Passes < 20.37 cfs potential flow)

Pond 1P: UG DETENTION BASIN WEST



Summary for Pond 2P: UG DETENTION BASIN EAST

Inflow Area = 3.753 ac, 94.84% Impervious, Inflow Depth = 5.78" for 100-YR event
Inflow = 34.36 cfs @ 12.13 hrs, Volume= 1.806 af
Outflow = 32.90 cfs @ 12.15 hrs, Volume= 1.806 af, Atten= 4%, Lag= 1.1 min
Primary = 32.90 cfs @ 12.15 hrs, Volume= 1.806 af
Routed to Reach 7R : Proposed Site Discharge

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 800.85' Surf.Area= 0.064 ac Storage= 0.202 af
Peak Elev= 804.61' @ 12.15 hrs Surf.Area= 0.022 ac Storage= 0.400 af (0.198 af above start)

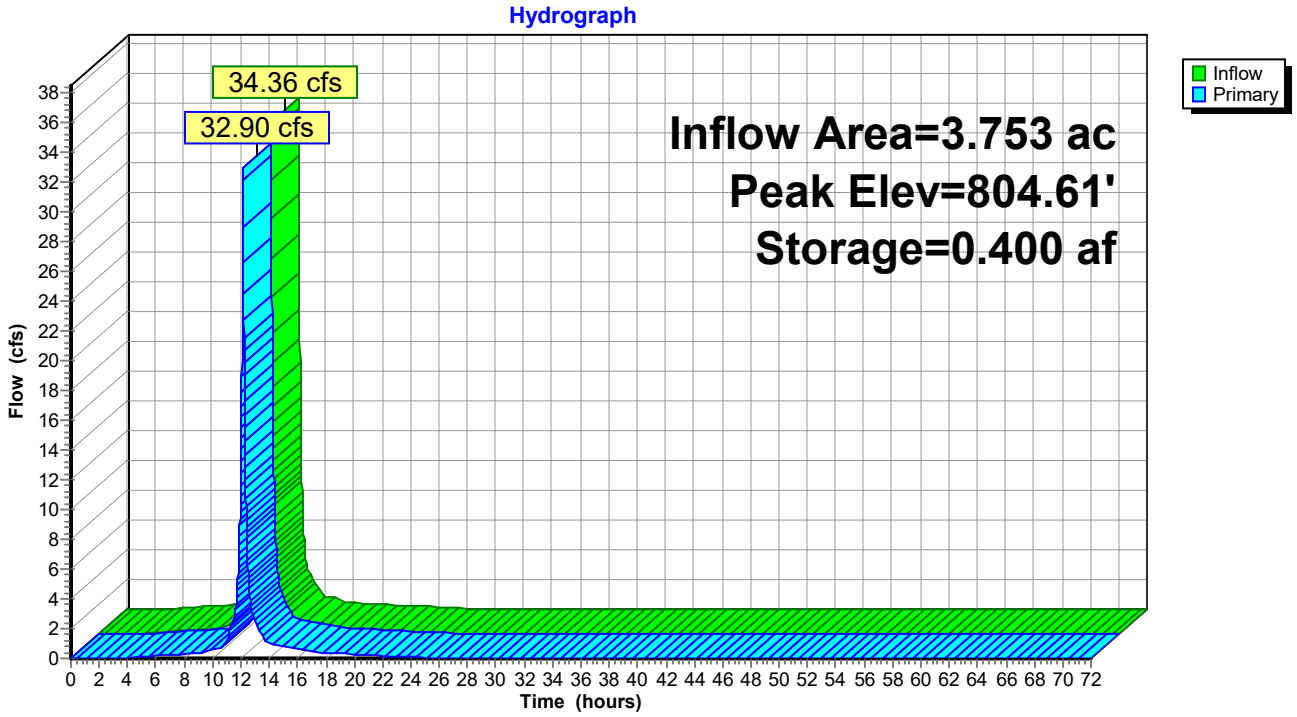
Plug-Flow detention time= 100.0 min calculated for 1.604 af (89% of inflow)
Center-of-Mass det. time= 26.5 min (776.1 - 749.6)

Volume	Invert	Avail.Storage	Storage Description
#1	796.85'	0.404 af	**96.0" Round 96" CONTECH EAST** L= 350.0'

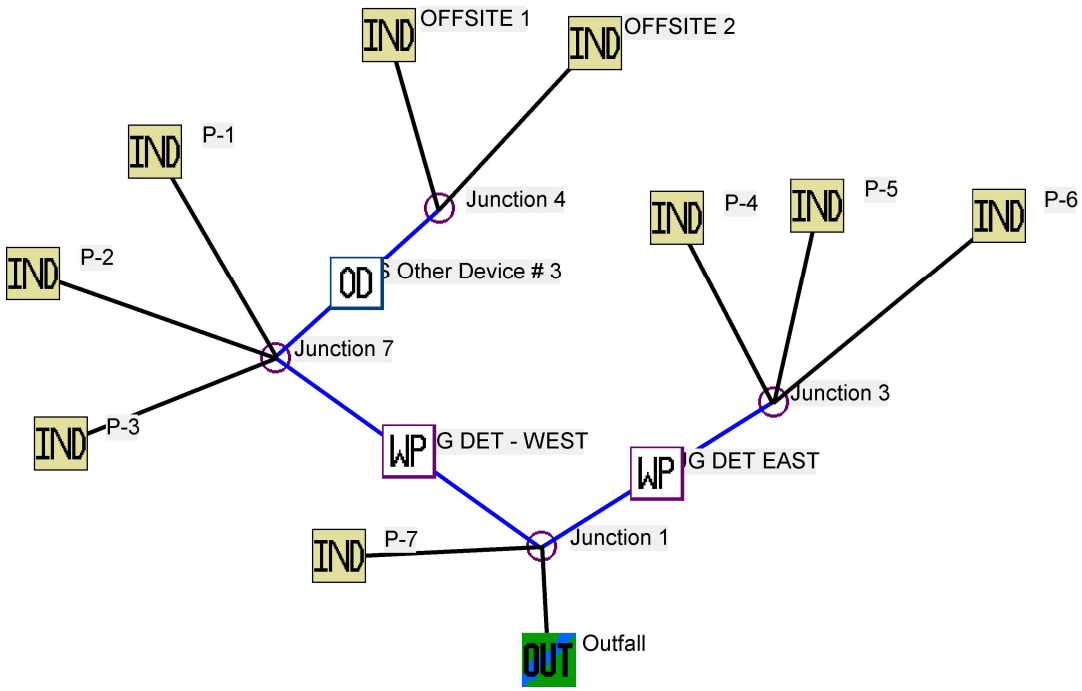
Device	Routing	Invert	Outlet Devices
#1	Primary	800.85'	**30.0" Round OUTLET PIPE** L= 40.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 800.85' / 800.70' S= 0.0037 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	800.85'	**6.0" Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	801.85'	**18.0" Vert. 2-18" Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	804.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=32.85 cfs @ 12.15 hrs HW=804.60' (Free Discharge)
└**1=OUTLET PIPE** (Barrel Controls 32.85 cfs @ 6.69 fps)
├**2=6" Orifice** (Passes < 1.77 cfs potential flow)
├**3=2-18" Orifice** (Passes < 24.07 cfs potential flow)
└**4=Sharp-Crested Rectangular Weir** (Passes < 8.97 cfs potential flow)

Pond 2P: UG DETENTION BASIN EAST



APPENDIX D
SLAMM Water Quality Analysis


IND
OFFSITE 1
IND
OFFSITE 2
IND
P-1
Junction 4
IND
P-4
IND
P-5
IND
P-6
IND
P-2
OD
Other Device # 3
Junction 7
Junction 3
IND
P-3
WP
G DET - WEST
WP
G DET EAST
IND
P-7
Junction 1
OUT
Outfall

Data file name: P:\3250244\Eng Data\Hydrology\SLAMM\Innio - SLAMM.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee 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
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust 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_Com Inst Indust Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust 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.ppdx
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: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/06 End of Winter Season: 03/28
Date: 05-01-2026 Time: 09:32:23
Site information: INNIO

LU# 1 - Industrial: P-1 Total area (ac): 0.620
1 - Roofs 1: 0.090 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.510 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.020 ac. Moderately Compacted Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Industrial: P-2 Total area (ac): 0.370
13 - Paved Parking 1: 0.370 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Industrial: P-3 Total area (ac): 0.780
2 - Roofs 2: 0.780 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Industrial: OFFSITE 1 Total area (ac): 0.740
13 - Paved Parking 1: 0.660 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.080 ac. Moderately Compacted Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 5 - Industrial: OFFSITE 2 Total area (ac): 0.140
13 - Paved Parking 1: 0.140 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 6 - Industrial: P-4 Total area (ac): 2.640
1 - Roofs 1: 0.170 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 2.280 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.190 ac. Moderately Compacted Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 7 - Industrial: P-5 Total area (ac): 0.660
1 - Roofs 1: 0.660 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 8 - Industrial: P-6 Total area (ac): 0.450
1 - Roofs 1: 0.450 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 9 - Industrial: P-7 Total area (ac): 0.120
31 - Sidewalks 1: 0.120 ac. Disconnected Moderately Compacted Silty PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - UG DET - WEST

Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 4
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.67
2. Number of orifices: 1
3. Invert elevation above datum (ft): 4

Outlet type: Orifice 2

1. Orifice diameter (ft): 1.25
2. Number of orifices: 2
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 6
2. Weir crest width (ft): 0.5
3. Height from datum to bottom of weir opening: 6.6

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	1.00	0.0375	0.00	0.00
2	2.00	0.0375	0.00	0.00
3	3.00	0.0375	0.00	0.00
4	4.00	0.0375	0.00	0.00
5	5.00	0.0375	0.00	0.00
6	6.00	0.0375	0.00	0.00
7	7.00	0.0375	0.00	0.00
8	8.00	0.0375	0.00	0.00

Control Practice 2: Wet Detention Pond CP# 2 (DS) - UG DET EAST

Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 4
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.5
2. Number of orifices: 1
3. Invert elevation above datum (ft): 4

Outlet type: Orifice 2

1. Orifice diameter (ft): 1.5
2. Number of orifices: 2
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 6
2. Weir crest width (ft): 0.5
3. Height from datum to bottom of weir opening: 7.15

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	1.00	0.0505	0.00	0.00
2	2.00	0.0505	0.00	0.00
3	3.00	0.0505	0.00	0.00
4	4.00	0.0505	0.00	0.00
5	5.00	0.0505	0.00	0.00
6	6.00	0.0505	0.00	0.00
7	7.00	0.0505	0.00	0.00
8	8.00	0.0505	0.00	0.00

Control Practice 3: Other Device CP# 1 (DS) - DS Other Device # 3

Fraction of drainage area served by device (ac) = 1.00
Particulate Concentration reduction fraction = 0.00
Filterable Concentration reduction fraction = 1.00
Runoff volume reduction fraction = 0

SLAMM for Windows Version 10.4.1

Data file name: P:\3250244\Eng Data\Hydrology\SLAMM\Innio - SLAMM.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee 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_Com Inst Indust 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_Com Inst Indust Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust 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: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/06 End of Winter Season: 03/28
Model Run Start Date: 01/05/69 Model Run End Date: 12/31/69
Date of run: 05-01-2026 Time of run: 09:31:37
Total Area Modeled (acres): 6.520
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:	510188	-	170.4	5428	-
Outfall Total with Controls:	510744	-0.11%	84.69	2700	50.26%
Annualized Total After Outfall Controls:	517838			2738	

APPENDIX E

Operations and Maintenance Manual and Checklist

Document Number

Storm Water Management Practice Maintenance Agreement

Innio Waukesha Gas Engines Inc., as "Owner" of the property described below, in accordance with Chapter 32 City of Waukesha Storm Water Management and Erosion Control, agrees to install and maintain storm water management practice(s) on the subject property in accordance with approved plans and Storm Water Management Plan conditions. The owner further agrees to the terms stated in this document to ensure that the storm water management practice(s) continues serving the intended functions in perpetuity. This Agreement includes the following exhibits:

Exhibit A: Legal Description of the real estate for which this Agreement applies ("Property").
Exhibit B: Location Map(s) – shows an accurate location of each storm water management practice affected by this Agreement.
Exhibit C: Maintenance Plan – prescribes those activities that must be carried out to maintain compliance with this Agreement.

Note: After construction verification has been accepted by the City of Waukesha, for all planned storm water management practices, an addendum(s) to this agreement shall be recorded by the Owner showing design and construction details. The addendum(s) may contain several additional exhibits, including certification of City of Waukesha of Storm Water and Erosion Control Permit termination, as described below.

Name and Return Address

City of Waukesha
201 Delafield Street
Waukesha, WI 53188

Parcel Identification Number(s) – (PIN)
WAKC1312951

Through this Agreement, the Owner hereby subjects the Property to the following covenants, conditions and restrictions:

1. The Owner shall be responsible for the routine and extraordinary maintenance and repair of the storm water management practice(s) and drainage easements identified in Exhibit B until Storm Water and Erosion Control Permit termination by the City of Waukesha in accordance with Chapter 32 of the City Code of Ordinances.
2. After Storm Water and Erosion Control Permit termination under 1., the current Owner(s) shall be solely responsible for maintenance and repair of the storm water management practices and drainage easements in accordance with the maintenance plan contained in Exhibit C.
3. The Owner(s) shall, at their own cost, complete inspections of the storm water management practices at the time intervals listed in Exhibit C, and conduct the inspections by a qualified professional, file the reports with the City of Waukesha after each inspection and complete any maintenance or repair work recommended in the report. The Owner(s) shall be liable for the failure to undertake any maintenance or repairs. After the work is completed by the Contractor, the qualified professional shall verify that the work was properly completed and submit the follow-up report to the City within 30 days.
4. In addition, and independent of the requirements under paragraph 3 above, the City of Waukesha, or its designee, is authorized to access the property as necessary to conduct inspections of the storm water management practices or drainage easements to ascertain compliance with the intent of this Agreement and the activities prescribed in Exhibit C. The City of Waukesha may require work to be done which differs from the report described in paragraph 3 above, if the City of Waukesha reasonably concludes that such work is necessary and consistent with the intent of this agreement. Upon notification by the City of Waukesha of required maintenance or repairs, the Owner(s) shall complete the specified maintenance or repairs within a reasonable time frame determined by the City of Waukesha.
5. If the Owner(s) do not complete an inspection under 3. above or required maintenance or repairs under 4. above within the specified time period, the City of Waukesha is authorized, but not required, to perform the specified inspections, maintenance or repairs. In the case of an emergency situation, as determined by the City of Waukesha, no notice shall be required prior to the City of Waukesha performing emergency maintenance or repairs. The City of Waukesha may levy the costs and expenses of such inspections, maintenance or repair related actions as a special charge against the Property and collected as such in accordance with the procedures under s. 66.0627 Wis. Stats. or subch. VII of ch. 66 Wis. Stats.

6. This Agreement shall run with the Property and be binding upon all heirs, successors and assigns. After the Owner records the addendum noted above, the City of Waukesha shall have the sole authority to modify this agreement upon a 30-day notice to the current Owner(s).

Dated this ___ day of _____, 202_.

Owner:

_____
Owner's Signature

_____
Owner's Typed/Printed Name

Mailing Address:_____

_____

_____

_____

Phone Number: _____

Email Address: _____

Acknowledgements

State of Wisconsin:
County of Waukesha

Personally came before me this ____ day of _____, 202_, the above named _____ to me known to be the person who executed the foregoing instrument and acknowledged the same.

_____.
Notary Public
My commission expires:_____.

This document was drafted by:

RA Smith, Inc.
Jeff Yersin, PE
16745 W. Bluemound Rd
Brookfield, WI 53005

City of Waukesha Common Council Approval

Dated this ___ day of _____, 202_.

_____
Shawn N. Reilly, Mayor

_____
Katie L. Panella, City Clerk

Acknowledgements

State of Wisconsin:
County of Waukesha

Personally came before me this ____ day of _____, 202_, the above named _____ to me known to be the person who executed the foregoing instrument and acknowledged the same.

_____.
Notary Public
My commission expires:_____.

Exhibit A – Legal Description

The following description and reduced copy map identifies the land parcel(s) affected by this Agreement. For a larger scale view of the referenced document, contact the Waukesha County Register of Deeds office.

Project Identifier: **Innio Project Green** Acres**: 38.778**
Date of Recording: **February 13, 2026**
Map Produced By: **raSmith, Brookfield, WI**
Legal Description: **Part of the SW1/4 SEC 3, SE1/4 SEC 4 & NE1/4 SEC 9 T6N R19E COM CTR ST PAUL AV 445.5'; SW OF CTR STATE STR; SE TO SE LI ST PAUL SW 35.6'; SE 321.84' TO N LI CM&STP R/W; SW ON R/W TO N LI C&NW R/W; S52 45'23 W 1755.835'; N37 14'37 W 100' TO N LI R/W; SW ON R/W TO CTR ST PAUL; NE ON CTR ST PAUL TO BEG EXCEPT HWY & EXCEPT DOC NO 3589968 23.519 AC DOC NO 4285671**

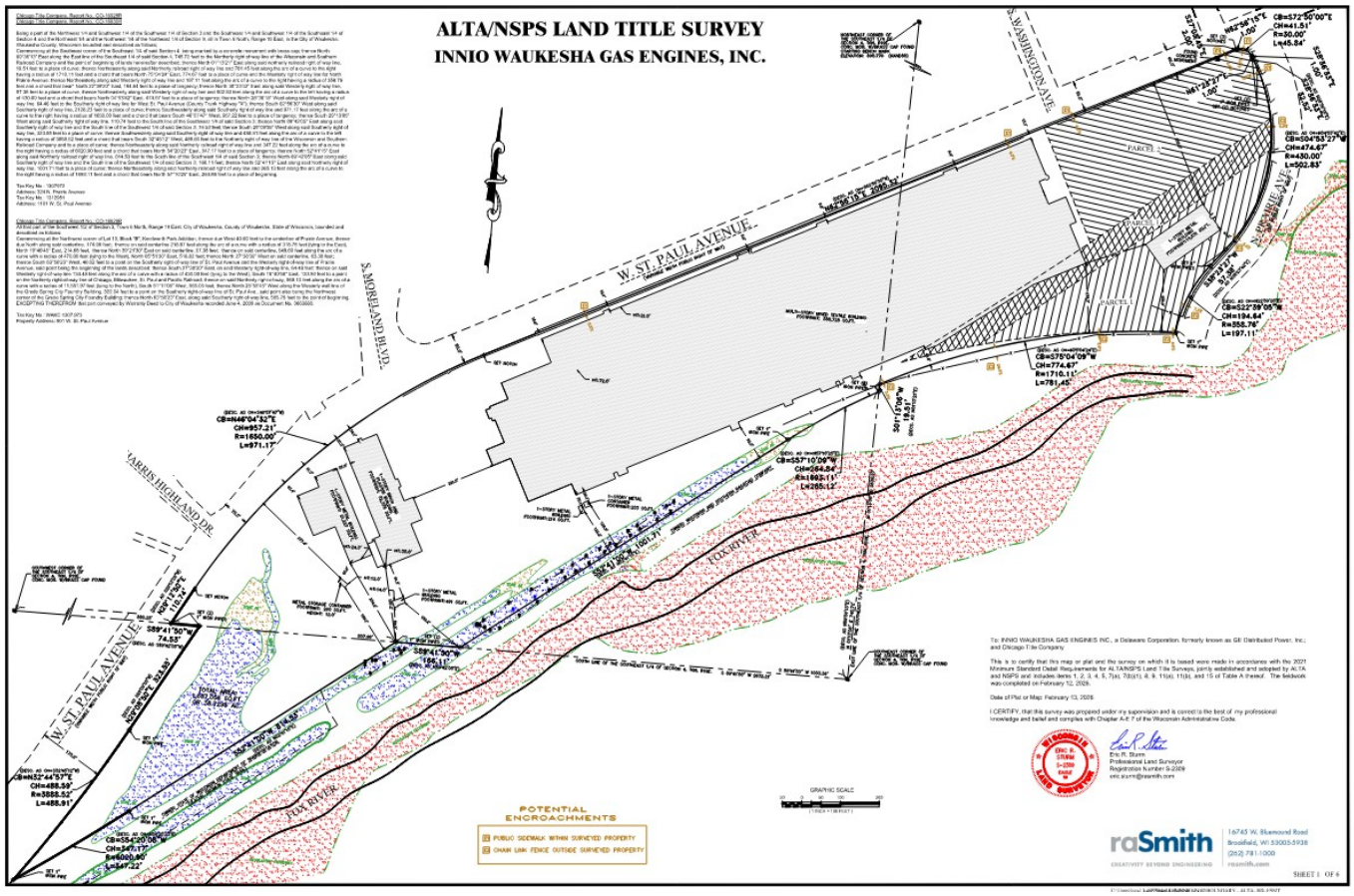


Exhibit B - Location Map
Storm Water Management Practices Covered by this Agreement

The storm water management practices covered by this Agreement are depicted in the reduced copy of a portion of the construction plans, as shown below. Full sized plans can be found at the City of Waukesha Engineering Dept. The practices include two underground detention basins, two outlet control structures, and all associated pipe necessary to daylight the storm discharge. All of the noted storm water management practices are located within a drainage easement at 1101 W. St. Paul Ave., as noted in Exhibit A.

Project Name: **Innio Project Green**
Storm water Practices: **Underground Detention Basins (2), Outlet Structures (2)**
Location of Practices: **1101 W. St Paul Ave.**
Owner: **Innio Waukesha Gas Engines Inc.**

Figure 1
Plan View of Storm Water Practices

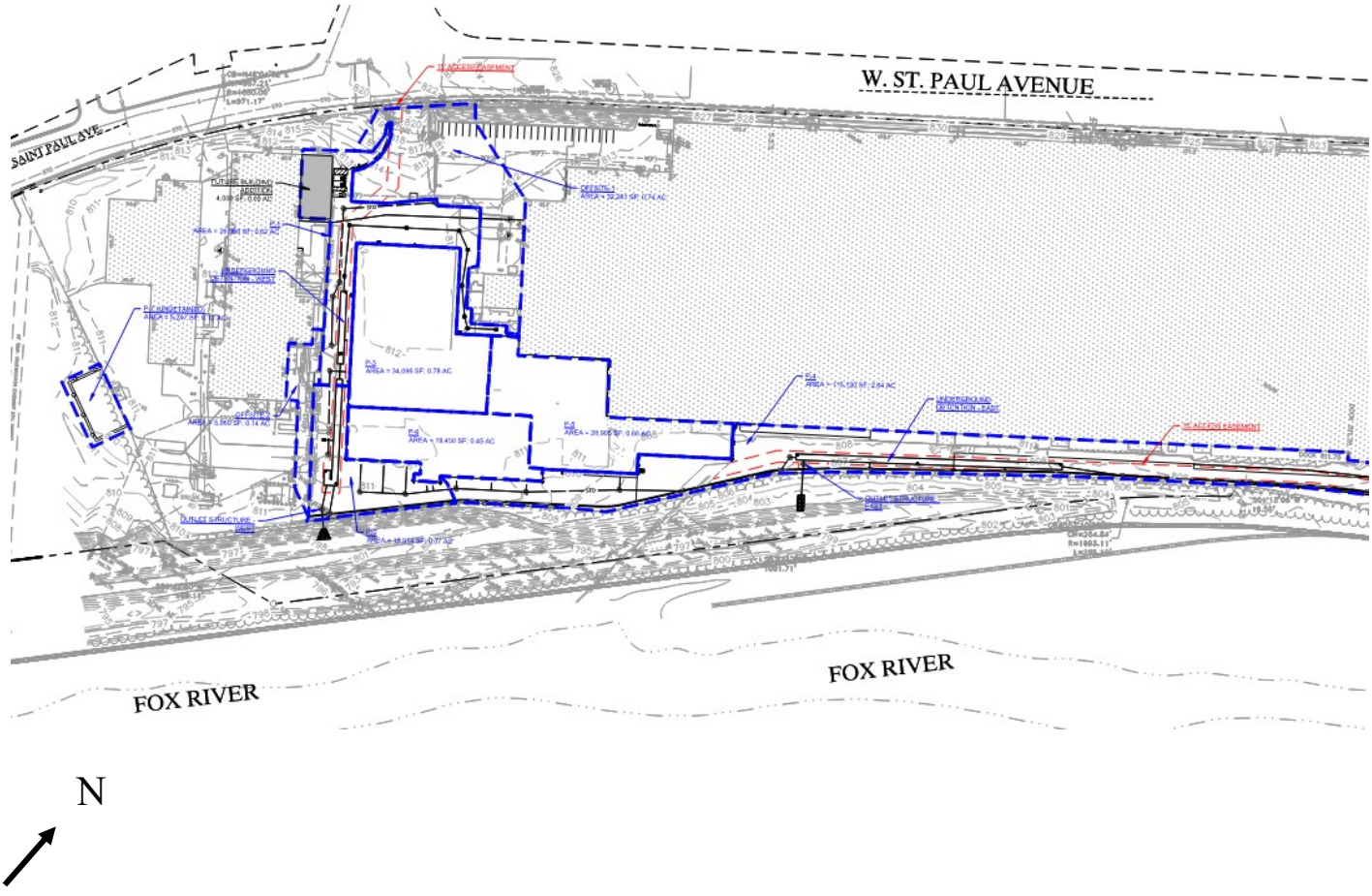


Exhibit B - Location Map (Continued)
Storm Water Management Practices Covered by this Agreement

The storm water management practices covered by this Agreement are depicted in the reduced copy of a portion of the construction plans, as shown below. The practices include two underground detention basins, two outlet control structures, and all associated pipe necessary to daylight the storm discharge. All of the noted storm water management practices are located within access easements, as noted below.

Project Name**:** **Innio Project Green**
Storm water Practices**:** **Underground Detention Basins (2), Outlet Structures (2)**
Location of Practices**:** **1101 W. St Paul Ave.**
Owner: **Innio Waukesha Gas Engines Inc.**

Figure 2

Stormwater Access Easement – West Detention (W. St. Paul Ave.)

SW Easement Line and Curve Table			
Line #/Curve #	Length	Bearing/Delta	Radius
C1	15.13	0.53	1650.00
L1	110.76	N27° 02' 08.12"W	
L2	78.53	N19° 39' 08.31"E	
L3	349.59	N27° 11' 37.86"W	
L4	23.00	N62° 48' 22.14"E	
L5	39.42	S27° 11' 37.86"E	
L6	8.20	S62° 48' 22.14"W	
L7	316.67	S27° 13' 49.40"E	
L8	78.56	S19° 39' 08.31"W	
L9	102.35	S27° 02' 08.12"E	

Sanitary Sewer and Stormwater Access Easement – East Detention (N. Prairie Ave.)

SE Easement Line and Curve Table			
Line #/Curve #	Length	Bearing/Delta	Radius
L26	89.52	S45° 35' 35.10"W	
L25	26.77	S62° 04' 16.59"W	
L24	7.85	N27° 06' 39.78"W	
L23	12.00	S62° 04' 16.59"W	
L22	7.85	S27° 06' 39.78"E	
L21	334.02	S62° 04' 16.59"W	
L20	332.17	S62° 22' 11.66"W	
L19	243.94	S69° 14' 25.12"W	
L18	348.98	S74° 33' 35.42"W	
L17	101.66	N76° 58' 01.98"W	
L16	104.52	S76° 58' 01.98"E	
L15	353.48	N74° 33' 35.42"E	
L14	245.54	N69° 14' 25.12"E	
L13	333.11	N62° 22' 11.66"E	
L12	375.00	N62° 04' 16.59"E	
L11	64.81	N45° 35' 35.10"E	
L10	30.79	N16° 26' 08.08"E	
C2	15.03	2.40	358.76

Exhibit C
Storm Water Practice Maintenance Plan

This exhibit explains the basic function of each of the storm water practices listed in Exhibit B and prescribes the minimum maintenance requirements to remain compliant with this Agreement. The maintenance activities listed below are aimed to ensure these practices continue serving their intended functions in perpetuity. The list of activities is not all inclusive, but rather indicates the minimum type of maintenance that can be expected for this particular site. Access to the stormwater practices for maintenance vehicles is shown in Exhibit B. Any failure of a storm water practice that is caused by a lack of maintenance will subject the Owner(s) to enforcement of the provisions listed on page 1 of this Agreement by the City of Waukesha.

System Description:
The underground detention basins are designed to trap 40% of sediment in runoff and maintain pre-development downstream peak flows. The 96" diameter basins will always be half full of water to trap particles in the bottom of the tank. To keep functionality, the basins, water level, and outlet structures must be maintained as specified in this Agreement.

The east basin receives runoff from a 2.65 acre drainage area (1.77 acres within the project limits and 0.88 acres "off-site" drainage coming from other areas within the parcel). During rainfall, the water level in the basin will temporarily rise and slowly drain down to the elevation of the control structure. The water level is controlled by a 24-inch concrete outlet pipe extending to the existing storm sewer from the east outlet structure. Within the east outlet structure, there is an 8" orifice and two 15" orifices cored into the weir plate. These orifices control the water level for smaller storm events. The weir controls the elevation of the larger storm events. A trash rack will be placed on the plate in front of the orifices to prevent clogging.

The west basin receives runoff from a 3.75 acre drainage area. During rainfall, the water level in the basin will temporarily rise and slowly drain down to the elevation of the control structure. The water level is controlled by a 30-inch concrete outlet pipe extending to the existing storm sewer from the east outlet structure. Within the east outlet structure, there is a 6" orifice and two 18" orifices cored into the weir plate. These orifices control the water level for smaller storm events. The weir controls the elevation of the larger storm events. A trash rack will be placed on the plate in front of the orifices to prevent clogging.

"As-built" construction drawings of the basin, showing actual dimensions, elevations, outlet structures, etc. will be recorded as an addendum(s) to this agreement within 60 days after City of Waukesha accepts verification of construction from the project engineer.

Minimum Maintenance Requirements:
To ensure the proper long-term function of the storm water management practices described above, the following activities must be completed:

1. All outlet pipes, catch basins, MHs and outlet control structures must be checked monthly to ensure there is no blockage from floating debris. Any blockage must be removed immediately.
2. The underground basins shall be inspected in the spring and fall every year. If the permanent pool falls below the outlet elevation, a review shall be performed to determine whether the tank has a leak. If the cause is leakage, the tank shall be repaired.
3. If floating algae or trash becomes a nuisance (decay odors, etc.), it must be removed from the basin and disposed of.
4. When sediment in the tank has accumulated to an elevation of 3.0 feet below the permanent pool elevation (1.0' of sediment depth), it must be removed. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. The difference between these measurements is the depth of water. A minimum depth of 3.0 feet of water shall be maintained at all times. All removed sediment must be placed in an appropriate upland disposal site and stabilized to prevent sediment from entering back into the storm sewer system and/or waters of the state. Failure to remove sediment from the bottom of the tank will cause resuspension of previously trapped sediments and increase downstream deposition.
5. No grading or filling or modifying of the basin other than for sediment removal is allowed, unless otherwise approved by the City of Waukesha.

6. Any other repair or maintenance needed to ensure the continued function of the storm water practices or as ordered by the City of Waukesha under the provisions listed on page 1 of this Agreement.
7. The titleholder(s) or their designee must document all inspections as specified above. Documentation shall include as a minimum: (a) Inspectors Name, Address and Telephone Number, (b) Date of Inspections, (c) Condition Report of the Storm Water Management Practice, (d) Corrective Actions to be Taken and Time Frame for Completion, (e) Follow-up Documentation after Completion of the Maintenance Activities. All documentation is to be delivered to the attention of the City Engineer at the City of Waukesha Engineering Division by January 31 each year.

Stormwater Pond/BMP Inspection Form

Submit inspection reports to: DPW@waukesha-wi.gov or the address below

DPW Engineering - Stormwater

201 Delafield Street Waukesha WI 53188

2023-0329

OWNER/REPRESENTATIVE INFORMATION	
Name:	**Representative (Y/N)**
Address:	
Email:	
Phone:	

INSPECTOR INFORMATION
Name:
Company:
Contact:

BMP INFORMATION	
Location:	
BMP Type:	**Year of Installation:**
ID#/Tax Key:	**Record Drawing Available**

INSPECTION	
Date:	**Date of Last Precipitation:**
Weather:	**Amount of Precipitation (inches):**

ITEM	Okay	Modify	N/A	NOTES
1) Access - 3' wide Inspection	☐	☐	☐	
2) Access - 15' wide Equipment	☐	☐	☐	
3) Slopes - Fully vegetated, no bare soil/erosion	☐	☐	☐	
4) Trees - None present in basin or on slopes	☐	☐	☐	
5) Safety Shelf	☐	☐	☐	
6) Emergency Spillway	☐	☐	☐	
7) Inlet(s) - No obstruction/no erosion	☐	☐	☐	
8) Inlet(s) - Quantity inspected	_____			
9) Outlet(s) - No obstruction/no erosion	☐	☐	☐	
10) Outlet(s) - Quantity inspected	_____			
11) Control Structure - Functional and secure	☐	☐	☐	
12) All Rip Rap - Clear of debris and vegetation	☐	☐	☐	
13) Sedimentation - No major accumulation	☐	☐	☐	
14) Permanent Pool Level - Per plan/weir	☐	☐	☐	
15) Evidence of pollutant *(e.g. oily sheen, trash)*	☐	☐	☐	
16) Evidence of invasive species	☐	☐	☐	
17) Evidence of burrowing animals	☐	☐	☐	
18) * Permanent Pool Level - Elevation	_____			
19) * Depth from sediment to water surface	_____			

INSPECTION SUMMARY/ADDITIONAL NOTES

PHOTOS
Include at least 3 photos with descriptions
1) Overall BMP condition
2) Condition of Control Structure
3) Condition of Inlet, Outlet, Spillway(s)
Other: *Items requiring significant maintenance, hazards, questionable findings*

RESOLUTION OF MODIFICATIONS

ACTION # KEY: (**1**) Monitor Condition (**2**) Routine Maintenance (**3**) Urgent Modification Required

ITEM #	DESCRIPTION OF WORK REQUIRED	ACTION #

COMPANY SCHEDULED TO PERFORM REQUIRED MODIFICATIONS
Name:
Company:
Contact:

Contech® CMP Detention Inspection and Maintenance Guide

Underground stormwater detention and infiltration systems must be inspected and maintained at regular intervals for purposes of performance and longevity.

Inspection

Inspection is the key to effective maintenance of CMP detention systems and is easily performed. Contech recommends ongoing, annual inspections. Sites with high trash load or small outlet control orifices may need more frequent inspections. The rate at which the system collects pollutants will depend more on-site specific activities rather than the size or configuration of the system.

Inspections should be performed more often in equipment washdown areas, in climates where sanding and/or salting operations take place, and in other various instances in which one would expect higher accumulations of sediment or abrasive/corrosive conditions. A record of each inspection is to be maintained for the life of the system.

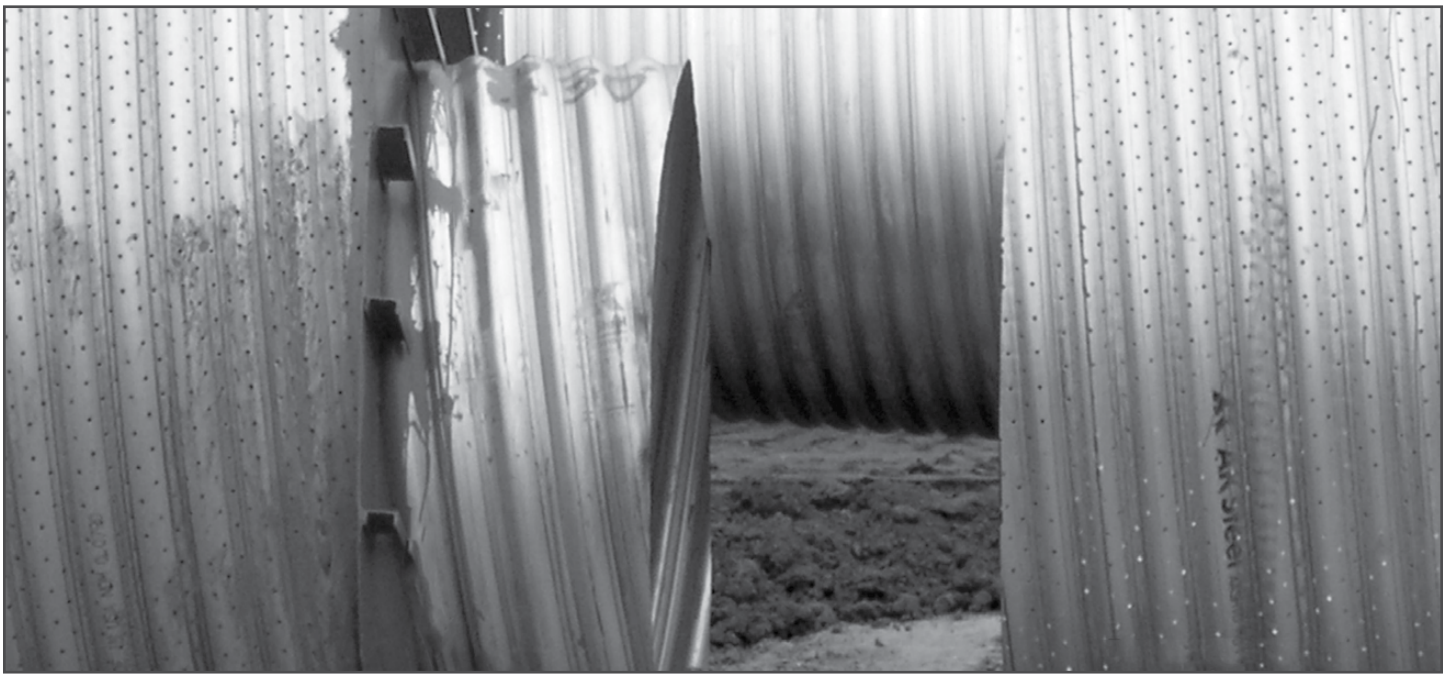
Maintenance

CMP detention systems should be cleaned when an inspection reveals accumulated sediment or trash is clogging the discharge orifice. Accumulated sediment and trash can typically be evacuated through the manhole over the outlet orifice. If maintenance is not performed as recommended, sediment and trash may accumulate in front of the outlet orifice. Manhole covers should be securely seated following cleaning activities. Contech suggests that all systems be designed with an access/inspection manhole situated at or near the inlet and the outlet orifice. Should it be necessary to get inside the system to perform maintenance activities, all appropriate precautions regarding confined space entry and OSHA regulations should be followed.

Annual inspections are best practice for all underground systems. During this inspection if evidence of salting/de-icing agents is observed within the system, it is best practice for the system to be rinsed, including above the spring line soon after the spring thaw as part of the maintenance program for the system.

Maintaining an underground detention or infiltration system is easiest when there is no flow entering the system. For this reason, it is a good idea to schedule the cleanout during dry weather.

The foregoing inspection and maintenance efforts help ensure underground pipe systems used for stormwater storage continue to function as intended by identifying recommended regular inspection and maintenance practices. Inspection and maintenance related to the structural integrity of the pipe or the soundness of pipe joint connections is beyond the scope of this guide.

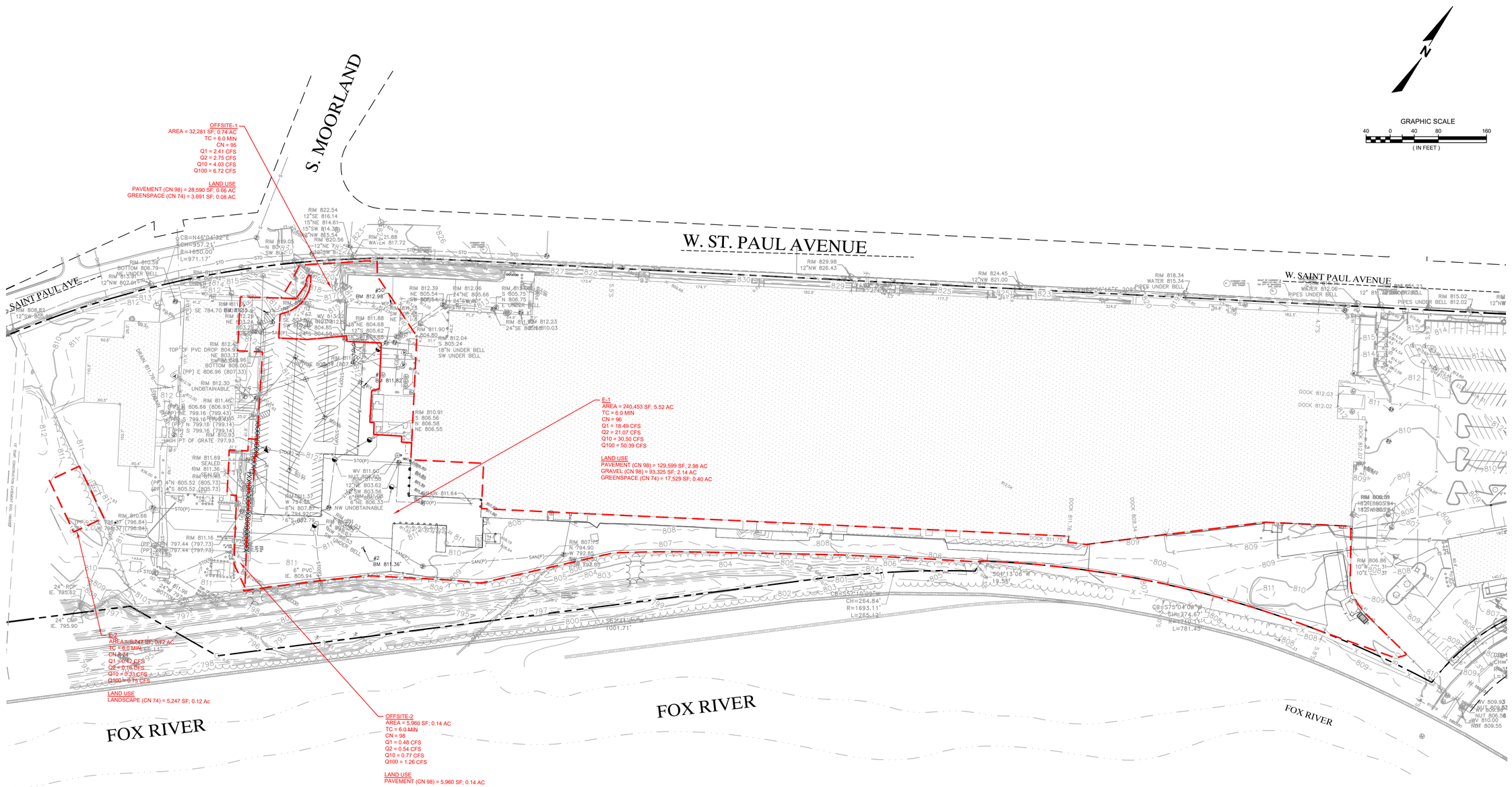


CONTECH®
CMP DETENTION SYSTEMS

CONTECH®
ENGINEERED SOLUTIONS

APPENDIX F

Hydrology Exhibit, Utility Plan and Details



DESCRIPTION	DATE
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raSmith
CREATIVITY BEYOND ENGINEERING
16745 W. Bluemound Road
Brookfield, WI 53005-5938
(262) 781-1000
rasmith.com
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO EXPANSION
CITY OF WAUKESHA, WI

HYDROLOGY EXHIBIT
EXISTING SITE CONDITIONS

Know what's **below.**
Call before you dig.

DATE: 03/20/2026
SCALE: 1" = 80'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, PE
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
HX-1

S. MOORLAND

W. ST. PAUL AVENUE

SAINT PAUL AVE.

W. SAINT PAUL AVENUE

FOX RIVER

FOX RIVER

FOX RIVER

OFFSITE-1
AREA = 32,281 SF; 0.74 AC
TC = 6.0 MIN
CN = 95
Q1 = 2.41 CFS
Q2 = 2.75 CFS
Q10 = 4.03 CFS
Q100 = 6.72 CFS

LAND USE
PAVEMENT (CN 98) = 28,590 SF; 0.66 AC
GREENSPACE (CN 74) = 3,691 SF; 0.08 AC

CB=N46°04'32"E
CH=957.21'
R=1650.00'
L=971.17'

FUTURE BUILDING ADDITION
4,000 SF; 0.09 AC

P-1
AREA = 26,968 SF; 0.62 AC
TC = 6.0 MIN
CN = 97
Q1 = 2.13 CFS
Q2 = 2.42 CFS
Q10 = 3.47 CFS
Q100 = 5.68 CFS

LAND USE
PAVEMENT (CN 98) = 21,958 SF; 0.51 AC
"FUTURE" ROOF (CN 98) = 4,000 SF; 0.09 AC
GREENSPACE (CN 74) = 1,018 SF; 0.02 AC

P-3
AREA = 34,096 SF; 0.78 AC
TC = 6.0 MIN
CN = 98
Q1 = 2.76 CFS
Q2 = 3.11 CFS
Q10 = 4.43 CFS
Q100 = 7.22 CFS

LAND USE
ROOF (CN 98) = 34,096 SF; 0.78 AC

P-5
AREA = 28,905 SF; 0.66 AC
TC = 6.0 MIN
CN = 98
Q1 = 2.34 CFS
Q2 = 2.64 CFS
Q10 = 3.75 CFS
Q100 = 6.12 CFS

LAND USE
ROOF (CN 98) = 28,905 SF; 0.66 AC

P-7 (UNDETAINED)
AREA = 5,247 SF; 0.12 AC
TC = 6.0 MIN
CN = 98
Q1 = 0.42 CFS
Q2 = 0.48 CFS
Q10 = 0.68 CFS
Q100 = 1.11 CFS

LAND USE
PAVEMENT (CN 98) = 5,247 SF; 0.12 Ac

S89°41'50"W
166.11'

P-2
AREA = 15,914 SF; 0.37 AC
TC = 6.0 MIN
CN = 98
Q1 = 1.29 CFS
Q2 = 1.45 CFS
Q10 = 2.07 CFS
Q100 = 3.37 CFS

LAND USE
PAVEMENT (CN 98) = 15,914 SF; 0.37 AC

P-6
AREA = 19,450 SF; 0.45 AC
TC = 6.0 MIN
CN = 98
Q1 = 1.57 CFS
Q2 = 1.78 CFS
Q10 = 2.52 CFS
Q100 = 4.12 CFS

LAND USE
ROOF (CN 98) = 19,450 SF; 0.45 AC

S52°41'00"W
1001.71'

P-4
AREA = 115,120 SF; 2.64 AC
TC = 6.0 MIN
CN = 96
Q1 = 8.85 CFS
Q2 = 10.09 CFS
Q10 = 14.60 CFS
Q100 = 24.13 CFS

LAND USE
PAVEMENT (CN 98) = 99,134 SF; 2.28 AC
ROOF (CN 98) = 7,553 SF; 0.17 AC
GREENSPACE (CN 74) = 8,433 SF; 0.19 AC

CB=S57°10'09"W
CH=264.84'
R=1693.11'
L=265.12'

S01°13'06"W
19.51'

CB=S75°04'09"W
CH=774.67'
R=1710.11'
L=781.45'

N62°56'15"E 2095.32'

OFFSITE-2
AREA = 5,960 SF; 0.14 AC
TC = 6.0 MIN
CN = 98
Q1 = 0.48 CFS
Q2 = 0.54 CFS
Q10 = 0.77 CFS
Q100 = 1.26 CFS

LAND USE
PAVEMENT (CN 98) = 5,960 SF; 0.14 AC

GRAPHIC SCALE
40 0 40 80 160
(IN FEET)

DESCRIPTION	DATE
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raSmith
CREATIVITY BEYOND ENGINEERING
16745 W. Bluemound Road
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Brookfield, WI | Appleton, WI | Madison, WI
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INNIO EXPANSION
CITY OF WAUKESHA, WI

HYDROLOGY EXHIBIT
PROPOSED SITE CONDITIIONS

Know what's **below.**
Call before you dig.

DATE: 03/20/2026

SCALE: 1" = 80'

JOB NO. 3250244

PROJECT MANAGER:
RYAN J. LANCOUR, PE

DESIGNED BY: TJR

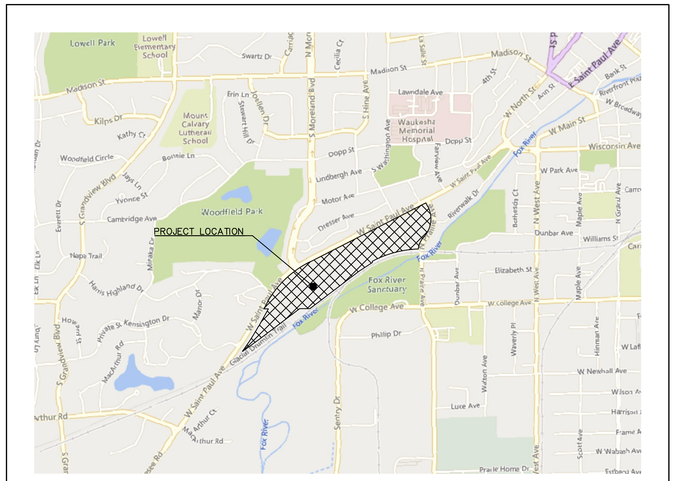
CHECKED BY: RJY

SHEET NUMBER

HX-2

SITE CIVIL PLANS
FOR
INNIO - PROJECT GREEN
1101 W ST PAUL AVE
WAUKESHA, WI 53188

VICINITY MAP



BENCHMARK #1:
HARN MONUMENT - DF9885
ELEVATION = 836.52'
VERTICAL DATUM: NAVD 88

LEVELED HUBS:
#1
ELEVATION = 811.82'

#2
ELEVATION = 811.36'

#50
ELEVATION = 812.98'

#52
ELEVATION = 812.59'

SEWRPC BENCHMARK #1:
SEWRPC BRASS CAP IN CONCRETE
PAVEMENT IN W. COLLEGE AVE.
NE:3, NW:4, SW:9, SE:10
ELEVATION = 805.30'
N:370,419.41 USFT
E:2,437,433.89 USFT

SEWRPC BENCHMARK #2:
CONC MON W/ BRASS CAP
NE:4, NW:4, SW:9, SE:9
ELEVATION = 865.09'
N:370,405.74 USFT
E:2,434,801.72 USFT

DATUM:
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

HORIZONTAL DATUM:
WISCONSIN STATE PLANES COORDINATE SYSTEM, SOUTH ZONE
(NAD 83)

LEGEND
(PROPOSED FEATURES)

- TREE REMOVAL
- EXISTING CONCRETE PAVEMENT TO BE REMOVED
- EXISTING ASPHALT PAVEMENT TO BE REMOVED
- EXISTING GRAVEL TO BE REMOVED
- EXISTING BUILDING/STRUCTURE TO BE REMOVED
- SAWCUT LINE
- PROPOSED PROPERTY LINE
- PROPOSED SITE LIGHTING (DESIGNED BY OTHERS, FOR REFERENCE ONLY)
- MONUMENT SIGNS (CONSTRUCTION DETAILS BY OTHERS)
- SIGN
- HEAVY-DUTY CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- HEAVY-DUTY ASPHALT PAVEMENT
- STANDARD-DUTY ASPHALT PAVEMENT
- COLORED AND STAMPED CONCRETE
- PROPOSED 18" HIGH-SIDE CURB & GUTTER (AS SHOWN ON SITE PLAN)
- PROPOSED 18" STANDARD CURB & GUTTER (AS SHOWN ON SITE PLAN)
- PROPOSED ACCESSIBLE PAVEMENT MARKING
- VAN ACCESSIBLE STALL
- PROPOSED TYPE 3 CURB RAMP (SEE DETAIL SHEET. NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 3A CURB RAMP (SEE DETAIL SHEET. NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 4 CURB RAMP (SEE DETAIL SHEET. NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 4A CURB RAMP (SEE DETAIL SHEET. NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 7 CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- DOOR
- STRUCTURAL RETAINING WALL – (DESIGNED BY OTHERS)
- 869.5 — PROPOSED 0.5-FOOT GRADE CONTOUR (ONLY USED WHEN CRITICAL)
- 869 — PROPOSED 1-FOOT GRADE CONTOUR
- 870 — PROPOSED 5-FOOT GRADE CONTOUR
- 877.70 X (877.70) — PROPOSED SPOT GRADE
- PROPOSED TOP OF CURB
- 877.70 TW — PROPOSED FINISHED SURFACE GRADE ADJACENT TO TOP OF WALL
- 877.00 BW — PROPOSED FINISHED SURFACE GRADE ADJACENT TO BASE OF WALL
- EB1 — PROPOSED EROSION CONTROL BALE TEMPORARY DITCH CHECK
- PROPOSED INLET PROTECTION
- PROPOSED SILT FENCE
- PROPOSED TEMPORARY DIVERSION SWALE & BERM
- PROPOSED LEVEL SPREADER
- PROPOSED STONE TRACKING MAT
- PROPOSED PERMANENT TURF REINFORCEMENT MAT
- EROSION CONTROL BLANKET
- PROPOSED RIPRAP
- G — PROPOSED GAS LINE
- E — PROPOSED ELECTRIC LINE
- T — PROPOSED TELEPHONE LINE
- W — PROPOSED WATER MAIN
- STO — PROPOSED STORM SEWER
- S — PROPOSED SANITARY SEWER
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE
- PROPOSED AREA DRAIN
- PROPOSED SANITARY MANHOLE

LEGEND

- ( ) INDICATES RECORDED DIMENSION WHERE DIFFERENT FROM ACTUAL MEASUREMENT
- OR SECTION OR 1/4 SECTION CORNER AS DESCRIBED
- 1" DIA. IRON PIPE FOUND (UNLESS OTHERWISE NOTED)
- 1" DIA. IRON PIPE, 18" LONG-SET (UNLESS OTHERWISE NOTED)
- BOLLARD
- SOIL BORING/MONITORING WELL
- FLAGPOLE
- MAILBOX
- SIGN
- BILLBOARD
- A/C AIR CONDITIONER
- CONTROL BOX
- TRAFFIC SIGNAL
- RAILROAD CROSSING SIGNAL
- CABLE PEDESTAL
- POWER POLE
- GUY POLE
- GUY WIRE
- LIGHT POLE
- SPOT/YARD/PEDESTAL LIGHT
- HANDICAPPED PARKING
- ELECTRIC MANHOLE
- ELECTRIC PEDESTAL
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- MARKED FIBER OPTIC
- GAS VALVE
- GAS METER
- GAS WARNING SIGN
- STORM MANHOLE
- ROUND INLET
- SQUARE INLET
- STORM SEWER END SECTION
- SANITARY MANHOLE
- SANITARY CLEANOUT OR SEPTIC VENT
- SANITARY INTERCEPTOR MANHOLE
- MISCELLANEOUS MANHOLE
- WATER VALVE
- HYDRANT
- WATER SERVICE CURB STOP
- WATER MANHOLE
- WELL
- WATER SURFACE
- WETLANDS FLAG
- MARSH
- CONIFEROUS TREE
- DECIDUOUS TREE
- SHRUB
- -S- —EDGE OF TREES —SANITARY SEWER
- -STO- —STORM SEWER
- -W- —WATERMAIN
- -G- —MARKED GAS MAIN
- -E- —MARKED ELECTRIC
- OHW —OVERHEAD WIRES
- -B- —BUREAU ELEC. SERV.
- -T- —MARKED TELEPHONE
- -TV- —MARKED CABLE TV LINE
- -FO- —MARKED FIBER OPTIC
- 780 — INDICATES EXISTING CONTOUR ELEVATION
- × 780.55 — INDICATES EXISTING SPOT ELEVATION
- —EXISTING PROPERTY LINE
- —EXISTING EASEMENT LINE

ENGINEER AND LANDSCAPE ARCHITECT:

raSmith
CREATIVITY BEYOND ENGINEERING
16745 W. Bluemound Road
Brookfield, WI 53005-5938
(262) 781-1000
rasmith.com

RYAN J. LANCOUR, P.E. SENIOR PROJECT MANAGER
PH: (262) 317-3259

OWNER:
INNIO WAUKESHA GAS ENGINE, INC.
CONTACT: CRAIG HEGEMANN, PLANT MANAGER
1101 WEST ST. PAUL AVE
WAUKESHA, WI 53188
EMAIL: CRAIG.HEGEMANN@INNIO.COM

PLAN INDEX

SHEET NO.	DESCRIPTION
C000	TITLE SHEET
~~1 – 6~~	~~ALTA SURVEY~~
~~C100~~	~~DEMOLITION PLAN OVERALL~~
~~C101~~	~~DEMOLITION PLAN BUILDING ADDITION~~
~~C102~~	~~DEMOLITION PLAN PARKING REVISIONS~~
C200	INTERIM EROSION CONTROL PLAN
C201	FINAL EROSION CONTROL PLAN
C300	SITE PLAN OVERALL
~~C301~~	~~SITE PLAN BUILDING ADDITION~~
~~C302~~	~~SITE PLAN ACCESS ROAD~~
C400	GRADING PLAN OVERALL
C401	GRADING PLAN BUILDING ADDITION
C402	GRADING PLAN ACCESS ROAD
C500	UTILITY PLAN OVERALL
C501	STORM UTILITY PLAN BUILDING ADDITION
C502	STORM UTILITY PLAN ACCESS ROAD
~~C503~~	~~SANITARY SEWER PLAN & PROFILE~~
C600	EROSION CONTROL DETAILS
~~C601~~	~~SITE AND PAVING DETAILS~~
C602	UTILITY DETAILS
C603	CONTECH DETAILS
C604	CONTECH DETAILS
C605	CONTECH DETAILS
C606	CONTECH DETAILS
C700	SPECIFICATIONS

CITY OF WAUKESHA NOTE

ALL SITE IMPROVEMENTS AND CONSTRUCTION SHOWN ON PLANS SHALL CONFORM TO THE CURRENT CITY OF WAUKESHA DESIGN AND CONSTRUCTION MANUAL. WHERE THE PLANS DO NOT COMPLY, IT SHALL BE THE SOLE RESPONSIBILITY AND EXPENSE OF THE DEVELOPER TO MAKE REVISIONS TO THE PLANS AND/OR CONSTRUCTED INFRASTRUCTURE TO COMPLY.

Know what's below. Call before you dig.

PLAN DATE: 05/22/2026

REVISIONS	ISSUE DATE	SHEET NO.'S	ISSUED FOR:

DESCRIPTION	DATE

raSmith
CREATIVITY BEYOND ENGINEERING
16745 W. Bluemound Road
Brookfield, WI | Appleton, WI | Madison, WI
(262) 781-1000
Cedarburg, WI | Naperville, IL | Irvine, CA
rasmith.com

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

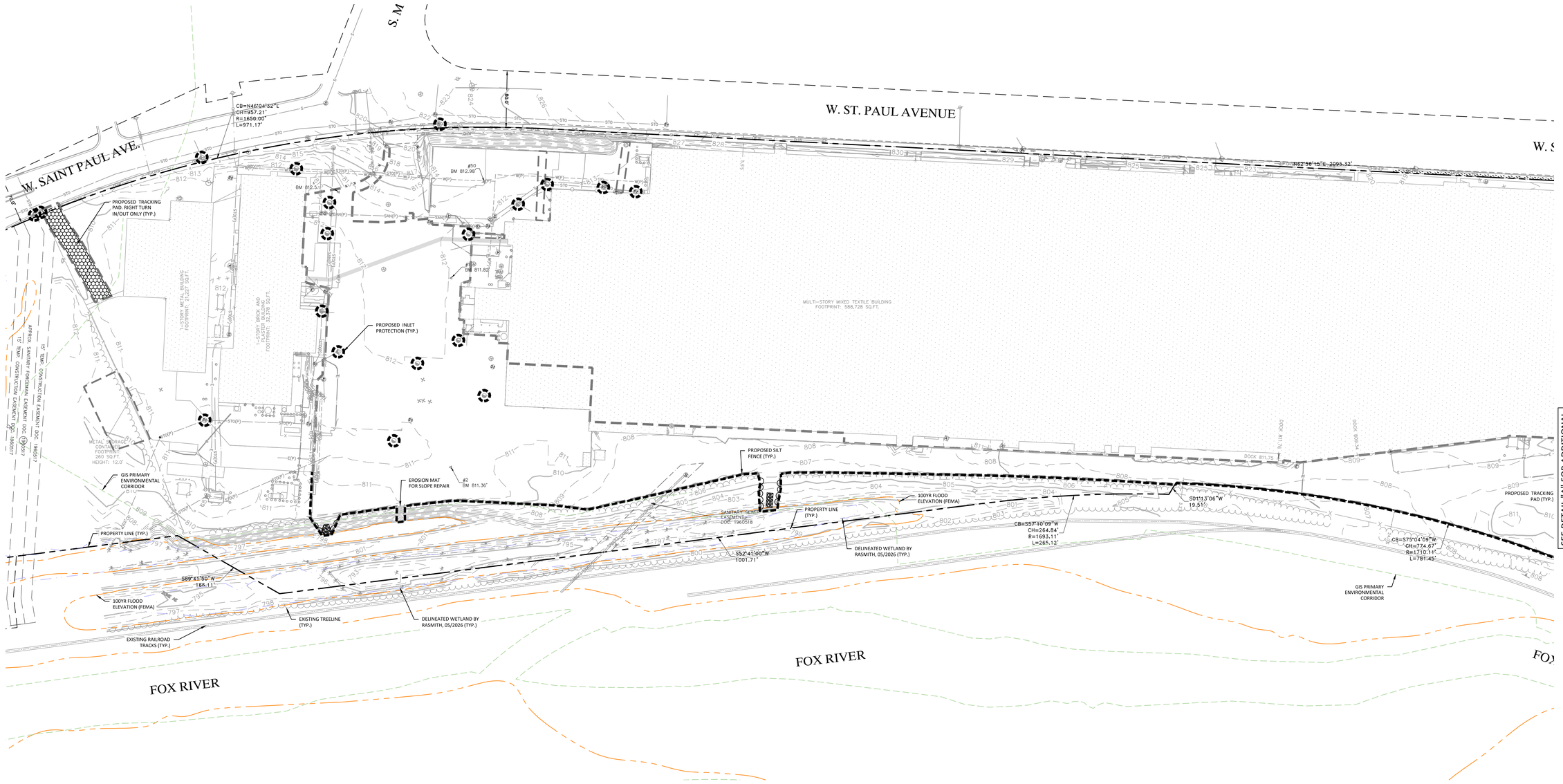
TITLE SHEET

WISCONSIN
ROBERT J. YERSIN
E-36666
FRANKLIN WI
PROFESSIONAL ENGINEER
05/21/2026

DATE: 05/22/2026
SCALE: N.T.S.
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C000

P:\3250244\Dwg\Sheets\3250244_T501 & 0701.dwg, TITLE, 5/21/2026 12:34:42 PM, TJR



EROSION CONTROL LEGEND

- PROPERTY LINE
- PRIMARY ENVIRONMENTAL CORRIDOR
- DELINEATED WETLAND
- 100 YEAR FLOOD ELEVATION
- PROPOSED INLET PROTECTION
- PROPOSED SILT FENCE
- LIMITS OF DISTURBANCE
- PROPOSED STONE TRACKING MAT
- PROPOSED PERMANENT TURF REINFORCEMENT MAT
- TEMPORARY CONSTRUCTION FENCE
- 869 EXISTING 1-FOOT GRADE CONTOUR
- 870 EXISTING 5-FOOT GRADE CONTOUR
- 869 PROPOSED 1-FOOT GRADE CONTOUR
- 870 PROPOSED 5-FOOT GRADE CONTOUR
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE

EROSION CONTROL NOTES

1. EXISTING TOPOGRAPHY OBTAINED BY RASMITH INC., DATED 02/12/2026
2. EROSION CONTROL MEASURES MUST BE INSPECTED AND REPAIRED PER DNR, AND city STANDARDS (WHICH EVER IS MOST FREQUENT AND CONSERVATIVE)
3. ANY SEDIMENT REACHING A PUBLIC OR PRIVATE ROAD OR SIDEWALK SHALL BE REMOVED BY STREET CLEANING, OTHER THAN FLUSHING, IMMEDIATELY.
4. CONTRACTOR SHALL KEEP A COPY OF THE EROSION CONTROL PLANS AT THE PROJECT SITE AND PROVIDE COMPLETED EROSION CONTROL CHECK SHEETS TO THE CONSTRUCTION INSPECTOR. CITY AND WDNR MAY REQUEST INSPECTION REPORTS AT ANY TIME.
5. ALL EROSION CONTROL METHODS SHALL BE IN ACCORDANCE WITH WDNR TECHNICAL STANDARDS AND CITY REQUIREMENTS AND STANDARDS.
6. DEWATERING AS NEEDED TO BE DONE ACCORDING TO WDNR STANDARD 1061.
7. ALL EXPOSED SOIL AREAS NOT DISTURBED FOR UP TO 14 DAYS SHALL BE IMMEDIATELY RESTORED WITH SEED AND MULCH OR BY SOME OTHER MEANS IN ACCORDANCE WITH THE WNDR TECHNICAL STANDARDS AND CITY EROSION CONTROL ORDINANCES.
8. DISTURBED AREAS THAT CANNOT BE STABILIZED WITH A DENSE GROWTH OF VEGETATION BY SEEDING AND MULCHING DUE TO TEMPERATURE (WINTER) OR TIMING OF CONSTRUCTION, SHALL BE STABILIZED BY APPLYING ANIONIC POLYACRYLAMIDE (PAM) IN ACCORDANCE WITH WDNR TECHNICAL STANDARD 1050.
9. CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL MEASURES AND PERFORMING MAINTENANCE THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES.
10. EXCESS SOILS ARE TO BE HAULED OFF SITE OR ENCLOSED WITH AN APPROVED SEDIMENT CONTROL DEVICE WITHIN 24 HRS.
11. THE CITY SHALL TEMPORARILY TERMINATE CONSTRUCTION UNTIL ALL EROSION CONTROL MEASURES ARE UPDATED AND TO THE SATISFACTION OF THE CITY. IF CONSTRUCTION IS TEMPORARILY SHUT DOWN BY THE CITY, THE CONTRACTOR SHALL GET APPROVAL FROM THE VILLAGE WHEN THEY ARE ALLOWED TO COMMENCE WORK.

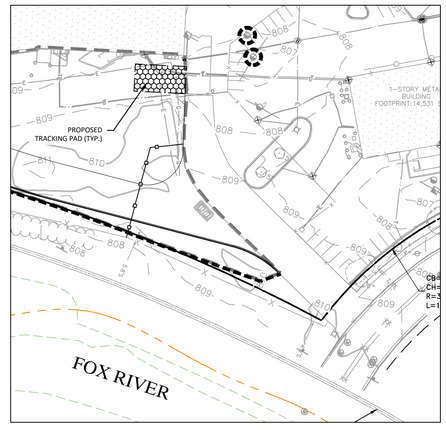
CONSTRUCTION SEQUENCE

1. INSTALL APPROPRIATE SILT FENCE, INLET PROTECTION AND CONSTRUCTION ENTRANCE AS SHOWN ON THE PLAN. CONSTRUCTION ENTRANCE TO BE RELOCATED AS NECESSARY FOR PHASING.
2. BEGIN CLEARING THE SITE AS SHOWN ON THE DEMOLITION PLANS, STRIP TOPSOIL AND STOCKPILE ONSITE. STOCKPILES ARE TO BE SEEDED IF NOT DISTURBED WITHIN 7 DAYS. STOCKPILES SHALL BE NO CLOSER THAN 25' FROM WETLANDS OR ENVIRONMENTAL CORRIDORS.
3. GRADE THE SITE AS SHOWN ON THE GRADING PLANS. GRADE THE SITE IN INCREMENTS AS NOT TO DISTURB PORTIONS OF THE SITE UNNECESSARILY. AFTER GRADING HAS BEEN COMPLETED, STABILIZE THE DISTURBED AREAS.
4. INSTALL UTILITIES INCLUDING STORM SEWER, UNDERGROUND DETENTION, SANITARY SEWER AS SHOWN ON THE UTILITY PLAN. INSTALL INLET PROTECTION AS NECESSARY.
5. PREPARE THE BUILDING PADS AS DETERMINED BY THE GEOTECHNICAL & STRUCTURAL ENGINEERS, AND BEGIN BUILDING CONSTRUCTION.
6. INSTALL PARKING LOT SUBGRADE AND BASE COURSE. CONSTRUCT CURB AND GUTTER, AND PAVE SITE AT LOCATIONS SHOWN ON THE PLANS.
7. TOPSOIL, SEED, FERTILIZER, AND MULCH TURF AREAS BROUGHT TO FINAL GRADE. PERMANENT EROSION MATTING SHALL BE INSTALLED AS REQUIRED ON THE PLAN.
8. ONCE THE PROJECT SITE IS 80% STABILIZED, ALL REMAINING TEMPORARY EROSION CONTROL BMPS SHALL BE REMOVED AND RESTORED AS NECESSARY.
9. UPON COMPLETION OF CONSTRUCTION, JET/VACUUM THE UNDERGROUND DETENTION AND STORM SEWER TO REMOVE ALL SILT.

START DATE: JUNE 2026
END DATE: NOVEMBER 2027

RECEIVING WATERS: FOX RIVER

DETAIL "A"
SCA: 1"=60'



0 60 120
GRAPHIC SCALE
Feet

Know what's below. Call before you dig.

DATE	DESCRIPTION

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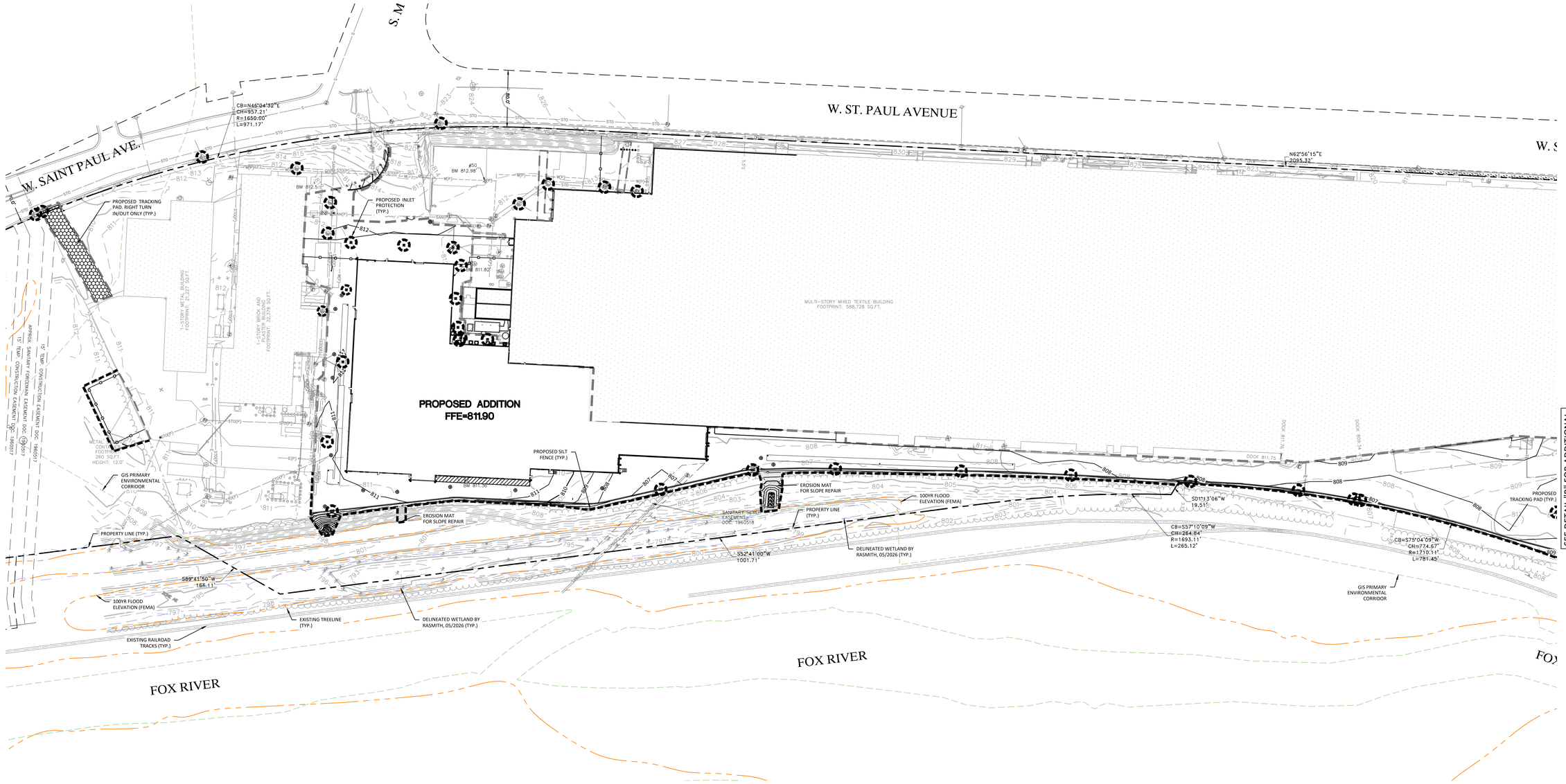
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

INTERIM EROSION CONTROL PLAN

DATE: 05/22/2026
SCALE: 1" = 60'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C200



SEE DETAIL "B" FOR ADDITIONAL EROSION CONTROL FEATURES

EROSION CONTROL LEGEND

- PROPERTY LINE
- PRIMARY ENVIRONMENTAL CORRIDOR
- DELINEATED WETLAND
- 100 YEAR FLOOD ELEVATION
- PROPOSED INLET PROTECTION
- PROPOSED SILT FENCE
- LIMITS OF DISTURBANCE
- PROPOSED STONE TRACKING MAT
- PROPOSED PERMANENT TURF REINFORCEMENT MAT
- TEMPORARY CONSTRUCTION FENCE
- 869 EXISTING 1-FOOT GRADE CONTOUR
- 870 EXISTING 5-FOOT GRADE CONTOUR
- 869 PROPOSED 1-FOOT GRADE CONTOUR
- 870 PROPOSED 5-FOOT GRADE CONTOUR
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE

EROSION CONTROL NOTES

1. EXISTING TOPOGRAPHY OBTAINED BY RASMITH INC., DATED 02/12/2026
2. EROSION CONTROL MEASURES MUST BE INSPECTED AND REPAIRED PER DNR, AND CITY STANDARDS (WHICH EVER IS MOST FREQUENT AND CONSERVATIVE)
3. ANY SEDIMENT REACHING A PUBLIC OR PRIVATE ROAD OR SIDEWALK SHALL BE REMOVED BY STREET CLEANING, OTHER THAN FLUSHING, IMMEDIATELY.
4. CONTRACTOR SHALL KEEP A COPY OF THE EROSION CONTROL PLANS AT THE PROJECT SITE AND PROVIDE COMPLETED EROSION CONTROL CHECK SHEETS TO THE CONSTRUCTION INSPECTOR. CITY AND WDNR MAY REQUEST INSPECTION REPORTS AT ANY TIME.
5. ALL EROSION CONTROL METHODS SHALL BE IN ACCORDANCE WITH WDNR TECHNICAL STANDARDS AND CITY REQUIREMENTS AND STANDARDS.
6. DEWATERING AS NEEDED TO BE DONE ACCORDING TO WDNR STANDARD 1061.
7. ALL EXPOSED SOIL AREAS NOT DISTURBED FOR UP TO 14 DAYS SHALL BE IMMEDIATELY RESTORED WITH SEED AND MULCH OR BY SOME OTHER MEANS IN ACCORDANCE WITH THE WNDR TECHNICAL STANDARDS AND CITY EROSION CONTROL ORDINANCES.
8. DISTURBED AREAS THAT CANNOT BE STABILIZED WITH A DENSE GROWTH OF VEGETATION BY SEEDING AND MULCHING DUE TO TEMPERATURE (WINTER) OR TIMING OF CONSTRUCTION, SHALL BE STABILIZED BY APPLYING ANIONIC POLYACRYLAMIDE (PAM) IN ACCORDANCE WITH WDNR TECHNICAL STANDARD 1050.
9. CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL MEASURES AND PERFORMING MAINTENANCE THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES.
10. EXCESS SOILS ARE TO BE HAULED OFF SITE OR ENCLOSED WITH AN APPROVED SEDIMENT CONTROL DEVICE WITHIN 24 HRS.
11. THE CITY SHALL TEMPORARILY TERMINATE CONSTRUCTION UNTIL ALL EROSION CONTROL MEASURES ARE UPDATED AND TO THE SATISFACTION OF THE CITY. IF CONSTRUCTION IS TEMPORARILY SHUT DOWN BY THE CITY, THE CONTRACTOR SHALL GET APPROVAL FROM THE city WHEN THEY ARE ALLOWED TO COMMENCE WORK.

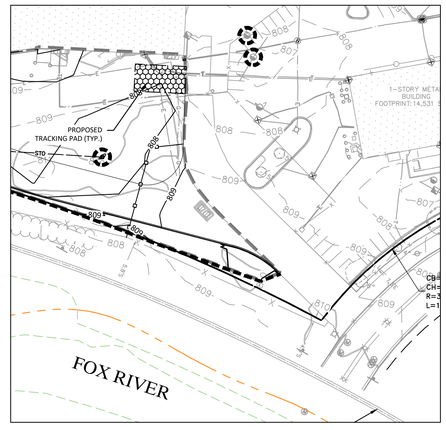
CONSTRUCTION SEQUENCE

1. INSTALL APPROPRIATE SILT FENCE, INLET PROTECTION AND CONSTRUCTION ENTRANCE AS SHOWN ON THE PLAN. CONSTRUCTION ENTRANCE TO BE RELOCATED AS NECESSARY FOR PHASING.
2. BEGIN CLEARING THE SITE AS SHOWN ON THE DEMOLITION PLANS, STRIP TOPSOIL AND STOCKPILE ONSITE. STOCKPILES ARE TO BE SEEDED IF NOT DISTURBED WITHIN 7 DAYS. STOCKPILES SHALL BE NO CLOSER THAN 25' FROM WETLANDS OR ENVIRONMENTAL CORRIDORS.
3. GRADE THE SITE AS SHOWN ON THE GRADING PLANS. GRADE THE SITE IN INCREMENTS AS NOT TO DISTURB PORTIONS OF THE SITE UNNECESSARILY. AFTER GRADING HAS BEEN COMPLETED, STABILIZE THE DISTURBED AREAS.
4. INSTALL UTILITIES INCLUDING STORM SEWER, UNDERGROUND DETENTION, SANITARY SEWER AS SHOWN ON THE UTILITY PLAN. INSTALL INLET PROTECTION AS NECESSARY.
5. PREPARE THE BUILDING PADS AS DETERMINED BY THE GEOTECHNICAL & STRUCTURAL ENGINEERS, AND BEGIN BUILDING CONSTRUCTION.
6. INSTALL PARKING LOT SUBGRADE AND BASE COURSE. CONSTRUCT CURB AND GUTTER, AND PAVE SITE AT LOCATIONS SHOWN ON THE PLANS.
7. TOPSOIL, SEED, FERTILIZER, AND MULCH TURF AREAS BROUGHT TO FINAL GRADE. PERMANENT EROSION MATTING SHALL BE INSTALLED AS REQUIRED ON THE PLAN.
8. ONCE THE PROJECT SITE IS 80% STABILIZED, ALL REMAINING TEMPORARY EROSION CONTROL BMPS SHALL BE REMOVED AND RESTORED AS NECESSARY.
9. UPON COMPLETION OF CONSTRUCTION, JET/VACUUM THE UNDERGROUND DETENTION AND STORM SEWER TO REMOVE ALL SILT.

START DATE: JUNE 2026
END DATE: NOVEMBER 2027

RECEIVING WATERS: FOX RIVER

DETAIL "B"
SCA: 1"=60'



0 60 120
GRAPHIC SCALE
Feet

Know what's below. Call before you dig.

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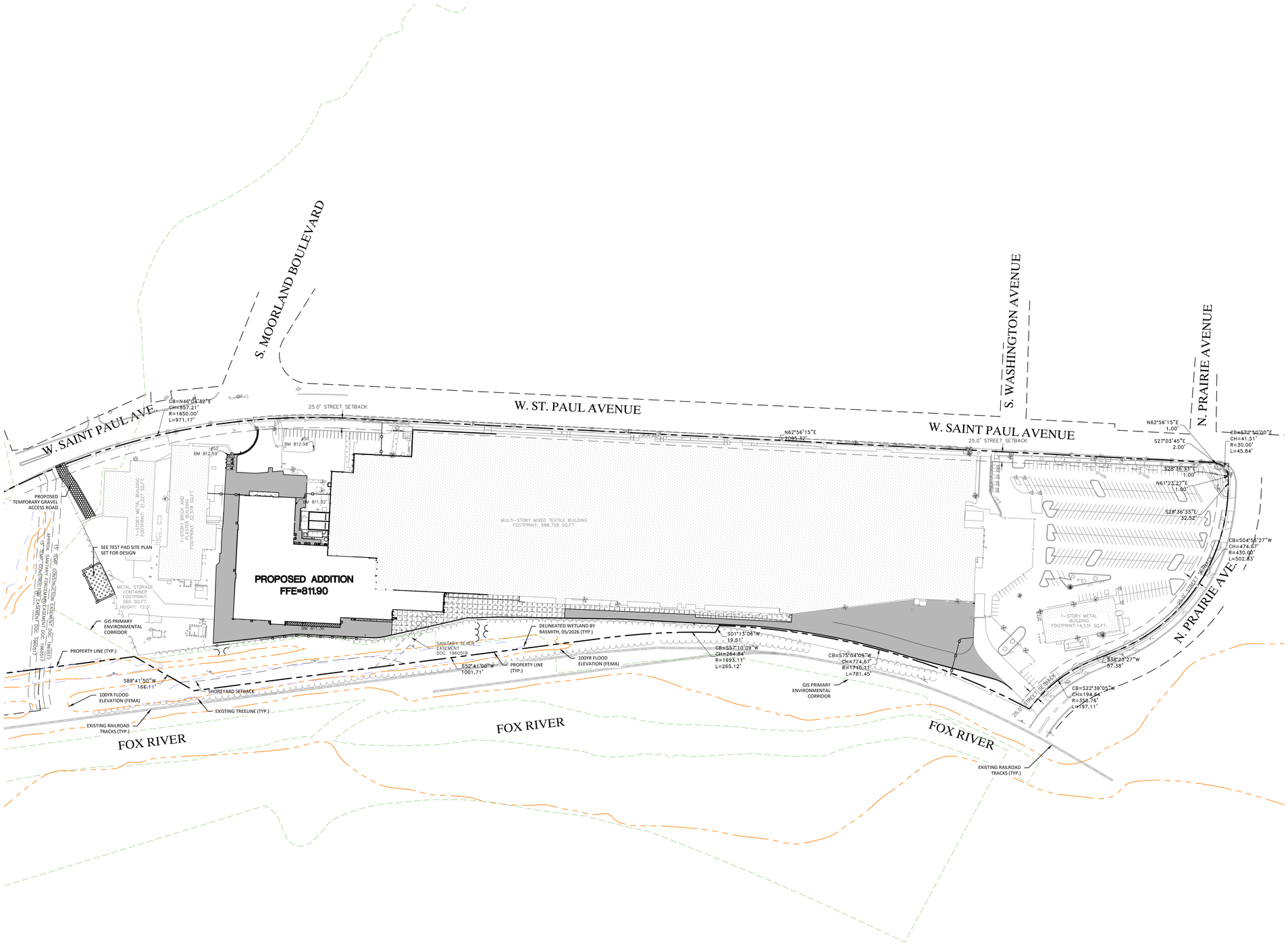
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI
FINAL EROSION CONTROL PLAN

DATE: 05/22/2026
SCALE: 1" = 60'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C201



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GRAPHIC SCALE
Feet

SITE & PAVING LEGEND

- PROPOSED PROPERTY LINE
- PRIMARY ENVIRONMENTAL CORRIDOR
- DELINEATED WETLAND
- 100 YEAR FLOOD ELEVATION
- HEAVY-DUTY CONCRETE PAVEMENT
- TEST CELL STRUCTURAL CONCRETE
- CONCRETE SIDEWALK
- HEAVY-DUTY ASPHALT PAVEMENT
- STANDARD-DUTY ASPHALT PAVEMENT
- PROPOSED GRAVEL
- PROPOSED 18" HIGH-SIDE CURB & GUTTER (AS SHOWN ON SITE PLAN)
- PROPOSED 18" STANDARD CURB & GUTTER (AS SHOWN ON SITE PLAN)
- VAN — PROPOSED ACCESSIBLE PAVEMENT MARKING VAN ACCESSIBLE STALL
- (X) — PARKING STALL COUNT
- (A) — PROPOSED ACCESSIBLE PARKING SIGNAGE
- (B) — STOP SIGN ON TEMPORARY POST

SITE & PAVING NOTES

1. EXISTING TOPOGRAPHY OBTAINED BY RASMITH INC., DATED 02/12/2026
2. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR PRECISE BUILDING DIMENSIONS, DOOR LOCATION, AND BUILDING UTILITY ENTRANCE LOCATIONS, ETC.
3. ALL PROPOSED IMPROVEMENTS SHALL BE CONSTRUCTED PARALLEL AND PERPENDICULAR TO THE EXISTING BUILDING.
4. ALL DIMENSIONS AND CORRESPONDING HORIZONTAL CONTROL RELATED TO PAVING REPRESENT FACE OF CURB, ELEVATIONS, AND CONTOURS REPRESENT FINISHED GRADES UNLESS OTHERWISE INDICATED. CURB RADII ARE 3' UNLESS OTHERWISE NOTED. BUILDINGS ARE DIMENSIONED TO FACE OF BUILDING.

SITE DATA

START DATE: JUNE 2026
END DATE: DECEMBER 2027

RECEIVING WATERS: FOX RIVER

CURRENT ZONING: M-2 GENERAL MANUFACTURING

SETBACKS:
STREET: 25'
SHOREYARD: 75' FROM ORDINARY HIGHWATER MARK

	SQFT	AC	COVERAGE
PARCEL AREA	1,689,150	38.78	100.0%
LIMITS OF DISTURBANCE	245,678	5.64	14.5%
PROJECT SITE AREA	245,678	5.64	100.0%
PROPOSED IMPERVIOUS AREA	236,249	5.42	96.2%
PROPOSED PERVIOUS AREA	9,451	0.21	3.8%

PARKING DATA

EXISTING STANDARD SPACES	510
EXISTING ACCESSIBLE SPACES	17
EXISTING TOTAL SPACES	527
PROVIDED STANDARD SPACES	402
PROVIDED ACCESSIBLE SPACES	16
PROVIDED TOTAL SPACES	418

PARKING SPACE DIMENSIONS: 9' WIDE X 18' DEEP W/ 2.0' OVERHANG
90° SPACE (STANDARD)

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R.A.SMITH, INC. ASSUMES NO RESPONSIBILITY FOR DAMAGES, LIABILITY OR COSTS RESULTING FROM CHANGES OR ALTERATIONS MADE TO THIS PLAN WITHOUT THE EXPRESSED WRITTEN CONSENT OF R.A.SMITH, INC.

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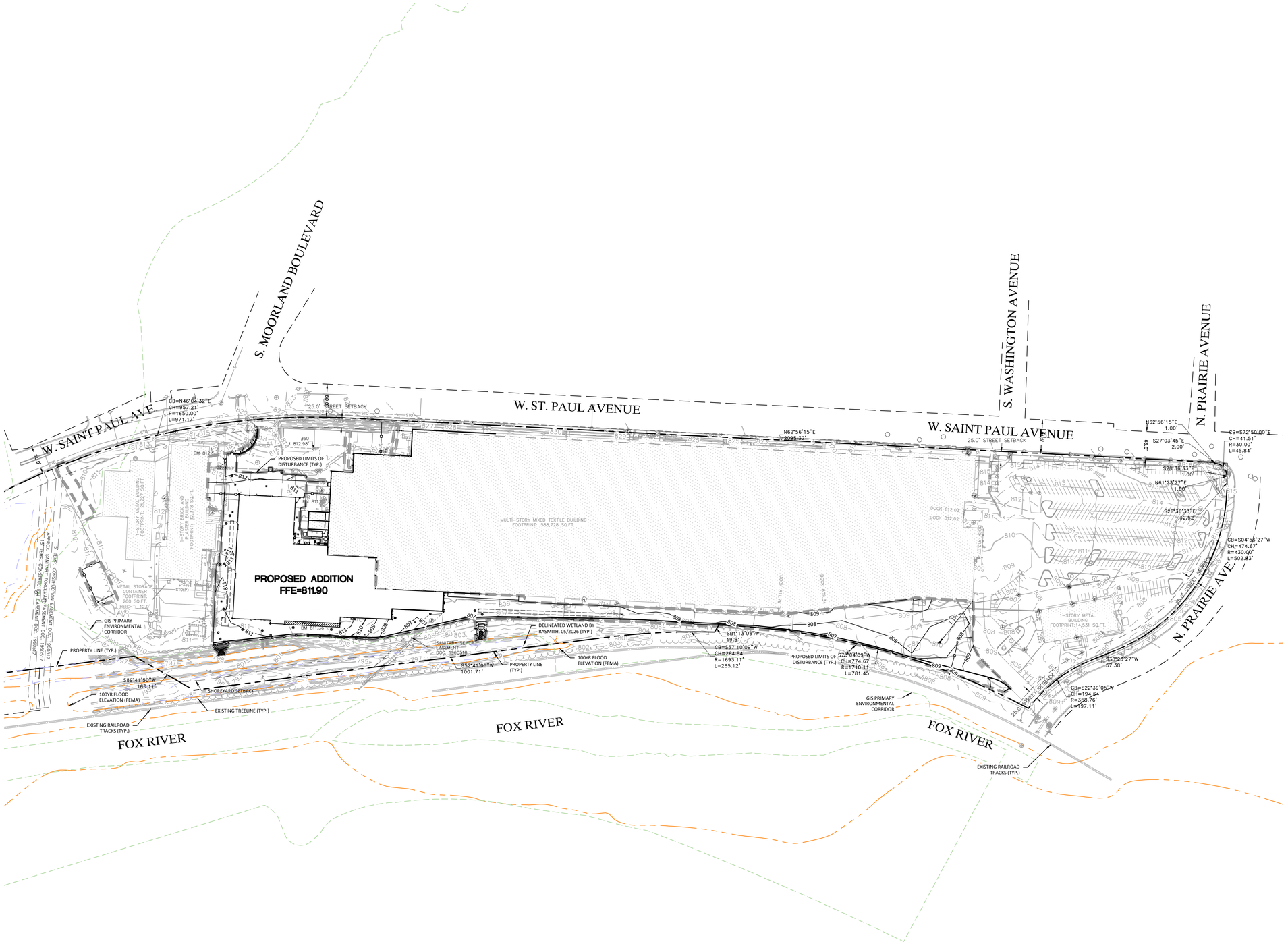
rasmith.com
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

SITE PLAN
OVERALL

DATE: 05/22/2026
SCALE: 1" = 100'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C300



GRADING LEGEND

- PROPOSED PROPERTY LINE
- PRIMARY ENVIRONMENTAL CORRIDOR
- DELINEATED WETLAND
- 100 YEAR FLOOD ELEVATION
- LIMITS OF DISTURBANCE
- 869 — EXISTING 1-FOOT GRADE CONTOUR
- 870 — EXISTING 5-FOOT GRADE CONTOUR
- 869 — PROPOSED 1-FOOT GRADE CONTOUR
- 870 — PROPOSED 5-FOOT GRADE CONTOUR
- 877.70 — PROPOSED SPOT GRADE
- (877.70) — PROPOSED TOP OF CURB
- 877.708 — PROPOSED SPOT GRADE TO MATCH EXISTING
- PROPOSED DIRECTIONAL SLOPE ARROW
- PROPOSED EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE

GRADING NOTES

1. EXISTING TOPOGRAPHY OBTAINED BY RASMITH INC., DATED 02/12/2026
2. CONTRACTOR TO VERIFY ALL EXISTING TOPOGRAPHY AND STRUCTURES ON THE SITE AND IMMEDIATELY NOTIFY THE ENGINEER ON ANY DISCREPANCIES PRIOR TO STARTING WORK.
3. THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR THE COMPUTATIONS OF ALL GRADING AND FOR ACTUAL LAND BALANCE, INCLUDING UTILITY TRENCH SPOIL. THE CONTRACTOR SHALL IMPORT OR EXPORT MATERIAL AS NECESSARY TO COMPLETE THE PROJECT.
4. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT INCLUDED IN THE BID DOCUMENTS FOR STRUCTURAL FILL AND COMPACTION REQUIREMENTS., WHICH SHALL BE PROOF-ROLLED AND INSPECTED BY THE OWNERS TESTING AGENCY PRIOR TO PAVING. NO FILL SHALL BE PLACED ON WET, FROZEN, OR SOFT SUBGRADE.
5. ALL SIDEWALKS AND ACCESSIBLE ROUTES SHALL HAVE A MAXIMUM 2.00% CROSS SLOPE AND A RUNNING SLOPE NO GREATER THAN 5.00%.
6. ADA STALLS SHOULD BE NO MORE THAN 2.00%. IN ALL DIRECTIONS.
7. MAXIMUM SLOPE IN LANDSCAPE AREAS SHALL BE 4:1 UNLESS OTHERWISE NOTED.
8. WHEN GRADE FLOWS AWAY FROM PROPOSED CURB, REJECT CURB SHALL BE INSTALLED.
9. MATCH EXISTING ELEVATION AT LIMITS OF CONSTRUCTION.
10. ADJUST ALL EXISTING MANHOLES, VALVES, INLETS, ETC. TO FINISHED GRADE, AS NECESSARY.

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Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

GRADING PLAN
OVERALL

DATE: 05/22/2026
SCALE: 1" = 100'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C400

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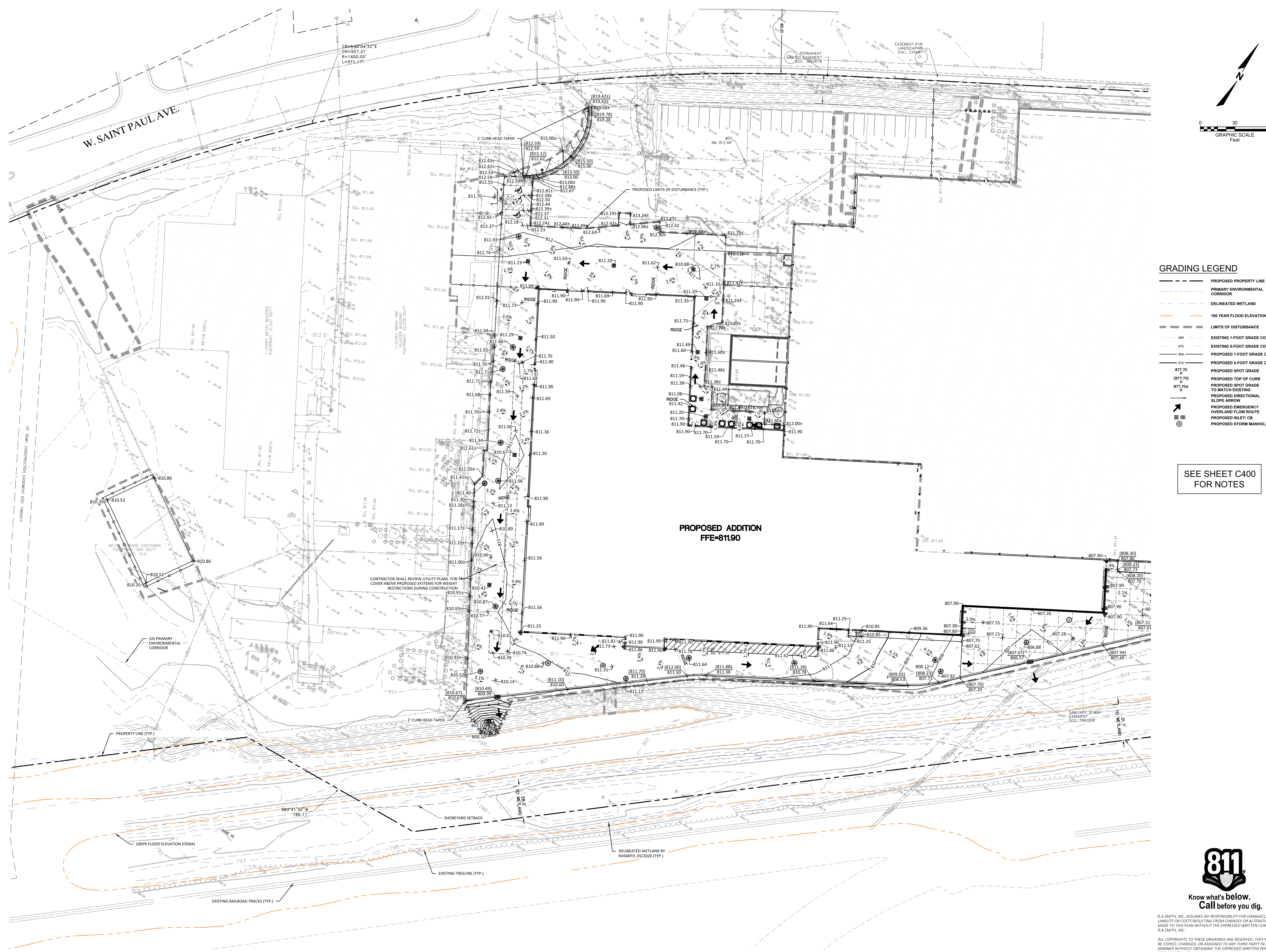

GRADING LEGEND

	PROPOSED PROPERTY LINE
	PRIMARY ENVIRONMENTAL CORRIDOR
	DELINEATED WETLAND
	100 YEAR FLOOD ELEVATION
	LIMITS OF DISTURBANCE
869	EXISTING 1-FOOT GRADE CONTOUR
870	EXISTING 5-FOOT GRADE CONTOUR
869	PROPOSED 1-FOOT GRADE CONTOUR
870	PROPOSED 5-FOOT GRADE CONTOUR
877.70 ×	PROPOSED SPOT GRADE
(877.70) ×	PROPOSED TOP OF CURB
877.70± ×	PROPOSED SPOT GRADE TO MATCH EXISTING
	PROPOSED DIRECTIONAL SLOPE ARROW
	PROPOSED EMERGENCY OVERLAND FLOW ROUTE
	PROPOSED INLET/ CB
	PROPOSED STORM MANHOLE

SEE SHEET C400 FOR NOTES

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Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

GRADING PLAN
BUILDING ADDITION

DATE: 05/22/2026
SCALE: 1" = 30'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C401

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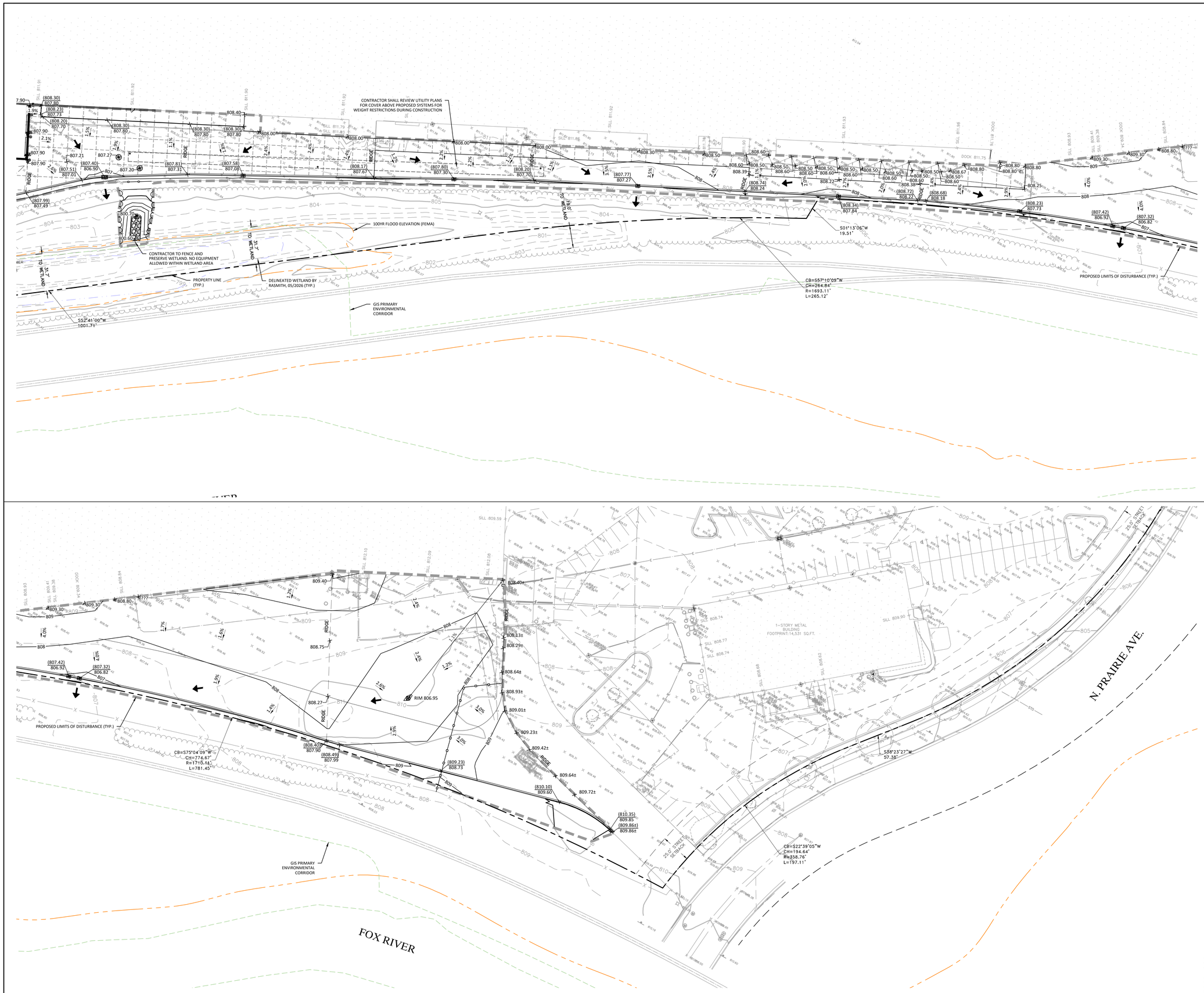

SEE SHEET C400 FOR NOTES

GRADING LEGEND

- PROPOSED PROPERTY LINE
- PRIMARY ENVIRONMENTAL CORRIDOR
- DELINEATED WETLAND
- 100 YEAR FLOOD ELEVATION
- LIMITS OF DISTURBANCE
- 869 EXISTING 1-FOOT GRADE CONTOUR
- 870 EXISTING 5-FOOT GRADE CONTOUR
- 869 PROPOSED 1-FOOT GRADE CONTOUR
- 870 PROPOSED 5-FOOT GRADE CONTOUR
- 877.70 PROPOSED SPOT GRADE
- (877.70) PROPOSED TOP OF CURB
- 877.70± PROPOSED SPOT GRADE TO MATCH EXISTING
- PROPOSED DIRECTIONAL SLOPE ARROW
- PROPOSED EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE

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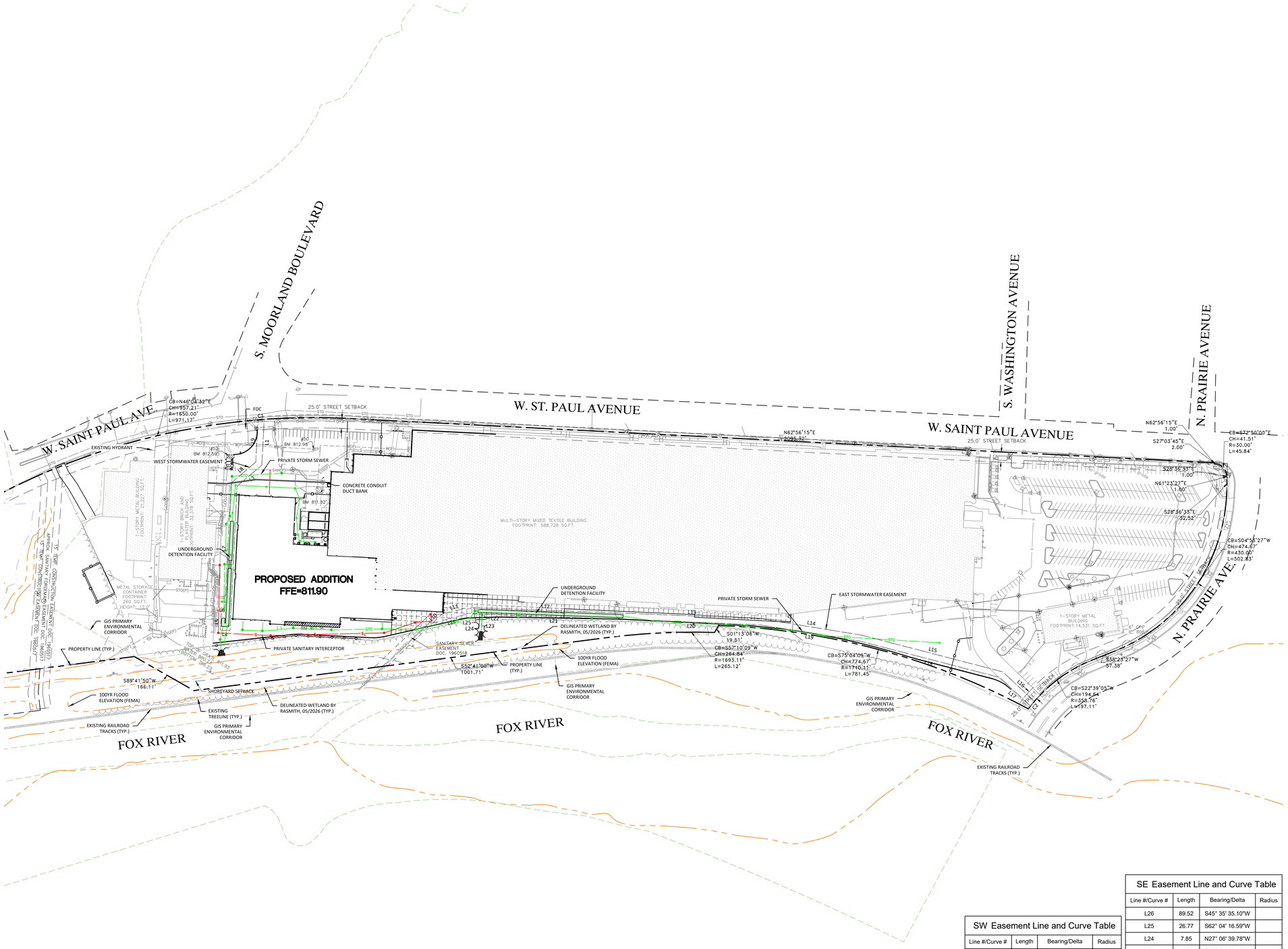
INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

GRADING PLAN
ACCESS ROAD

DATE: 05/22/2026
SCALE: 1" = 30'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C402



UTILITY LEGEND

- PROPOSED PROPERTY LINE
- PRIMARY ENVIRONMENTAL CORRIDOR
- DELINEATED WETLAND
- 100 YEAR FLOOD ELEVATION
- EXISTING GAS LINE
- EXISTING ELECTRIC LINE
- EXISTING TELEPHONE LINE
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED GAS LINE
- PROPOSED ELECTRIC LINE
- PROPOSED TELEPHONE LINE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE
- PROPOSED AREA DRAIN
- PROPOSED SANITARY MANHOLE

UTILITY NOTES

1. EXISTING TOPOGRAPHY OBTAINED BY RASMITH INC., DATED 02/12/2026
2. THE CONTRACTOR SHALL CONTACT DIGGERS HOTLINE TO LOCATE UTILITIES PRIOR TO START OF EXCAVATION.
3. THE LOCATION AND ELEVATION OF UNDERGROUND UTILITIES SHOWN ON THE PLANS BASED ON INFORMATION PROVIDED BY THE AUTHORITY HAVING JURISDICTION (AHJ) OR, FIELD SURVEY, WHERE POSSIBLE. THE UTILITIES SHOWN ON THE PLAN CANNOT BE GUARANTEED AS EXACT OR COMPLETE.
4. BEFORE PROCEEDING WITH ANY UTILITY CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE EACH EXISTING LATERAL OR POINT OF CONNECTION AND VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES. IF ANY EXISTING UTILITIES ARE NOT AS SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR POSSIBLE REDESIGN.
5. CONTRACTOR SHALL VERIFY ALL BUILDING SERVICE CONNECTION POINTS WITH ARCHITECTURAL PLANS PRIOR TO CONSTRUCTION.
6. PIPE LENGTH DISTANCES AND ELEVATION ARE GIVEN TO THE CENTER OF STORM STRUCTURES. OUTFALL STRUCTURES SHALL BE PLACED TO BLEND WITH EXISTING OR PROPOSED TOPOGRAPHY.
7. RIM ELEVATION ARE GIVEN TO THE FLOWLINE FOR INLET GRATES OR THE CENTER OF MANHOLE CASTING FOR MANHOLES.
8. REFER TO THE CONSTRUCTION SPECIFICATION FOR PIPE MATERIALS. STORM SEWER SHALL BE HDPE UNLESS OTHERWISE NOTED ON THIS PLAN.
9. VERTICAL AND HORIZONTAL SEPARATION STANDARDS FOR WATER AND SEWER SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR WATER AND SEWER CONSTRUCTION IN WISCONSIN.
10. PROPOSED ELECTRIC, GAS, AND TELECOMMUNICATION LINES ARE SHOWN IN APPROXIMATE LOCATIONS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO APPLY FOR NEW/RELOCATED FACILITIES AND TO COORDINATE FINAL LOCATION WITH THE UTILITY COMPANIES. ALL UTILITY COMPANY FEES SHALL BE PAID BY THE OWNER.
11. RIMS OF EXISTING STRUCTURES SHALL BE ADJUSTED TO FINAL GRADE.
12. SANITARY SEWER LATERALS SHALL HAVE A GREEN #12 LOCATER WIRE INSTALLED ALONG THE ENTIRE LENGTH. LOCATER WIRE SHALL BE BROUGHT TO THE SURFACE AT THE EDGE OF THE BUILDING AND ENCLOSED IN A CURB BOX WITH "SEWER" ON THE COVER.

CITY OF WAUKESHA UTILITY NOTES

1. ALL SANITARY SEWER TO BE INSTALLED IN ACCORDANCE WITH CITY OF WAUKESHA STANDARDS.
2. ALL APPLICATIONS AND FEES FOR SANITARY SEWER MUST BE COMPLETED AND PAID PRIOR TO CONNECTION TO SEWER SYSTEMS
3. ANY UTILITY WORK IN THE RIGHT-OF-WAY AND ALL SANITARY SEWER CONNECTIONS TO BE INSPECTED BY CITY. NOTIFY CITY 72 HOURS IN ADVANCE OF CONNECTING TO SEWER
4. WHEN STARTING AN INSTALLATION, THE FARTHEST DOWNSTREAM LOCATION OF THE NEW SANITARY SEWER SYSTEM SHALL HAVE A PLUG INSTALLED AND MAINTAINED BY THE UTILITY CONTRACTOR, THAT PLUG SHALL NOT BE REMOVED UNTIL THE SYSTEM HAS BEEN ACCEPTED BY THE CITY ENGINEER AND DEEMED OPERATIONAL BY THE CITY.
5. THE EXISTING PARCEL HAS A SANITARY SEWER LATERAL CONNECTING THE CITY'S SEWER MAIN. CONTRACTOR SHALL PROVIDE A PRE AND POST CONSTRUCTION SEWER LATERAL VIDEO TO CITY FOR REVIEW AND APPROVAL. IF LATERAL MAINTENANCE IS NEEDED, THEN THE LATERAL IMPROVEMENTS MAY NEED TO BE INCLUDED AS PART OF THIS PROJECT. THE LATERAL PIPE AND CONNECTION TO THE MAIN MAY NEED TO BE LINED OR REPLAYED TO REDUCE INFILTRATION INTO THE CITY'S SANITARY SEWER SYSTEM OR IMPROVE THE STRUCTURAL INTEGRITY.
6. A RECORD DRAWING OF THE SANITARY/STORM SEWER FACILITIES SEALED BY A PROFESSIONAL ENGINEER OR REGISTERED LAND SURVEYOR SHALL BE SUBMITTED TO THE ENGINEERING DEPARTMENT.
7. THE CONTRACTOR SHALL VERIFY THE EXISTING STORM PIPE MATERIAL THAT THE PROPOSED PIPE IS BEING CONNECTED TO.
8. THE STORM WATER FACILITY SHALL BE INSPECTED BY A CITY OF WAUKESHA INSPECTOR AT LEAST ONCE DURING CONSTRUCTION AND ONCE AFTER THE FINAL SITE STABILIZATION OF THE SITE.
9. ALL WORK WITHIN THE CITY RIGHT OF WAY AND CITY EASEMENTS SHALL BE IN ACCORDANCE WITH CURRENT CITY STANDARD SPECIFICATIONS AND DETAILS.

SW Easement Line and Curve Table

Line #/Curve #	Length	Bearing/Delta	Radius
C1	15.13	0.53	1650.00
L1	110.76	N27° 02' 08.12"W	
L2	78.53	N19° 39' 08.31"E	
L3	349.59	N27° 11' 37.86"W	
L4	23.00	N62° 48' 22.14"E	
L5	39.42	S27° 11' 37.86"E	
L6	8.20	S62° 48' 22.14"W	
L7	316.67	S27° 13' 49.40"E	
L8	78.56	S19° 39' 08.31"W	
L9	102.35	S27° 02' 08.12"E	

SE Easement Line and Curve Table

Line #/Curve #	Length	Bearing/Delta	Radius
L26	89.52	S45° 35' 35.10"W	
L25	26.77	S62° 04' 16.59"W	
L24	7.85	N27° 06' 39.78"W	
L23	12.00	S62° 04' 16.59"W	
L22	7.85	S27° 06' 39.78"E	
L21	334.02	S62° 04' 16.59"W	
L20	332.17	S62° 22' 11.66"W	
L19	243.94	S69° 14' 25.12"W	
L18	348.98	S74° 33' 35.42"W	
L17	101.66	N76° 58' 01.98"W	
L16	104.52	S76° 58' 01.98"E	
L15	353.48	N74° 33' 35.42"E	
L14	245.54	N69° 14' 25.12"E	
L13	333.11	N62° 22' 11.66"E	
L12	375.00	N62° 04' 16.59"E	
L11	64.81	N45° 35' 35.10"E	
L10	30.79	N16° 26' 08.08"E	
C2	15.03	2.40	358.76

Know what's below. Call before you dig.

DATE	DESCRIPTION

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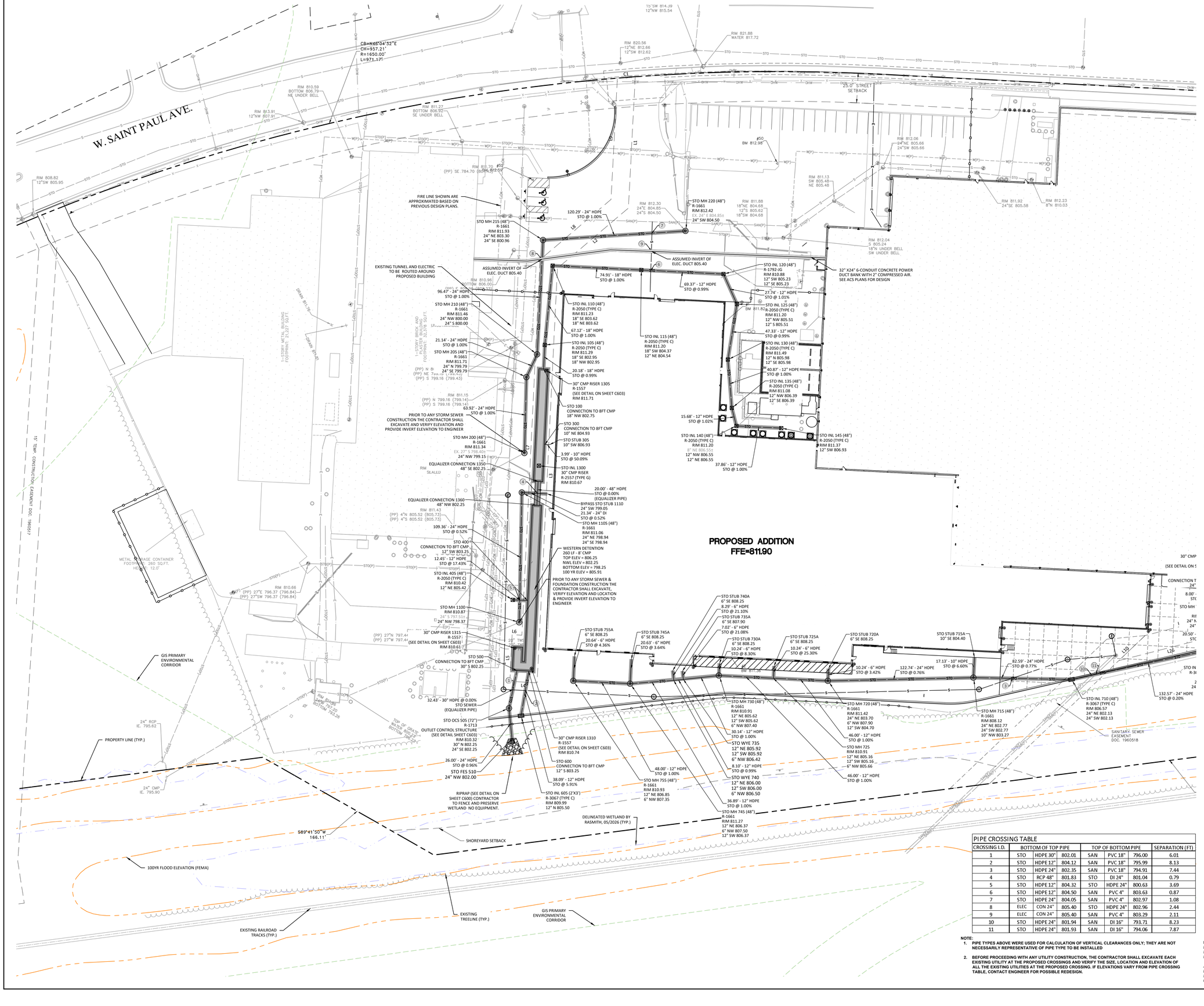
rasmith.com
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

UTILITY PLAN OVERALL

DATE: 05/22/2026
SCALE: 1" = 100'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C500



UTILITY LEGEND

- PROPOSED PROPERTY LINE
- PRIMARY ENVIRONMENTAL CORRIDOR
- DELINEATED WETLAND
- 100 YEAR FLOOD ELEVATION
- EXISTING GAS LINE
- EXISTING ELECTRIC LINE
- EXISTING TELEPHONE LINE
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED GAS LINE
- PROPOSED ELECTRIC LINE
- PROPOSED TELEPHONE LINE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE
- PROPOSED AREA DRAIN
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER

SEE SHEET C500 FOR NOTES

PIPE CROSSING TABLE							
CROSSING I.D.	BOTTOM OF TOP PIPE			TOP OF BOTTOM PIPE			SEPARATION (FT)
1	STO	HDPE 30"	802.01	SAN	PVC 18"	796.00	6.01
2	STO	HDPE 12"	804.12	SAN	PVC 18"	795.99	8.13
3	STO	HDPE 24"	802.35	SAN	PVC 18"	794.91	7.44
4	STO	RCP 48"	801.83	STO	DI 24"	801.04	0.79
5	STO	HDPE 12"	804.32	STO	HDPE 24"	800.63	3.69
6	STO	HDPE 12"	804.50	SAN	PVC 4"	803.63	0.87
7	STO	HDPE 24"	804.05	SAN	PVC 4"	802.97	1.08
8	ELEC	CON 24"	805.40	STO	HDPE 24"	802.96	2.44
9	ELEC	CON 24"	805.40	SAN	PVC 4"	803.29	2.11
10	STO	HDPE 24"	801.94	SAN	DI 16"	793.71	8.23
11	STO	HDPE 24"	801.93	SAN	DI 16"	794.06	7.87

NOTE:
1. PIPE TYPES ABOVE WERE USED FOR CALCULATION OF VERTICAL CLEARANCES ONLY; THEY ARE NOT NECESSARILY REPRESENTATIVE OF PIPE TYPE TO BE INSTALLED
2. BEFORE PROCEEDING WITH ANY UTILITY CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE EACH EXISTING UTILITY AT THE PROPOSED CROSSINGS AND VERIFY THE SIZE, LOCATION AND ELEVATION OF ALL THE EXISTING UTILITIES AT THE PROPOSED CROSSING. IF ELEVATIONS VARY FROM PIPE CROSSING TABLE, CONTACT ENGINEER FOR POSSIBLE REDESIGN.

Know what's below. Call before you dig.

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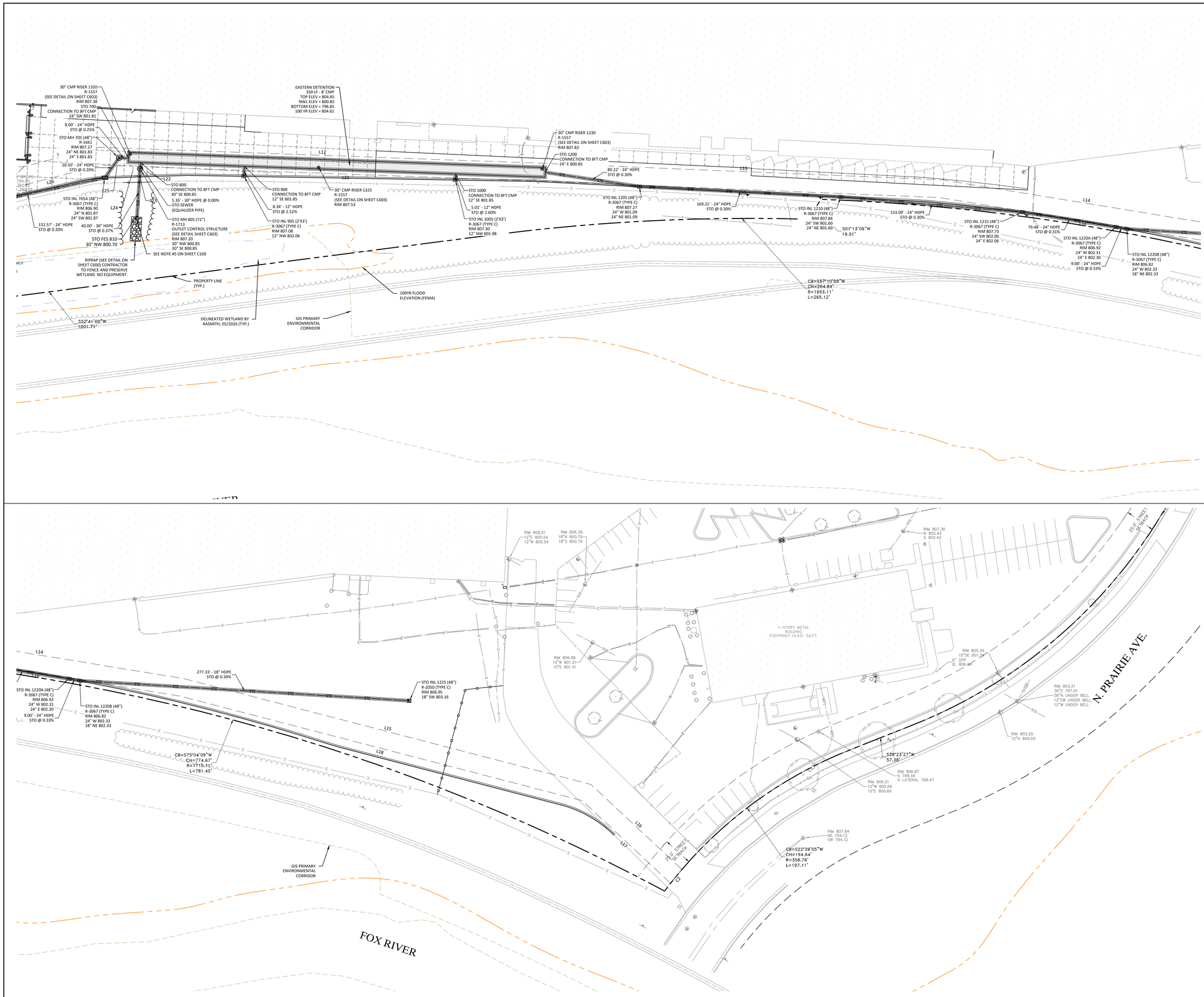
INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

STORM UTILITY PLAN
BUILDING ADDITION

DATE: 05/22/2026
SCALE: 1" = 30'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C501



UTILITY LEGEND

- PROPOSED PROPERTY LINE
- PRIMARY ENVIRONMENTAL CORRIDOR
- DELINEATED WETLAND
- 100 YEAR FLOOD ELEVATION
- EXISTING GAS LINE
- EXISTING ELECTRIC LINE
- EXISTING TELEPHONE LINE
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED GAS LINE
- PROPOSED ELECTRIC LINE
- PROPOSED TELEPHONE LINE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE
- PROPOSED AREA DRAIN
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER

SEE SHEET C500
FOR NOTES

Know what's below.
Call before you dig.

DESCRIPTION	DATE

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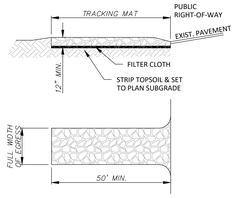
rasmith.com
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

STORM UTILITY PLAN
ACCESS ROAD

DATE: 05/22/2026
SCALE: 1" = 30'
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C502



CONSIDERATIONS:

1. *TIRE WASHING AND TRACKING PAD TO CONFORM TO WDNR CONSERVATION PRACTICE STANDARD 1057.*
2. *VEHICLES TRAVELING ACROSS THE TRACKING PAD SHOULD MAINTAIN A SLOW CONSTANT SPEED.*
3. *THE BEST APPROACH TO PREVENTING OFF-SITE TRACKING IS TO RESTRICT VEHICLES TO STABILIZED AREAS.*
4. *IT IS ALWAYS PREFERABLE TO PREVENT SEDIMENT FROM BEING DEPOSITED UPON THE ROAD THAN CLEANING THE ROAD LATER. SEDIMENT ON A ROAD CAN CREATE A SAFETY HAZARD AS WELL AS A POLLUTION PROBLEM.*
5. *ANY SEDIMENT TRACKED ONTO A PUBLIC OR PRIVATE ROAD SHOULD BE REMOVED BY STREET CLEANING, NOT FLUSHING, BEFORE THE END OF EACH WORKING DAY.*

NOTES:

A. TRACKING PAD:

1. *THE TRACKING PAD SHALL BE INSTALLED PRIOR TO ANY TRAFFIC LEAVING THE SITE.*
2. *THE AGGREGATE FOR THE TRACKING PAD SHALL BE HARD, DURABLE, ANGULAR STONE OR RECYCLED CONCRETE MEETING THE GRADATION OF TABLE 1 OF THE WISCONSIN DNR TECHNICAL STANDARD 1057. WHERE THIS GRADATION IS NOT AVAILABLE, MEET THE GRADATION IN WISCONSIN DEPARTMENT OF TRANSPORTATION (DOT) 2018 STANDARD SPECIFICATION, SECTION 312, SELECT CRUSHED MATERIAL.*
3. *THE AGGREGATE SHALL BE PLACED IN A LAYER AT LEAST 12 INCHES THICK. ON SITES WITH A HIGH WATER TABLE, OR WHERE SATURATED CONDITIONS ARE EXPECTED DURING THE LIFE OF THE PRACTICE, STONE TRACKING PADS SHALL BE UNDERLAIN WITH A WISDOT TYPE R GEOTEXTILE FABRIC TO PREVENT MIGRATION OF UNDERLYING SOIL INTO THE STONE.*
4. *THE TRACKING PAD SHALL BE THE FULL WIDTH OF THE EGRESS POINT. THE TRACKING PAD SHALL BE A MINIMUM OF 50 FEET LONG.*
5. *SURFACE WATER MUST BE PREVENTED FROM PASSING THROUGH THE TRACKING PAD. FLOWS SHALL BE DIVERTED AWAY FROM TRACKING PADS OR CONVEYED UNDER AND AROUND THEM BY USING A VARIETY OF PRACTICES, SUCH AS CULVERTS, WATER BARS, OR OTHER SIMILAR PRACTICES.*

B. TIRE WASHING:

IF CONDITIONS ON THE SITE ARE SUCH THAT THE SEDIMENT IS NOT REMOVED FROM VEHICLE TIRES BY THE TRACKING PAD, THEN TIRES SHALL BE WASHED UTILIZING PRESSURIZED WATER BEFORE ENTERING A PUBLIC ROAD.

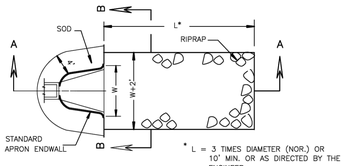
1. *THE WASHING STATION SHALL BE LOCATED ON-SITE ON AN AREA THAT IS STABILIZED AND DRAINS INTO A SUITABLE SEDIMENT TRAPPING OR SETTLING DEVICE.*
2. *THE WASH RACK SHALL CONSIST OF A HEAVY GRATING OVER A LOWERED AREA. THE RACK SHALL BE STRONG ENOUGH TO SUPPORT THE VEHICLES THAT WILL CROSS IT.*

C. MAINTENANCE

1. *ROCKS LODGED BETWEEN THE TIRES IF DUAL WHEEL VEHICLES SHALL BE REMOVED PRIOR TO LEAVING THE CONSTRUCTION SITE.*
2. *TRACKING PADS AND TIRE WASHING STATIONS SHALL, AT AT MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.*
3. *THE TRACKING PAD PERFORMANCE SHALL BE MAINTAINED BY SCRAPING OR TOP-DRESSING WITH ADDITIONAL AGGREGATE.*
4. *A MINIMUM 12-INCH THICK PAD SHALL BE MAINTAINED.*

STONE TRACKING PAD AND TIRE WASHING

(NOT TO SCALE)



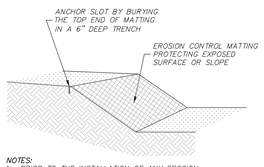
DIMENSIONS

OUTLET	L	W	W + 2	d50	d50 x 2
810	20.5'	7.0'	9.0'	9"	1.5'
510	13.75'	8.0"	10.0'	9"	1.5'

RIPRAP SHALL COMPLY WITH THE SECTION 606 OF THE STATE OF WISCONSIN STANDARD FOR HIGHWAY AND STRUCTURE CONSTRUCTION.

PLAN VIEW CONTOURS AND GRADES REPRESENT PROPOSED TOP OF RIPRAP ELEVATIONS.

CITY OF WAUKESHA DEPARTMENT OF PUBLIC WORKS	STANDARD CONSTRUCTION DETAILS --RIPRAP AND GEOTEXTILE FABRIC AT APRON ENDWALLS--			
APPROVED: ALEX DAMZEN DATE: APPROVED: DATE:	DRAWN BY: DSB DATE: CHECKED BY: DATE:	PLOT SCALE 20.000' PLOT DATE 12/13/2018 8:20 AM	DETAIL NUMBER: PROJECT NO:	05-0400



NOTES:
1. PRIOR TO THE INSTALLATION OF ANY EROSION CONTROL MATTING, ALL ROCKS, DIRT CLODS, STUMPS, ROOTS, TRASH AND ANY OTHER OBSTRUCTIONS WHICH WOULD PREVENT THE MAT FROM LAYING IN DIRECT CONTACT WITH THE SOIL SHALL BE REMOVED.
2. EROSION CONTROL MATTING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 628 OF THE WISCONSIN DOT STANDARD SPECIFICATIONS, DNR TECHNICAL STANDARD 1052 (NON CHANNEL APPLICATIONS), DNR TECHNICAL STANDARD 1053 (CHANNEL APPLICATIONS), AND LATEST MANUFACTURER SPECIFICATIONS, ESPECIALLY NOTING REQUIRED STAPLE PATTERNS AND ANCHOR TRENCH REQUIREMENTS.
3. INSTALLATION PROCEDURES MUST INSURE THAT THE MAT WILL REMAIN IN CONTACT WITH THE SOIL.
4. THE MATTING SHALL BE ANCHORED PER MANUFACTURER REQUIREMENTS.
5. THE MATTING SHALL BE ANCHORED TO THE GROUND PER MANUFACTURER REQUIREMENTS.
6. TEMPORARY EROSION CONTROL MATTING SHALL BE NORTH AMERICAN GREEN S150 BN, AND PERMANENT EROSION CONTROL MATTING SHALL BE CLASS 1 TYPE B.
7. MATTED AREAS MUST BE INSPECTED ON A WEEKLY BASIS, AND AFTER EACH SIGNIFICANT RAINFALL. BARE SPOTS, MISSING OR LOOSENED MATTING MUST BE IMMEDIATELY REPLACED AND/OR RE-ANCHORED.
8. FOR CHANNEL APPLICATIONS, EXTEND MAT UPSLOPE ONE-FOOT MINIMUM VERTICALLY FROM DITCH BOTTOM OR SIX-INCHES HIGHER THAN DESIGN FLOW, WHICHEVER IS GREATER.

EROSION CONTROL MATTING

(NOT TO SCALE)

EROSION CONTROL NOTES

1. **INSTALLATION – The contractor shall install EC measures per plan prior to land disturbing activities. The EC plan indicates minimum measures, the contractor shall furnish and install additional measures as required to secure the site and as directed by the City or any other authorized agent. The contractor is responsible for repairing any damages due to sedimentation, dust, or any other materials originating from the site.**
2. **INSPECTION – The contractor shall inspect EC measures at least once per week and within 24 hours after each 0.5 inch rainfall. Log inspections on-site or online and make them available to the City and other authorized agents upon request. Use DNR Form 3400-187 or equivalent.**
3. **Maintain EC measures in accordance with the notes below and DNR Technical Standards: https://DNR.Wisconsin.gov/Topic/Stormwater/Standards/const_standards.html**
   a. **INLET PROTECTIONS – Type D shall be used in curbs and roadways unless the structure is not deep enough. Curb head boards shall not be installed in areas where and when City snow plow trucks might be in operation – See Figure 1 and DNR Tech Standard #1060**
   b. **SILT FENCE – shall be trenched and compacted at the base to prevent undercutting. Joints shall be made by twist or hook method to prevent bypassing – See Figure 2 and DNR Tech Standard #1056**
   c. **SILT SOCK – shall be in continuous contact with the ground to prevent undercutting. Joints shall be overlapped 24" and shingled in the direction of flow – See Figure 3 and DNR Tech Standard #1056**
   d. **TRACKING PAD – stone size shall be approximately 25 to 50% by weight passing the 1.5" sieve. The tracking pad shall be at least 12 inches thick, 12 feet wide, and 50 feet long with traffic restricted to pass over the length of the pad – See DNR Tech Standard #1057**
   e. **SWEEPING – and/or scraping shall occur as needed to maintain public safety and prevent sediment from reaching the storm water drainage system and at the end of each work day. See DNR Tech Standard # 1057**
   f. **STOCKPILES – shall be surrounded with silt fence or silt sock if remaining for 24 hours or longer and downstream inlets must be protected.**
   g. **STABILIZATION – Areas remaining inactive for 14 days or longer shall be temporarily stabilized. Areas shall be permanently stabilized within 7 days of reaching final grade.**
4. **REMOVAL – The contractor shall remove EC measures when land disturbing activities have ceased and the site is stabilized. Final Stabilization is achieved when uniform perennial vegetative cover is established at a density of 70% or greater for all areas not covered by permanent structures.**
5. **Permitting of GROUNDWATER DEWATERING is the responsibility of the contractor. Groundwater dewatering is subject to a DNR Discharge Permit and a WDNR High Capacity Well Approval if cumulative pump capacity is 70 GPM or more.**
6. **For more erosion control requirements, refer to City of Waukesha Standard Construction Specifications Division 3, Section 02.**
7. **PLAN REVISIONS or amendments shall be submitted to the City and WDNR at least 5 days prior to field implementation.**

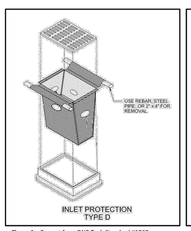


Figure 1 – Excerpt from DNR Tech Standard #1060

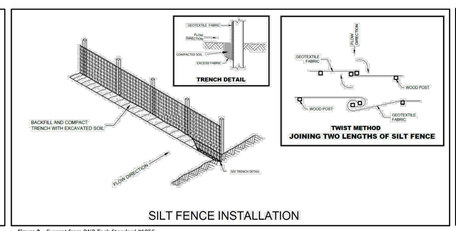


Figure 2 – Excerpt from DNR Tech Standard #1056

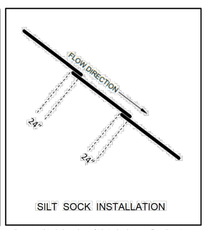


Figure 3 – Shingled overlaps of Silt Sock relative to flow direction

CITY OF WAUKESHA DEPARTMENT OF PUBLIC WORKS	STANDARD CONSTRUCTION DETAILS EROSION CONTROL			
APPROVED: ALEX DAMZEN DATE: APPROVED: DATE:	DRAWN BY: DSB DATE: CHECKED BY: DATE:	PLOT SCALE 0.876404 PLOT DATE 12/19/2022 4:13 PM	DETAIL NUMBER: PROJECT NO:	02-0001 STANDARD DETAILS

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Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

DATE	DESCRIPTION

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

EROSION CONTROL DETAILS

DATE: 05/22/2026

SCALE: N.T.S.

JOB NO. 3250244

PROJECT MANAGER:
RYAN J. LANCOUR, P.E.

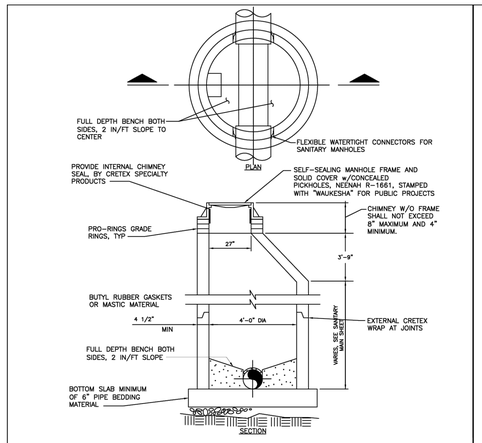
DESIGNED BY: TJR

CHECKED BY: RJY

SHEET NUMBER

C600

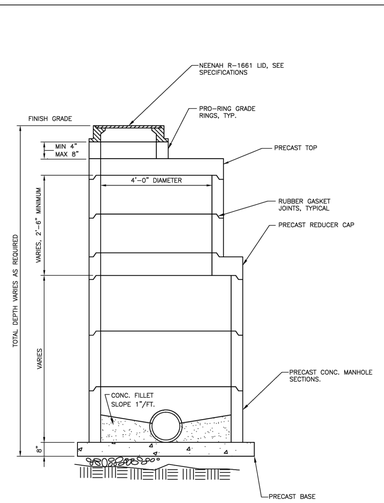
P:\3250244\Dwg\Sheets\3250244_TS01 & DT01.dwg, EROSION CONTROL 1, 5/21/2026 12:37:47 PM, TJR



NOTES:
1. MANHOLE SECTIONS, BASES AND TOP SLABS SHALL BE PRECAST REINFORCED CONCRETE.
2. JOINTS BETWEEN MANHOLE SECTIONS SHALL BE TONGUE AND GROOVE WITH COMPRESSION TYPE RUBBER GASKET OR/AND APPROVED BITUMASTIC MATERIAL.
3. THE INVERT CHANNEL SHALL BE TROWELED SMOOTH, DENSE SURFACE AND A SEMICIRCLE SHAPE CONFORMING TO THE INSIDE OF THE ADJACENT SEWER SECTIONS.
4. ALL PIPE SHALL BE GROUTED IN-PLACE INTO NEW MANHOLE WALLS. PROVIDE A WATERTIGHT, FLEXIBLE SEAL BETWEEN PIPE AND MANHOLE. CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
5. MANHOLE CASTINGS SHALL BE NEENAH R-1661 FRAME AND SELF-SEALING SOLID COVER WITH CONCEALED PICK-HOLES WITH THE "CITY OF WAUKESHA" & "DPW" ON PUBLIC MANHOLES.
6. ALL ANNULAR SPACES SHALL BE FILLED WITH A MASTIC OR CEMENTITIOUS FILLER.

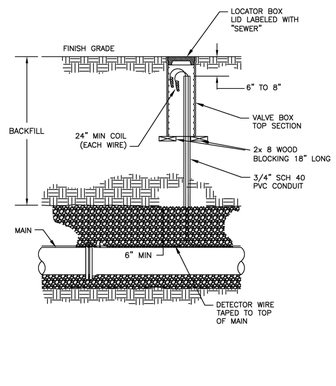
CITY OF WAUKESHA DEPARTMENT OF PUBLIC WORKS	STANDARD CONSTRUCTION DETAILS --SANITARY MANHOLE--	
APPROVED: ALEX DAMZEN DATE:	DRAWN BY: DSB DATE:	PLOT SCALE: 0.750063
APPROVED: DATE:	CHECKED BY: DATE:	PLOT DATE: 1-14-2022 5:12 PM

DETAIL NUMBER: **05-0001**
PROJECT NO: 1



CITY OF WAUKESHA DEPARTMENT OF PUBLIC WORKS	STANDARD CONSTRUCTION DETAILS STANDARD STORM MANHOLE	
APPROVED: ALEX DAMZEN DATE:	DRAWN BY: JMEIL DATE: 12/13/18	PLOT SCALE: 0.750000
APPROVED: DATE:	CHECKED BY: DATE:	PLOT DATE: 1-14-2022 5:25 PM

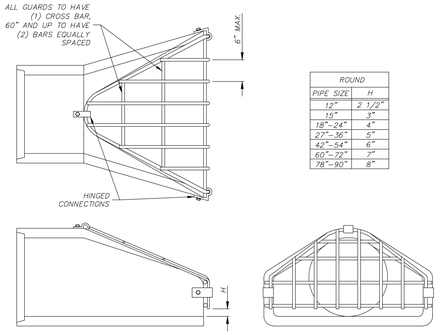
DETAIL NUMBER: **05-0003**
PROJECT NO: 1



CITY OF WAUKESHA DEPARTMENT OF PUBLIC WORKS	STANDARD CONSTRUCTION DETAILS --DETECTOR WIRE AND LOCATION BOX--	
APPROVED: ALEX DAMZEN DATE:	DRAWN BY: DSB DATE:	PLOT SCALE: 0.666667
APPROVED: DATE:	CHECKED BY: DATE:	PLOT DATE: 1-14-2022 5:08 PM

DETAIL NUMBER: **05-0100**
PROJECT NO: 1

TRASH GUARDS FOR FLARED END SECTIONS



ROUND	
PIPE SIZE	H
12"	2 1/2"
15"	3"
18"-24"	4"
27"-36"	5"
42"-54"	6"
60"-72"	7"
78"-90"	8"

BAR SIZES							
STANDARD DESIGN				HEAVY DESIGN			
PIPE SIZE	HOLE DIA. REQ'D	BOLT DIA.	BAR SIZE	PIPE SIZE	HOLE DIA. REQ'D	BOLT DIA.	BAR SIZE
12"-24"	3/4"	5/8"	5/8"	12"-18"	3/4"	5/8"	3/4"
27"-48"	7/8"	3/4"	3/4"	21"-42"	7/8"	3/4"	1"
54"-90"	1 1/8"	1"	1"	48"-90"	1 1/8"	1"	1 1/4"
BOLT LENGTH = PIPE WALL THICKNESS + 2 1/2"							

NOTE:
HOT DIP GALVANIZED PER ASTM A153.

TRASH GUARDS FOR FLARED END SECTIONS
SCALE: NOT TO SCALE DATE: DWG. NO. RCP TRASH

REF: SEC. 3.2.6(a)

STANDARD SECTION (CLASS "C" BEDDING)	
NOT TO SCALE MARCH 1976	FILE NO. 3

REF: SEC. 3.2.6(b)

STANDARD SECTION (CLASS "B" BEDDING)	
NOT TO SCALE MARCH 1976	FILE NO. 4

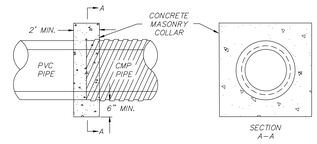
NOTE:
1. SEE FILE NO. 16A FOR DETAILS AND DIMENSIONS OF FRAME
2. USE SOLID GASKETED "SELF-SEAL" COVER.
3. FOR "SELF-SEAL" COVERS WITH 1" DIA. VENTHOLE USE APPROVED REMOVABLE PLUG.
4. MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
5. FINISH: NO PAINT

REF: SEC. 3.5.4 (e) & 8.48.0
NEENAH R-1661-B SELF-SEAL OR EQUAL

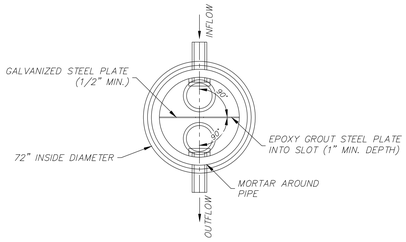
STANDARD SANITARY MANHOLE COVER	
NOT TO SCALE JULY 1987	FILE NO. 14B

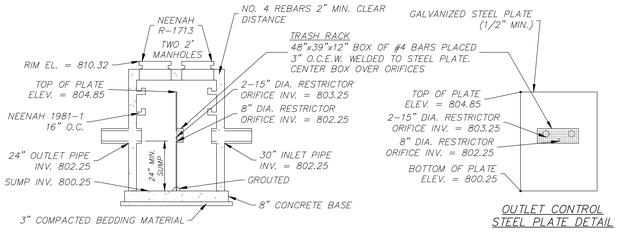
NOTES:
1. RISER PIPE SHALL BE EXTENDED ABOVE GROUND LEVEL INITIALLY & THEN IT MAY BE CUT BACK TO MATCH FINAL GRADE (BY OTHERS).
2. POSITION CLEAN-OUTS UPSTREAM OF BENDS, WHEN FEASIBLE.
3. REMOVABLE WATERTIGHT TOP ON FROST SLEEVES SUBJECT TO VEHICLE TRAFFIC SHALL BE CAST IRON.

CLEAN-OUT STRUCTURE DETAIL
(NOT TO SCALE)



CMP & PVC PIPE CONNECTION DETAIL

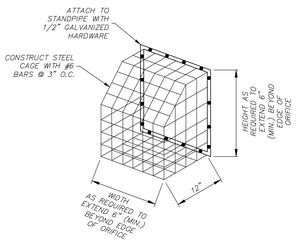




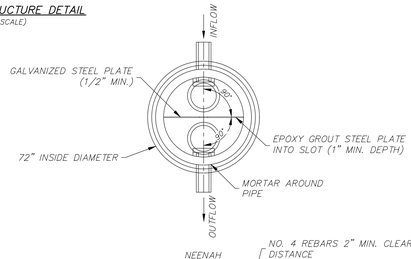
OUTLET CONTROL STEEL PLATE DETAIL

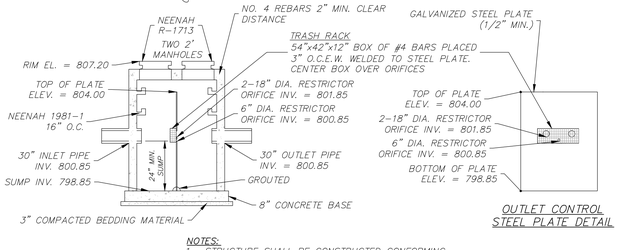
NOTES:
1. STRUCTURE SHALL BE CONSTRUCTED CONFORMING TO THE REQUIREMENTS OF ASTM C-478.
2. REINFORCING STEEL NOT SHOWN

OUTLET CONTROL STRUCTURE DETAIL – STO 505
(NOT TO SCALE)



TYPE A TRASH RACK
(NOT TO SCALE)





OUTLET CONTROL STEEL PLATE DETAIL

NOTES:
1. STRUCTURE SHALL BE CONSTRUCTED CONFORMING TO THE REQUIREMENTS OF ASTM C-478.
2. REINFORCING STEEL NOT SHOWN

OUTLET CONTROL STRUCTURE DETAIL – STO 805
(NOT TO SCALE)

DATE	DESCRIPTION
	UTILITY DETAILS

raSmith
CREATIVITY BEYOND ENGINEERING
16745 W. Bluemound Road
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rasmith.com
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

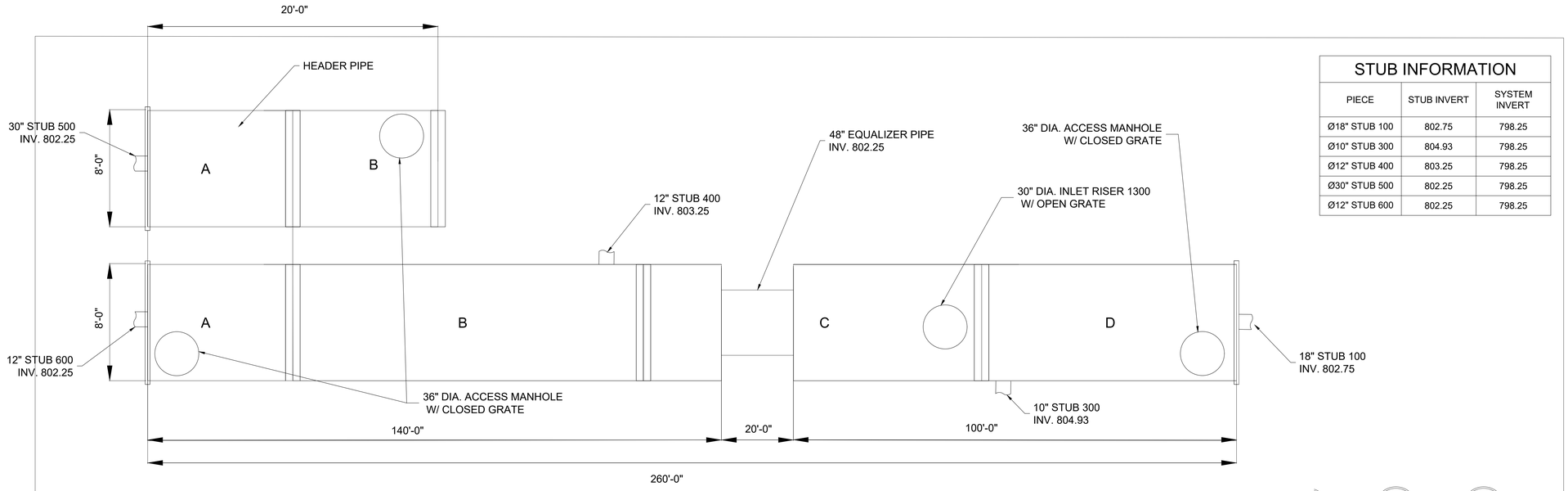
INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

UTILITY DETAILS

DATE: 05/22/2026
SCALE: N.T.S.
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

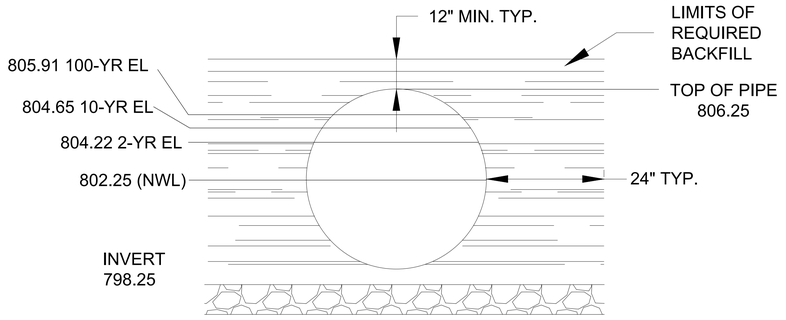
SHEET NUMBER
C602

P:\3250244\dwg\Sheets\3250244_TSO1 & DT01.dwg, SEWER, 5/21/2026 12:37:54 PM, TJR



STUB INFORMATION		
PIECE	STUB INVERT	SYSTEM INVERT
Ø18" STUB 100	802.75	798.25
Ø10" STUB 300	804.93	798.25
Ø12" STUB 400	803.25	798.25
Ø30" STUB 500	802.25	798.25
Ø12" STUB 600	802.25	798.25

LOCKSEAM GASKET DETAIL



TYPICAL SECTION VIEW
SCALE: N.T.S.

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (#) PAGES INCLUDING THE FOLLOWING:

- **VOLUME = 13,062 CF**
- **MAINLINE PIPE GAUGE =**
- **WALL TYPE =**
- **DIAMETER =**
- **FINISH =**
- **CORRUGATION =**

CUSTOMER _____ DATE _____

MARK	DATE	REVISION DESCRIPTION	BY

WEST UG BASIN
96" DIA ALUMINIZED PIPE

PROJECT No.:	SEQ. No.:	DATE:
DESIGNED:	DRAWN:	
CHECKED:	APPROVED:	
SHEET NO.: SHEET_NO.		

P:\3250244\DWG\SHEETS\3250244_TS01 & DT01.DWG 5/21/2026 12:37 PM

P:\3250244\Dwg\Sheets\3250244_TS01 & DT01.dwg, STORMWATER 1, 5/21/2026 12:37:57 PM, TJR

DESCRIPTION | DATE

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rasmith.com
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

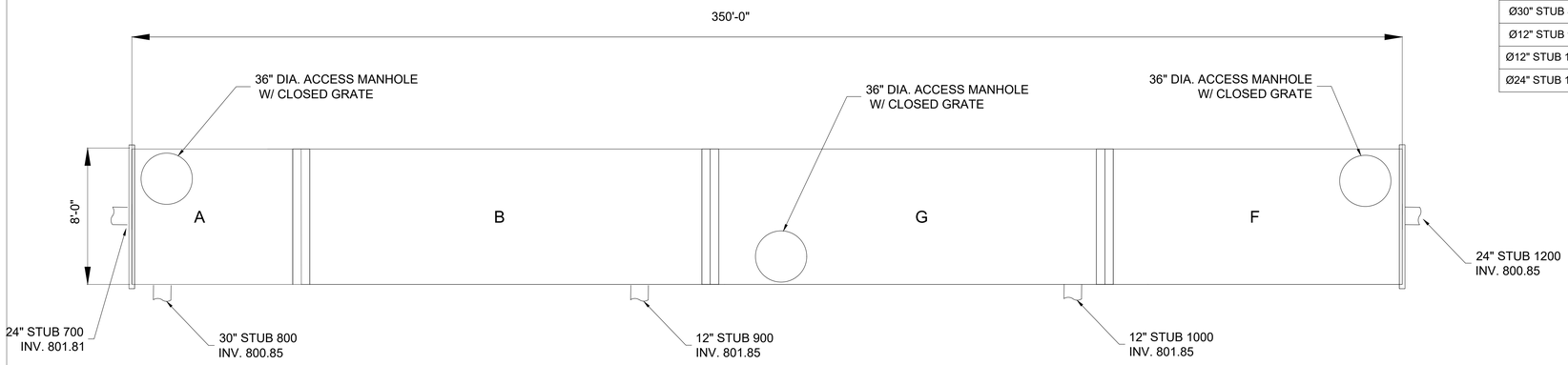
INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

CONTECH DETAILS

DATE: 05/22/2026
SCALE: N.T.S.
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C603

STUB INFORMATION		
PIECE	STUB INVERT	SYSTEM INVERT
Ø24" STUB 700	801.81	796.85
Ø30" STUB 800	800.85	796.85
Ø12" STUB 900	801.85	796.85
Ø12" STUB 1000	801.85	796.85
Ø24" STUB 1200	800.85	796.85

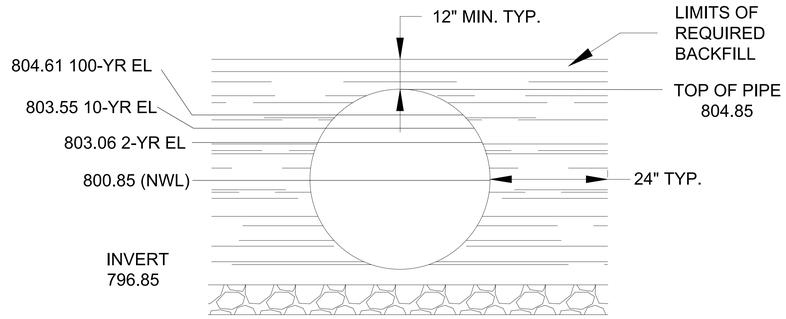


LOCKSEAM GASKET DETAIL

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (#) PAGES INCLUDING THE FOLLOWING:

- **VOLUME = 17,584 CF**
- **MAINLINE PIPE GAUGE =**
- **WALL TYPE =**
- **DIAMETER =**
- **FINISH =**
- **CORRUGATION =**

CUSTOMER _____ DATE _____



TYPICAL SECTION VIEW
SCALE: N.T.S.

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.

MARK	DATE	REVISION DESCRIPTION	BY

EAST UG BASIN
96" DIA ALUMINIZED PIPE

PROJECT No.:	SEQ. No.:	DATE:
DESIGNED:	DRAWN:	
CHECKED:	APPROVED:	
SHEET NO.: SHEET_NO.		

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DESCRIPTION | DATE

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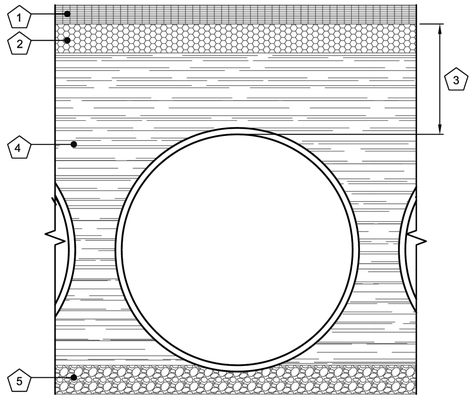
rasmith.com
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

CONTECH DETAILS

DATE: 05/22/2026
SCALE: N.T.S.
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C604



KEY:

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 96"
   18" MIN. FOR DIAMETERS FROM 102" AND LARGER MEASURED TO TOP OF RIGID OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145 A1, A2 OR A3, OR APPROVED EQUAL. PLACED IN 8" LIFTS (COMPACTED TO MIN. 90% STANDARD DENSITY PER AASHTO T99.)
5. GRANULAR BEDDING, ROUGHLY SHAPED TO FIT THE BOTTOM OF PIPE, 4" TO 6" IN DEPTH

FOUNDATION/BEDDING PREPARATION

PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4" - 6" OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

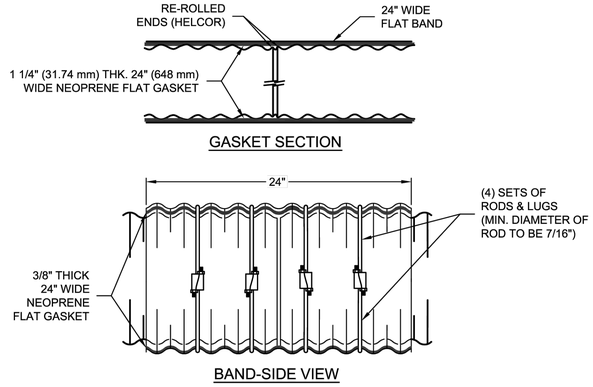
BACKFILL

THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M145, OR A WELL-GRADED GRANULAR FILL AS APPROVED BY THE SITE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

BACKFILL DETAIL

SCALE: N.T.S.



OPEN CELL NEOPRENE GASKET. ASTM SPECIFICATION D-1056, GRADE 2C3, SKINNED ALL FOUR SIDES OF ONE-PIECE CONSTRUCTION

NEOPRENE GASKET

GENERAL NOTES:

1. SLEEVE GASKET(S) ARE REQUIRED.
2. SLEEVE GASKET MUST BE ONE PIECE; TOTAL WIDTH OF ONE SLEEVE MUST BE EQUAL OR EXCEED 24".
3. MINIMUM OF TWO INDENTATION OF BAND MUST REST IN TWO INDENTATIONS ON EACH END OF PIPE.
4. A MINIMUM OF FOUR RODS AND LUGS RE REQUIRED. TWO RODS AND LUGS ON EACH SIDE OF PIPE.
5. RODS SHALL BE 7/8"Ø. ALL THREAD ROD IS NOT ACCEPTABLE. RODS MUST BE SMOOTH BAR TYPE.
6. GASKET TO BE LUBRICATED ON THE OUTSIDE BEFORE THE BAND IS APPLIED.

10-C BAND DETAIL

SCALE: N.T.S.

MARK	DATE	REVISION DESCRIPTION	BY

INNIO - PROJECT GREEN
CITY OF WAUKESHA , WI

PROJECT No.:	SEQ. No.:	DATE:
551813	010	10/21/2016
DESIGNED: DRA	DRAWN: DRA	
CHECKED:	APPROVED:	
SHEET NO.: P2 OF 3		

DESCRIPTION | DATE

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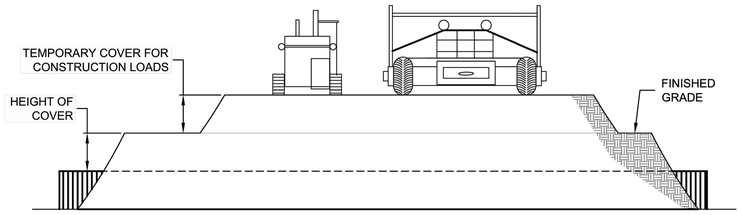
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

CONTECH DETAILS

DATE: 05/22/2026
SCALE: N.T.S.
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C605



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

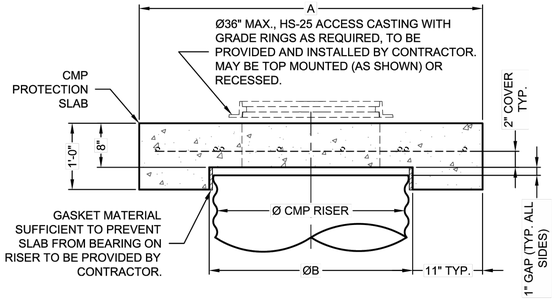
INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

MATERIAL SPECIFICATION

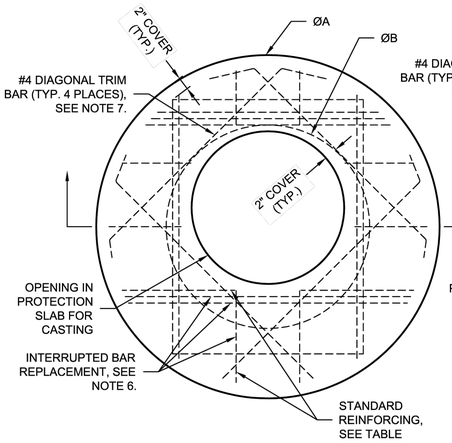
SCALE: N.T.S.



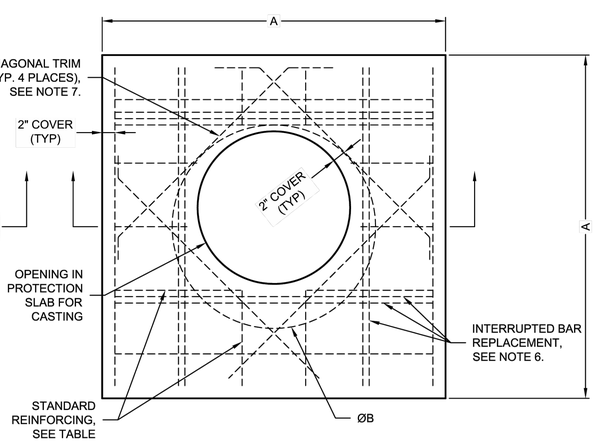
SECTION VIEW

REINFORCING TABLE				
Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	Ø 4' 4'x4'	26"	#5 @ 10" OCEW #5 @ 10" OCEW	2,540 1,900
30"	Ø 4'-6" 4'-6" x 4'-6"	32"	#5 @ 10" OCEW #5 @ 9" OCEW	2,260 1,670
36"	Ø 5' 5' x 5'	38"	#5 @ 9" OCEW #5 @ 8" OCEW	2,060 1,500
42"	Ø 5'-6" 5'-6" x 5'-6"	44"	#5 @ 8" OCEW #5 @ 8" OCEW	1,490 1,370
48"	Ø 6' 6' x 6'	50"	#5 @ 7" OCEW #5 @ 7" OCEW	1,210 1,270

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 350.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 4,000 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

MARK	DATE	REVISION DESCRIPTION	BY

INNIO - PROJECT GREEN
CITY OF WAUKESHA , WI

PROJECT No.:	SEQ. No.:	DATE:
551813	010	10/21/2016
DESIGNED: DRA	DRAWN: DRA	
CHECKED:	APPROVED:	
SHEET NO.: P3 OF 3		

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DESCRIPTION | DATE

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CREATIVITY BEYOND ENGINEERING
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Brookfield, WI 53005-5938
(262) 781-1000
rasmith.com
Brookfield, WI | Appleton, WI | Madison, WI
Cedarburg, WI | Naperville, IL | Irvine, CA

INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

CONTECH DETAILS

DATE: 05/22/2026
SCALE: N.T.S.
JOB NO. 3250244
PROJECT MANAGER: RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C606

DIVISION 1 – GENERAL REQUIREMENTS

01 41 00 – REGULATORY REQUIREMENTS

1. THE LATEST EDITIONS OF THE FOLLOWING DOCUMENTS AND ANY SUPPLEMENTS THERETO, SHALL GOVERN ALL CONSTRUCTION ITEMS ON THIS PLAN UNLESS OTHERWISE NOTED:
   a. WISCONSIN DEPARTMENT OF NATURAL RESOURCES (WDNR) STORM WATER TECHNICAL STANDARDS
   b. WISCONSIN EROSION CONTROL PRODUCT ACCEPTABILITY LIST
   c. STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN (SSSWCW)
   d. WISCONSIN ADMINISTRATIVE CODE, SECTIONS SPS 381–387
   e. WISCONSIN DEPARTMENT OF TRANSPORTATION (WISDOT) STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION
   f. WISCONSIN DEPARTMENT OF TRANSPORTATION (WISDOT) APPROVED PRODUCT LISTS (APL)
   g. FEDERAL HIGHWAY ADMINISTRATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
   h. WISCONSIN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (WMUTCD)
   i. UNITED STATES DEPARTMENT OF JUSTICE ADA STANDARDS
   j. UNITED STATES DEPARTMENT OF TRANSPORTATION ADA STANDARDS FOR TRANSPORTATION FACILITIES
   k. MUNICIPALITY DEVELOPMENT STANDARDS
   l. COUNTY DEVELOPMENT STANDARDS
2. THE OWNER, ENGINEER AND MUNICIPALITY SHALL BE NOTIFIED AT LEAST 48 HOURS IN ADVANCE OF PERFORMING ANY CONSTRUCTION ACTIVITIES.
3. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING COPIES OF ALL PERMITS AND FOR ABIDING BY ALL PERMIT REQUIREMENTS AND RESTRICTIONS.
4. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE, AND LOCAL SAFETY REQUIREMENTS TOGETHER WITH EXERCISING PRECAUTIONS AT ALL TIMES FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT IS ALSO THE RESPONSIBILITY OF THE CONTRACTOR TO INITIATE, MAINTAIN, AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS, AND PROGRAMS IN CONNECTION WITH THE WORK.
5. SHOP DRAWINGS AND/OR MANUFACTURER'S PRODUCT DATA SUBMITTALS ARE REQUIRED ONLY IF THE PRODUCT OR METHOD OF CONSTRUCTION IS DIFFERENT FROM THAT SPECIFIED OR IF REQUIRED BY THE MUNICIPAL ENGINEER.
   a. ALL DOCUMENTS SUBMITTED FOR REVIEW SHALL HAVE THE SPECIFIC MATERIAL, PART, SIZE, ETC. HIGHLIGHTED IN SOME FASHION. EXAMPLE: A FITTING CUT SHEET HAS MULTIPLE PRESSURE RATING FOR DIFFERENT SIZE BENDS. HIGHLIGHT THE PRESSURE CLASS & SIZE TO BE USED ON PROJECT. ALL SUBMITTALS NOT PROPERLY IDENTIFYING THE SPECIFIC MATERIAL BEING USED WILL BE REJECTED.
   b. CONTRACTOR SHALL SUBMIT A PDF COPY AND AN EXPLANATION AS TO HOW THE SUBSTITUTION MEETS THE PROPOSED DESIGN (PRODUCT SPECIFICATION SHEETS WITHOUT EXPLANATION WILL NOT BE ACCEPTED) TO THE OWNER'S REPRESENTATIVE OR ENGINEER FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL NOT PROCEED UNTIL THE OWNER'S APPROVAL IS GIVEN. IN PROJECT SCHEDULING CONTRACTOR SHALL ACCOUNT FOR 5 WORKING DAYS FOR SUBMITTAL REVIEW. IN THE EVENT SUCH SUBSTITUTION IS APPROVED, THE OWNER WILL REQUIRE FROM THE CONTRACTOR A CREDITED DEDUCTION FROM THE CONTRACT AMOUNT EQUAL TO ANY SAVINGS IN MATERIAL COST RESULTING FROM USE OF THE PROPOSED SUBSTITUTE.
6. THE CONTRACTOR SHALL ASSUME COMPLETE AND SOLE RESPONSIBILITY FOR THE QUALITY OF WORK. IF CHANGES OR ADJUSTMENTS ARE RECOMMENDED BY THE CONTRACTOR, THEY MAY BE MADE ONLY UPON WRITTEN APPROVAL OF THE OWNER OR THEIR REPRESENTATIVE.
   a. ALL WORK SHALL BE DONE IN COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE OWNER OR THEIR REPRESENTATIVE SHALL DECIDE ALL QUESTIONS WHICH SHALL ARISE AS TO THE QUALITY AND ACCEPTABILITY OF MATERIALS FURNISHED, WORK PERFORMED, AND WORKMANSHIP. INTERPRETATION OF THE PLANS AND SPECIFICATIONS BY THE OWNER OR THEIR REPRESENTATIVE SHALL DETERMINE THE AMOUNT OF WORK PERFORMED AND MATERIALS FURNISHED.
   b. FAILURE OR NEGLIGENCE ON THE PART OF THE OWNER OR THEIR REPRESENTATIVE TO CONDEMN OR REJECT SUBSTANDARD OR INFERIOR WORK OR MATERIALS SHALL NOT BE CONSTRUED TO IMPLY AN ACCEPTANCE OF SUCH WORK OR MATERIALS, IF IT BECOMES EVIDENT AT ANY TIME PRIOR TO THE FINAL ACCEPTANCE OF THE WORK BY THE OWNER. NEITHER SHALL IT BE CONSTRUED AS BARRING THE OWNER, AT ANY SUBSEQUENT TIME, FROM THE RECOVERY OF DAMAGES OR OF SUCH A SUM OF MONEY AS MAY BE NEEDED TO BUILD ANEW ALL PORTIONS OF THE SUBSTANDARD OR INFERIOR WORK OR REPLACEMENT OF IMPROPER MATERIALS WHEREVER FOUND.
   c. INSPECTORS EMPLOYED BY THE OWNER SHALL BE AUTHORIZED TO INSPECT ALL WORK DONE AND ALL MATERIAL FURNISHED. SUCH INSPECTION MAY EXTEND TO ALL OR ANY PART OF THE WORK AND TO THE PREPARATION, FABRICATION OR MANUFACTURE OF THE MATERIALS TO BE USED. THE INSPECTOR IS NOT AUTHORIZED TO REVOKE, ALTER OR WAIVE ANY REQUIREMENTS OF THE SPECIFICATIONS, NOR IS HE AUTHORIZED TO APPROVE OR ACCEPT ANY PORTION OF THE COMPLETED PROJECT. HE SHALL CALL THE ATTENTION OF THE CONTRACTOR TO ANY FAILURE OF THE WORK OR MATERIALS TO CONFORM TO THE SPECIFICATIONS AND CONTRACT, AND SHALL HAVE THE AUTHORITY TO REJECT MATERIALS. ANY DISPUTE BETWEEN THE INSPECTOR AND CONTRACTOR SHALL BE REFERRED TO THE OWNER OR THEIR REPRESENTATIVE. ANY ADVICE WHICH THE INSPECTOR MAY GIVE THE CONTRACTOR SHALL IN NO WAY BE CONSTRUED AS BINDING THE ENGINEER IN ANY WAY OR RELEASING THE CONTRACTOR FROM FULFILLING ANY OF THE TERMS OF THE CONTRACT.
   d. ALL MATERIALS AND EACH PART OF DETAIL OF THE WORK SHALL BE SUBJECT AT ALL TIMES TO INSPECTION BY THE OWNER OR HIS AUTHORIZED REPRESENTATIVE OR THE AUTHORITY HAVING JURISDICTION AND THE CONTRACTOR WILL BE HELD STRICTLY TO THE TRUE INTENT OF THE SPECIFICATIONS IN REGARD TO QUALITY OF MATERIALS, WORKMANSHIP, AND THE DILIGENT EXECUTION OF THE CONTRACT. SUCH INSPECTION MAY INCLUDE MILL, PLANT OR SHOP INSPECTION, AND ANY MATERIAL FURNISHED UNDER THESE SPECIFICATIONS IS SUBJECT TO SUCH INSPECTION. THE OWNER OR HIS REPRESENTATIVES SHALL BE ALLOWED ACCESS TO ALL PART OF THE WORK, AND SHALL BE FURNISHED WITH SUCH INFORMATION AND ASSISTANCE BY THE CONTRACTOR AS IS DETERMINED BY THE OWNER OR HIS REPRESENTATIVE, TO MAKE A COMPLETE AND DETAILED INSPECTION.
   e. ALL WORKMANSHIP SHALL CONFORM TO THE BEST STANDARD PRACTICE. UNLESS OTHERWISE SPECIFIED, THE SPECIFICATIONS OR RECOGNIZED ASSOCIATION OF MANUFACTURERS AND CONTRACTORS OR INDUSTRIAL MANUFACTURERS SHALL BE USED AS GUIDES FOR THE STANDARDS OF WORKMANSHIP.
   f. ALL EXPOSED ITEMS OF WORK SHALL PRESENT A NEAT WORKMANLIKE APPEARANCE AND SHALL BE AS TRUE TO SHAPE AND ALIGNMENT AS POSSIBLE TO OBTAIN WITH MEASURING OR LEVELING INSTRUMENTS GENERALLY USED IN THE RESPECTIVE TYPES OF WORK. ITEMS OF WORK SHALL BE SOUND AND FULLY PROTECTED AGAINST DAMAGE AND PREMATURE DETERIORATION. IT IS SPECIFICALLY UNDERSTOOD THAT IN ALL QUESTIONS OF QUALITY AND ACCEPTABILITY OF WORKMANSHIP, THE CONTRACTOR AGREES TO ABIDE BY THE DECISION OF THE OWNER OR THEIR REPRESENTATIVE.
   g. ALL MATERIALS AND WORKMANSHIP NOT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS SHALL BE CONSIDERED AS DEFECTIVE, AND ALL SUCH MATERIALS, WHETHER IN-PLACE OR NOT, SHALL BE REJECTED AND SHALL BE REMOVED FROM THE WORK BY THE CONTRACTOR AT HIS EXPENSE. UPON FAILURE ON THE PART OF THE CONTRACTOR TO COMPLY WITH ANY ORDER OF THE OWNER RELATIVE TO THE PROVISIONS OF THIS ARTICLE, THE OWNER SHALL HAVE THE AUTHORITY TO REMOVE AND REPLACE SUCH DEFECTIVE MATERIAL AND TO DEDUCT THE COST OF REMOVAL AND REPLACEMENT FROM ANY MONIES DUE OR WHICH MAY BECOME DUE THE CONTRACTOR.
   h. THE CONTRACTOR SHALL KEEP A LEGIBLE COPY OF THE PLANS, SPECIFICATIONS, AND ALL PERMITS AT THE SITE OF THE WORK AT ALL TIMES.
   i. AT THE COMPLETION OF THE WORK AND PRIOR TO FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE THE OWNER OR THEIR REPRESENTATIVE WITH A MARKED-UP SET OF DRAWINGS SHOWING ALL CHANGES OR VARIATIONS FROM THE ORIGINAL DRAWINGS. THESE CHANGES SHALL BE MADE ON A SET OF FIELD DRAWINGS AS THE WORK TAKES PLACE, NOT AFTER THE WORK IS COMPLETE. THIS SET OF DRAWINGS SHOULD BE KEPT CLEAN IN A LOCATION AT THE SITE WHERE THE OWNER OR THEIR REPRESENTATIVE MAY EXAMINE THEM.
   j. THE MARKED-UP DRAWINGS SHALL BE ACCURATE. ARBITRARY MARKINGS ARE OF NO VALUE. CAREFUL MEASUREMENTS SHALL BE MADE TO LOCATE UNDERGROUND EXTERIOR AND UNDERGROUND INTERIOR SEWERS, GAS LINES, WATER LINES, ELECTRICAL CONDUIT AND MISCELLANEOUS PIPING.
7. CONTRACTOR IS RESPONSIBLE FOR ALL TRAFFIC CONTROL, TRAFFIC CONTROL PLANS AND PERMITTING FOR ALL WORK TO BE COMPLETED ONSITE OR IN THE PUBLIC RIGHT-OF WAY.

01 70 00 – EXECUTION & CLOSEOUT REQUIREMENTS

1. THE CONTRACTOR IS RESPONSIBLE FOR EXAMINING ALL EXISTING SITE CONDITIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL COMPARE WITH THIS PLAN.
2. EXISTING UTILITY INFORMATION IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY, BASED ON BEST AVAILABLE PUBLIC RECORDS, AS-BUILT DRAWINGS, AND FIELD OBSERVATIONS. NO RESPONSIBILITY IS ASSUMED BY THE OWNER OR ENGINEER FOR ACCURACY OR COMPLETENESS. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND NATURE OF EXISTING UTILITIES, AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.
3. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS, ELEVATIONS, AND SIZES OF EXISTING UTILITIES AND SHALL CHECK ALL PROPOSED UTILITY CONNECTIONS AND CROSSINGS PRIOR TO PROCEEDING WITH ANY WORK. ANY CONFLICTS SHALL BE REPORTED TO THE ENGINEER SO REDESIGN MAY OCCUR IF NEEDED. COST OF REPLACEMENT OR REPAIR OF EXISTING UTILITIES DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING SOIL CONDITIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. A GEOTECHNICAL REPORT MAY BE AVAILABLE FROM THE OWNER. THE CONTRACTOR SHALL ABIDE BY THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT AND SUBSEQUENT RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL FIELD VERIFY ELEVATIONS OF THE BENCHMARKS AND HORIZONTAL CONTROL BY REFERENCING SHOWN COORDINATES TO KNOWN PROPERTY LINES, AND SHALL NOTIFY THE ENGINEER OF DISCREPANCIES IN EITHER VERTICAL OR HORIZONTAL CONTROL PRIOR TO PROCEEDING WITH ANY WORK.
6. SURVEY BENCHMARKS AND CONTROL POINTS SHALL BE MAINTAINED AND PROTECTED FROM DISTURBANCE.
7. PROPERTY CORNERS SHALL BE CAREFULLY PROTECTED AT ALL TIMES. PROPERTY MONUMENTS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
8. ANY ADJACENT PROPERTIES OR ROAD RIGHT-OF-WAYS WHICH ARE DAMAGED DURING CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR. THE COST OF RESTORATION IS CONSIDERED INCIDENTAL AND SHALL BE INCLUDED.
9. PUBLIC ROADS SHALL NOT BE FULLY CLOSED TO TRAFFIC AT ANY TIME. ALL INGRESS AND EGRESS TRAFFIC TO THE PROJECT SITE SHALL BE LIMITED TO THE CONSTRUCTION ENTRANCE.
10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DETERMINING QUANTITIES, SHALL BID ON THEIR OWN ESTIMATE OF THE WORK REQUIRED, AND SHALL NOT RELY ON THE ENGINEER'S ESTIMATE.
11. REQUESTS FOR CLARIFICATION WILL BE INTERPRETED BY THE OWNER/ENGINEER PRIOR TO AWARD OF CONTRACT, AND WHEN NECESSARY, OFFICIAL WRITTEN RESPONSES WILL BE ISSUED. OFFICIAL WRITTEN RESPONSES SHALL BE BINDING TO THE WORK. IN NO WAY SHALL VERBAL DIALOGUE CONSTITUTE OFFICIAL RESPONSE.
12. SHOULD ANY DISCREPANCIES BE DISCOVERED BY THE CONTRACTOR AFTER AWARD OF CONTRACT, NOTIFY OWNER/ENGINEER IN WRITING IMMEDIATELY. CONSTRUCTION OF ITEMS AFFECTED BY THE DISCREPANCIES SHALL NOT COMMENCE OR CONTINUE UNTIL AN OFFICIAL WRITTEN RESPONSE IS ISSUED.
13. ALL WORK SHALL BE GUARANTEED BY THE CONTRACTOR FOR A MINIMUM PERIOD OF 12 MONTHS FROM THE DATE OF FINAL ACCEPTANCE. THIS GUARANTEE SHALL INCLUDE ALL DEFECTS IN MATERIALS AND WORKMANSHIP.
14. THE CONTRACTOR SHALL INDEMNIFY THE OWNER, THE ENGINEER, AND THE MUNICIPALITY, THEIR AGENTS, ETC., FROM ALL LIABILITY INVOLVED WITH THE CONSTRUCTION, INSTALLATION, AND TESTING OF THE WORK ON THIS PROJECT.

DIVISION 31 – EARTHWORK

31 10 00 – SITE CLEARING & DEMOLITION

1. WORK SHALL CONSIST OF DEMOLITION, ABANDONMENT, AND REMOVAL OF EXISTING FOUNDATIONS, WALLS, SLABS, FENCES, PIPING, PAVEMENTS, AND OTHER MANMADE ITEMS INTERFERING WITH NEW CONSTRUCTION. WORK SHALL ALSO CONSIST OF CLEARING AND GRUBBING OF TREES, SHRUBS, VEGETATION, ROOTS, STUMPS, RUBBISH, AND OTHER PERISHABLE MATTER INTERFERING WITH NEW CONSTRUCTION.
2. ALL ITEMS SHALL INCLUDE ALL NECESSARY MATERIALS AND LABOR TO COMPLETE THE ITEM IN PLACE.
3. CALL 811 TO NOTIFY UTILITY PROVIDERS AND REQUEST FIELD LOCATION OF EXISTING UTILITIES WITHIN PROJECT LIMITS PRIOR TO ANY CONSTRUCTION RELATED ACTIVITIES.
4. INSTALL PERIMETER FENCING AS INDICATED PRIOR TO COMMENCING ANY CONSTRUCTION RELATED ACTIVITY.
5. CLEARLY IDENTIFY ALL VEGETATION TO BE PRESERVED AND/OR RELOCATED PRIOR TO CLEARING AND GRUBBING.
6. PROTECT EXISTING IMPROVEMENTS TO REMAIN DURING CONSTRUCTION. ANY DAMAGED IMPROVEMENTS SHALL BE RESTORED TO ORIGINAL CONDITION, OR AS OTHERWISE ACCEPTABLE TO THE OWNER.
7. REMOVE EXISTING ABOVE-GRADE AND BELOW-GRADE IMPROVEMENTS AS INDICATED AND AS NECESSARY TO CONSTRUCT PROPOSED IMPROVEMENTS.
8. SAWCUT ALL PAVEMENT TO BE REMOVED IN STRAIGHT LINES TO FULL DEPTH.
9. DEMOLISH CONCRETE AND MASONRY IN SMALL SECTIONS. BREAK UP CONCRETE SLABS THAT ARE 2 FEET OR MORE BELOW PROPOSED SUBGRADE TO PERMIT DRAINAGE.
10. DISCONNECT AND SEAL/CAP EXISTING UTILITIES TO BE REMOVED, RELOCATED, OR ABANDONED IN ACCORDANCE WITH REQUIREMENTS OF UTILITY PROVIDERS.
11. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING OWNERSHIP OF AND COORDINATING NECESSARY REMOVAL AND/OR RELOCATION OF ALL EXISTING UTILITIES WITHIN THE PROJECT LIMITS.
12. DO NOT INTERRUPT UTILITY SERVICE TO EXISTING FACILITIES UNLESS PERMITTED BY THE OWNER.
13. VOIDS LEFT BY REMOVALS SHALL BE LEVELED TO PREVENT PONDING OF WATER.
14. REMOVE AND LEGALLY DISPOSE OF DEMOLISHED MATERIALS, TRASH, AND DEBRIS FROM THE PROJECT SITE. RUBBISH, TRASH, GARBAGE, AND LITTER SHALL BE PLACED IN SEALED CONTAINERS THROUGHOUT CONSTRUCTION.

31 20 00 – EARTH MOVING

1. WORK SHALL CONSIST OF STRIPPING AND STORAGE OF TOPSOIL, EXCAVATION, EMBANKMENT, IMPORTING OR EXPORTING MATERIAL TO ACHIEVE LAND BALANCE, COMPACTION, FINISH GRADING, SUBGRADE PREPARATION, AND REPLACEMENT OF TOPSOIL.
2. ALL ITEMS SHALL INCLUDE ALL NECESSARY MATERIALS AND LABOR TO COMPLETE THE ITEM IN PLACE.
3. ALL EARTHWORK SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT AND SUBSEQUENT RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION BASED ON FIELD CONDITIONS, AND THESE REQUIREMENTS. THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER SHALL GOVERN.
4. CONTRACTOR SHALL REVIEW THE SITE ENVIRONMENTAL REPORT (PHASE2) AND IMPLEMENT RECOMMENDATIONS OUTLINED IN SOIL MANAGEMENT PLAN
5. EXCAVATE TO SUBGRADE REGARDLESS OF THE CHARACTER OF SURFACE AND SUBSURFACE CONDITIONS ENCOUNTERED. EXCAVATED MATERIAL MAY INCLUDE ROCK AND UNCLASSIFIED OBSTRUCTIONS, WHICH IS CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE WORK.
6. EXISTING FOUNDATIONS, BUILDING REMNANTS, AND UNSATISFACTORY MATERIAL SHALL BE COMPLETELY REMOVED FROM WITHIN AND A MINIMUM OF 10 FEET BEYOND BUILDING PAD AREAS. ANY RELATED EXCAVATION SHALL BE BACKFILLED WITH COMPACTED ENGINEERED FILL MATERIAL.
7. EXISTING FOUNDATIONS, BUILDING REMNANTS, AND UNSATISFACTORY MATERIAL SHALL BE REMOVED TO A MINIMUM OF 2 FEET BELOW PROPOSED SUBGRADE WITHIN GREENSPACE AND PAVEMENT AREAS. ANY RELATED EXCAVATION SHALL BE BACKFILLED WITH COMPACTED ENGINEERED FILL MATERIAL.
8. AREAS SHALL BE GRADED TO WITHIN 1 INCH, MORE OR LESS, OF PROPOSED SUBGRADE. DEVIATIONS SHALL NOT BE CONSISTENT IN ONE DIRECTION.
9. DISKING, HARROWING, AND AERATION TECHNIQUES SHALL BE USED TO DRY SUBGRADE PRIOR TO PROOF ROLLING.
10. IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER, PROOF ROLL SUBGRADE BELOW BUILDING PAD AND PAVEMENT AREAS DURING DRY WEATHER WITH A FULLY LOADED TANDEM AXLE DUMP TRUCK WHERE COHESIVE SOILS ARE PREDOMINANT, AND WITH A SMOOTH DRUMMED VIBRATORY ROLLER WHERE GRANULAR SOILS ARE PREDOMINANT. SUBGRADE WHICH IS OBSERVED TO RUT OR DEFLECT EXCESSIVELY SHALL BE UNDERCUT IN ACCORDANCE WITH RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER. DO NOT PROOF ROLL WET OR SATURATED SUBGRADE.
11. THE CONTRACTOR SHALL MAINTAIN POSITIVE SITE DRAINAGE THROUGHOUT CONSTRUCTION. THIS MAY INCLUDE EXCAVATION OF TEMPORARY DITCHES OR PUMPING TO ALLEVIATE WATER PONDING. SURFACE WATER AND GROUNDWATER SHALL BE PREVENTED FROM ENTERING EXCAVATIONS, PONDING ON PREPARED SUBGRADES, AND FLOODING PROJECT SITE AND/OR SURROUNDING AREAS.
12. THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR ALL EARTHWORK COMPUTATIONS AND FOR ACTUAL LAND BALANCE, INCLUDING UTILITY TRENCH SPOIL. THE CONTRACTOR SHALL IMPORT OR EXPORT MATERIAL AS NECESSARY TO COMPLETE THE PROJECT.
13. TOPSOIL REPLACEMENT DEPTH SHALL BE AS CALLED OUT ON THE CIVIL OR LANDSCAPE PLANS, OR A MINIMUM OF SIX INCHES IF NOT CALLED OUT ON LANDSCAPE PLAN.
14. TOPSOIL IN PARKING ISLANDS: ALL PARKING LOT ISLANDS TO BE BACKFILLED WITH TOPSOIL TO A MINIMUM DEPTH OF 18" BY GRADING CONTRACTOR TO INSURE LONG TERM PLANT HEALTH. CROWN ALL PLANTING ISLANDS A MINIMUM OF 6" TO PROVIDE PROPER DRAINAGE, UNLESS OTHERWISE SPECIFIED.

31 25 00 – EROSION & SEDIMENTATION CONTROLS

1. WORK SHALL CONSIST OF INSTALLATION OF TEMPORARY AND PERMANENT PRACTICES FOR SEDIMENTATION CONTROL, EROSION CONTROL, SLOPE PROTECTION, AND REMOVAL OF PRACTICES UPON FINAL SITE STABILIZATION.
2. ALL ITEMS SHALL INCLUDE ALL NECESSARY MATERIALS AND LABOR TO COMPLETE THE ITEM IN PLACE.
3. INSTALLATION AND MAINTENANCE OF PRACTICES SHALL BE IN ACCORDANCE WITH THE APPLICABLE WDNR TECHNICAL STANDARD, OR THE WISCONSIN CONSTRUCTION SITE BEST MANAGEMENT PRACTICE HANDBOOK IF A TECHNICAL STANDARD IS NOT AVAILABLE.
4. ALL PRACTICES SHALL BE INSTALLED PRIOR TO COMMENCING ANY LAND DISTURBING CONSTRUCTION RELATED ACTIVITY. EARTHWORK ASSOCIATED WITH INSTALLATION OF PRACTICES MAY OCCUR CONCURRENTLY.
5. ALL PRACTICES SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT AND WARRANTY PERIOD IN CONFORMANCE WITH PERMIT REQUIREMENTS.
6. ALL PRACTICES SHALL BE ROUTINELY INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL GREATER THAN 0.5 INCHES. THE CONTRACTOR IS REQUIRED TO PERFORM INSPECTIONS, KEEP A LOG, AND CONDUCT REPAIRS AS NEEDED.
7. ALL DISTURBED AREAS SHALL DRAIN TO A CONTROL PRACTICE AT ALL TIMES DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED. DEPENDING UPON HOW THE CONTRACTOR GRADES THE SITE, IT MAY BE NECESSARY TO INSTALL ADDITIONAL CONTROL PRACTICES IN VARIOUS LOCATIONS THROUGHOUT THE PROJECT SITE. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL CONTROL PRACTICES NECESSARY TO PREVENT EROSION AND SEDIMENTATION.
8. ALL DISTURBED GROUND LEFT INACTIVE FOR 7 DAYS SHALL BE STABILIZED WITH A TEMPORARY SEED MIXTURE AND MULCH. THE TEMPORARY SEED MIXTURE SHALL BE IN ACCORDANCE WITH SECTION 630 OF WISDOT STANDARD SPECIFICATIONS. WINTER WHEAT OR RYE SHALL BE USED FOR TEMPORARY SEED AFTER SEPTEMBER 1.
9. DISTURBED AREAS THAT CAN NOT BE STABILIZED WITH A DENSE GROWTH OF VEGETATION DUE TO TEMPERATURE OR TIMING OF CONSTRUCTION SHALL BE STABILIZED BY APPLYING ANIONIC POLYACRYLAMIDE (PAM).
10. ALL ACTIVITIES ON THE PROJECT SITE SHALL BE CONDUCTED IN A LOGICAL SEQUENCE TO MINIMIZE THE AREA OF BARE SOIL EXPOSED AT ANY ONE TIME.
11. DUST GENERATED BY CONSTRUCTION RELATED ACTIVITIES SHALL BE MINIMIZED BY USE OF WATERING, CALCIUM CHLORIDE SURFACE TREATMENT, CONSTRUCTION SCHEDULING, OR OTHER APPROPRIATE MEASURES.
12. THE CONTRACTOR SHALL BE PREPARED FOR DEWATERING CONDITIONS BY HAVING APPROPRIATE PUMPS AND FILTER BAGS ONSITE. ALL WATER FROM CONSTRUCTION DEWATERING SHALL BE TREATED PRIOR TO DISCHARGE FROM THE PROJECT SITE.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE CLEANLINESS OF THE PROJECT SITE AND PUBLIC ROADS DURING CONSTRUCTION. PUBLIC ROADS SHALL BE KEPT FREE OF SEDIMENT TRACKED FROM AREAS UNDER CONSTRUCTION BY DAILY SWEEPING OR OTHER APPROPRIATE MEASURES.
14. FINAL STABILIZATION OF LANDSCAPED AREAS SHALL BE IN ACCORDANCE WITH THE APPROVED LANDSCAPE PLAN.
15. ALL SEEDED AREAS SHALL BE FERTILIZED, RESEEDED AS NECESSARY, AND MULCHED IN ACCORDANCE WITH THE APPROVED LANDSCAPE PLAN TO MAINTAIN A VIGOROUS DENSE VEGETATIVE COVER.

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 12 00 – ASPHALT PAVING

1. WORK SHALL CONSIST OF FINE GRADING SUBGRADE, EXCAVATION BELOW SUBGRADE (IF NECESSARY), PLACEMENT OF CRUSHED STONE BASE, INSTALLATION OF HOT-MIX ASPHALT, PAVEMENT MARKING, SIGNAGE, AND CLEANUP.
2. ALL ITEMS SHALL INCLUDE ALL NECESSARY MATERIALS AND LABOR TO COMPLETE THE ITEM IN PLACE.
3. ASPHALT PAVEMENT MIX DESIGNS SUBMITTED FOR REVIEW SHALL BE FORMATTED USING WISDOT MIX DESIGN STANDARD DATA INPUT FORM/REPORT 249.
4. CRUSHED STONE BASE SHALL BE IN ACCORDANCE WITH SECTION 305 OF WISDOT STANDARD SPECIFICATIONS.
5. ASPHALTIC MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 455 OF WISDOT STANDARD SPECIFICATIONS.
6. AGGREGATE SHALL BE IN ACCORDANCE WITH SECTION 460 OF WISDOT STANDARD SPECIFICATIONS.
7. DO NOT CONDUCT ASPHALT PAVING IF ANY OF THE FOLLOWING CONDITIONS EXIST: CRUSHED STONE BASE IS WET OR EXCESSIVELY DAMP; TEMPERATURE IS BELOW 30 DEGREES FAHRENHEIT AT TIME OF BINDER COURSE INSTALLATION; TEMPERATURE HAS BEEN BELOW 35 DEGREES FAHRENHEIT WITHIN 12 HOURS PRIOR TO TACK COAT APPLICATION; TEMPERATURE IS BELOW 40 DEGREES FAHRENHEIT AT TIME OF SURFACE COURSE INSTALLATION.
8. COMPACT ASPHALT IN ACCORDANCE WITH SECTION 450 OF WISDOT STANDARD SPECIFICATIONS. COMPACT ASPHALT TO PRODUCE THE THICKNESS INDICATED WITHIN PLUS/MINUS 1/4-INCH FOR BINDER COURSE, AND WITHIN PLUS 1/4-INCH FOR SURFACE COURSE (NO MINUS).
9. APPLY TACK COAT BETWEEN ASPHALT COURSES AT A MINIMUM RATE OF 0.25 GAL/SY.
10. NO TRAFFIC SHALL BE ALLOWED ON ASPHALT AFTER FINAL ROLLING UNTIL IT HAS COOLED AND HARDENED.
11. FINAL ASPHALT SURFACE SHALL BE WITHIN A 1/8-INCH TOLERANCE AS DETERMINED BY USING A 10-FOOT STRAIGHTEDGE APPLIED LONGITUDINALLY OR TRANSVERSELY. REMOVE AND REPLACE ALL RAISED AND DEPRESSED AREAS EXCEEDING TOLERANCE.
12. A SLOPE NO GREATER THAN 2% IN ALL DIRECTIONS AT ADA PARKING STALLS AND ADJACENT UNLOADING AREAS IS REQUIRED. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.
13. A SLOPE NO GREATER THAN 5% ALONG THE LENGTH OF THE ACCESSIBLE ROUTE IS REQUIRED. A SLOPE NO GREATER THAN 2% ACROSS THE WIDTH OF THE ACCESSIBLE ROUTE IS REQUIRED. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.

32 13 00 – CONCRETE PAVING

1. WORK SHALL CONSIST OF FINE GRADING SUBGRADE, EXCAVATION BELOW SUBGRADE (IF NECESSARY), PLACEMENT OF CRUSHED STONE BASE, INSTALLATION OF CONCRETE, AND CLEANUP.
2. ALL ITEMS SHALL INCLUDE ALL NECESSARY MATERIALS AND LABOR TO COMPLETE THE ITEM IN PLACE.
3. CRUSHED STONE BASE SHALL BE IN ACCORDANCE WITH SECTION 305 OF WISDOT STANDARD SPECIFICATIONS.
4. CONCRETE PAVING SHALL BE IN ACCORDANCE WITH WISDOT STANDARD SPECIFICATIONS:
   a. SECTION 405– COLORED AND STAMPED CONCRETE PAVING
   b. SECTION 415– CONCRETE PAVEMENT
   c. SECTION 416– CONCRETE PAVEMENT REPAIR
   d. SECTION 601– CONCRETE CURBING
   e. SECTION 602– CONCRETE SIDEWALK AND PATIO PAVING
5. CONCRETE SHALL BE GRADE A AIR-ENTRAINED IN ACCORDANCE WITH SECTION 501 OF WISDOT STANDARD SPECIFICATIONS, WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
6. AGGREGATE SHALL BE IN ACCORDANCE WITH SECTION 501 OF WISDOT STANDARD SPECIFICATIONS.
7. WATER SHALL BE IN ACCORDANCE WITH SECTION 501 OF WISDOT STANDARD SPECIFICATIONS AND ASTM C94 / C94M.
8. AIR-ENTRAINING SHALL BE IN ACCORDANCE WITH SECTION 501 OF WISDOT STANDARD SPECIFICATIONS AND ASTM C260.

DIVISION 32 – EXTERIOR IMPROVEMENTS

9. RETARDING, WATER-REDUCING, AND NON-CHLORIDE ACCELERATING ADMIXTURES SHALL BE IN ACCORDANCE WITH SECTION 501 OF WISDOT STANDARD SPECIFICATIONS AND AASHTO M194.
10. LIQUID CURING COMPOUND SHALL BE IN ACCORDANCE WITH SECTION 415 OF WISDOT STANDARD SPECIFICATIONS AND AASHTO M 148.
11. CONCRETE FORMS SHALL REMAIN IN PLACE AT LEAST 24 HOURS AFTER CONCRETE INSTALLATION AND SHALL BE CLEANED AFTER EACH USE. CONCRETE FORMS SHALL BE COATED WITH RELEASE AGENT TO ALLOW SEPARATION WITHOUT DAMAGE TO CONCRETE.
12. CONSTRUCTION AND CONTRACTION JOINTS SHALL BE IN ACCORDANCE WITH SECTION 415 OF WISDOT STANDARD SPECIFICATIONS. JOINT PATTERN SHALL FOLLOW ARCHITECTURAL PLANS IF AVAILABLE.
13. ISOLATION JOINTS SHALL CONSIST OF PREFORMED JOINT FILLER STRIPS ABUTTING CURBING, INLETS, CATCH BASINS, MANHOLES, STRUCTURES, AND OTHER FIXED OBJECTS.
14. EDGES OF CONCRETE PAVEMENT, CURBING, SIDEWALK, PATIOS, AND JOINTS SHALL BE TOOLED IN CONCRETE AFTER INITIAL FLOATING WITH AN EDGING TOOL TO A 1/4-INCH RADIUS. REPEAT TOOLING AFTER APPLYING SURFACE FINISHES AND ELIMINATE TOOL MARKS ON SURFACES.
15. FINISH, CURE, AND PROTECT CURBING IN ACCORDANCE WITH SECTION 601 OF WISDOT STANDARD SPECIFICATIONS.
16. FINISH (LIGHT BROOM), CURE, AND PROTECT SIDEWALK AND PATIOS IN ACCORDANCE WITH SECTION 602 OF WISDOT STANDARD SPECIFICATIONS.
17. FINISH (ARTIFICIAL TURF DRAG), CURE, AND PROTECT VEHICULAR PAVEMENT AND PADS IN ACCORDANCE WITH SECTION 415 OF WISDOT STANDARD SPECIFICATIONS.
18. MAINTAIN CONCRETE FREE OF STAINS, DISCOLORATION, DIRT, AND OTHER FOREIGN MATERIAL. SWEEP CONCRETE PRIOR TO SUBSTANTIAL COMPLETION INSPECTION.
19. MAXIMUM DIFFERENCE BETWEEN CONCRETE SIDEWALKS AND ADJACENT PAVEMENT SURFACES SHALL NOT EXCEED 1/4-INCH VERTICAL.
20. A SLOPE NO GREATER THAN 2% IN ALL DIRECTIONS AT ADA PARKING STALLS AND ADJACENT UNLOADING AREAS IS REQUIRED. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.
21. A SLOPE NO GREATER THAN 5% ALONG THE LENGTH OF THE ACCESSIBLE ROUTE IS REQUIRED. A SLOPE NO GREATER THAN 2% ACROSS THE WIDTH OF THE ACCESSIBLE ROUTE IS REQUIRED. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.
22. ALL ACCESSIBLE DOORWAYS REQUIRE AN EXTERIOR LANDING THAT IS A MINIMUM OF 5 FEET BY 5 FEET WITH A SLOPE NO GREATER THAN 2% IN ALL DIRECTIONS. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.
23. REMOVE AND REPLACE CONCRETE THAT IS BROKEN, DAMAGED, DEFECTIVE, OR DOES NOT COMPLY WITH THE REQUIREMENTS LISTED ABOVE.

32 17 00 – PAVEMENT MARKING

1. WORK SHALL CONSIST OF INSTALLATION OF PARKING LOT STRIPING, DIRECTIONAL ARROWS, AND ACCESSIBLE SYMBOLS.
2. ALL ITEMS SHALL INCLUDE ALL NECESSARY MATERIALS AND LABOR TO COMPLETE THE ITEM IN PLACE.
3. PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH SECTION 646 OF WISDOT STANDARD SPECIFICATIONS AND WISDOT APPROVED PRODUCTS LIST. COLOR SHALL BE WHITE UNLESS NOTED OTHERWISE ON THIS PLAN. MARKINGS SEPARATING OPPOSING TRAFFIC SHALL BE YELLOW.
4. ALL PARKING LOT STRIPING SHALL BE 4-INCH WIDTH UNLESS NOTED OTHERWISE ON THIS PLAN.
5. BARRICADE WORK AREA DURING INSTALLATION AND UNTIL PAVEMENT MARKING IS DRIED. PROTECT ADJACENT AREAS FROM RECEIVING PAINT OR EPOXY.
6. APPLY PAVEMENT MARKING IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS TO PRODUCE MARKINGS AS INDICATED WITH UNIFORM, STRAIGHT EDGES. TEMPLATES SHALL BE PROFESSIONALLY MADE TO INDUSTRY STANDARDS.
7. APPLY PAVEMENT MARKING TO CLEAN AND DRY SURFACE, FREE FROM FROST, TO ENSURE PROPER BONDING.
8. NOTIFY OWNER OF ANY UNSOUND CONDITIONS PRIOR TO COMMENCING WORK. APPLYING PAVEMENT MARKING CONSTITUTES CONTRACTOR'S ACCEPTANCE OF SURFACE AS SUITABLE FOR INSTALLATION.

33 30 00 – SANITARY SEWERAGE

1. WORK SHALL CONSIST OF INSTALLATION AND TESTING OF THE SANITARY SEWERAGE SYSTEM AND ALL APPURTENANCES.
2. ALL ITEMS SHALL INCLUDE ALL NECESSARY MATERIALS AND LABOR TO COMPLETE THE ITEM IN PLACE.
3. ALL PUBLIC SANITARY SEWERAGE WORK SHALL BE IN ACCORDANCE WITH WISCONSIN ADMINISTRATIVE CODE NR 110, MUNICIPALITY DEVELOPMENT STANDARDS AND SSSWCW.
4. ALL PRIVATE SANITARY SEWERAGE WORK SHALL BE IN ACCORDANCE WITH WISCONSIN ADMINISTRATIVE CODE SPS 382, MUNICIPALITY DEVELOPMENT STANDARDS AND SSSWCW.
5. POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS SHALL BE SDR 35 CONFORMING TO ASTM D3034 FOR SANITARY LATERALS, AND SHALL BE SDR 26 CONFORMING TO ASTM D3034 FOR SANITARY MAIN, BOTH WITH PUSH-ON RUBBER GASKETED JOINTS IN ACCORDANCE WITH SECTIONS 8.10.6 AND 8.41.4 OF SSSWCW.
6. MANHOLES SHALL BE PRECAST REINFORCED CONCRETE IN ACCORDANCE WITH SECTION 8.39.0 OF SSSWCW AND CONFORM TO ASTM C478. SIZES SHALL BE AS INDICATED AND VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING.
7. TRENCH SECTION SHALL BE CLASS B IN ACCORDANCE WITH SECTION 3.2.6 OF SSSWCW. MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE OUTSIDE DIAMETER OF PIPE PLUS 20 INCHES.
8. PIPE BEDDING AND COVER MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 8.43.0 OF SSSWCW. MINIMUM COVER OVER PIPE SHALL BE 12 INCHES.
9. TRENCH BACKFILL MATERIAL SHALL BE MECHANICALLY COMPACTED GRANULAR BACKFILL IN ACCORDANCE WITH SECTION 8.43.4 OF SSSWCW BENEATH AND WITHIN 5 FEET OF PAVEMENT AREAS, AND SHALL BE SPOIL BACKFILL IN ACCORDANCE WITH SECTION 8.43.5 OF SSSWCW BENEATH GREENSPACE AREAS, UNLESS ALTERNATIVE COMPACTION IS RECOMMENDED IN THE GEOTECHNICAL REPORT OR BY THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION, IN WHICH CASE THE CONTRACTOR IS TO FOLLOW THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.
10. CAUTION MUST BE FOLLOWED REGARDING THE COMPACTION OF ALL UTILITY TRENCHES. FLOODING OF BACKFILL MATERIAL IS NOT ALLOWED.
11. ALL CONNECTIONS TO EXISTING SANITARY SEWER PIPES AND STRUCTURES SHALL BE CORED CONNECTIONS, UNLESS NOTED OTHERWISE. PREFABRICATED WYE CONNECTIONS ARE REQUIRED FOR ALL BUILDING SANITARY SERVICE PIPES, UNLESS NOTED OTHERWISE.

DIVISION 33 – UTILITIES

12. CLEANOUTS AND RISER EXTENSIONS SHALL BE INSTALLED IN ACCORDANCE WITH SPS 382.35 FROM SEWER PIPES TO GROUND SURFACE. LIGHT DUTY LOADING CLASSIFICATION SHALL BE USED IN UNPAVED AREAS. MEDIUM DUTY LOADING CLASSIFICATION SHALL BE USED IN PAVED FOOT TRAFFIC AREAS. HEAVY DUTY LOADING CLASSIFICATION SHALL BE USED IN PAVED VEHICULAR TRAFFIC AREAS. FRAMES AND COVERS SHALL BE SET FLUSH WITH SURFACE.
13. TRACER WIRE SHALL BE GREEN AND INSTALLED IN ACCORDANCE WITH SECTION 2.11.2 OF SSSWCW ON ALL BURIED NON-METALLIC PUBLIC SANITARY SEWER PIPE, PRIVATE SANITARY INTERCEPTOR PIPE, AND BUILDING SANITARY SERVICE PIPE. TRACER WIRE SHALL BE INSULATED, SINGLE-CONDUCTOR, 12 GAUGE SOLID COPPER OR COPPER COATED STEEL WIRE, SECURED AT LEAST EVERY 10 FEET AND AT ALL BENDS, WITH ACCESS POINTS AT LEAST EVERY 400 FEET.
14. PROPOSED SANITARY SERVICES SHOWN ON THIS PLAN SHALL TERMINATE AT A POINT FIVE (5) FEET FROM THE EXTERIOR BUILDING WALL.
15. THE CONTRACTOR SHALL ADJUST ALL MANHOLE RIMS TO FINISHED SURFACE.
16. AFTER INSTALLATION OF SANITARY SEWERAGE SYSTEM, CLEAN ALL DEBRIS FROM SYSTEM AND INSPECT FOR DAMAGE. CONDUCT TESTING OF INSTALLED PIPE IN ACCORDANCE WITH SSSWCW. REPAIR ANY DAMAGE AND REPLACE ANY PIPE NOT PASSING TESTING.

33 40 00 – STORMWATER DRAINAGE

1. WORK SHALL CONSIST OF INSTALLATION AND TESTING OF THE STORMWATER DRAINAGE SYSTEM AND ALL APPURTENANCES.
2. ALL ITEMS SHALL INCLUDE ALL NECESSARY MATERIALS AND LABOR TO COMPLETE THE ITEM IN PLACE.
3. ALL PUBLIC STORMWATER DRAINAGE WORK SHALL BE IN ACCORDANCE WITH WISCONSIN ADMINISTRATIVE CODE SPS 382, MUNICIPALITY DEVELOPMENT STANDARDS AND SSSWCW.
4. ALL PRIVATE STORMWATER DRAINAGE WORK SHALL BE IN ACCORDANCE WITH WISCONSIN ADMINISTRATIVE CODE SPS 382 AND MUNICIPALITY DEVELOPMENT STANDARDS.
5. REINFORCED CONCRETE PIPE (RCP) AND END SECTIONS SHALL BE IN ACCORDANCE WITH SECTION 8.6.0 OF SSSWCW AND CONFORM TO ASTM C76 WITH RUBBER GASKETED JOINTS CONFORMING TO ASTM C443. UNLESS NOTED OTHERWISE, 12-INCH DIAMETER PIPE SHALL BE CLASS V, 15-INCH DIAMETER PIPE SHALL BE CLASS IV, AND 18-INCH DIAMETER PIPE AND LARGER SHALL BE CLASS III.
6. CORRUGATED METAL PIPE (CMP) AND END SECTIONS SHALL BE 16 GAUGE CONFORMING TO ASTM A760.
7. DUCTILE IRON PIPE (DIP) SHALL BE CLASS 150 CONFORMING TO AWWA C151 WITH RUBBER GASKETED JOINTS IN ACCORDANCE WITH SECTION 8.18.0 OF SSSWCW.
6. HIGH-DENSITY POLYETHYLENE (HDPE) PIPE SHALL BE ADS N12 WT IB PIPE CONFORMING TO ASTM F2648 WITH WATER TIGHT JOINTS CONFORMING TO ASTM D3212, GASKETS CONFORMING TO ASTM F477 AND FITTINGS CONFORMING TO ASTM F2306.
7. POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS SHALL BE SDR 35 CONFORMING TO ASTM D3034 WITH PUSH-ON RUBBER GASKETED JOINTS CONFORMING TO ASTM D3212.
8. CORRUGATED STEEL (METAL) PIPE-UNDERGROUND DETENTION SYSTEM ASTM A929 & ASTM A760
   8.1. ALUMINIZED TYPE 2 STEEL COILS (GAUGE 14) SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M-36 OR ASTM A760
   8.2. CONTECH: ROD & LUG BANDS
   8.3. WATER RESISTANCES: PIPE SEAM SHALL USE SEALANT
   8.4. ALL NEW CONNECTIONS TO EXITING SYSTEM SHALL BE A FIELD WELDED CONNECTION. NO OTHER CONNECTION TYPES IS ALLOWED WITH WRITTEN PERMISSION FROM THE ENGINEER.
9. MANHOLES SHALL BE PRECAST REINFORCED CONCRETE IN ACCORDANCE WITH SECTION 8.39.0 OF SSSWCW AND CONFORM TO ASTM C478. SIZES SHALL BE AS INDICATED AND VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING.
10. CATCH BASINS SHALL BE PRECAST REINFORCED CONCRETE IN ACCORDANCE WITH SECTION 3.6.0 OF SSSWCW AND CONFORM TO ASTM C478. SIZES SHALL BE AS INDICATED AND VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING.
11. INLETS SHALL BE PRECAST REINFORCED CONCRETE IN ACCORDANCE WITH SECTION 3.6.0 OF SSSWCW AND CONFORM TO ASTM C913. SIZES SHALL BE AS INDICATED AND VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING.
12. AREA DRAINS SHALL BE ADS NYLOPLAST AS APPROVED BY THE WISCONSIN DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES PLUMBING PRODUCTS REGISTER.
13. FRAMES AND GRATES SHALL BE AS INDICATED. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING FRAMES AND GRATES ARE COMPATIBLE WITH PRECAST STRUCTURES PRIOR TO ORDERING.
14. TRENCH SECTION SHALL BE CLASS B IN ACCORDANCE WITH SECTION 3.2.6 OF SSSWCW. MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE OUTSIDE DIAMETER OF PIPE PLUS 20 INCHES.
15. PIPE BEDDING AND COVER MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 8.43.0 OF SSSWCW. MINIMUM COVER OVER PIPE SHALL BE 12 INCHES.
16. TRENCH BACKFILL MATERIAL SHALL BE MECHANICALLY COMPACTED GRANULAR BACKFILL IN ACCORDANCE WITH SECTION 8.43.4 OF SSSWCW BENEATH AND WITHIN 5 FEET OF PAVEMENT AREAS, AND SHALL BE SPOIL BACKFILL IN ACCORDANCE WITH SECTION 8.43.5 OF SSSWCW BENEATH GREENSPACE AREAS, UNLESS ALTERNATIVE COMPACTION IS RECOMMENDED IN THE GEOTECHNICAL REPORT OR BY THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION, IN WHICH CASE THE CONTRACTOR IS TO FOLLOW THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.
17. CAUTION MUST BE FOLLOWED REGARDING THE COMPACTION OF ALL UTILITY TRENCHES. FLOODING OF BACKFILL MATERIAL IS NOT ALLOWED.
18. ALL CONNECTIONS TO EXISTING STORM SEWER PIPES AND STRUCTURES SHALL BE CORED CONNECTIONS, UNLESS NOTED OTHERWISE.
19. FLEXIBLE COMPRESSION COUPLINGS SHALL BE USED IN THE CONNECTION OF DISSIMILAR PIPE MATERIALS.
20. CLEANOUTS AND RISER EXTENSIONS SHALL BE INSTALLED IN ACCORDANCE WITH SPS 382.35 FROM SEWER PIPES TO GROUND SURFACE. LIGHT DUTY LOADING CLASSIFICATION SHALL BE USED IN UNPAVED AREAS. MEDIUM DUTY LOADING CLASSIFICATION SHALL BE USED IN PAVED FOOT TRAFFIC AREAS. HEAVY DUTY LOADING CLASSIFICATION SHALL BE USED IN PAVED VEHICULAR TRAFFIC AREAS. FRAMES AND COVERS SHALL BE SET FLUSH WITH SURFACE.
21. TRACER WIRE SHALL BE BROWN AND INSTALLED IN ACCORDANCE WITH SECTION 2.11.1 OF SSSWCW ON ALL BURIED NON-METALLIC PUBLIC STORM SEWER PIPE, PRIVATE STORM INTERCEPTOR PIPE, AND BUILDING STORM SERVICE PIPE. TRACER WIRE SHALL BE INSULATED, SINGLE-CONDUCTOR, 12 GAUGE SOLID COPPER OR COPPER COATED STEEL WIRE, SECURED AT LEAST EVERY 10 FEET AND AT ALL BENDS, WITH ACCESS POINTS AT LEAST EVERY 400 FEET.
22. FIELD TILE ENCOUNTERED DURING CONSTRUCTION SHALL BE CONNECTED TO THE STORMWATER DRAINAGE SYSTEM. IF THIS CANNOT BE ACCOMPLISHED, THEN IT SHALL BE REPAIRED WITH NEW PIPE OF SIMILAR SIZE AND MATERIAL. DOCUMENTATION OF SUCH FIELD TILE SHALL BE PROVIDED TO THE OWNER.
23. PROPOSED STORM SERVICES SHOWN ON THIS PLAN SHALL TERMINATE AT A POINT FIVE (5) FEET FROM THE EXTERIOR BUILDING WALL. CONNECTIONS TO DOWNSPOUTS SHALL BE PER DETAILS ON THE BUILDING PLUMBING PLANS. THE EXACT LOCATION OF DOWNSPOUTS SHALL BE PER THE ARCHITECTURAL PLANS.
24. THE CONTRACTOR SHALL ADJUST ALL MANHOLE RIMS AND INLETS TO FINISHED SURFACE.
25. AFTER INSTALLATION OF STORMWATER DRAINAGE SYSTEM, CLEAN ALL DEBRIS FROM SYSTEM AND INSPECT FOR DAMAGE. REPAIR ANY DAMAGE.

DATE	DESCRIPTION

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INNIO - PROJECT GREEN
CITY OF WAUKESHA, WI

SPECIFICATIONS

DATE: 05/22/2026
SCALE: N.T.S.
JOB NO. 3250244
PROJECT MANAGER:
RYAN J. LANCOUR, P.E.
DESIGNED BY: TJR
CHECKED BY: RJY

SHEET NUMBER
C700

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