WOOLPERT

Stormwater Management Summary

To: Town of Brownsburg Engineering Department

From: Brianne VanGorder, P.E.

Date: January 29, 2026

Subject: Meijer #338A-OD1 – Stormwater Management Summary

INTRODUCTION

This Stormwater Management summary was prepared to summarize the drainage conditions and analysis for the proposed Heartland Dental in the Meijer outlot development located at 9180 E. 56th Street, Brownsburg, Indiana. Detention facilities are designed and constructed by the overall developer as established by the Meijer Store ABE Stormwater Management Report developed by Woolpert, Inc. dated September 5, 2023, and revised January 10, 2025. See Exhibit 3 for a copy of this report.

SITE DESCRIPTION

1. Existing Conditions: Outlot A of the Meijer subdivision, which is 1.21-acres. The lot has been prepared for future development. It is rough graded for a building pad and drainage facilities provided.

2. Proposed Conditions: A Heartland Dental with associated parking areas and access drives will be constructed on the 1.21-acre site. Storm sewer and utility services will be constructed and connected to the proposed subdivision utility infrastructure. Stormwater runoff will be managed within stormwater management facilities that are designed and constructed by the overall development. See FIG-1B of the Meijer Subdivision Stormwater Management Report for the Post-Development Project Area Drainage Plan. See FIG-1D of the Meijer Subdivision Stormwater Management Report for the subdivision Inlet Drainage Plan.

STORM SEWER DESIGN

See Exhibit 1 for the Inlet Drainage Plan. The storm sewer system is divided into multiple drainage areas, all of which drain to a proposed catch basin or curb inlet. The proposed drainage structures discharge to existing drainage structures as part of the Meijer subdivision. The onsite storm sewers were designed in accordance with the Town of Brownsburg Codified Ordinances. The storm sewers are designed to convey the 10-year storm event. An n-value of 0.012 was used for the storm design calculations. See Exhibit 2 for the post-developed weighted C calculations and storm sewer design. The areas draining to Structures 1.01 and 2.03 are assumed to include future development on Outlot D. As such, the runoff coefficient reflects that area being 75% impervious and 25% pervious. Based on this analysis, the Meijer subdivision storm sewer has the capacity for the proposed Heartland Dental development.

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Dayton, OH 45430
937.461.5660

EXHIBIT 1
INLET DRAINAGE PLAN

Woolpert, Inc.
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Dayton, OH 45430
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MEIJER
OUTLOT D
2.08 ACRES

MEIJER
OUTLOT A
1.21 ACRES

PROPOSED BUILDING
4,285± SF
FFE = 887.90

20' SANITARY SEWER EASEMENT

10' GAS EASEMENT

N02°28'55"W R.

S87°31'05"W R.

15' BUFFER YARD

25' SIDE YARD SETBACK

20' BUFFER YARD

50' FRONT YARD SETBACK

20' ACCESSORY STRUCTURE/PARKING SETBACK

25' PRIMARY STRUCTURE SETBACK

25' SANITARY SEWER EASEMENT PER INST. NO. 202210601

EAST 56TH STREET (E. COUNTY ROAD 600 N.)

1.01
0.35 ACRES
C = 0.74

CUMULATIVE 1.00
0.46 ACRES
C = 0.73

1.00
0.11 ACRES
C = 0.72

2.04
0.13 ACRES
C = 0.85

2.03
0.82 ACRES
C = 0.70

2.02
0.16 ACRES
C = 0.74

2.00
0.14 ACRES
C = 0.69

CUMULATIVE 2.00
1.36 ACRES
C = 0.72

2.01
0.11 ACRES
C = 0.77

5' CI TC: 886.41
INV 24" W 879.66
INV 30" E 879.66

4' YARD INLET TC: 885.00
INV 24" E 880.00

5' CI TC: 886.42
INV 24" W 879.92
INV 30" E 879.47
INV 24" S 879.57

5' CI TC: 886.42
INV 30" W 879.43
INV 30" NE 879.33

4' CI TC: 886.40
INV 18" S 879.92
INV 24" N 879.82
INV 24" W 879.92

4' CI TC: 886.40
INV 18" N 880.27

STM MH TC: 885.21
INV 36" RCP W 879.33
INV 36" RCP E 879.33
INV 15" RCP S 879.91

CURB INLET TC: 884.16
INV 15" RCP N 879.76
INV 15" RCP S 879.86

STM MH TC: 884.98
INV 36" RCP W 875.09
INV 36" RCP E 874.99
INV 15" RCP S 878.68

CURB INLET TC: 883.93
INV 15" RCP N 879.53
INV 15" RCP S 879.73

A1 INLET DRAINAGE PLAN
1"=20'

NORTH

0 20 40 60
GRAPHIC SCALE IN FEET

WOOLPERT
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meijer
2929 WALKER AVENUE
GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER OUTLOT #338A
9190 E. 56TH STREET
BROWNSBURG, INDIANA 46112

INLET DRAINAGE PLAN

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
10026635

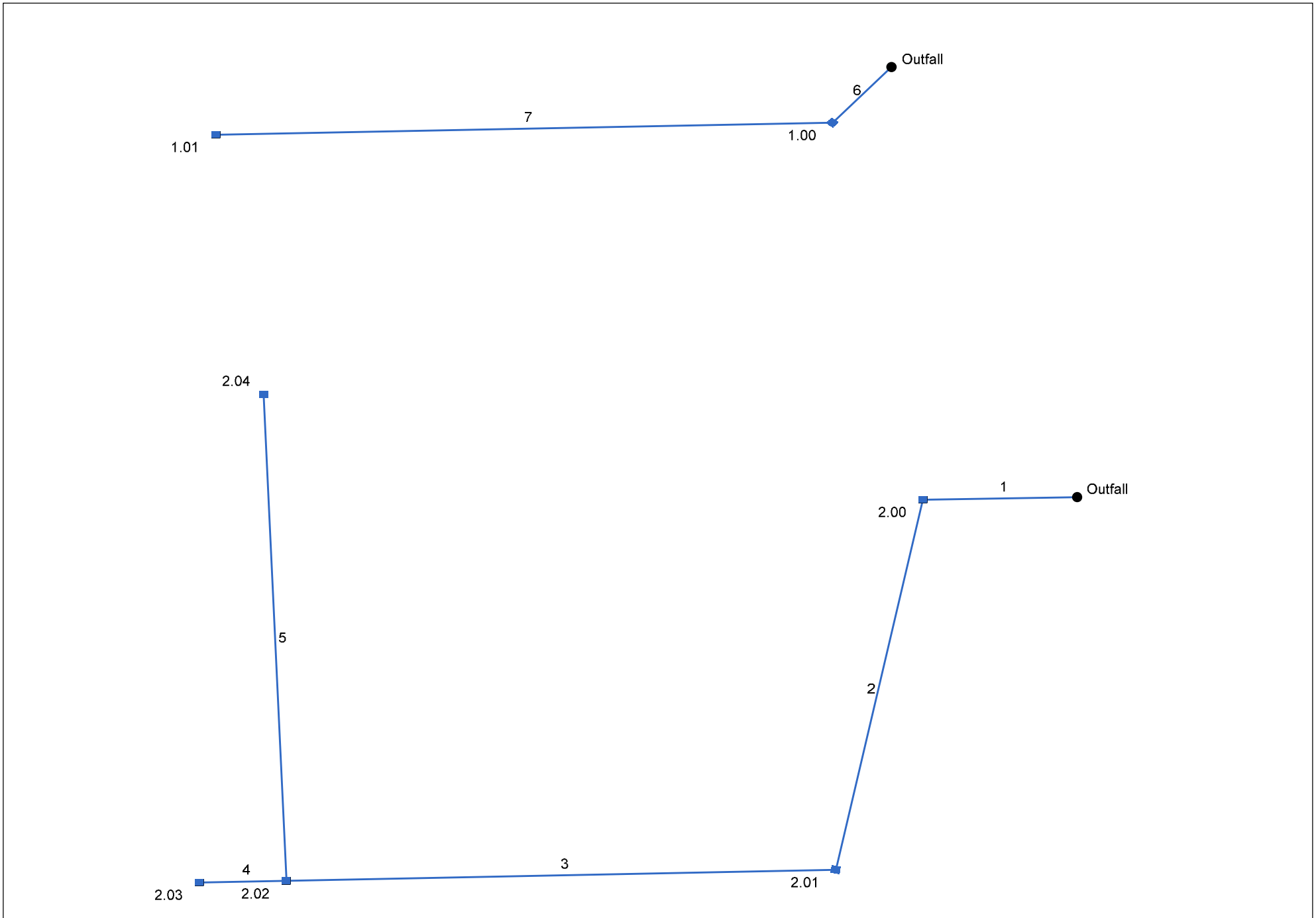
EXH 1

Images: _Xrefs: 10026635TBLK.dwg; 10026635-x.dwg; 10026635-p.dwg; 10026635-g.dwg
Layout: "A1" Model: INLET DRAINAGE PLAN
Last Saved By:BJVonGorder, 1/23/2026 2:55:05 PM
G:\DE\Clients\Meijer\10026635 Meijer 338A-OD1, Brownsburg, IN\4.0 Disciplines\Civil\Eng\Storm Design\10026635-Drainage Plan Exhibit.dwg Plotted By:VonGorder, Brianne Plotted:January 23, 2026, 2:55:49 PM

EXHIBIT 2
STORM SEWER DESIGN

Woolpert, Inc.
4454 Idea Center Boulevard
Dayton, OH 45430
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Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: P-STM.stm	Number of lines: 7	Date: 1/23/2026

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
7	1.01	1.94	15	Cir	142.000	880.30	881.00	0.493	881.68	881.79	0.09	881.88	6	Grate
6	1.00	2.53	15	Cir	21.000	880.10	880.20	0.476	881.60*	881.63*	0.05	881.68	End	Grate
5	2.04	0.83	12	Cir	140.000	880.67	881.37	0.500	882.55*	882.61*	0.02	882.63	3	Grate
4	2.03	4.30	18	Cir	20.000	880.77	880.87	0.500	882.55*	882.58*	0.09	882.67	3	Generic
3	2.02	6.02	24	Cir	126.500	880.42	880.67	0.198	882.42	882.49	0.06	882.55	2	Grate
2	2.01	6.65	24	Cir	108.323	880.10	880.32	0.203	882.10	882.17	0.07	882.24	1	Grate
1	EX 2.31	7.37	24	Cir	35.487	879.92	879.99	0.197	881.92	881.95	0.08	882.03	End	Grate

Project File: P-STM.stm | Number of lines: 7 | Run Date: 1/23/2026

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
7	6	142.000	0.35	0.35	0.74	0.26	0.26	5.0	5.0	7.5	1.94	4.91	1.98	15	0.49	880.30	881.00	881.68	881.79	886.00	885.68	1.01
6	End	21.000	0.11	0.46	0.72	0.08	0.34	5.0	5.0	7.5	2.53	4.83	2.06	15	0.48	880.10	880.20	881.60	881.63	885.00	886.00	1.00
5	3	140.000	0.13	0.13	0.85	0.11	0.11	5.0	5.0	7.5	0.83	2.73	1.05	12	0.50	880.67	881.37	882.55	882.61	885.53	886.43	2.04
4	3	20.000	0.82	0.82	0.70	0.57	0.57	5.0	5.0	7.5	4.30	8.04	2.43	18	0.50	880.77	880.87	882.55	882.58	885.53	885.00	2.03
3	2	126.500	0.16	1.11	0.74	0.12	0.80	5.0	5.0	7.5	6.02	10.89	1.96	24	0.20	880.42	880.67	882.42	882.49	885.90	885.53	2.02
2	1	108.323	0.11	1.22	0.77	0.08	0.89	5.0	5.0	7.5	6.65	11.04	2.15	24	0.20	880.10	880.32	882.10	882.17	886.00	885.90	2.01
1	End	35.487	0.14	1.36	0.69	0.10	0.98	5.0	5.0	7.5	7.37	10.88	2.35	24	0.20	879.92	879.99	881.92	881.95	886.40	886.00	EX 2.31

Project File: P-STM.stm | Number of lines: 7 | Run Date: 1/23/2026

NOTES:Intensity = 58.29 / (Inlet time + 8.60) ^ 0.79; Return period =Yrs. 10 ; Pipe travel time suppressed. ; c = cir e = ellip b = box

Inlet Report

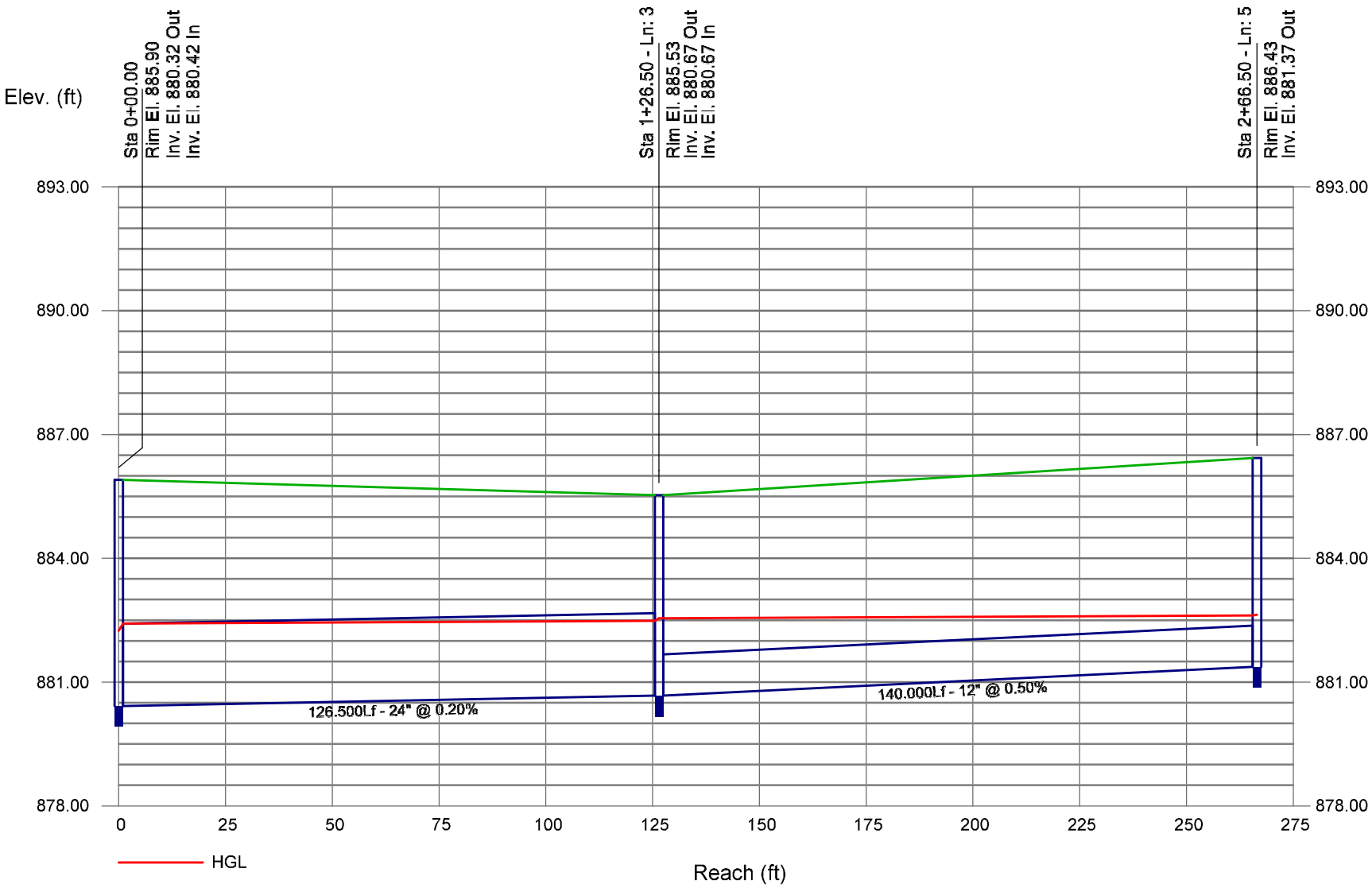
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
7	1.01	1.94	0.00	1.94	0.00	Grate	0.0	0.00	0.74	0.93	0.80	Sag	1.00	0.005	0.020	0.012	0.40	20.98	0.40	20.98	0.0	Off
6	1.00	0.59	0.00	0.59	0.00	Grate	0.0	0.00	0.74	0.93	0.80	Sag	1.00	0.050	0.020	0.012	0.20	8.63	0.20	8.63	0.0	Off
5	2.04	0.83	0.00	0.83	0.00	Grate	0.0	0.00	0.74	0.93	0.80	Sag	1.00	0.050	0.020	0.012	0.25	10.91	0.25	10.91	0.0	Off
4	2.03	4.30	0.00	4.30	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	1.00	0.050	0.020	0.012	0.30	13.50	0.30	13.50	0.0	Off
3	2.02	0.89	0.00	0.89	0.00	Grate	0.0	0.00	0.74	0.93	0.80	Sag	1.00	0.050	0.020	0.012	0.26	11.44	0.26	11.44	0.0	Off
2	2.01	0.63	0.00	0.63	0.00	Grate	0.0	0.00	0.74	0.93	0.80	Sag	1.00	0.050	0.020	0.012	0.21	9.05	0.21	9.05	0.0	Off
1	2.00	0.72	0.00	0.72	0.00	Grate	0.0	0.00	0.74	0.93	0.80	Sag	1.00	0.050	0.020	0.012	0.23	9.93	0.23	9.93	0.0	Off

Project File: P-STM.stm | Number of lines: 7 | Run Date: 1/23/2026

NOTES: Inlet N-Values = 0.012; Intensity = 58.29 / (Inlet time + 8.60) ^ 0.79; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

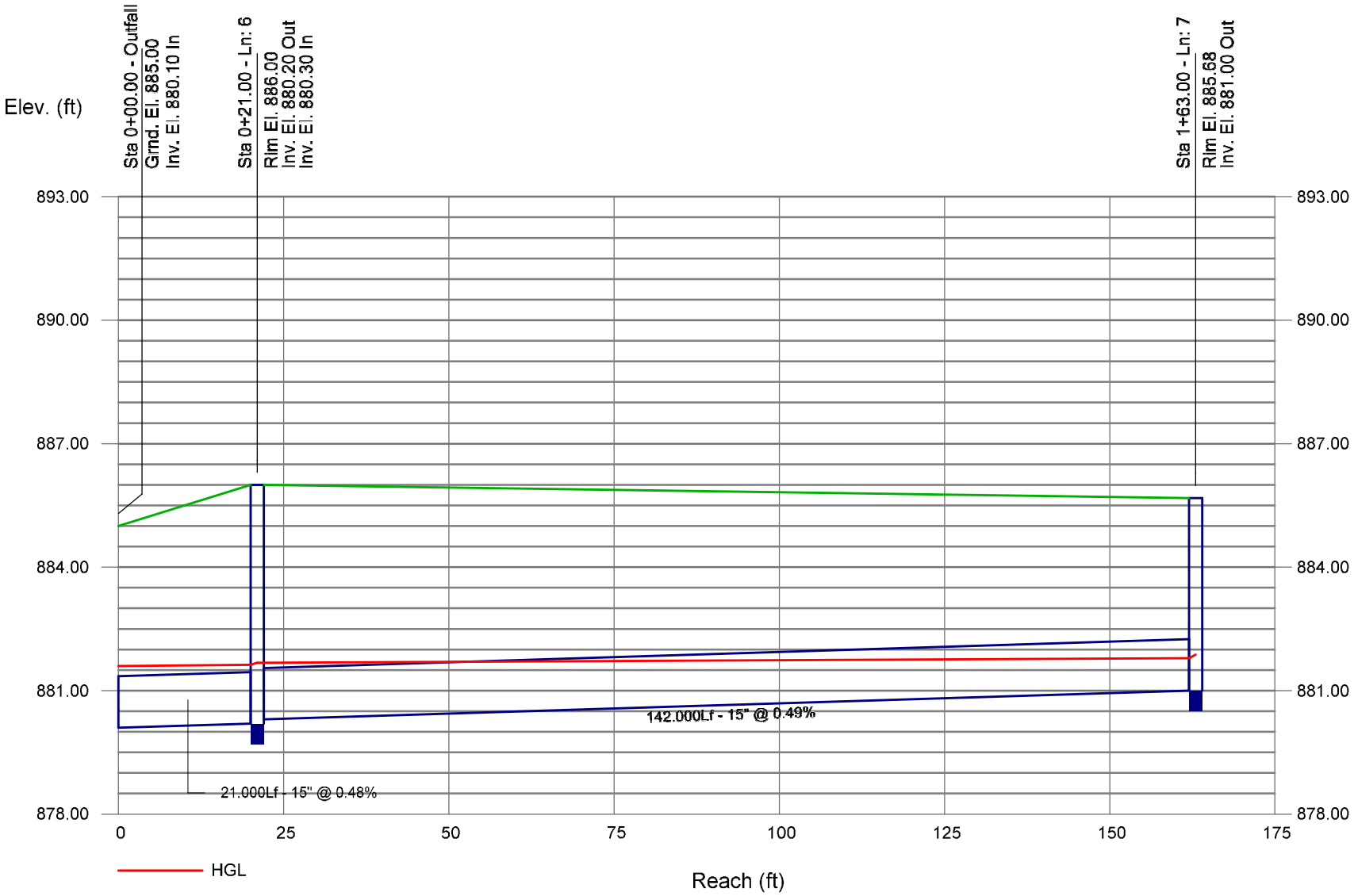
Storm Sewer Profile

Proj. file: P-STM.stm



Storm Sewer Profile

Proj. file: P-STM.stm



Storm Sewer Profile

Proj. file: P-STM.stm

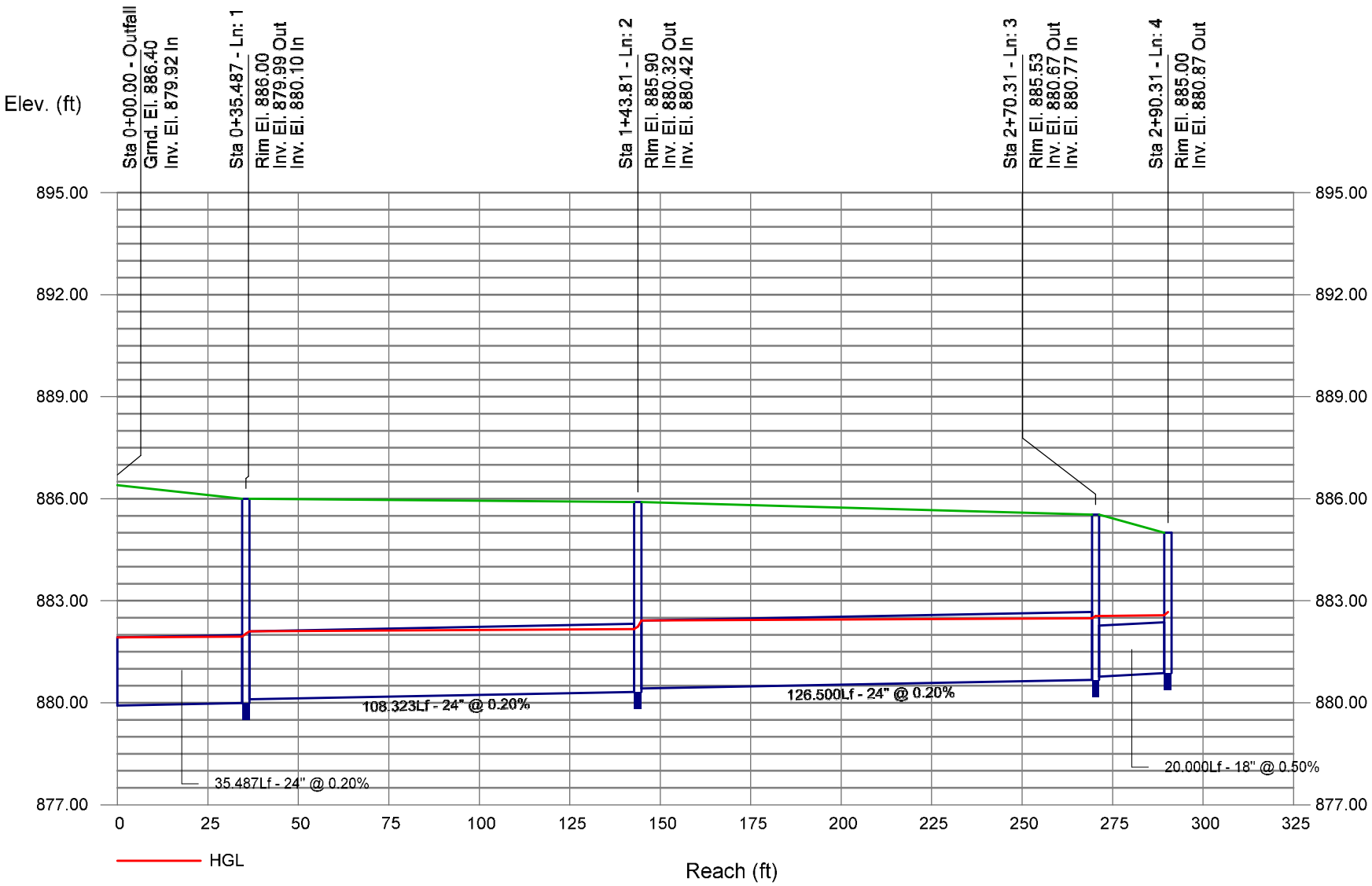


EXHIBIT 3

STORMWATER MANAGEMENT REPORT FOR MEIJER STORE ABE

Woolpert, Inc.
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WOOLPERT
ARCHITECTURE | ENGINEERING | GEOSPATIAL

STORMWATER MANAGEMENT REPORT

PREPARED FOR:

MEIJER STORE #338 ABE
9202 E 56TH STREET
TOWN OF BROWNSBURG
HENDRICKS COUNTY, INDIANA 46112

PREPARED BY:

WOOLPERT, INC.
4454 IDEA CENTER BOULEVARD
DAYTON, OH 45430

WOOLPERT PROJECT: 10020046

September 5, 2023
REV. February 23, 2024
REV. January 10, 2025

Woolpert, Inc.
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513.272.8300

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INTRODUCTION

This stormwater management report was prepared to provide the methodology and control measures that will be utilized to control stormwater runoff from the proposed Meijer development in post-construction conditions. The development will be constructed at 9202 East 56th St, Brownsburg, Hendricks County, IN. The site is bordered by East 56th Street (E CR 600 N) to the south, N CR 900 E to the west, undeveloped agricultural land to the north, and the right-of-way and future stormwater management basin for the Ronald Reagan Parkway extension to the east.

The Town of Brownsburg Stormwater Management regulations were used to design the stormwater management system, along with the Hendricks County required release rates. HydroCAD was used to simulate pre- and post-developed runoff and to model post-developed stormwater management routing.

PROJECT DESCRIPTION

The 31.63-acre site will be developed as a Meijer supercenter and mExpress convenience/fueling store with associated parking area, access drives and landscaping. Four entrance drives will be constructed to access the site: two on East 56th Street (E CR 600 N) and two on N CR 900 E. Storm sewer and utility services will be constructed and connect to the existing utility infrastructure. Two proposed above-ground stormwater management basins and an underground stormwater management system will provide detention and water quality treatment for the Meijer development in accordance with the Town of Brownsburg and Hendricks County requirements. Additionally, the commercial outlots to be constructed in the future have been considered in the proposed design. The proposed stormwater management system is designed to manage all detention from the commercial outlots.

PRE-DEVELOPED SITE CONDITIONS

See Figure 1A for the Pre-Developed Drainage Plan and Figure 1C for the Site Watershed Map. The existing 31.63-acre site is an undeveloped agricultural field. The site is composed primarily of poorly drained Hydrologic Soil Group (HSG) C/D (Treaty Silt Loam) and somewhat poorly drained HSG B/D (Crosby Silt Loam) soils. The site slopes from northwest to southeast at roughly 0.50 – 2.00 percent. Existing storm runoff sheet flows to a common low point at the southeast corner of the site. Additionally, there is an existing 27” storm pipe running West to East across the site. This pipe conveys stormwater discharge from the Hession Farms Subdivision from the west side of CR 900 as well as discharge from the OrthoIndy detention basin located to the southwest of the subject site. The 27” pipe increases in size to a 36” pipe immediately downstream (east) of the subject site and discharges to School Branch. Immediately east of the subject site is the South Detention Pond for the Ronald Regan Extension Road Project, currently under construction. This detention basin is owned and maintained by the Hendricks County Engineering Department. As part of the construction, the 36” discharge pipe from Hession Farms and OrthoIndy will be rerouted around the new detention basin. All stormwater discharge from the South Detention Pond and the 36” pipe will discharge to School Branch. Lastly, the southern portion of the site is bordered by two outlots owned by OrthoIndy, B-1 and B-2, 1.70 acres and 1.80 acres in area, respectively. These outlots will be developed by others but existing runoff within these areas sheet flows from west to east towards the common low point on the subject property.

POST-DEVELOPED SITE CONDITIONS

See Figure 1B for the Post-Developed Drainage Plan. The Meijer supercenter and convenience store as well as the outlots of the development will be constructed on the 31.63-acre site. The existing 27” storm pipe will remain undisturbed throughout construction. Storm sewer and utility services will be constructed and connect to existing utility infrastructure. The proposed stormwater management system will provide detention and water quality treatment for the development per Town of Brownsburg and Hendricks County requirements.

The proposed stormwater management system is separated into two detention systems for the north and south portions of the site generally delineated by the existing 27” storm pipe running West to East across the site. The majority of the north portion of the site discharges to the above-ground wet detention basin (Pond 1P) located along the northern and eastern property lines. Pond 1P provides detention volume and water quality for the Meijer supercenter store, northern parking lots, Outlots B & C and off-site drainage north of the subject property. The on-site drainage areas referred to as A-1, Out B, and Out C will be detained within the basin. The off-site drainage areas north of the subject property referred to as D-1 and D-2 will bypass through the basin as uncontrolled flow. The small area along

the perimeter referred to as C-2 will remain uncontrolled and contribute to the total site runoff. Pond 1P has a wet bottom elevation of 875.00, a normal pool elevation of 877.29, and a top of bank elevation of 885.00.

The majority of the south portion of the site discharges to the combined above-ground basin and underground detention facility (Pond 2P) located north of Outlot A and the mExpress. Pond 2P provides detention volume and water quality for the Meijer convenience store/fueling station, southern parking lots, and Outlot A. The on-site drainage areas referred to as A-2 and Out A will be detained within the detention system. Small areas along the perimeter referred to as C-3, C-4, C-5, C-6, and C-7 will remain uncontrolled and contribute to the total site runoff. The underground stormwater management facility and the above-ground detention basin are connected via a 42" equalization pipe. The underground detention system does not accept any site runoff but works in combination with the above-ground detention basin to provide additional storage volume. The 42” equalizer pipe will begin to stage as the above-ground detention basin fills up. Runoff volume will continue to stage between the above-ground detention basin, the 42” equalizer pipe and the underground detention system. Runoff volume will flow into and out of the underground detention system via the 42” pipe as the above-ground detention basin fills up and begins to outlet from the outlet control structure, 3.02, at a controlled release rate. Both systems are hydraulically connected and have been modeled as one entity. Pond 2P has a dry bottom elevation of 877.38 with a top of bank elevation of 886.00. The underground detention system is a CONTECH 72” CMP system with stone backfill.

For each post-developed drainage area, the acreage, CN value, and time of concentration were determined. The CN value is weighted based on an impervious CN of 98 and an open space, good condition CN of 80. To comply with Town of Brownsburg and Hendricks County requirements, the future outlots were assumed to have a CN of 95 for commercial development. In post-developed conditions, the HSG has been modeled as Group D. The post-developed time of concentrations for detained developed areas were calculated to be 15.0 minutes assuming 10 minutes of overland flow and 5 minutes of pipe flow. The post-developed time of concentrations for the undetained perimeter areas were assumed to be 6.0 minutes based on the minimum allowable per TR-55 guidance.

The outlet control structures for each detention basin discharge to the existing 27” pipe in accordance with Watershed-Specific Release Rates as coordinated with the Hendricks County Drainage Board. An analysis of the existing 27” pipe running through the subject site indicates that the pipe has sufficient capacity to convey the detained runoff from the proposed development to School Branch. See Appendix 1.6 for the analysis.

Emergency overflow spillways have been provided for both above-ground detention basins and are designed to directly discharge into the future Ronald Reagan detention basin east of the site. An analysis of the Ronald Reagan Parkway detention basin indicates that the emergency spillway has sufficient capacity to allow for the potential overflow from the Meijer basin emergency spillways. See Appendix 1.3 for the Emergency Spillway Calculations.

DETENTION DESIGN

Stormwater detention will be provided for the proposed development in accordance with the Town of Brownsburg and Hendricks County design requirements. Per a comment received from the Hendricks County Drainage Board on January 4th, 2024, the allowable release rates for the 10- and 100-year storm events have been calculated based on 0.1 cfs per acre and 0.3 cfs per acre, respectively. Table 1.1 on the following page provides the drainage areas for each detention system as well as the allowable release rates. Tables 1.2 and 1.3 provide summaries of the designed release rates. See Appendices 1.1 and 1.2 for HydroCAD Inputs and Results.

POND 1P (ABOVE-GROUND BASIN) DETENTION DESIGN

The proposed above-ground stormwater management system is designed so that runoff from the post-developed Meijer supercenter store, northern parking lots, Outlots B & C will be managed within the detention basin up to and including the 100-year storm. Runoff from the drainage areas referred to as A-1, Out B, and Out C will discharge to the proposed basin. A 40" X 40" structure will be modified to serve as the outlet control structure to control the post-developed release rates for this area. A 4" orifice at invert 877.29 will function as the primary control device. A 12" orifice at invert 882.14 will function as the secondary control device. The grate of the outlet control structure will have an elevation of 884.54. The stormwater management system will outlet to the existing 27" pipe through a 12" pipe at invert 877.29. An emergency spillway will be provided at elevation 884.54 and the top of the basin is at 885.00. See Appendix 1.4 for the Outlet Structure Detail.

POND 2P (COMBINED ABOVE-GROUND & UNDERGROUND BASIN) DETENTION DESIGN

The proposed combined above-ground basin and 72" underground stormwater management system is designed so that runoff from the post-developed Meijer convenience store/fueling station, southern parking lots, and Outlot A will be managed within the detention basin up to and including the 100-year storm. Runoff from the drainage areas referred to as A-2 and Out A will discharge to the proposed basin. A storm structure will be modified to serve as the outlet control structure to control the post-developed release rates for this area. A 4" orifice at invert 877.38 will function as the primary control device. A 12" orifice at invert 882.61 will function as the secondary control device. The grate of the outlet control structure will have an elevation of 885.40. The stormwater management system will outlet to the existing 27" pipe through a 12" pipe at invert 877.38. An emergency spillway will be provided at elevation 885.40 and the top of the basin is at 886.00. See Appendix 1.4 for the Outlet Structure and Underground Detention System Details.

Per comments received from the Hendricks County Drainage Board on January 4th, 2024, the underground detention system was requested to be modeled separately from the above-ground detention basin 2P. Due to HydroCAD modeling software limitations, the model produced oscillations in the hydrograph output for the south pond. After reviewing various HydroCAD help documents, it is recommended to model these systems as a single detention facility for accurate routing.

Table 1.1: Allowable Release Rate Calculations

Rows highlighted orange denote drainage areas that are detained within the detention systems. Non-highlighted rows indicate drainage areas that are bypassed within the detention systems.

Detention System 1P (North Detention Basin)

Site Type	Node Name	Area (acres)	10-yr Existing Release Rate (cfs)	10-yr Allowable (0.1 cfs/acre)	100-yr Existing Release Rate (cfs)	100-yr Allowable (0.3 cfs/acre)	
Meijer Site	A-1	16.51	96.82	1.65	147.35	4.95	
Outlot B	Out B	1.92	7.32	0.19	11.59	0.58	
Outlot C	Out C	3.82	10.34	0.38	16.52	1.15	
North Offsite D-1	D-1	18.48	24.10	24.10	38.78	38.78	
North Offsite D-2	D-2	10.72	29.71	29.71	47.46	47.46	
	Total Area	51.45					
				Total 10-yr Allowable Release Rate =		56.04	cfs
				Total 100-yr Allowable Release Rate =		92.92	cfs

Detention System 2P (South Detention Basin & Underground System)

Site Type	Node Name	Area (acres)	10-yr Existing Release Rate (cfs)	10-yr Allowable (0.1 cfs/acre)	100-yr Existing Release Rate (cfs)	100-yr Allowable (0.3 cfs/acre)	
Meijer Site	A-2	5.18	27.86	0.52	42.39	1.55	
Outlot A	Out A	3.12	10.92	0.31	17.40	0.94	
	Total Area	8.30					
				Total 10-yr Allowable Release Rate =		0.83	cfs
				Total 100-yr Allowable Release Rate =		2.49	cfs

Undetained Area (Bypass Flow Contributing to Total Site Runoff)

Site Type	Node Name	Area (acres)	10-yr Existing Release Rate (cfs)	10-yr Allowable (0.1 cfs/acre)	100-yr Existing Release Rate (cfs)	100-yr Allowable (0.3 cfs/acre)	
Ortho-Indy Oulot	B-1	1.70	7.07	7.07	12.17	12.17	
Ortho-Indy Oulot	B-2	1.80	4.25	4.25	7.65	7.65	
Undetained Area 2	C-2	0.16	0.70	0.02	1.21	0.05	
Undetained Area 3	C-3	0.29	1.07	0.03	1.85	0.09	
Undetained Area 4	C-4	0.19	0.66	0.02	1.09	0.06	
Undetained Area 5	C-5	0.16	0.38	0.02	0.66	0.05	
Undetained Area 6	C-6	0.05	0.26	0.01	0.39	0.02	
Undetained Area 7	C-7	0.19	0.26	0.02	0.39	0.06	
	Total Area	4.54					
				Total 10-yr Allowable Release Rate =		11.42	cfs
				Total 100-yr Allowable Release Rate =		20.13	cfs

Total On-Site 10-YR Allowable Release Rate =	3.16	cfs
Total On-Site 100-YR Allowable Release Rate =	9.48	cfs

Total Site 10-YR Allowable Release Rate =	68.29	cfs
Total Site 100-YR Allowable Release Rate =	115.54	cfs

Table 1.2: On-Site Release Rate Summary

Site Area	10-YR Allowable Release Rate	10-YR Design Release Rate	WSE	100-YR Allowable Release Rate	100-YR Design Release Rate	WSE
Pond 1P	2.23 cfs	0.91 cfs	882.14’	6.68 cfs	4.00 cfs	883.27’
Pond 2P	0.83 cfs	0.95 cfs*	882.61’	2.49 cfs	5.19 cfs*	884.29’
Undetained Areas	0.10 cfs			0.31 cfs		
Total Site Runoff	3.16 cfs	5.62 cfs*		9.48 cfs	9.08 cfs	

*Note:
The design release rates for the detention system are above the calculated allowable release rates. This is due to the minimum orifice size of 4” as stated in the Town of Brownsburg Stormwater Manual.

Table 1.3: On-Site & Off-Site Release Rate Summary

Site Area	10-YR Allowable Release Rate	10-YR Design Release Rate	WSE	100-YR Allowable Release Rate	100-YR Design Release Rate	WSE
Pond 1P	56.04 cfs	6.24 cfs	884.48’	92.92 cfs	61.91 cfs	884.86’
Pond 2P	0.83 cfs	0.95 cfs*	882.61’	2.49 cfs	5.19 cfs*	884.29’
Undetained Areas	11.42 cfs			20.13 cfs		
Total Site Runoff	68.29 cfs	15.13 cfs		115.54 cfs	69.48 cfs	

*Note:
The design release rates for the detention system are above the calculated allowable release rates. This is due to the minimum orifice size of 4” as stated in the Town of Brownsburg Stormwater Manual. However, once both on-site detained and off-site bypass areas are considered, actual release rates for both the 10- and 100-year design storms are below allowable release rates.

STORM WATER QUALITY

Stormwater quality will be provided by a treatment train of three Hydrodynamic Separators, Structures 1.01, 1.31, & 2.01, to allow for pre-treatment of the stormwater runoff prior to entering the detention systems and the detention basins. Applicable water quality flow rates were used to size each structure to adhere to Town of Brownsburg requirements. Each water quality structure is specified as a Cascade Separator™ by CONTECH Engineering which has independent third-party testing showing 80% TSS removal rates as required by the Town of Brownsburg. See Appendix 1.5 for Water Quality Structure Sizing.

STORM SEWER DESIGN

See Figure 1D for the Inlet Drainage Plan. The storm sewer system for the site is divided into multiple drainage areas, all of which typically drain to a proposed catch basin or curb inlet and discharge to one of the proposed detention basins. The storm sewer is sized to convey the 10-year storm event and keep the hydraulic grade line within the pipe per Town of Brownsburg and Hendricks County requirements. The system was also designed to keep the hydraulic grade line below the rims of the drainage structures for the 25-year storm event. An n-value of 0.012 was used for the storm sewer design calculations. Additionally, a ponding analysis was completed for all drainage structures with the assumption that 50% of the open grate area for each inlet was blocked. The castings assumed for this analysis adhere to the Town of Brownsburg Construction Standards and utilize applicable Neenah casting types. See Appendices 2.2, 2.3 and 2.4 for Hydraflow Storm Sewers Calculations.

Per Town of Brownsburg regulations, the 100-yr ponding limits under the assumption that all storm inlets are at capacity have been provided on the proposed grading plan. The ponding limits at storm structures 1.02 and 1.03 include the truck dock area and abut the east building face. The pavement elevations in this area are set at or above the 100-yr water surface elevation of the detention basin, so the water elevations in the pond will not impact or flood this area. This ponding would only be a result of clogging or capacity issues with the storm sewer inlet grates to receive surface runoff. Additionally, per Meijer prototypical design standards, the truck dock entrance doors are set 50” above finished grade in this area to align with the main store finished floor elevation and the concrete pad for the entrance is sloped away from the building face at 1.00% to allow for positive drainage. Although the ponding limits abut the building face, site runoff will not pond up to the truck dock entrance doors, even in a case of clogging or capacity issues. The structural integrity of the building foundation will not be impacted by the ponding. The ponding will fluctuate as the detention

basin fills up and drains, so no permanent ponding will occur in this area. In summary, the design is not anticipated to impact the building foundation.

CONCLUSION

The proposed design meets the requirements outlined in the Town of Brownsburg and Hendricks County Stormwater Technical Standards Manual Adopted October 2017.

FIGURES

FIGURE 1A – PRE-DEVELOPED DRAINAGE PLAN

D-1 - UNDETAINED
18.48 ACRES
CN = 89, Tc = 81.9 MIN.

D-2 - UNDETAINED
10.72 ACRES
CN = 89, Tc = 28.1 MIN.

OUT C - DETAINED
3.88 ACRES
CN = 89, Tc = 20.6 MIN.

PRE-DEVELOPED SITE
22.85 ACRES
CN = 89, Tc = 34.5 MIN.

OUT B - DETAINED
1.57 ACRES
CN = 89, Tc = 9.5 MIN.

B-1 - UNDETAINED
1.70 ACRES
CN = 81, Tc = 6.20 MIN.

B-2 - UNDETAINED
1.80 ACRES
CN = 79, Tc = 21.2 MIN.

OUT A - DETAINED
3.33 ACRES
CN = 89, Tc = 20.6 MIN.

N. COUNTY ROAD 900 E.

EAST 56TH STREET (E. COUNTY ROAD 600 N.)

LOT 1
OI COMMERCIAL LOT 1 – SECONDARY PLAT
PLAT CABINET 9 SLIDE 2 PAGES 1A & 1B
INSTR. NO. 202215039

CrA
ThrA
YclA

CULTIVATED FIELD (CORN)
EXISTING WETLANDS
EARTHWORK IN PROCESS
REGIONAL DETENTION BASIN (BY OTHERS)
FIELD EDGE
DIRT
GRASS
CONC. WALK
SILT FENCE
1.0%

LEGEND

- EXISTING DRAINAGE STRUCTURE
- SD — EXISTING STORM SEWER
- 1179 — EXISTING 1' CONTOUR
- 1180 — EXISTING 5' CONTOUR
- PROJECT BOUNDARY
- DRAINAGE AREA BOUNDARY

SOILS LEGEND

CrA	CROSBY SILT LOAM, 0–2% SLOPES HYDROLOGIC GROUP: C/D
YclA	CROSBY SILT LOAM (URBAN LAND COMPLEX), 0–2% SLOPES HYDROLOGIC GROUP: C/D
ThrA	TREATY SILTY CLAY LOAM, 0–1% SLOPES HYDROLOGIC GROUP: B/D

DRAINAGE AREA SUMMARY

AREA B–1	1.70 ACRES
AREA B–2	1.80 ACRES
AREA D–1	18.48 ACRES
AREA D–2	10.72 ACRES
OUTLOT A	3.33 ACRES
OUTLOT B	1.57 ACRES
OUTLOT C	3.87 ACRES
PRE–DEVELOPED SITE	22.85 ACRES
TOTAL AREA	64.32 ACRES

BENCHMARK:

THE BASIS OF ELEVATIONS HEREON IS NAVD 88 PER OBSERVATIONS OF SELECTED STATIONS IN THE NATIONAL GEODETIC SURVEY CONTINUOUSLY OPERATING REFERENCE STATION (NGS CORS) NETWORK.
MAG NAIL SET IN THE CORNER TOP OF THE CURB JOINT – SEE DRAWING FOR LOCATION.
ELEVATION = 889.36'

A1 PRE-DEVELOPED DRAINAGE PLAN
1" = 60'

NORTH

0 60 120 180
GRAPHIC SCALE IN FEET

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meijer
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GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

PRE-DEVELOPED DRAINAGE PLAN

ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

1A

Images: Topo – County GIS.PNG; Xrefs: 10020046–x.dwg; 10020046TBLK.dwg
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FIGURE 1B – POST-DEVELOPED DRAINAGE PLAN

D-1 - UNDETAINED
18.48 ACRES
CN = 89, Tc = 81.9 MIN.

D-2 - UNDETAINED
10.72 ACRES
CN = 89, Tc = 28.1 MIN.

OUT C - DETAINED
3.82 ACRES
CN = 95, Tc = 15 MIN.

meijer
159,935 SQ. FT.
FF ELEV = 889.00

A-1 - DETAINED
16.51 ACRES
CN = 92, Tc = 15 min

OUTDOOR GARDEN CENTER

OUTDOOR SALES AREA

OUT B - DETAINED
1.92 ACRES
CN = 95, Tc = 15 MIN.

C-2 - UNDETAINED
0.16 ACRES
CN = 80, Tc = 6 MIN.

C-3 - UNDETAINED
0.29 ACRES
CN = 80, Tc = 6 MIN.

C-4 - UNDETAINED
0.19 ACRES
CN = 80, Tc = 6 MIN.

C-5 - UNDETAINED
0.17 ACRES
CN = 80, Tc = 6 MIN.

B-2 - UNDETAINED
1.80 ACRES
CN = 79, Tc = 21.1 MIN.

B-1 - UNDETAINED
1.70 ACRES
CN = 81, Tc = 6.2 MIN.

OUTLOT
(BY OTHERS)
1.86 ACRES

OUTLOT
(BY OTHERS)
1.80 ACRES

OUT A - DETAINED
3.12 ACRES
CN = 95, Tc = 15 MIN.

A-2 - DETAINED
5.18 ACRES
CN = 93
Tc = 15 MIN.

C-6 - UNDETAINED
0.05 ACRES
CN = 94, Tc = 6 MIN.

C-7 - UNDETAINED
0.19 ACRES
CN = 84, Tc = 6 MIN.

N. COUNTY ROAD 900 E.

EAST 56TH STREET (E. COUNTY ROAD 600 N.)

RONALD REAGAN BASIN
(BY OTHERS)

WET DETENTION BASIN
TOP OF BANK ELEV. = 885.00
NORMAL POOL ELEV. = 877.29
BOTTOM ELEV. = 865.00
10 YR. ELEV. = 882.14
100 YR. ELEV. = 883.27

EMERGENCY SPILLWAY
FLOOD ROUTING PATH
ELEVATION = 884.54

EMERGENCY SPILLWAY
FLOOD ROUTING PATH
ELEVATION = 885.40

DRY DETENTION BASIN
TOP OF BANK ELEV. = 885.00
BOTTOM ELEV. = 877.38
10 YR. ELEV. = 882.61
100 YR. ELEV. = 884.29

UNDERGROUND DETENTION SYSTEM
(72" CMP ROUND CHAMBER SYSTEM)
TOP OF STONE ELEV. = 884.53
TOP OF PIPE ELEV = 884.03
BOTTOM OF PIPE ELEV. = 878.03
BOTTOM OF STONE ELEV. = 877.53
10 YR. ELEV. = 882.61
100 YR. ELEV. = 884.29

LOT 1
OI COMMERCIAL LOT 1 – SECONDARY PLAT
PLAT CABINET 9 SLIDE 2 PAGES 1A & 1B
INSTR. NO. 202215039

LEGEND

- EXISTING DRAINAGE STRUCTURE
- EXISTING STORM SEWER
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- STORM SEWER
- DRAINAGE STRUCTURE
- XX STORM STRUCTURE ID
- PROJECT BOUNDARY
- DRAINAGE AREA BOUNDARY

DRAINAGE AREA SUMMARY

NORTH DETENTION POND DRAINAGE AREA

A–1 – DETAINED	16.51 AC
OUT B – DETAINED	1.92 AC
OUT C – DETAINED	3.82 AC
D–1 – UNDETAINED, BYPASS	18.48 AC
D–2 – UNDETAINED, BYPASS	10.72 AC
TOTAL DRAINAGE AREA	51.45 ACRES

SOUTH DETENTION POND & UNDERGROUND SYSTEM DRAINAGE AREA

A–2 – DETAINED	5.18 AC
OUT A – DETAINED	3.12 AC
TOTAL DRAINAGE AREA	8.30 ACRES

UNDETAINED AREAS, CONSIDERED WITHIN TOTAL SITE RUNOFF

B–1 – UNDETAINED	1.70 AC
B–2 – UNDETAINED	1.80 AC
C–2 – UNDETAINED	0.16 AC
C–3 – UNDETAINED	0.29 AC
C–4 – UNDETAINED	0.19 AC
C–5 – UNDETAINED	0.16 AC
C–6 – UNDETAINED	0.05 AC
C–7 – UNDETAINED	0.19 AC
TOTAL UNDETAINED AREA	4.54 ACRES

DRAINAGE AREA LEGEND

- A–1
- A–2
- MEIJER OUTLOTS A, B, & C
- OUTLOTS BY OTHERS B–1 & B–2
- C–2
- C–3
- C–4
- C–5
- C–6
- C–7
- D–1
- D–2

A1 POST-DEVELOPED DRAINAGE PLAN
1" = 60'

NORTH

0 60 120 180
GRAPHIC SCALE IN FEET

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GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
8202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

POST-DEVELOPED DRAINAGE PLAN

ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

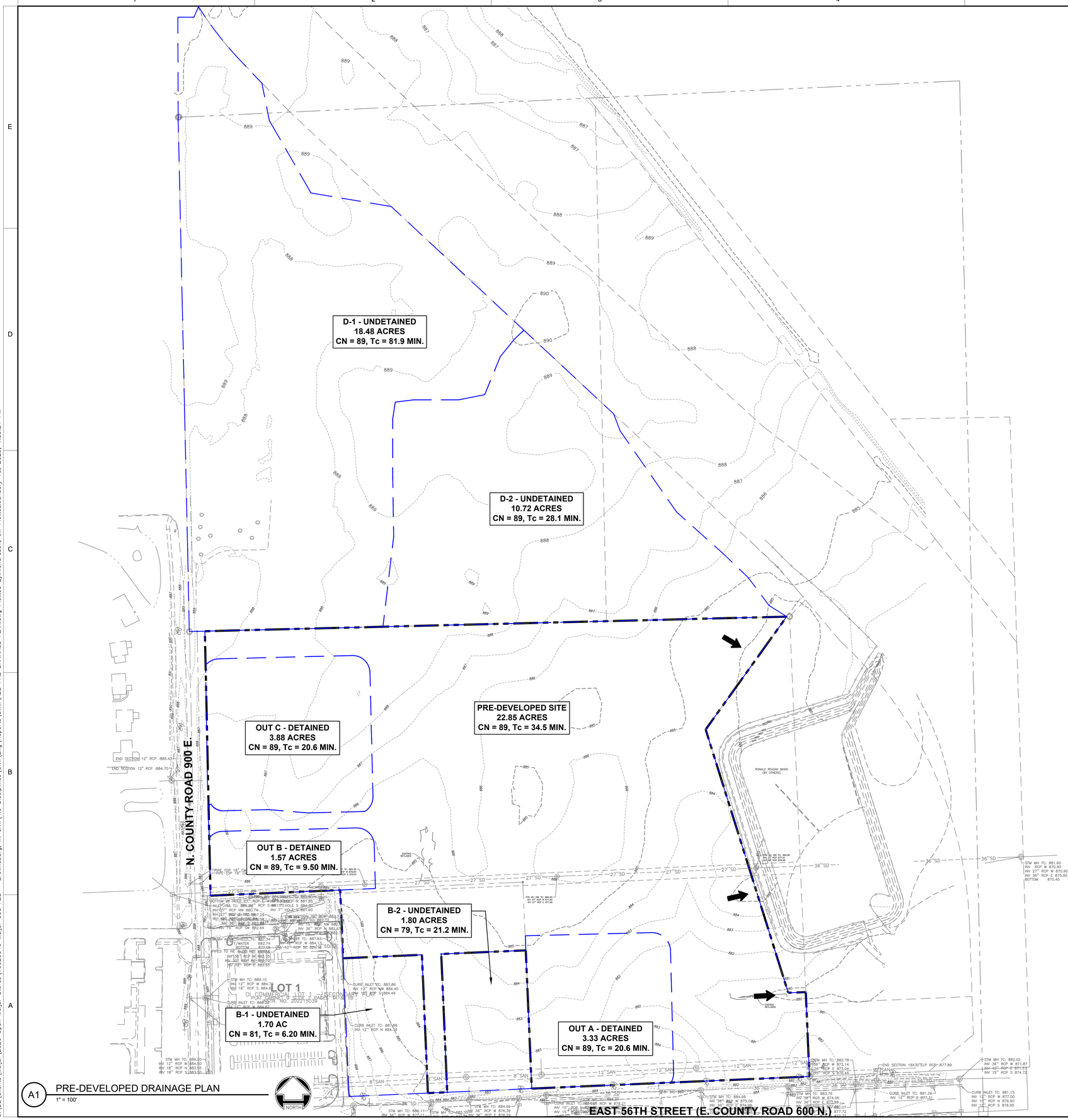
PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

1B

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FIGURE 1C – SITE WATERSHED MAP



LEGEND

- EXISTING DRAINAGE STRUCTURE
- EXISTING STORM SEWER
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROJECT BOUNDARY
- DRAINAGE AREA BOUNDARY

DRAINAGE AREA SUMMARY

AREA B-1	1.70 ACRES
AREA B-2	1.80 ACRES
AREA D-1	18.48 ACRES
AREA D-2	10.72 ACRES
OUTLOT A	3.33 ACRES
OUTLOT B	1.57 ACRES
OUTLOT C	3.87 ACRES
PRE-DEVELOPED SITE	22.85 ACRES
TOTAL AREA	64.32 ACRES

A1 PRE-DEVELOPED DRAINAGE PLAN
1" = 100'

0 100 200 300
GRAPHIC SCALE IN FEET

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BROWNSBURG, INDIANA 46112

SITE WATERSHED MAP

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CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

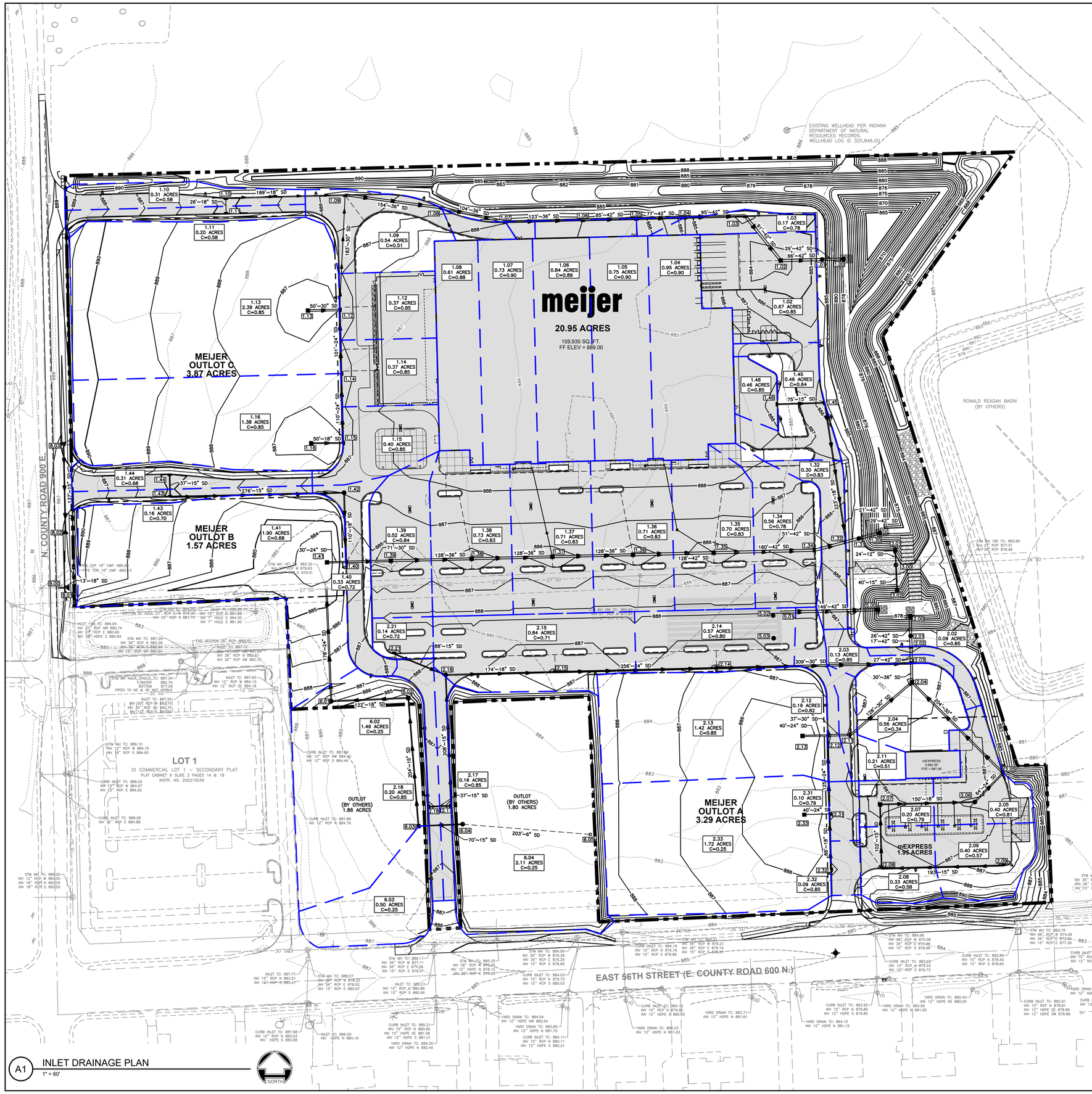
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FIGURE 1D – INLET DRAINAGE PLAN



LEGEND

- EXISTING DRAINAGE STRUCTURE
- EXISTING STORM SEWER
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROJECT BOUNDARY
- DRAINAGE AREA BOUNDARY
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- STORM SEWER
- UNDERDRAIN
- MANHOLE
- DRAINAGE BASIN
- CLEANOUT
- STORM STRUCTURE ID NUMBER
- IMPERVIOUS AREA

A1 INLET DRAINAGE PLAN
1" = 60'

NORTH

0 60 120 180
GRAPHIC SCALE IN FEET

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REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

INLET DRAINAGE PLAN

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PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

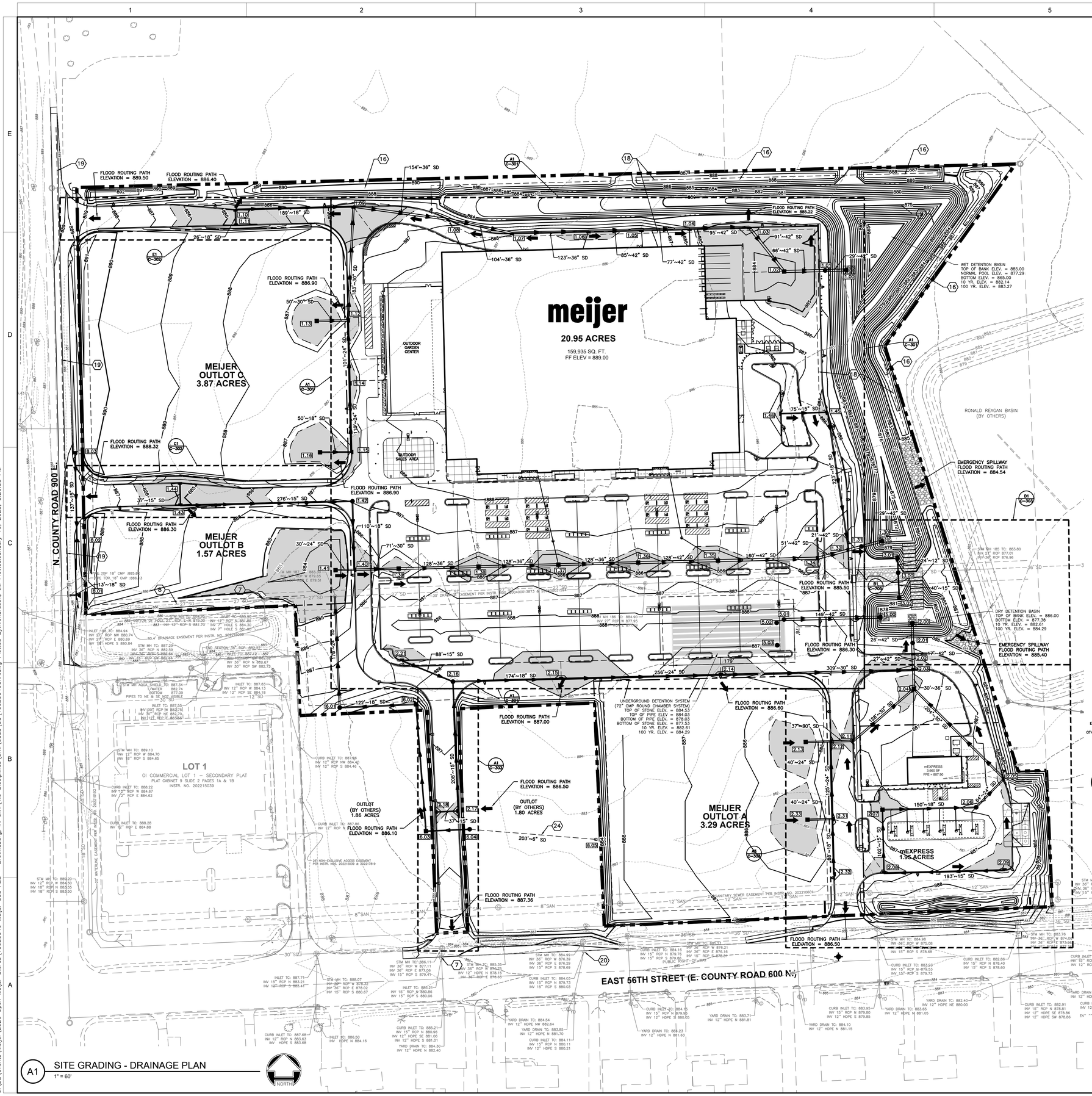
PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

1D

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FIGURE 2 – GRADING PLANS



LEGEND

- PROPERTY LINE
- 799 EXISTING 1' CONTOUR
- 800 EXISTING 5' CONTOUR
- SD EXISTING STORM SEWER
- 799 PROPOSED 1' CONTOUR
- 800 PROPOSED 5' CONTOUR
- STORM SEWER
- FUTURE STORM SEWER
- UNDERDRAIN
- MANHOLE
- DRAINAGE BASIN
- CLEANOUT
- XX STORM STRUCTURE ID NUMBER
- ROCK OUTLET PROTECTION
- FLOOD ROUTING ARROW
- 100-YEAR FLOOD LIMITS (WITH ALL INLETS BLOCKED)

GRADING NOTES

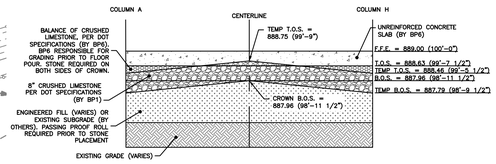
1. ALL SPOT ELEVATIONS ARE TO:
   TOP OF PAVEMENT – (TP)
   TOP OF SLAB – (TS)
   TOP OF CURB – (TC)
   TOP OF WALL – (TW)
   GUTTER PAN – (GP)
   UNLESS NOTED OTHERWISE.
2. CONTOURS SHOWN ARE FOR REFERENCE ONLY.
3. PROVIDE POSITIVE DRAINAGE AT ALL TIMES TO ENSURE NO STANDING WATER WITHIN PAVEMENT, BUILDING PAD, OR GREEN AREAS.
4. FOR ALL CURB ISLANDS, CENTER OF ISLANDS TO BE A MINIMUM OF 6" HIGHER THAN TOP OF CURB.
5. RESTORE ALL STREET SURFACES, DRIVEWAYS, CULVERTS, ROADSIDE DRAINAGE DITCHES, AND OTHER PUBLIC OR PRIVATE STRUCTURES THAT ARE DISTURBED OR DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO MATCH AT A MINIMUM EXISTING CONDITIONS.
6. CONTRACTOR'S MANNER AND METHOD OF INGRESS AND EGRESS WITH RESPECT TO THE PROJECT AREAS SHALL IN NO WAY PROHIBIT OR DISTURB NORMAL PEDESTRIAN OR VEHICULAR TRAFFIC IN THE VICINITY AND IS SUBJECT TO REGULATION AND WRITTEN APPROVAL OF APPROPRIATE GOVERNING AGENCIES.
7. FINISHED SUBGRADE SURFACE SHALL NOT BE MORE THAN 0.1 FEET ABOVE OR BELOW ESTABLISHED FINISHED SUBGRADE ELEVATIONS AND ALL GROUND SURFACES SHALL VARY UNIFORMLY BETWEEN INDICATED ELEVATIONS. FINISHED DITCHES SHALL BE GRADED TO ALLOW FOR PROPER DRAINAGE WITHOUT PONDING AND IN A MANNER THAT WILL MINIMIZE EROSION.
8. VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
9. UTILITIES SHALL END 5 FEET FROM THE BUILDING UNLESS NOTED OTHERWISE.
10. PROTECT AND MAINTAIN CROSSINGS OF OTHER UTILITIES.
11. ALL MATERIAL, SPECIFICATIONS, AND CONSTRUCTION METHODS SHALL BE IN CONFORMANCE WITH MEIJER STANDARD SPECIFICATIONS AND THOSE OF THE APPROPRIATE UTILITY COMPANIES.
12. BEFORE COMMENCING WORK, CONTRACTOR SHALL VERIFY ALL LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES.
13. ACCORDING TO THE FLOOD INSURANCE RATE MAP – MAP NUMBER 18063C0176E, PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY WITH A REVISION DATE OF JUNE 15, 2022, WHICH IS THE MOST CURRENT FLOOD INSURANCE RATE MAP AVAILABLE ON FEMA'S WEBSITE, THIS SITE IS LOCATED IN ZONE "X" (NO SCREEN) – AREAS OF MINIMAL FLOOD HAZARD. THE ABOVE REFERENCED FLOODPLAIN MAP WAS UTILIZED FOR THIS DETERMINATION.
14. ENTRY LANDINGS PART OF AN ACCESSIBLE ROUTE SHALL MAINTAIN A MAXIMUM SLOPE OF 1.50% IN ALL DIRECTIONS. THIS IS INTENDED TO ALLOW FOR CONSTRUCTION TOLERANCES. SLOPES STEEPER THAN 1:48 SHALL NOT BE PERMITTED THUS MEETING THE REQUIREMENTS OF THE DEPARTMENT OF JUSTICE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN. ALL SLOPES TO BE VERIFIED AS ACCEPTABLE BY USING A 2'–0" LEVEL.

KEYNOTES

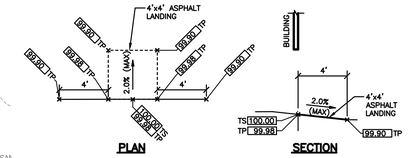
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14. LOADING DOCK WALL 4" UNDERDRAIN. INVERT = 882.43.
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16. 3' BERM ALONG NORTH AND EAST PROPERTY LINE. SEE LANDSCAPE PLAN.
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23. RONALD REAGAN STORM BY OTHERS.
24. 6" PERFORATED UNDERDRAIN.

IMPERVIOUS SURFACE BREAKDOWN

MAIN STORE	
TYPE	AREA (SQ. FT.)
COMPACTED GRAVEL	0
CONCRETE/ASPHALT	450,622
BUILDING FOOTPRINT	159,935
TOTAL IMPERVIOUS SURFACE	610,557
mEXPRESS	
TYPE	AREA (SQ. FT.)
COMPACTED GRAVEL	0
CONCRETE/ASPHALT	40,037
BUILDING FOOTPRINT	3,660
TOTAL IMPERVIOUS SURFACE	43,697



B5 STONE CROWN BUILDING PAD DETAIL
NOT TO SCALE



NOTES:
1. MAXIMUM GRADE OF LANDING IS 2%.
2. FOR DOUBLE DOORS, PAD SHALL BE 4'x8' WITH SIMILAR ELEVATIONS.

A6 TYPICAL GRADES AT DOOR
NOT TO SCALE

BENCHMARK:

THE BASIS OF ELEVATIONS HEREON IS NAVD 88 PER OBSERVATIONS OF SELECTED STATIONS IN THE NATIONAL GEODETIC SURVEY CONTINUOUSLY OPERATING REFERENCE STATION (NOS CORS) NETWORK.
MAG NAIL SET IN THE CORNER TOP OF THE CURB JOINT – SEE DRAWING FOR LOCATION.
ELEVATION = 889.36'

A1 SITE GRADING - DRAINAGE PLAN
1" = 60'

0 60 120 180
GRAPHIC SCALE IN FEET

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ARCHITECTURE | ENGINEERING | GEOSPATIAL
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Dayton, OH 45430
937.461.5660

meijer
2929 WALKER AVENUE
GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

SITE GRADING - DRAINAGE PLAN

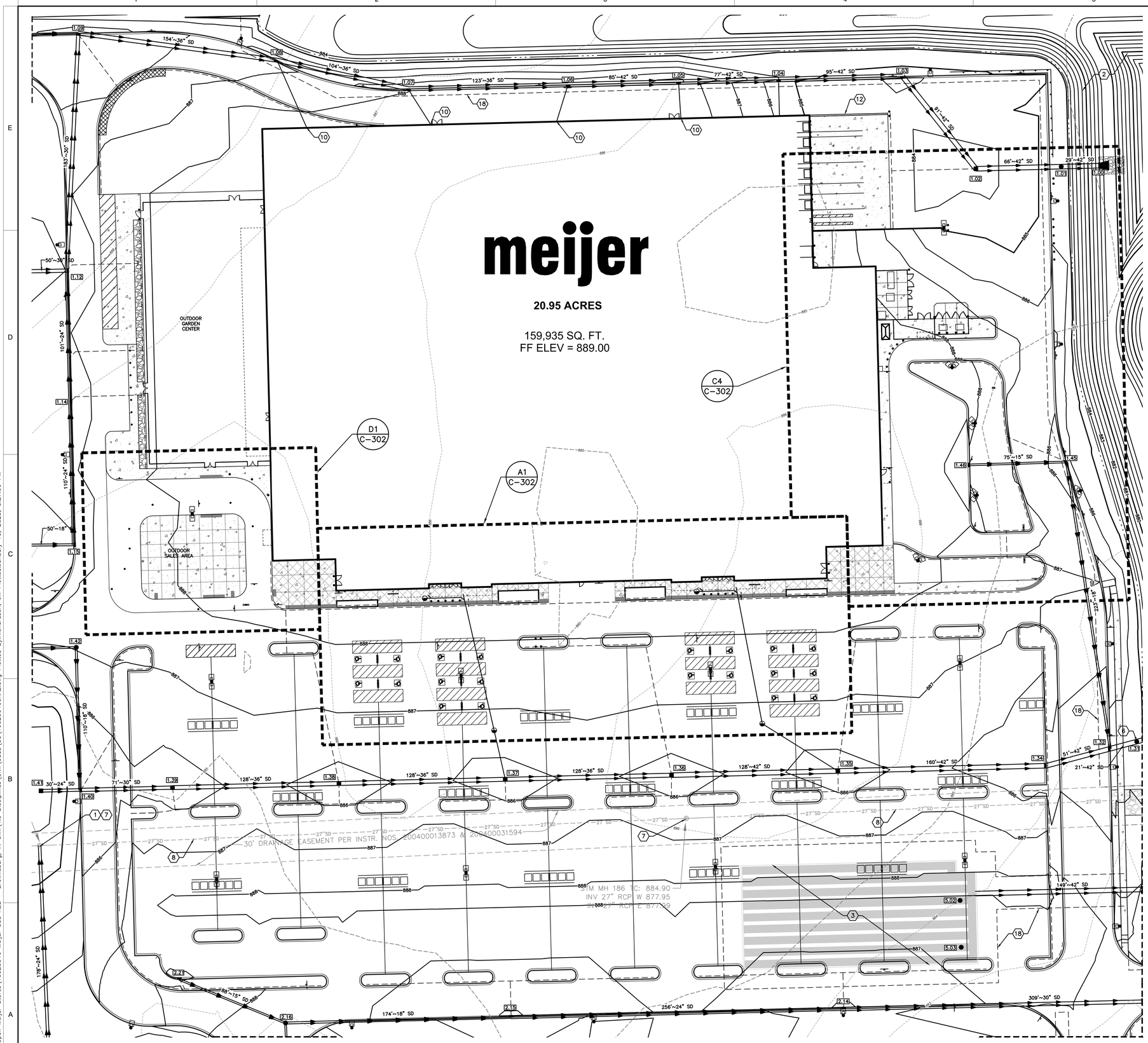
ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

C-300

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LEGEND

- PROPERTY LINE
- 799 EXISTING 1' CONTOUR
- 800 EXISTING 5' CONTOUR
- SD EXISTING STORM SEWER
- 799 PROPOSED 1' CONTOUR
- 800 PROPOSED 5' CONTOUR
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- FUTURE STORM SEWER
- UNDERDRAIN
- MANHOLE
- DRAINAGE BASIN
- CLEANOUT
- XX STORM STRUCTURE ID NUMBER
- ROCK OUTLET PROTECTION

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1" = 30'

0 30 60 90
GRAPHIC SCALE IN FEET

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GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
902 E. 56TH STREET
BROWNSBURG, INDIANA 46112

DETAILED SITE GRADING - DRAINAGE PLAN

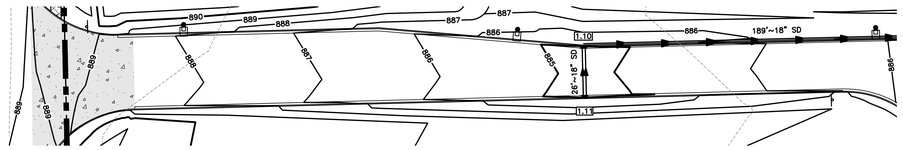
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PROJECT MANAGER	DESIGNER
BLS	JMR

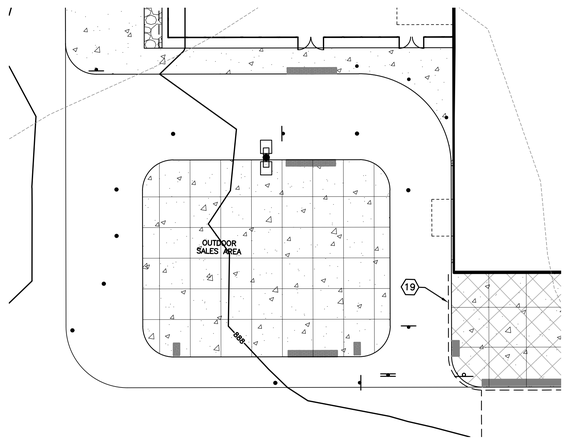
JOB NO.
NS-26-00338

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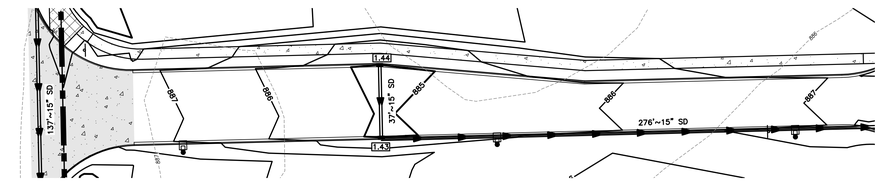
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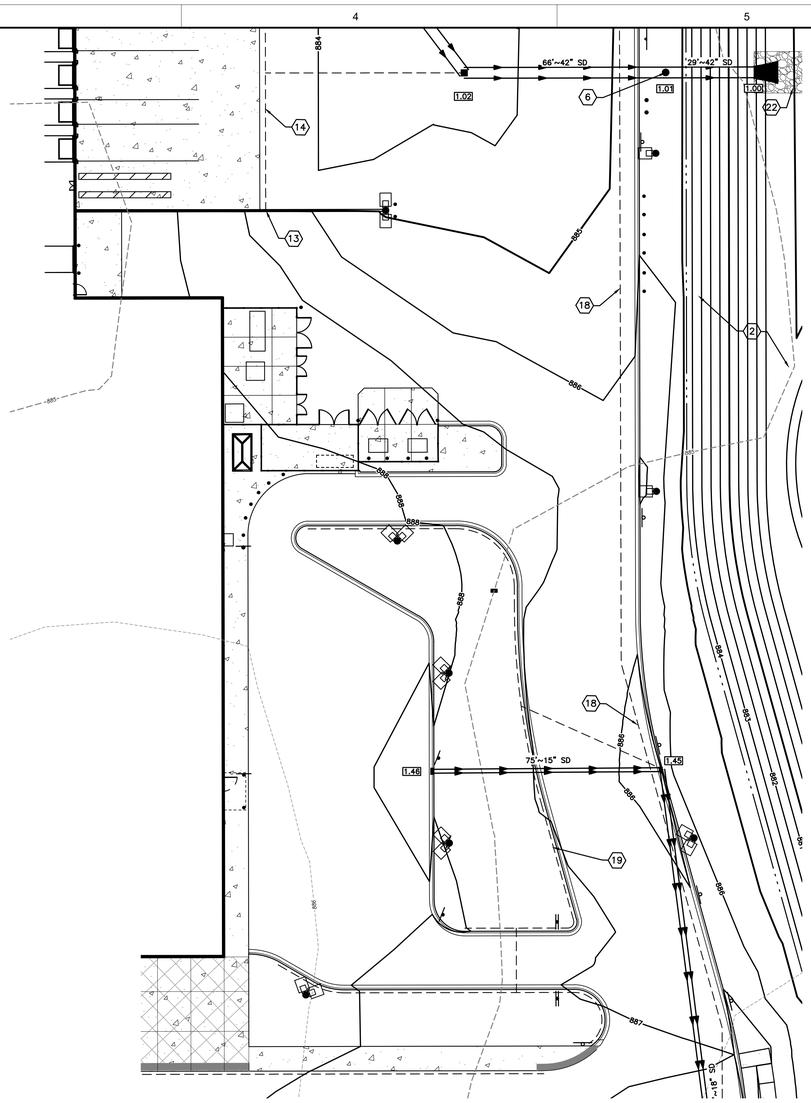
E1 ENLARGED N. CR. 900 E. NORTH ENTRANCE
1" = 30'



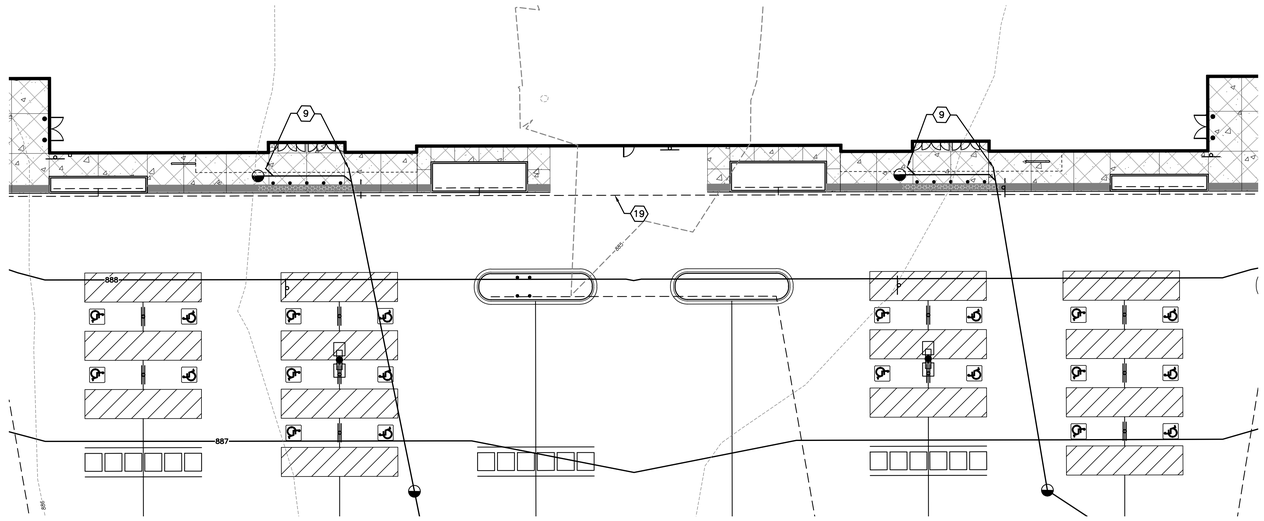
D1 ENLARGED PHARMACY DRIVE-THRU
1" = 20'



C1 ENLARGED N. CR. 900 E. SOUTH ENTRANCE
1" = 30'



C4 ENLARGED PICKUP AREA, EXTERIOT SHELTER, ORGANIX. STORAGE AREA, ELECTRIC YARD, GRADE LEVEL RECEIVING
1" = 20'



A1 ENLARGED FRONT OF BUILDING/LANDSCAPE BEDS
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9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

SITE GRADING - DRAINAGE PLAN ENLARGEMENTS & DETAILS

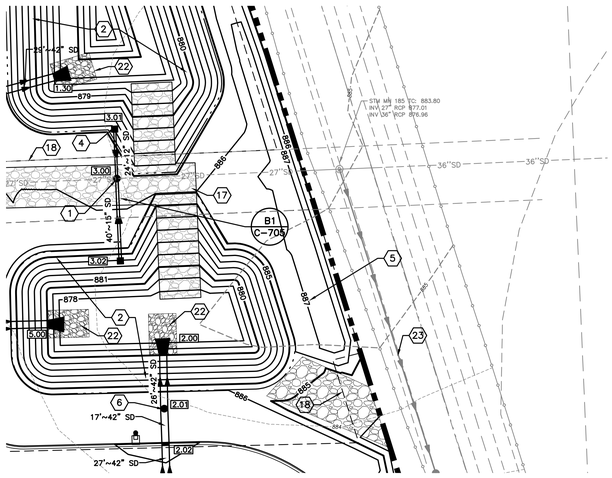
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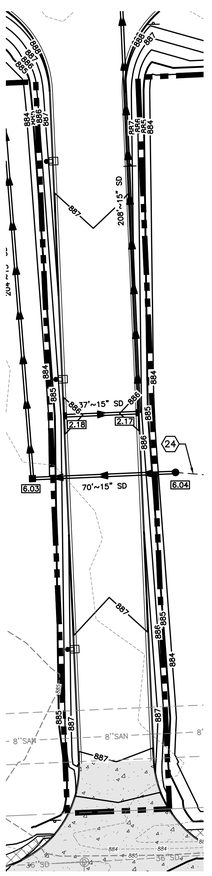
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NS-26-00338

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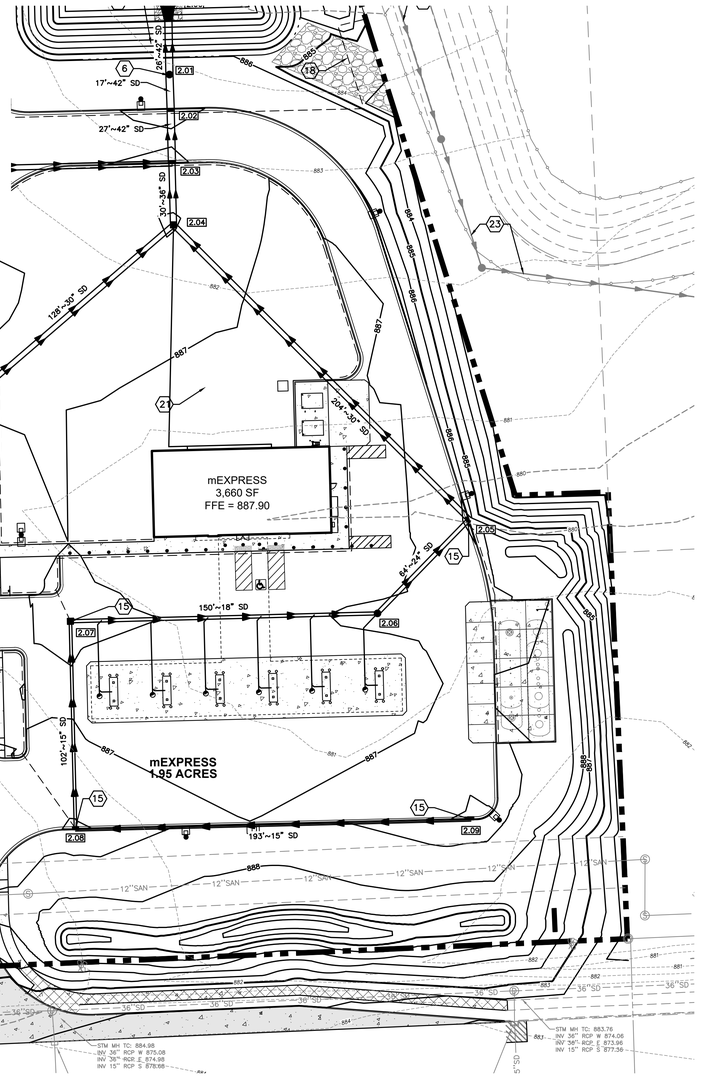
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D1 ENLARGED DETENTION OUTLET AREA
1" = 30'



A1 ENLARGED E. CR. 600. NORTH WEST ENTRANCE
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23. RONALD REAGAN STORM BY OTHERS.
24. 6" PERFORATED UNDERDRAIN.

GRADING NOTES

1. ALL SPOT ELEVATIONS ARE TO:
   TOP OF PAVEMENT – (TP)
   TOP OF SLAB – (TS)
   TOP OF CURB – (TC)
   TOP OF WALL – (TW)
   GUTTER PAN – (GP)
   UNLESS NOTED OTHERWISE.
2. CONTOURS SHOWN ARE FOR REFERENCE ONLY.
3. PROVIDE POSITIVE DRAINAGE AT ALL TIMES TO ENSURE NO STANDING WATER WITHIN PAVEMENT, BUILDING PAD, OR GREEN AREAS.
4. FOR ALL CURB ISLANDS, CENTER OF ISLANDS TO BE A MINIMUM OF 6" HIGHER THAN TOP OF CURB.
5. RESTORE ALL STREET SURFACES, DRIVEWAYS, CULVERTS, ROADSIDE DRAINAGE DITCHES, AND OTHER PUBLIC OR PRIVATE STRUCTURES THAT ARE DISTURBED OR DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO MATCH AT A MINIMUM EXISTING CONDITIONS.
6. CONTRACTOR'S MANNER AND METHOD OF INGRESS AND EGRESS WITH RESPECT TO THE PROJECT AREAS SHALL IN NO WAY PROHIBIT OR DISTURB NORMAL PEDESTRIAN OR VEHICULAR TRAFFIC IN THE VICINITY AND IS SUBJECT TO REGULATION AND WRITTEN APPROVAL OF APPROPRIATE GOVERNING AGENCIES.
7. FINISHED SUBGRADE SURFACE SHALL NOT BE MORE THAN 0.1 FEET ABOVE OR BELOW ESTABLISHED FINISHED SUBGRADE ELEVATIONS AND ALL GROUND SURFACES SHALL VARY UNIFORMLY BETWEEN INDICATED ELEVATIONS. FINISHED DITCHES SHALL BE GRADED TO ALLOW FOR PROPER DRAINAGE WITHOUT PONDING AND IN A MANNER THAT WILL MINIMIZE EROSION.
8. VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
9. UTILITIES SHALL END 5 FEET FROM THE BUILDING UNLESS NOTED OTHERWISE.
10. PROTECT AND MAINTAIN CROSSINGS OF OTHER UTILITIES.
11. ALL MATERIAL, SPECIFICATIONS, AND CONSTRUCTION METHODS SHALL BE IN CONFORMANCE WITH MEIJER STANDARD SPECIFICATIONS AND THOSE OF THE APPROPRIATE UTILITY COMPANIES.
12. BEFORE COMMENCING WORK, CONTRACTOR SHALL VERIFY ALL LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES.
13. ACCORDING TO THE FLOOD INSURANCE RATE MAP – MAP NUMBER 18063C0176E, PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY WITH A REVISION DATE OF JUNE 15, 2022, WHICH IS THE MOST CURRENT FLOOD INSURANCE RATE MAP AVAILABLE ON FEMA'S WEBSITE, THIS SITE IS LOCATED IN ZONE "X" (NO SCREEN) – AREAS OF MINIMAL FLOOD HAZARD. THE ABOVE REFERENCED FLOODPLAIN MAP WAS UTILIZED FOR THIS DETERMINATION.
14. ENTRY LANDINGS PART OF AN ACCESSIBLE ROUTE SHALL MAINTAIN A MAXIMUM SLOPE OF 1.50% IN ALL DIRECTIONS. THIS IS INTENDED TO ALLOW FOR CONSTRUCTION TOLERANCES. SLOPES STEEPER THAN 1:48 SHALL NOT BE PERMITTED THUS MEETING THE REQUIREMENTS OF THE DEPARTMENT OF JUSTICE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN. ALL SLOPES TO BE VERIFIED AS ACCEPTABLE BY USING A 2'-0" LEVEL.

BENCHMARK:

THE BASIS OF ELEVATIONS HEREON IS NAVD 88 PER OBSERVATIONS OF SELECTED STATIONS IN THE NATIONAL GEODETIC SURVEY CONTINUOUSLY OPERATING REFERENCE STATION (NGS CORS) NETWORK.
MAG NAIL SET IN THE CORNER TOP OF THE CURB JOINT – SEE DRAWING FOR LOCATION.
ELEVATION = 889.36'

Indiana 811 Know what's below. Call before you dig.

WOOLPERT
ARCHITECTURE | ENGINEERING | GEOSPATIAL
4454 Idea Center Boulevard
Dayton, OH 45430
937.461.5660

meijer
2929 WALKER AVENUE
GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

SITE GRADING - DRAINAGE PLAN ENLARGEMENTS & DETAILS

ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

C-303

Images: , , Xrefs: 10020046-x.dwg; 10020046TBLK.dwg; 10020046-GRA-NOTES.dwg; 10020046-p.dwg; 10020046-g.dwg
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FIGURE 3 – UTILITY PLANS

UTILITIES RESPONSIBILITIES SUMMARY

1. "WORK" IS DEFINED AS INSTALLATION OF SUBJECT UTILITY, INCLUDING TRENCHING, BEDDING, BACKFILL, AS WELL AS DEMOLITION AND RESTORATION OF THE DISTURBED AREA. INSPECTIONS ARE NOT INCLUDED. "INSTALL" MEANS PROVIDE AND INSTALL UNLESS NOTED OTHERWISE.
2. SANITARY SEWER: MEIJER CONTRACTOR (MC) SHALL PERFORM ALL WORK INCLUDING MAKING CONNECTION TO THE EXISTING MAIN. MC TO SCHEDULE PRE-CONSTRUCTION MEETING WITH HENDRICKS COUNTY REGIONAL SEWER DISTRICT (HCRSD) PRIOR TO STARTING CONSTRUCTION. MC SHALL NOTIFY HCRSD 48 HOURS PRIOR TO ANY SANITARY INSTALLATION AND TESTING. HCRSD TO BE PRESENT FOR ALL TESTING.
3. WATER: MC SHALL PERFORM ALL WORK ASSOCIATED WITH INSTALLATION OF THE WATER SERVICE LINE. CITIZENS ENERGY GROUP (CEG) SHALL MAKE THE TAP ON THE EXISTING MAIN. MC SHALL CONNECT TO THE TAP. MC SHALL CONTACT CEG TO SCHEDULE A PRE-CONSTRUCTION MEETING PRIOR TO INSTALLING FIRE PROTECTION SERVICES. MC TO NOTIFY THE BROWNSBURG FIRE DEPARTMENT (BFD) 48 HOURS PRIOR TO INSTALLATION OF WATER AND FIRE SERVICE LINES, BUT PRESENCE IS NOT REQUIRED. BFD TO BE PRESENT TO WITNESS ACCEPTANCE TESTING.
4. STORM SEWER: MC SHALL PERFORM ALL WORK. MC SHALL CONTACT THE TOWN OF BROWNSBURG WHEN PERFORMING WORK IN THE RIGHT-OF-WAY TO DETERMINE CONTRACTOR REQUIREMENTS.
5. GAS: FOR BOTH BUILDINGS, THE GAS COMPANY, CENTERPOINT ENERGY (CE), SHALL PROVIDE ALL SERVICE PIPING AND EQUIPMENT FROM THE POINT OF CONNECTION AT THE RIGHT-OF-WAY UP TO AND INCLUDING THE GAS METER. MC TO INSTALL ALL SERVICE PIPING FROM THE POINT OF CONNECTION AT THE RIGHT-OF-WAY TO THE GAS METER. CE TO INSTALL GAS METER ONCE MC HAS INSTALLED THE STUBBED OUT CONNECTION. MC TO PROVIDE AND INSTALL ALL PIPING AND MATERIALS DOWNSTREAM OF THE GAS METER. MC SHALL INSTALL METER PROTECTION BOLLARDS PER CE REQUIREMENTS.
6. COMMUNICATIONS:
   - 6.1. MAIN STORE: MC SHALL ISNTALL ALL CONDUIT AND MANHOLES. MC SHALL COORDINATE WITH MEIJER IT AND EVERSTREAM TO COORDINATE WITH MEIJER-SELECTED COMMUNICATIONS PROVIDER WHO SHALL PULL ALL WIRING AND MAKE CONNECTIONS.
   - 6.2. mEXPRESS: MC SHALL INSTALL HANDHOLES AND WIRING. MC SHALL COORDINATE WITH MEIJER IT AND EVERSTREAM TO MAKE CONNECTIONS.
7. ELECTRIC:
   - 7.1. MAIN STORE: THE ELECTRIC COMPANY, HENDRICKS POWER (HP), SHALL PROVIDE AND INSTALL ALL CONDUIT, CONDUCTOR, AND EQUIPMENT FROM THE POINT OF CONNECTION UP TO THE PRIMARY METERING CABINET. MC TO PROVIDE AND INSTALL ALL CONDUIT, CONDUCTOR, AND EQUIPMENT DOWNSTREAM OF THE METERING CABINET.
   - 7.2. mEXPRESS: HP SHALL PROVIDE AND INSTALL ALL CONDUIT, CONDUCTOR, AND EQUIPMENT FROM THE POINT OF CONNECTION UP TO AND INCLUDING THE TRANSFORMER. HP TO PROVIDE TRANSFORMER PAD. HP TO INSTALL METER ON SIDE OF TRANSFORMER.

GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR ALL RESTORATION AND CLEAN-UP ASSOCIATED WITH THE INSTALLATION OF THE PROPOSED UTILITIES WITHIN THE PUBLIC RIGHT-OF-WAY AND EASEMENT.
2. VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
3. UTILITIES SHALL END 5 FEET FROM THE BUILDING UNLESS NOTED OTHERWISE.
4. PROTECT AND MAINTAIN CROSSINGS OF OTHER UTILITIES.
5. ALL DIMENSIONS ARE TO COLUMN LINE, CENTERLINE OF PIPE, CENTER OF MANHOLE, EDGE OF PAVEMENT OR BACK OF CURB WHERE APPLICABLE. DIMENSIONS TO COLUMN LINE ASSUME 9" THICK BUILDING WALL.
6. ALL MATERIAL, SPECIFICATIONS, AND CONSTRUCTION METHODS SHALL BE IN CONFORMANCE WITH MEIJER STANDARD SPECIFICATIONS AND DETAILS AND TOWN OF BROWNSBURG AND HENDRICKS COUNTY REQUIREMENTS.
7. CONTRACTOR SHALL PERFORM FULL DEPTH REMOVAL AND REPLACEMENT OF EXISTING PAVEMENT PER MEIJER REQUIREMENTS AT PROPOSED UTILITIES INSTALLATION IN EXISTING PAVED AREAS.
8. PROVIDE MINIMUM 18" VERTICAL CLEARANCE AT ALL UTILITY CROSSINGS.

EXISTING WELLHEAD PER INDIANA DEPARTMENT OF NATURAL RESOURCES RECORDS. WELLHEAD LOG ID 325,846.00

meijer
20.95 ACRES
159,935 SQ. FT.
FF ELEV = 889.00

MEIJER OUTLOT C 3.87 ACRES

MEIJER OUTLOT B 1.57 ACRES

MEIJER OUTLOT A 3.29 ACRES

OUTLOT (BY OTHERS) 1.86 ACRES

OUTLOT (BY OTHERS) 1.80 ACRES

LOT 1
OI COMMERCIAL LOT 1 – SECONDARY PLAT
PLAT CABINET B SLIDE 2 PAGES 1A & 1B
INSTR. NO. 202215039

RONALD REAGAN BASIN (BY OTHERS)

mEXPRESS 1.95 ACRES
mEXPRESS 3,663 SF
FFE = 887.90

OUTDOOR GARDEN CENTER

OUTDOOR SALES AREA

N. COUNTY ROAD 900 E.

EAST 56TH STREET (E. COUNTY ROAD 600 N.)

36' NON-EXCLUSIVE ACCESS EASEMENT PER INSTR. NOS. 202215039 & 202217819

30' DRAINAGE EASEMENT PER INSTR. NOS. 200400013873 & 200400031397

80.4' DRAINAGE EASEMENT PER INSTR. NO. 200400013873

25' SANITARY SEWER EASEMENT PER INSTR. NO. 202210601

EVERSTREAM F.O. PULLBOX

A1 UTILITY PLAN
1" = 60'

NORTH

GRAPHIC SCALE IN FEET
0 60 120 180

LEGEND

- CATCH BASIN
- CURB INLET
- MANHOLE
- CLEANOUT
- XX'~XX" SD — STORM SEWER
- UNDERDRAIN
- X.X — STORM STRUCTURE I.D.
- XX'~8" SAN — SANITARY SEWER
- SANITARY SERVICE
- SANITARY SEWER I.D.
- 10"WTR — FIRE SERVICE
- 4"WTR — DOMESTIC WATER SERVICE
- FIRE HYDRANT
- WATER VALVE
- TEE
- WATER BEND
- G — GAS SERVICE
- UCT — UNDERGROUND COMMUNICATIONS SERVICE
- UCP — UNDERGROUND COMMUNICATIONS SERVICE
- UCS — UNDERGROUND COMMUNICATIONS SERVICE
- UE — UNDERGROUND ELECTRIC SERVICE
- LIGHT POLE

KEYNOTES (X)

1. CONNECT TO EXISTING UTILITY PER AGENCY REQUIREMENTS. CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITY IN WHICH TO MAKE CONNECTION.
2. ELECTRIC UTILITY OWNER TO MAKE CONNECTION TO EXISTING UTILITY. UTILITY OWNER TO PERFORM RESTORATION WORK OF DISTURBED AREA UNLESS NOTED OTHERWISE.
3. ABOVE-GROUND STORMWATER MANAGEMENT FACILITY.
4. UNDERGROUND STORMWATER MANAGEMENT FACILITY.
5. DETENTION OUTLET STRUCTURE.
6. WATER QUALITY HYDRODYNAMIC SEPARATOR.
7. ENVIRONMENTAL CATCH BASIN.
8. 4" CANOPY STORM DRAIN AT 1.00% (MIN). INVERT AT BUILDING FACE = 886.75.
9. 6" CANOPY DRAIN INV. 883.90. 5' BEYOND EDGE OF CONCRETE SLAB.
10. 6" STORM ROOF DRAIN AT 2.00% (MIN). INVERT AT BUILDING = 886.50.
11. 6" CANOPY STORM DRAIN AT 0.50% (MIN).
12. 4" GARDEN CENTER DRAIN AT 0.50% (MIN). INVERT = 886.00.
13. 6" ROOF DRAIN FOR GUTTER DOWNSPOUTS. SEE C2 ON C-700.
14. LOADING DOCK WALL 4" UNDERDRAIN. INVERT = 882.43.
15. 4" SANITARY SERVICE. INVERT AT BUILDING = 883.90.
16. RONALD REAGAN STORM BY OTHERS.
17. 4" HDPE PERFORATED DRAIN WITH NYLON SOCK. INVERT = 881.90 ADJACENT TO FUEL TANKS. CONNECT TO STRUCTURE 2.05. INSTALLATION AND FINAL DETERMINATION WILL BE DECISION OF FUEL SYSTEM DESIGNER.
18. CONVERT EXISTING CHAIR BACK CURB INLET TO FLAT GRATE STORM INLET PER TOWN OF BROWNSBURG REQUIREMENTS. SEE STORM NOTE 7 THIS SHEET.
19. PROPOSED FIRE HYDRANT ASSEMBLY.
20. FIRE DEPARTMENT CONNECTION. SEE WATER NOTE 10.
21. 10" BUILDING FIRE SERVICE.
22. 4" DOMESTIC WATER SERVICE. 2" DOMESTIC METER AND BACKFLOW PREVENTER TO BE LOCATED INSIDE THE BUILDING.
23. POST INDICATOR VALVE.
24. 2" WATER SERVICE. 1.5" DOMESTIC METER AND BACKFLOW PREVENTER TO BE LOCATED INSIDE THE BUILDING.
25. 2" IRRIGATION SERVICE. 1.5" METER AND BACKFLOW PREVENTER TO BE LOCATED INSIDE THE BUILDING. IRRIGATION METER SHALL HAVE DUAL SET UP PER CITIZENS ENERGY GROUP STANDARD DRAWING T.4. SEE DETAIL ON C-709.
26. 6" SANITARY SERVICE. INVERT AT BUILDING = 885.00.
27. 6" SANITARY SERVICE. INVERT AT BUILDING = 882.00.
28. 6" SANITARY SERVICE. INVERT AT BUILDING = 882.60.
29. GREASE INTERCEPTOR.
30. GREASE INTERCEPTOR SANITARY VENT LINE.
31. 8" WATER LINE TO SERVE FUTURE OUTLOT DEVELOPMENT. PROVIDE WATER LINE CAP PER AGENCY REQUIREMENTS.
32. GAS MAIN BY GAS COMPANY LOCATED IN 10' EASEMENT. GAS COMPANY TO RESTORE ALL DISTURBED AREAS OUTSIDE OF MEIJER WORK LIMITS RELATED TO GAS MAIN INSTALLATION WORK.
33. UNDERGROUND ELECTRIC LOCATED IN 10' EASEMENT. WIRING TO BE DIRECT BURIED BY HENDRICKS POWER.
34. GAS METER.
35. MAIN STORE 2" GAS SERVICE.
36. mEXPRESS 1" GAS SERVICE.
37. PAD-MOUNTED TRANSFORMER. SEE SHEET C-800.
38. PAD-MOUNTED ELECTRICAL EQUIPMENT. SEE SHEET C-800.
39. UNDERGROUND ELECTRIC SERVICE. SEE SHEET C-800.
40. UNDERGROUND COMMUNICATIONS SERVICE. SEE SHEET C-800.
41. HELIUM CABINET. SEE P-405.
42. PHARMACY DETECTION LOOP. VENDOR TO SAWCUT ASPHALT, INSTALL DETECTION LOOP, AND SEAL ASPHALT.

UTILITIES SUMMARY

SUPERCENTER:

ELECTRIC: PRIMARY SERVICE, PREFERRED BASED ON RATE, MEIJER OWNED TRANSFORMER 2,000 KVA, SECONDARY 480/277V, 3PH, 4W GRD WYE.

PHONE: FIBER OPTIC ENTRANCE CABLE.

GAS: 11,966 CFH @ 2 PSI (5 PSI IF AVAILABLE) FOR 1.5 STORE.

WATER: 4" DIA. PIPE WITH 2" METER, 10,000 GPD SUMMER, 5,000 GPD WINTER, 150 GPM PEAK USE, 65 PSI AFTER BACKFLOW PREVENTER.

FIRE PROTECTION: 10" DIA. MIN., 1,575 GPM @ 35 PSI AT BASE OF RISER.

SANITARY SEWER: 5,000 GPD AVG., 40 GPM PEAK FLOW.

IRRIGATION: DESIGN TO BE PROVIDED AS PART OF FINAL DESIGN.

MEXPRESS:

ELECTRIC: SECONDARY SERVICE PREFERRED BASED ON RATE. PAD-MOUNT UTILITY OWNED TRANSFORMER, 600 AMP, 120/208V, 3PH, 4W SECONDARY SERVICE. TRANSFORMER SIZED AND FURNISHED BY UTILITY COMPANY.

PHONE: FED FROM SUPERCENTER, TYPICALLY NO DEDICATED SERVICE.

GAS: 394 CFH @ 7" WC

WATER: 2" DIA., 1.5" METER, 50 GPM PEAK USE, 65 PSI AFTER BACKFLOW PREVENTER. 750 GPD SUMMER, 500 GPD NON-SUMMER.

FIRE PROTECTION: NOT REQUIRED.

SANITARY SEWER: 500 GPD AVG. 20 GPM PEAK.

STORM NOTES

1. INSTALL UNDERDRAINS AT ALL PROPOSED CATCH BASINS.
2. ALL UNDERDRAINS ARE 4" DIAMETER AT MINIMUM SLOPE OF 0.50% UNLESS OTHERWISE NOTED.
3. END SECTIONS ARE INCLUDED IN PIPE LENGTHS SHOWN.
4. PROVIDE INLET FILTER FOR ALL CATCH BASIN INLETS.
5. PROVIDE RIP RAP AT ALL END SECTIONS UNLESS OTHERWISE NOTED.
6. ALL STORM GRATE CASTINGS TO BE PRE-CAST WITH A POLLUTION PREVENTION MESSAGE PERMANENTLY ATTACHED, PER TOWN OF BROWNSBURG STANDARD DETAILS SW-13 AND SW-14, POLLUTION PREVENTION MESSAGE TO STATE, AT MINIMUM, "DUMP NO WASTE <FISH ICON> DRAINGS TO WATERWAY" IN MINIMUM 1 INCH HIGH LETTERS.
7. EXISTING CHAIR BACK CURB DRAIN INLETS THAT ARE LOCATED IN THE NEW DRIVE ENTRANCES TO 56TH STREET ARE TO BE CONVERTED TO FLAT GRATE STORM INLET PER TOWN OF BROWNSBURG REQUIREMENTS. CASTINGS WILL HAVE TO BE SPECIAL ORDERED. CONTRACTOR TO PROVIDE ONE ADDITIONAL CASTING TO BROWNSBURG STREET DEPARTMENT AS SPARE STOCK FOR EACH CONVERSION FOR A TOTAL OF SIX NEW CASTINGS.

SANITARY NOTES

1. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.
2. A CONTINUOUS 20' LENGTH OF SDR-35 PVC SHALL BE EXTENDED FROM THE YARD CLEANOUTS AT THE FRONT OF THE BUILDING. COORDINATE WITH PLUMBING CONTRACTOR ON LOCATION AND ROUTING.
3. FERNCO COUPLINGS SHALL NOT BE USED ALONG THE SERVICE LATERALS FROM THE FRONT OF THE BUILDING TO THE SANITARY MANHOLE OR MAIN.

WATER NOTES

1. INSTALL WATER MAIN WITH A MINIMUM OF 4.5 FEET OF COVER.
2. CONTRACTOR TO COORDINATE WITH CITIZENS ENERGY GROUP FOR INSPECTION OF INSTALLATION OF WATER LINES INCLUDING CONNECTIONS TO EXISTING. PROVIDE 48 HOURS NOTICE.
3. ON SITE HYDRANTS SHALL FACE THE BUILDING.
4. HYDRANTS LOCATED IN CURB ISLAND OR GREEN SPACE SHALL BE LOCATED 5' FROM BACK OF CURB OR EDGE OF PAVEMENT (TYP.).
5. INSTALL CONCRETE PADS FOR ALL HYDRANT VALVES IN NON-PAVED AREAS.
6. PROVIDE A MINIMUM OF EIGHTEEN (18) INCHES OF VERTICAL SEPARATION AND TEN (10) FEET OF HORIZONTAL SEPARATION BETWEEN THE WATER LINE AND ALL SANITARY AND STORM SEWERS.
7. PROVIDE THRUST BLOCKS AT ALL WATER BENDS, PLUGS AND TEES IF REQUIRED BY THE UTILITY COMPANY.
8. EXISTING WATER MAINS AND ALL HYDRANTS REQUIRE PREVENTERS TO ADHERE TO CITIZENS ENERGY GROUP STANDARD DETAILS AND REQUIREMENTS.
9. ALL PROPOSED WATER METERS AND BACKFLOW PREVENTERS TO ADHERE TO CITIZENS ENERGY GROUP STANDARD DETAILS AND REQUIREMENTS.
10. FIRE DEPARTMENT CONNECTION SHALL BE 5" STORZ WITH 30-DEGREE DOWN ANGLE AND HEIGHT BETWEEN 3'-4' ABOVE FINISHED GRADE. REFER TO TOWN OF BROWNSBURG CONSTRUCTION STANDARD DETAIL DW-12.

GAS NOTES

1. GAS COMPANY WILL PROVIDE GAS SERVICE TAP, METER, REGULATOR, AND INSTALL THE NEW SERVICE LINE TO THE METER.

BENCHMARK:

THE BASIS OF ELEVATIONS HEREON IS NAVD 88 PER OBSERVATIONS OF SELECTED STATIONS IN THE NATIONAL GEODETIC SURVEY CONTINUOUSLY OPERATING REFERENCE STATION (NGS CORS) NETWORK.
MAG NAIL SET IN THE CORNER TOP OF THE CURB JOINT – SEE DRAWING FOR LOCATION.
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MEIJER STORE #338
9200 E. 56TH STREET
BROWNSBURG, INDIANA 46112

UTILITY PLAN

ISSUED FOR:	
PERMIT	MM/DD/YY
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CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

C-400

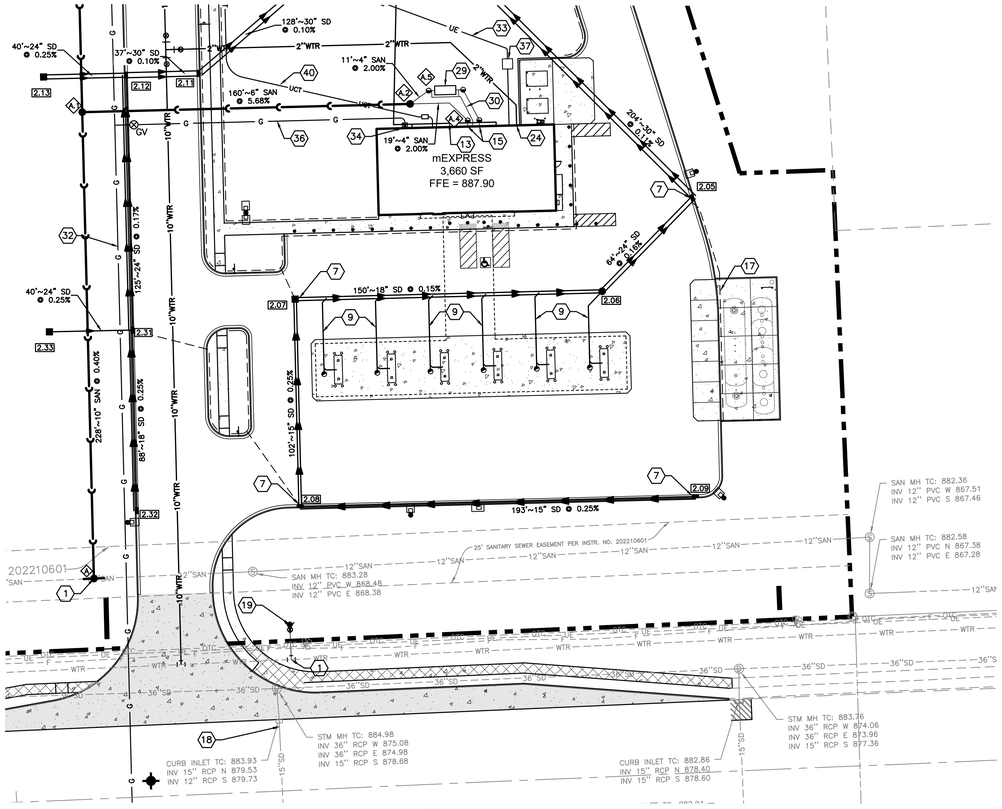
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Last Plotted:January 10, 2025, 2:10:15 PM
Last Saved By:A.Reedy, 1/10/2025 1:52:23 PM
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UTILITIES RESPONSIBILITIES SUMMARY

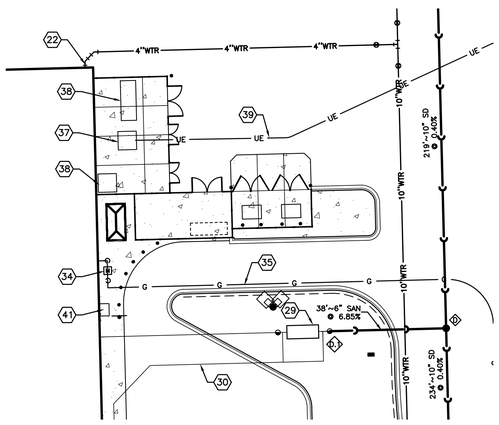
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6. COMMUNICATIONS:
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   - 6.2. mEXPRESS: MC SHALL INSTALL HANDHOLES AND WIRING. MC SHALL COORDINATE WITH MEIJER IT AND EVERSTREAM TO MAKE CONNECTIONS.
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GENERAL NOTES

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5. ALL DIMENSIONS ARE TO COLUMN LINE, CENTERLINE OF PIPE, CENTER OF MANHOLE, EDGE OF PAVEMENT OR BACK OF CURB WHERE APPLICABLE. DIMENSIONS TO COLUMN LINE ASSUME 9" THICK BUILDING WALL.
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7. CONTRACTOR SHALL PERFORM FULL DEPTH REMOVAL AND REPLACEMENT OF EXISTING PAVEMENT PER MEIJER REQUIREMENTS AT PROPOSED UTILITIES INSTALLATION IN EXISTING PAVED AREAS.
8. PROVIDE MINIMUM 18" VERTICAL CLEARANCE AT ALL UTILITY CROSSINGS.



C1 mEXPRESS UTILITY PLAN
1" = 30'



A1 UTILITY CONNECTION ENLARGEMENT
1" = 20'

LEGEND

- CATCH BASIN
- CURB INLET
- MANHOLE
- CLEANOUT
- XX'~XX" SD — STORM SEWER
- UNDERDRAIN
- [X.X] — STORM STRUCTURE I.D.
- XX'~8" SAN — SANITARY SEWER
- SANITARY SERVICE
- SANITARY SEWER I.D.
- 10"WTR — FIRE SERVICE
- 4"WTR — DOMESTIC WATER SERVICE
- FIRE HYDRANT
- WATER VALVE
- TEE
- WATER BEND
- G — GAS SERVICE
- UCT — UNDERGROUND COMMUNICATIONS SERVICE
- UCP — UNDERGROUND COMMUNICATIONS SERVICE
- UCS — UNDERGROUND COMMUNICATIONS SERVICE
- UE — UNDERGROUND ELECTRIC SERVICE
- LIGHT POLE

STORM NOTES

1. INSTALL UNDERDRAINS AT ALL PROPOSED CATCH BASINS.
2. ALL UNDERDRAINS ARE 4" DIAMETER AT MINIMUM SLOPE OF 0.50% UNLESS OTHERWISE NOTED.
3. END SECTIONS ARE INCLUDED IN PIPE LENGTHS SHOWN.
4. PROVIDE INLET FILTER FOR ALL CATCH BASIN INLETS.
5. PROVIDE RIP RAP AT ALL END SECTIONS UNLESS OTHERWISE NOTED.
6. ALL STORM GRATE CASTINGS TO BE PRE-CAST WITH A POLLUTION PREVENTION MESSAGE PERMANENTLY ATTACHED. PER TOWN OF BROWNSBURG STANDARD DETAILS SW-13 AND SW-14, POLLUTION PREVENTION MESSAGE TO STATE, AT MINIMUM, "DUMP NO WASTE <FISH ICON> DRAINGS TO WATERWAY" IN MINIMUM 1 INCH HIGH LETTERS.
7. EXISTING CHAIR BACK CURB DRAIN INLETS THAT ARE LOCATED IN THE NEW DRIVE ENTRANCES TO 56TH STREET ARE TO BE CONVERTED TO FLAT GRATE STORM INLET PER TOWN OF BROWNSBURG REQUIREMENTS. CASTINGS WILL HAVE TO BE SPECIAL ORDERED. CONTRACTOR PROVIDE ONE ADDITIONAL CASTING TO BROWNSBURG STREET DEPARTMENT AS SPARE STOCK FOR EACH CONVERSION FOR A TOTAL OF SIX NEW CASTINGS.

SANITARY NOTES

1. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.
2. A CONTINUOUS 20' LENGTH OF SDR-35 PVC SHALL BE EXTENDED FROM THE YARD CLEANOUTS AT THE FRONT OF THE BUILDING. COORDINATE WITH PLUMBING CONTRACTOR ON LOCATION AND ROUTING.
3. FERNCO COUPLINGS SHALL NOT BE USED ALONG THE SERVICE LATERALS FROM THE FRONT OF THE BUILDING TO THE SANITARY MANHOLE OR MAIN.

KEYNOTES (X)

1. CONNECT TO EXISTING UTILITY PER AGENCY REQUIREMENTS. CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITY IN WHICH TO MAKE CONNECTION.
2. ELECTRIC UTILITY OWNER TO MAKE CONNECTION TO EXISTING UTILITY. UTILITY OWNER TO PERFORM RESTORATION WORK OF DISTURBED AREA UNLESS NOTED OTHERWISE.
3. ABOVE-GROUND STORMWATER MANAGEMENT FACILITY.
4. UNDERGROUND STORMWATER MANAGEMENT FACILITY.
5. DETENTION OUTLET STRUCTURE.
6. WATER QUALITY HYDRODYNAMIC SEPARATOR.
7. ENVIRONMENTAL CATCH BASIN.
8. 4" CANOPY STORM DRAIN AT 1.00% (MIN). INVERT AT BUILDING FACE = 886.75.
9. 6" CANOPY DRAIN INV. 883.90. 5' BEYOND EDGE OF CONCRETE SLAB.
10. 6" STORM ROOF DRAIN AT 2.00% (MIN). INVERT AT BUILDING = 886.50.
11. 6" CANOPY STORM DRAIN AT 0.50% (MIN).
12. 4" GARDEN CENTER DRAIN AT 0.50% (MIN). INVERT = 886.00.
13. 6" ROOF DRAIN FOR GUTTER DOWNSPOUTS. SEE C2 ON C-700.
14. LOADING DOCK WALL 4" UNDERDRAIN. INVERT = 882.43.
15. 4" SANITARY SERVICE. INVERT AT BUILDING = 883.90.
16. RONALD REAGAN STORM BY OTHERS.
17. 4" HDPE PERFORATED DRAIN WITH NYLON SOCK. INVERT = 881.90 ADJACENT TO FUEL TANKS. CONNECT TO STRUCTURE 2.05. INSTALLATION AND FINAL DETERMINATION WILL BE DECISION OF FUEL SYSTEM DESIGNER.
18. CONVERT EXISTING CHAIR BACK CURB INLET TO FLAT GRATE STORM INLET PER TOWN OF BROWNSBURG REQUIREMENTS. SEE STORM NOTE 7 THIS SHEET.
19. PROPOSED FIRE HYDRANT ASSEMBLY.
20. FIRE DEPARTMENT CONNECTION. SEE WATER NOTE 10.
21. 10" BUILDING FIRE SERVICE.
22. 4" DOMESTIC WATER SERVICE. 2" DOMESTIC METER AND BACKFLOW PREVENTER TO BE LOCATED INSIDE THE BUILDING.
23. POST INDICATOR VALVE.
24. 2" WATER SERVICE. 1.5" DOMESTIC METER AND BACKFLOW PREVENTER TO BE LOCATED INSIDE THE BUILDING.
25. 2" IRRIGATION SERVICE. 1.5" METER AND BACKFLOW PREVENTER TO BE LOCATED INSIDE THE BUILDING. IRRIGATION METER SHALL HAVE DUAL SET UP PER CITIZENS ENERGY GROUP STANDARD DRAWING 1.4. SEE DETAIL ON C-709.
26. 6" SANITARY SERVICE. INVERT AT BUILDING = 885.00.
27. 6" SANITARY SERVICE. INVERT AT BUILDING = 882.00.
28. 6" SANITARY SERVICE. INVERT AT BUILDING = 882.60.
29. GREASE INTERCEPTOR.
30. GREASE INTERCEPTOR SANITARY VENT LINE.
31. 8" WATER LINE TO SERVE FUTURE OUTLOT DEVELOPMENT. PROVIDE WATER LINE CAP PER AGENCY REQUIREMENTS.
32. GAS MAIN BY GAS COMPANY LOCATED IN 10' EASEMENT. GAS COMPANY TO RESTORE ALL DISTURBED AREAS OUTSIDE OF MEIJER WORK LIMITS RELATED TO GAS MAIN INSTALLATION WORK.
33. UNDERGROUND ELECTRIC LOCATED IN 10' EASEMENT. WIRING TO BE DIRECT BURIED BY HENDRICKS POWER.
34. GAS METER.
35. MAIN STORE 2" GAS SERVICE.
36. mEXPRESS 1" GAS SERVICE.
37. PAD-MOUNTED TRANSFORMER. SEE SHEET C-800.
38. PAD-MOUNTED ELECTRICAL EQUIPMENT. SEE SHEET C-800.
39. UNDERGROUND ELECTRIC SERVICE. SEE SHEET C-800.
40. UNDERGROUND COMMUNICATIONS SERVICE. SEE SHEET C-800.
41. HELIUM CABINET. SEE P-405.
42. PHARMACY DETECTION LOOP. VENDOR TO SAWCUT ASPHALT, INSTALL DETECTION LOOP, AND SEAL ASPHALT.

BENCHMARK:

THE BASIS OF ELEVATIONS HEREON IS NAVD 88 PER OBSERVATIONS OF SELECTED STATIONS IN THE NATIONAL GEODETIC SURVEY CONTINUOUSLY OPERATING REFERENCE STATION (NGS CORS) NETWORK.
MAG NAIL SET IN THE CORNER TOP OF THE CURB JOINT - SEE DRAWING FOR LOCATION.
ELEVATION = 889.36'

Know what's below. Call before you dig.

UTILITIES SUMMARY

SUPERCENTER:

ELECTRIC: PRIMARY SERVICE, PREFERRED BASED ON RATE, MEIJER OWNED TRANSFORMER 2,000 KVA, SECONDARY 480/277V, 3PH, 4W GRD WYE.

PHONE: FIBER OPTIC ENTRANCE CABLE.

GAS: 11,966 CFH @ 2 PSI (5 PSI IF AVAILABLE) FOR 1.5 STORE.

WATER: 4" DIA. PIPE WITH 2" METER, 10,000 GPD SUMMER, 5,000 GPD WINTER, 150 GPM PEAK USE, 65 PSI AFTER BACKFLOW PREVENTER.

FIRE PROTECTION: 10" DIA. MIN., 1,575 GPM @ 35 PSI AT BASE OF RISER.

SANITARY SEWER: 5,000 GPD AVG., 40 GPM PEAK FLOW.

IRRIGATION: DESIGN TO BE PROVIDED AS PART OF FINAL DESIGN.

MEXPRESS:

ELECTRIC: SECONDARY SERVICE PREFERRED BASED ON RATE, PAD-MOUNT UTILITY OWNED TRANSFORMER, 600 AMP, 120/208V, 3PH, 4W SECONDARY SERVICE, TRANSFORMER SIZED AND FURNISHED BY UTILITY COMPANY.

PHONE: FED FROM SUPERCENTER, TYPICALLY NO DEDICATED SERVICE.

GAS: 394 CFH @ 7" WC

WATER: 2" DIA., 1.5" METER, 50 GPM PEAK USE, 65 PSI AFTER BACKFLOW PREVENTER. 750 GPD SUMMER, 500 GPD NON-SUMMER.

FIRE PROTECTION: NOT REQUIRED.

SANITARY SEWER: 500 GPD AVG. 20 GPM PEAK.

WATER NOTES

1. INSTALL WATER MAIN WITH A MINIMUM OF 4.5 FEET OF COVER.
2. CONTRACTOR TO COORDINATE WITH CITIZENS ENERGY GROUP FOR INSPECTION OF INSTALLATION OF WATER LINES INCLUDING CONNECTIONS TO EXISTING. PROVIDE 48 HOURS NOTICE.
3. ON SITE HYDRANTS SHALL FACE THE BUILDING.
4. HYDRANTS LOCATED IN CURB ISLAND OR GREEN SPACE SHALL BE LOCATED 5' FROM BACK OF CURB OR EDGE OF PAVEMENT (TYP.).
5. INSTALL CONCRETE PADS FOR ALL HYDRANT VALVES IN NON-PAVED AREAS.
6. PROVIDE A MINIMUM OF EIGHTEEN (18) INCHES OF VERTICAL SEPARATION AND TEN (10) FEET OF HORIZONTAL SEPARATION BETWEEN THE WATER LINE AND ALL SANITARY AND STORM SEWERS.
7. PROVIDE THRUST BLOCKS AT ALL WATER BENDS, PLUGS AND TEES IF REQUIRED BY THE UTILITY COMPANY.
8. EXISTING WATER MAINS AND ALL HYDRANTS REQUIRE TESTING. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY.
9. ALL PROPOSED WATER METERS AND BACKFLOW PREVENTERS TO ADHERE TO CITIZENS ENERGY GROUP STANDARD DETAILS AND REQUIREMENTS.
10. FIRE DEPARTMENT CONNECTION SHALL BE 5" STORZ WITH 30-DEGREE DOWN ANGLE AND HEIGHT BETWEEN 3'-4' ABOVE FINISHED GRADE. REFER TO TOWN OF BROWNSBURG CONSTRUCTION STANDARD DETAIL DW-12.

GAS NOTES

1. GAS COMPANY WILL PROVIDE GAS SERVICE TAP, METER, REGULATOR, AND INSTALL THE NEW SERVICE LINE TO THE METER.

WOOLPERT
ARCHITECTURE | ENGINEERING | GEOSPATIAL
4454 Idea Center Boulevard
Dayton, OH 45430
937.461.5660

meijer
2929 WALKER AVENUE
GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

UTILITY PLAN ENLARGEMENTS

ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

C-401

Images: _Xrefs: 10020046-p.dwg; 10020046-x.dwg; 10020046TBLK.dwg; 10020046-UTL-NOTES.dwg
Last Saved By:A.Reedy 1/9/2025 3:25:45 PM
G:\DE\Clients\Meijer\2026 Open Meijer Stores\10020046 Meijer 338 ABE - Brownsburg, IN Civil\4.0 Disciplines\Civil\Cadd\Cet\10020046UTL2.dwg Plotted By:Reedy, Angelo Plotted:January 10, 2025, 2:11:11 PM

STORM STRUCTURE TABLE

STRUCTURE ID	DESCRIPTION	RIM/GRATE	INVERTS	NORTHING	EASTING	CASTING	MISCELLANEOUS NOTES
1.00	42" CONCRETE FLARED END SECTION	881.13	42" = 877.39 (W)	1678527.9570	3156056.0038		
1.01	CONTECH CDS 10-C UNIT	885.52	42" = 877.52 (W) 42" = 877.42 (E)	1678527.2352	3156027.1678	SEE DETAIL ON C-708	
1.02	5' CB	883.43	42" = 877.74 (NW) 42" = 877.64 (E)	1678525.5918	3155961.5195	NEENAH R-3402-E	
1.03	5' CI	884.33	42" = 877.93 (W) 42" = 877.83 (SE)	1678596.6609	3155905.0400	NEENAH R-3287-SB10	
1.04	5' CI	886.02	42" = 878.13 (W) 42" = 878.03 (E) 6" = 882.74 (S)	1678594.2737	3155809.6806	NEENAH R-3287-SB10	
1.05	5' CI	889.18	42" = 878.31 (W) 42" = 878.21 (E) 6" = 885.93 (S)	1678592.3473	3155732.7256	NEENAH R-3287-SB10	
1.06	4' CI	888.47	36" = 878.50 (W) 42" = 878.40 (E) 6" = 885.22 (S)	1678590.2184	3155647.6807	NEENAH R-3287-SB10	
1.07	4' CI	888.48	36" = 878.78 (W) 36" = 878.68 (E) 6" = 885.23 (SE)	1678587.1437	3155524.8532	NEENAH R-3287-SB10	
1.08	4' CI	887.29	36" = 879.66 (W) 36" = 878.94 (E) 6" = 884.04 (SE)	1678609.1607	3155423.6957	NEENAH R-3287-SB10	
1.09	4' CI	885.53	36" = 879.90 (E) 18" = 880.00 (W) 30" = 880.00 (S)	1678629.8852	3155270.9014	NEENAH R-3287-SB10	
1.10	4' CI	885.16	18" = 880.47 (E) 18" = 880.57 (S)	1678625.1479	3155081.6606	NEENAH R-3287-SB10	
1.11	3'' CI	885.15	18" = 880.64 (N)	1678599.1540	3155082.2291	NEENAH R-3287-SB10	
1.12	4' CI	887.01	30" = 880.99 (N) 24" = 881.09 (S) 30" = 881.09 (W)	1678447.2178	3155261.9716	NEENAH R-3287-SB10	
1.13	4' CB	886.50	30" = 881.22 (E)	1678446.3431	3155211.9793	NEENAH R-4215-C	
1.14	4' CI	887.17	24" = 881.44 (S) 24" = 881.34 (N)	1678346.3190	3155264.4974	NEENAH R-3287-SB10	
1.15	4' CB	886.91	24" = 881.72 (N) 18" = 881.82 (W)	1678236.2526	3155267.2527	NEENAH R-3287-SB10	
1.16	3' CB	886.41	18" = 881.95 (E)	1678235.8757	3155217.2479	NEENAH R-4215-C	
1.30	42" CONCRETE FLARED END SECTION	881.13	42" = 877.39 (W)	1678092.2588	3156113.4527		
1.31	CONTECH CDS 8-C UNIT	885.13	42" = 877.52 (W) 42" = 877.42 (E)	1678084.7401	3156085.2803	SEE DETAIL ON C-708	
1.32	5' CI	885.53	18" = 878.99 (N) 42" = 877.64 (W) 42" = 877.54 (E)	1678079.3089	3156064.9300	NEENAH R-3287-SB10	
1.34	5' CI	885.60	42" = 877.69 (E) 42" = 877.79 (W)	1678066.1818	3156015.7431	NEENAH R-3287-SB10	
1.35	5' CB	885.50	42" = 877.95 (E) 42" = 878.05 (W)	1678062.1652	3155855.2934	NEENAH R-3402-E	
1.36	5' CB	885.50	36" = 878.28 (W) 42" = 878.18 (E)	1678058.9620	3155727.3335	NEENAH R-3402-E	
1.37	4' CB	885.50	36" = 878.51 (W) 36" = 878.41 (E)	1678055.7588	3155599.3736	NEENAH R-3402-E	
1.38	4' CB	885.50	36" = 878.74 (W) 36" = 878.64 (E)	1678052.5556	3155471.4136	NEENAH R-3402-E	
1.39	4' CB	885.50	30" = 878.97 (W) 36" = 878.87 (E)	1678049.3495	3155343.3408	NEENAH R-3402-E	
1.40	4' CI	885.84	18" = 879.75 (N) 30" = 879.04 (E) 24" = 879.14 (W)	1678047.5634	3155271.9891	NEENAH R-3287-SB10	
1.41	4' CB	883.25	24" = 879.21 (E)	1678046.8801	3155242.1641	NEENAH R-4215-C	
1.42	TYPE 1 MANHOLE	887.07	15" = 880.12 (W) 18" = 880.02 (S)	1678157.2801	3155269.2401	NEENAH R-1642	
1.43	3' CI	885.32	15" = 880.91 (N) 15" = 880.81 (E)	1678150.3740	3154993.4070	NEENAH R-3287-SB10	
1.44	3' CI	885.20	15" = 881.00 (S)	1678187.3645	3154992.5633	NEENAH R-3287-SB10	
1.45	3' CI	886.11	18" = 879.55 (S) 15" = 879.65 (W)	1678299.9729	3156031.3733	NEENAH R-3287-SB10	
1.46	2' CI	887.85	15" = 879.95 (E)	1678297.7123	3155956.8991	NEENAH R-3287-SB10	
2.00	42" CONCRETE FLARED END SECTION	881.22	42" = 877.48 (S)	1677956.6825	3156166.9908		
2.01	CONTECH CDS 8-C UNIT	886.10	42" = 877.61 (S) 42" = 877.51 (N)	1677930.1920	3156167.4878	SEE DETAIL ON C-708	
2.02	5' CI	886.31	42" = 877.73 (S) 42" = 877.63 (N)	1677913.6959	3156168.0668	NEENAH R-3287-SB10	
2.03	5' CI	886.40	42" = 877.76 (N) 30" = 877.95 (W) 36" = 877.86 (S)	1677886.7044	3156168.7425	NEENAH R-3287-SB10	
2.04	4' CB	885.90	36" = 877.89 (N) 30" = 878.26 (SE) 30" = 877.99 (SW)	1677856.7075	3156169.4934	NEENAH R-4215-C	
2.05	3' ENV. CI	886.40	24" = 878.79 (SW) 30" = 878.49 (NW)	1677712.6462	3156314.0564	NEENAH R-3287-SB10	
2.06	TYPE 1 MANHOLE	886.76	18" = 879.39 (W) 24" = 878.89 (NE)	1677666.6980	3156269.2328	NEENAH R-1642	
2.07	3' ENV. CB	886.56	15" = 879.72 (S) 18" = 879.62 (E)	1677662.8426	3156119.0763	NEENAH R-3402-E	
2.08	2' ENV. CI	886.40	15" = 880.07 (E) 15" = 879.97 (N)	1677560.8796	3156121.5775	NEENAH R-3287-SB10	
2.09	2' ENV. CI	886.40	15" = 880.55 (W)	1677565.7188	3156314.8899	NEENAH R-3287-SB10	
2.11	4' CI	885.97	30" = 878.22 (W) 30" = 878.12 (NE)	1677773.3026	3156072.5903	NEENAH R-3287-SB10	
2.12	4' CI	886.42	24" = 878.36 (W) 30" = 878.26 (E) 24" = 879.55 (S)	1677772.3767	3156035.6019	NEENAH R-3287-SB10	
2.13	4' CB	885.00	24" = 878.46 (E)	1677771.5320	3155996.0642	NEENAH R-4215-C	
2.14	4' CI	886.41	24" = 878.81 (W) 30" = 878.31 (E)	1677878.9726	3155859.8792	NEENAH R-3287-SB10	
2.15	3' CI	886.41	24" = 879.29 (E) 18" = 879.39 (W)	1677872.5662	3155603.9594	NEENAH R-3287-SB10	
2.16	4' MH	887.83	15" = 879.85 (S) 18" = 879.75 (E) 15" = 879.95 (W)	1677868.2195	3155430.3212	NEENAH R-1642	
2.17	2' CI	886.41	15" = 880.47 (W) 15" = 880.37 (N)	1677660.7673	3155439.3086	NEENAH R-3287-SB10	
2.18	2' CI	886.41	15" = 880.56 (E)	1677659.1658	3155402.3432	NEENAH R-3287-SB10	
2.21	2' CI	887.39	15" = 880.17 (E)	1677901.6862	3155348.6507	NEENAH R-3287-SB10	
2.31	3' CI	886.40	18" = 879.86 (S) 24" = 879.76 (N) 24" = 879.86 (W)	1677647.7225	3156038.7234	NEENAH R-3287-SB10	
2.32	3' CI	886.40	18" = 880.08 (N)	1677559.3610	3156040.9359	NEENAH R-3287-SB10	
2.33	4' CB	885.00	24" = 879.96 (E)	1677646.8715	3155998.9347	NEENAH R-4215-C	
3.00	TYPE 1 MANHOLE	885.21	12" = 877.22 (N) 15" = 877.22 (S)	1678042.7255	3156144.2836	NEENAH R-1642	
3.01	OUTLET CONTROL STRUCTURE	885.00	12" = 877.29 (S)	1678066.9172	3156143.2356	SEE DETAIL ON C-705	
3.02	OUTLET CONTROL STRUCTURE	883.90	15" = 877.38 (N)	1678002.4776	3156146.0273	SEE DETAIL ON C-705	
5.00	42" CONCRETE FLARED END SECTION	881.12	42" = 877.38 (W)	1677971.5263	3156110.6416		
5.01	UNDERGROUND DETENTION OUTLET	881.47	42" = 877.53 (E)	1677967.7856	3155961.2094		

STORM STRUCTURE TABLE

STRUCTURE ID	DESCRIPTION	RIM/GRATE	INVERTS	NORTHING	EASTING	CASTING	MISCELLANEOUS NOTES
5.02	UG DET 36" DIA. RISER	887.91		1677962.4862	3155949.3388		
5.03	UG DET 36" DIA. RISER	887.31		1677926.4976	3155950.2433		
6.01	TYPE 1 MANHOLE	886.15	18" = 879.96 (E) 24" = 879.96 (N)	1677826.5182	3155248.8253	NEENAH R-1642	
6.02	3' CB	883.35	15" = 880.27 (S) 18" = 880.27 (W)	1677831.8138	3155371.0609	NEENAH R-4215-C	
6.03	2' CB	884.15	15" = 880.78 (E) 15" = 880.78 (N)	1677628.4798	3155387.1571	NEENAH R-4215-C	
6.04	4' MH	883.49	15" = 880.96 (W) 6" = 880.96 (E)	1677631.5095	3155457.0915		
6.05	8" DIA. NYLOPLAST DRAIN BASIN 2808AG	882.64	6" = 881.47 (W)	1677615.3695	3155659.6249		
8.00	CONCRETE COLLAR FOR EX 18" RCP	887.93	18" = 886.13 (E)	1678006.4230	3154816.5790		
8.01	18" END SECTION	888.43	18" = 886.23 (W)	1678006.6681	3154829.3078		
8.02	15" END SECTION	887.49	15" = 885.55 (N)	1678096.2812	3154827.4023		
8.03	15" END SECTION	887.77	15" = 885.83 (S)	1678233.2540	3154824.4897		

SANITARY STRUCTURE TABLE

STRUCTURE ID	DESCRIPTION	RIM	INVERTS	NORTHING	EASTING	MISCELLANEOUS NOTES
A	DOGHOUSE SAN MH	888.21	10" = 869.79 (N) 12" = 868.67 (W) 12" = 868.67 (E)	1677526.1858	3156020.6652	
A.1	SAN MH	885.84	10" = 870.81 (N) 10" = 870.71 (S) 6" = 872.50 (E)	1677754.3198	3156014.9544	
A.2	SAN MH	887.66	6" = 881.61 (W) 4" = 883.27 (S) 4" = 881.71 (NE)	1677758.3321	3156175.2870	
A.3	NODE	884.02	4" = 883.65 (SE) 4" = 883.65 (W)	1677758.8122	3156194.4729	
A.4	CLEANOUT	887.76	4" = 883.90 (NW)	1677750.2618	3156203.4624	
A.5	CLEANOUT	887.58	4" = 881.93 (SW)	1677764.8328	3156184.3979	
B	SAN MH	887.31	10" = 871.49 (N) 10" = 871.39 (S)	1677900.7685	3156011.2883	
C	SAN MH	886.02	10" = 872.52 (N) 10" = 872.42 (S) 8" = 873.06 (W)	1678131.6740	3156005.5081	
D	SAN MH W/ DROP CONNECTION	886.84	6" = 880.43 (W) 10" = 873.55 (N) 10" = 873.45 (S)	1678365.5606	3155999.6532	
D.1	CLEANOUT	888.04	6" = 883.03 (E)	1678364.6098	3155961.6693	
E	SAN MH	884.85	10" = 874.53 (W) 10" = 874.43 (S)	1678584.8588	3155994.1637	
F	SAN MH	884.39	10" = 875.08 (W) 10" = 874.98 (E)	1678581.5819	3155863.0017	
G	SAN MH W/ DROP CONNECTION	888.41	10" = 876.36 (W) 6" = 884.02 (S) 10" = 876.26 (E)	1678572.9302	3155516.7065	
G.1	CLEANOUT	888.82	6" = 884.79 (S) 6" = 884.79 (N)	1678561.9388	3155516.9815	
G.2	CONNECT TO MAIN STORE SANITARY SYSTEM	885.54	6" = 885.00 (N)	1678558.9397	3155517.0566	
H	SAN MH	886.55	10" = 877.18 (N) 10" = 877.08 (E) 8" = 877.18 (W)	1678567.6399	3155304.9572	
H.2	SAN MH	889.29	10" = 877.52 (S)	1678669.4005	3155302.4096	
H.3	SAN MH	887.74	8" = 877.54 (E)	1678565.8540	3155233.4742	
I	SAN MH	887.22	8" = 873.92 (W) 6" = 875.47 (NW) 8" = 873.82 (E)	1678127.8831	3155853.6483	
I.1	CLEANOUT	888.95	6" = 882.00 (SE)	1678206.1491	3155802.8981	
J	SAN MH W/ DROP CONNECTION	887.22	8" = 875.30 (W) 6" = 879.22 (N) 8" = 875.20 (E)	1678121.4947	3155597.7280	
J.1	CLEANOUT	888.95	6" = 885.00 (S)	1678200.3994	3155573.2133	
K	SAN MH	885.08	8" = 877.16 (N) 8" = 877.06 (E)	1678112.6827	3155244.7203	
L	SAN MH	886.79	8" = 877.69 (S)	1678218.8371	3155242.0617	

STRUCTURE TABLE NOTES

1. EX = EXISTING.
2. CI = CURB INLET.
3. CB = CATCH BASIN.
4. MH = MANHOLE.
5. CTE = CONNECT TO EXISTING.
6. RIM/GRATE ELEVATION INDICATES:
   - 6.1. FOR MANHOLE, JUNCTION BOX/CLEANOUT: RIM ELEVATION.
   - 6.2. FOR CATCH BASIN: GRATE ELEVATION.
   - 6.3. FOR CURB INLET: TOP OF CASTING/TOP OF CURB ELEVATION.
7. ALL PROPOSED STORM STRUCTURE TYPES SHALL BE IN ACCORDANCE WITH TOWN OF BROWNSBURG CONSTRUCTION STANDARD DETAILS UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL REVIEW CONDITION OF EXISTING STRUCTURES TO REMAIN IN WHICH PROPOSED PIPES ARE PROPOSED TO CONNECT. IF CONDITIONS WARRANT IT, STRUCTURE(S) SHALL BE REPLACED.
9. ALL STORM GRATE CASTINGS TO BE PRE-CAST WITH A POLLUTION PREVENTION MESSAGE PERMANENTLY ATTACHED. PER TOWN OF BROWNSBURG STANDARD DETAILS SW-13 AND SW-14. POLLUTION PREVENTION MESSAGE TO STATE, AT MINIMUM, "DUMP NO WASTE <FISH ICON> DRAINS TO WATERWAY" IN MINIMUM 1 INCH HIGH LETTERS.
10. STORM SEWER PIPING TO BE HIGH DENSITY POLYETHYLENE (HDPE) FOR PIPES 12 TO 24 INCHES IN DIAMETER, POLYPROPYLENE (PP) FOR PIPES 12 TO 60 INCHES IN DIAMETER, POLYVINYL CHLORIDE (PVC) FOR PIPES 12 TO 36 INCHES IN DIAMETER, OR REINFORCED CONCRETE (RCP) FOR PIPES 12 INCHES IN DIAMETER OR LARGER IN ACCORDANCE WITH THE TOWN OF BROWNSBURG CONSTRUCTION STANDARDS, MOST CURRENT EDITION.
11. CONTRACTOR TO SIZE STORM STRUCTURES PER TOWN OF BROWNSBURG STANDARDS.
12. ALL CATCH BASINS AND CURB INLETS SHALL HAVE A 2' SUMP. OUTLET STRUCTURES SHALL NOT HAVE A SUMP.
13. BID ALTERNATE 5: PROVIDE SQUARE CONCRETE COLLARS FOR SANITARY AND STORM STRUCTURES.

WOOLPERT
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(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

STRUCTURE DATA TABLES

ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

C-402

Images: , Xrefs: 10020046-p.dwg; 10020046-x.dwg; 10020046IBLK.dwg; 10020046-UTL-NOTES.dwg
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APPENDICES

SECTION 1:
DETENTION DESIGN INFORMATION

1.1 – HydroCAD INPUTS AND RESULTS – ONSITE RUNOFF

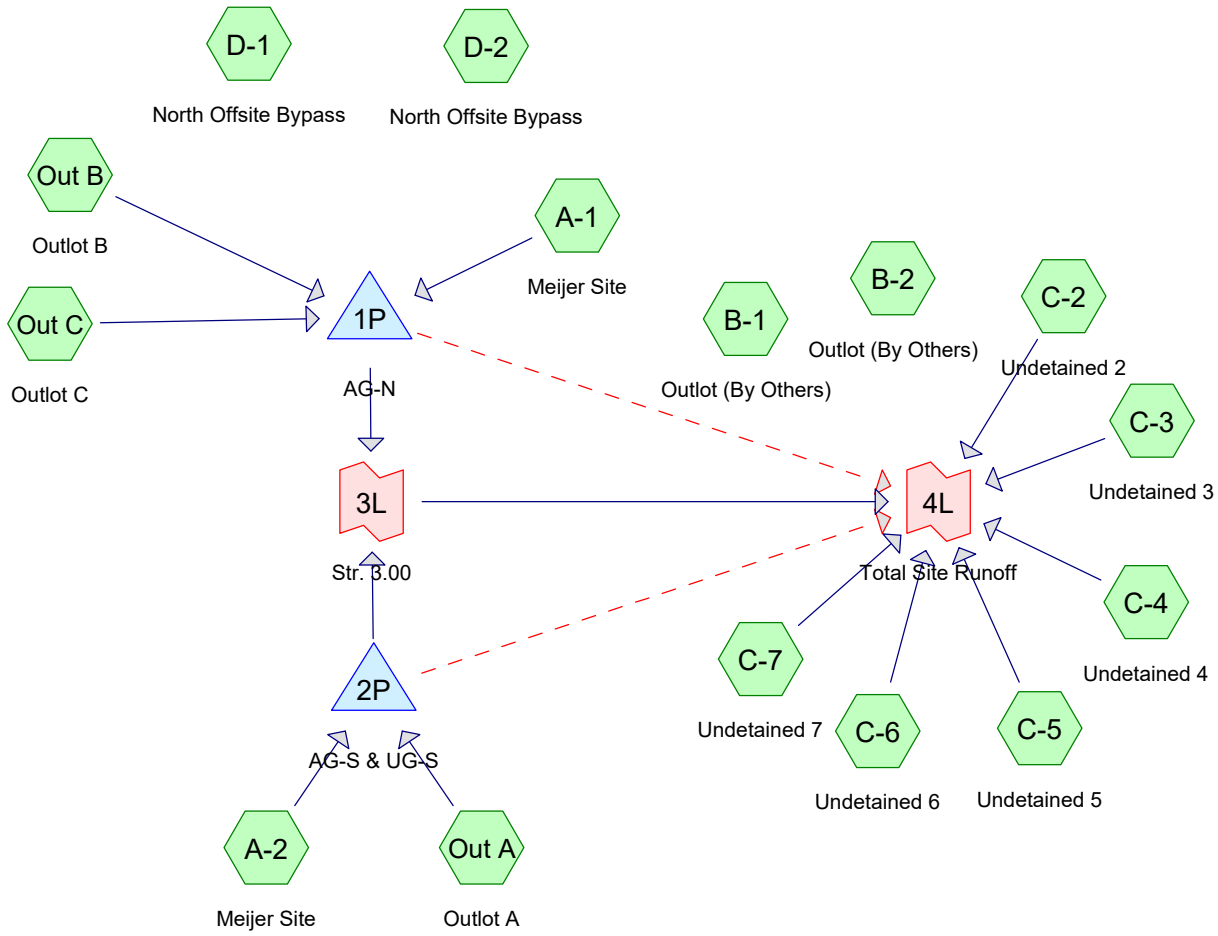
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Subcat Reach Pond Link

Routing Diagram for Meijer ABE SWM
Prepared by Woolpert, Inc, Printed 1/10/2025
HydroCAD® 10.20-5c s/n 00728 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10yr-24hr	Type II 24-hr		Default	24.00	1	4.28	2
2	100yr-24hr	Type II 24-hr		Default	24.00	1	6.30	2

Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A-1: Meijer Site Runoff Area=16.510 ac 69.41% Impervious Runoff Depth=3.39"
Tc=15.0 min CN=92 Runoff=69.11 cfs 203,077 cf

Subcatchment A-2: Meijer Site Runoff Area=5.180 ac 69.31% Impervious Runoff Depth=3.39"
Tc=6.0 min CN=92 Runoff=28.92 cfs 63,715 cf

Subcatchment B-1: Outlot (By Others) Runoff Area=1.700 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=263' Tc=6.2 min CN=81 Runoff=7.05 cfs 14,557 cf

Subcatchment B-2: Outlot (By Others) Runoff Area=1.800 ac 0.00% Impervious Runoff Depth=2.19"
Flow Length=274' Tc=21.1 min CN=79 Runoff=4.25 cfs 14,330 cf

Subcatchment C-2: Undetained 2 Runoff Area=0.160 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=0.65 cfs 1,321 cf

Subcatchment C-3: Undetained 3 Runoff Area=0.290 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=1.17 cfs 2,395 cf

Subcatchment C-4: Undetained 4 Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=0.77 cfs 1,569 cf

Subcatchment C-5: Undetained 5 Runoff Area=0.170 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=0.69 cfs 1,404 cf

Subcatchment C-6: Undetained 6 Runoff Area=0.050 ac 80.00% Impervious Runoff Depth=3.60"
Tc=6.0 min CN=94 Runoff=0.29 cfs 653 cf

Subcatchment C-7: Undetained 7 Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=0.77 cfs 1,569 cf

Subcatchment D-1: North Offsite Bypass Runoff Area=18.480 ac 0.00% Impervious Runoff Depth=3.09"
Flow Length=1,684' Tc=81.9 min CN=89 Runoff=24.12 cfs 207,069 cf

Subcatchment D-2: North Offsite Bypass Runoff Area=10.720 ac 0.00% Impervious Runoff Depth=3.09"
Flow Length=952' Tc=28.1 min CN=89 Runoff=29.65 cfs 120,118 cf

Subcatchment Out A: Outlot A Runoff Area=3.120 ac 85.00% Impervious Runoff Depth=3.71"
Tc=20.0 min CN=95 Runoff=12.01 cfs 41,988 cf

Subcatchment Out B: Outlot B Runoff Area=1.920 ac 85.00% Impervious Runoff Depth=3.71"
Tc=15.0 min CN=95 Runoff=8.50 cfs 25,839 cf

Subcatchment Out C: Outlot C Runoff Area=3.820 ac 85.00% Impervious Runoff Depth=3.71"
Tc=15.0 min CN=95 Runoff=16.92 cfs 51,408 cf

Pond 1P: AG-N Peak Elev=882.14' Storage=236,943 cf Inflow=94.53 cfs 280,324 cf
Primary=0.91 cfs 178,351 cf Secondary=0.00 cfs 0 cf Outflow=0.91 cfs 178,351 cf

Pond 2P: AG-S & UG-S Peak Elev=882.61' Storage=70,517 cf Inflow=36.68 cfs 105,703 cf
Primary=0.95 cfs 105,686 cf Secondary=0.00 cfs 0 cf Outflow=0.95 cfs 105,686 cf

Link 3L: Str. 3.00 Inflow=1.84 cfs 284,037 cf
Primary=1.84 cfs 284,037 cf

Link 4L: Total Site Runoff Inflow=5.62 cfs 292,950 cf
Primary=5.62 cfs 292,950 cf

Total Runoff Area = 2,800,908 sf Runoff Volume = 751,012 cf Average Runoff Depth = 3.22"
64.82% Pervious = 1,815,537 sf 35.18% Impervious = 985,371 sf

Summary for Subcatchment A-1: Meijer Site

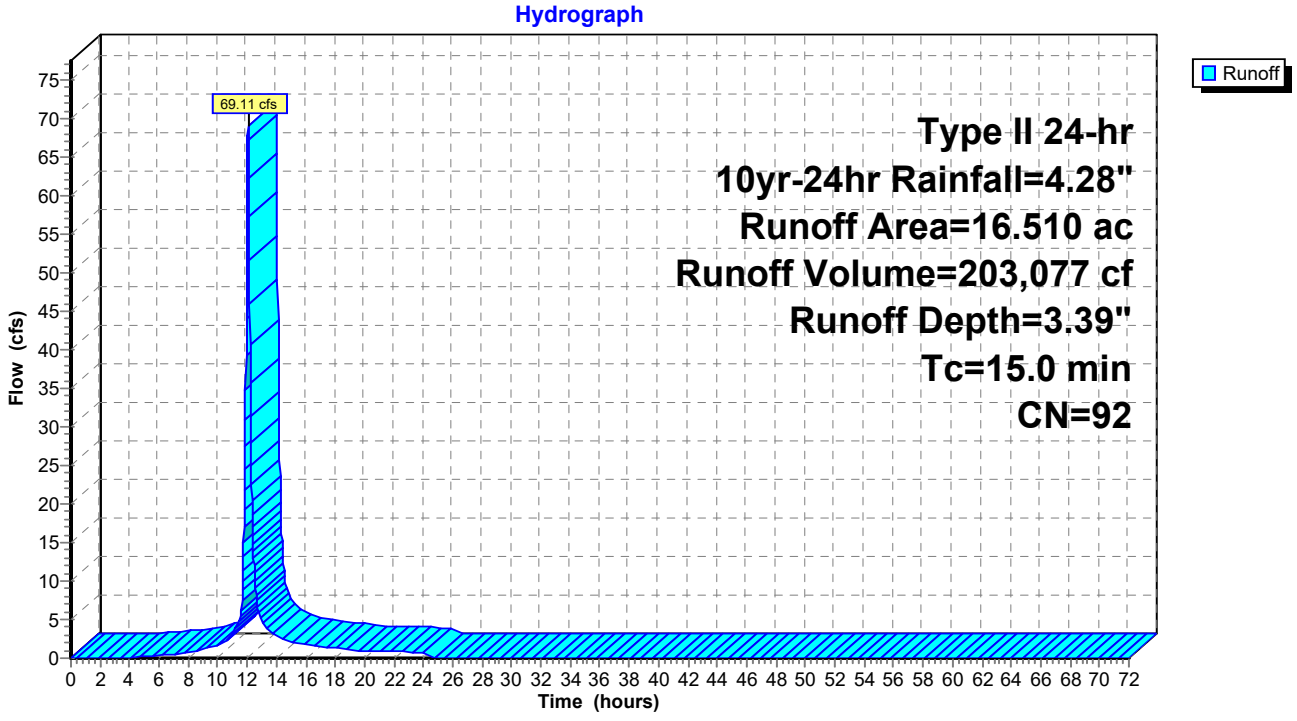
Runoff = 69.11 cfs @ 12.06 hrs, Volume= 203,077 cf, Depth= 3.39"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
11.460	98	Paved parking, HSG D
5.050	80	>75% Grass cover, Good, HSG D
16.510	92	Weighted Average
5.050	80	30.59% Pervious Area
11.460	98	69.41% Impervious Area

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

Subcatchment A-1: Meijer Site



Summary for Subcatchment A-2: Meijer Site

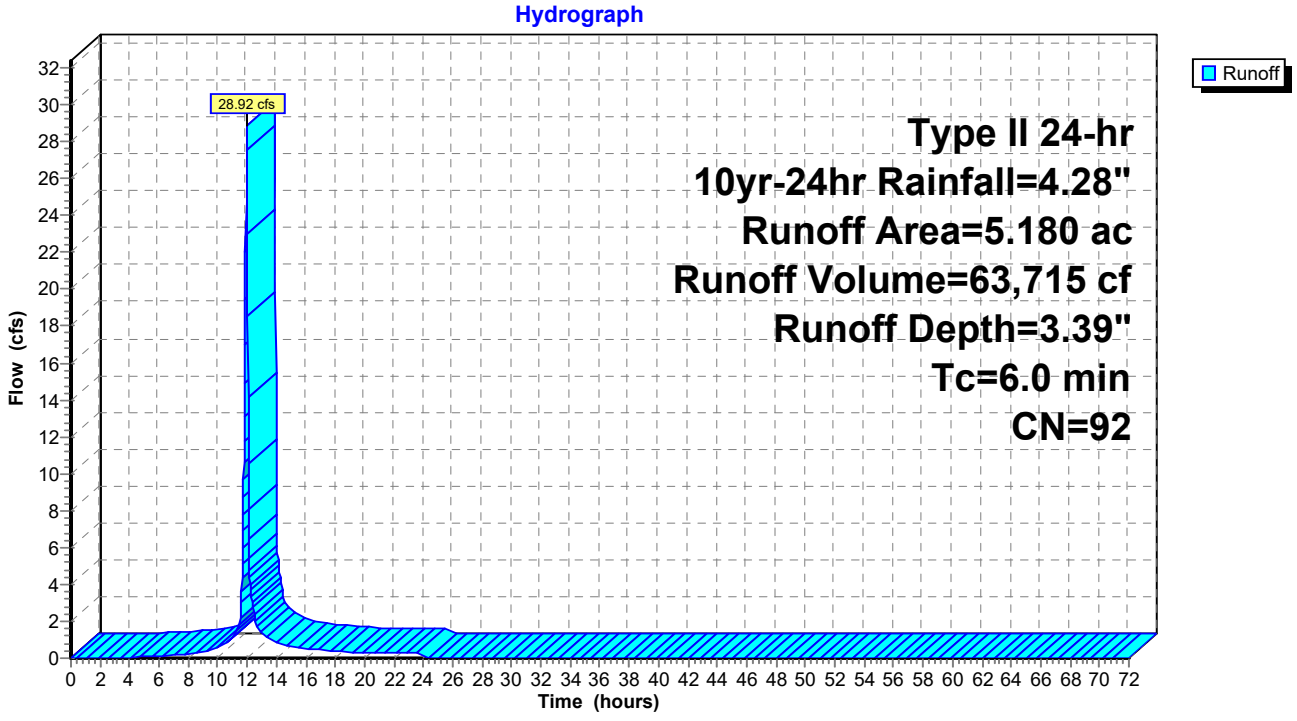
Runoff = 28.92 cfs @ 11.97 hrs, Volume= 63,715 cf, Depth= 3.39"
Routed to Pond 2P : AG-S & UG-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
3.590	98	Paved parking, HSG D
1.590	80	>75% Grass cover, Good, HSG D
5.180	92	Weighted Average
1.590	80	30.69% Pervious Area
3.590	98	69.31% Impervious Area

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

Subcatchment A-2: Meijer Site



Summary for Subcatchment B-1: Outlot (By Others)

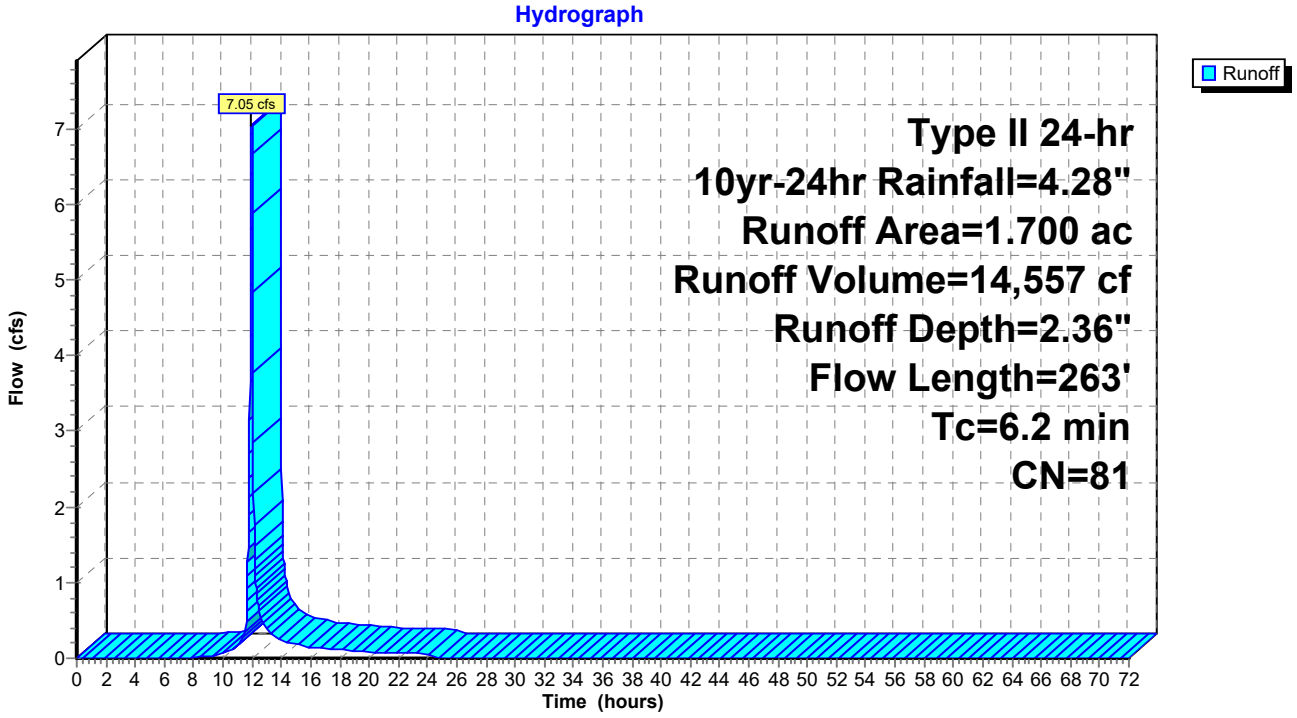
Runoff = 7.05 cfs @ 11.98 hrs, Volume= 14,557 cf, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

	Area (ac)	CN	Description
*	1.000	78	Row crops, straight row, Good, HSG B
	0.700	85	Row crops, straight row, Good, HSG C
	1.700	81	Weighted Average
	1.700	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0327	0.48		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
2.8	163	0.0113	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.2	263	Total			

Subcatchment B-1: Outlot (By Others)



Summary for Subcatchment B-2: Outlot (By Others)

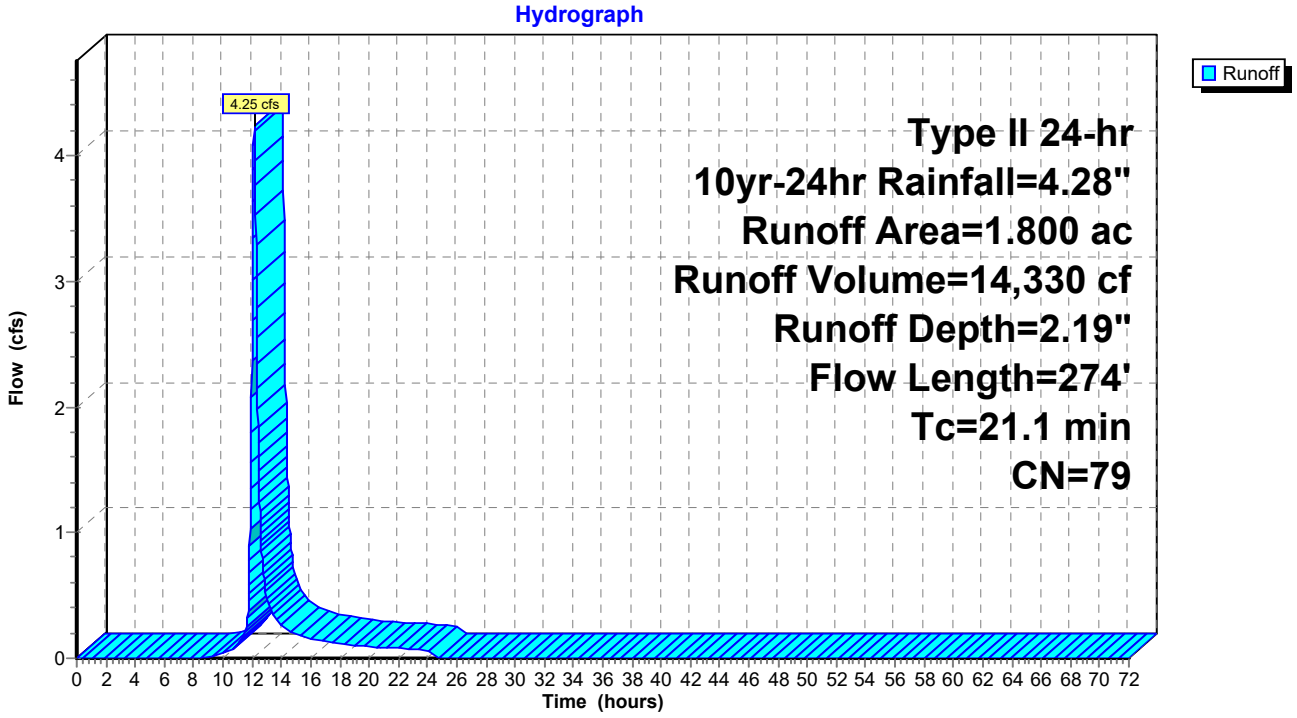
Runoff = 4.25 cfs @ 12.14 hrs, Volume= 14,330 cf, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

	Area (ac)	CN	Description
*	1.500	78	Row crops, straight row, Good, HSG B
	0.300	85	Row crops, straight row, Good, HSG C
	1.800	79	Weighted Average
	1.800	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0130	0.33		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
16.1	174	0.0004	0.18		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
21.1	274	Total			

Subcatchment B-2: Outlot (By Others)



Summary for Subcatchment C-2: Undetained 2

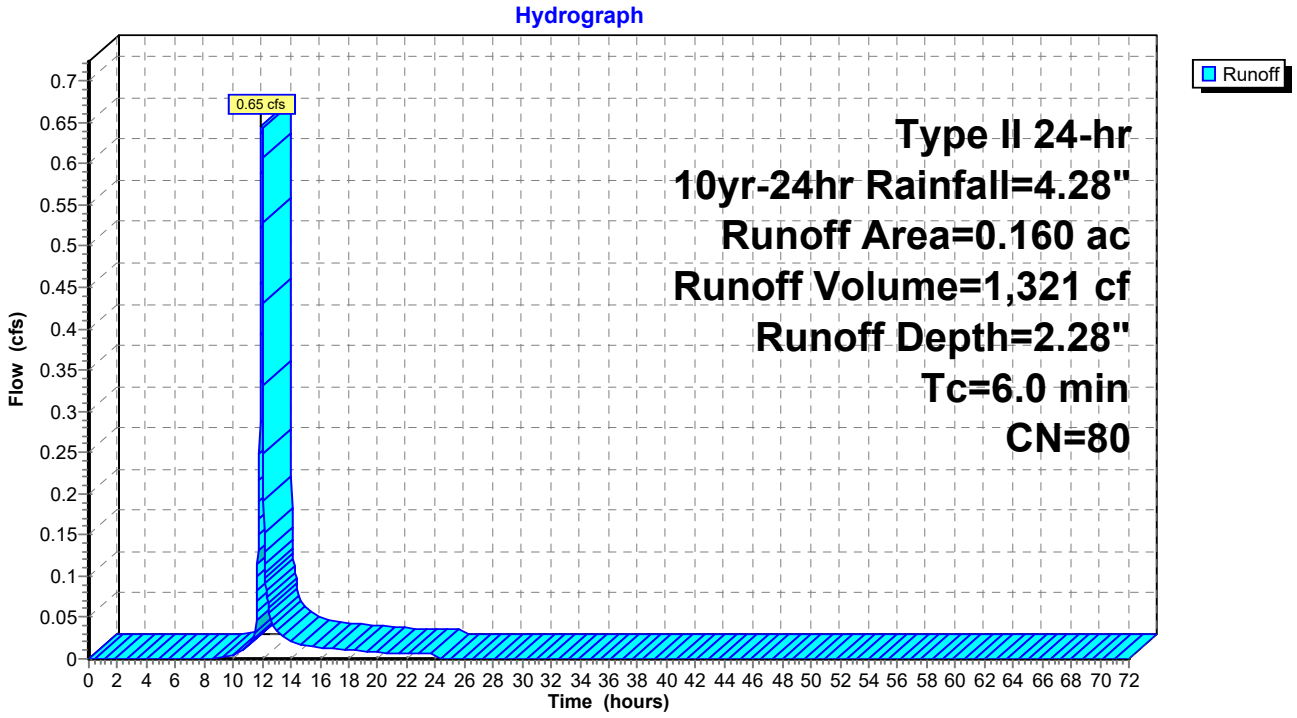
Runoff = 0.65 cfs @ 11.97 hrs, Volume= 1,321 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.160	80	>75% Grass cover, Good, HSG D
0.160	80	100.00% Pervious Area

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

Subcatchment C-2: Undetained 2



Summary for Subcatchment C-3: Undetained 3

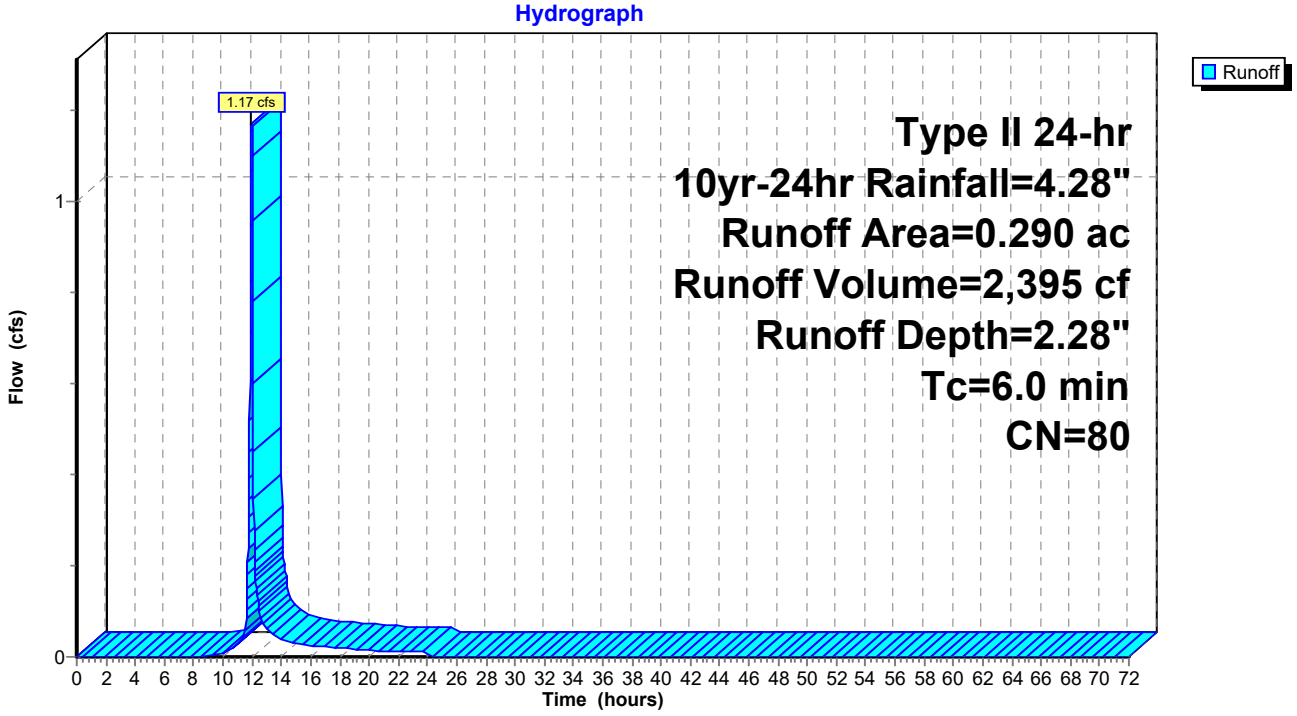
Runoff = 1.17 cfs @ 11.97 hrs, Volume= 2,395 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
0.290	80	100.00% Pervious Area

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

Subcatchment C-3: Undetained 3



Summary for Subcatchment C-4: Undetained 4

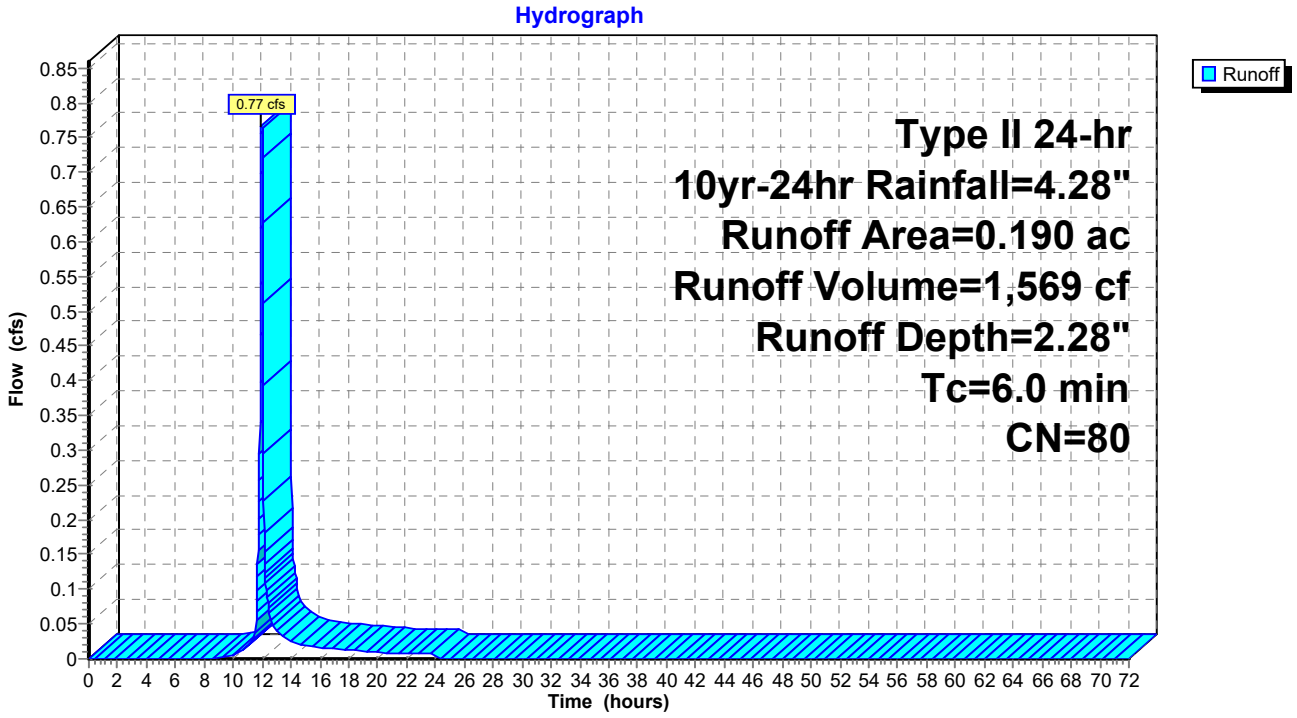
Runoff = 0.77 cfs @ 11.97 hrs, Volume= 1,569 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.190	80	>75% Grass cover, Good, HSG D
0.190	80	100.00% Pervious Area

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

Subcatchment C-4: Undetained 4



Summary for Subcatchment C-5: Undetained 5

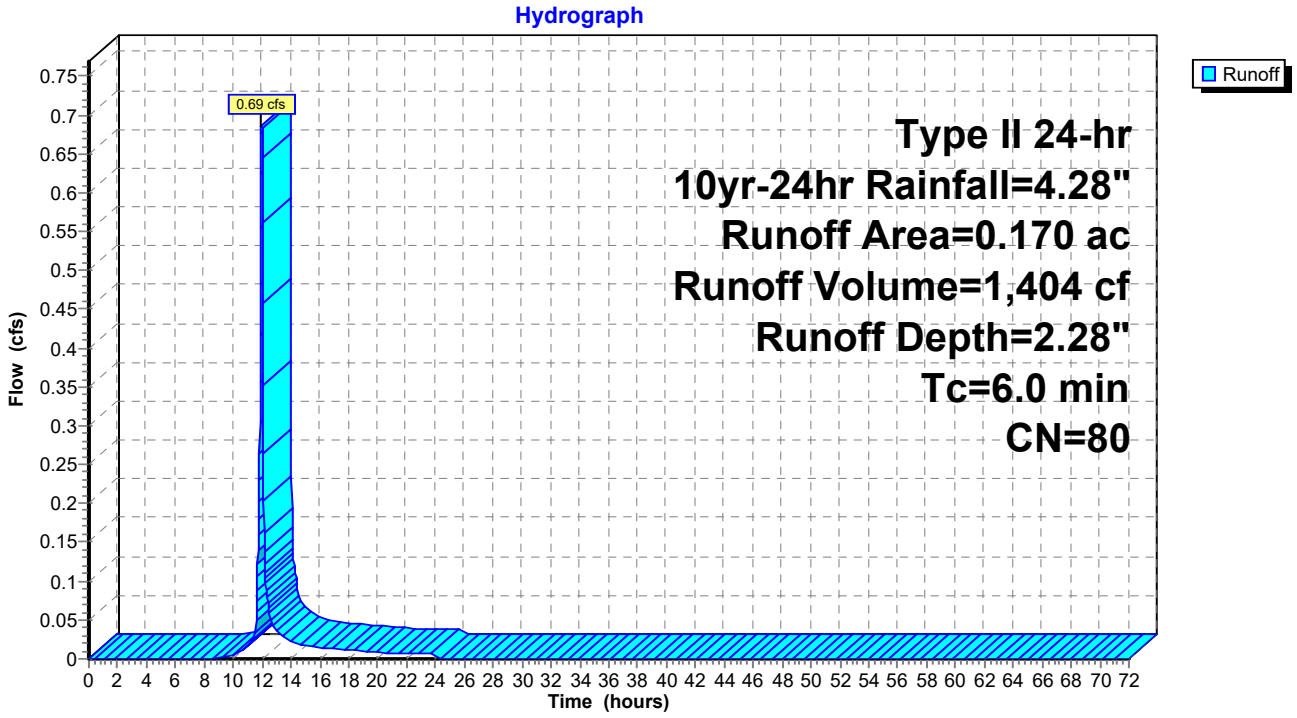
Runoff = 0.69 cfs @ 11.97 hrs, Volume= 1,404 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.170	80	>75% Grass cover, Good, HSG D
0.170	80	100.00% Pervious Area

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

Subcatchment C-5: Undetained 5



Summary for Subcatchment C-6: Undetained 6

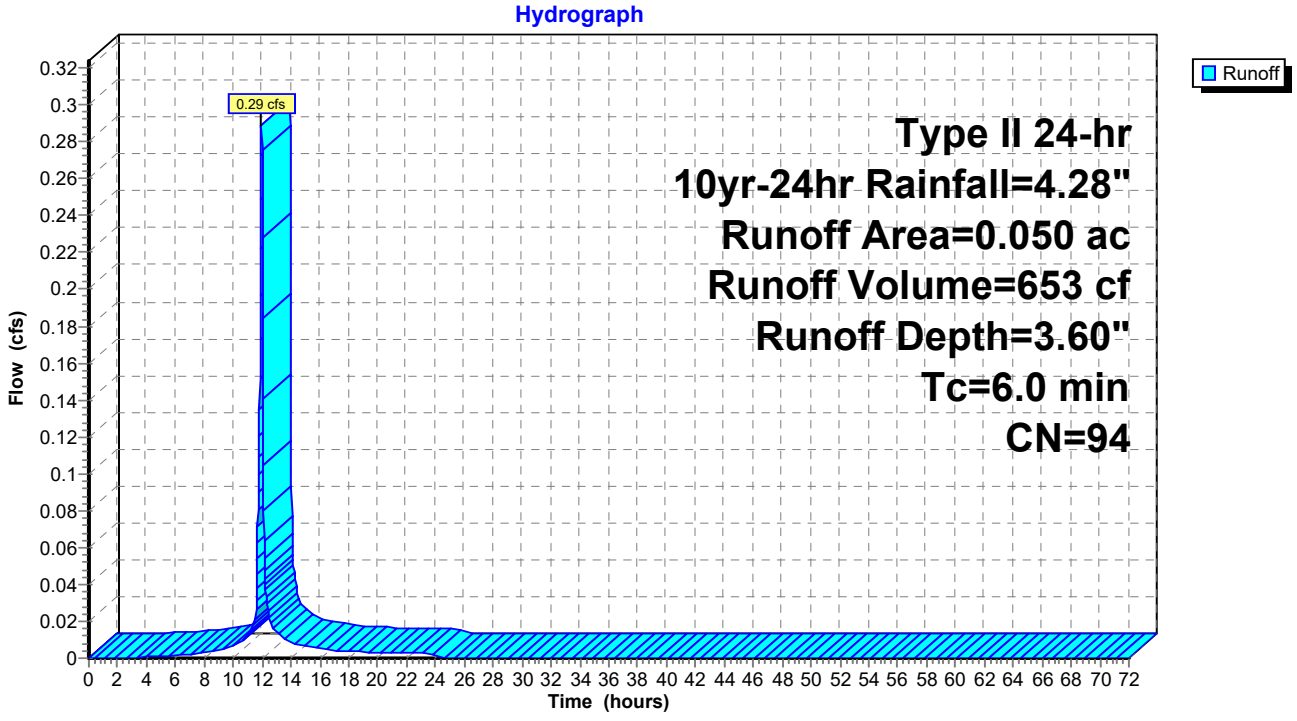
Runoff = 0.29 cfs @ 11.97 hrs, Volume= 653 cf, Depth= 3.60"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG D
0.010	80	>75% Grass cover, Good, HSG D
0.050	94	Weighted Average
0.010	80	20.00% Pervious Area
0.040	98	80.00% Impervious Area

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

Subcatchment C-6: Undetained 6



Summary for Subcatchment C-7: Undetained 7

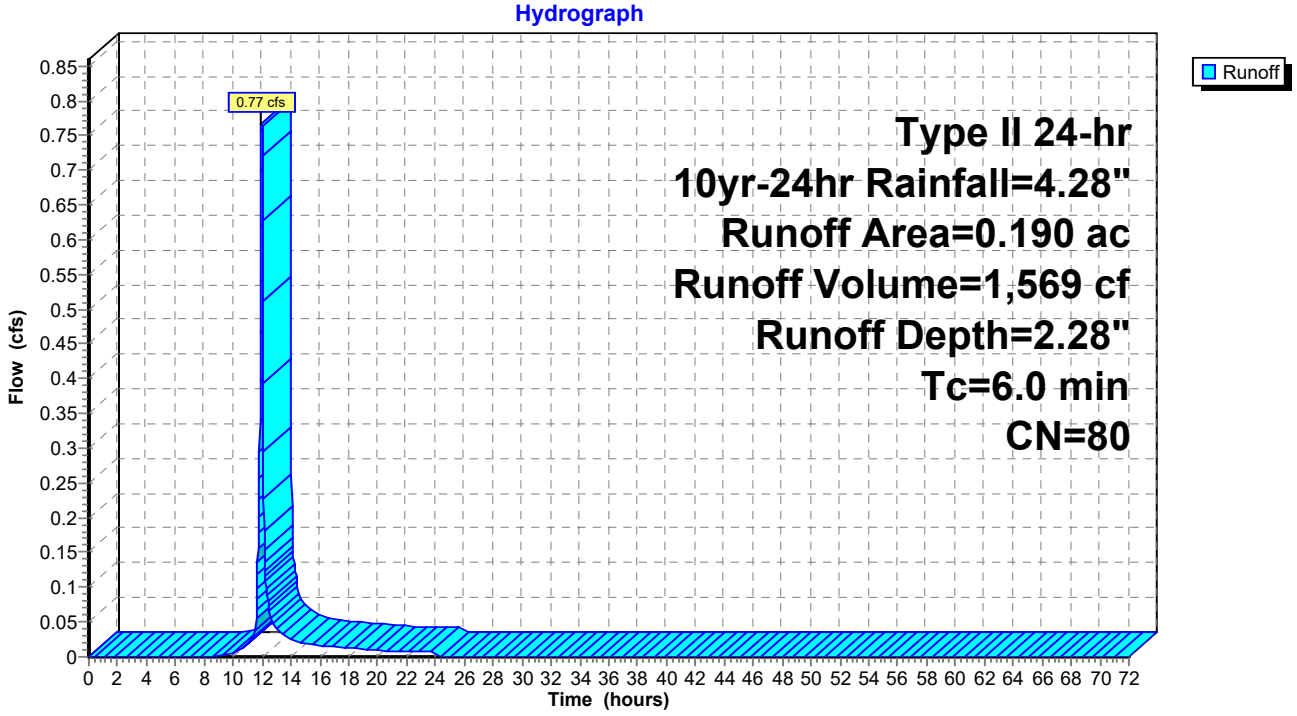
Runoff = 0.77 cfs @ 11.97 hrs, Volume= 1,569 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.190	80	>75% Grass cover, Good, HSG D
0.190	80	100.00% Pervious Area

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

Subcatchment C-7: Undetained 7



Summary for Subcatchment D-1: North Offsite Bypass

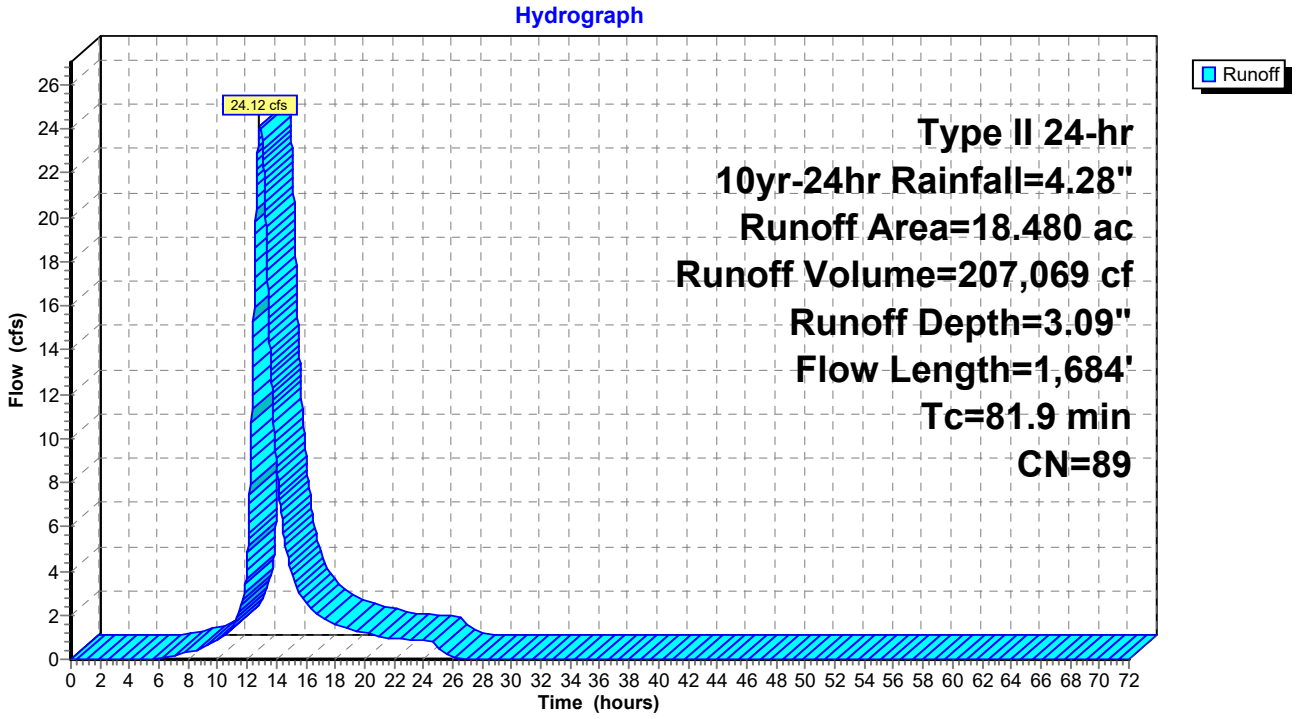
Runoff = 24.12 cfs @ 12.85 hrs, Volume= 207,069 cf, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
18.480	89	Row crops, straight row, Good, HSG D
18.480	89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0075	0.27		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
75.7	1,584	0.0015	0.35		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
81.9	1,684	Total			

Subcatchment D-1: North Offsite Bypass



Summary for Subcatchment D-2: North Offsite Bypass

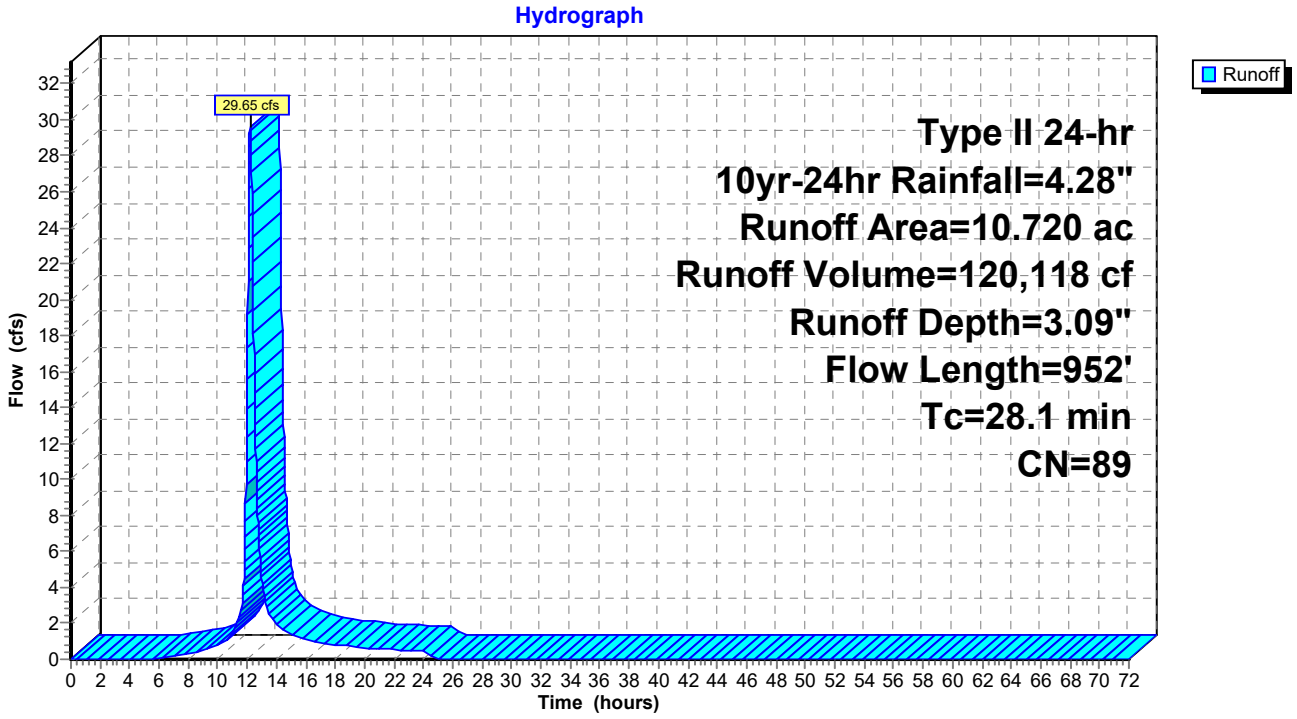
Runoff = 29.65 cfs @ 12.21 hrs, Volume= 120,118 cf, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
10.720	89	Row crops, straight row, Good, HSG D
10.720	89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0090	0.29		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
22.3	852	0.0050	0.64		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
28.1	952	Total			

Subcatchment D-2: North Offsite Bypass



Summary for Subcatchment Out A: Outlot A

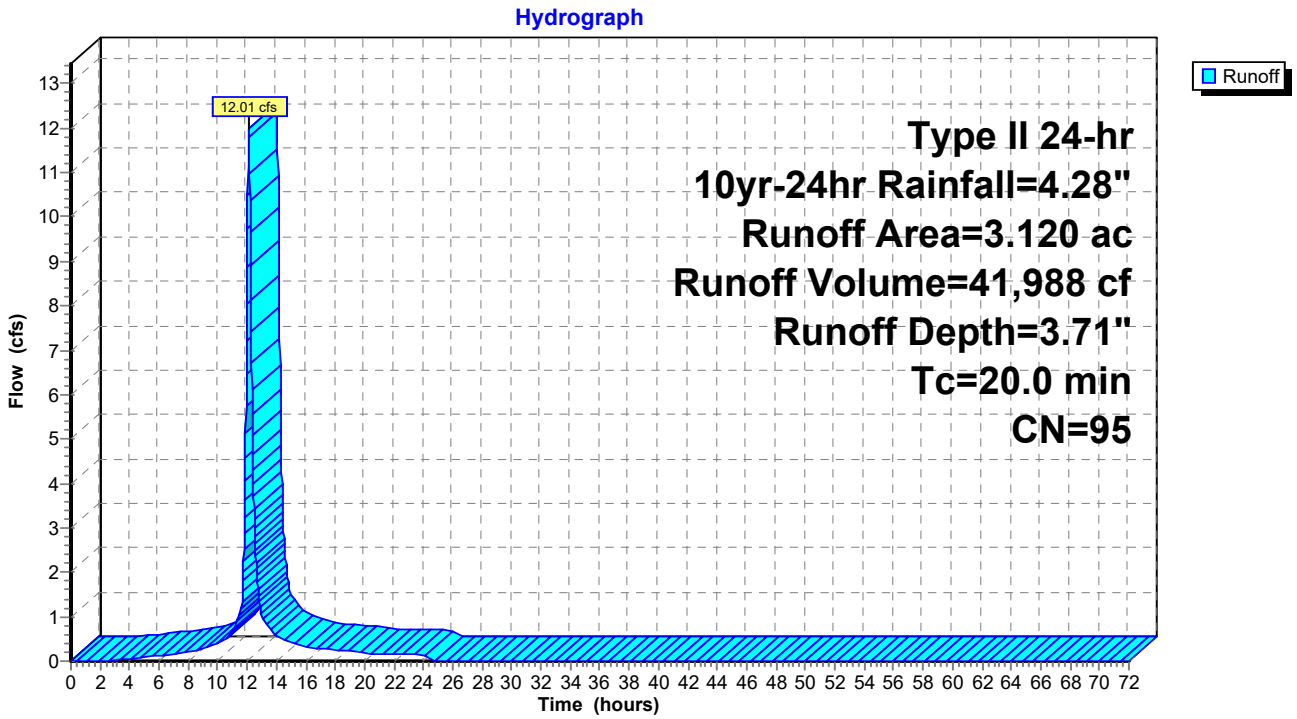
Runoff = 12.01 cfs @ 12.12 hrs, Volume= 41,988 cf, Depth= 3.71"
Routed to Pond 2P : AG-S & UG-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
3.120	95	Urban commercial, 85% imp, HSG D
0.468	78	15.00% Pervious Area
2.652	98	85.00% Impervious Area

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

Subcatchment Out A: Outlot A



Summary for Subcatchment Out B: Outlot B

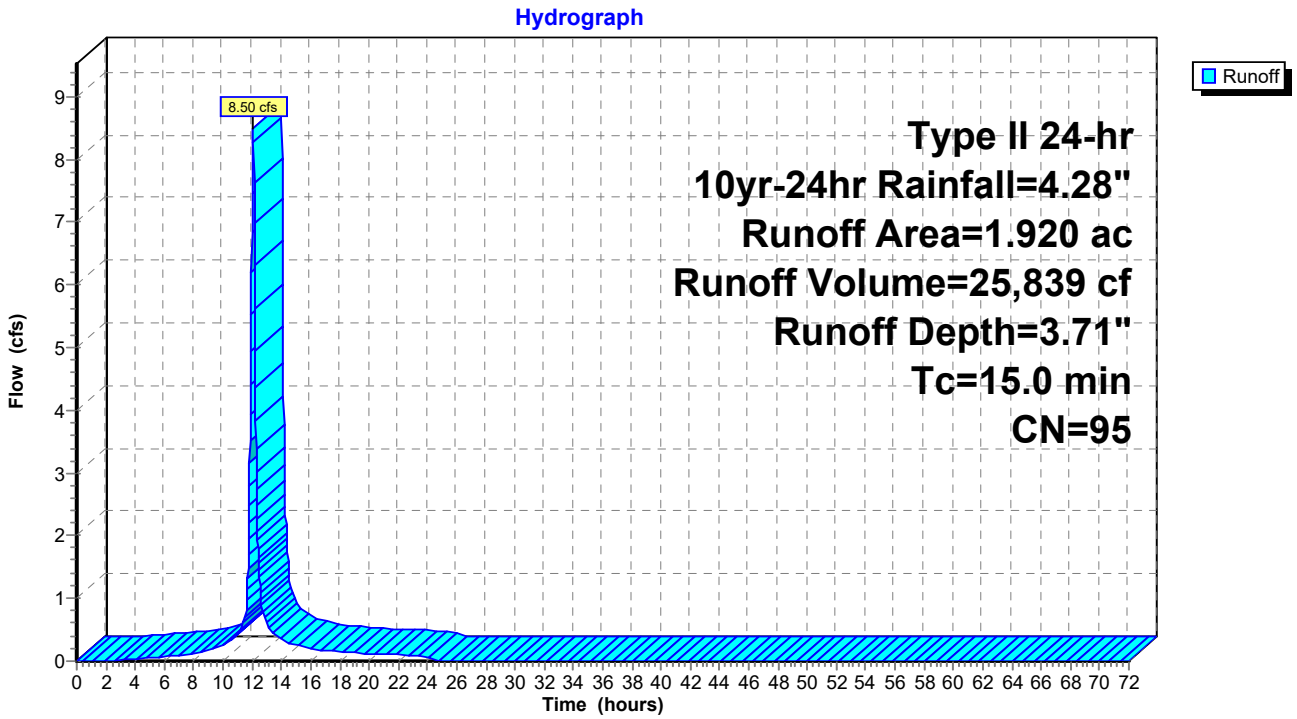
Runoff = 8.50 cfs @ 12.06 hrs, Volume= 25,839 cf, Depth= 3.71"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
1.920	95	Urban commercial, 85% imp, HSG D
0.288	78	15.00% Pervious Area
1.632	98	85.00% Impervious Area

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

Subcatchment Out B: Outlot B



Summary for Subcatchment Out C: Outlot C

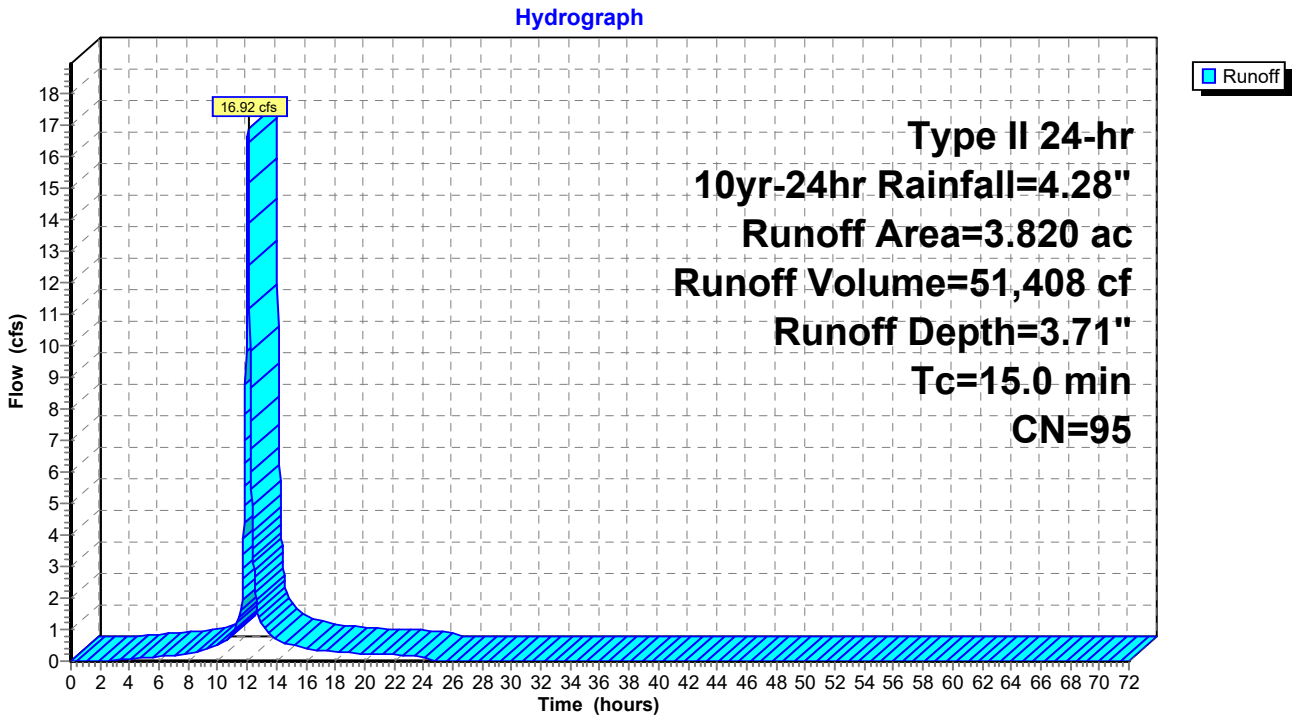
Runoff = 16.92 cfs @ 12.06 hrs, Volume= 51,408 cf, Depth= 3.71"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
3.820	95	Urban commercial, 85% imp, HSG D
0.573	78	15.00% Pervious Area
3.247	98	85.00% Impervious Area

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

Subcatchment Out C: Outlot C



Summary for Pond 1P: AG-N

Inflow Area = 969,210 sf, 73.43% Impervious, Inflow Depth = 3.47" for 10yr-24hr event
Inflow = 94.53 cfs @ 12.06 hrs, Volume= 280,324 cf
Outflow = 0.91 cfs @ 24.12 hrs, Volume= 178,351 cf, Atten= 99%, Lag= 723.4 min
Primary = 0.91 cfs @ 24.12 hrs, Volume= 178,351 cf
Routed to Link 3L : Str. 3.00
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 4L : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 882.14' @ 24.12 hrs Surf.Area= 68,682 sf Storage= 236,943 cf

Plug-Flow detention time= 1,692.1 min calculated for 178,302 cf (64% of inflow)
Center-of-Mass det. time= 1,590.5 min (2,379.0 - 788.5)

Volume	Invert	Avail.Storage	Storage Description
#1	877.29'	573,880 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

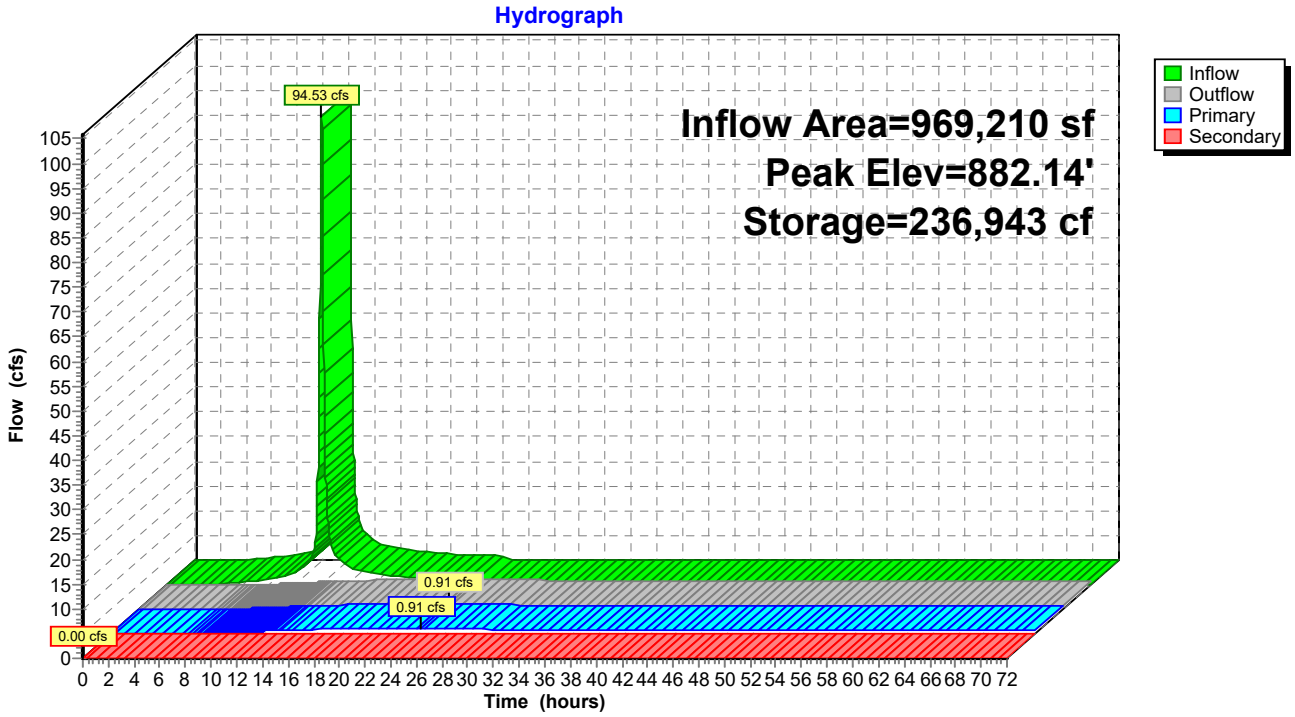
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
877.29	33,121	1,437.0	0	0	33,121
878.00	37,072	1,579.0	24,905	24,905	67,219
879.00	42,856	1,793.0	39,929	64,834	124,667
880.00	49,752	2,010.0	46,261	111,096	190,366
881.00	57,879	2,227.0	53,764	164,860	263,563
882.00	67,238	2,444.0	62,500	227,360	344,257
883.00	77,811	2,659.0	72,460	299,820	431,602
884.00	87,356	2,779.0	82,537	382,358	483,602
884.64	92,754	2,793.0	57,627	439,984	490,061
885.00	95,775	2,800.0	33,934	473,918	493,335
886.00	104,208	2,819.0	99,962	573,880	502,283

Device	Routing	Invert	Outlet Devices
#1	Primary	877.29'	**12.0" Round Culvert** L= 24.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 877.29' / 877.22' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	877.29'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	882.14'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	884.54'	**110.0' long + 3.0 '/' SideZ x 26.2' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.91 cfs @ 24.12 hrs HW=882.14' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.91 cfs of 7.89 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 0.91 cfs @ 10.42 fps)
└**3=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.11 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=877.29' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: AG-N


Hydrograph
Inflow Area=969,210 sf
Peak Elev=882.14'
Storage=236,943 cf
94.53 cfs
0.91 cfs
0.91 cfs
0.00 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)

Summary for Pond 2P: AG-S & UG-S

Inflow Area = 361,548 sf, 75.20% Impervious, Inflow Depth = 3.51" for 10yr-24hr event
Inflow = 36.68 cfs @ 11.98 hrs, Volume= 105,703 cf
Outflow = 0.95 cfs @ 15.57 hrs, Volume= 105,686 cf, Atten= 97%, Lag= 215.7 min
Primary = 0.95 cfs @ 15.57 hrs, Volume= 105,686 cf
Routed to Link 3L : Str. 3.00
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 4L : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 882.61' @ 15.57 hrs Surf.Area= 20,190 sf Storage= 70,517 cf

Plug-Flow detention time= 866.2 min calculated for 105,686 cf (100% of inflow)
Center-of-Mass det. time= 866.1 min (1,649.5 - 783.4)

Volume	Invert	Avail.Storage	Storage Description
#1	877.38'	43,614 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2A	877.53'	22,031 cf	**80.00'W x 180.82'L x 7.00'H Underground Detention** 101,259 cf Overall - 46,183 cf Embedded = 55,076 cf x 40.0% Voids
#3A	878.03'	46,183 cf	**CMP Round 72** x 9 Inside #2 Effective Size= 72.0"W x 72.0"H => 28.27 sf x 20.00'L = 565.5 cf Overall Size= 72.0"W x 72.0"H x 20.00'L Row Length Adjustment= +152.82' x 28.27 sf x 9 rows 78.00' Header x 28.27 sf x 1 = 2,205.4 cf Inside
		111,827 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
877.38	1,605	205.0	0	0	1,605
878.00	2,000	220.0	1,115	1,115	2,129
879.00	2,697	245.0	2,340	3,455	3,083
880.00	3,462	265.0	3,072	6,527	3,934
881.00	4,284	284.0	3,866	10,392	4,808
882.00	5,163	303.0	4,717	15,109	5,743
883.00	6,098	321.0	5,624	20,733	6,690
884.00	7,090	340.0	6,588	27,321	7,742
885.00	8,138	359.0	7,608	34,929	8,855
885.90	9,130	376.0	7,766	42,695	9,903
886.00	9,248	378.0	919	43,614	10,029

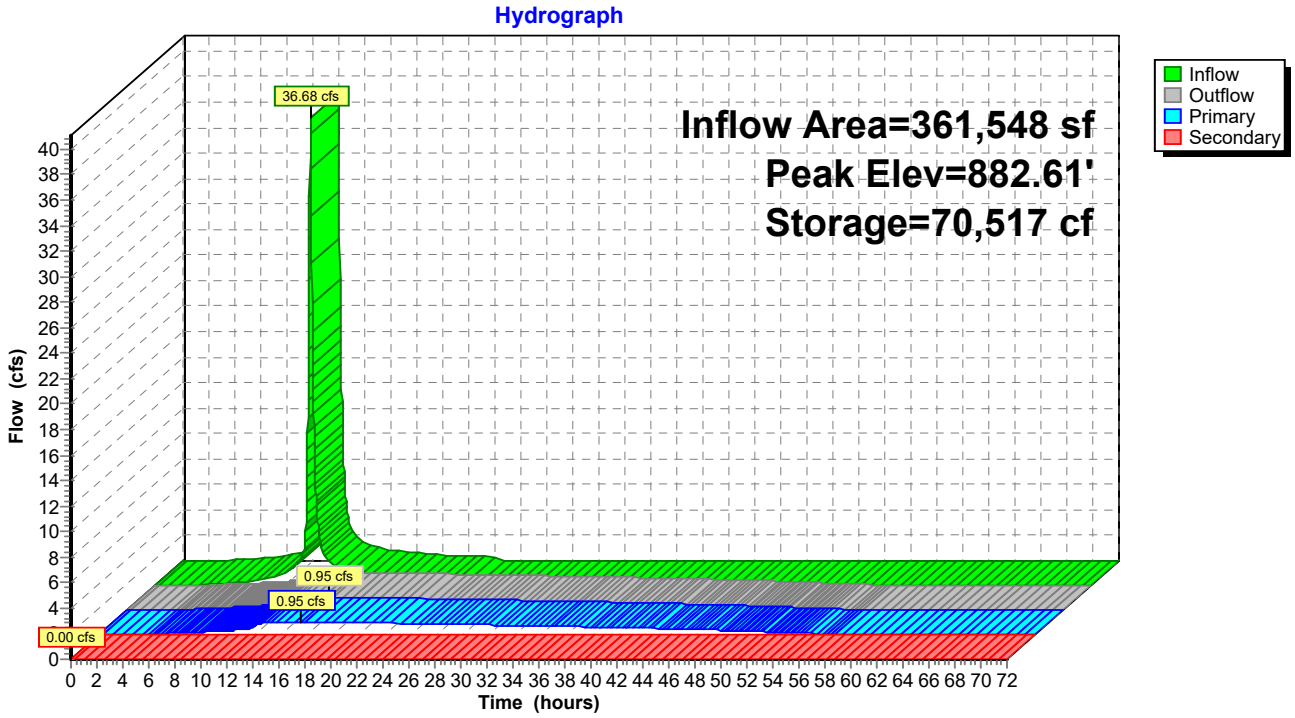
Device	Routing	Invert	Outlet Devices
#1	Primary	877.38'	**15.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 877.38' / 877.22' S= 0.0040 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	877.38'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	882.61'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	885.40'	**25.0' long + 3.0 '/' SideZ x 53.8' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.95 cfs @ 15.57 hrs HW=882.61' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.95 cfs of 12.68 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 0.95 cfs @ 10.83 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=877.38' TW=0.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond 2P: AG-S & UG-S

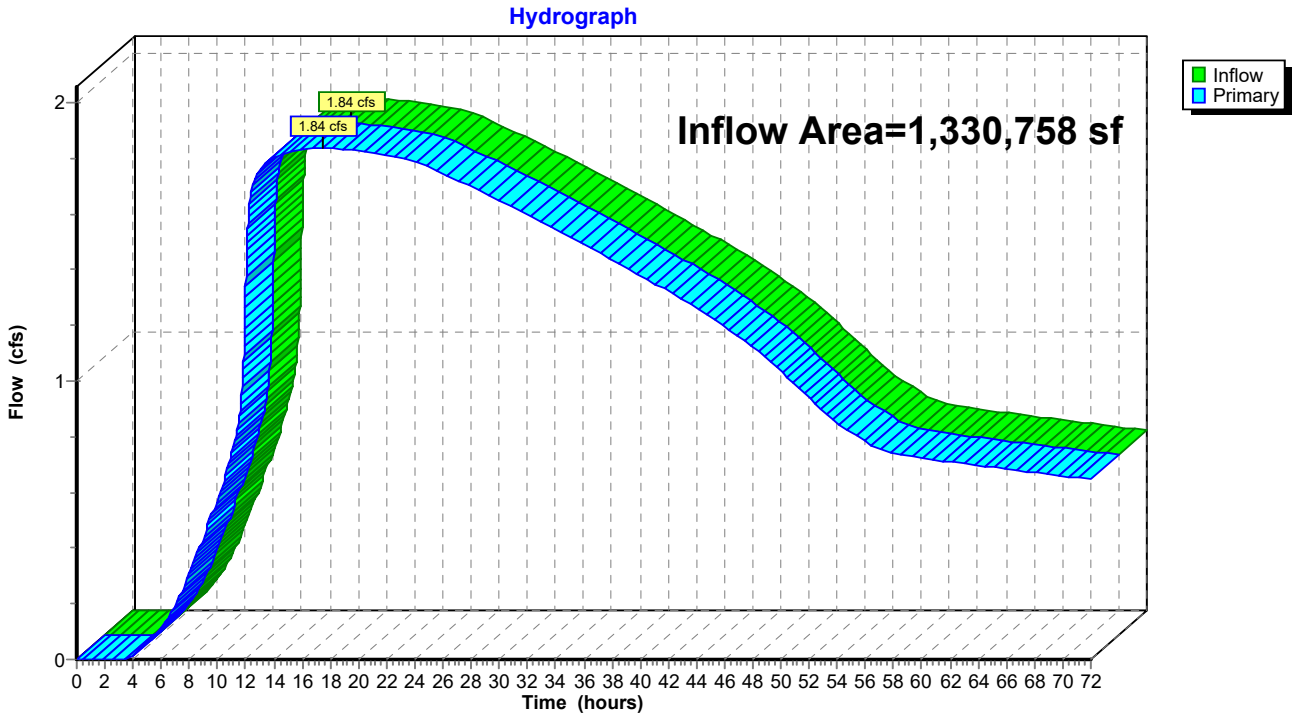


Summary for Link 3L: Str. 3.00

Inflow Area = 1,330,758 sf, 73.91% Impervious, Inflow Depth > 2.56" for 10yr-24hr event
Inflow = 1.84 cfs @ 17.43 hrs, Volume= 284,037 cf
Primary = 1.84 cfs @ 17.43 hrs, Volume= 284,037 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Total Site Runoff

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link 3L: Str. 3.00

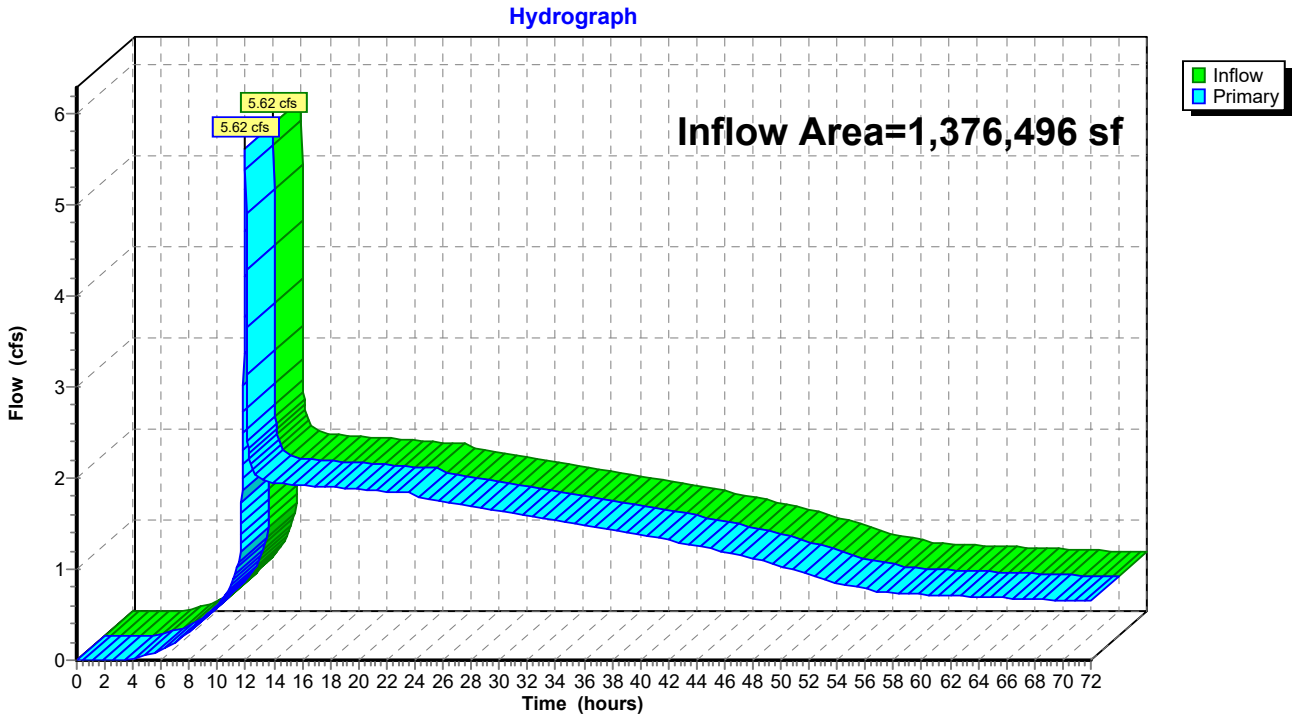


Summary for Link 4L: Total Site Runoff

Inflow Area = 1,376,496 sf, 71.59% Impervious, Inflow Depth > 2.55" for 10yr-24hr event
Inflow = 5.62 cfs @ 11.98 hrs, Volume= 292,950 cf
Primary = 5.62 cfs @ 11.98 hrs, Volume= 292,950 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link 4L: Total Site Runoff



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A-1: Meijer Site Runoff Area=16.510 ac 69.41% Impervious Runoff Depth=5.36"
Tc=15.0 min CN=92 Runoff=106.61 cfs 321,508 cf

Subcatchment A-2: Meijer Site Runoff Area=5.180 ac 69.31% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=92 Runoff=44.40 cfs 100,873 cf

Subcatchment B-1: Outlot (By Others) Runoff Area=1.700 ac 0.00% Impervious Runoff Depth=4.16"
Flow Length=263' Tc=6.2 min CN=81 Runoff=12.14 cfs 25,660 cf

Subcatchment B-2: Outlot (By Others) Runoff Area=1.800 ac 0.00% Impervious Runoff Depth=3.95"
Flow Length=274' Tc=21.1 min CN=79 Runoff=7.64 cfs 25,801 cf

Subcatchment C-2: Undetained 2 Runoff Area=0.160 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=1.13 cfs 2,354 cf

Subcatchment C-3: Undetained 3 Runoff Area=0.290 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=2.04 cfs 4,267 cf

Subcatchment C-4: Undetained 4 Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=1.34 cfs 2,795 cf

Subcatchment C-5: Undetained 5 Runoff Area=0.170 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=1.20 cfs 2,501 cf

Subcatchment C-6: Undetained 6 Runoff Area=0.050 ac 80.00% Impervious Runoff Depth=5.59"
Tc=6.0 min CN=94 Runoff=0.44 cfs 1,015 cf

Subcatchment C-7: Undetained 7 Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=1.34 cfs 2,795 cf

Subcatchment D-1: North Offsite Bypass Runoff Area=18.480 ac 0.00% Impervious Runoff Depth=5.03"
Flow Length=1,684' Tc=81.9 min CN=89 Runoff=38.79 cfs 337,185 cf

Subcatchment D-2: North Offsite Bypass Runoff Area=10.720 ac 0.00% Impervious Runoff Depth=5.03"
Flow Length=952' Tc=28.1 min CN=89 Runoff=47.37 cfs 195,597 cf

Subcatchment Out A: Outlot A Runoff Area=3.120 ac 85.00% Impervious Runoff Depth=5.71"
Tc=20.0 min CN=95 Runoff=18.08 cfs 64,665 cf

Subcatchment Out B: Outlot B Runoff Area=1.920 ac 85.00% Impervious Runoff Depth=5.71"
Tc=15.0 min CN=95 Runoff=12.79 cfs 39,794 cf

Subcatchment Out C: Outlot C Runoff Area=3.820 ac 85.00% Impervious Runoff Depth=5.71"
Tc=15.0 min CN=95 Runoff=25.45 cfs 79,173 cf

Pond 1P: AG-N Peak Elev=883.27' Storage=320,793 cf Inflow=144.85 cfs 440,475 cf
Primary=4.00 cfs 314,892 cf Secondary=0.00 cfs 0 cf Outflow=4.00 cfs 314,892 cf

Pond 2P: AG-S & UG-S Peak Elev=884.29' Storage=96,191 cf Inflow=56.14 cfs 165,538 cf
Primary=5.19 cfs 165,518 cf Secondary=0.00 cfs 0 cf Outflow=5.19 cfs 165,518 cf

Link 3L: Str. 3.00 Inflow=8.48 cfs 480,410 cf
Primary=8.48 cfs 480,410 cf

Link 4L: Total Site Runoff Inflow=9.08 cfs 496,137 cf
Primary=9.08 cfs 496,137 cf

Total Runoff Area = 2,800,908 sf Runoff Volume = 1,205,983 cf Average Runoff Depth = 5.17"
64.82% Pervious = 1,815,537 sf 35.18% Impervious = 985,371 sf

Summary for Subcatchment A-1: Meijer Site

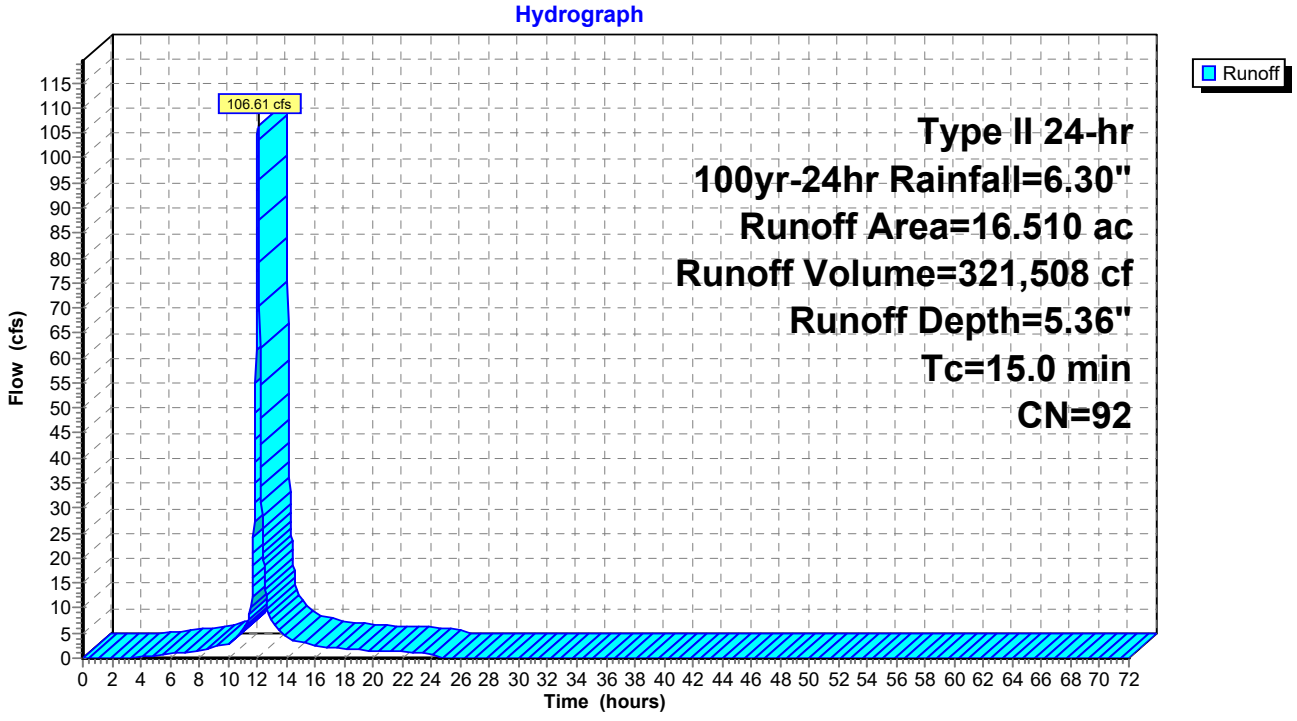
Runoff = 106.61 cfs @ 12.06 hrs, Volume= 321,508 cf, Depth= 5.36"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
11.460	98	Paved parking, HSG D
5.050	80	>75% Grass cover, Good, HSG D
16.510	92	Weighted Average
5.050	80	30.59% Pervious Area
11.460	98	69.41% Impervious Area

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

Subcatchment A-1: Meijer Site



Summary for Subcatchment A-2: Meijer Site

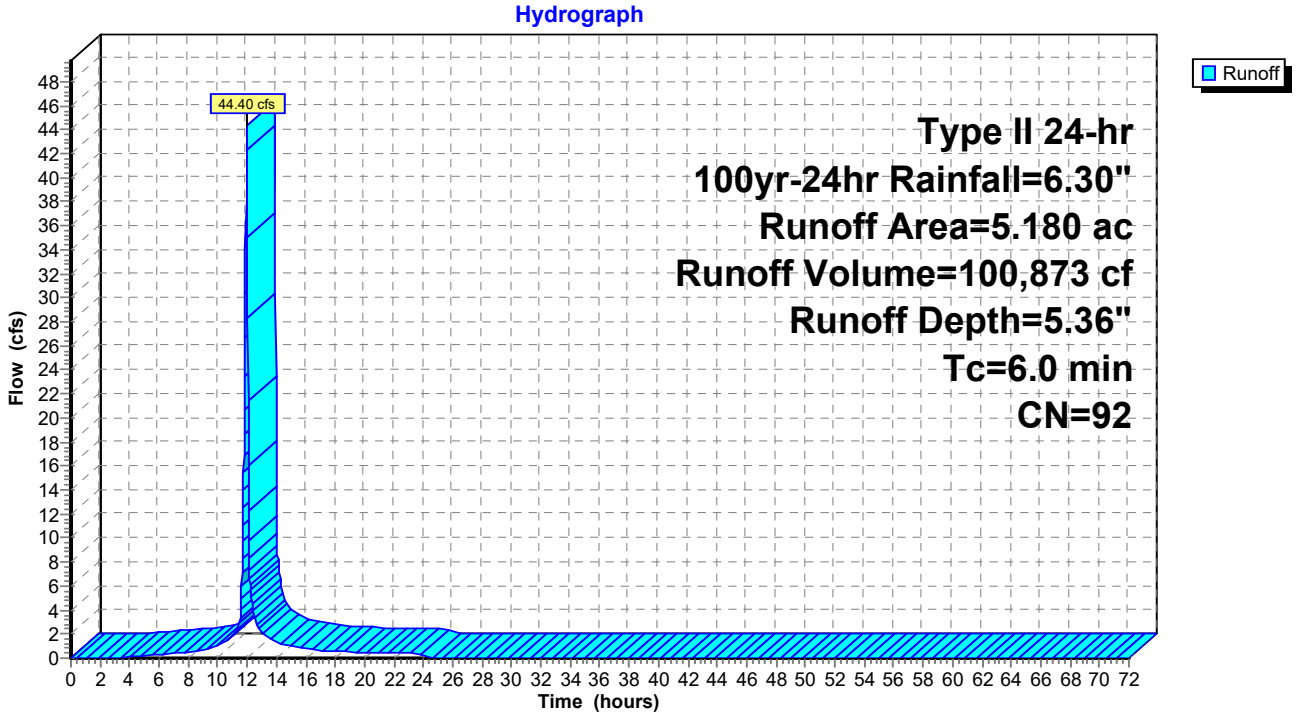
Runoff = 44.40 cfs @ 11.97 hrs, Volume= 100,873 cf, Depth= 5.36"
Routed to Pond 2P : AG-S & UG-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
3.590	98	Paved parking, HSG D
1.590	80	>75% Grass cover, Good, HSG D
5.180	92	Weighted Average
1.590	80	30.69% Pervious Area
3.590	98	69.31% Impervious Area

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

Subcatchment A-2: Meijer Site



Summary for Subcatchment B-1: Outlot (By Others)

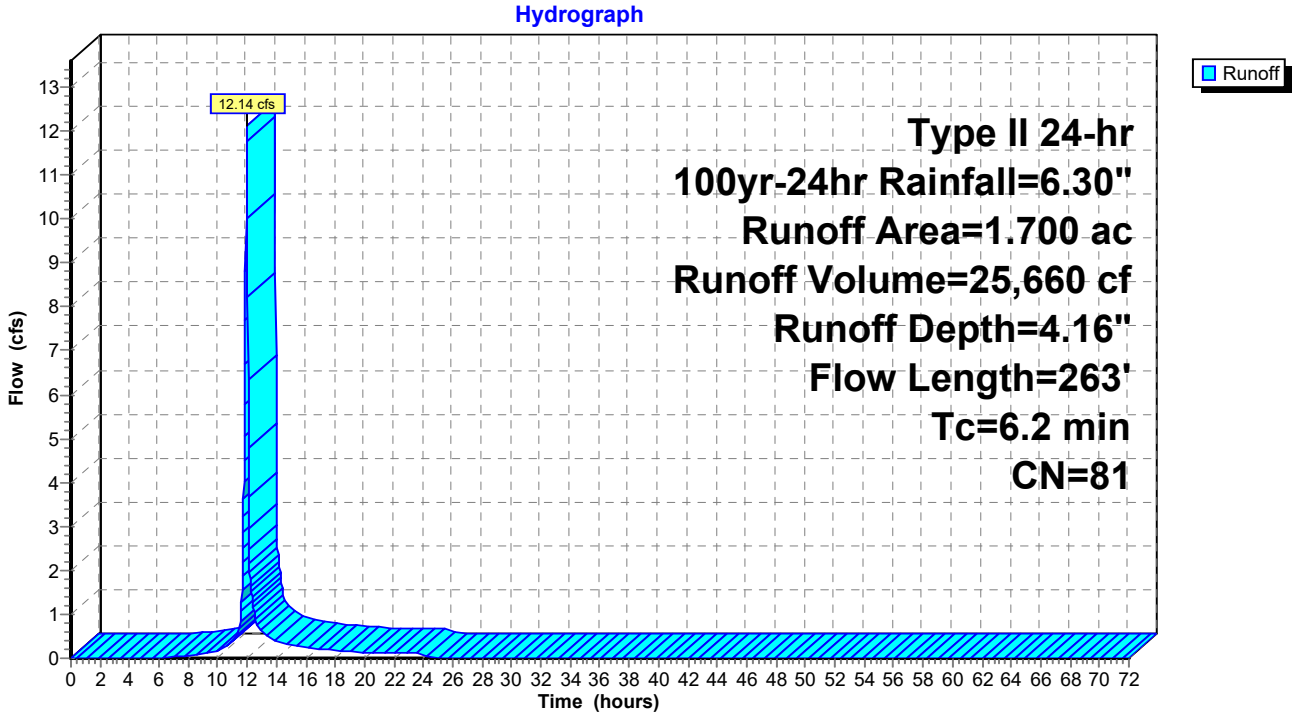
Runoff = 12.14 cfs @ 11.97 hrs, Volume= 25,660 cf, Depth= 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

	Area (ac)	CN	Description
*	1.000	78	Row crops, straight row, Good, HSG B
	0.700	85	Row crops, straight row, Good, HSG C
	1.700	81	Weighted Average
	1.700	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0327	0.48		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
2.8	163	0.0113	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.2	263	Total			

Subcatchment B-1: Outlot (By Others)



Summary for Subcatchment B-2: Outlot (By Others)

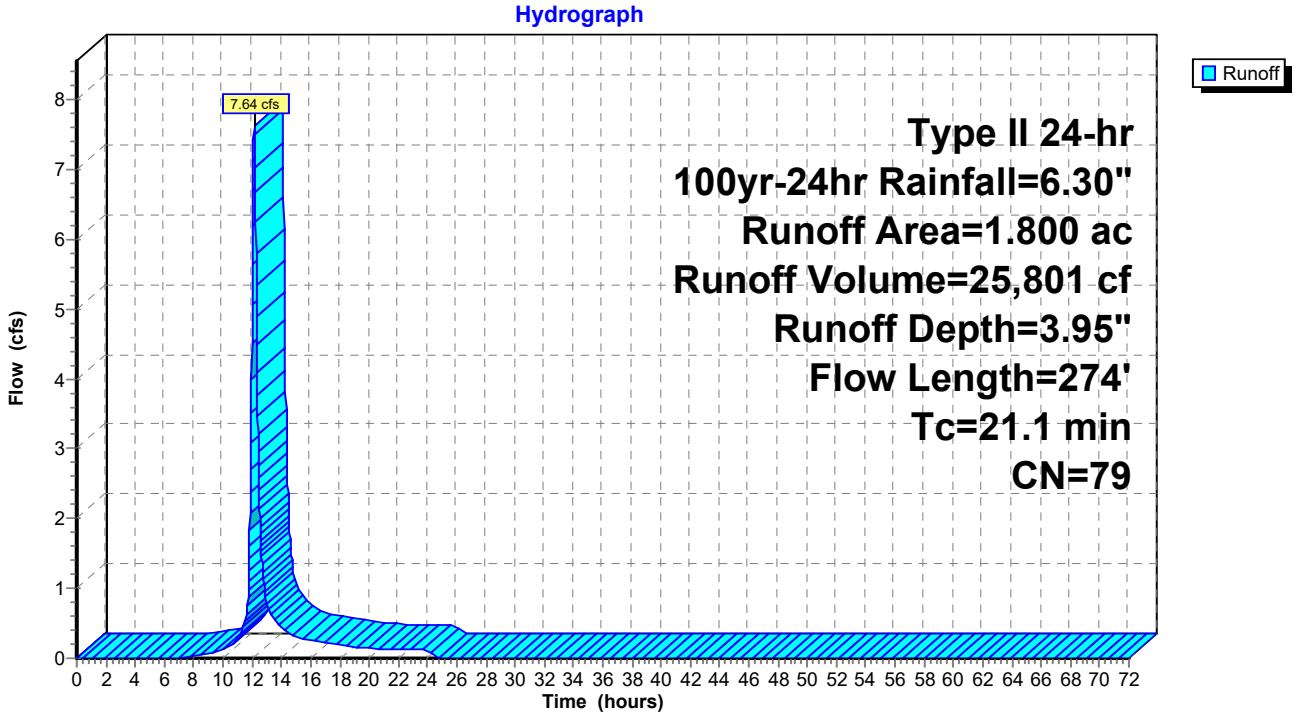
Runoff = 7.64 cfs @ 12.13 hrs, Volume= 25,801 cf, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

	Area (ac)	CN	Description
*	1.500	78	Row crops, straight row, Good, HSG B
	0.300	85	Row crops, straight row, Good, HSG C
	1.800	79	Weighted Average
	1.800	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0130	0.33		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
16.1	174	0.0004	0.18		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
21.1	274	Total			

Subcatchment B-2: Outlot (By Others)



Summary for Subcatchment C-2: Undetained 2

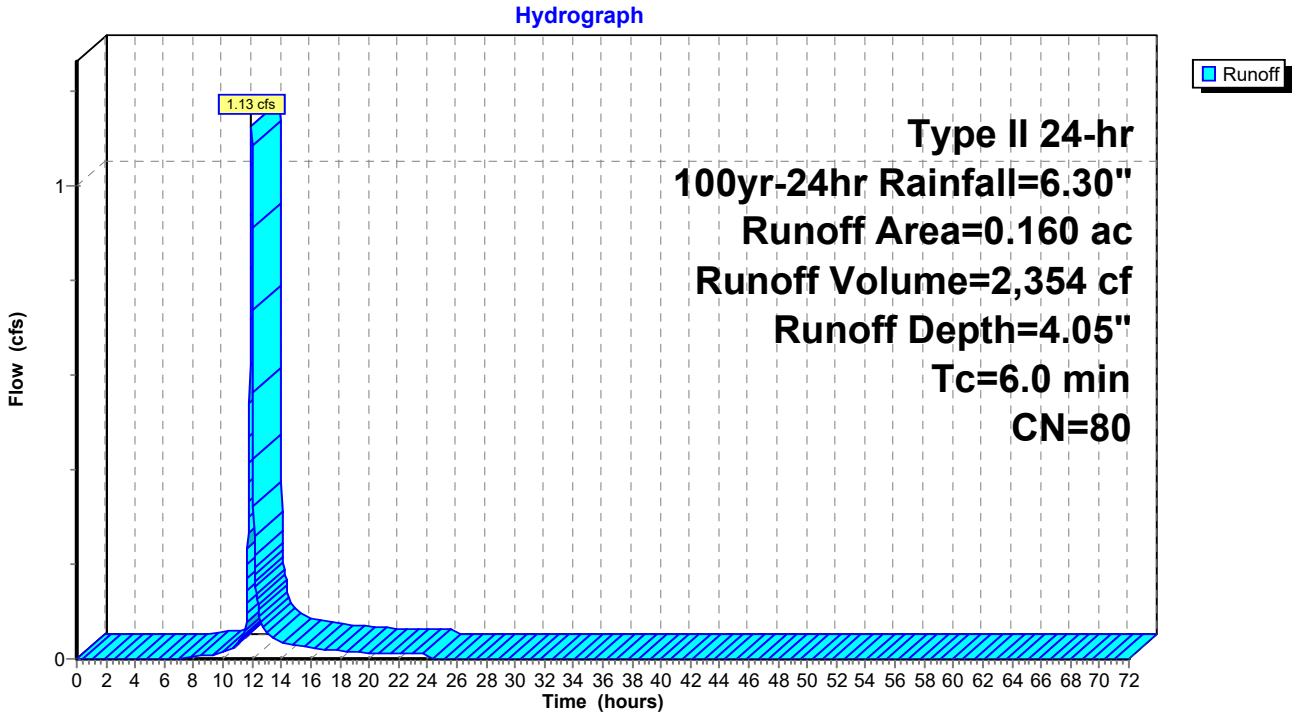
Runoff = 1.13 cfs @ 11.97 hrs, Volume= 2,354 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.160	80	>75% Grass cover, Good, HSG D
0.160	80	100.00% Pervious Area

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

Subcatchment C-2: Undetained 2



Summary for Subcatchment C-3: Undetained 3

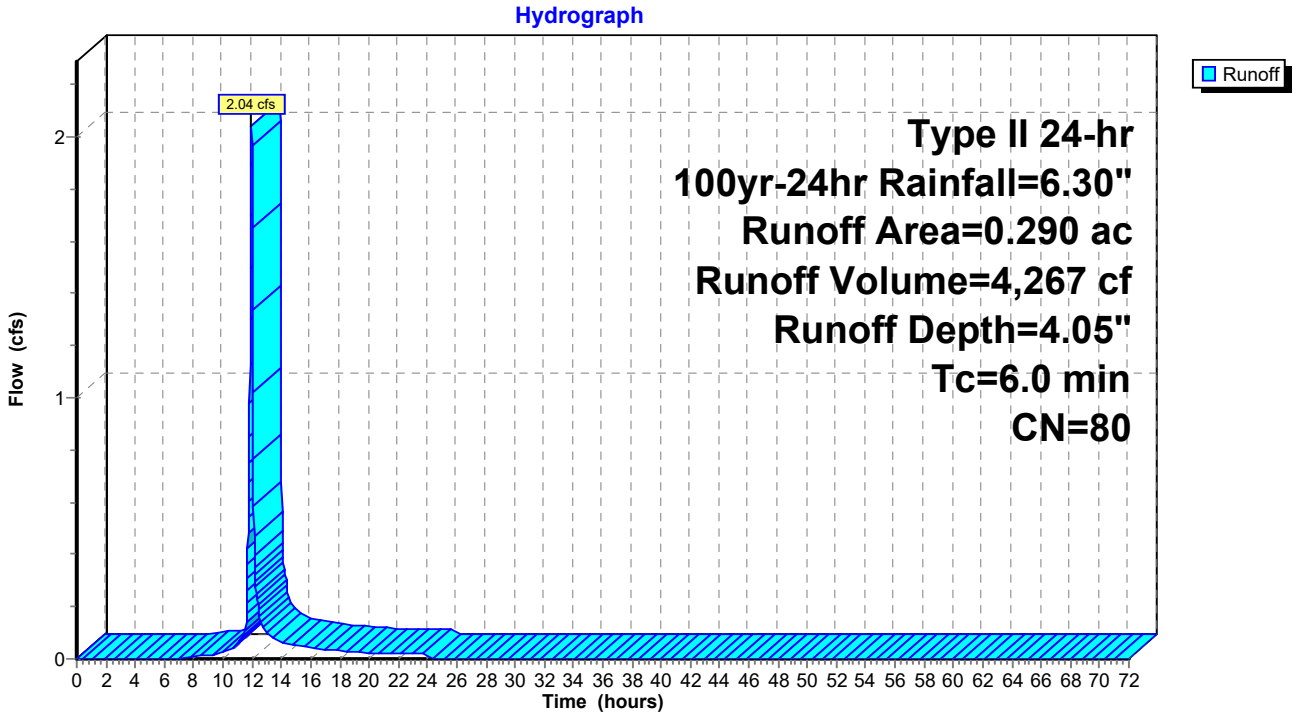
Runoff = 2.04 cfs @ 11.97 hrs, Volume= 4,267 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
0.290	80	100.00% Pervious Area

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

Subcatchment C-3: Undetained 3



Summary for Subcatchment C-4: Undetained 4

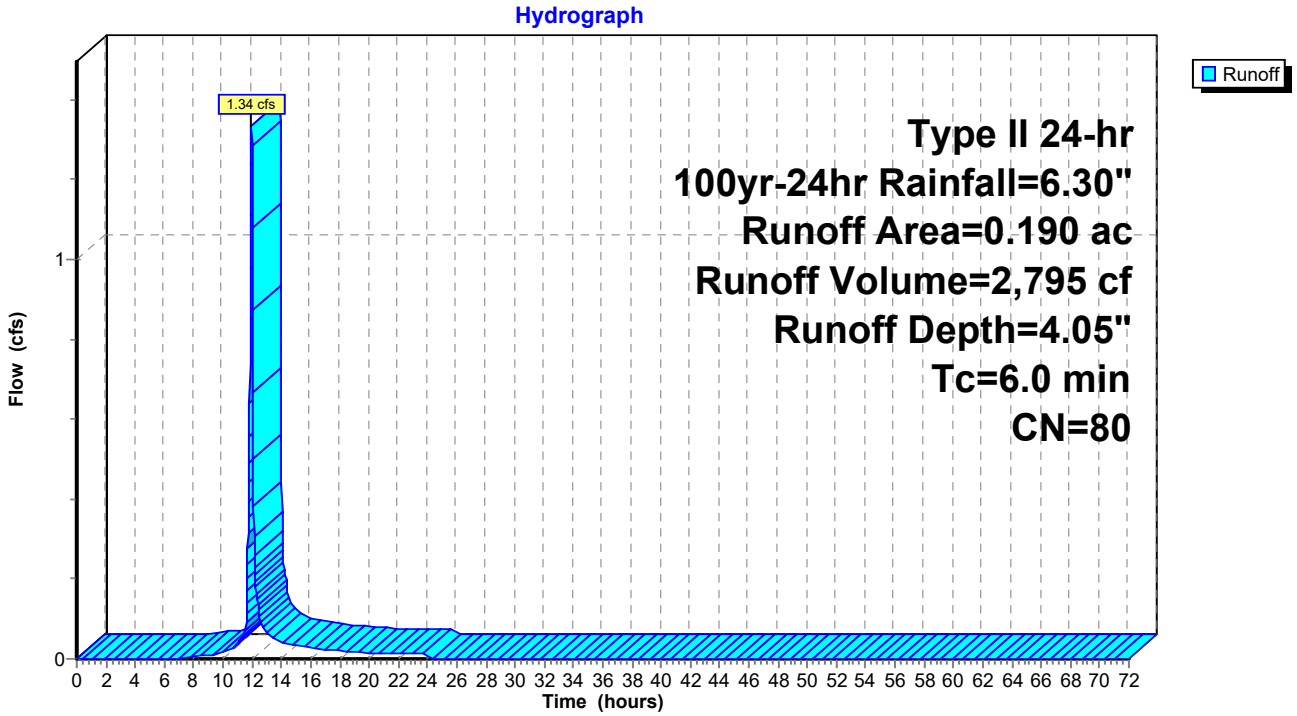
Runoff = 1.34 cfs @ 11.97 hrs, Volume= 2,795 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.190	80	>75% Grass cover, Good, HSG D
0.190	80	100.00% Pervious Area

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

Subcatchment C-4: Undetained 4



Summary for Subcatchment C-5: Undetained 5

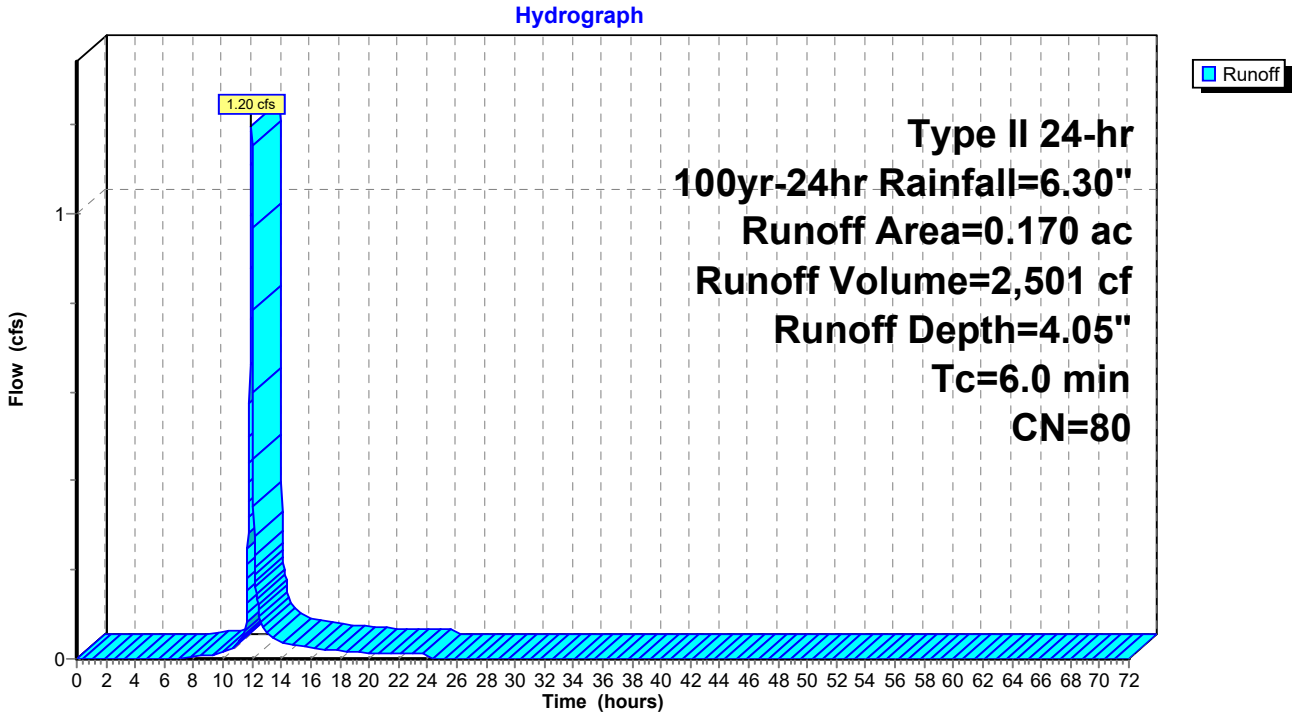
Runoff = 1.20 cfs @ 11.97 hrs, Volume= 2,501 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.170	80	>75% Grass cover, Good, HSG D
0.170	80	100.00% Pervious Area

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

Subcatchment C-5: Undetained 5



Summary for Subcatchment C-6: Undetained 6

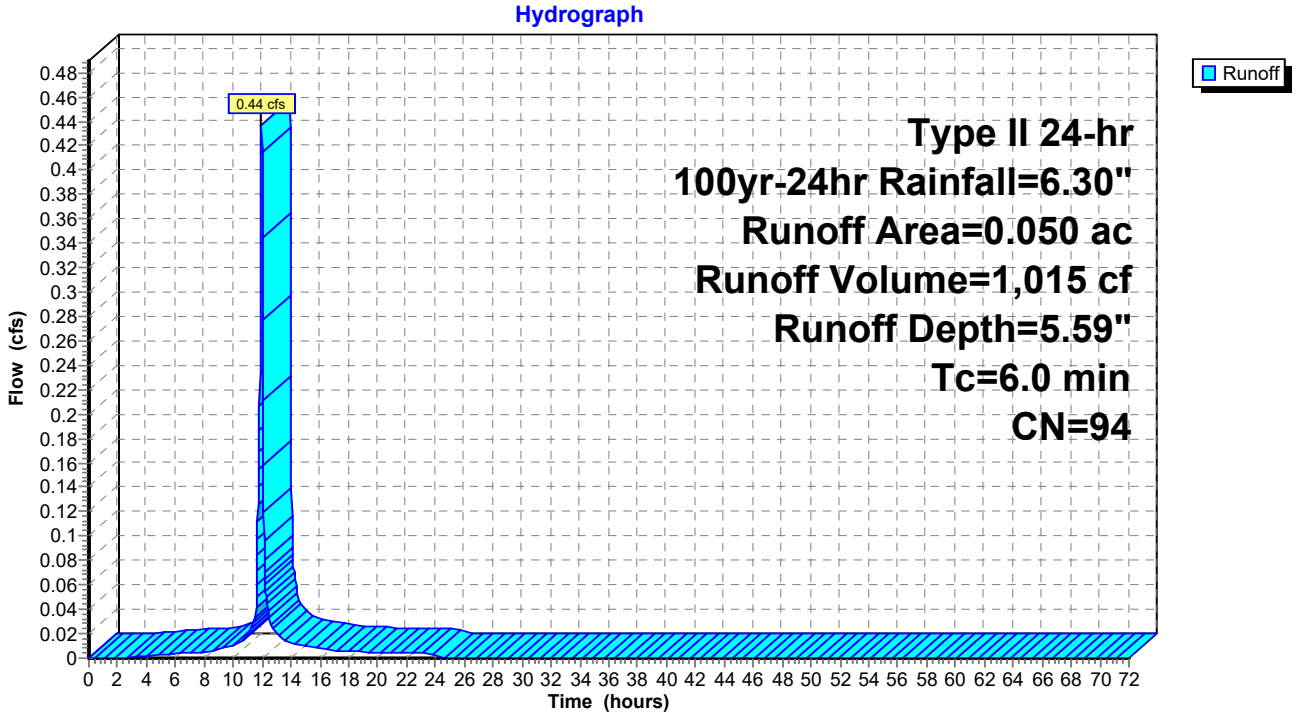
Runoff = 0.44 cfs @ 11.97 hrs, Volume= 1,015 cf, Depth= 5.59"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG D
0.010	80	>75% Grass cover, Good, HSG D
0.050	94	Weighted Average
0.010	80	20.00% Pervious Area
0.040	98	80.00% Impervious Area

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

Subcatchment C-6: Undetained 6



Summary for Subcatchment C-7: Undetained 7

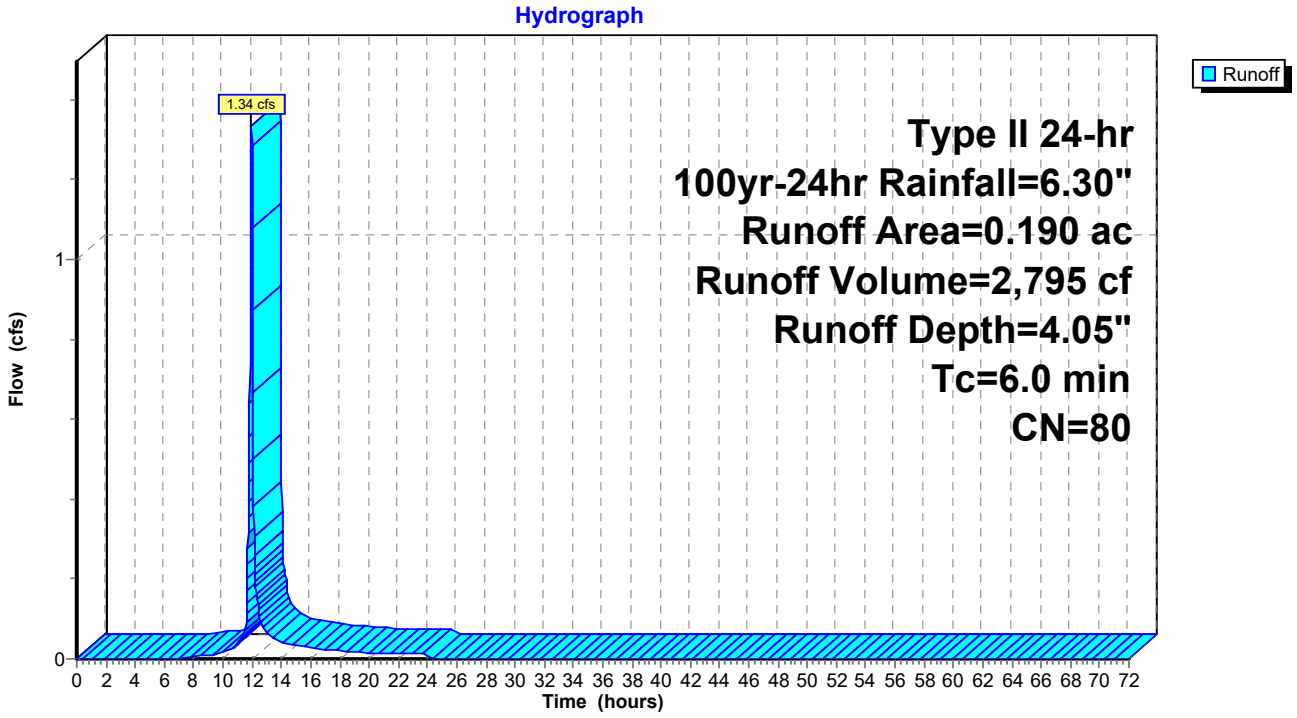
Runoff = 1.34 cfs @ 11.97 hrs, Volume= 2,795 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.190	80	>75% Grass cover, Good, HSG D
0.190	80	100.00% Pervious Area

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

Subcatchment C-7: Undetained 7



Summary for Subcatchment D-1: North Offsite Bypass

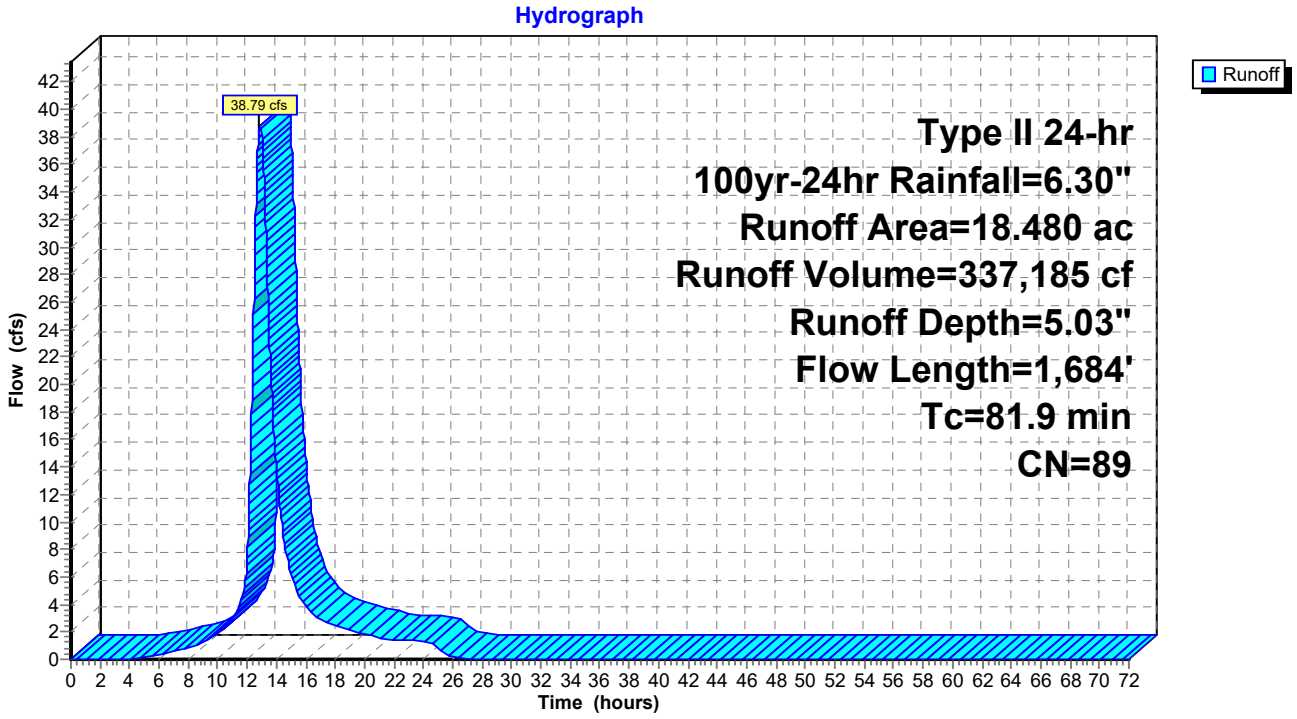
Runoff = 38.79 cfs @ 12.85 hrs, Volume= 337,185 cf, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
18.480	89	Row crops, straight row, Good, HSG D
18.480	89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0075	0.27		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
75.7	1,584	0.0015	0.35		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
81.9	1,684	Total			

Subcatchment D-1: North Offsite Bypass



Summary for Subcatchment D-2: North Offsite Bypass

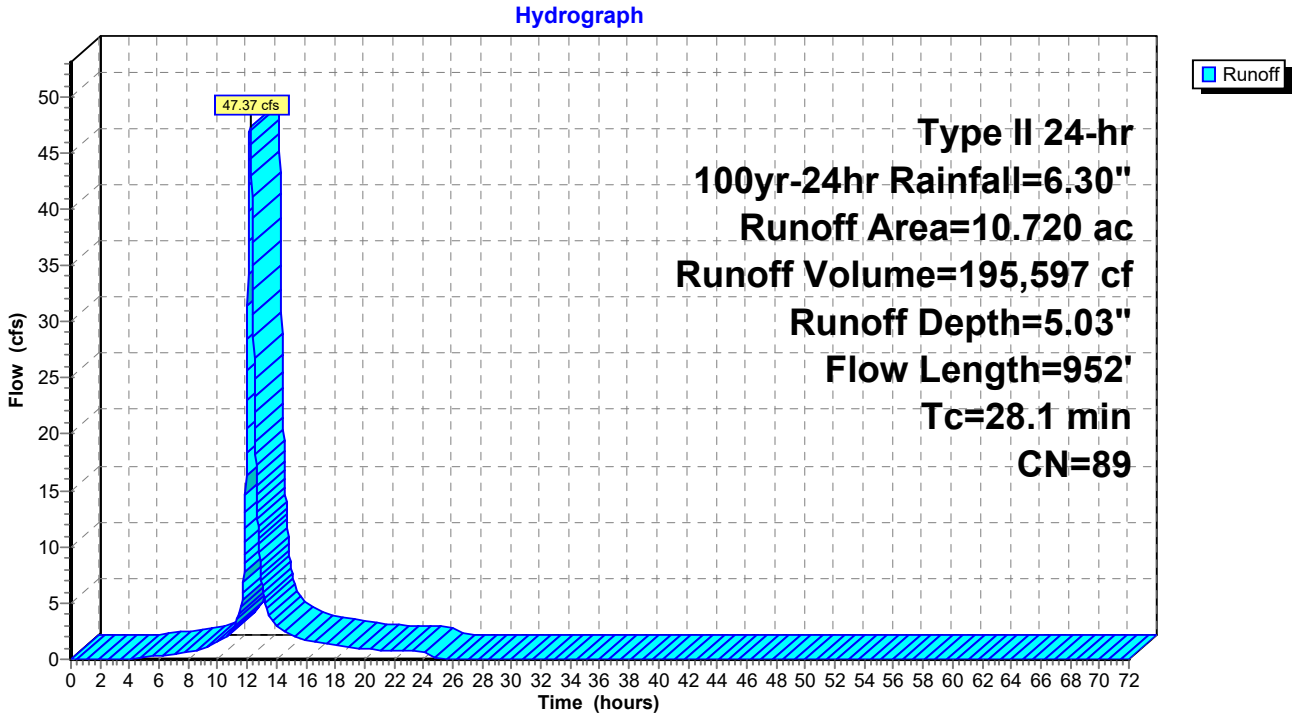
Runoff = 47.37 cfs @ 12.21 hrs, Volume= 195,597 cf, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
10.720	89	Row crops, straight row, Good, HSG D
10.720	89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0090	0.29		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
22.3	852	0.0050	0.64		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
28.1	952	Total			

Subcatchment D-2: North Offsite Bypass



Summary for Subcatchment Out A: Outlot A

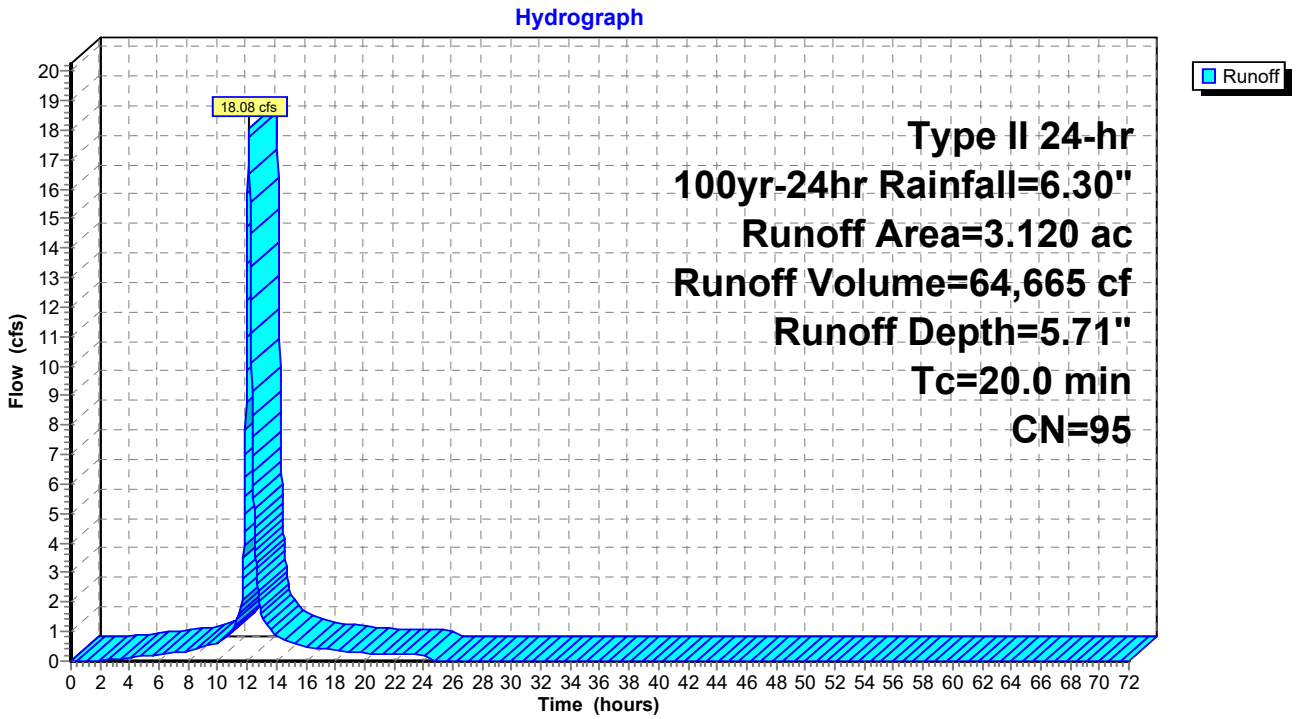
Runoff = 18.08 cfs @ 12.12 hrs, Volume= 64,665 cf, Depth= 5.71"
Routed to Pond 2P : AG-S & UG-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
3.120	95	Urban commercial, 85% imp, HSG D
0.468	78	15.00% Pervious Area
2.652	98	85.00% Impervious Area

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

Subcatchment Out A: Outlot A



Summary for Subcatchment Out B: Outlot B

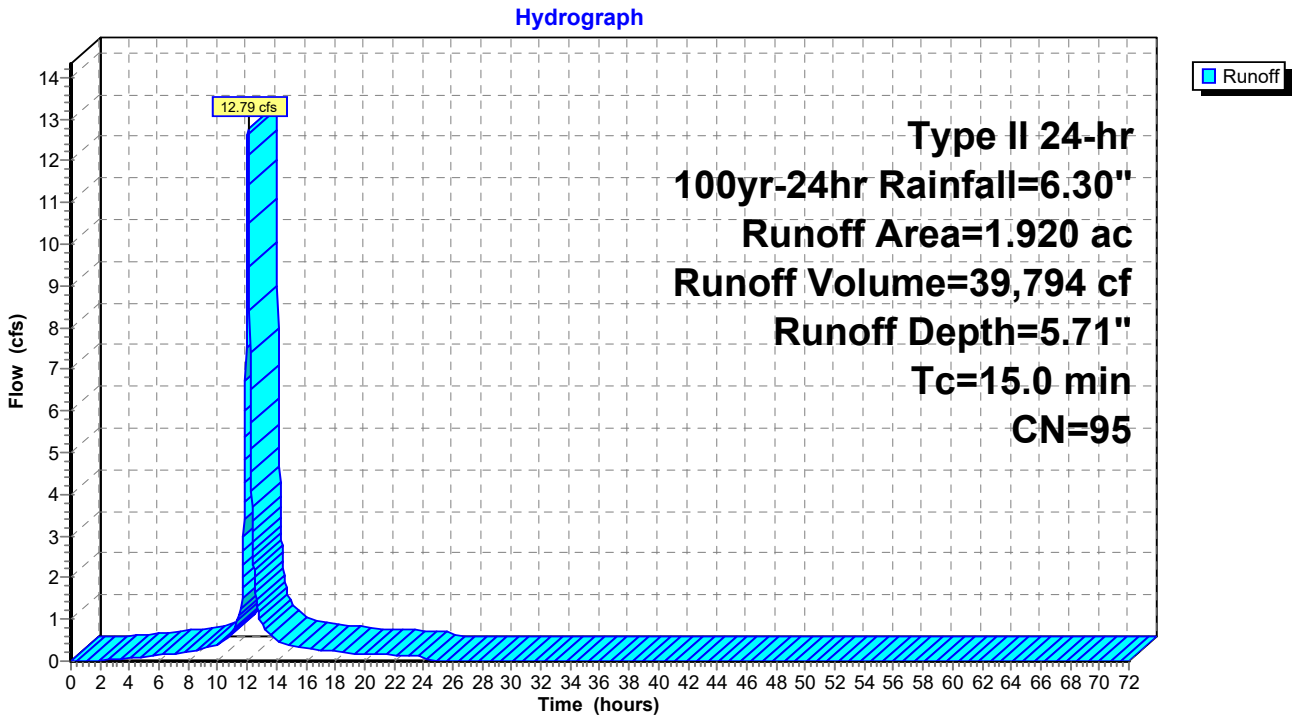
Runoff = 12.79 cfs @ 12.06 hrs, Volume= 39,794 cf, Depth= 5.71"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
1.920	95	Urban commercial, 85% imp, HSG D
0.288	78	15.00% Pervious Area
1.632	98	85.00% Impervious Area

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

Subcatchment Out B: Outlot B



Summary for Subcatchment Out C: Outlot C

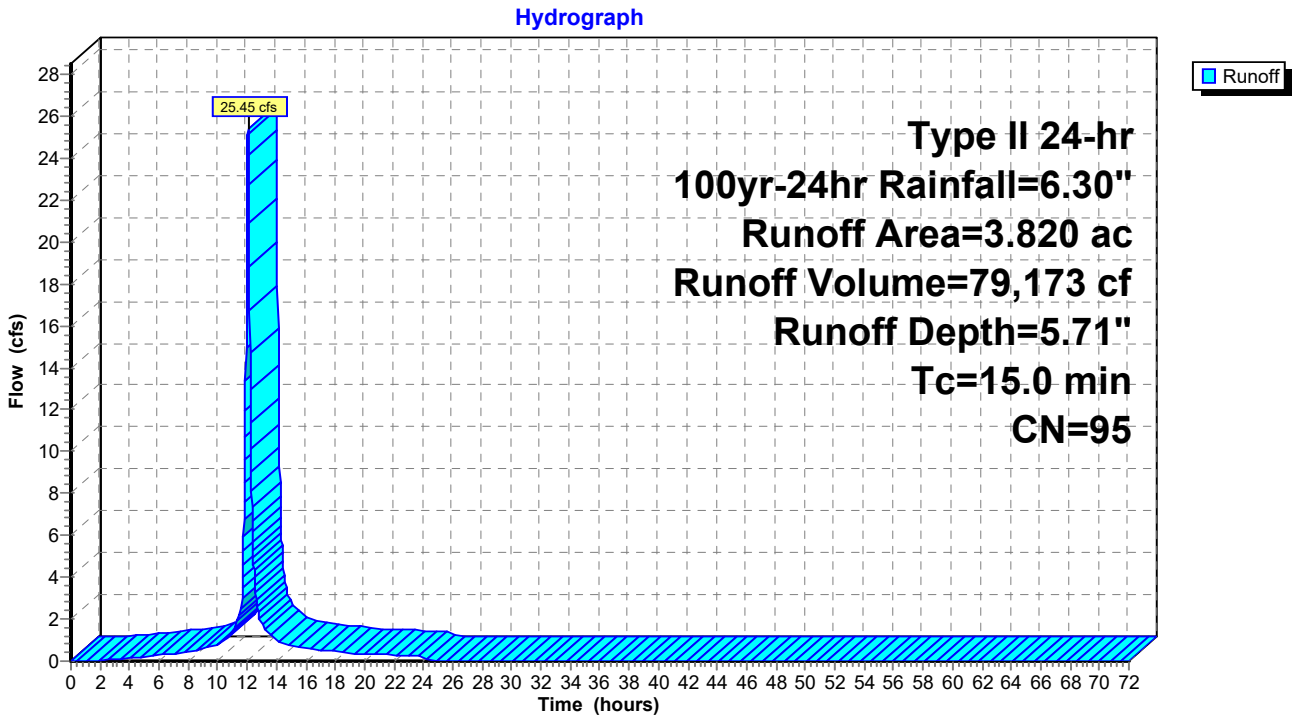
Runoff = 25.45 cfs @ 12.06 hrs, Volume= 79,173 cf, Depth= 5.71"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
3.820	95	Urban commercial, 85% imp, HSG D
0.573	78	15.00% Pervious Area
3.247	98	85.00% Impervious Area

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

Subcatchment Out C: Outlot C



Summary for Pond 1P: AG-N

Inflow Area = 969,210 sf, 73.43% Impervious, Inflow Depth = 5.45" for 100yr-24hr event
Inflow = 144.85 cfs @ 12.06 hrs, Volume= 440,475 cf
Outflow = 4.00 cfs @ 15.40 hrs, Volume= 314,892 cf, Atten= 97%, Lag= 200.3 min
Primary = 4.00 cfs @ 15.40 hrs, Volume= 314,892 cf
Routed to Link 3L : Str. 3.00
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 4L : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 883.27' @ 15.40 hrs Surf.Area= 80,290 sf Storage= 320,793 cf

Plug-Flow detention time= 1,199.9 min calculated for 314,804 cf (71% of inflow)
Center-of-Mass det. time= 1,106.9 min (1,883.8 - 776.9)

Volume	Invert	Avail.Storage	Storage Description
#1	877.29'	573,880 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

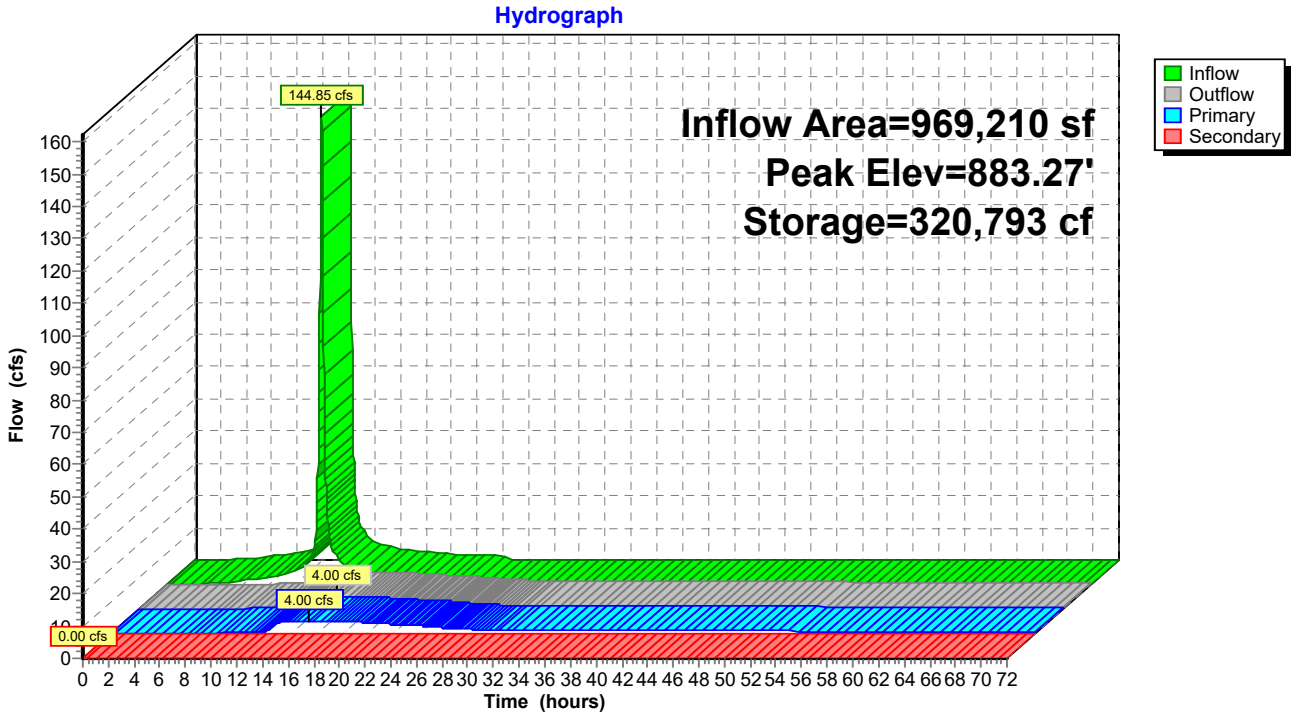
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
877.29	33,121	1,437.0	0	0	33,121
878.00	37,072	1,579.0	24,905	24,905	67,219
879.00	42,856	1,793.0	39,929	64,834	124,667
880.00	49,752	2,010.0	46,261	111,096	190,366
881.00	57,879	2,227.0	53,764	164,860	263,563
882.00	67,238	2,444.0	62,500	227,360	344,257
883.00	77,811	2,659.0	72,460	299,820	431,602
884.00	87,356	2,779.0	82,537	382,358	483,602
884.64	92,754	2,793.0	57,627	439,984	490,061
885.00	95,775	2,800.0	33,934	473,918	493,335
886.00	104,208	2,819.0	99,962	573,880	502,283

Device	Routing	Invert	Outlet Devices
#1	Primary	877.29'	**12.0" Round Culvert** L= 24.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 877.29' / 877.22' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	877.29'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	882.14'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	884.54'	**110.0' long + 3.0 '/' SideZ x 26.2' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.00 cfs @ 15.40 hrs HW=883.27' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.00 cfs of 8.85 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 1.01 cfs @ 11.60 fps)
└**3=Orifice/Grate** (Orifice Controls 2.99 cfs @ 3.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=877.29' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: AG-N


Hydrograph
Inflow Area=969,210 sf
Peak Elev=883.27'
Storage=320,793 cf
144.85 cfs
4.00 cfs
4.00 cfs
0.00 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)

Summary for Pond 2P: AG-S & UG-S

Inflow Area = 361,548 sf, 75.20% Impervious, Inflow Depth = 5.49" for 100yr-24hr event
Inflow = 56.14 cfs @ 11.98 hrs, Volume= 165,538 cf
Outflow = 5.19 cfs @ 12.70 hrs, Volume= 165,518 cf, Atten= 91%, Lag= 43.3 min
Primary = 5.19 cfs @ 12.70 hrs, Volume= 165,518 cf
Routed to Link 3L : Str. 3.00
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 4L : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 884.29' @ 12.70 hrs Surf.Area= 21,848 sf Storage= 96,191 cf

Plug-Flow detention time= 678.6 min calculated for 165,472 cf (100% of inflow)
Center-of-Mass det. time= 679.0 min (1,451.1 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	877.38'	43,614 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2A	877.53'	22,031 cf	**80.00'W x 180.82'L x 7.00'H Underground Detention** 101,259 cf Overall - 46,183 cf Embedded = 55,076 cf x 40.0% Voids
#3A	878.03'	46,183 cf	**CMP Round 72** x 9 Inside #2 Effective Size= 72.0"W x 72.0"H => 28.27 sf x 20.00'L = 565.5 cf Overall Size= 72.0"W x 72.0"H x 20.00'L Row Length Adjustment= +152.82' x 28.27 sf x 9 rows 78.00' Header x 28.27 sf x 1 = 2,205.4 cf Inside
		111,827 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
877.38	1,605	205.0	0	0	1,605
878.00	2,000	220.0	1,115	1,115	2,129
879.00	2,697	245.0	2,340	3,455	3,083
880.00	3,462	265.0	3,072	6,527	3,934
881.00	4,284	284.0	3,866	10,392	4,808
882.00	5,163	303.0	4,717	15,109	5,743
883.00	6,098	321.0	5,624	20,733	6,690
884.00	7,090	340.0	6,588	27,321	7,742
885.00	8,138	359.0	7,608	34,929	8,855
885.90	9,130	376.0	7,766	42,695	9,903
886.00	9,248	378.0	919	43,614	10,029

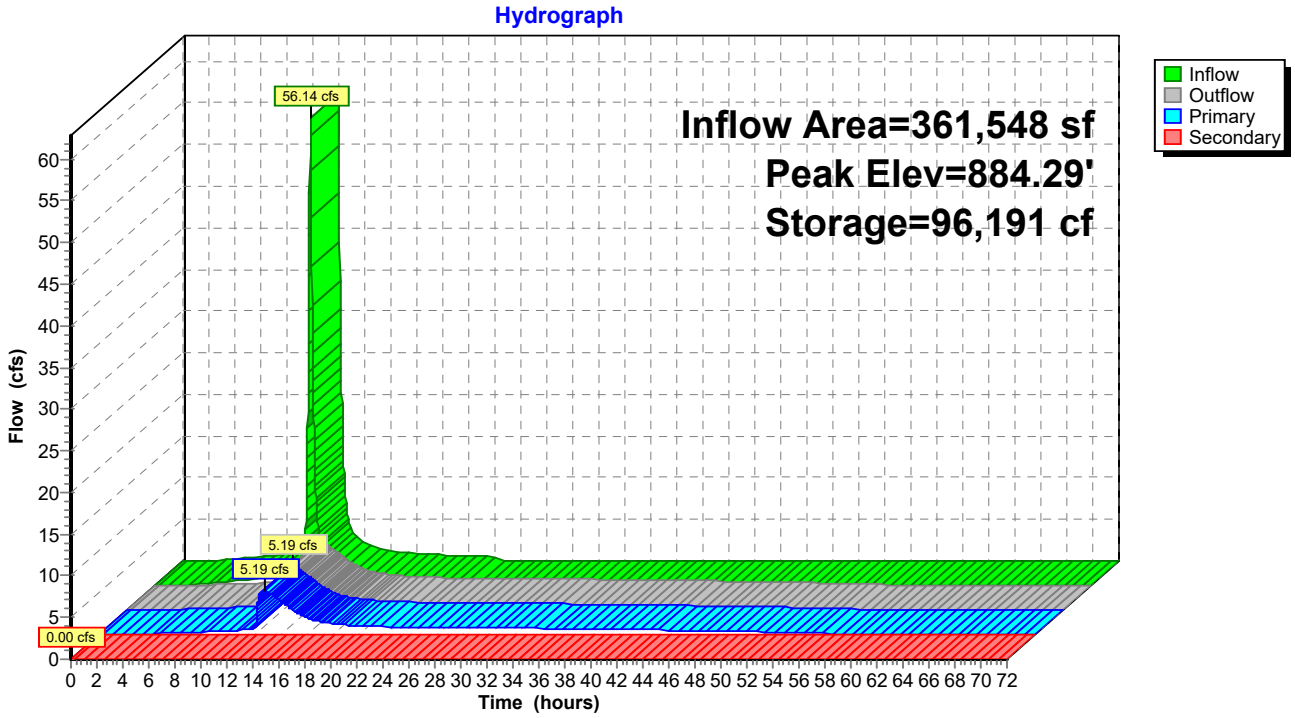
Device	Routing	Invert	Outlet Devices
#1	Primary	877.38'	**15.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 877.38' / 877.22' S= 0.0040 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	877.38'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	882.61'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	885.40'	**25.0' long + 3.0 '/' SideZ x 53.8' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.19 cfs @ 12.70 hrs HW=884.29' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 5.19 cfs of 14.81 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 1.09 cfs @ 12.50 fps)
└**3=Orifice/Grate** (Orifice Controls 4.10 cfs @ 5.22 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=877.38' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond 2P: AG-S & UG-S

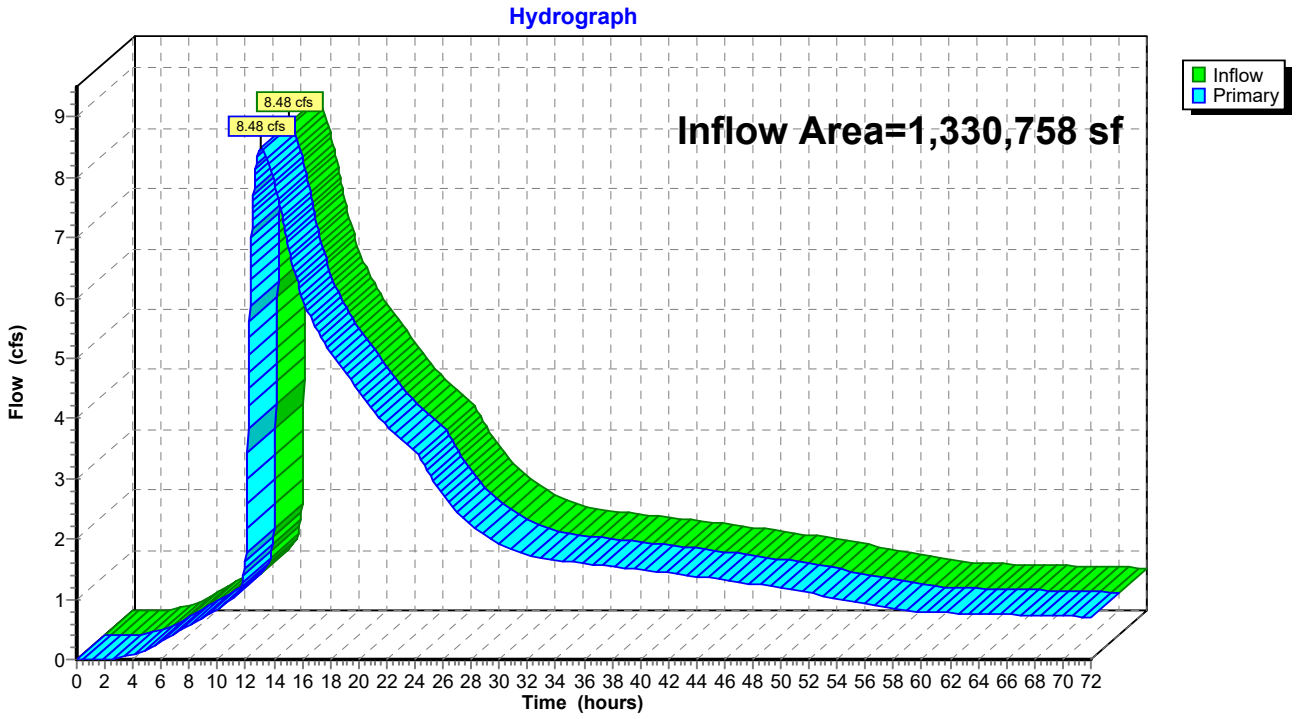


Summary for Link 3L: Str. 3.00

Inflow Area = 1,330,758 sf, 73.91% Impervious, Inflow Depth > 4.33" for 100yr-24hr event
Inflow = 8.48 cfs @ 13.10 hrs, Volume= 480,410 cf
Primary = 8.48 cfs @ 13.10 hrs, Volume= 480,410 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Total Site Runoff

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link 3L: Str. 3.00

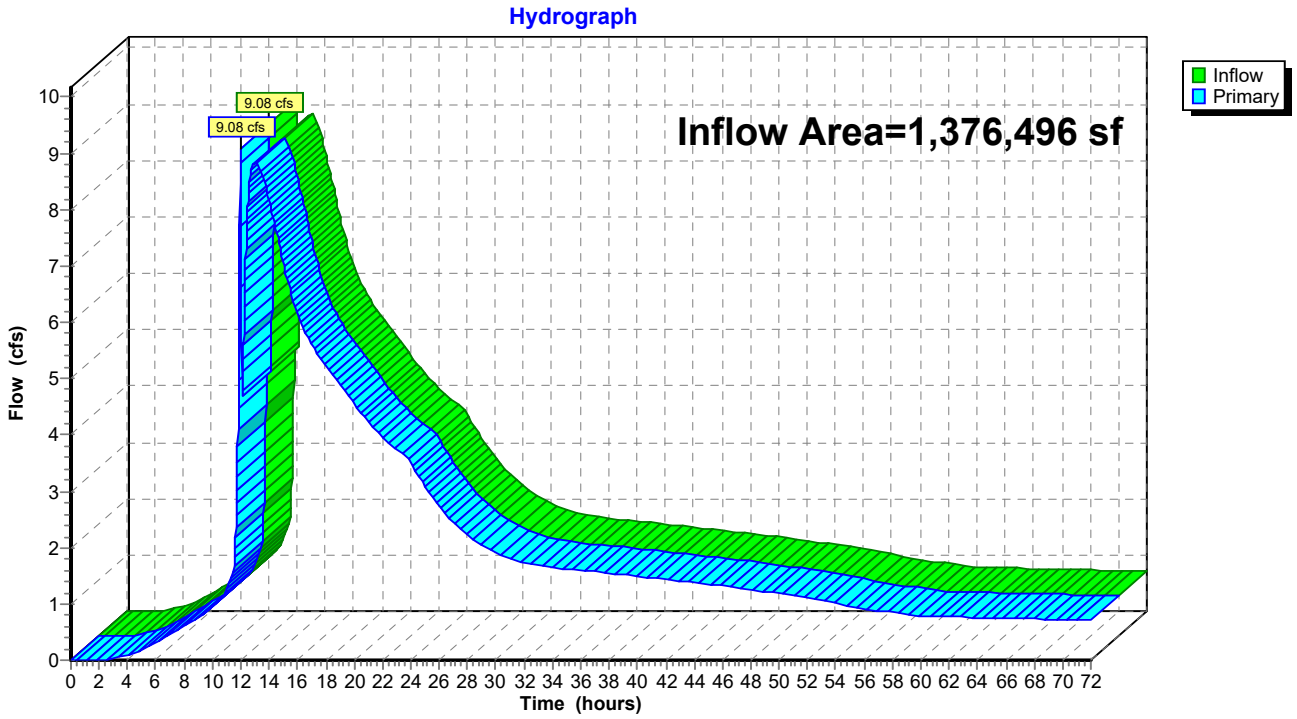


Summary for Link 4L: Total Site Runoff

Inflow Area = 1,376,496 sf, 71.59% Impervious, Inflow Depth > 4.33" for 100yr-24hr event
Inflow = 9.08 cfs @ 11.97 hrs, Volume= 496,137 cf
Primary = 9.08 cfs @ 11.97 hrs, Volume= 496,137 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link 4L: Total Site Runoff



1.2 – HydroCAD INPUTS AND RESULTS – ONSITE & OFFSITE RUNOFF

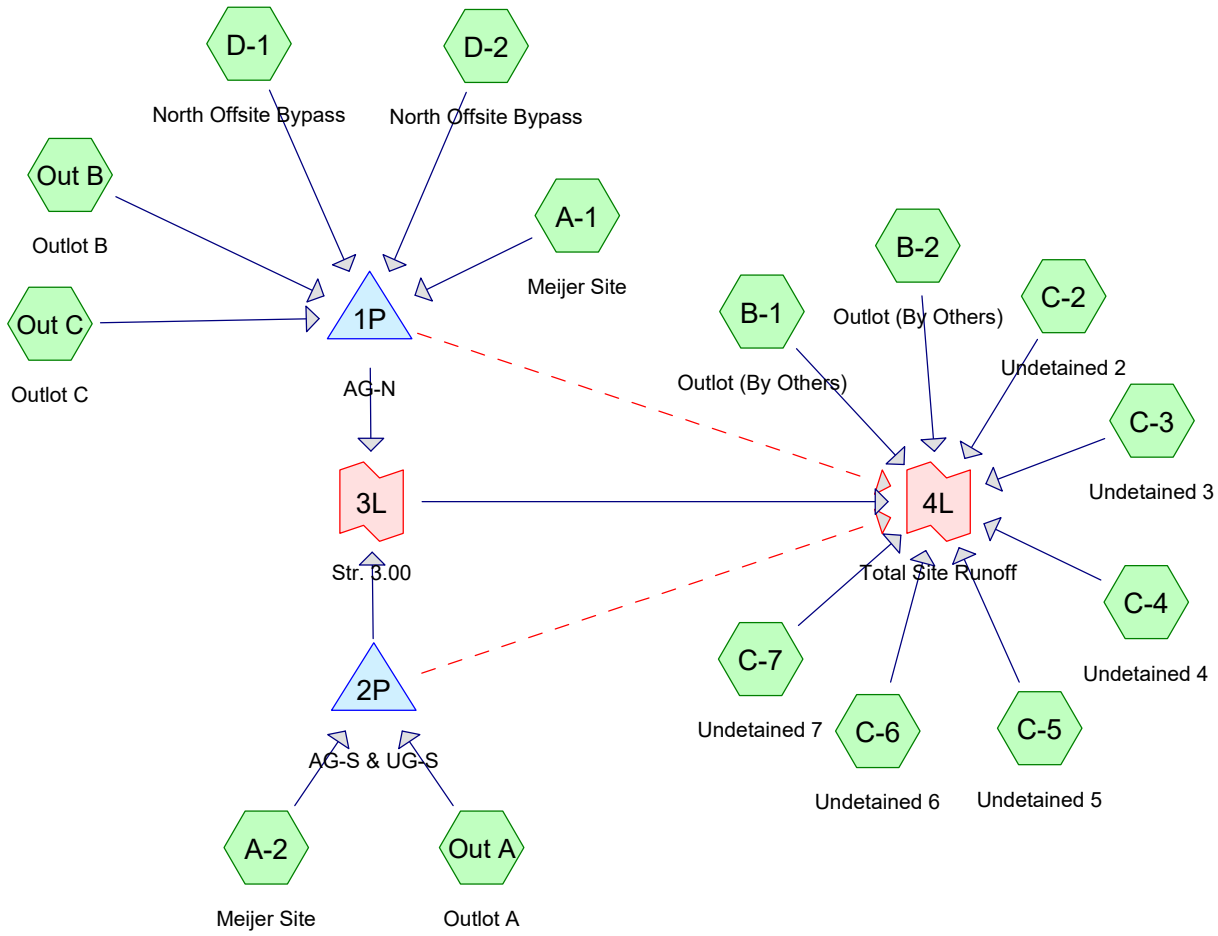
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36 Subcat C-6: Undetained 6
37 Subcat C-7: Undetained 7
38 Subcat D-1: North Offsite Bypass
39 Subcat D-2: North Offsite Bypass
40 Subcat Out A: Outlot A
41 Subcat Out B: Outlot B
42 Subcat Out C: Outlot C
43 Pond 1P: AG-N
45 Pond 2P: AG-S & UG-S
47 Link 3L: Str. 3.00

48 Link 4L: Total Site Runoff



Subcat Reach Pond Link

Routing Diagram for Meijer ABE SWM
Prepared by Woolpert, Inc, Printed 1/10/2025
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10yr-24hr	Type II 24-hr		Default	24.00	1	4.28	2
2	100yr-24hr	Type II 24-hr		Default	24.00	1	6.30	2

Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A-1: Meijer Site Runoff Area=16.510 ac 69.41% Impervious Runoff Depth=3.39"
Tc=15.0 min CN=92 Runoff=69.11 cfs 203,077 cf

Subcatchment A-2: Meijer Site Runoff Area=5.180 ac 69.31% Impervious Runoff Depth=3.39"
Tc=6.0 min CN=92 Runoff=28.92 cfs 63,715 cf

Subcatchment B-1: Outlot (By Others) Runoff Area=1.700 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=263' Tc=6.2 min CN=81 Runoff=7.05 cfs 14,557 cf

Subcatchment B-2: Outlot (By Others) Runoff Area=1.800 ac 0.00% Impervious Runoff Depth=2.19"
Flow Length=274' Tc=21.1 min CN=79 Runoff=4.25 cfs 14,330 cf

Subcatchment C-2: Undetained 2 Runoff Area=0.160 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=0.65 cfs 1,321 cf

Subcatchment C-3: Undetained 3 Runoff Area=0.290 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=1.17 cfs 2,395 cf

Subcatchment C-4: Undetained 4 Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=0.77 cfs 1,569 cf

Subcatchment C-5: Undetained 5 Runoff Area=0.170 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=0.69 cfs 1,404 cf

Subcatchment C-6: Undetained 6 Runoff Area=0.050 ac 80.00% Impervious Runoff Depth=3.60"
Tc=6.0 min CN=94 Runoff=0.29 cfs 653 cf

Subcatchment C-7: Undetained 7 Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=80 Runoff=0.77 cfs 1,569 cf

Subcatchment D-1: North Offsite Bypass Runoff Area=18.480 ac 0.00% Impervious Runoff Depth=3.09"
Flow Length=1,684' Tc=81.9 min CN=89 Runoff=24.12 cfs 207,069 cf

Subcatchment D-2: North Offsite Bypass Runoff Area=10.720 ac 0.00% Impervious Runoff Depth=3.09"
Flow Length=952' Tc=28.1 min CN=89 Runoff=29.65 cfs 120,118 cf

Subcatchment Out A: Outlot A Runoff Area=3.120 ac 85.00% Impervious Runoff Depth=3.71"
Tc=20.0 min CN=95 Runoff=12.01 cfs 41,988 cf

Subcatchment Out B: Outlot B Runoff Area=1.920 ac 85.00% Impervious Runoff Depth=3.71"
Tc=15.0 min CN=95 Runoff=8.50 cfs 25,839 cf

Subcatchment Out C: Outlot C Runoff Area=3.820 ac 85.00% Impervious Runoff Depth=3.71"
Tc=15.0 min CN=95 Runoff=16.92 cfs 51,408 cf

Pond 1P: AG-N Peak Elev=884.48' Storage=425,157 cf Inflow=122.04 cfs 607,511 cf
Primary=6.24 cfs 467,517 cf Secondary=0.00 cfs 0 cf Outflow=6.24 cfs 467,517 cf

Pond 2P: AG-S & UG-S Peak Elev=882.61' Storage=70,517 cf Inflow=36.68 cfs 105,703 cf
Primary=0.95 cfs 105,686 cf Secondary=0.00 cfs 0 cf Outflow=0.95 cfs 105,686 cf

Link 3L: Str. 3.00 Inflow=7.19 cfs 573,203 cf
Primary=7.19 cfs 573,203 cf

Link 4L: Total Site Runoff Inflow=15.13 cfs 611,002 cf
Primary=15.13 cfs 611,002 cf

Total Runoff Area = 2,800,908 sf Runoff Volume = 751,012 cf Average Runoff Depth = 3.22"
64.82% Pervious = 1,815,537 sf 35.18% Impervious = 985,371 sf

Summary for Subcatchment A-1: Meijer Site

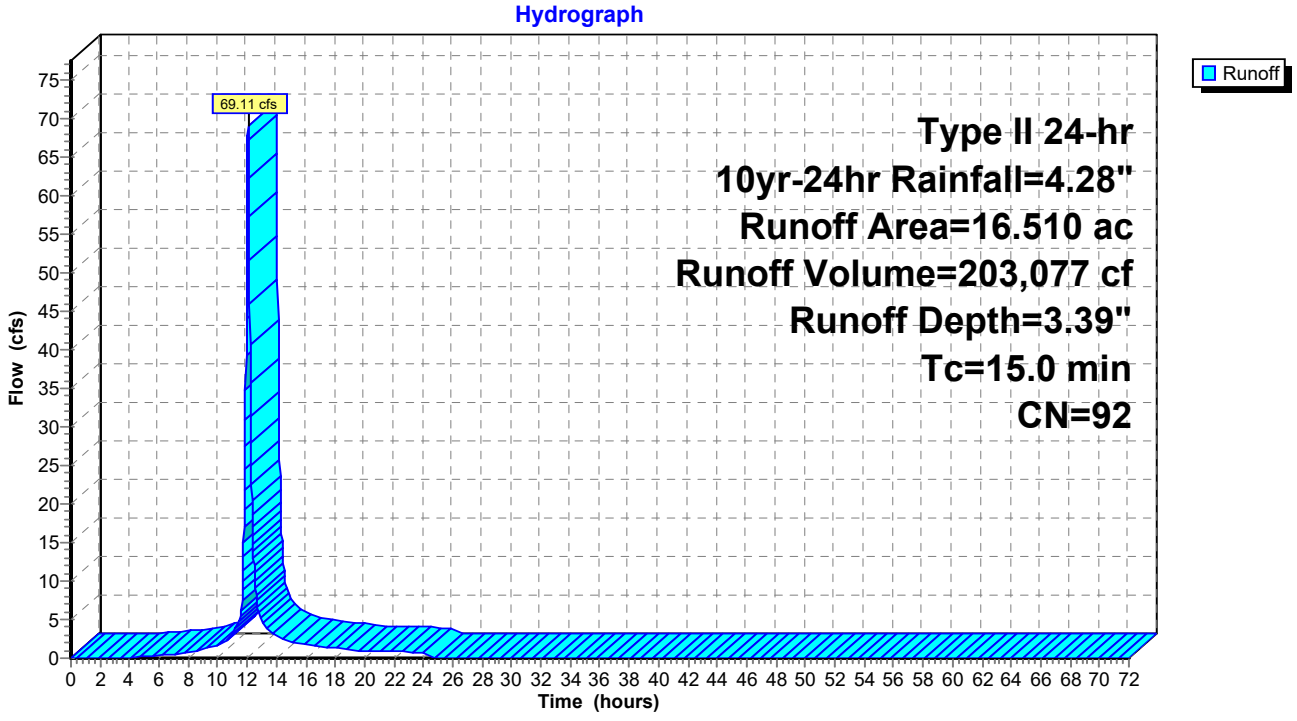
Runoff = 69.11 cfs @ 12.06 hrs, Volume= 203,077 cf, Depth= 3.39"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
11.460	98	Paved parking, HSG D
5.050	80	>75% Grass cover, Good, HSG D
16.510	92	Weighted Average
5.050	80	30.59% Pervious Area
11.460	98	69.41% Impervious Area

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

Subcatchment A-1: Meijer Site



Summary for Subcatchment A-2: Meijer Site

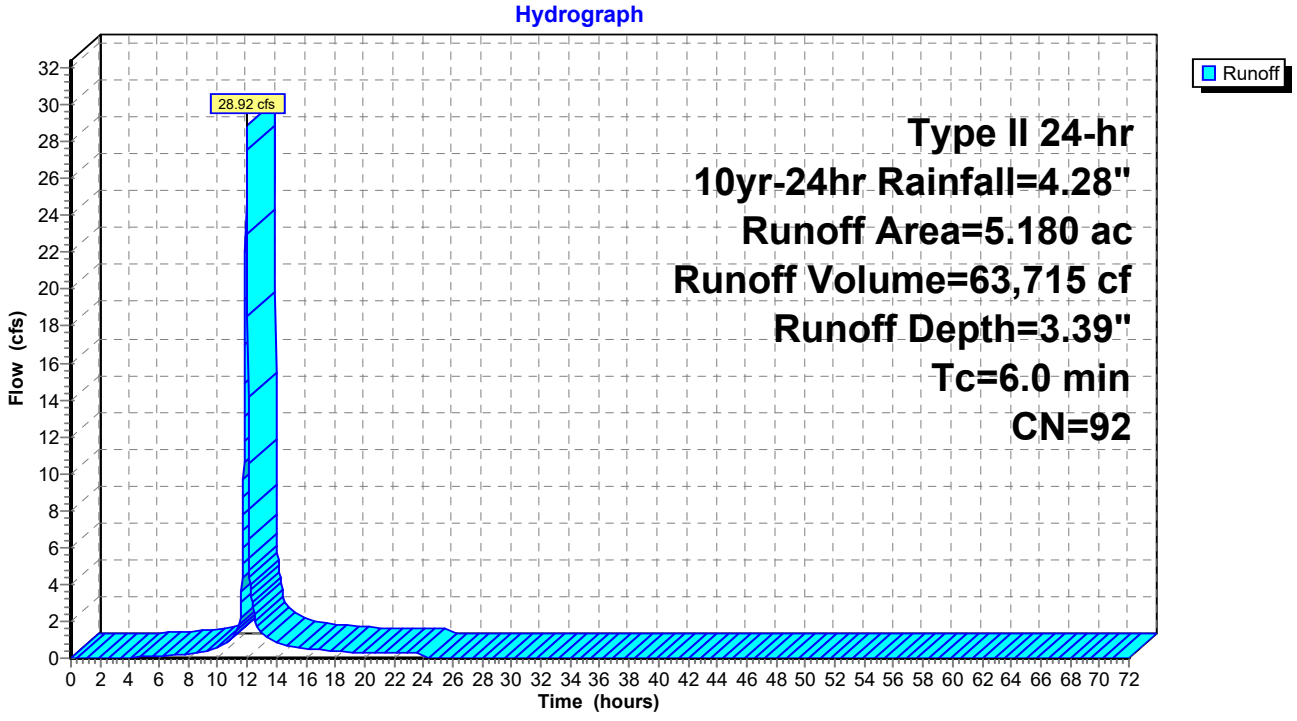
Runoff = 28.92 cfs @ 11.97 hrs, Volume= 63,715 cf, Depth= 3.39"
Routed to Pond 2P : AG-S & UG-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
3.590	98	Paved parking, HSG D
1.590	80	>75% Grass cover, Good, HSG D
5.180	92	Weighted Average
1.590	80	30.69% Pervious Area
3.590	98	69.31% Impervious Area

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

Subcatchment A-2: Meijer Site



Summary for Subcatchment B-1: Outlot (By Others)

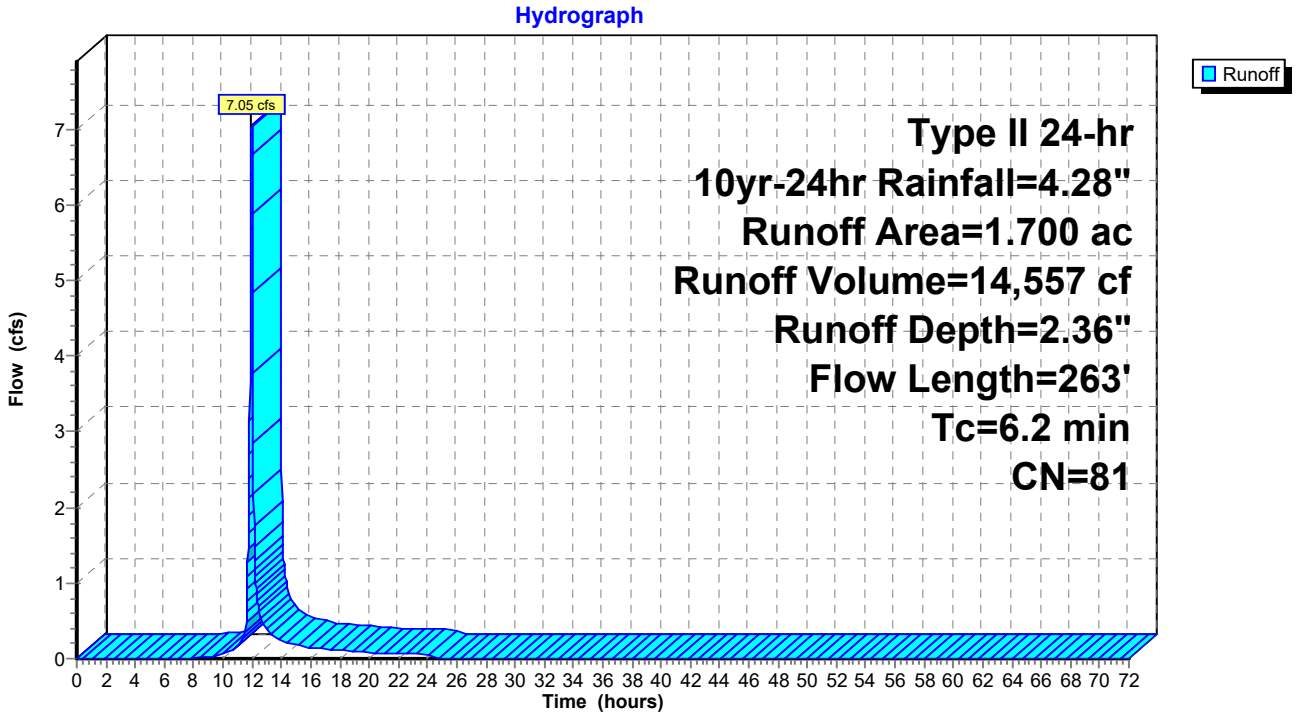
Runoff = 7.05 cfs @ 11.98 hrs, Volume= 14,557 cf, Depth= 2.36"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

	Area (ac)	CN	Description
*	1.000	78	Row crops, straight row, Good, HSG B
	0.700	85	Row crops, straight row, Good, HSG C
	1.700	81	Weighted Average
	1.700	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0327	0.48		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
2.8	163	0.0113	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.2	263	Total			

Subcatchment B-1: Outlot (By Others)



Summary for Subcatchment B-2: Outlot (By Others)

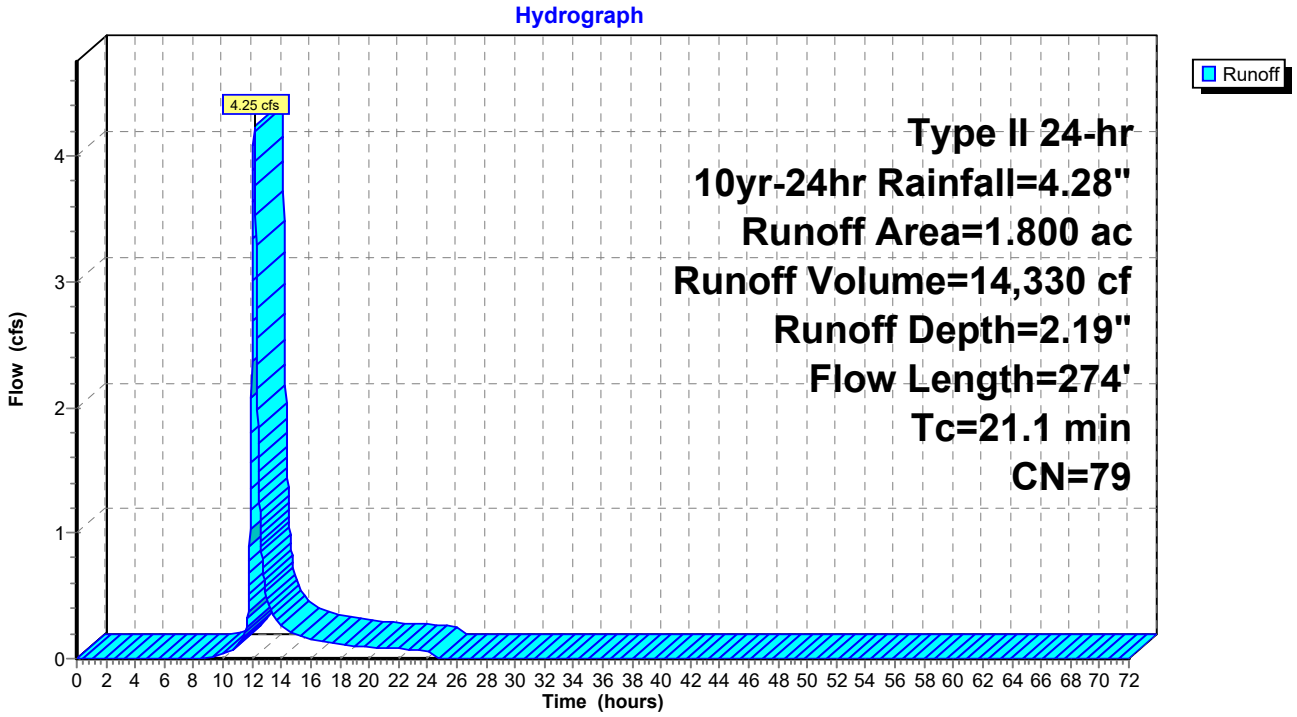
Runoff = 4.25 cfs @ 12.14 hrs, Volume= 14,330 cf, Depth= 2.19"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

	Area (ac)	CN	Description
*	1.500	78	Row crops, straight row, Good, HSG B
	0.300	85	Row crops, straight row, Good, HSG C
	1.800	79	Weighted Average
	1.800	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0130	0.33		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
16.1	174	0.0004	0.18		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
21.1	274	Total			

Subcatchment B-2: Outlot (By Others)



Summary for Subcatchment C-2: Undetained 2

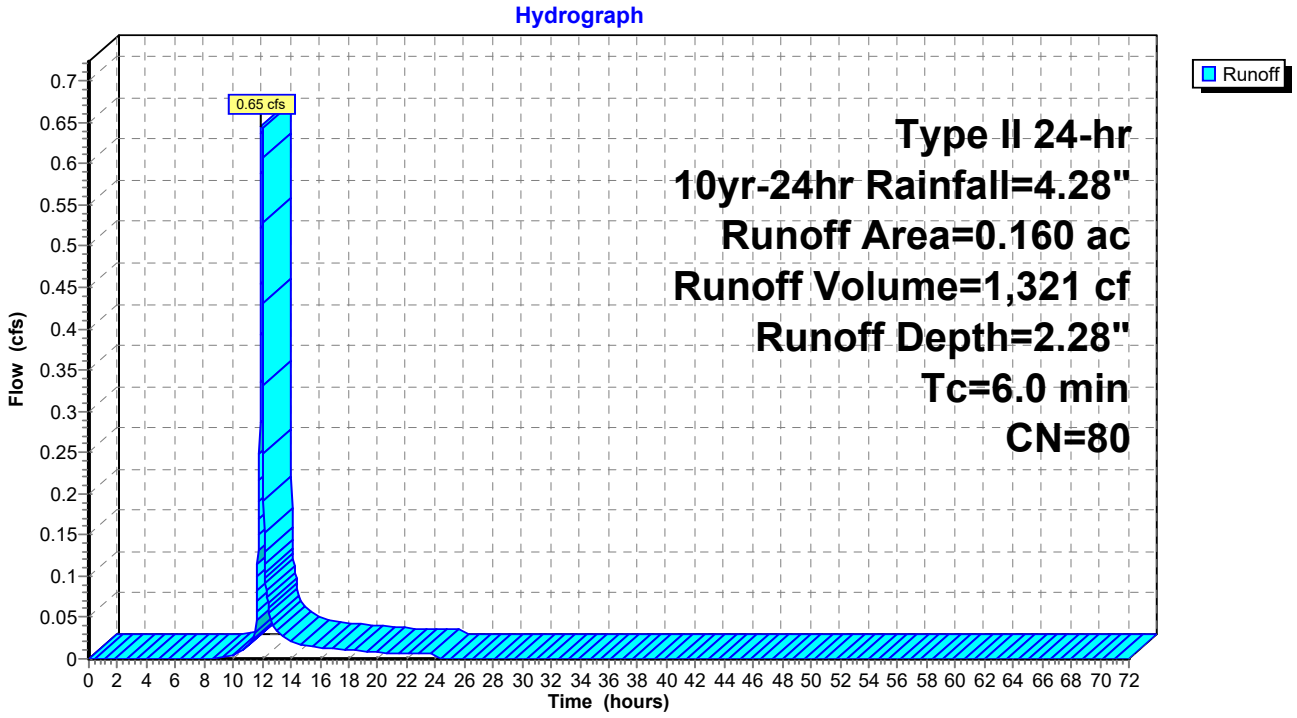
Runoff = 0.65 cfs @ 11.97 hrs, Volume= 1,321 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.160	80	>75% Grass cover, Good, HSG D
0.160	80	100.00% Pervious Area

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

Subcatchment C-2: Undetained 2



Summary for Subcatchment C-3: Undetained 3

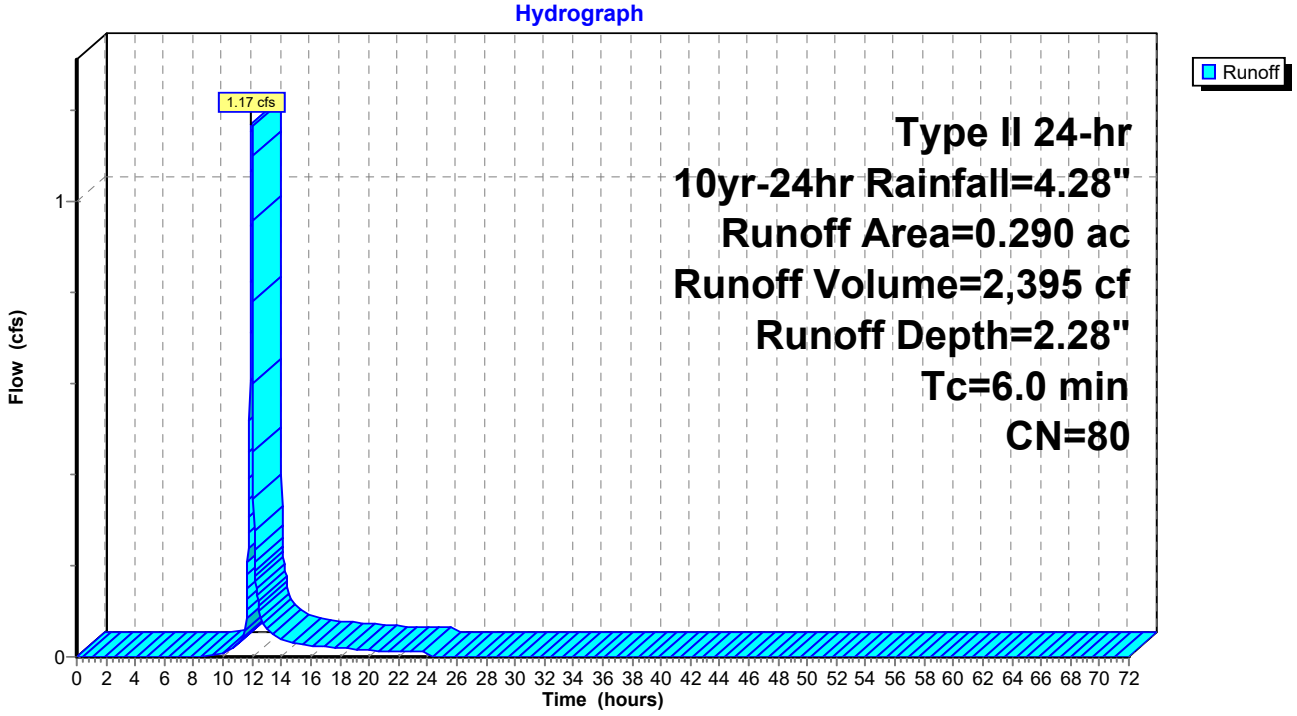
Runoff = 1.17 cfs @ 11.97 hrs, Volume= 2,395 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
0.290	80	100.00% Pervious Area

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

Subcatchment C-3: Undetained 3



Summary for Subcatchment C-4: Undetained 4

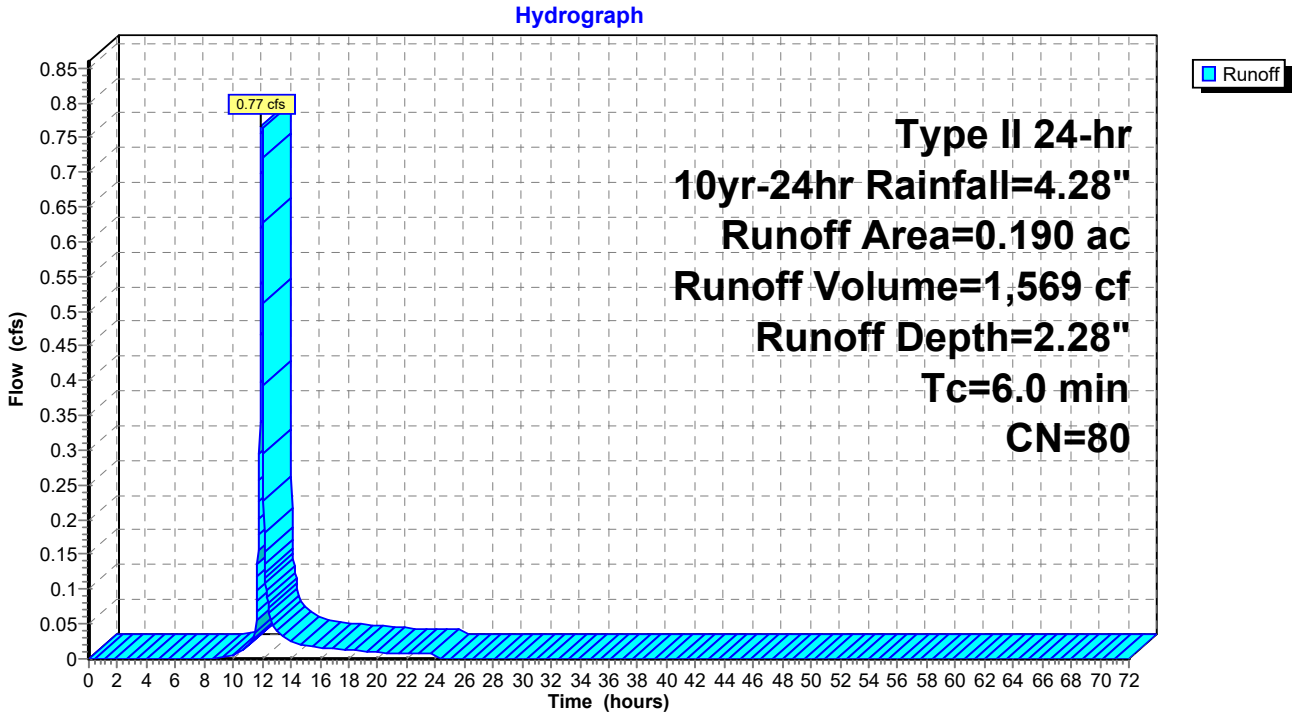
Runoff = 0.77 cfs @ 11.97 hrs, Volume= 1,569 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.190	80	>75% Grass cover, Good, HSG D
0.190	80	100.00% Pervious Area

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

Subcatchment C-4: Undetained 4



Summary for Subcatchment C-5: Undetained 5

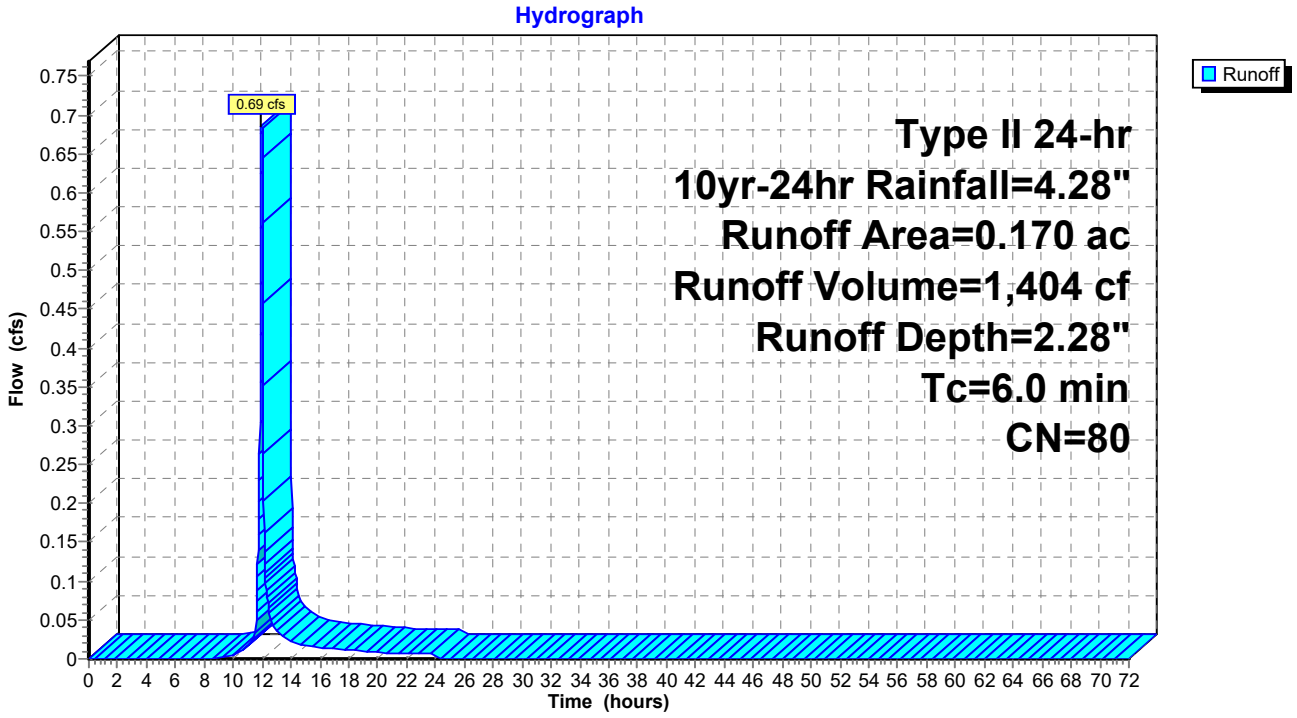
Runoff = 0.69 cfs @ 11.97 hrs, Volume= 1,404 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.170	80	>75% Grass cover, Good, HSG D
0.170	80	100.00% Pervious Area

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

Subcatchment C-5: Undetained 5



Summary for Subcatchment C-6: Undetained 6

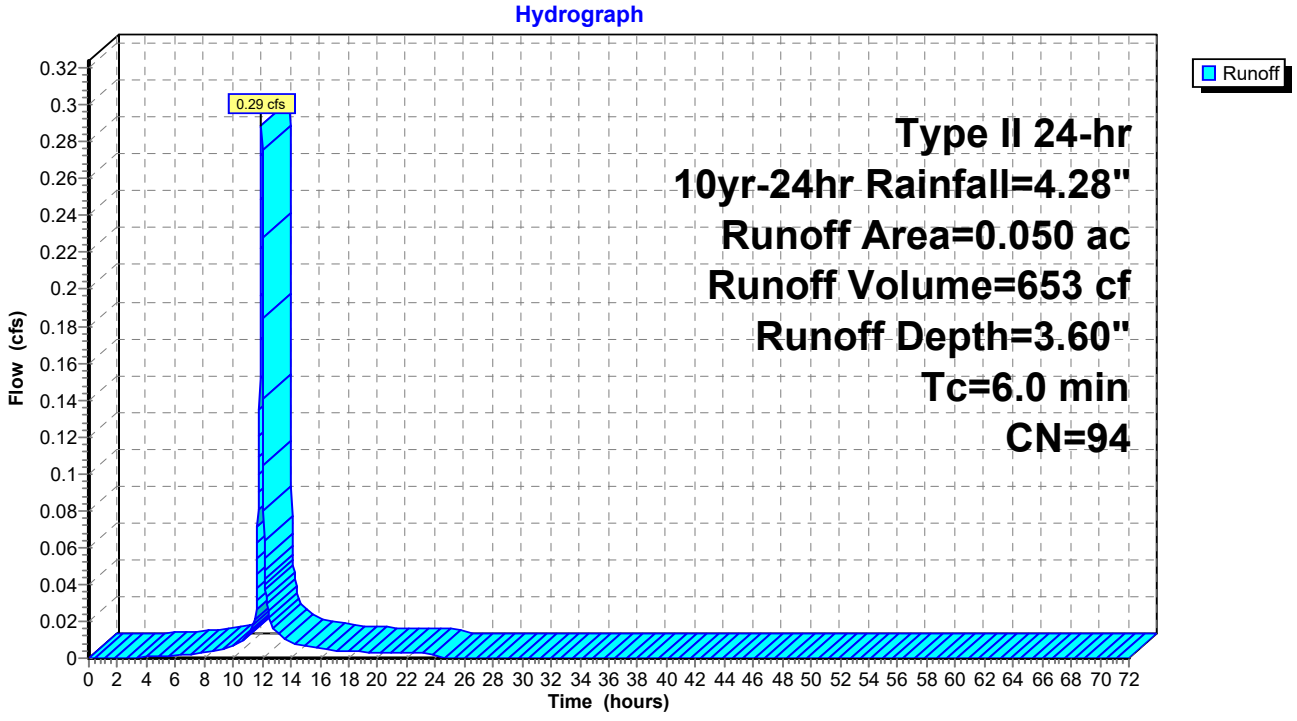
Runoff = 0.29 cfs @ 11.97 hrs, Volume= 653 cf, Depth= 3.60"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG D
0.010	80	>75% Grass cover, Good, HSG D
0.050	94	Weighted Average
0.010	80	20.00% Pervious Area
0.040	98	80.00% Impervious Area

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

Subcatchment C-6: Undetained 6



Summary for Subcatchment C-7: Undetained 7

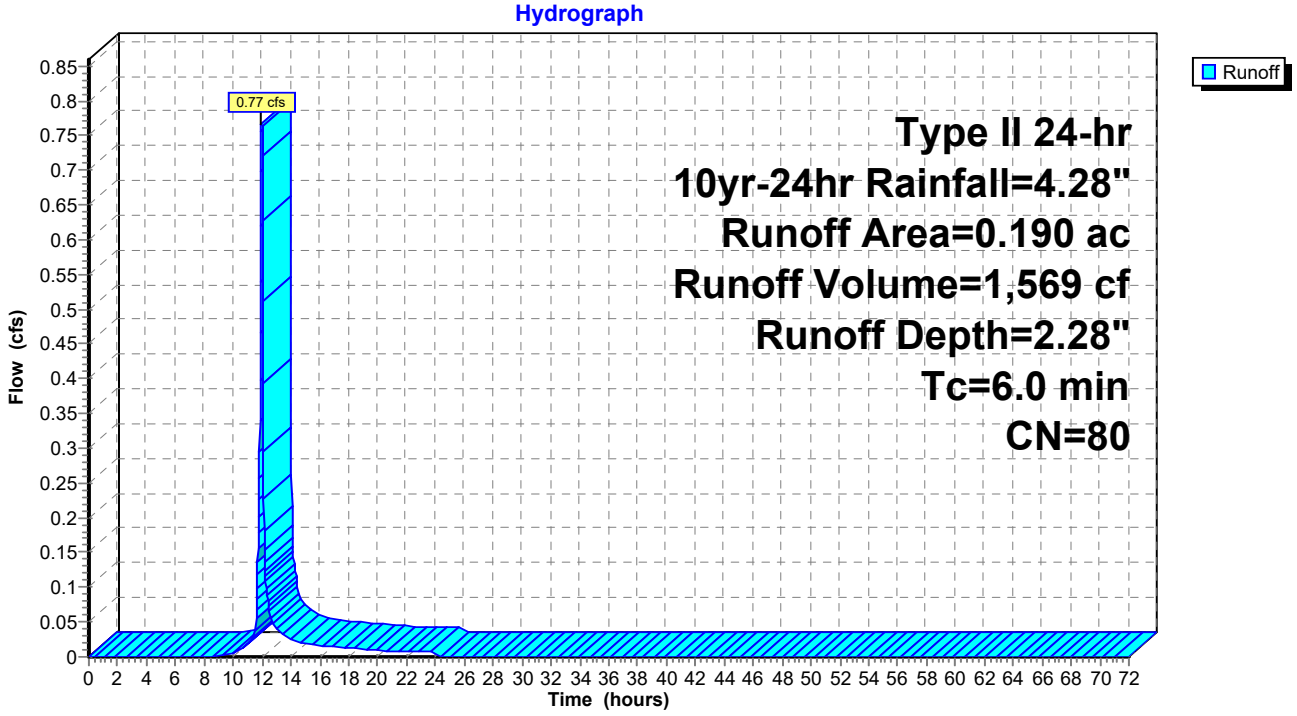
Runoff = 0.77 cfs @ 11.97 hrs, Volume= 1,569 cf, Depth= 2.28"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
0.190	80	>75% Grass cover, Good, HSG D
0.190	80	100.00% Pervious Area

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

Subcatchment C-7: Undetained 7



Summary for Subcatchment D-1: North Offsite Bypass

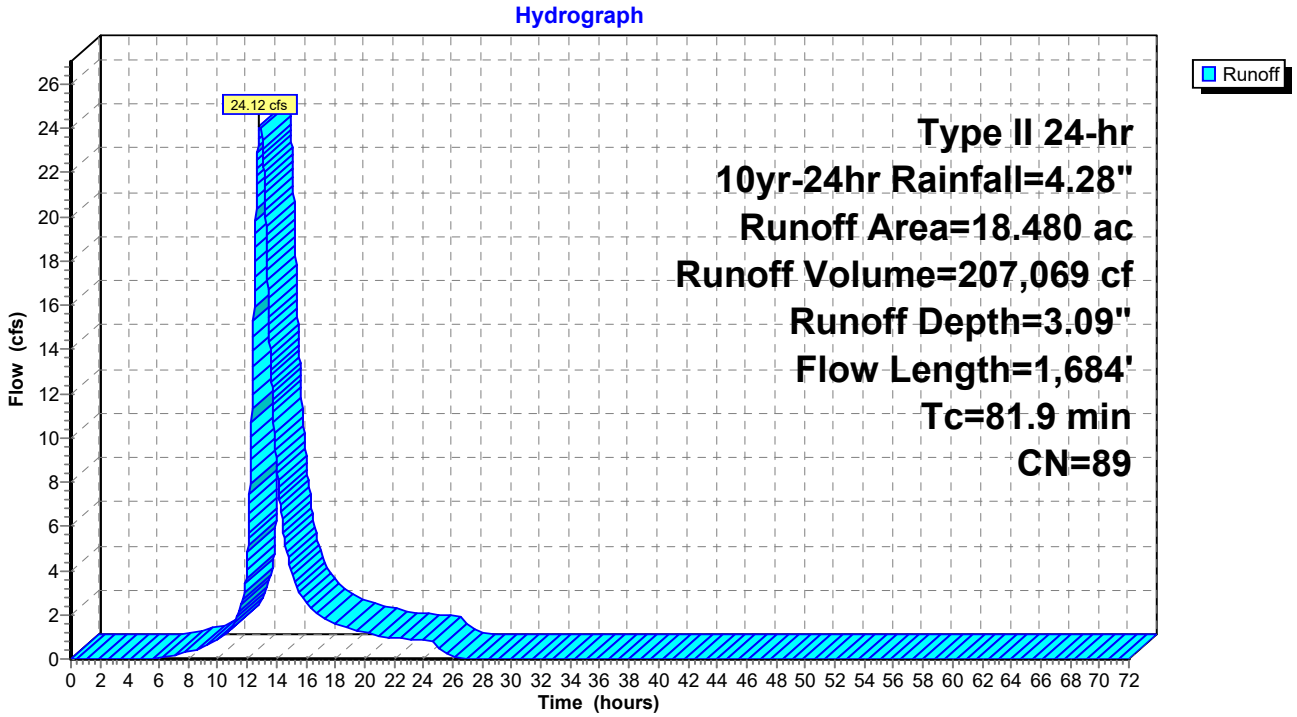
Runoff = 24.12 cfs @ 12.85 hrs, Volume= 207,069 cf, Depth= 3.09"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
18.480	89	Row crops, straight row, Good, HSG D
18.480	89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0075	0.27		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
75.7	1,584	0.0015	0.35		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
81.9	1,684	Total			

Subcatchment D-1: North Offsite Bypass



Summary for Subcatchment D-2: North Offsite Bypass

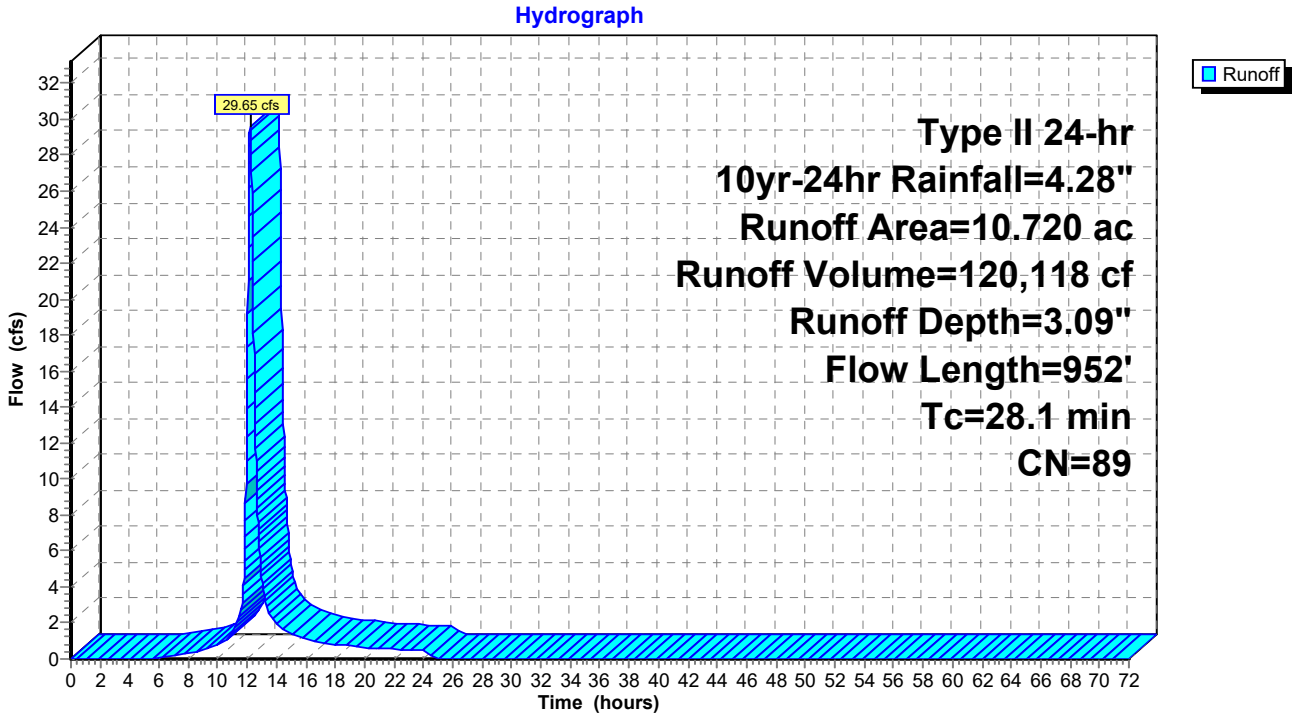
Runoff = 29.65 cfs @ 12.21 hrs, Volume= 120,118 cf, Depth= 3.09"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
10.720	89	Row crops, straight row, Good, HSG D
10.720	89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0090	0.29		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
22.3	852	0.0050	0.64		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
28.1	952	Total			

Subcatchment D-2: North Offsite Bypass



Summary for Subcatchment Out A: Outlot A

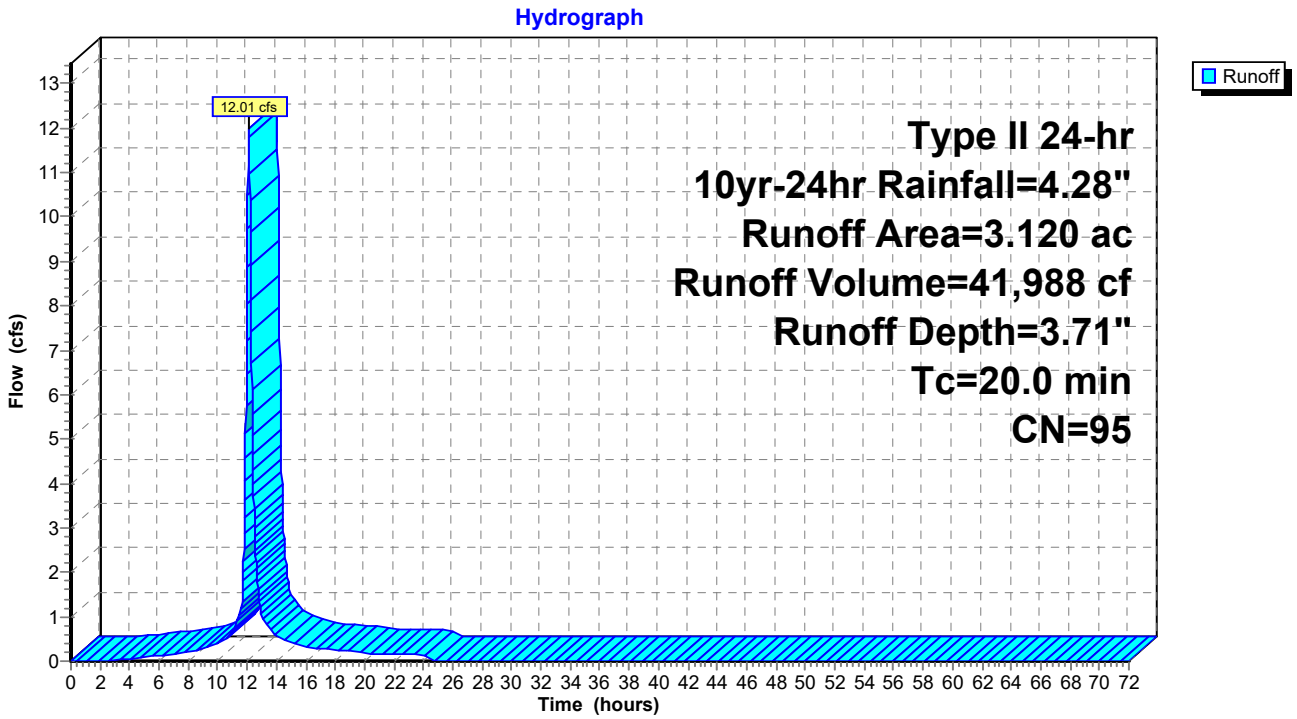
Runoff = 12.01 cfs @ 12.12 hrs, Volume= 41,988 cf, Depth= 3.71"
Routed to Pond 2P : AG-S & UG-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
3.120	95	Urban commercial, 85% imp, HSG D
0.468	78	15.00% Pervious Area
2.652	98	85.00% Impervious Area

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

Subcatchment Out A: Outlot A



Summary for Subcatchment Out B: Outlot B

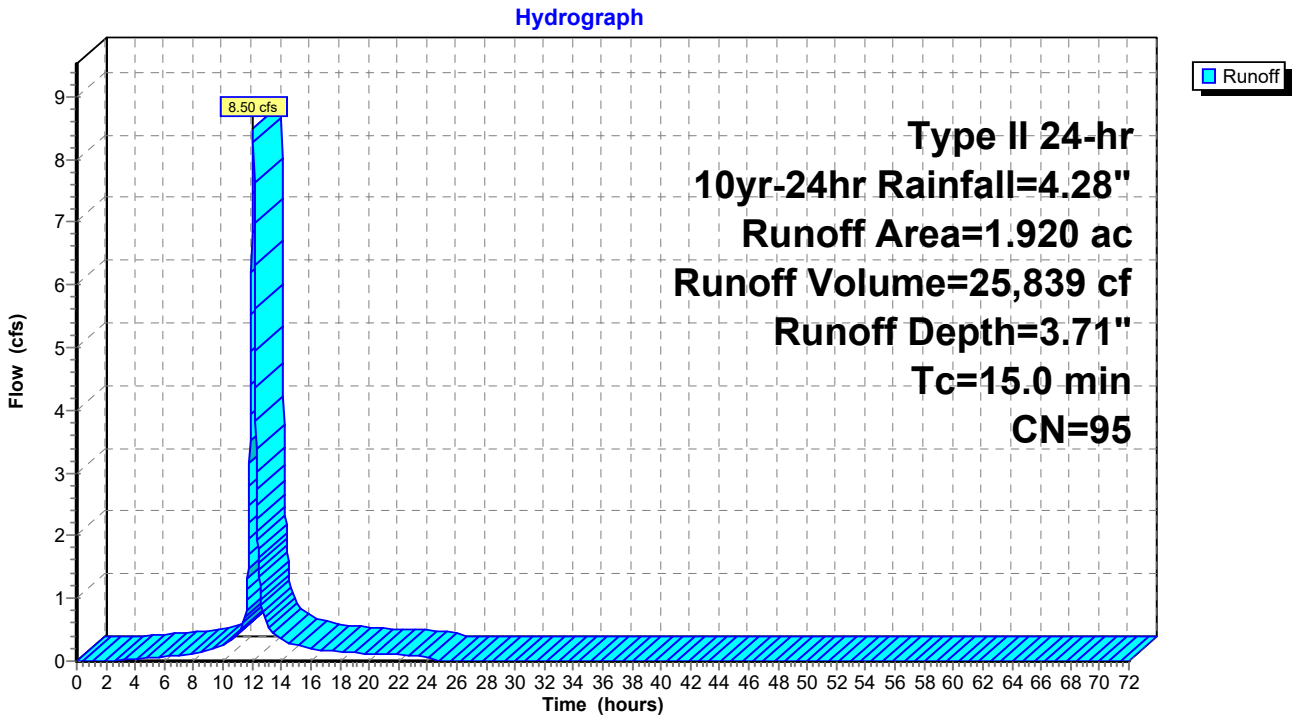
Runoff = 8.50 cfs @ 12.06 hrs, Volume= 25,839 cf, Depth= 3.71"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
1.920	95	Urban commercial, 85% imp, HSG D
0.288	78	15.00% Pervious Area
1.632	98	85.00% Impervious Area

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

Subcatchment Out B: Outlot B



Summary for Subcatchment Out C: Outlot C

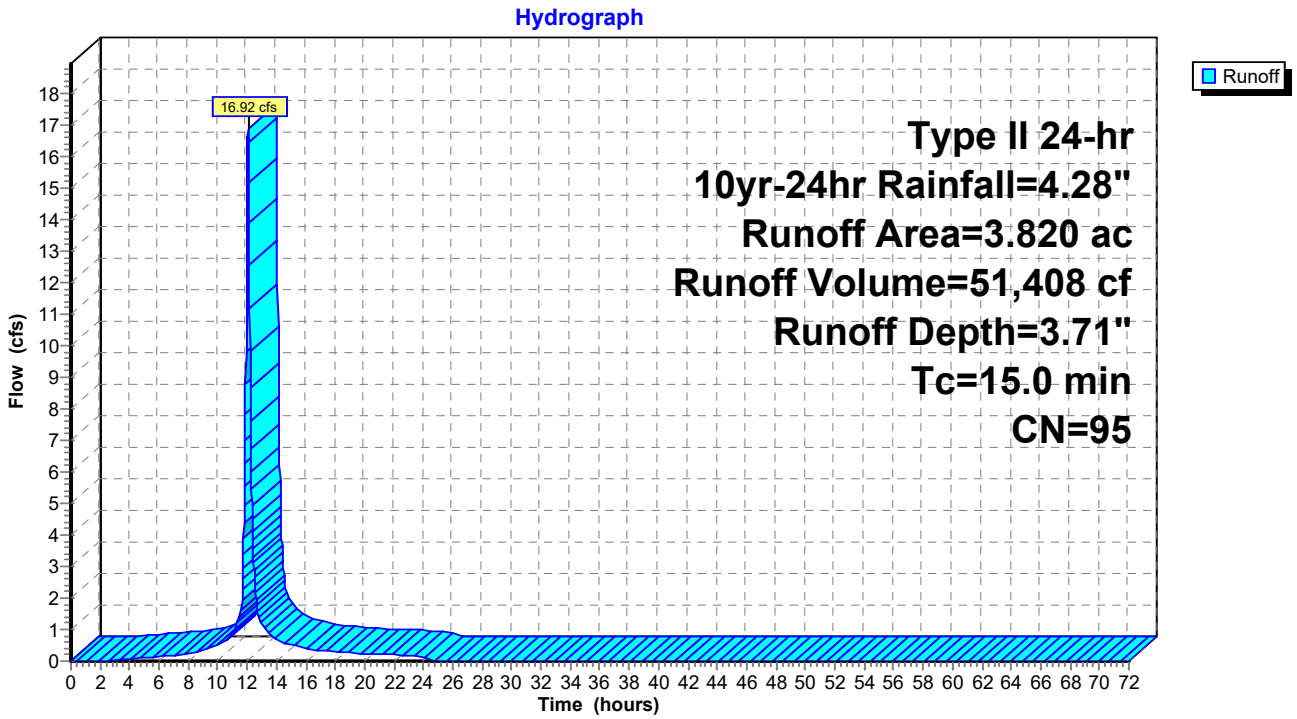
Runoff = 16.92 cfs @ 12.06 hrs, Volume= 51,408 cf, Depth= 3.71"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10yr-24hr Rainfall=4.28"

Area (ac)	CN	Description
3.820	95	Urban commercial, 85% imp, HSG D
0.573	78	15.00% Pervious Area
3.247	98	85.00% Impervious Area

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

Subcatchment Out C: Outlot C



Summary for Pond 1P: AG-N

Inflow Area = 2,241,162 sf, 31.76% Impervious, Inflow Depth = 3.25" for 10yr-24hr event
Inflow = 122.04 cfs @ 12.08 hrs, Volume= 607,511 cf
Outflow = 6.24 cfs @ 15.84 hrs, Volume= 467,517 cf, Atten= 95%, Lag= 225.6 min
Primary = 6.24 cfs @ 15.84 hrs, Volume= 467,517 cf
Routed to Link 3L : Str. 3.00
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 4L : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 884.48' @ 15.84 hrs Surf.Area= 91,380 sf Storage= 425,157 cf

Plug-Flow detention time= 993.3 min calculated for 467,517 cf (77% of inflow)
Center-of-Mass det. time= 905.7 min (1,726.7 - 821.1)

Volume	Invert	Avail.Storage	Storage Description
#1	877.29'	573,880 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

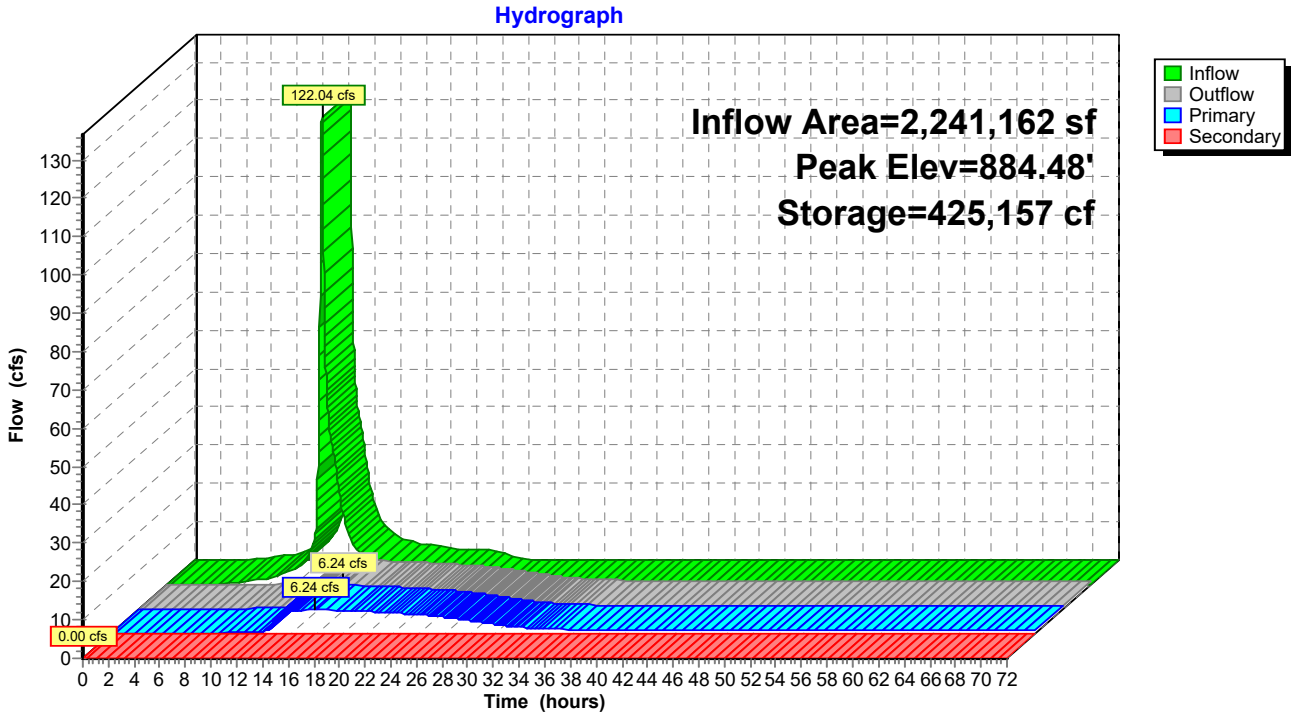
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
877.29	33,121	1,437.0	0	0	33,121
878.00	37,072	1,579.0	24,905	24,905	67,219
879.00	42,856	1,793.0	39,929	64,834	124,667
880.00	49,752	2,010.0	46,261	111,096	190,366
881.00	57,879	2,227.0	53,764	164,860	263,563
882.00	67,238	2,444.0	62,500	227,360	344,257
883.00	77,811	2,659.0	72,460	299,820	431,602
884.00	87,356	2,779.0	82,537	382,358	483,602
884.64	92,754	2,793.0	57,627	439,984	490,061
885.00	95,775	2,800.0	33,934	473,918	493,335
886.00	104,208	2,819.0	99,962	573,880	502,283

Device	Routing	Invert	Outlet Devices
#1	Primary	877.29'	**12.0" Round Culvert** L= 24.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 877.29' / 877.22' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	877.29'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	882.14'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	884.54'	**110.0' long + 3.0 '/' SideZ x 26.2' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.24 cfs @ 15.84 hrs HW=884.48' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 6.24 cfs of 9.78 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 1.11 cfs @ 12.76 fps)
└**3=Orifice/Grate** (Orifice Controls 5.13 cfs @ 6.53 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=877.29' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: AG-N


Hydrograph
Inflow Area=2,241,162 sf
Peak Elev=884.48'
Storage=425,157 cf
122.04 cfs
6.24 cfs
6.24 cfs
0.00 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 10 20 30 40 50 60 70 80 90 100 110 120 130
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Summary for Pond 2P: AG-S & UG-S

Inflow Area = 361,548 sf, 75.20% Impervious, Inflow Depth = 3.51" for 10yr-24hr event
Inflow = 36.68 cfs @ 11.98 hrs, Volume= 105,703 cf
Outflow = 0.95 cfs @ 15.57 hrs, Volume= 105,686 cf, Atten= 97%, Lag= 215.7 min
Primary = 0.95 cfs @ 15.57 hrs, Volume= 105,686 cf
Routed to Link 3L : Str. 3.00
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 4L : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 882.61' @ 15.57 hrs Surf.Area= 20,190 sf Storage= 70,517 cf

Plug-Flow detention time= 866.2 min calculated for 105,686 cf (100% of inflow)
Center-of-Mass det. time= 866.1 min (1,649.5 - 783.4)

Volume	Invert	Avail.Storage	Storage Description
#1	877.38'	43,614 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2A	877.53'	22,031 cf	**80.00'W x 180.82'L x 7.00'H Underground Detention** 101,259 cf Overall - 46,183 cf Embedded = 55,076 cf x 40.0% Voids
#3A	878.03'	46,183 cf	**CMP Round 72** x 9 Inside #2 Effective Size= 72.0"W x 72.0"H => 28.27 sf x 20.00'L = 565.5 cf Overall Size= 72.0"W x 72.0"H x 20.00'L Row Length Adjustment= +152.82' x 28.27 sf x 9 rows 78.00' Header x 28.27 sf x 1 = 2,205.4 cf Inside
		111,827 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
877.38	1,605	205.0	0	0	1,605
878.00	2,000	220.0	1,115	1,115	2,129
879.00	2,697	245.0	2,340	3,455	3,083
880.00	3,462	265.0	3,072	6,527	3,934
881.00	4,284	284.0	3,866	10,392	4,808
882.00	5,163	303.0	4,717	15,109	5,743
883.00	6,098	321.0	5,624	20,733	6,690
884.00	7,090	340.0	6,588	27,321	7,742
885.00	8,138	359.0	7,608	34,929	8,855
885.90	9,130	376.0	7,766	42,695	9,903
886.00	9,248	378.0	919	43,614	10,029

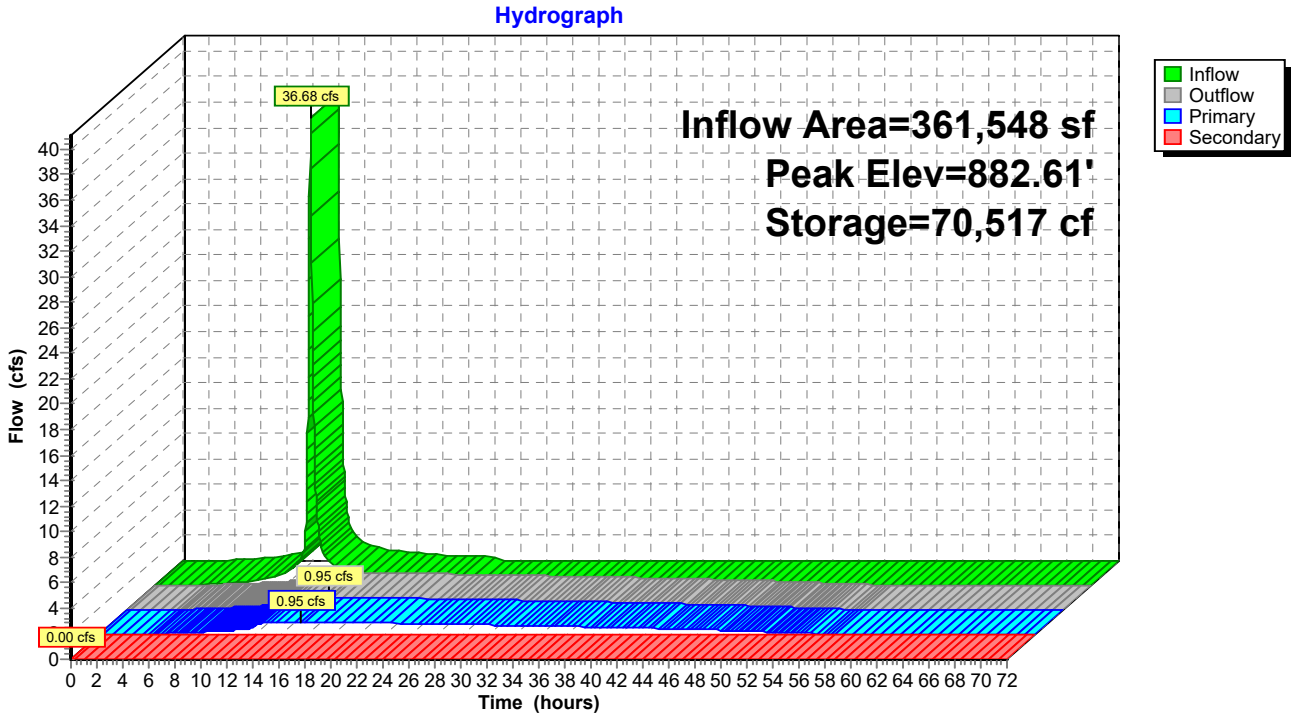
Device	Routing	Invert	Outlet Devices
#1	Primary	877.38'	**15.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 877.38' / 877.22' S= 0.0040 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	877.38'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	882.61'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	885.40'	**25.0' long + 3.0 '/' SideZ x 53.8' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.95 cfs @ 15.57 hrs HW=882.61' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.95 cfs of 12.68 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 0.95 cfs @ 10.83 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=877.38' TW=0.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond 2P: AG-S & UG-S

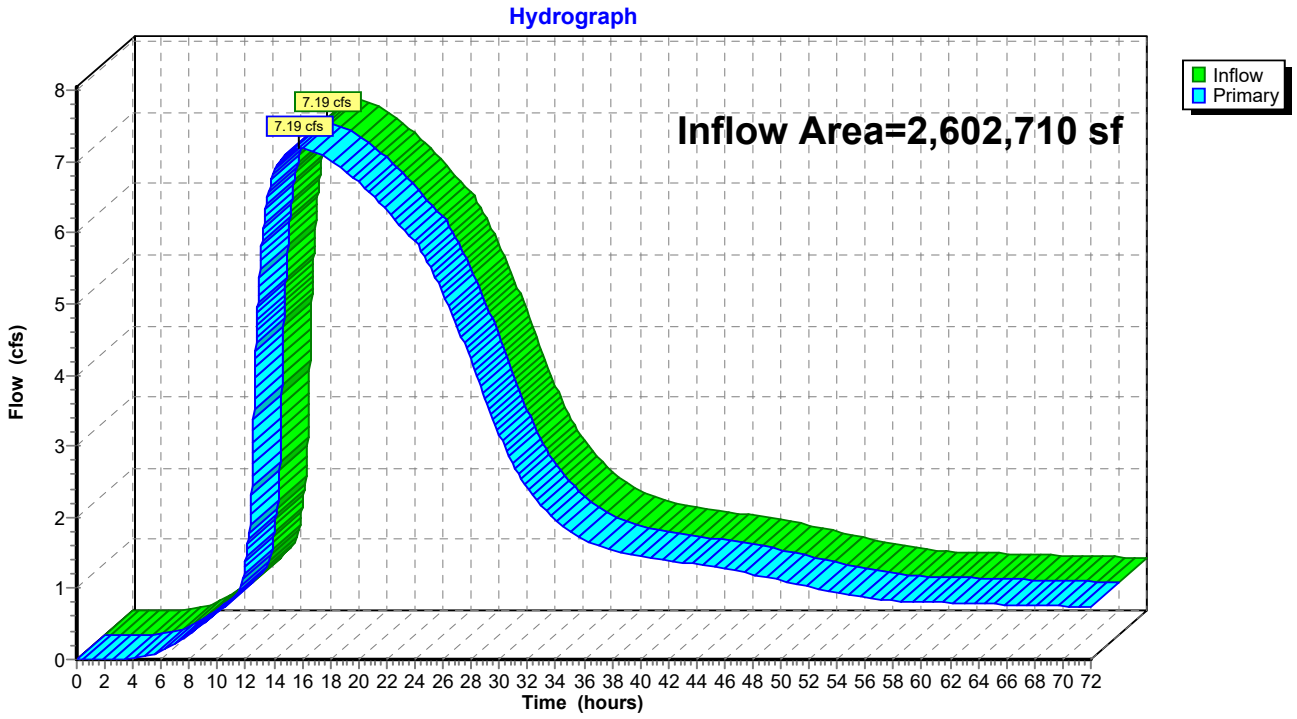


Summary for Link 3L: Str. 3.00

Inflow Area = 2,602,710 sf, 37.79% Impervious, Inflow Depth > 2.64" for 10yr-24hr event
Inflow = 7.19 cfs @ 15.83 hrs, Volume= 573,203 cf
Primary = 7.19 cfs @ 15.83 hrs, Volume= 573,203 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Total Site Runoff

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link 3L: Str. 3.00

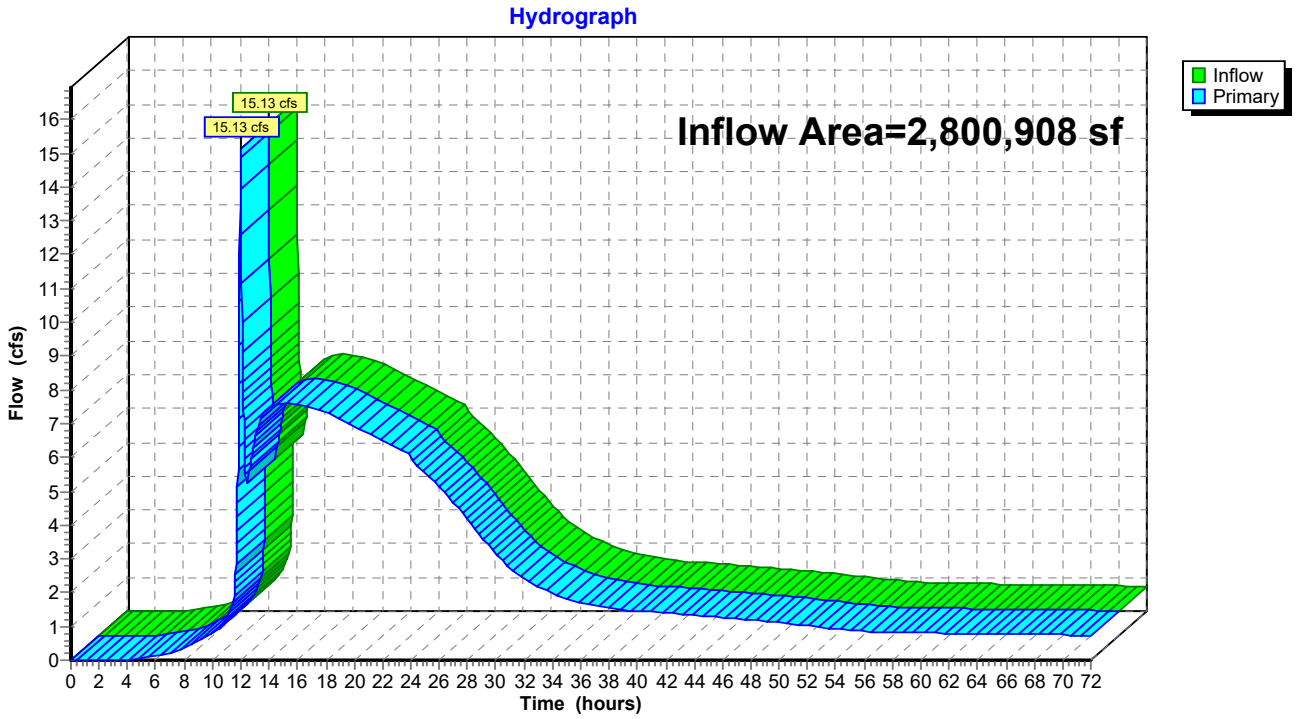


Summary for Link 4L: Total Site Runoff

Inflow Area = 2,800,908 sf, 35.18% Impervious, Inflow Depth > 2.62" for 10yr-24hr event
Inflow = 15.13 cfs @ 11.98 hrs, Volume= 611,002 cf
Primary = 15.13 cfs @ 11.98 hrs, Volume= 611,002 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link 4L: Total Site Runoff



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A-1: Meijer Site Runoff Area=16.510 ac 69.41% Impervious Runoff Depth=5.36"
Tc=15.0 min CN=92 Runoff=106.61 cfs 321,508 cf

Subcatchment A-2: Meijer Site Runoff Area=5.180 ac 69.31% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=92 Runoff=44.40 cfs 100,873 cf

Subcatchment B-1: Outlot (By Others) Runoff Area=1.700 ac 0.00% Impervious Runoff Depth=4.16"
Flow Length=263' Tc=6.2 min CN=81 Runoff=12.14 cfs 25,660 cf

Subcatchment B-2: Outlot (By Others) Runoff Area=1.800 ac 0.00% Impervious Runoff Depth=3.95"
Flow Length=274' Tc=21.1 min CN=79 Runoff=7.64 cfs 25,801 cf

Subcatchment C-2: Undetained 2 Runoff Area=0.160 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=1.13 cfs 2,354 cf

Subcatchment C-3: Undetained 3 Runoff Area=0.290 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=2.04 cfs 4,267 cf

Subcatchment C-4: Undetained 4 Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=1.34 cfs 2,795 cf

Subcatchment C-5: Undetained 5 Runoff Area=0.170 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=1.20 cfs 2,501 cf

Subcatchment C-6: Undetained 6 Runoff Area=0.050 ac 80.00% Impervious Runoff Depth=5.59"
Tc=6.0 min CN=94 Runoff=0.44 cfs 1,015 cf

Subcatchment C-7: Undetained 7 Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=80 Runoff=1.34 cfs 2,795 cf

Subcatchment D-1: North Offsite Bypass Runoff Area=18.480 ac 0.00% Impervious Runoff Depth=5.03"
Flow Length=1,684' Tc=81.9 min CN=89 Runoff=38.79 cfs 337,185 cf

Subcatchment D-2: North Offsite Bypass Runoff Area=10.720 ac 0.00% Impervious Runoff Depth=5.03"
Flow Length=952' Tc=28.1 min CN=89 Runoff=47.37 cfs 195,597 cf

Subcatchment Out A: Outlot A Runoff Area=3.120 ac 85.00% Impervious Runoff Depth=5.71"
Tc=20.0 min CN=95 Runoff=18.08 cfs 64,665 cf

Subcatchment Out B: Outlot B Runoff Area=1.920 ac 85.00% Impervious Runoff Depth=5.71"
Tc=15.0 min CN=95 Runoff=12.79 cfs 39,794 cf

Subcatchment Out C: Outlot C Runoff Area=3.820 ac 85.00% Impervious Runoff Depth=5.71"
Tc=15.0 min CN=95 Runoff=25.45 cfs 79,173 cf

Pond 1P: AG-N Peak Elev=884.86' Storage=461,014 cf Inflow=190.01 cfs 973,257 cf
Primary=6.78 cfs 537,974 cf Secondary=55.12 cfs 289,883 cf Outflow=61.91 cfs 827,857 cf

Pond 2P: AG-S & UG-S Peak Elev=884.29' Storage=96,191 cf Inflow=56.14 cfs 165,538 cf
Primary=5.19 cfs 165,518 cf Secondary=0.00 cfs 0 cf Outflow=5.19 cfs 165,518 cf

Link 3L: Str. 3.00 Inflow=11.97 cfs 703,492 cf
Primary=11.97 cfs 703,492 cf

Link 4L: Total Site Runoff Inflow=69.48 cfs 1,060,563 cf
Primary=69.48 cfs 1,060,563 cf

Total Runoff Area = 2,800,908 sf Runoff Volume = 1,205,983 cf Average Runoff Depth = 5.17"
64.82% Pervious = 1,815,537 sf 35.18% Impervious = 985,371 sf

Summary for Subcatchment A-1: Meijer Site

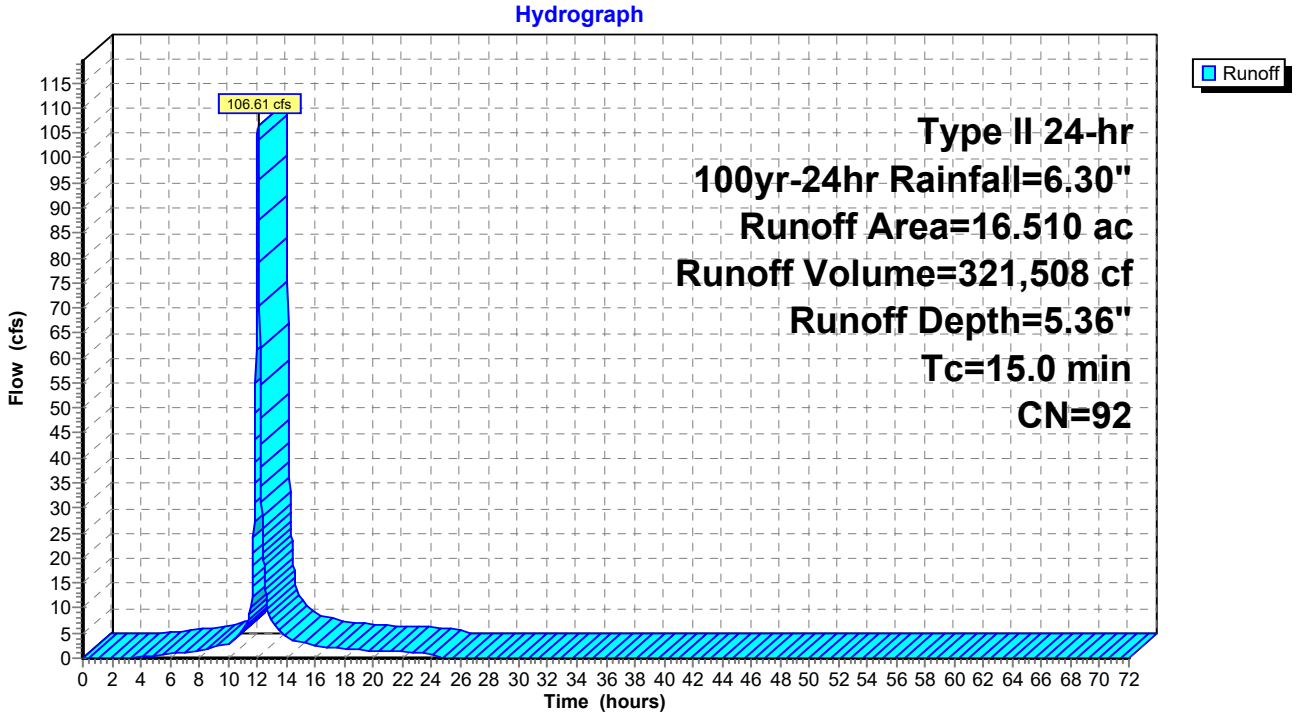
Runoff = 106.61 cfs @ 12.06 hrs, Volume= 321,508 cf, Depth= 5.36"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
11.460	98	Paved parking, HSG D
5.050	80	>75% Grass cover, Good, HSG D
16.510	92	Weighted Average
5.050	80	30.59% Pervious Area
11.460	98	69.41% Impervious Area

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

Subcatchment A-1: Meijer Site



Summary for Subcatchment A-2: Meijer Site

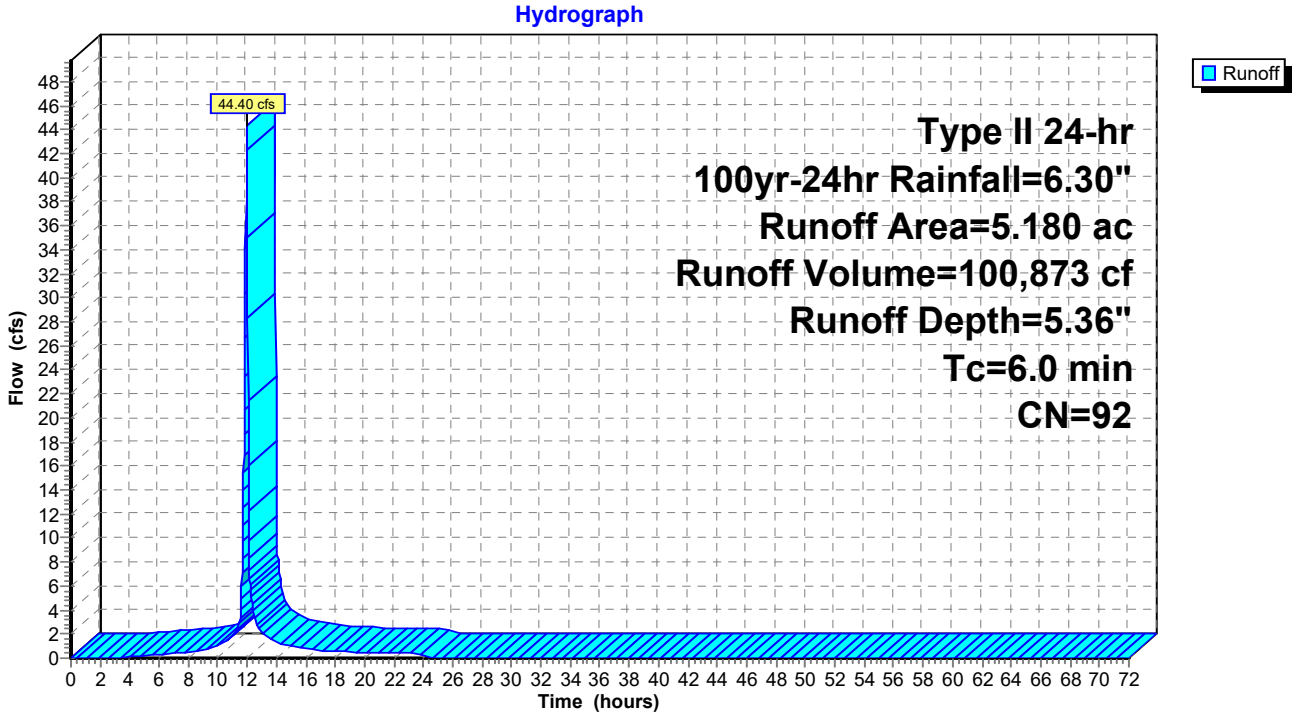
Runoff = 44.40 cfs @ 11.97 hrs, Volume= 100,873 cf, Depth= 5.36"
Routed to Pond 2P : AG-S & UG-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
3.590	98	Paved parking, HSG D
1.590	80	>75% Grass cover, Good, HSG D
5.180	92	Weighted Average
1.590	80	30.69% Pervious Area
3.590	98	69.31% Impervious Area

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

Subcatchment A-2: Meijer Site



Summary for Subcatchment B-1: Outlot (By Others)

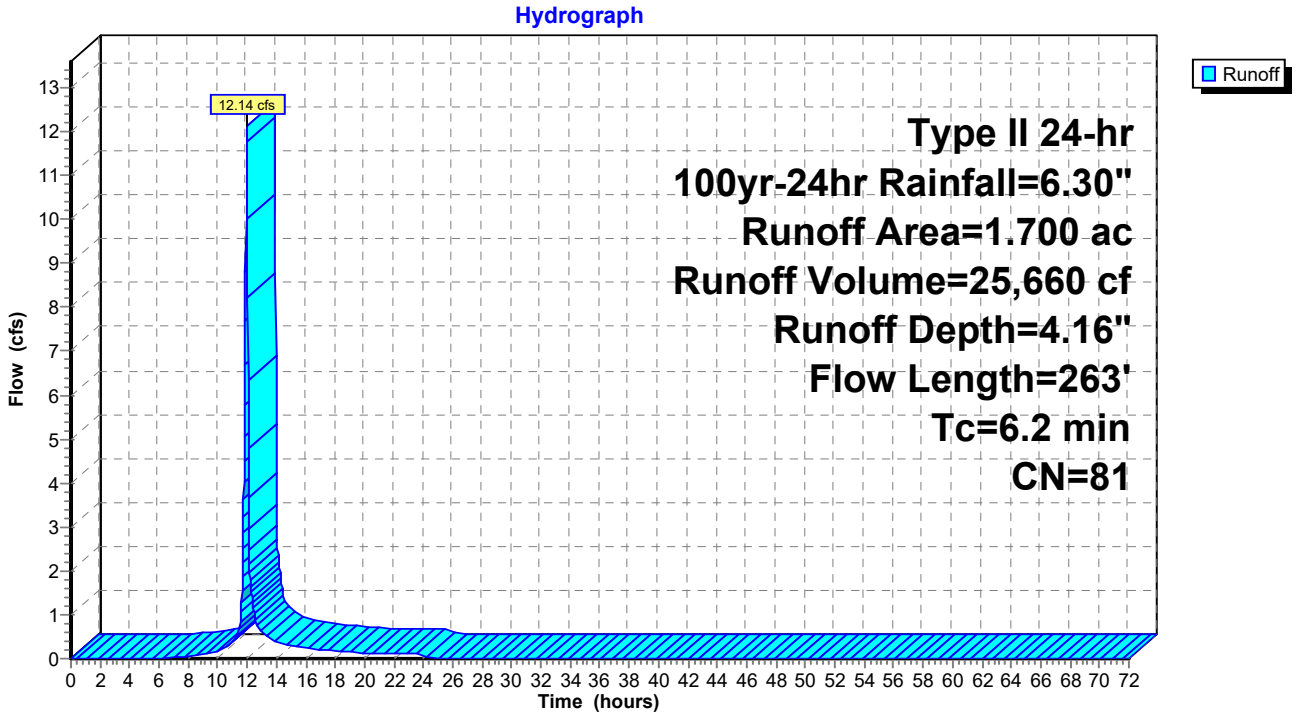
Runoff = 12.14 cfs @ 11.97 hrs, Volume= 25,660 cf, Depth= 4.16"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

	Area (ac)	CN	Description
*	1.000	78	Row crops, straight row, Good, HSG B
	0.700	85	Row crops, straight row, Good, HSG C
	1.700	81	Weighted Average
	1.700	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.0327	0.48		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
2.8	163	0.0113	0.96		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.2	263	Total			

Subcatchment B-1: Outlot (By Others)



Summary for Subcatchment B-2: Outlot (By Others)

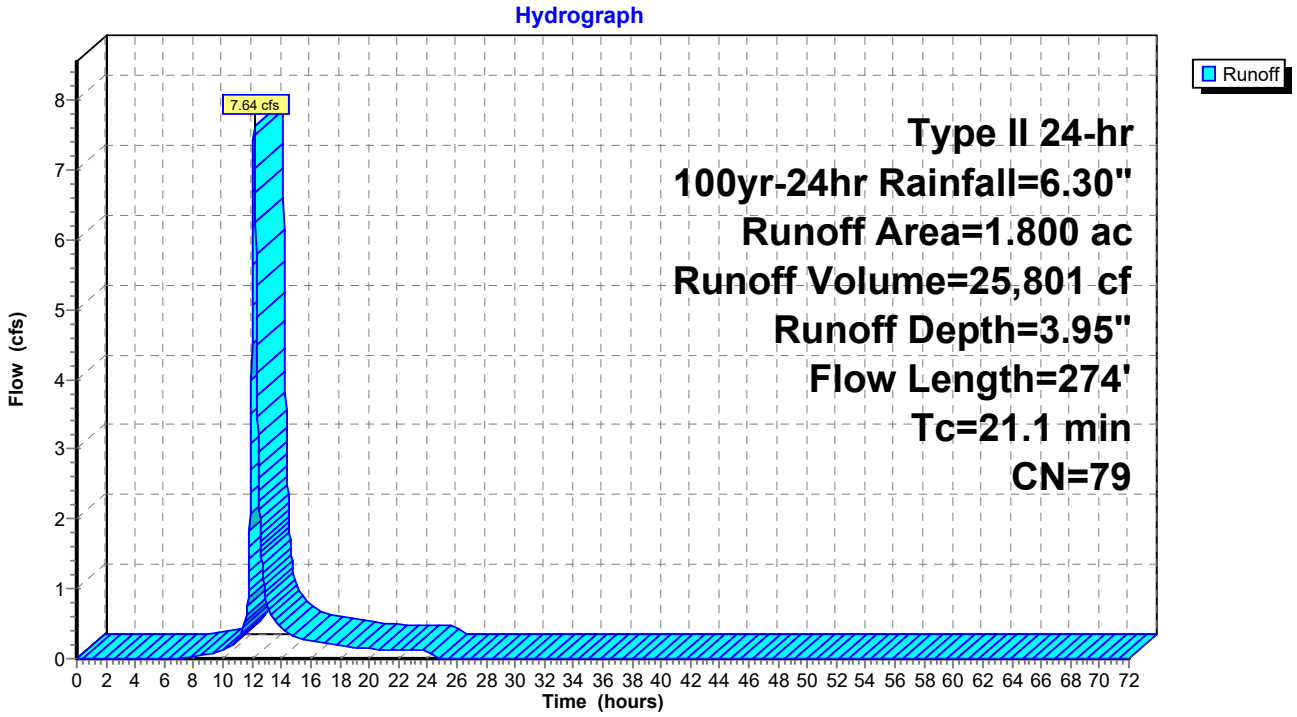
Runoff = 7.64 cfs @ 12.13 hrs, Volume= 25,801 cf, Depth= 3.95"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

	Area (ac)	CN	Description
*	1.500	78	Row crops, straight row, Good, HSG B
	0.300	85	Row crops, straight row, Good, HSG C
	1.800	79	Weighted Average
	1.800	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0130	0.33		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
16.1	174	0.0004	0.18		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
21.1	274	Total			

Subcatchment B-2: Outlot (By Others)



Summary for Subcatchment C-2: Undetained 2

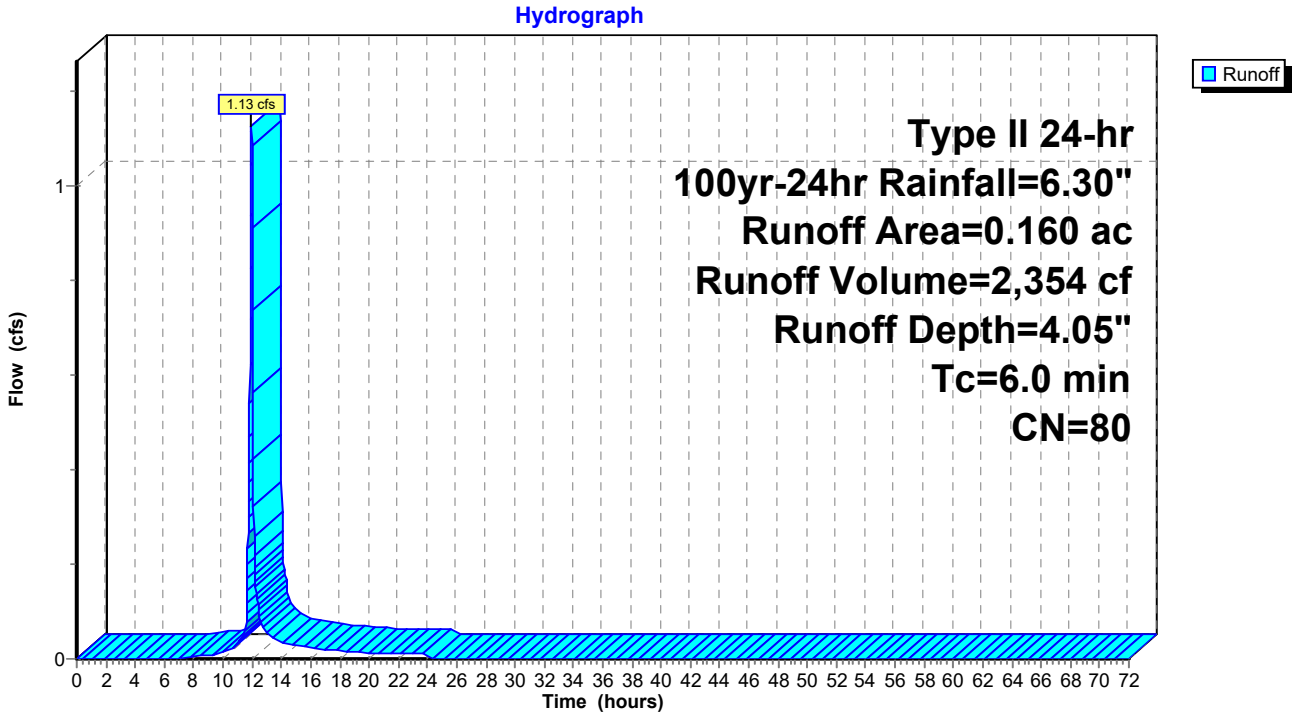
Runoff = 1.13 cfs @ 11.97 hrs, Volume= 2,354 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.160	80	>75% Grass cover, Good, HSG D
0.160	80	100.00% Pervious Area

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

Subcatchment C-2: Undetained 2



Summary for Subcatchment C-3: Undetained 3

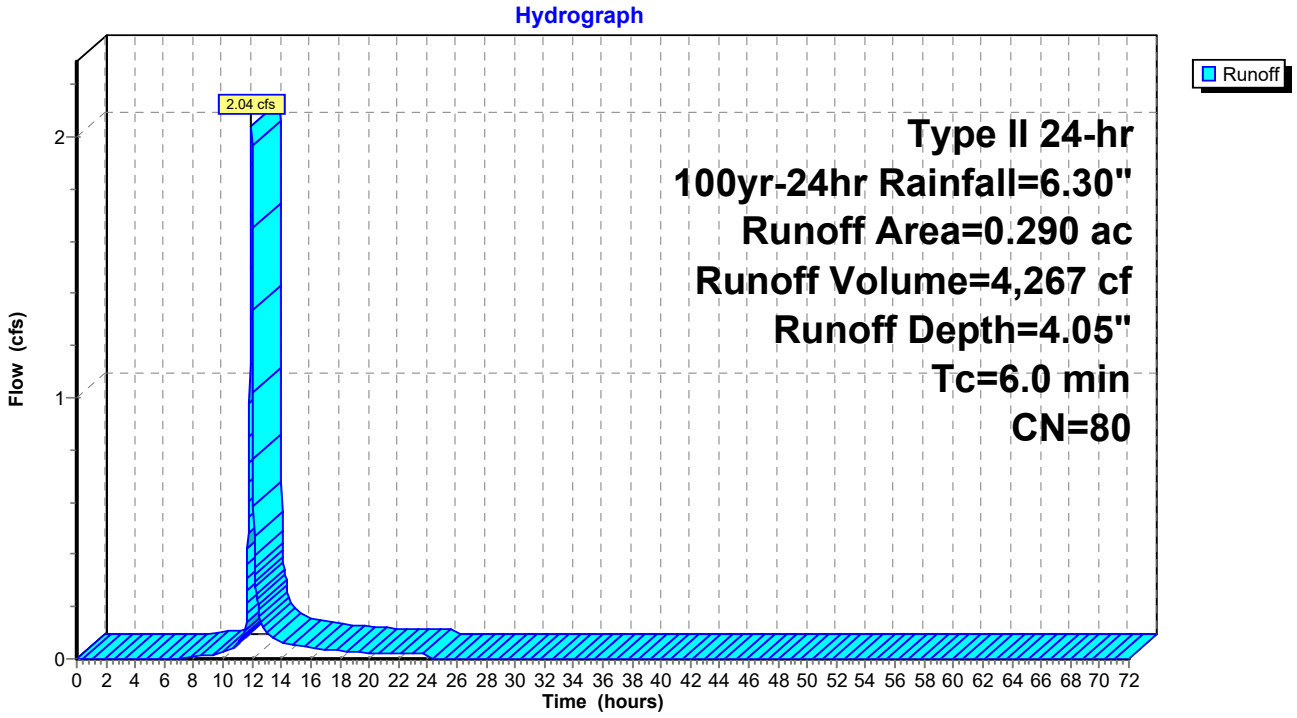
Runoff = 2.04 cfs @ 11.97 hrs, Volume= 4,267 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
0.290	80	100.00% Pervious Area

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

Subcatchment C-3: Undetained 3



Summary for Subcatchment C-4: Undetained 4

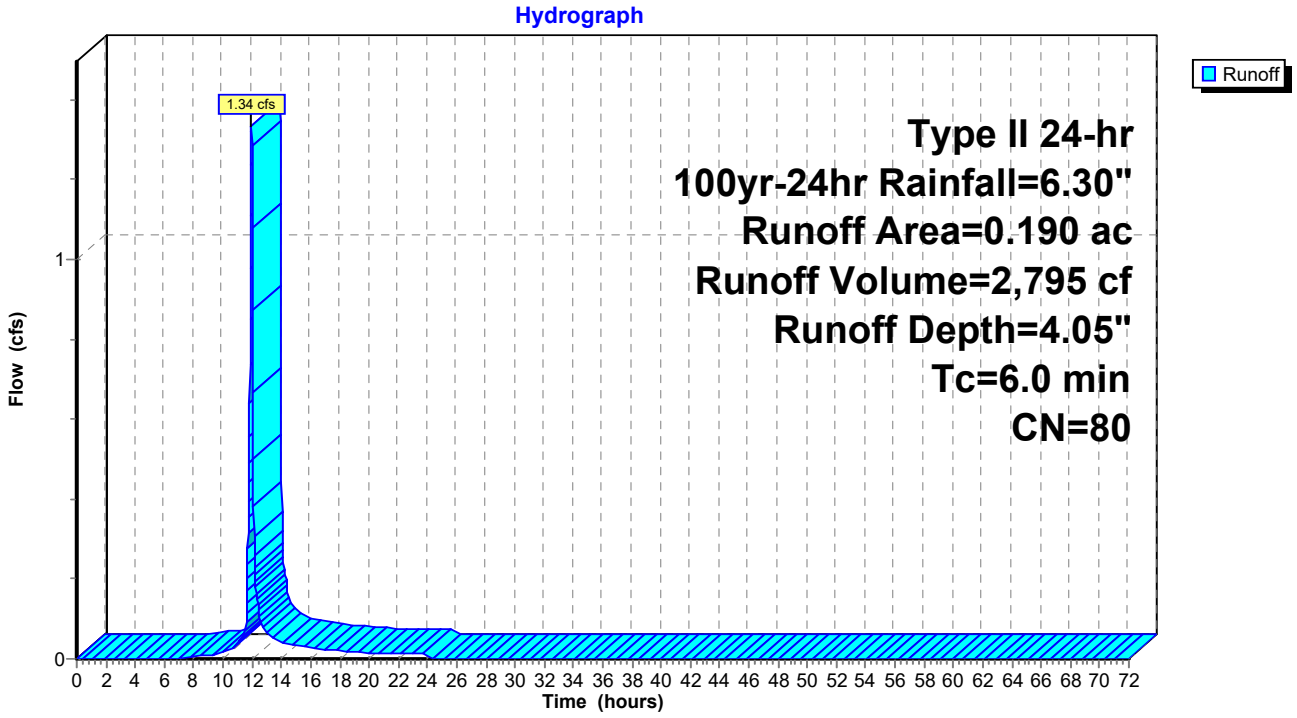
Runoff = 1.34 cfs @ 11.97 hrs, Volume= 2,795 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.190	80	>75% Grass cover, Good, HSG D
0.190	80	100.00% Pervious Area

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

Subcatchment C-4: Undetained 4



Summary for Subcatchment C-5: Undetained 5

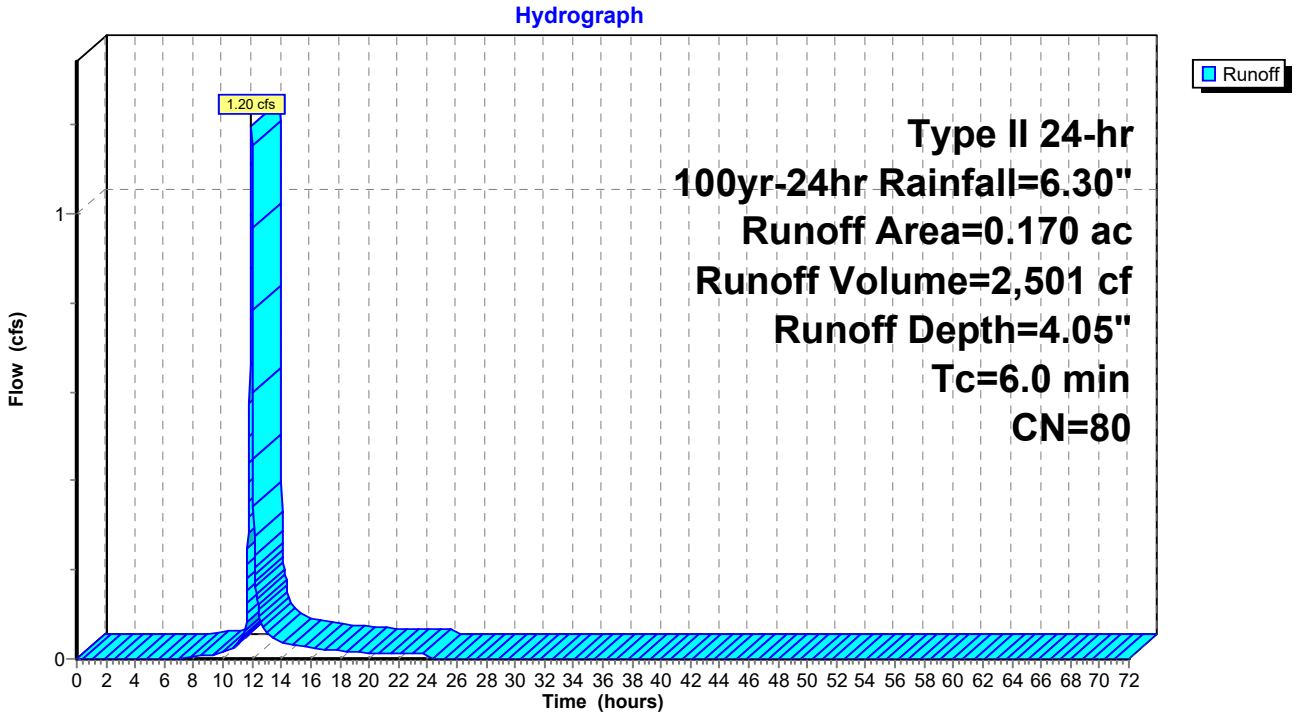
Runoff = 1.20 cfs @ 11.97 hrs, Volume= 2,501 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.170	80	>75% Grass cover, Good, HSG D
0.170	80	100.00% Pervious Area

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

Subcatchment C-5: Undetained 5



Summary for Subcatchment C-6: Undetained 6

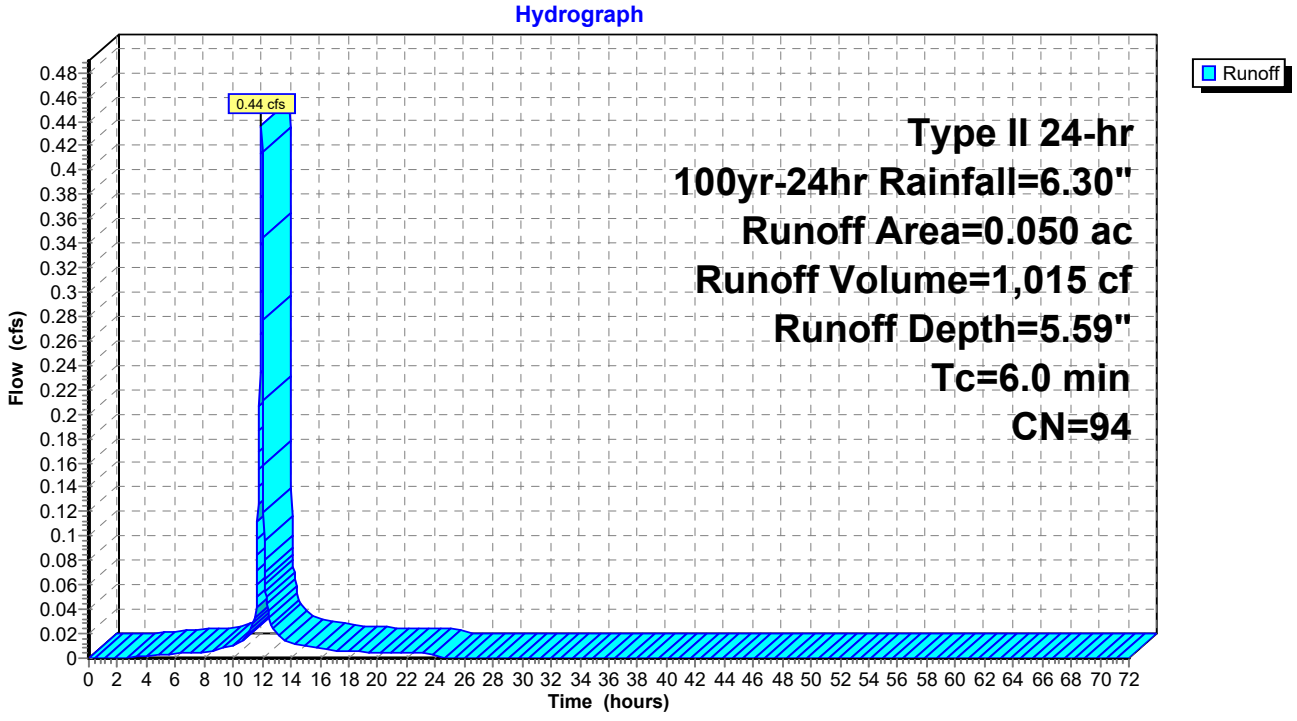
Runoff = 0.44 cfs @ 11.97 hrs, Volume= 1,015 cf, Depth= 5.59"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG D
0.010	80	>75% Grass cover, Good, HSG D
0.050	94	Weighted Average
0.010	80	20.00% Pervious Area
0.040	98	80.00% Impervious Area

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

Subcatchment C-6: Undetained 6



Summary for Subcatchment C-7: Undetained 7

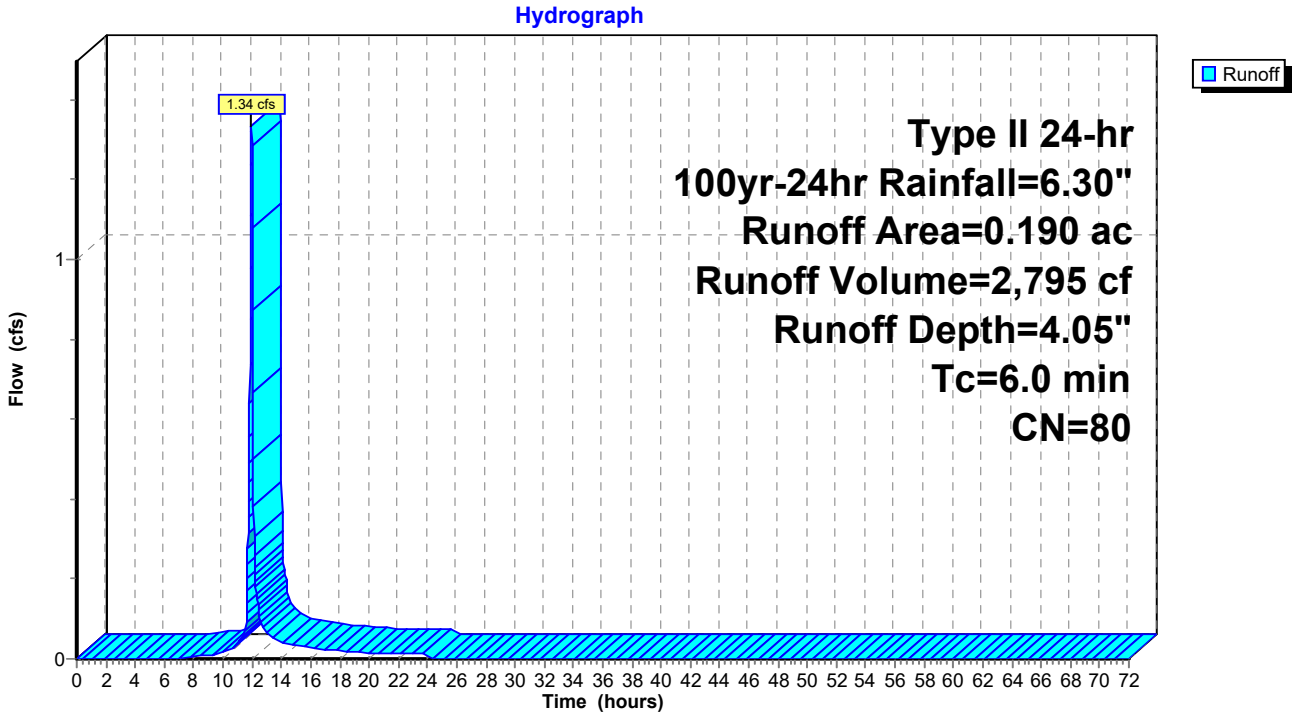
Runoff = 1.34 cfs @ 11.97 hrs, Volume= 2,795 cf, Depth= 4.05"
Routed to Link 4L : Total Site Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
0.190	80	>75% Grass cover, Good, HSG D
0.190	80	100.00% Pervious Area

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

Subcatchment C-7: Undetained 7



Summary for Subcatchment D-1: North Offsite Bypass

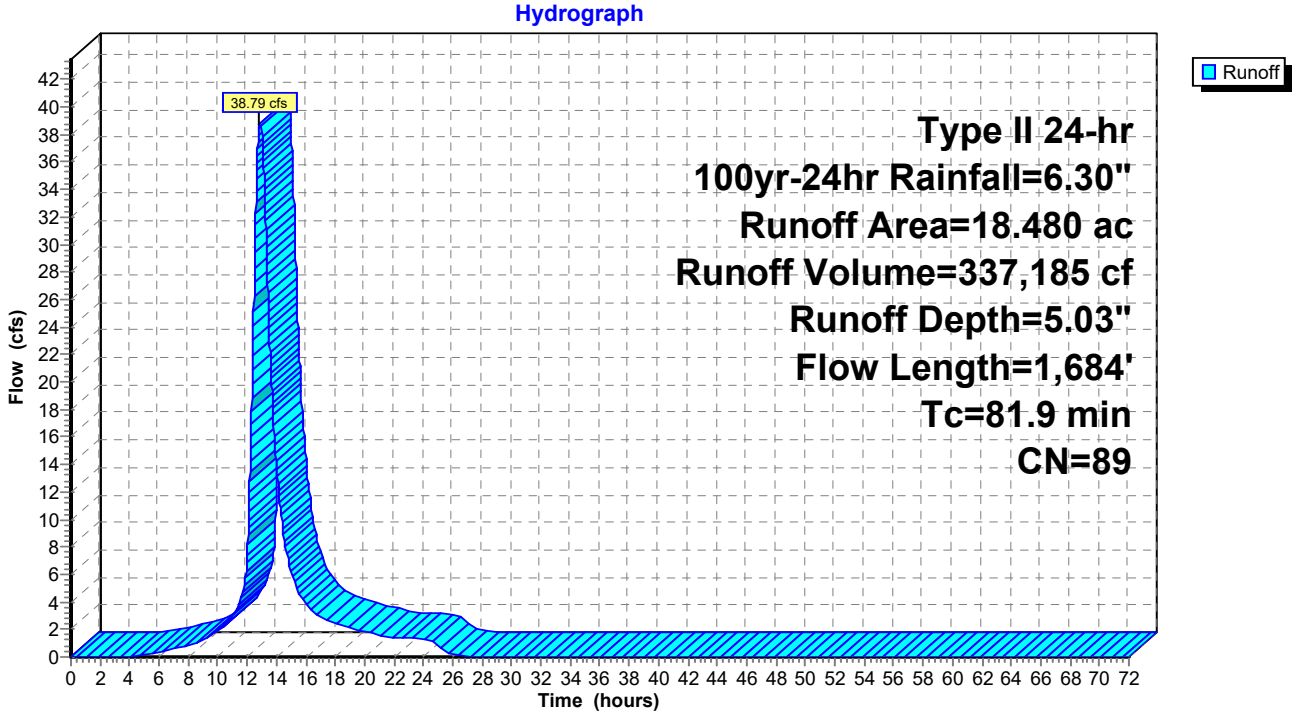
Runoff = 38.79 cfs @ 12.85 hrs, Volume= 337,185 cf, Depth= 5.03"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
18.480	89	Row crops, straight row, Good, HSG D
18.480	89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0075	0.27		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
75.7	1,584	0.0015	0.35		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
81.9	1,684	Total			

Subcatchment D-1: North Offsite Bypass



Summary for Subcatchment D-2: North Offsite Bypass

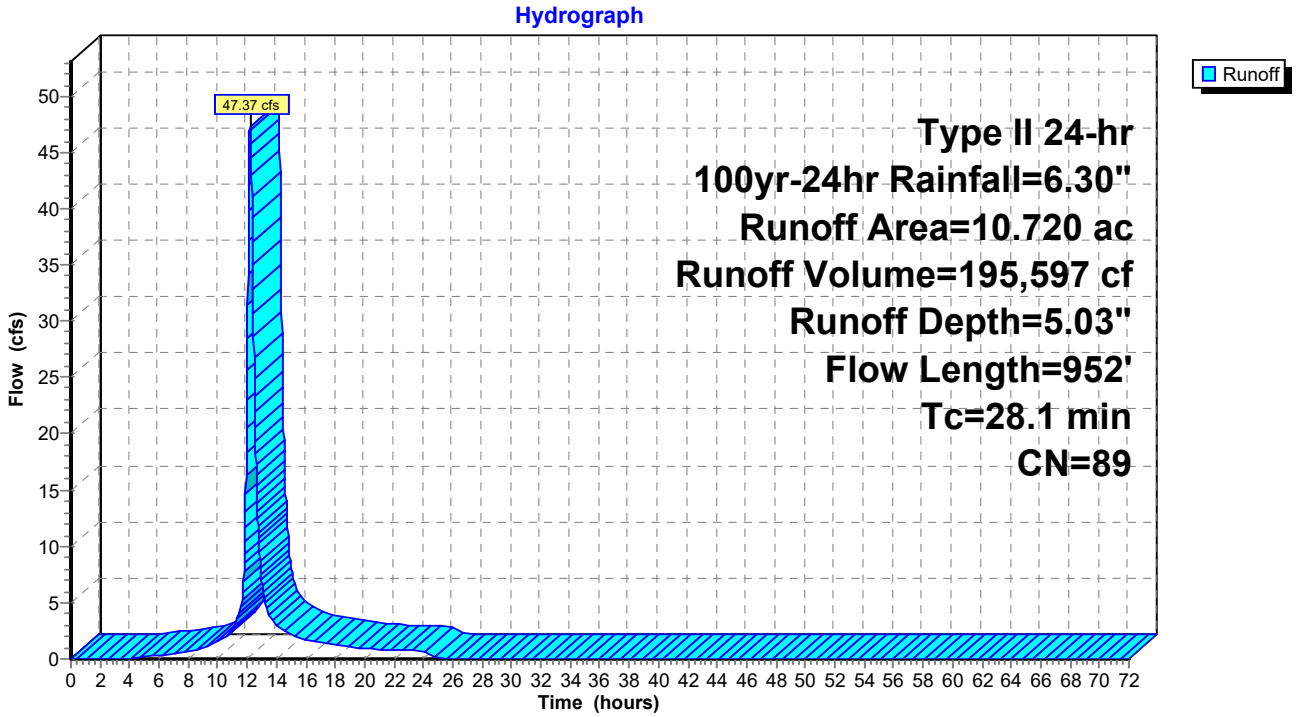
Runoff = 47.37 cfs @ 12.21 hrs, Volume= 195,597 cf, Depth= 5.03"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
10.720	89	Row crops, straight row, Good, HSG D
10.720	89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0090	0.29		**Sheet Flow,** Fallow n= 0.050 P2= 3.02"
22.3	852	0.0050	0.64		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
28.1	952	Total			

Subcatchment D-2: North Offsite Bypass



Summary for Subcatchment Out A: Outlot A

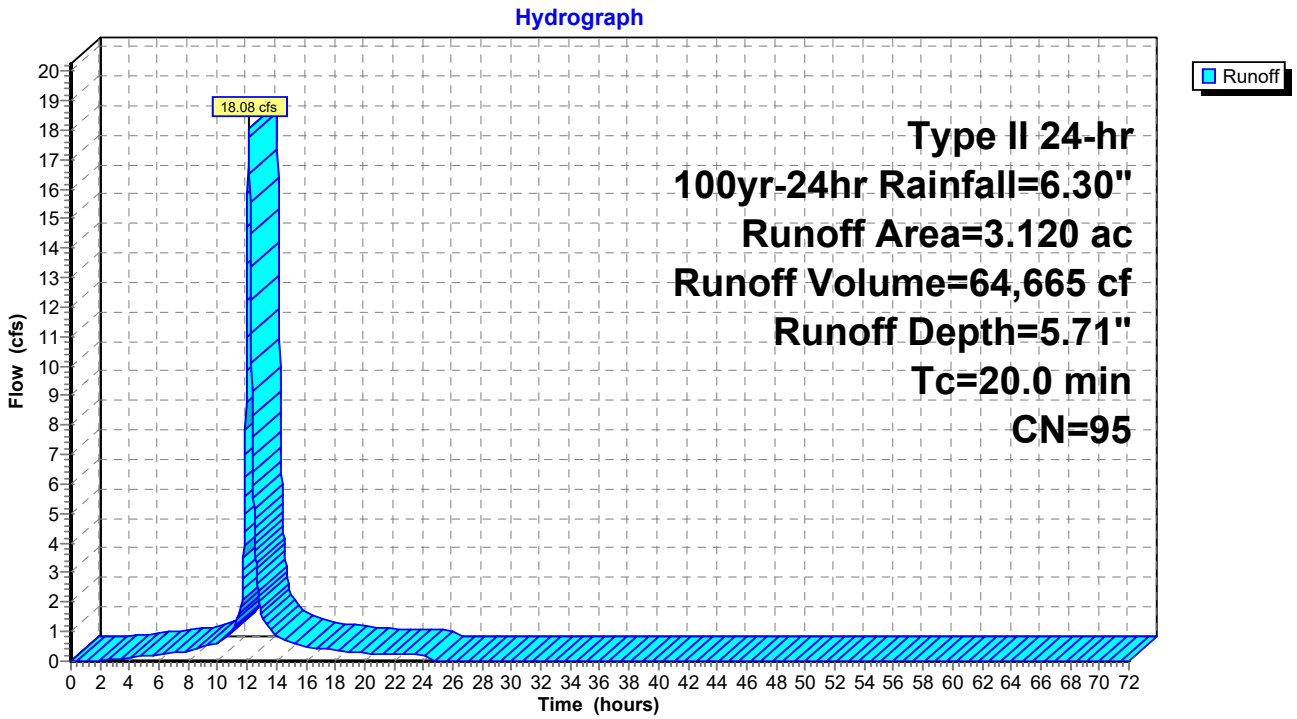
Runoff = 18.08 cfs @ 12.12 hrs, Volume= 64,665 cf, Depth= 5.71"
Routed to Pond 2P : AG-S & UG-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
3.120	95	Urban commercial, 85% imp, HSG D
0.468	78	15.00% Pervious Area
2.652	98	85.00% Impervious Area

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

Subcatchment Out A: Outlot A



Summary for Subcatchment Out B: Outlot B

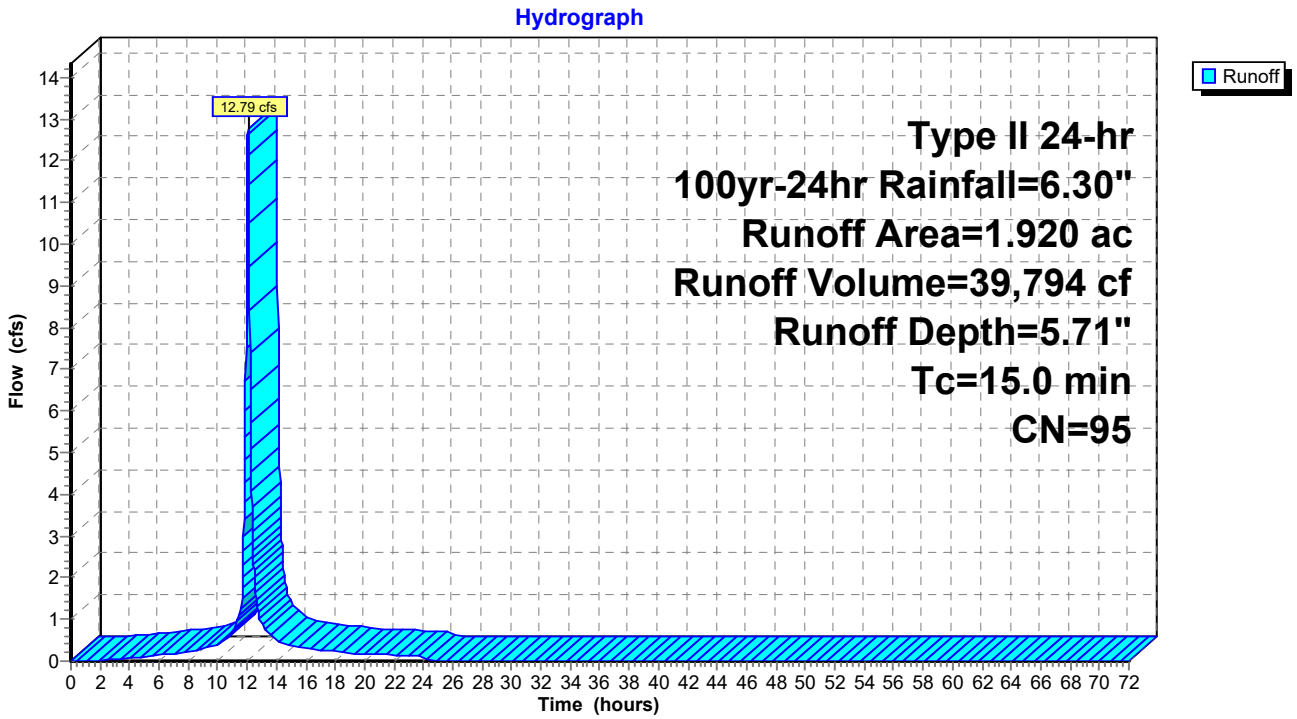
Runoff = 12.79 cfs @ 12.06 hrs, Volume= 39,794 cf, Depth= 5.71"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
1.920	95	Urban commercial, 85% imp, HSG D
0.288	78	15.00% Pervious Area
1.632	98	85.00% Impervious Area

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

Subcatchment Out B: Outlot B



Summary for Subcatchment Out C: Outlot C

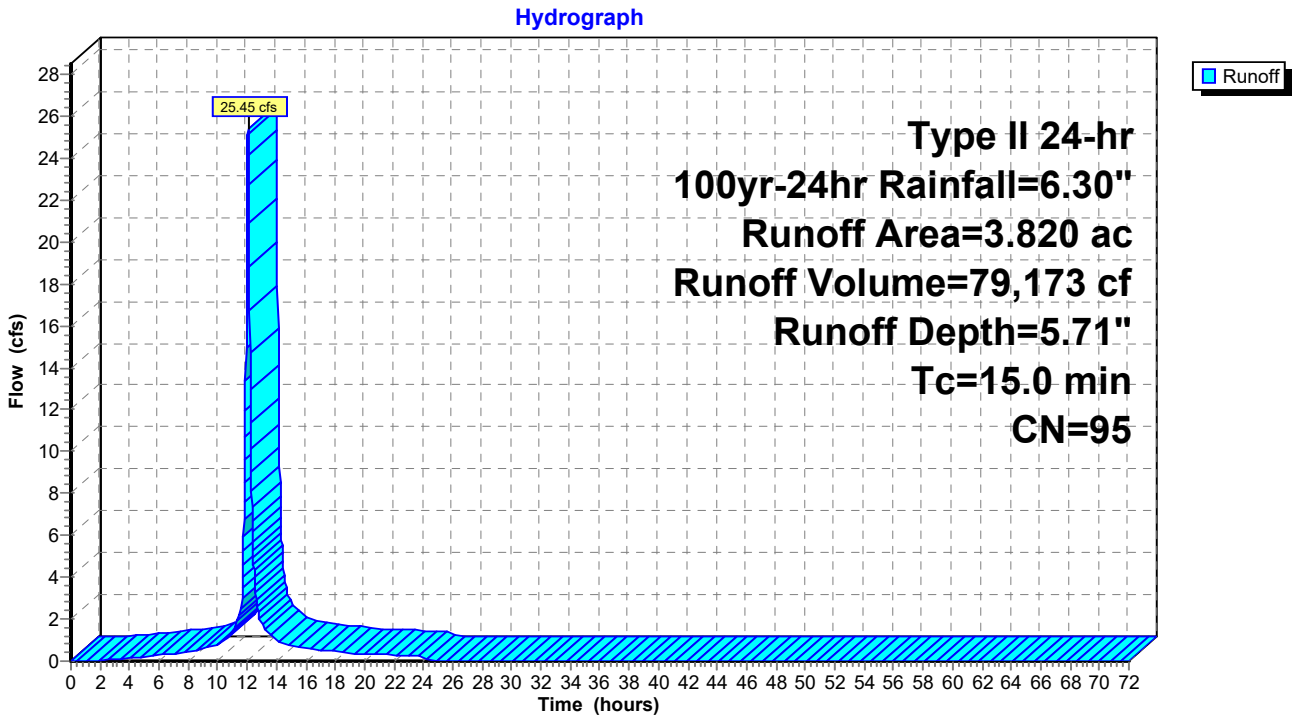
Runoff = 25.45 cfs @ 12.06 hrs, Volume= 79,173 cf, Depth= 5.71"
Routed to Pond 1P : AG-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100yr-24hr Rainfall=6.30"

Area (ac)	CN	Description
3.820	95	Urban commercial, 85% imp, HSG D
0.573	78	15.00% Pervious Area
3.247	98	85.00% Impervious Area

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

Subcatchment Out C: Outlot C



Summary for Pond 1P: AG-N

Inflow Area = 2,241,162 sf, 31.76% Impervious, Inflow Depth = 5.21" for 100yr-24hr event
Inflow = 190.01 cfs @ 12.08 hrs, Volume= 973,257 cf
Outflow = 61.91 cfs @ 12.75 hrs, Volume= 827,857 cf, Atten= 67%, Lag= 40.5 min
Primary = 6.78 cfs @ 12.75 hrs, Volume= 537,974 cf
Routed to Link 3L : Str. 3.00
Secondary = 55.12 cfs @ 12.75 hrs, Volume= 289,883 cf
Routed to Link 4L : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 884.86' @ 12.75 hrs Surf.Area= 94,632 sf Storage= 461,014 cf

Plug-Flow detention time= 635.9 min calculated for 827,627 cf (85% of inflow)
Center-of-Mass det. time= 568.4 min (1,377.3 - 808.9)

Volume	Invert	Avail.Storage	Storage Description
#1	877.29'	573,880 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

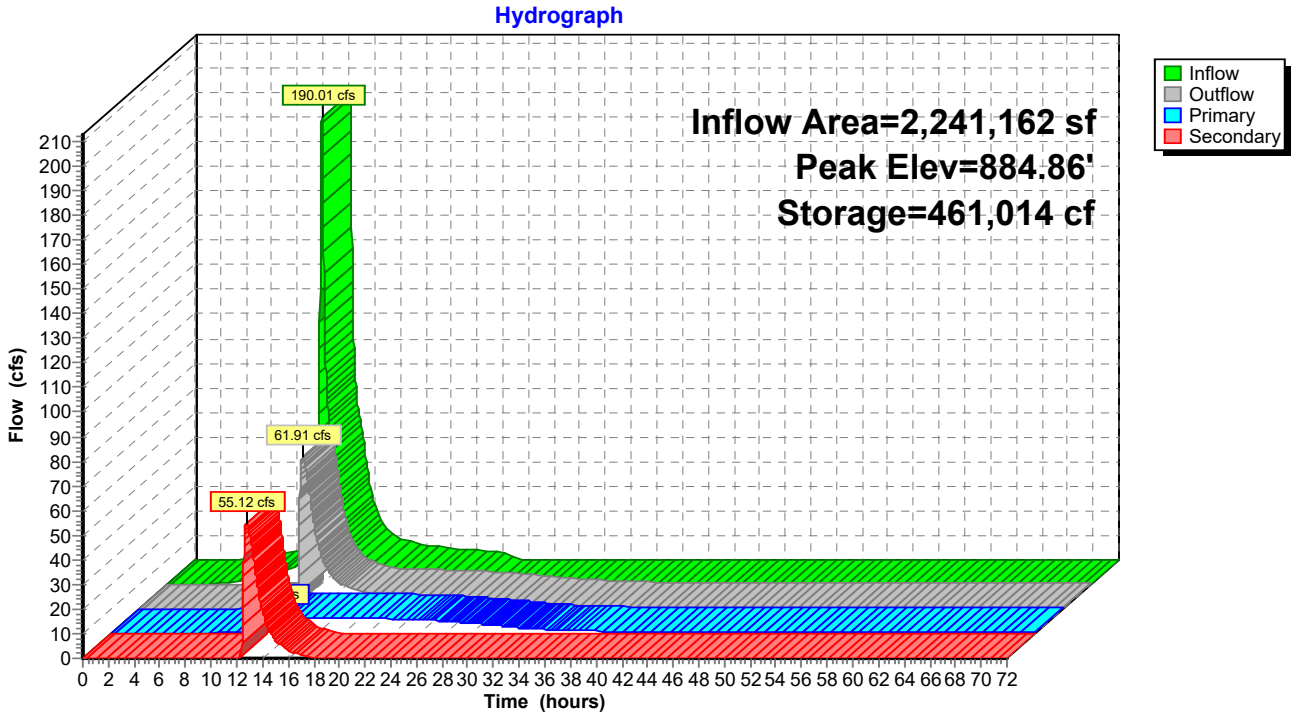
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
877.29	33,121	1,437.0	0	0	33,121
878.00	37,072	1,579.0	24,905	24,905	67,219
879.00	42,856	1,793.0	39,929	64,834	124,667
880.00	49,752	2,010.0	46,261	111,096	190,366
881.00	57,879	2,227.0	53,764	164,860	263,563
882.00	67,238	2,444.0	62,500	227,360	344,257
883.00	77,811	2,659.0	72,460	299,820	431,602
884.00	87,356	2,779.0	82,537	382,358	483,602
884.64	92,754	2,793.0	57,627	439,984	490,061
885.00	95,775	2,800.0	33,934	473,918	493,335
886.00	104,208	2,819.0	99,962	573,880	502,283

Device	Routing	Invert	Outlet Devices
#1	Primary	877.29'	**12.0" Round Culvert** L= 24.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 877.29' / 877.22' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	877.29'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	882.14'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	884.54'	**110.0' long + 3.0 '/' SideZ x 26.2' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.78 cfs @ 12.75 hrs HW=884.86' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 6.78 cfs of 10.06 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 1.14 cfs @ 13.11 fps)
└**3=Orifice/Grate** (Orifice Controls 5.64 cfs @ 7.18 fps)

Secondary OutFlow Max=55.11 cfs @ 12.75 hrs HW=884.86' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 55.11 cfs @ 1.53 fps)

Pond 1P: AG-N


Hydrograph
Inflow Area=2,241,162 sf
Peak Elev=884.86'
Storage=461,014 cf
190.01 cfs
61.91 cfs
55.12 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)

Summary for Pond 2P: AG-S & UG-S

Inflow Area = 361,548 sf, 75.20% Impervious, Inflow Depth = 5.49" for 100yr-24hr event
Inflow = 56.14 cfs @ 11.98 hrs, Volume= 165,538 cf
Outflow = 5.19 cfs @ 12.70 hrs, Volume= 165,518 cf, Atten= 91%, Lag= 43.3 min
Primary = 5.19 cfs @ 12.70 hrs, Volume= 165,518 cf
Routed to Link 3L : Str. 3.00
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 4L : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 884.29' @ 12.70 hrs Surf.Area= 21,848 sf Storage= 96,191 cf

Plug-Flow detention time= 678.6 min calculated for 165,472 cf (100% of inflow)
Center-of-Mass det. time= 679.0 min (1,451.1 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	877.38'	43,614 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2A	877.53'	22,031 cf	**80.00'W x 180.82'L x 7.00'H Underground Detention** 101,259 cf Overall - 46,183 cf Embedded = 55,076 cf x 40.0% Voids
#3A	878.03'	46,183 cf	**CMP Round 72** x 9 Inside #2 Effective Size= 72.0"W x 72.0"H => 28.27 sf x 20.00'L = 565.5 cf Overall Size= 72.0"W x 72.0"H x 20.00'L Row Length Adjustment= +152.82' x 28.27 sf x 9 rows 78.00' Header x 28.27 sf x 1 = 2,205.4 cf Inside
		111,827 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
877.38	1,605	205.0	0	0	1,605
878.00	2,000	220.0	1,115	1,115	2,129
879.00	2,697	245.0	2,340	3,455	3,083
880.00	3,462	265.0	3,072	6,527	3,934
881.00	4,284	284.0	3,866	10,392	4,808
882.00	5,163	303.0	4,717	15,109	5,743
883.00	6,098	321.0	5,624	20,733	6,690
884.00	7,090	340.0	6,588	27,321	7,742
885.00	8,138	359.0	7,608	34,929	8,855
885.90	9,130	376.0	7,766	42,695	9,903
886.00	9,248	378.0	919	43,614	10,029

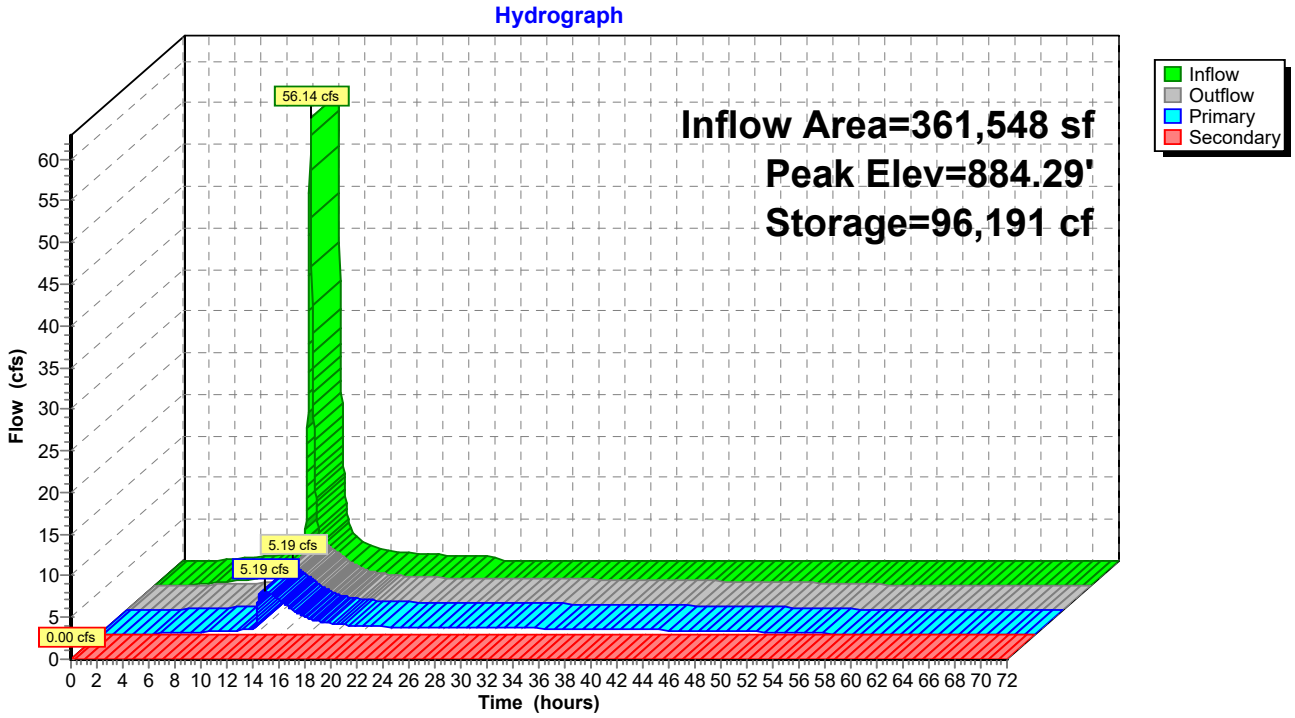
Device	Routing	Invert	Outlet Devices
#1	Primary	877.38'	**15.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 877.38' / 877.22' S= 0.0040 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	877.38'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	882.61'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	885.40'	**25.0' long + 3.0 '/' SideZ x 53.8' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.19 cfs @ 12.70 hrs HW=884.29' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 5.19 cfs of 14.81 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 1.09 cfs @ 12.50 fps)
└**3=Orifice/Grate** (Orifice Controls 4.10 cfs @ 5.22 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=877.38' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond 2P: AG-S & UG-S

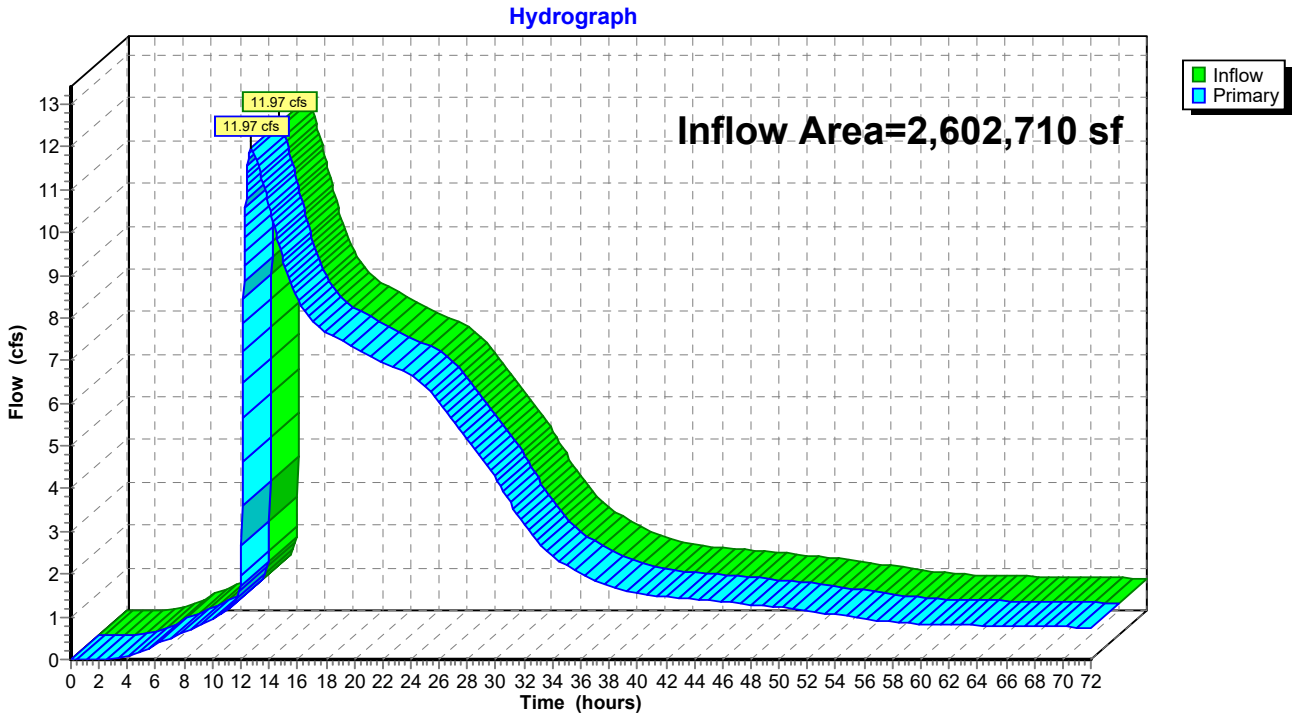


Summary for Link 3L: Str. 3.00

Inflow Area = 2,602,710 sf, 37.79% Impervious, Inflow Depth > 3.24" for 100yr-24hr event
Inflow = 11.97 cfs @ 12.72 hrs, Volume= 703,492 cf
Primary = 11.97 cfs @ 12.72 hrs, Volume= 703,492 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Total Site Runoff

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link 3L: Str. 3.00

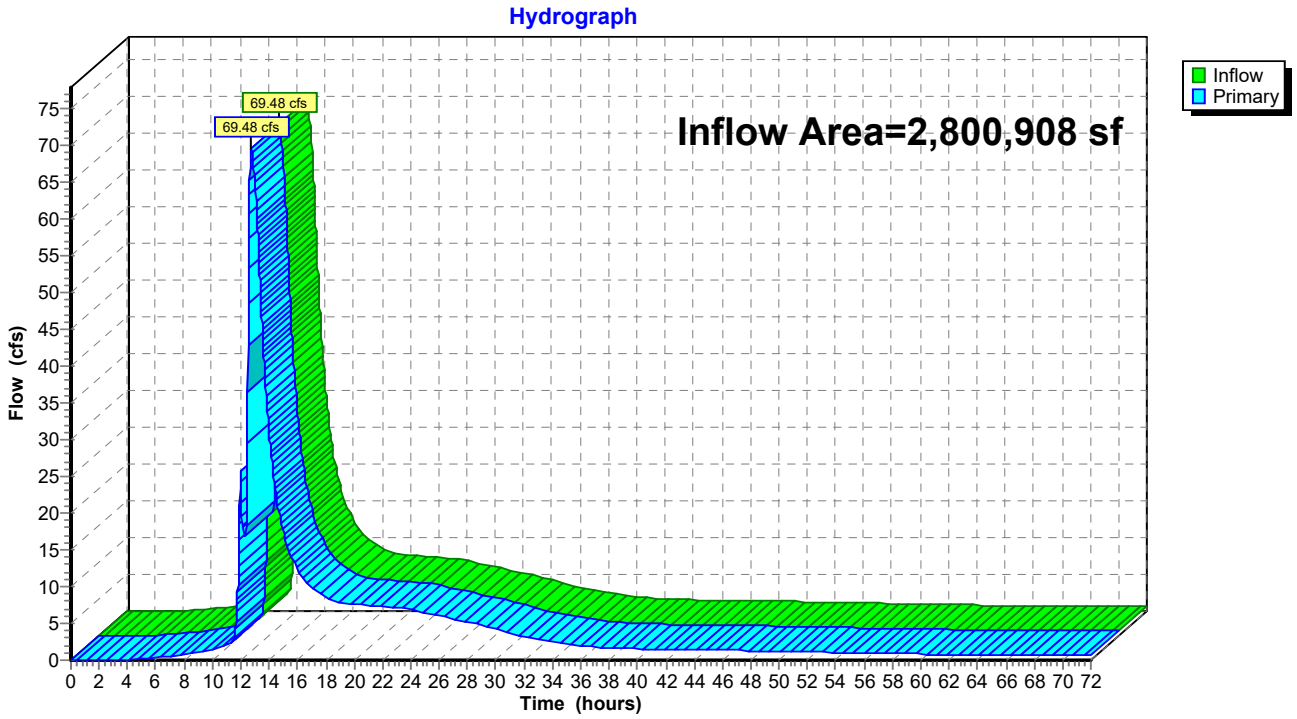


Summary for Link 4L: Total Site Runoff

Inflow Area = 2,800,908 sf, 35.18% Impervious, Inflow Depth > 4.54" for 100yr-24hr event
Inflow = 69.48 cfs @ 12.74 hrs, Volume= 1,060,563 cf
Primary = 69.48 cfs @ 12.74 hrs, Volume= 1,060,563 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link 4L: Total Site Runoff



1.3 – EMERGENCY SPILLWAY CALCULATIONS

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Jan 10 2025

North Detention Basin - Emergency Spillway

Trapezoidal

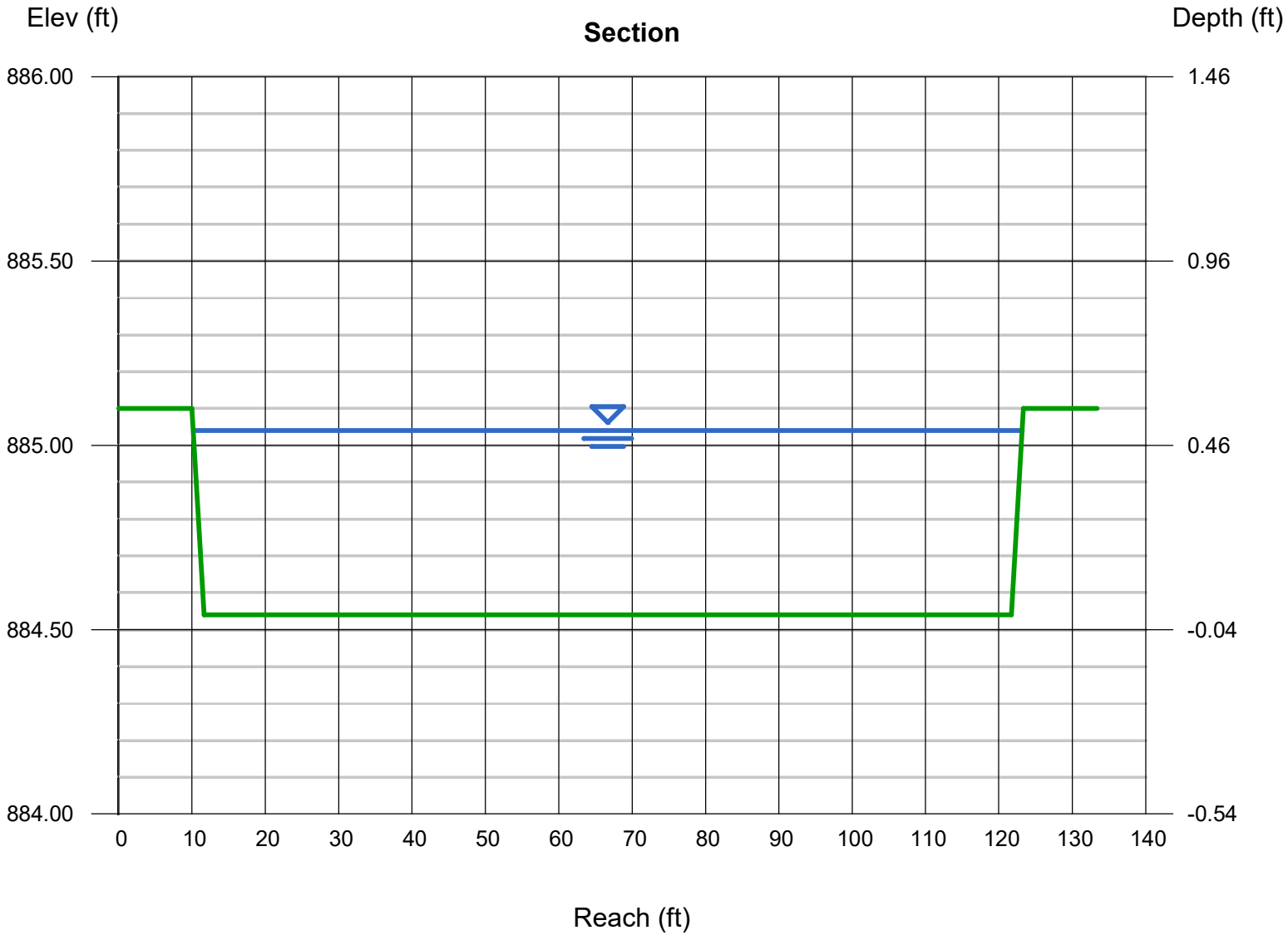
Bottom Width (ft)	= 110.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 0.56
Invert Elev (ft)	= 884.54
Slope (%)	= 2.00
N-Value	= 0.025

Calculations

Compute by:	Known Q
Known Q (cfs)	= 288.76

Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 288.76
Area (sqft)	= 55.75
Velocity (ft/s)	= 5.18
Wetted Perim (ft)	= 113.16
Crit Depth, Yc (ft)	= 0.56
Top Width (ft)	= 113.00
EGL (ft)	= 0.92



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Jan 10 2025

South Detention Basin Emergency Spillway

Trapezoidal

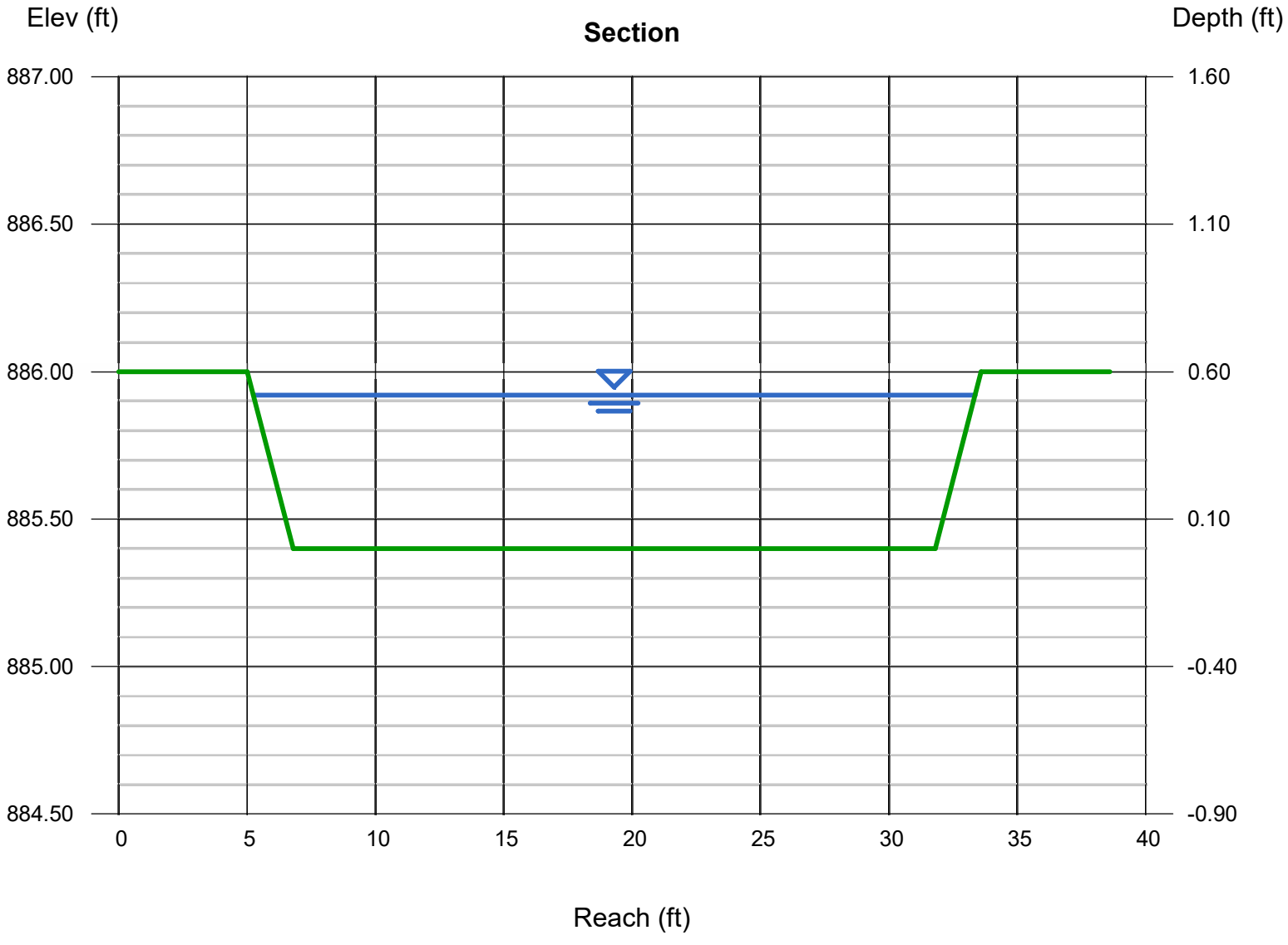
Bottom Width (ft)	= 25.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 0.60
Invert Elev (ft)	= 885.40
Slope (%)	= 2.00
N-Value	= 0.025

Calculations

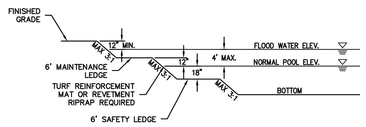
Compute by:	Known Q
Known Q (cfs)	= 70.41

Highlighted

Depth (ft)	= 0.52
Q (cfs)	= 70.41
Area (sqft)	= 13.81
Velocity (ft/s)	= 5.10
Wetted Perim (ft)	= 28.29
Crit Depth, Yc (ft)	= 0.60
Top Width (ft)	= 28.12
EGL (ft)	= 0.92



1.4 – STORMWATER DETAILS



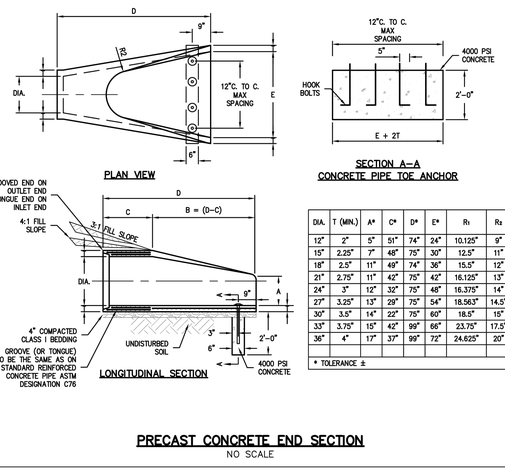
POND SECTION

NOTES:

1. GENERAL
   - A. ALL PONDS, INCLUDING THOSE NOT USED FOR DETENTION/RETENTION SHALL INCORPORATE APPLICABLE REQUIREMENTS BELOW. PONDS SHALL MEET THE REQUIREMENTS OF THE TOWN'S STORMWATER MANAGEMENT ORDINANCE AND THE HENDRICKS COUNTY STORMWATER TECHNICAL STANDARDS MANUAL UNLESS OTHERWISE NOTED.
2. ACCESS
   - A. PROVIDE INGRESS AND EGRESS FROM A NEARBY ROAD AND A SAFETY RAMP INTO THE POND.
   - B. SAFETY RAMP SHALL BE A MINIMUM OF 20 FEET WIDE AND MAXIMUM EXIT SLOPE OF 6H:1V.
3. WET POND DESIGN
   - A. MAXIMUM GROUND SLOPE AND POND DIMENSIONS SHALL BE AS SHOWN.
   - B. POND SHALL BE DESIGNED TO PREVENT STAGNATION OF WATER. POND DESIGN SHALL CONSIDER SHAPE, DEPTH, VEGETATIVE BUFFERS, AND OTHER METHODS TO ENCOURAGE A WELL – FUNCTIONING POND. THE TOWN MAY REQUIRE SURFACE OR SUBMERGED AERATION EQUIPMENT IF POND STAGNATION IS A CONCERN.
4. DRY POND DESIGN
   - A. AN UNDERDRAIN IS REQUIRED.
   - B. MAXIMUM GROUND SLOPE SHALL BE 3H:1V. PROTECT SIDE SLOPES WITH TURF REINFORCEMENT MAT.

DETENTION/RETENTION PONDS
NO SCALE

TOWN OF BROWNSBURG
DETAIL NO. EW-04
REVISION DATE: SEPT 2016



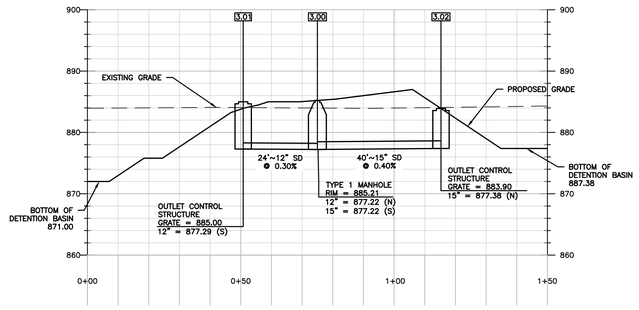
DIA.	T (MIN.)	A*	C*	D*	E*	R1	R2	APPROX. WEIGHT
12"	2"	5"	51"	74"	24"	10.125"	9"	800
15"	2.25"	7"	48"	75"	30"	12.5"	11"	1100
18"	2.5"	11"	49"	74"	36"	15.5"	12"	1300
21"	2.75"	11"	42"	75"	42"	16.125"	13"	1500
24"	3"	12"	32"	75"	48"	16.375"	14"	1800
27"	3.25"	13"	29"	75"	54"	18.563"	14.5"	2100
30"	3.5"	14"	22"	75"	60"	18.5"	15"	2400
33"	3.75"	15"	42"	99"	66"	23.75"	17.5"	4100
36"	4"	17"	37"	99"	72"	24.625"	20"	4200

* TOLERANCE ±

PRECAST CONCRETE END SECTION
NO SCALE

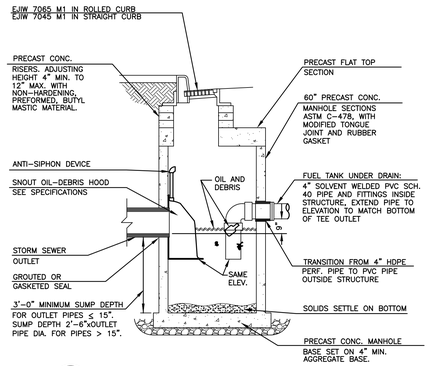
TOWN OF BROWNSBURG
DETAIL NO. SW-09
REVISION DATE: SEPT 2016

B1 TOWN OF BROWNSBURG STORM DETAILS
HORIZ: 1"= 20' VERT: 1"=10'

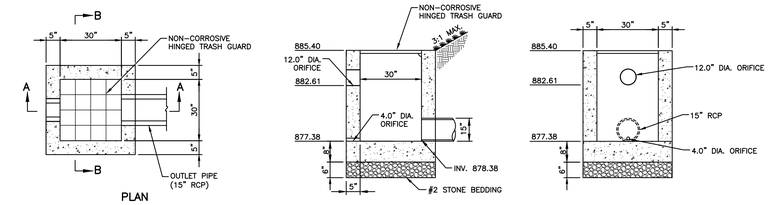


SECTION A-A

A1 DETENTION BASIN CROSS SECTION A-A
HORIZ: 1"= 20' VERT: 1"=10'



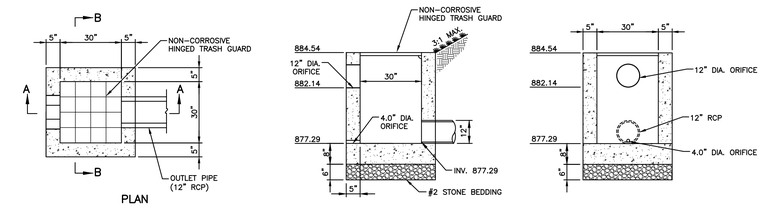
D3 ENVIRONMENTAL CATCH BASIN (mEXPRESS)
NTS



NOTE: CONCRETE SHALL BE PRECAST.

STRUCTURE 3.02
SOUTH POND OUTLET DETAIL
NO SCALE

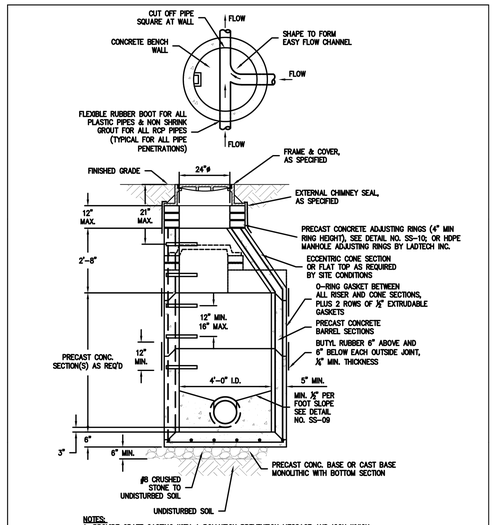
D4 POND 2 OUTLET STRUCTURE (SOUTH)
NTS



NOTE: CONCRETE SHALL BE PRECAST.

STRUCTURE 3.01
NORTH POND OUTLET DETAIL
NO SCALE

C4 POND 1 OUTLET STRUCTURE (NORTH)
NTS



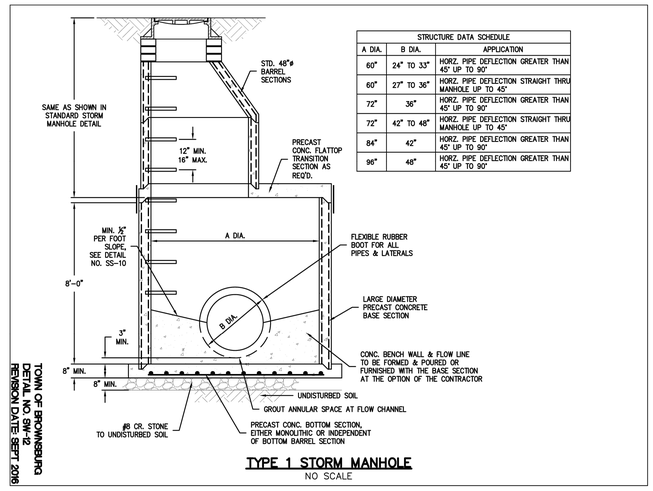
NOTES:
1. PROVIDE GRATE CASTING WITH A POLLUTION PREVENTION MESSAGE AND ICON WHICH ARE PERMANENTLY ATTACHED OR CAST DIRECTLY INTO THE CASTING. THE CASTING SHALL HAVE THE MESSAGE "DUMP NO WASTE <FISH ICON> DRAINS TO WATERWAY" IN MINIMUM 1 INCH HIGH LETTERS.
2. INSTALL CASTING ¾" BELOW FINISHED PAVEMENT ELEVATION.

STANDARD STORM MANHOLE
NO SCALE

REFER TO SPEC SECTION 02720

TOWN OF BROWNSBURG
DETAIL NO. SW–11
REVISION DATE: FEBRUARY 2024

Town standards can be found at www.brownsburg.org



STRUCTURE DATA SCHEDULE		
A DIA.	B DIA.	APPLICATION
60"	24" TO 33"	HORZ. PIPE DEFLECTION GREATER THAN 45° UP TO 90°
60"	27" TO 36"	HORZ. PIPE DEFLECTION STRAIGHT THRU MANHOLE UP TO 45°
72"	36"	HORZ. PIPE DEFLECTION GREATER THAN 45° UP TO 90°
72"	42" TO 48"	HORZ. PIPE DEFLECTION STRAIGHT THRU MANHOLE UP TO 45°
84"	42"	HORZ. PIPE DEFLECTION GREATER THAN 45° UP TO 90°
96"	48"	HORZ. PIPE DEFLECTION GREATER THAN 45° UP TO 90°

TYPE 1 STORM MANHOLE
NO SCALE

TOWN OF BROWNSBURG
DETAIL NO. SW–12
REVISION DATE: SEPT 2016

A3 TOWN OF BROWNSBURG MANHOLE DETAILS
NTS

BENCHMARK:

THE BASIS OF ELEVATIONS HEREON IS NAVD 88 PER OBSERVATIONS OF SELECTED STATIONS IN THE NATIONAL GEODETIC SURVEY CONTINUOUSLY OPERATING REFERENCE STATION (NGS CORS) NETWORK.
MAG NAIL SET IN THE CORNER TOP OF THE CURB JOINT – SEE DRAWING FOR LOCATION.
ELEVATION = 889.36'

WOOLPERT
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4454 Idea Center Boulevard
Dayton, OH 45430
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meijer
2929 WALKER AVENUE
GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

STORMWATER DETAILS

ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

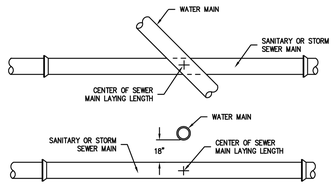
PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

C-705

Indiana 811 Know what's below. Call before you dig.

Images: _Xrefs: 10220046TBLK.dwg; 10220046GRA.dwg
Layout: C-705 Notes
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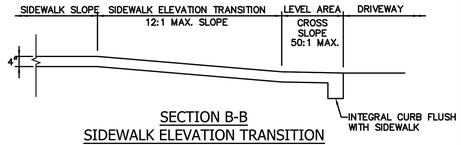


NOTES:
1. WATER MAIN AND SEWER MINIMUM SEPARATION: 18" VERTICAL SEPARATION 10'-0" HORIZONTAL SEPARATION.

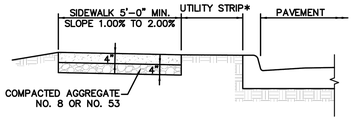
MINIMUM CROSSOVER AND SEPARATION REQUIREMENTS FOR SEWER & WATER MAINS

NO SCALE

TOWN OF BROWNSBURG
DETAIL NO. GE-02
REVISION DATE: SEPT 2016



SECTION B-B
SIDEWALK ELEVATION TRANSITION



SECTION A-A
SIDEWALK WITH UTILITY STRIP

* UTILITY STRIP WIDTH SHALL COMPLY WITH THE CURRENT TOWN OF BROWNSBURG SUBDIVISION CONTROL ORDINANCE AND CURRENT TOWN OF BROWNSBURG THOROUGHFARE PLAN.

CONCRETE SIDEWALK DETAIL

NO SCALE

NOTE:

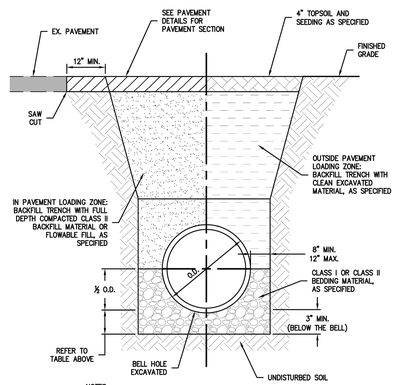
CONCRETE SIDEWALK SHALL BE INSTALLED ON COMPACTED SUBGRADE. NO. 8 OR NO. 53 STONE SHALL BE INSTALLED AND COMPACTED ON THE APPROVED SUBGRADE. CONCRETE SHALL BE INDOT CLASS A CONCRETE AND IT SHALL HAVE A 28-DAY MINIMUM CONCRETE COMPRESSIVE STRENGTH OF 4,000 PSI. WHERE A SIDEWALK PASSES THROUGH A DRIVE APPROACH, IT SHALL BE THE SAME THICKNESS AS THE ADJACENT CONCRETE DRIVE, THE CONCRETE EQUIVALENT FOR THE ADJACENT HMA DRIVE, OR SIX (6) INCHES, WHICHEVER IS GREATER.

REFER TO SPEC SECTION 02500, 02502

TOWN OF BROWNSBURG
DETAIL NO. TR-06
REVISION DATE: FEBRUARY 2024

Town standards can be found at www.brownsburg.org

PIPE SIZE	12" TO 15"	18" TO 30"	36" & OVER
BEDDING BELOW THE PIPE BARREL	4"	O.D. / 4	8"



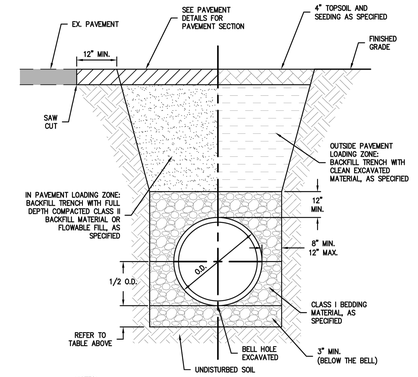
NOTES:
1. RIGID PIPE MATERIALS FOR STORM SEWERS INCLUDE DUCTILE IRON AND REINFORCED CONCRETE PIPE (RCP).
2. RIGID PIPE MATERIALS FOR SANITARY SEWERS INCLUDE DUCTILE IRON PIPE.
3. PAVEMENT LOADING ZONE IS THE AREA WITHIN 5 FEET OF ANY EDGE OF PAVEMENT, CURB, GUTTER, SIDEWALK OR SIMILAR STRUCTURE.

RIGID GRAVITY PIPE TRENCH

NO SCALE

TOWN OF BROWNSBURG
DETAIL NO. OT-02
REVISION DATE: SEPT 2016

PIPE SIZE	12" TO 15"	18" TO 30"	36" & OVER
BEDDING BELOW THE PIPE BARREL	4"	O.D. / 4	8"



NOTES:
1. INSTALLATION OF FLEXIBLE PIPE SHALL BE IN ACCORDANCE WITH ASTM D2321.
2. FLEXIBLE PIPE MATERIALS FOR STORM SEWERS INCLUDE HIGH DENSITY POLYETHYLENE (HDPE), POLYPROPYLENE, AND POLYVINYL CHLORIDE (PVC) PIPE.
3. FLEXIBLE PIPE MATERIALS FOR SANITARY SEWERS INCLUDE POLYVINYL CHLORIDE (PVC) PIPE.
4. PAVEMENT LOADING ZONE IS THE AREA WITHIN 5 FEET OF ANY EDGE OF PAVEMENT, CURB, GUTTER, SIDEWALK OR SIMILAR STRUCTURE.

FLEXIBLE GRAVITY PIPE TRENCH

NO SCALE

TOWN OF BROWNSBURG
DETAIL NO. OT-04
REVISION DATE: FEB 2017

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937.461.5660

meijer
2929 WALKER AVENUE
GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

TOWN OF BROWNSBURG DETAILS

ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

C-706

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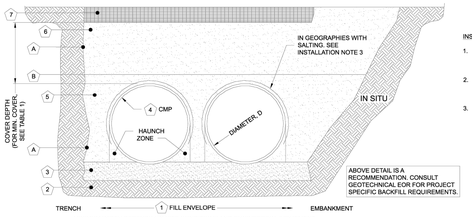


TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.

INSTALLATION NOTES

1. 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.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT A GEOMEMBRANE BARRIER IS RECOMMENDED OVER THE UPPER HALF OF THE PIPE. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.

TABLE 2: xFiltration

XFILTRATION® JOINT STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.50 × D	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.00 PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	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 FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	PIPE SHOULD BE PLACED ON THE FOUNDATION BOTTOM WITH A 4"-6" MINIMUM STONE DEPTH ROUGHLY SHAPPED TO FIT THE BOTTOM OF THE PIPE. IF THE ENGINEER OF RECORD DETERMINES THAT STONE BEDDING IS NOT NEEDED, THE PIPE MAY BE PLACED ON THE TRENCH BOTTOM SEPERATED WITH A NON-WOVEN GEOTEXTILE PLACED AT THE INVERT OF A RELATIVELY LOOSE MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH.	
4			CORRUGATED METAL PIPE	
5	BACKFILL	FREE-DRAINING, ANGULAR, NATURALLY OCCURING WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** APPROVED EQUAL * OR AASHTO	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. 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 SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	*IN
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION WHEN STONE BEDDING IS USED. IF NO STONE BEDDING IS USED, THEN SIDE GEOTEXTILE IS REQUIRED.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.
- APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO65166 Meijer ABE - Brownsburg, IN
72" Underground xFiltration - Rev2
Brownsburg, IN
DETENTION SYSTEM

PROJECT No.: 45892	SEQ. No.: 65166	DATE: 12/20/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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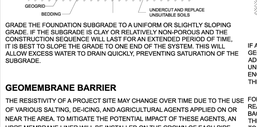
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.



GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

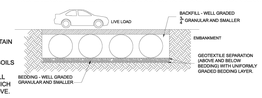
GEOMEMBRANE BARRIER

THE RESISTIVITY OF A PROJECT SITE MAY CHANGE OVER TIME DUE TO THE USE OF VARIOUS SALTING, DE-ICING, AND AGRICULTURAL AGENTS APPLIED ON OR NEAR THE AREA. TO MITIGATE THE POTENTIAL IMPACT OF THESE AGENTS, AN HDPE MEMBRANE LINER WILL BE INSTALLED ON THE CROWN OF EACH PIPE, CREATING AN IMPERMEABLE BARRIER. THIS MEASURE IS DESIGNED TO PROTECT THE SYSTEM FROM ENVIRONMENTAL CHANGES THAT COULD LEAD TO PREMATURE CORROSION AND REDUCE THE OVERALL SERVICE LIFE.

IN-SITU TRENCH WALL

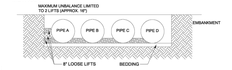
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



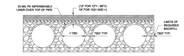
BACKFILL PLACEMENT

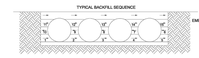
MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.



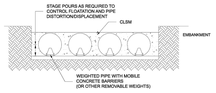
IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.





WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

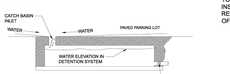


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

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.

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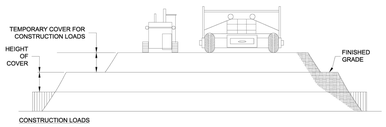
DATE	REVISION DESCRIPTION	BY

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9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO65166 Meijer ABE - Brownsburg, IN
72" Underground xFiltration - Rev2
Brownsburg, IN
DETENTION SYSTEM

PROJECT No.: 45892	SEQ. No.: 65166	DATE: 12/20/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		



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 DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

POLYMER COATED: AASHTO M-245 OR ASTM A-762

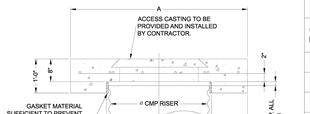
ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSPS (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.

REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION I OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) 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.

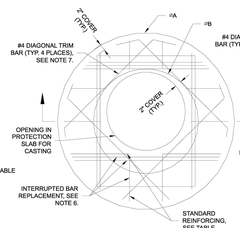
NOTE:
THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.



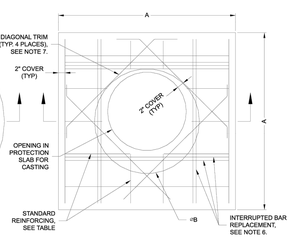
SECTION VIEW

REINFORCING TABLE				
ø CMP RISER	A	ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	ø 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	ø 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	ø 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	ø 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	ø 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 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 ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO65166 Meijer ABE - Brownsburg, IN
72" Underground xFiltration - Rev2
Brownsburg, IN
DETENTION SYSTEM

PROJECT No.: 45892	SEQ. No.: 65166	DATE: 12/20/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

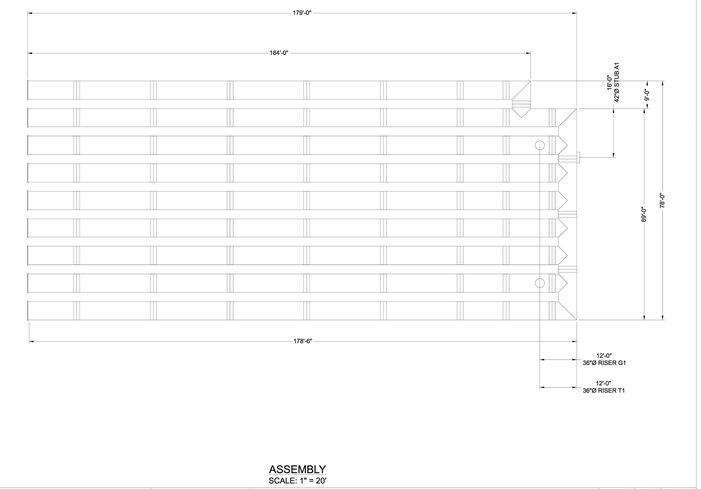
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,620 LF

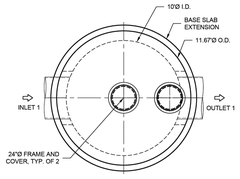
STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 68,080 CF
- PIPE STORAGE VOLUME = 45,804 CF
- BACKFILL STORAGE VOLUME = 22,412 CF
- TOTAL STORAGE PROVIDED = 68,216 CF
- STONE VOID = 40%

PIPE DETAILS
- DIAMETER = 72"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = X-FILTRATION
- BARREL SPACING = 36"

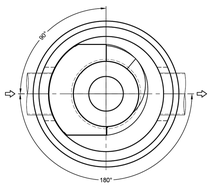
BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



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 OT



PLAN VIEW
INTERNALS NOT SHOWN



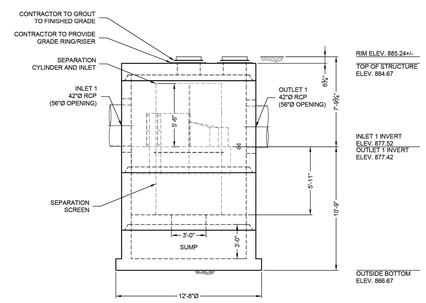
PLAN VIEW FOR PIPE ORIENTATION
TOP SLAB NOT SHOWN

MATERIAL LIST (PROVIDED BY CONTECH)

COUNT	DESCRIPTION	INSTALLED BY
1	5653-10 CONCENTRIC FIBERGLASS INSERT	CONTRACTOR
1	5653, 2400 micron, 5.71' O.D. x 5.42' SCREEN, GREEN FLANGE UP	CONTRACTOR
1	56 SERIES HARDWARE KIT	CONTRACTOR
1	SEALANT FOR JOINTS	CONTRACTOR
2	24"Ø X 4" FRAME AND COVER, EJ #41600389, OR EQUIV.	CONTRACTOR

SITE DESIGN DATA

WATER QUALITY FLOW RATE	9.46 CFS
PEAK FLOW RATE	53.09 CFS
RETURN PERIOD OF PEAK FLOW	100 YRS



ELEVATION VIEW

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 32500 LBS.
STRUCTURE IS DELIVERED IN 4 PIECES

MAX FOOTPRINT = 12.67'Ø

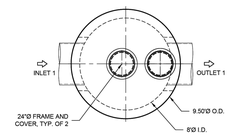
CONTECH
CONTRACT
DRAWING

CDS5653-10-C - 831258-15
MEIJER ABE - BROWNSBURG, IN
BROWNSBURG, IN
SITE DESIGNATION: 1.01 - WQU

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DATE: 12/12/24
DESIGNED: MDB | DRAWN: CER
CHECKED: MDB | APPROVED: MDB
PROJECT No.: 831258 | SEQUENCE No.: 15
SHEET: 1 OF 1
NCI
LAYOUT 1A

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PLAN VIEW
INTERNALS NOT SHOWN

INTERNAL COMPONENTS TO BE INSTALLED ON SITE BY CONTECH FIELD CONSULTANT. PLEASE CONTACT CONTECH FOR CURRENT INSTALLATION LEAD TIME



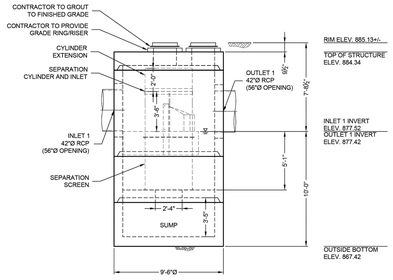
PLAN VIEW FOR PIPE ORIENTATION
TOP SLAB NOT SHOWN

MATERIAL LIST (PROVIDED BY CONTECH)

COUNT	DESCRIPTION	INSTALLED BY
1	4045-8 CONCENTRIC FIBERGLASS INSERT	CONTRACTOR
1	4045, 2400 micron, 4.1' O.D. x 4.58' SCREEN, GREEN FLANGE UP	CONTRACTOR
1	20, 30, 40 SERIES HARDWARE KIT	CONTRACTOR
1	40 SERIES, 3 FT. TALL CYLINDER EXTENSION	CONTRACTOR
1	SEALANT FOR JOINTS	CONTRACTOR
2	24"Ø X 4" FRAME AND COVER, EJ #41600389, OR EQUIV.	CONTRACTOR

SITE DESIGN DATA

WATER QUALITY FLOW RATE	6.58 CFS
PEAK FLOW RATE	42.08 CFS
RETURN PERIOD OF PEAK FLOW	100 YRS



ELEVATION VIEW

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
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3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
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C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 20000 LBS.
STRUCTURE IS DELIVERED IN 4 PIECES

MAX FOOTPRINT = 9.50'Ø

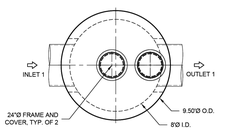
CONTECH
PROPOSAL
DRAWING

CDS4045-8-C - 831258-20
MEIJER ABE - BROWNSBURG, IN
BROWNSBURG, IN
SITE DESIGNATION: 1.31 - WQU

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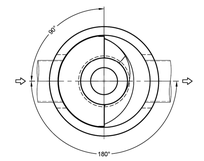
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PROJECT No.: 831258 | SEQUENCE No.: 20
SHEET: 1 OF 1
NCI
LAYOUT 1A

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PLAN VIEW
INTERNALS NOT SHOWN

INTERNAL COMPONENTS TO BE INSTALLED ON SITE BY CONTECH FIELD CONSULTANT. PLEASE CONTACT CONTECH FOR CURRENT INSTALLATION LEAD TIME



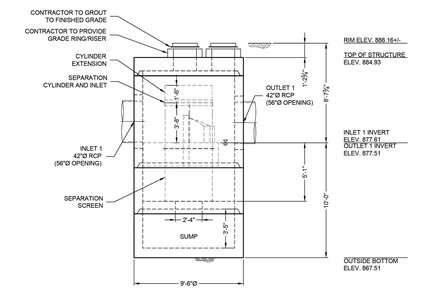
PLAN VIEW FOR PIPE ORIENTATION
TOP SLAB NOT SHOWN

MATERIAL LIST (PROVIDED BY CONTECH)

COUNT	DESCRIPTION	INSTALLED BY
1	4045-8 CONCENTRIC FIBERGLASS INSERT	CONTRACTOR
1	4045, 2400 micron, 4.1' O.D. x 4.58' SCREEN, GREEN FLANGE UP	CONTRACTOR
1	20, 30, 40 SERIES HARDWARE KIT	CONTRACTOR
1	40 SERIES, 1.5 FT. TALL CYLINDER EXTENSION	CONTRACTOR
1	SEALANT FOR JOINTS	CONTRACTOR
2	24"Ø X 4" FRAME AND COVER, EJ #41600389, OR EQUIV.	CONTRACTOR

SITE DESIGN DATA

WATER QUALITY FLOW RATE	6.55 CFS
PEAK FLOW RATE	34.22 CFS
RETURN PERIOD OF PEAK FLOW	100 YRS



ELEVATION VIEW

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 22000 LBS.
STRUCTURE IS DELIVERED IN 4 PIECES

MAX FOOTPRINT = 9.50'Ø

CONTECH
CONTRACT
DRAWING

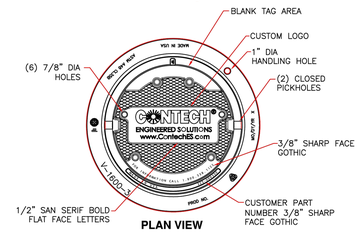
CDS4045-8-C - 831258-25
MEIJER ABE - BROWNSBURG, IN
BROWNSBURG, IN
SITE DESIGNATION: 2.01 - WQU

CONTECH ENGINEERED SOLUTIONS LLC
9025 Centre Pointe Dr, Suite 400, West Chester, OH 45069
800.338.1122 | 513.645.7000 | 513.645.7993 FAX
www.ContechES.com

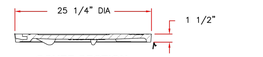
DATE: 12/13/24
DESIGNED: MDB | DRAWN: CER
CHECKED: MDB | APPROVED: MDB
PROJECT No.: 831258 | SEQUENCE No.: 25
SHEET: 1 OF 1
NCI
LAYOUT 1A

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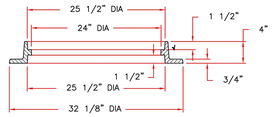
V1600-3 V1610-3 Assembly



PLAN VIEW



COVER SECTION



RING SECTION

Product Number
41600389

Design Features
-Materials
Frame
Gray Iron (CL35B)
Cover
Gray Iron (CL35B)

-Design Load
Heavy Duty
-Open Area
n/a
-Coating
Undipped
- -/- Designates Machined Surface

Certification
- ASTM A48
-Country of Origin:USA

Major Components
41600310
41600374

Drawing Revision
05/02/2008 Designer: DEW
6/20/2017 Revised By: DAE

Disclaimer
Weights (lbs./kg) dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

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meijer
2929 WALKER AVENUE
GRAND RAPIDS, MICHIGAN 49544
(616) 453-6711

REV.	DATE	DESCRIPTION

MEIJER STORE #338
9202 E. 56TH STREET
BROWNSBURG, INDIANA 46112

CONTECH DETAILS

ISSUED FOR:	
PERMIT	MM/DD/YY
BID	MM/DD/YY
CONSTRUCTION	MM/DD/YY

PROJECT MANAGER	DESIGNER
BLS	JMR

JOB NO.
NS-26-00338

C-708

Indiana 811
Know what's below.
Call before you dig.

Images: ..\Xrefs: 10020046TBLK.dwg
Layout: Tab1 Name: C-708 CONTECH DETAILS
Last Saved By:Doulton, 12/20/2024 3:56:20 PM
G:\DE\Clients\Meijer\2026 Open Meijer Stores\10020046 Meijer 338 ABE – Brownsburg, IN Civil\4.0 Disciplines\Civil\Cadd\Cd\10020046DET7.dwg Plotted By:Reedy, Angela Plotted:January 10, 2025, 2:35:54 PM

1.5 – WATER QUALITY STRUCTURE SIZING

Project: Meijer ABE
Location: *Brownsburg, IN*
Prepared For: Woolpert, Inc

Purpose: To calculate the first flush runoff flow rate (WQF) over a given site area. In this situation the WQV to be analyzed is the runoff produced by the first 1" of rainfall.

Reference: United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Given:

Structure Name	A (acres)	A ($miles^2$)	Runoff Coefficient	Percent Imp. (%)*	t_c (min)	t_c (hr)
1.01	10.67	0.01667	0.84	90.00	19.0	0.317
1.31	7.54	0.01178	0.79	81.67	16.0	0.267
2.01	7.59	0.01186	0.77	78.33	15.0	0.250

* Assumes runoff coefficient of 0.3 for pervious areas and 0.9 for impervious areas.

Procedure:

The Water Quality Flow (WQF) is calculated using the Water Quality Volume (WQV). This WQV, converted to watershed inches, is substituted for the runoff depth (Q) in the Natural Resources Conservation Service (formerly Soil Conservation Service), TR-55 Gr

1. Compute WQV in watershed inches using the following equation:

$$WQV = P * R$$

where: WQV = water quality volume (watershed inches)
P = design precipitation (inches)
R = volumetric runoff coefficient = 0.05 + 0.009(I)
I = percent impervious cover

Structure Name	Percent Imp. (%)	R	P (in)	WQV (in)	WQV (CF)
1.01	90.00	0.860	1	0.860	33,309.61
1.31	81.67	0.785	1	0.785	21,485.61
2.01	78.33	0.755	1	0.755	20,801.53

2. Compute the NRCS Runoff Curve Number (CN) using the following equation, or graphically using Figure 2-1 from TR-55 (USDA, 1986):

$$CN = 1000 / [10+5P+10Q-10(Q^2+1.25QP)^{1/2}]$$

where: CN = Runoff Curve Number
P = design precipitation (inches)
Q = runoff depth (watershed inches)

Structure Name	Q (in)	CN
1.01	0.860	98.72
1.31	0.785	97.93
2.01	0.755	97.59



3. Using computed CN, read initial abstraction (I_a) from Table 4-1 in Chapter 4 of TR-55; compute I_a/P, interpolating when appropriate.

Structure Name	I_a (in)	I_a/P
1.01	0.041	0.041
1.31	0.041	0.041
2.01	0.041	0.041

4. Compute the time of concentration (t_c) in hours and the drainage area in square miles. A minimum t_c of 0.167 hours (10 minutes) should be used.

Structure Name	t_c (hr)	A (miles^2)
1.01	0.317	0.01667
1.31	0.267	0.01178
2.01	0.250	0.01186

5. Read the unit peak discharge (q_u) from Exhibit 4-II in Chapter 4 of TR-55 for appropriate t_c for type II rainfall distribution.

Structure Name	t_c (hr)	I_a/P	q_u (csm/in)
1.01	0.317	0.041	660
1.31	0.267	0.041	712
2.01	0.250	0.041	731

6. Substituting WQV (watershed inches) for runoff depth (Q), compute the water quality flow (WQF) from the following equation:

$$\mathbf{WQF = (q_u)*(A)*(Q)}$$

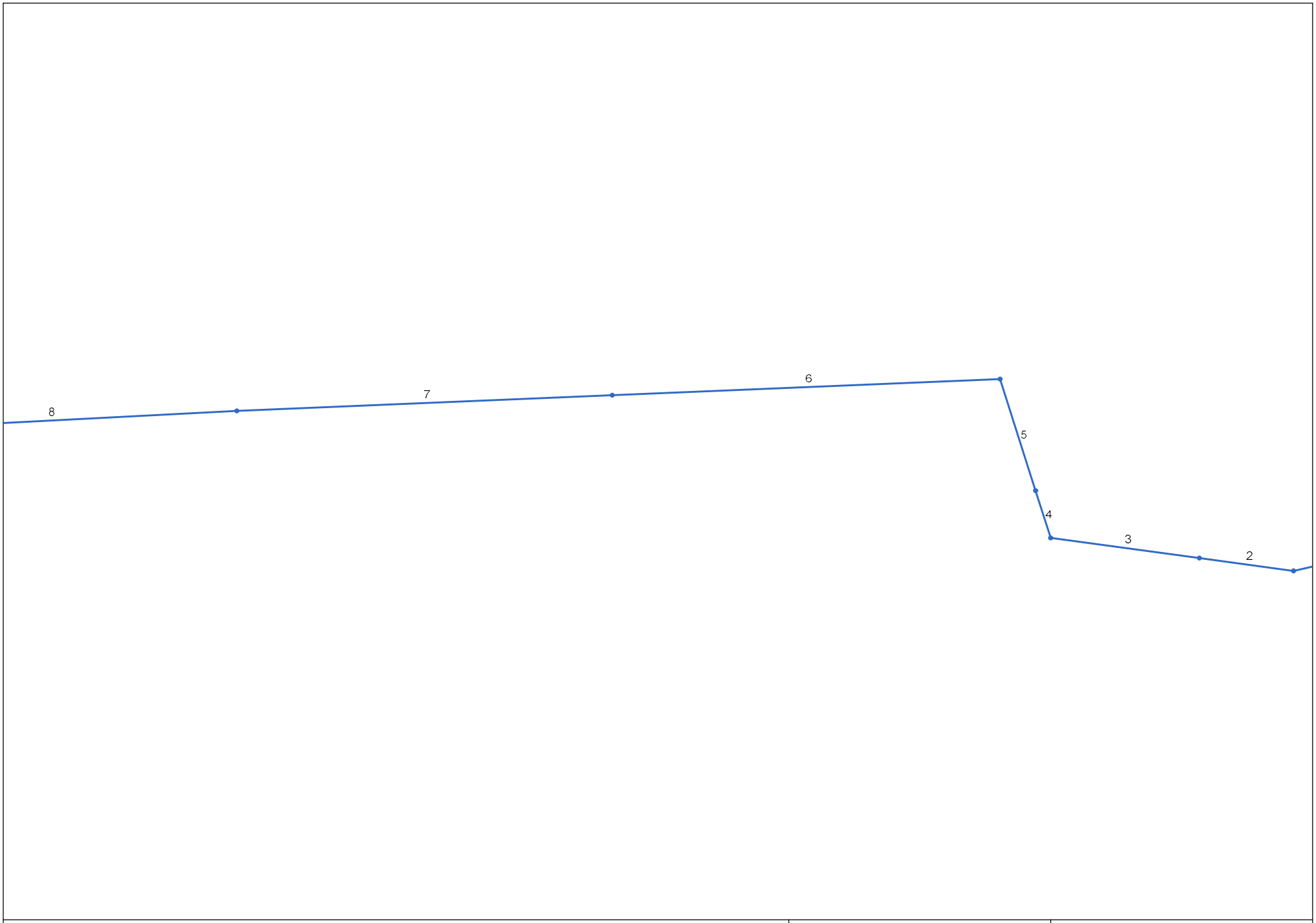
where: WQF = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi^2/inch)
A = drainage area (mi^2)
Q = runoff depth (watershed inches)

Structure Name	q_u (csm/in)	A (miles^2)	Q (in)	WQF (cfs)	
1.01	660	0.01667	0.860	9.46	CDS5653-10
1.31	712	0.01178	0.785	6.58	CDS4045-8
2.01	731	0.01186	0.755	6.55	CDS4045-8



1.6 – EXISTING 27” PIPE ANALYSIS

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 10018158 - EX STM PIPE.stm	Number of lines: 8	Date: 1/31/2024

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	166.000	166.947	MH	0.00	0.00	0.00	0.0	876.37	0.09	876.52	36	Cir	0.013	0.41	880.35	205
2	1	126.000	20.811	MH	0.00	0.00	0.00	0.0	876.52	0.09	876.63	36	Cir	0.013	0.15	879.48	204
3	2	199.000	0.000	MH	0.00	0.00	0.00	0.0	876.63	0.09	876.81	36	Cir	0.013	0.92	882.04	203
4	3	66.000	64.661	MH	0.00	0.00	0.00	0.0	876.81	0.09	876.87	36	Cir	0.013	0.15	883.12	202
5	4	156.000	0.000	MH	0.00	0.00	0.00	0.0	876.87	0.09	877.01	36	Cir	0.013	0.97	883.80	185-201
6	5	515.000	-74.830	MH	1.84*	0.00	0.00	0.0	877.01	0.19	877.99	36	Cir	0.013	0.15	886.51	186
7	6	498.000	0.000	MH	2.56**	0.00	0.00	0.0	877.95	0.31	879.51	27	Cir	0.013	0.15	884.86	187
8	7	499.000	-0.552	MH	16.53**	0.00	0.00	0.0	879.30	0.28	880.69	27	Cir	0.013	1.00	884.94	188

*10-year outflow from Meijer detention basins. Emergency flood routing via spillways at the Meijer property lines.

**100-year outflow from Hession Farms, OrthoIndy, and future OrthoIndy detention basins due to emergency flood routing requirements.

Project File: 10018158 - EX STM PIPE.stm | Number of lines: 8 | Date: 1/31/2024

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	166.000	0.00	0.00	0.00	0.00	0.00	0.0	9.4	0.0	20.93	20.05	3.22	36	0.09	876.37	876.52	878.97	879.12	0.00	880.35	205
2	1	126.000	0.00	0.00	0.00	0.00	0.00	0.0	8.7	0.0	20.93	19.70	3.14	36	0.09	876.52	876.63	879.20	879.31	880.35	879.48	204
3	2	199.000	0.00	0.00	0.00	0.00	0.00	0.0	7.7	0.0	20.93	20.06	3.13	36	0.09	876.63	876.81	879.33	879.50	879.48	882.04	203
4	3	66.000	0.00	0.00	0.00	0.00	0.00	0.0	7.3	0.0	20.93	20.11	3.03	36	0.09	876.81	876.87	879.64	879.70	882.04	883.12	202
5	4	156.000	0.00	0.00	0.00	0.00	0.00	0.0	6.4	0.0	20.93	19.98	3.02	36	0.09	876.87	877.01	879.72	879.85	883.12	883.80	185-201
6	5	515.000	0.00	0.00	0.00	0.00	0.00	0.0	3.7	0.0	20.93	29.09	3.17	36	0.19	877.01	877.99	879.99	880.44	883.80	886.51	186
7	6	498.000	0.00	0.00	0.00	0.00	0.00	0.0	2.0	0.0	19.09	17.33	4.80	27	0.31	877.95	879.51	880.47	882.36	886.51	884.86	187
8	7	499.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	16.53	16.34	4.16	27	0.28	879.30	880.69	882.42	883.84	884.86	884.94	188

Project File: 10018158 - EX STM PIPE.stm

Number of lines: 8

Run Date: 1/31/2024

NOTES:Intensity = 50.33 / (Inlet time + 5.80) ^ 0.66; Return period =Yrs. 100 ; c = cir e = ellip b = box

SECTION 2:
SUPPLEMENTAL DESIGN DATA

2.1 – NCRS WEB SOIL SURVEY REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hendricks County, Indiana



October 23, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Map Unit Descriptions..... 8
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ThrA—Treaty silty clay loam, 0 to 1 percent slopes..... 11
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Soil Qualities and Features.....15
Hydrologic Soil Group (Meijer - ABE).....15

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:3,160 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Hendricks County, Indiana
Survey Area Data: Version 27, Sep 1, 2023

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

Date(s) aerial images were photographed: Jun 15, 2022—Jun 21, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	10.9	34.6%
ThrA	Treaty silty clay loam, 0 to 1 percent slopes	20.7	65.4%
YclA	Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes	0.0	0.1%
Totals for Area of Interest		**31.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hendricks County, Indiana

CrA—Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2thy4
Elevation: 600 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 49 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Crosby and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Water-lain moraines, recessionial moraines, ground moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 10 inches: silt loam
Btg - 10 to 17 inches: silty clay loam
2Bt - 17 to 29 inches: clay loam
2BCt - 29 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Williamstown, eroded

Percent of map unit: 5 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Treaty, drained

Percent of map unit: 2 percent
Landform: Swales, water-lain moraines, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

ThrA—Treaty silty clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2ygzn
Elevation: 450 to 1,200 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Treaty, frequently ponded, drained, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Treaty, Frequently Ponded, Drained

Setting

Landform: Depressions, ground moraines, water-lain moraines, swales
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 10 inches: silty clay loam
A - 10 to 14 inches: silty clay loam

Btg1 - 14 to 36 inches: silty clay loam
2Btg2 - 36 to 59 inches: loam
2C - 59 to 79 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Minor Components

Southwest, frequently ponded, drained

Percent of map unit: 5 percent
Landform: Depressions, ground moraines, drainageways
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Ecological site: F111XA004IN - Wet Alluvium
Hydric soil rating: Yes

Rensselaer, frequently ponded, drained

Percent of map unit: 5 percent
Landform: Depressions, ground moraines, glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XA016IN - Outwash Mollisol
Hydric soil rating: Yes

Pella, frequently ponded, drained

Percent of map unit: 5 percent
Landform: Outwash plains, till plains, lake plains, ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XA016IN - Outwash Mollisol
Hydric soil rating: Yes

Crosby

Percent of map unit: 5 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines

Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

YclA—Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w57p
Elevation: 600 to 1,040 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Crosby and similar soils: 60 percent
Urban land: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 10 inches: silt loam
Btg - 10 to 17 inches: silty clay loam
2Bt - 17 to 29 inches: clay loam
2BCt - 29 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Treaty, drained

Percent of map unit: 5 percent
Landform: Swales, water-lain moraines, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Williamstown, eroded

Percent of map unit: 5 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Meijer - ABE)

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

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

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

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

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

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

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

Custom Soil Resource Report
Map—Hydrologic Soil Group (Meijer - ABE)



Map Scale: 1:3,160 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Hendricks County, Indiana
Survey Area Data: Version 27, Sep 1, 2023

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

Date(s) aerial images were photographed: Jun 15, 2022—Jun 21, 2022

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

Table—Hydrologic Soil Group (Meijer - ABE)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	10.9	34.6%
ThrA	Treaty silty clay loam, 0 to 1 percent slopes	B/D	20.7	65.4%
YclA	Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes	C/D	0.0	0.1%
Totals for Area of Interest			**31.7**	**100.0%**

Rating Options—Hydrologic Soil Group (Meijer - ABE)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

2.2 – HYDRAFLOW STORM SEWERS – 10-YR DESIGN CALCULATIONS

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	28.845	0.00	10.68	0.00	0.00	8.93	0.0	27.4	3.5	31.14	31.63	3.75	42	0.10	877.39	877.42	880.21	880.24	881.13	885.49	1.01
2	1	65.669	0.67	10.68	0.85	0.57	8.93	5.0	27.0	3.5	31.37	43.01	3.91	42	0.18	877.52	877.64	880.27	880.33	885.49	883.43	1.02
3	2	90.779	0.17	10.01	0.78	0.13	8.36	5.0	26.6	3.6	29.69	45.76	3.52	42	0.10	877.74	877.83	880.64	880.67	883.43	883.83	1.03
4	3	95.389	0.95	9.84	0.90	0.86	8.23	5.0	26.0	3.6	29.56	32.58	3.39	42	0.10	877.93	878.03	880.91	880.99	883.83	885.52	1.04
5	4	76.979	0.75	8.89	0.90	0.68	7.37	5.0	25.6	3.6	26.76	32.44	3.10	42	0.10	878.13	878.21	881.08	881.13	885.52	888.68	1.05
6	5	85.072	0.84	8.14	0.89	0.75	6.70	5.0	25.0	3.7	24.62	35.46	2.91	42	0.11	878.31	878.40	881.21	881.24	888.68	887.97	1.06
7	6	122.866	0.73	7.30	0.90	0.66	5.95	5.0	24.4	3.7	22.21	25.53	3.25	36	0.15	878.50	878.68	881.31	881.43	887.97	887.98	1.07
8	7	103.526	0.61	6.57	0.88	0.54	5.29	5.0	23.8	3.8	20.04	26.22	3.00	36	0.15	878.78	878.94	881.51	881.58	887.98	886.79	1.08
9	8	154.193	0.54	5.96	0.53	0.29	4.76	5.0	22.8	3.9	18.45	26.32	3.75	36	0.16	879.66	879.90	881.66	881.85	886.79	885.03	1.09
10	9	182.886	0.37	4.91	0.85	0.31	4.17	5.0	21.9	4.0	16.56	32.69	4.73	30	0.54	880.00	880.99	882.34	882.36	885.03	886.51	1.12
11	10	100.931	0.37	2.15	0.85	0.31	1.83	5.0	21.2	4.0	7.39	12.19	3.67	24	0.25	881.09	881.34	882.36	882.52	886.51	886.68	1.14
12	11	110.101	0.40	1.78	0.85	0.34	1.51	5.0	20.3	4.1	6.27	12.36	3.46	24	0.25	881.44	881.72	882.63	882.78	886.68	886.41	1.15
13	12	50.006	1.38	1.38	0.85	1.17	1.17	20.0	20.0	4.2	4.90	5.80	3.10	18	0.26	881.82	881.95	883.10	883.18	886.41	886.41	1.16
14	10	50.000	2.39	2.39	0.85	2.03	2.03	20.0	20.0	4.2	8.49	20.91	3.50	30	0.26	881.09	881.22	882.36	882.42	886.51	886.50	1.13
15	9	189.300	0.31	0.51	0.58	0.18	0.30	5.0	5.9	7.1	2.11	5.67	1.19	18	0.25	880.00	880.47	882.34	882.41	885.03	884.66	1.10
16	15	26.000	0.20	0.20	0.58	0.12	0.12	5.0	5.0	7.5	0.87	5.45	0.49	18	0.27	880.57	880.64	882.44	882.44	884.66	884.65	1.11
17	End	29.159	0.00	7.79	0.00	0.00	5.97	0.0	22.3	3.9	23.51	31.79	3.61	42	0.10	877.39	877.42	879.63	879.66	881.13	885.13	1.31
18	17	21.063	0.30	7.79	0.83	0.25	5.97	5.0	22.1	3.9	23.59	30.97	3.54	42	0.09	877.52	877.54	879.81	879.83	885.13	885.03	1.32
19	18	50.908	0.56	6.63	0.78	0.44	5.09	5.0	21.7	4.0	20.30	31.53	2.80	42	0.10	877.64	877.69	880.12	880.15	885.03	885.11	1.34
20	19	160.500	0.70	6.07	0.83	0.58	4.65	5.0	20.5	4.1	19.19	31.77	2.76	42	0.10	877.79	877.95	880.21	880.29	885.11	885.50	1.35
21	20	128.000	0.71	5.37	0.83	0.59	4.07	5.0	19.4	4.3	17.33	32.06	2.63	42	0.10	878.05	878.18	880.35	880.41	885.50	885.50	1.36
22	21	128.000	0.71	4.66	0.83	0.59	3.48	5.0	18.4	4.4	15.23	21.25	2.79	36	0.10	878.28	878.41	880.46	880.55	885.50	885.50	1.37

Project File: 250106 ABE STM.stm

Number of lines: 52

Run Date: 1/9/2025

NOTES:Intensity = 58.29 / (Inlet time + 8.60) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	128.000	0.73	3.95	0.83	0.61	2.90	5.0	17.3	4.5	13.08	21.25	2.52	36	0.10	878.51	878.64	880.61	880.67	885.50	885.50	1.38
24	23	128.113	0.52	3.22	0.84	0.44	2.29	5.0	15.9	4.7	10.80	21.25	2.23	36	0.10	878.74	878.87	880.72	880.78	885.50	885.50	1.39
25	24	71.374	0.33	2.70	0.72	0.24	1.85	5.0	15.2	4.8	8.93	12.84	2.32	30	0.10	878.97	879.04	880.82	880.86	885.50	885.34	1.40
26	25	109.751	0.00	0.47	0.00	0.00	0.32	0.0	7.8	6.5	2.08	5.69	1.47	18	0.25	879.75	880.02	881.01	881.04	885.34	887.07	1.42
27	26	275.920	0.16	0.47	0.70	0.11	0.32	5.0	5.5	7.3	2.35	3.50	2.72	15	0.25	880.12	880.81	881.08	881.55	887.07	884.82	1.43
28	27	37.000	0.31	0.31	0.68	0.21	0.21	5.0	5.0	7.5	1.58	3.45	1.83	15	0.24	880.91	881.00	881.78	881.80	884.82	884.70	1.44
29	18	223.201	0.46	0.86	0.64	0.29	0.63	5.0	5.6	7.2	4.59	5.26	3.28	18	0.25	878.99	879.55	880.12	880.64	885.03	885.61	1.45
30	29	74.508	0.40	0.40	0.85	0.34	0.34	5.0	5.0	7.5	2.55	4.44	2.22	15	0.40	879.65	879.95	880.90	880.97	885.61	887.64	1.46
31	25	29.833	1.90	1.90	0.68	1.29	1.29	15.0	15.0	4.9	6.28	11.87	2.08	24	0.23	879.14	879.21	881.01	881.02	885.34	883.25	1.41
32	End	26.495	0.00	7.75	0.00	0.00	5.83	0.0	22.9	3.9	22.54	33.87	3.76	42	0.11	877.48	877.51	879.57	879.60	881.22	886.16	2.01
33	32	16.506	0.09	7.75	0.85	0.08	5.83	5.0	22.8	3.9	22.61	35.04	3.87	42	0.12	877.61	877.63	879.66	879.67	886.16	885.81	2.02
34	33	27.000	0.13	7.66	0.85	0.11	5.75	5.0	22.6	3.9	22.42	33.55	3.73	42	0.11	877.73	877.76	879.82	879.86	885.81	885.90	2.03
35	34	308.960	0.57	1.91	0.80	0.46	1.46	5.0	11.3	5.6	8.11	14.00	1.85	30	0.12	877.95	878.31	880.18	880.29	885.90	885.91	2.14
36	35	256.000	0.84	1.34	0.71	0.60	1.00	5.0	9.3	6.0	6.06	9.79	2.64	24	0.19	878.81	879.29	880.32	880.56	885.91	885.91	2.15
37	36	173.693	0.00	0.50	0.00	0.00	0.41	0.0	7.5	6.6	2.67	4.78	1.94	18	0.21	879.39	879.75	880.62	880.74	885.91	887.83	2.16
38	37	207.647	0.16	0.36	0.85	0.14	0.31	5.0	5.6	7.2	2.22	3.23	2.47	15	0.25	879.85	880.37	880.82	881.15	887.83	885.91	2.17
39	38	37.000	0.20	0.20	0.85	0.17	0.17	5.0	5.0	7.5	1.27	4.60	1.51	15	0.24	880.47	880.56	881.33	881.33	885.91	885.91	2.18
40	34	30.006	0.56	5.62	0.34	0.19	4.18	5.0	22.4	3.9	16.39	22.86	2.80	36	0.10	877.86	877.89	880.18	880.19	885.90	885.90	2.04
41	40	204.089	0.40	1.33	0.81	0.32	0.90	5.0	10.0	5.9	5.27	13.77	1.27	30	0.11	878.26	878.49	880.34	880.38	885.90	885.90	2.05
42	41	64.190	0.00	0.93	0.00	0.00	0.58	0.0	9.1	6.1	3.51	8.93	1.32	24	0.16	878.79	878.89	880.42	880.43	885.90	886.76	2.06
43	42	150.206	0.20	0.93	0.79	0.16	0.58	5.0	8.0	6.4	3.70	4.11	2.63	18	0.15	879.39	879.62	880.50	880.73	886.76	886.56	2.07
44	43	101.994	0.33	0.73	0.58	0.19	0.42	5.0	7.3	6.6	2.78	3.20	2.39	15	0.25	879.72	879.97	880.89	881.05	886.56	885.90	2.08

Project File: 250106 ABE STM.stm | Number of lines: 52 | Run Date: 1/9/2025

NOTES:Intensity = 58.29 / (Inlet time + 8.60) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	44	193.373	0.40	0.40	0.57	0.23	0.23	5.0	5.0	7.5	1.71	3.22	1.77	15	0.25	880.07	880.55	881.19	881.34	885.90	885.90	2.09
46	40	127.854	0.21	3.73	0.51	0.11	3.09	5.0	21.6	4.0	12.37	14.17	2.60	30	0.10	877.99	878.12	880.34	880.43	885.90	885.92	2.11
47	46	37.000	0.19	3.52	0.82	0.16	2.98	5.0	21.3	4.0	12.02	14.62	2.54	30	0.11	878.22	878.26	880.54	880.56	885.92	885.92	2.12
48	47	124.693	0.10	1.91	0.79	0.08	1.62	5.0	20.3	4.1	6.69	10.06	3.42	24	0.17	879.55	879.76	880.74	880.96	885.92	885.90	2.31
49	48	39.798	1.72	1.72	0.85	1.46	1.46	20.0	20.0	4.2	6.11	12.28	2.75	24	0.25	879.86	879.96	881.23	881.25	885.90	885.00	2.33
50	48	88.389	0.09	0.09	0.85	0.08	0.08	5.0	5.0	7.5	0.57	7.57	1.43	18	0.25	879.86	880.08	881.23	880.36	885.90	885.90	2.32
51	37	88.261	0.14	0.14	0.72	0.10	0.10	5.0	5.0	7.5	0.76	3.22	0.99	15	0.25	879.95	880.17	880.82	880.83	887.83	886.89	2.21
52	47	39.547	1.42	1.42	0.85	1.21	1.21	20.0	20.0	4.2	5.04	12.32	1.60	24	0.25	878.36	878.46	880.71	880.73	885.92	885.00	2.13

Project File: 250106 ABE STM.stm | Number of lines: 52 | Run Date: 1/9/2025

NOTES:Intensity = 58.29 / (Inlet time + 8.60) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

2.3 – HYDRAFLOW STORM SEWERS – 25-YR DESIGN CALCULATIONS

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	28.845	0.00	10.68	0.00	0.00	8.93	0.0	26.4	4.1	36.96	31.63	3.84	42	0.10	877.39	877.42	882.14	882.18	881.13	885.49	1.01
2	1	65.669	0.67	10.68	0.85	0.57	8.93	5.0	26.1	4.2	37.19	43.01	3.87	42	0.18	877.52	877.64	882.21	882.30	885.49	883.43	1.02
3	2	90.779	0.17	10.01	0.78	0.13	8.36	5.0	25.7	4.2	35.14	45.76	3.65	42	0.10	877.74	877.83	882.59	882.65	883.43	883.83	1.03
4	3	95.389	0.95	9.84	0.90	0.86	8.23	5.0	25.2	4.2	34.93	32.58	3.63	42	0.10	877.93	878.03	882.91	883.02	883.83	885.52	1.04
5	4	76.979	0.75	8.89	0.90	0.68	7.37	5.0	24.8	4.3	31.58	32.44	3.28	42	0.10	878.13	878.21	883.12	883.20	885.52	888.68	1.05
6	5	85.072	0.84	8.14	0.89	0.75	6.70	5.0	24.4	4.3	29.00	35.46	3.01	42	0.11	878.31	878.40	883.28	883.34	888.68	887.97	1.06
7	6	122.866	0.73	7.30	0.90	0.66	5.95	5.0	23.8	4.4	26.10	25.53	3.69	36	0.15	878.50	878.68	883.41	883.60	887.97	887.98	1.07
8	7	103.526	0.61	6.57	0.88	0.54	5.29	5.0	23.3	4.4	23.50	26.22	3.33	36	0.15	878.78	878.94	883.71	883.84	887.98	886.79	1.08
9	8	154.193	0.54	5.96	0.53	0.29	4.76	5.0	22.4	4.5	21.56	26.32	3.05	36	0.16	879.66	879.90	883.92	884.08	886.79	885.03	1.09
10	9	182.886	0.37	4.91	0.85	0.31	4.17	5.0	21.7	4.6	19.29	32.69	3.93	30	0.54	880.00	880.99	884.40	884.75	885.03	886.51	1.12
11	10	100.931	0.37	2.15	0.85	0.31	1.83	5.0	21.1	4.7	8.58	12.19	2.73	24	0.25	881.09	881.34	885.11	885.23	886.51	886.68	1.14
12	11	110.101	0.40	1.78	0.85	0.34	1.51	5.0	20.3	4.8	7.25	12.36	2.31	24	0.25	881.44	881.72	885.29	885.39	886.68	886.41	1.15
13	12	50.006	1.38	1.38	0.85	1.17	1.17	20.0	20.0	4.8	5.66	5.80	3.20	18	0.26	881.82	881.95	885.51	885.63	886.41	886.41	1.16
14	10	50.000	2.39	2.39	0.85	2.03	2.03	20.0	20.0	4.8	9.80	20.91	2.00	30	0.26	881.09	881.22	885.11	885.14	886.51	886.50	1.13
15	9	189.300	0.31	0.51	0.58	0.18	0.30	5.0	5.8	8.3	2.44	5.67	1.38	18	0.25	880.00	880.47	884.40	884.49	885.03	884.66	1.10
16	15	26.000	0.20	0.20	0.58	0.12	0.12	5.0	5.0	8.6	1.00	5.45	0.57	18	0.27	880.57	880.64	884.53	884.54	884.66	884.65	1.11
17	End	29.159	0.00	7.79	0.00	0.00	5.97	0.0	21.3	4.7	27.88	31.79	2.90	42	0.10	877.39	877.42	882.14	882.16	881.13	885.13	1.31
18	17	21.063	0.30	7.79	0.83	0.25	5.97	5.0	21.2	4.7	27.96	30.97	2.91	42	0.09	877.52	877.54	882.18	882.20	885.13	885.03	1.32
19	18	50.908	0.56	6.63	0.78	0.44	5.09	5.0	20.9	4.7	24.03	31.53	2.50	42	0.10	877.64	877.69	882.40	882.42	885.03	885.11	1.34
20	19	160.500	0.70	6.07	0.83	0.58	4.65	5.0	19.8	4.9	22.61	31.77	2.35	42	0.10	877.79	877.95	882.47	882.55	885.11	885.50	1.35
21	20	128.000	0.71	5.37	0.83	0.59	4.07	5.0	18.8	5.0	20.33	32.06	2.11	42	0.10	878.05	878.18	882.60	882.65	885.50	885.50	1.36
22	21	128.000	0.71	4.66	0.83	0.59	3.48	5.0	18.0	5.1	17.80	21.25	2.52	36	0.10	878.28	878.41	882.68	882.78	885.50	885.50	1.37

Project File: 250106 ABE STM.stm | Number of lines: 52 | Run Date: 1/9/2025

NOTES:Intensity = 55.51 / (Inlet time + 7.50) ^ 0.74; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	128.000	0.73	3.95	0.83	0.61	2.90	5.0	17.0	5.3	15.22	21.25	2.15	36	0.10	878.51	878.64	882.82	882.89	885.50	885.50	1.38
24	23	128.113	0.52	3.22	0.84	0.44	2.29	5.0	15.8	5.5	12.49	21.25	1.77	36	0.10	878.74	878.87	882.93	882.97	885.50	885.50	1.39
25	24	71.374	0.33	2.70	0.72	0.24	1.85	5.0	15.2	5.6	10.29	12.84	2.10	30	0.10	878.97	879.04	883.00	883.04	885.50	885.34	1.40
26	25	109.751	0.00	0.47	0.00	0.00	0.32	0.0	7.5	7.6	2.44	5.69	1.38	18	0.25	879.75	880.02	883.16	883.21	885.34	887.07	1.42
27	26	275.920	0.16	0.47	0.70	0.11	0.32	5.0	5.4	8.4	2.72	3.50	2.22	15	0.25	880.12	880.81	883.24	883.66	887.07	884.82	1.43
28	27	37.000	0.31	0.31	0.68	0.21	0.21	5.0	5.0	8.6	1.82	3.45	1.48	15	0.24	880.91	881.00	883.77	883.80	884.82	884.70	1.44
29	18	223.201	0.46	0.86	0.64	0.29	0.63	5.0	5.5	8.4	5.31	5.26	3.01	18	0.25	878.99	879.55	882.40	882.97	885.03	885.61	1.45
30	29	74.508	0.40	0.40	0.85	0.34	0.34	5.0	5.0	8.6	2.93	4.44	2.39	15	0.40	879.65	879.95	883.18	883.31	885.61	887.64	1.46
31	25	29.833	1.90	1.90	0.68	1.29	1.29	15.0	15.0	5.6	7.23	11.87	2.30	24	0.23	879.14	879.21	883.16	883.19	885.34	883.25	1.41
32	End	26.495	0.00	7.75	0.00	0.00	5.83	0.0	22.5	4.5	26.35	33.87	2.74	42	0.11	877.48	877.51	883.27	883.29	881.22	886.16	2.01
33	32	16.506	0.09	7.75	0.85	0.08	5.83	5.0	22.4	4.5	26.42	35.04	2.75	42	0.12	877.61	877.63	883.31	883.32	886.16	885.81	2.02
34	33	27.000	0.13	7.66	0.85	0.11	5.75	5.0	22.3	4.6	26.18	33.55	2.72	42	0.11	877.73	877.76	883.38	883.39	885.81	885.90	2.03
35	34	308.960	0.57	1.91	0.80	0.46	1.46	5.0	10.5	6.6	9.64	14.00	1.96	30	0.12	877.95	878.31	883.57	883.74	885.90	885.91	2.14
36	35	256.000	0.84	1.34	0.71	0.60	1.00	5.0	8.7	7.1	7.15	9.79	2.27	24	0.19	878.81	879.29	883.77	884.02	885.91	885.91	2.15
37	36	173.693	0.00	0.50	0.00	0.00	0.41	0.0	7.1	7.7	3.12	4.78	1.77	18	0.21	879.39	879.75	884.06	884.22	885.91	887.83	2.16
38	37	207.647	0.16	0.36	0.85	0.14	0.31	5.0	5.5	8.4	2.56	3.23	2.09	15	0.25	879.85	880.37	884.27	884.59	887.83	885.91	2.17
39	38	37.000	0.20	0.20	0.85	0.17	0.17	5.0	5.0	8.6	1.47	4.60	1.20	15	0.24	880.47	880.56	884.69	884.70	885.91	885.91	2.18
40	34	30.006	0.56	5.62	0.34	0.19	4.18	5.0	22.1	4.6	19.12	22.86	2.70	36	0.10	877.86	877.89	883.57	883.59	885.90	885.90	2.04
41	40	204.089	0.40	1.33	0.81	0.32	0.90	5.0	9.4	6.9	6.24	13.77	1.27	30	0.11	878.26	878.49	883.73	883.77	885.90	885.90	2.05
42	41	64.190	0.00	0.93	0.00	0.00	0.58	0.0	8.6	7.2	4.14	8.93	1.32	24	0.16	878.79	878.89	883.81	883.83	885.90	886.76	2.06
43	42	150.206	0.20	0.93	0.79	0.16	0.58	5.0	7.6	7.5	4.33	4.11	2.45	18	0.15	879.39	879.62	883.85	884.11	886.76	886.56	2.07
44	43	101.994	0.33	0.73	0.58	0.19	0.42	5.0	7.0	7.7	3.24	3.20	2.64	15	0.25	879.72	879.97	884.25	884.50	886.56	885.90	2.08

Project File: 250106 ABE STM.stm | Number of lines: 52 | Run Date: 1/9/2025

NOTES:Intensity = 55.51 / (Inlet time + 7.50) ^ 0.74; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	44	193.373	0.40	0.40	0.57	0.23	0.23	5.0	5.0	8.6	1.97	3.22	1.60	15	0.25	880.07	880.55	884.67	884.85	885.90	885.90	2.09
46	40	127.854	0.21	3.73	0.51	0.11	3.09	5.0	21.4	4.7	14.38	14.17	2.93	30	0.10	877.99	878.12	883.73	883.86	885.90	885.92	2.11
47	46	37.000	0.19	3.52	0.82	0.16	2.98	5.0	21.1	4.7	13.96	14.62	2.84	30	0.11	878.22	878.26	884.00	884.03	885.92	885.92	2.12
48	47	124.693	0.10	1.91	0.79	0.08	1.62	5.0	20.3	4.8	7.75	10.06	2.47	24	0.17	879.55	879.76	884.22	884.35	885.92	885.90	2.31
49	48	39.798	1.72	1.72	0.85	1.46	1.46	20.0	20.0	4.8	7.06	12.28	2.25	24	0.25	879.86	879.96	884.49	884.52	885.90	885.00	2.33
50	48	88.389	0.09	0.09	0.85	0.08	0.08	5.0	5.0	8.6	0.66	7.57	0.37	18	0.25	879.86	880.08	884.49	884.49	885.90	885.90	2.32
51	37	88.261	0.14	0.14	0.72	0.10	0.10	5.0	5.0	8.6	0.87	3.22	0.71	15	0.25	879.95	880.17	884.27	884.28	887.83	886.89	2.21
52	47	39.547	1.42	1.42	0.85	1.21	1.21	20.0	20.0	4.8	5.83	12.32	1.85	24	0.25	878.36	878.46	884.22	884.24	885.92	885.00	2.13

Project File: 250106 ABE STM.stm | Number of lines: 52 | Run Date: 1/9/2025

NOTES:Intensity = 55.51 / (Inlet time + 7.50) ^ 0.74; Return period =Yrs. 25 ; c = cir e = ellip b = box

2.4 – HYDRAFLOW STORM SEWERS – PONDING ANALYSIS

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	1.01	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2	1.02	4.27	0.00	4.27	0.00	DrGrt	0.0	0.00	1.04	1.02	1.02	Sag	2.00	0.020	0.020	0.000	0.58	60.30	0.58	60.30	0.0	Off
3	1.03	0.99	0.00	0.99	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.20	6.86	0.20	6.86	0.0	Off
4	1.04	6.41	0.00	6.41	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.55	24.26	0.55	24.26	0.0	Off
5	1.05	5.06	0.00	5.06	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.47	20.69	0.47	20.69	0.0	Off
6	1.06	5.60	0.00	5.60	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.50	22.17	0.50	22.17	0.0	Off
7	1.07	4.92	0.00	4.92	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.47	20.32	0.47	20.32	0.0	Off
8	1.08	4.02	0.00	4.02	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.41	17.73	0.41	17.73	0.0	Off
9	1.09	2.14	0.00	2.14	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.29	11.59	0.29	11.59	0.0	Off
10	1.12	2.36	0.00	2.36	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.013	0.31	12.36	0.31	12.36	0.0	Off
11	1.14	2.36	0.00	2.36	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.31	12.36	0.31	12.36	0.0	Off
12	1.15	2.55	0.00	2.55	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.32	13.03	0.32	13.03	0.0	Off
13	1.16	4.90	0.00	4.90	0.00	DrGrt	0.0	0.00	1.64	1.28	1.28	Sag	2.00	0.020	0.020	0.000	0.47	48.67	0.47	48.67	0.0	Off
14	1.13	8.49	0.00	8.49	0.00	DrGrt	0.0	0.00	1.65	4.28	1.28	Sag	2.00	0.020	0.020	0.000	0.92	93.60	0.92	93.60	0.0	Off
15	1.10	1.35	0.00	1.35	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.013	0.23	8.45	0.23	8.45	0.0	Off
16	1.11	0.87	0.00	0.87	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.013	0.19	6.25	0.19	6.25	0.0	Off
17	1.31	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
18	1.32	1.87	0.00	1.87	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.27	10.55	0.27	10.55	0.0	Off
19	1.34	3.27	0.00	3.27	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.37	15.43	0.37	15.43	0.0	Off
20	1.35	4.35	0.00	4.35	0.00	DrGrt	0.0	0.00	1.04	1.02	1.02	Sag	2.00	0.020	0.020	0.000	0.61	62.68	0.61	62.68	0.0	Off
21	1.36	4.42	0.00	4.42	0.00	DrGrt	0.0	0.00	1.04	1.02	1.02	Sag	2.00	0.020	0.020	0.000	0.62	64.42	0.62	64.42	0.0	Off
22	1.37	4.42	0.00	4.42	0.00	DrGrt	0.0	0.00	1.04	1.02	1.02	Sag	2.00	0.020	0.020	0.000	0.62	64.42	0.62	64.42	0.0	Off
23	1.38	4.54	0.00	4.54	0.00	DrGrt	0.0	0.00	1.04	1.02	1.02	Sag	2.00	0.020	0.020	0.000	0.66	67.99	0.66	67.99	0.0	Off

Project File: 250106 ABE STM.stm | Number of lines: 52 | Run Date: 1/9/2025

NOTES: Inlet N-Values = 0.016; Intensity = 58.29 / (Inlet time + 8.60) ^ 0.79; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	1.39	3.27	0.00	3.27	0.00	DrGrt	0.0	0.00	1.04	1.02	1.02	Sag	2.00	0.020	0.020	0.000	0.41	43.48	0.41	43.48	0.0	Off
25	1.40	1.78	0.00	1.78	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.26	10.22	0.26	10.22	0.0	Off
26	1.42	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
27	1.43	0.84	0.00	0.84	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.18	6.11	0.18	6.11	0.0	Off
28	1.44	1.58	0.00	1.58	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.25	9.42	0.25	9.42	0.0	Off
29	1.45	2.21	0.00	2.21	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.30	11.82	0.30	11.82	0.0	Off
30	1.46	2.55	0.00	2.55	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.32	13.03	0.32	13.03	0.0	Off
31	1.41	6.28	0.00	6.28	0.00	DrGrt	0.0	0.00	1.64	1.28	1.28	Sag	2.00	0.020	0.020	0.000	0.55	57.05	0.55	57.05	0.0	Off
32	2.01	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
33	2.02	0.57	0.00	0.57	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.15	4.69	0.15	4.69	0.0	Off
34	2.03	0.83	0.00	0.83	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.18	6.05	0.18	6.05	0.0	Off
35	2.14	3.42	0.00	3.42	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.38	15.88	0.38	15.88	0.0	Off
36	2.15	4.47	0.00	4.47	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.013	0.44	19.04	0.44	19.04	0.0	Off
37	2.16	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
38	2.17	1.02	0.00	1.02	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.20	6.98	0.20	6.98	0.0	Off
39	2.18	1.27	0.00	1.27	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.22	8.13	0.22	8.13	0.0	Off
40	2.04	1.43	0.00	1.43	0.00	DrGrt	0.0	0.00	1.64	1.28	1.28	Sag	2.00	0.020	0.020	0.000	0.20	22.49	0.20	22.49	0.0	Off
41	2.05	2.43	0.00	2.43	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.31	12.61	0.31	12.61	0.0	Off
42	2.06	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
43	2.07	1.18	0.00	1.18	0.00	DrGrt	0.0	0.00	1.04	1.02	1.02	Sag	2.00	0.020	0.020	0.000	0.21	23.05	0.21	23.05	0.0	Off
44	2.08	1.43	0.00	1.43	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.24	8.82	0.24	8.82	0.0	Off
45	2.09	1.71	0.00	1.71	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.26	9.93	0.26	9.93	0.0	Off
46	2.11	0.80	0.00	0.80	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.18	5.92	0.18	5.92	0.0	Off

Project File: 250106 ABE STM.stm | Number of lines: 52 | Run Date: 1/9/2025

NOTES: Inlet N-Values = 0.016; Intensity = 58.29 / (Inlet time + 8.60) ^ 0.79; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
47	2.12	1.17	0.00	1.17	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.21	7.66	0.21	7.66	0.0	Off
48	2.31	0.59	0.00	0.59	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.16	4.79	0.16	4.79	0.0	Off
49	2.33	6.11	0.00	6.11	0.00	DrGrt	0.0	0.00	1.64	1.28	1.28	Sag	2.00	0.020	0.020	0.000	0.54	56.05	0.54	56.05	0.0	Off
50	2.32	0.57	0.00	0.57	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.15	4.69	0.15	4.69	0.0	Off
51	2.21	0.76	0.00	0.76	0.00	Comb	6.0	2.00	0.75	0.87	0.87	Sag	2.00	0.050	0.020	0.000	0.17	5.68	0.17	5.68	0.0	Off
52	2.13	5.04	0.00	5.04	0.00	DrGrt	0.0	0.00	1.64	1.28	1.28	Sag	2.00	0.020	0.020	0.000	0.48	49.57	0.48	49.57	0.0	Off

Project File: 250106 ABE STM.stm | Number of lines: 52 | Run Date: 1/9/2025

NOTES: Inlet N-Values = 0.016; Intensity = 58.29 / (Inlet time + 8.60) ^ 0.79; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.