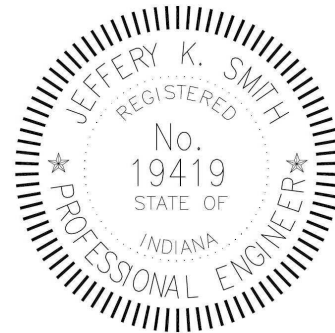


Final Drainage Report for

LAUGLE BUILDING #2
AT PATRIOT DEFENSE
RESEARCH PARK
LOT #2

Dated: May 3, 2023

The stormwater runoff from this site was included in the overall drainage design for Patriot Defense Research Park - Buildings #1 and #2. The drainage plan for was prepared by Projects Plus, dated September 3, 2021, revised on December 16, 2021. The drainage report was reviewed and approved under Franklin project PC 2021-41 (SPR)



Calculations Prepared By:

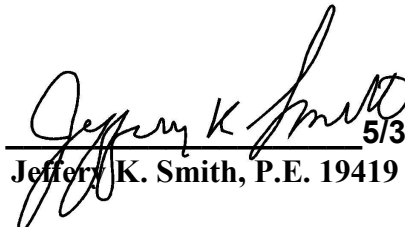
PROJECTS plus

1257 Airport Parkway, Suite A
Greenwood, Indiana 46143

LAND PLANNING • ENGINEERING • SURVEYING • PROJECT MANAGEMENT

OFFICE (317) 882-5003
FAX (317) 882-1082

Certified By:


Jeffery K. Smith, P.E. 19419 5/3/23

REPORT INDEX:

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- Summary of Pre-Developed Drainage Conditions and Allowable Release Rates
- Summary of Post-Developed Drainage Conditions and Water Quality Calculations
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- 10 yr. Storm Sewer HYDRAFLOW Storm Sewer Calculations

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- Post-Developed Drainage Map
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TECHNICAL INFORMATION DATA

Project Summary:

This project, “Laugle Building #2 at Patriot Defense Research Park - Lot #2”, is a proposed 77,750 s.f. industrial building on an 20.33 acre parcel in the Patriot Defense Research Park Subdivision, located in the City of Franklin, Johnson County, Indiana. The site is located at 2035 Earlywood Dr., Franklin, IN 46131. The project will consist of a new building, with improvements consisting of asphalt pavement, walks and associated utility infrastructure.

Drainage Summary:

The stormwater runoff from this site was included in the overall drainage design for Patriot Defense Research Park - Buildings #1 and #2. The drainage plan for was prepared by Projects Plus, dated September 3, 2021, revised on December 16, 2021. The drainage report was reviewed and approved under Franklin project PC 2021-41 (SPR).

This drainage plan delineated an onsite watershed and the proposed project is entirely in this watershed delineation for Pond “1”. Pond “1” was designed for 29.5 acres of industrial development with a maximum impervious coverage of 72% and a developed CN of 90. The proposed site has an impervious coverage of 55% within the drainage basin watershed; therefore no additional detention is required for this project.

Summary of Post-Developed Drainage Conditions:

The overall site is master planned for build out of industrial buildings, with an assumed impervious coverage of 72% for an Urban District for light industrial used. The runoff from improvements, shown as Onsite Post-Basin ‘1’, was routed through an onsite detention pond with the outlet release rate controlled by a pond control structure. The outflow from the pond released east to Canary Creek along the east property line.

The release point to Canary Creek is in floodzone AE (studied floodzone with elevations established) as per FEMA Firm Map #18097C0143 E, effective January 29, 2021. The 100-year tailwater elevation of 758.80 was established via the Firm Map and this elevation was included in the computation of the 100 year flood elevation for the detention pond.

The drainage design for the site met the requirements of General Drainage Standards, Chapter 6.19 of the City of Franklin Subdivision Control Ordinance. A summary of the drainage runoff and detention pond releases is as follow:

Onsite Post-Basin '1':

A = 29.5 acres CN = 90

$Q_2 = 18.05$ cfs, $Q_{10} = 39.76$ cfs, $Q_{100} = 71.54$ cfs

Detention Pond #1:

N.P. = 752.00, T.O.B. = 761.50, Storage = 652,128 Cu. Ft.

100-yr elev. = 759.33

Detention Outflow (w/o Tailwater):

$Q_2 = 1.28$ cfs, $Q_{10} = 2.30$ cfs, $Q_{100} = 7.26$ cfs

Detention Outflow (w/ Tailwater):

$Q_2 = 0.00$ cfs, $Q_{10} = 0.00$ cfs, $Q_{100} = 2.10$ cfs

Water Quality:

The detention pond and pond control box was designed to meet the City of Franklin Subdivision Control Ordinance, Section 6.19, for water quality design. The water quality detention pond was designed for option #1; detain 20% of the 0.5" direct runoff for 24 hours past the peak.

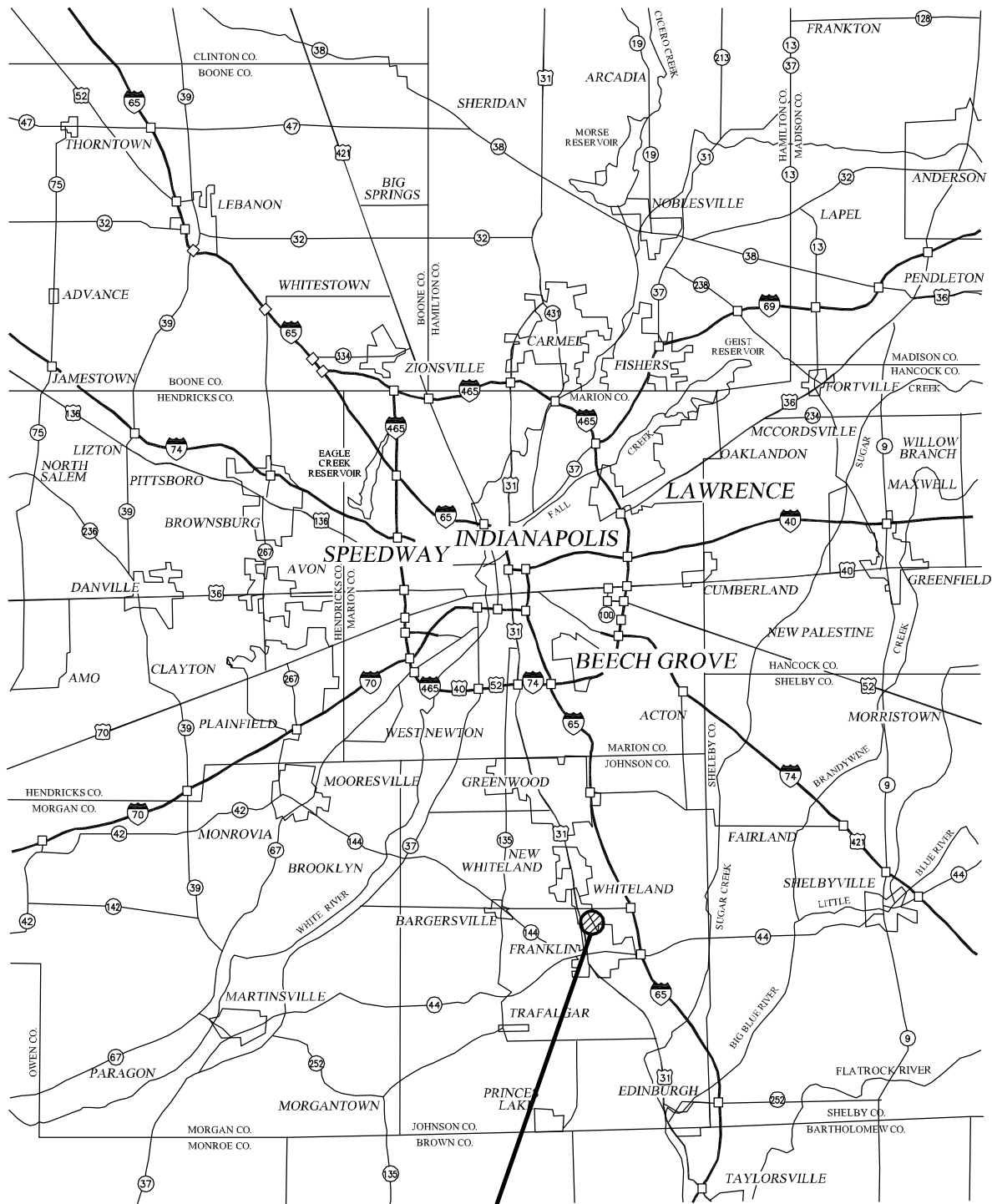
Engineering Methodology:

The calculations contained herein have been prepared in compliance with the City of Franklin Subdivision Control Ordinance. The detention facilities were designed using HYDRAFLOW Hydrograph Routing Module. A storm hydrograph is developed using the "SCS Curve Number Method" for each watershed and routed through a user defined detention basin and outlet structure configuration. Water surface elevations and outlet rates are determined by the storage indication method which uses a stage/storage/discharge relationship and inflow hydrograph to set the inflow minus the outflow equal to the change in storage. The post-developed drainage basins and basin characteristics for each pond are shown on the "Post-Development Drainage Map".

The storm sewer system was designed using the HYDRAFLOW Storm Sewer Module. Discharge rates for each inlet were calculated using the "Rational Method" and input into the HYDRAFLOW Storm Sewer Module to calculate the velocity, capacity, hydraulic grade line, gutter and inlet spreads for each storm sewer system. A weighted coefficient was computed for all storm basins in accordance with Chapter 6.19 of the City of Franklin General Drainage Standards. Individual times of concentration were calculated using Manning Equation. The storm sewer system is sized for a 10-year storm runoff event with no surcharging.

Stormwater Pollution Prevention:

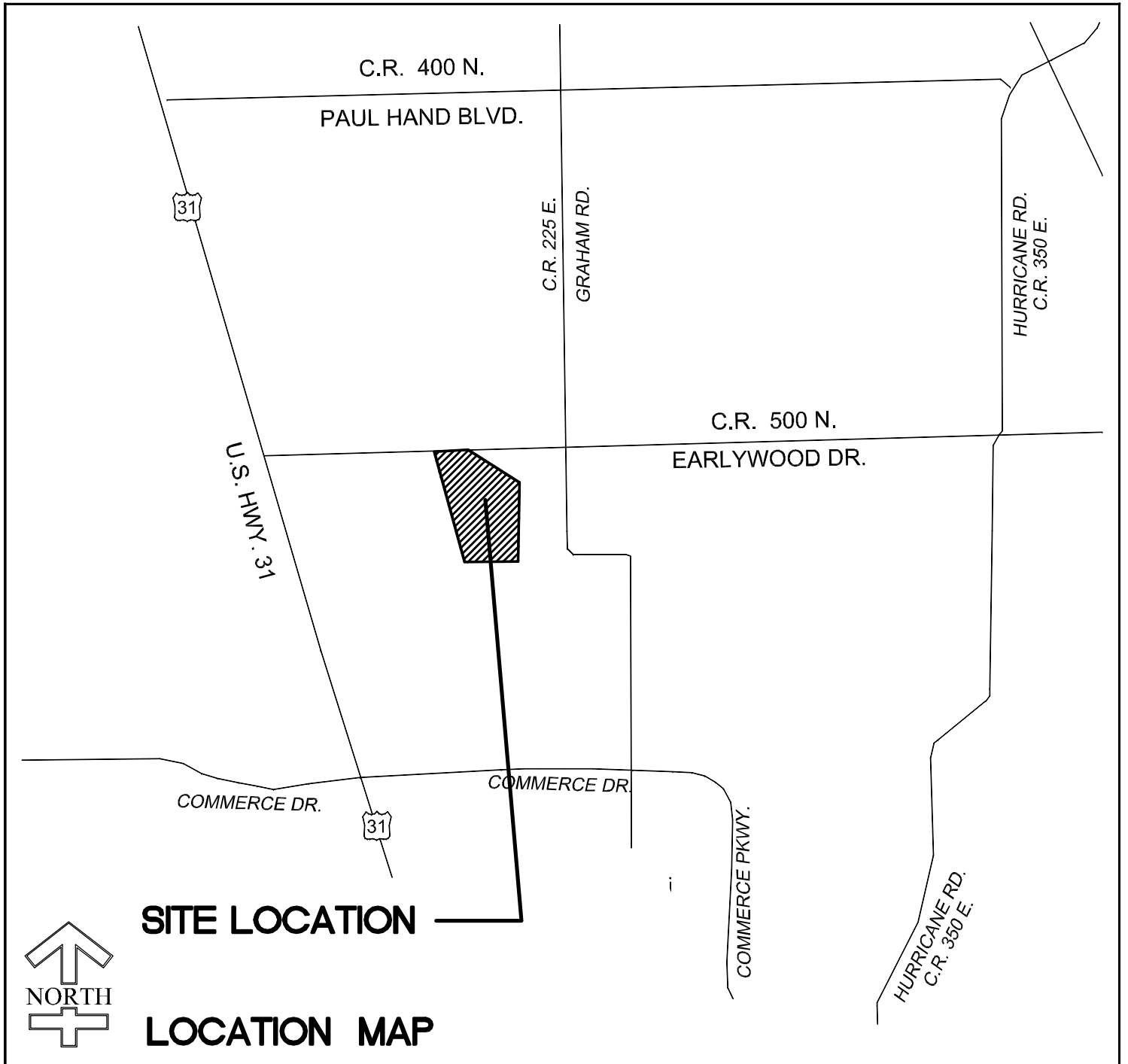
The land disturbing activities will be greater than 1 acre; therefore, an IDEM CSGP Construction Stormwater Permit submittal is required. A Stormwater Pollution Prevention Plan (SWPPP) with an activities schedule will be submitted as part of the construction plans. Standard maintenance schedules and details will be included. All swales and pond banks will be mulch-seeded and have an erosion control blanket installed. All drainage easements will be mulch-seeded and the rights-of-way will be temporary seeded. A perimeter filter fence will be installed where needed as well as at all ditch inlets.



SITE LOCATION

AREA MAP





National Flood Hazard Layer FIRMette



86°48'W 39°31'17"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

Without Base Flood Elevation (BFE)
Zone A, V, A99

With BFE or Depth
Zone AE, AO, AH, VE, AR

Regulatory Floodway

SPECIAL FLOOD HAZARD AREAS

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile
Zone X

Future Conditions 1% Annual Chance Flood Hazard
Zone X

Area with Reduced Flood Risk due to Levee. See Notes.
Zone X

Area with Flood Risk due to Levee
Zone D

OTHER AREAS OF FLOOD HAZARD

NO SCREEN

Area of Minimal Flood Hazard
Zone X

Effective LOMRs

Area of Undetermined Flood Hazard
Zone D

OTHER AREAS

Channel, Culvert, or Storm Sewer

Levee, Dike, or Floodwall

GENERAL STRUCTURES

Cross Sections with 1% Annual Chance Water Surface Elevation

Coastal Transect

Base Flood Elevation Line (BFE)

Limit of Study

Jurisdiction Boundary

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

OTHER FEATURES

Digital Data Available

No Digital Data Available

Unmapped

MAP PANELS

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **4/15/2021 at 12:58 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

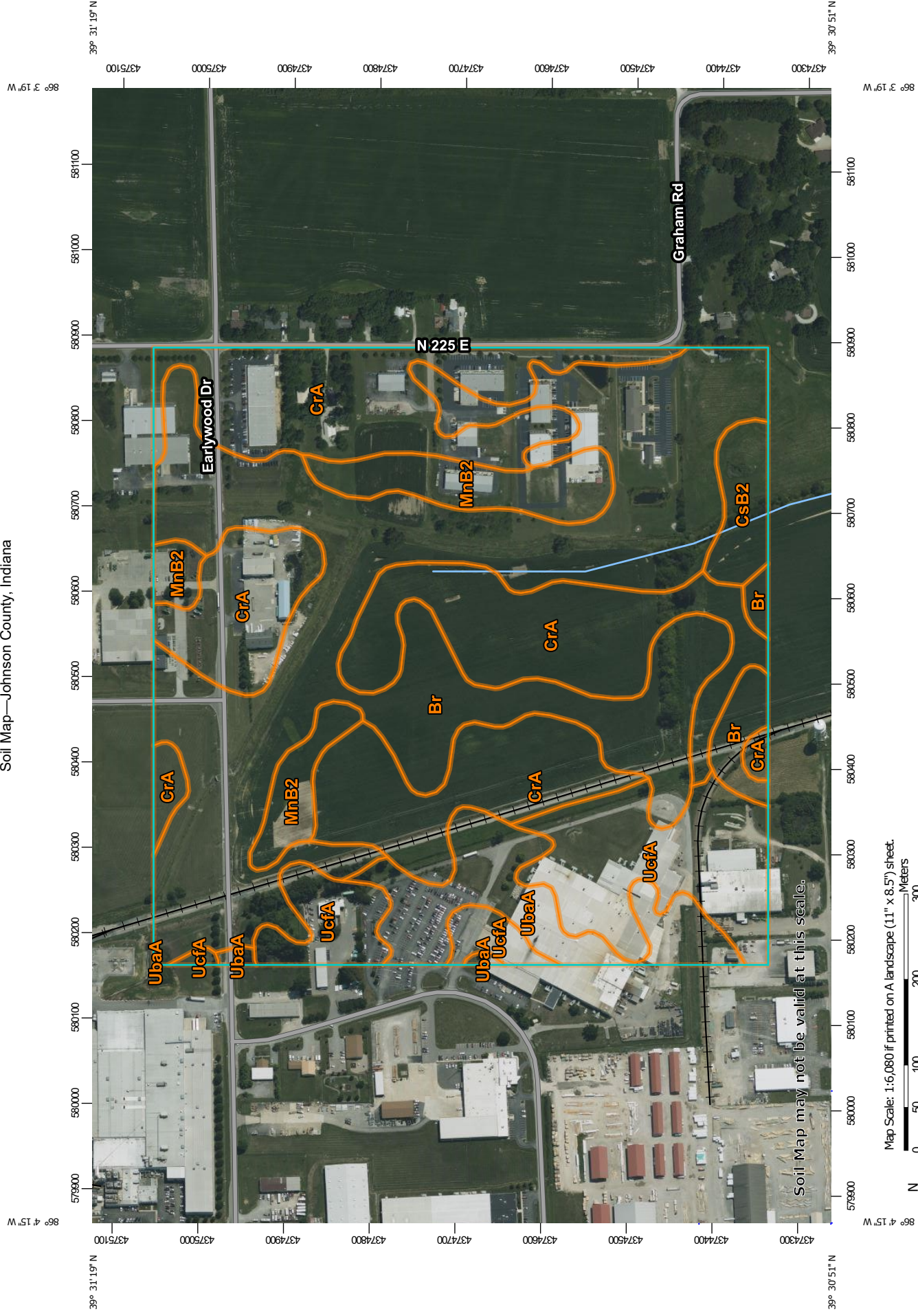
0 250 500 1,000 1,500 2,000 Feet

1:6,000

86°33'30"W 39°30'49"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Soil Map—Johnson County, Indiana




Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey


8/16/2021
Page 1 of 3


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: Johnson County, Indiana
Survey Area Data: Version 28, Jun 4, 2020

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

Date(s) aerial images were photographed: Jul 27, 2019—Sep 26, 2019

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
Br	Brookston silty clay loam, 0 to 2 percent slopes	52.6	40.8%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	42.3	32.8%
CsB2	Crosby-Miami silt loams, 2 to 4 percent slopes, eroded	2.7	2.1%
MnB2	Miami silt loam, 2 to 6 percent slopes, eroded	8.0	6.2%
UbaA	Urban land-Brookston complex, 0 to 2 percent slopes	8.4	6.5%
UcfA	Urban land-Crosby silt loam complex, fine-loamy subsoil, 0 to 2 percent slopes	14.8	11.5%
Totals for Area of Interest		128.7	100.0%

Hours	Minutes	Return Period - Rainfall Intensity (in/hr)					
		2	5	10	25	50	100
0.08	5	4.75	6.14	6.99	8.08	8.83	9.69
0.17	10	3.63	4.75	5.48	6.40	7.07	7.77
0.25	15	2.97	3.92	4.55	5.34	5.94	6.53
0.5	30	1.98	2.64	3.09	3.65	4.10	4.50
1	60	1.25	1.67	1.96	2.31	2.62	2.88
2	120	0.76	1.02	1.20	1.40	1.59	1.75
3	180	0.56	0.75	0.88	1.03	1.17	1.29
6	360	0.33	0.44	0.52	0.60	0.68	0.75
12	720	0.20	0.26	0.30	0.35	0.39	0.43
24	1440	0.11	0.15	0.17	0.20	0.22	0.25

Hours	Minutes	Return Period - Rainfall Depth (in)					
		2	5	10	25	50	100
0.08	5	0.40	0.51	0.58	0.67	0.74	0.81
0.17	10	0.61	0.79	0.91	1.07	1.18	1.30
0.25	15	0.74	0.98	1.14	1.34	1.49	1.63
0.5	30	0.99	1.32	1.55	1.83	2.05	2.25
1	60	1.25	1.67	1.96	2.31	2.62	2.88
2	120	1.52	2.04	2.40	2.80	3.18	3.50
3	180	1.68	2.25	2.64	3.09	3.51	3.87
6	360	1.98	2.64	3.12	3.60	4.08	4.50
12	720	2.40	3.12	3.60	4.20	4.68	5.16
24	1440	2.64	3.60	4.08	4.80	5.28	6.00

TABLE 202-02: IDF and IDD Tables for Indianapolis, IN

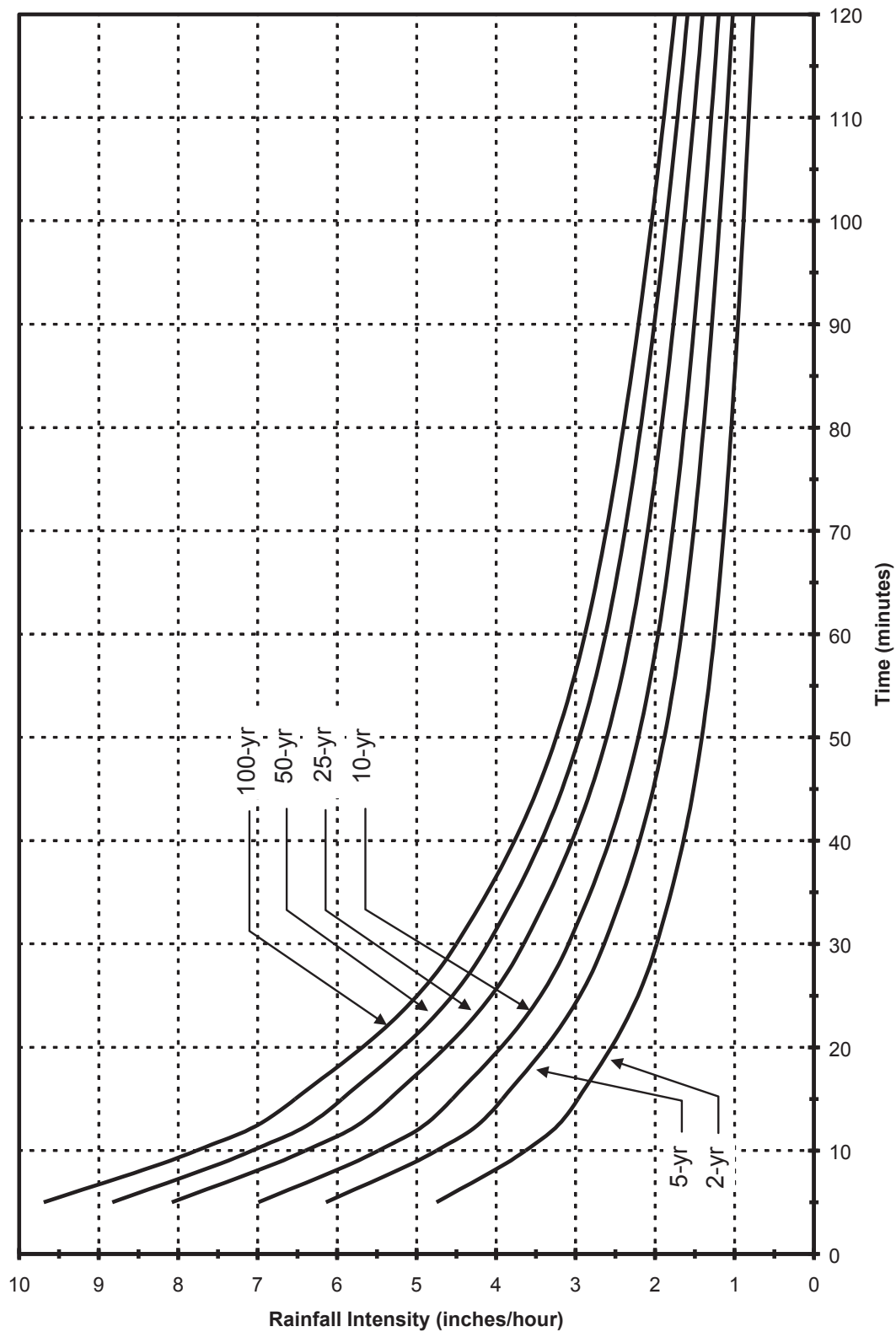


FIGURE 202-01: Indianapolis IDF Curve

<i>Cumulative storm rainfall (percent) for given storm type</i>				
<i>Cumulative storm time (percent)</i>	<i>First- quartile</i>	<i>Second- quartile</i>	<i>Third- quartile</i>	<i>Fourth- quartile</i>
5	16	3	3	2
10	33	8	6	5
15	43	12	9	8
20	52	16	12	10
25	60	22	15	13
30	66	29	19	16
35	71	39	23	19
40	75	51	27	22
45	79	62	32	25
50	82	70	38	28
55	84	76	45	32
60	86	81	57	35
65	88	85	70	39
70	90	88	79	45
75	92	91	85	51
80	94	93	89	59
85	96	95	92	72
90	97	97	95	84
95	98	98	97	92

FIGURE 202-02: Huff Rainfall Distribution
(SOURCE: Bulletin 71, "Rainfall Frequency Atlas of the Midwest", 1992)

% Storm Time	% Precipitation
0	0.0
5	2.7
10	6.5
15	11.0
20	18.1
25	26.0
30	35.9
35	44.7
40	52.9
45	61.0
50	67.9
55	72.5
60	76.5
65	80.2
70	83.8
75	87.2
80	90.7
85	93.3
90	95.9
95	97.9
100	100.0

Estimated Values in Italics

TABLE 202-03: Huff Curve Ordinates

(SOURCE: Purdue, et al, "Statistical Characteristics of Short Time Increment Rainfall")

Worksheet 3: Time of Concentration (T_C) or travel time (T_t)

Project	By	Date
Location	Checked	Date

Check one: ☐ Present ☐ Developed

Check one: ☐ T_C ☐ T_t through subarea

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_C only)

	Segment ID				
1. Surface description (table 3-1)					
2. Manning's roughness coefficient, n (table 3-1)					
3. Flow length, L (total L \geq 300 ft) ft					
4. Two-year 24-hour rainfall, P_2 in					
5. Land slope, s ft/ft					
6. $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T_t hr		+		=	

Shallow concentrated flow

	Segment ID				
7. Surface description (paved or unpaved)					
8. Flow length, L ft					
9. Watercourse slope, s ft/ft					
10. Average velocity, V (figure 3-1) ft/s					
11. $T_t = \frac{L}{3600 V}$ Compute T_t hr		+		=	

Channel flow

	Segment ID				
12. Cross sectional flow area, a ft ²					
13. Wetted perimeter, p_w ft					
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r ft					
15. Channel slope, s ft/ft					
16. Manning's roughness coefficient, n					
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V ft/s					
18. Flow length, L ft					
19. $T_t = \frac{L}{3600 V}$ Compute T_t hr		+		=	
20. Watershed or subarea T_C or T_t (add T_t in steps 6, 11, and 19) Hr					

FIGURE 203-01: Time of Concentration or Travel Time Worksheet
(SOURCE: 210-VI-TR-55, Second Ed., June 1986)

Surface Description	n
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated Soils:	
Residue cover $\leq 20\%$	0.06
Residue cover $> 20\%$	0.17
Grass:	
Short grass prairie	0.15
Dense grasses	0.24
Bermuda grass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.40
Dense underbrush	0.80

TABLE 203-01: Roughness coefficients (Manning's n) for sheet flow

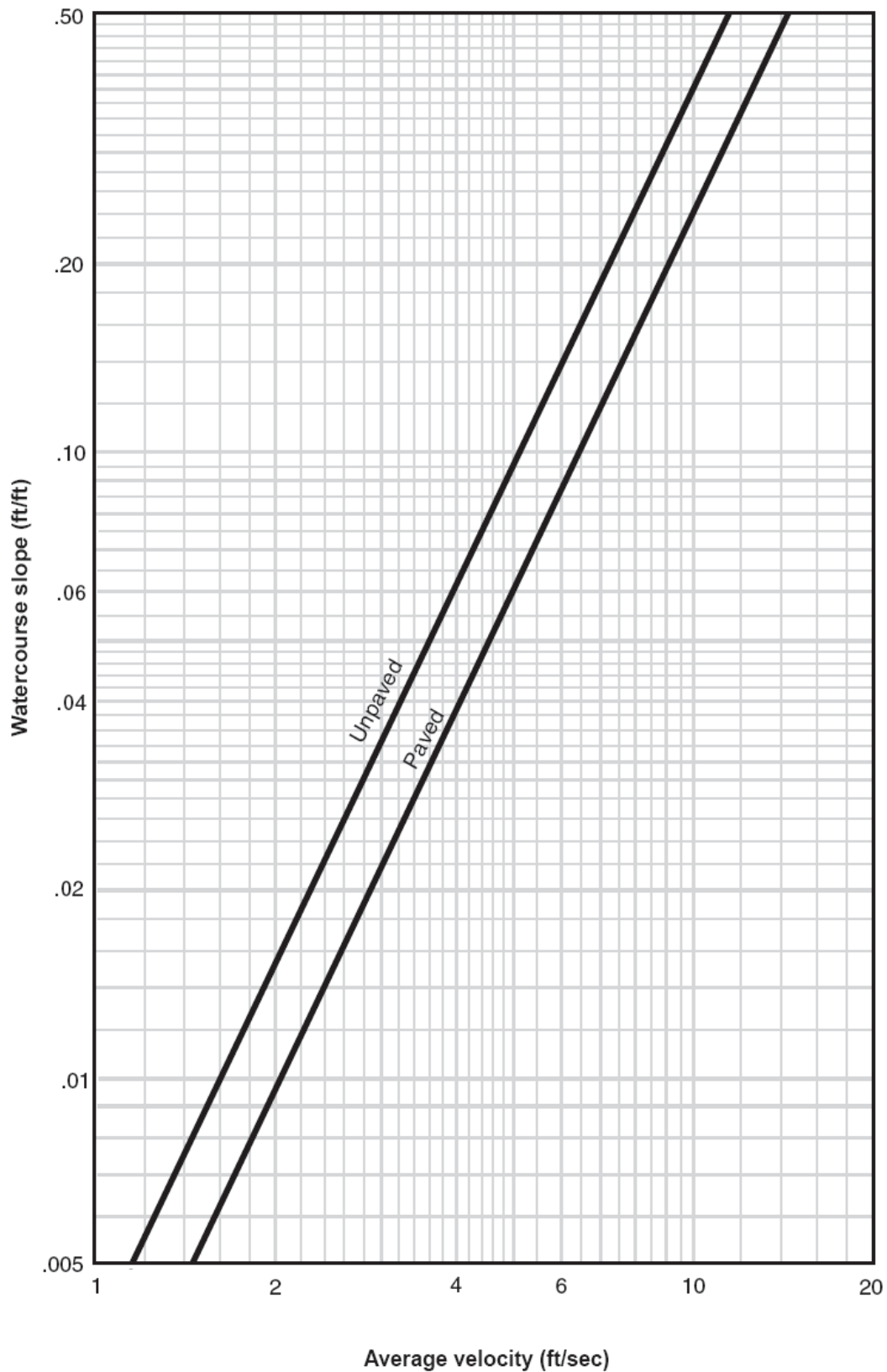


FIGURE 203-02: Average Velocities for Estimating Travel Time for Shallow Concentrated Flow
(SOURCE: 210-VI-TR-55, Second Ed., June 1986)

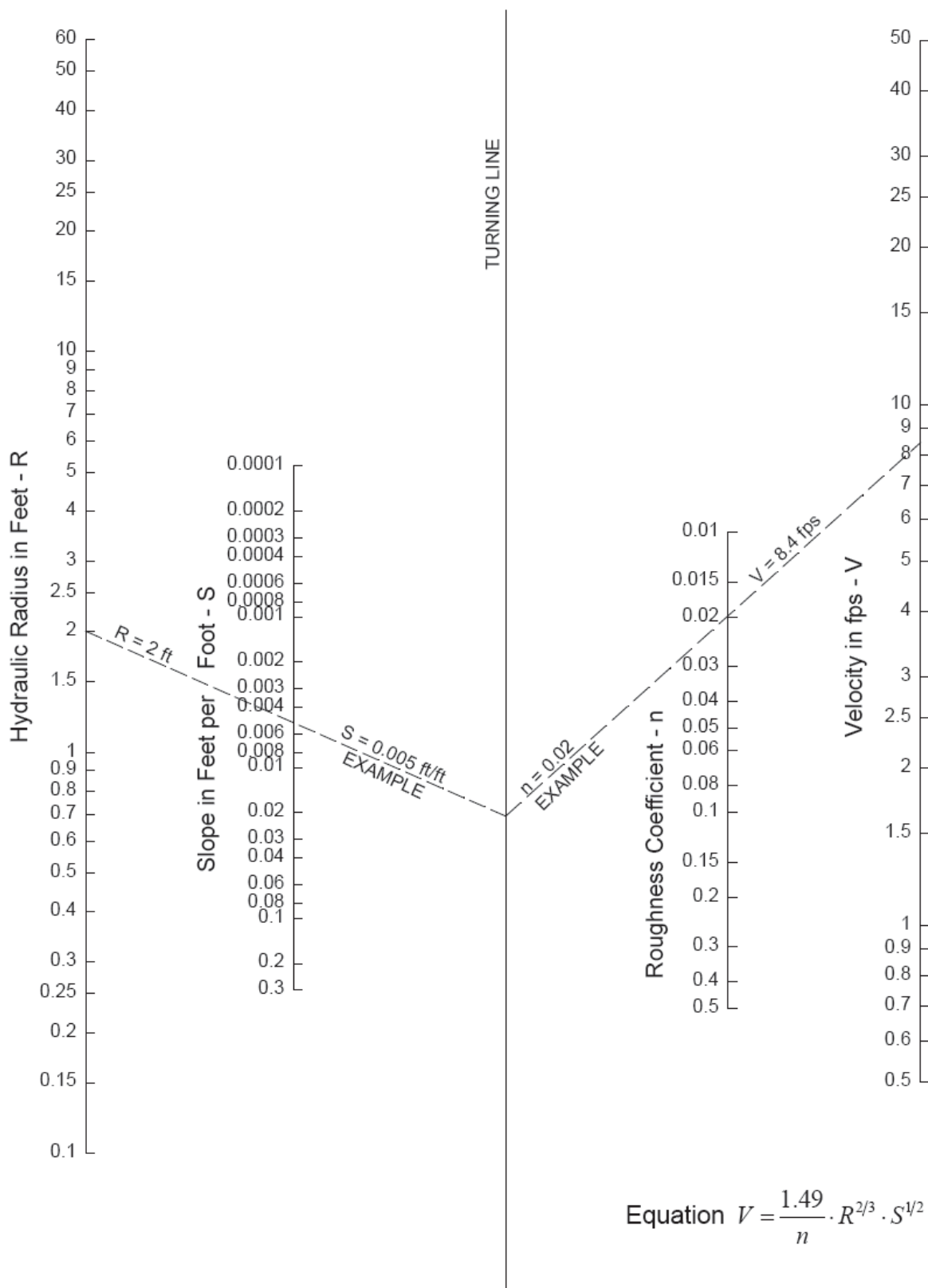


FIGURE 203-03: Nomograph for Solution of Manning Equation
 (SOURCE: North Carolina Erosion & Sediment Control Planning & Design Manual, 09/01/88)

<u>TYPE OF SURFACE</u>	<u>RUNOFF COEFFICIENT ©</u>
<u>Non-Urban Areas</u>	
Bare earth	0.55
Steep grassed areas (slope 2:1)	0.60
Turf meadows	0.25
Forested areas	0.20
Cultivated fields	0.30
<u>Urban Areas</u>	
All watertight roof surfaces	0.90
Pavement	0.85
Gravel	0.85
Impervious soils (heavy)	0.55
Impervious soils (with turf)	0.45
Slightly pervious soil	0.25
Slightly pervious soil (with turf)	0.20
Moderately pervious soil	0.15
Moderately pervious soil (with turf)	0.10
Business, Commercial & Industrial	0.85
Apartments & Townhouses	0.70
Schools & Churches	0.55
Single Family Lots < 10,000 SF	0.45
Lots < 12,000 SF	0.45
Lots < 17,000 SF	0.40
Lots > ½ acre	0.35
Park, Cemetery or Unimproved Area	0.30

TABLE 204-01: Runoff Coefficients© for Use in the Rational Method

[Absence of an entry indicates the feature is not a concern. The symbol < means less than; > means greater than]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action
		Frequency	Duration	Months	Depth	Kind	Months	
Brookston: Br	B/D	Frequent	Brief	Dec-May	^{Ft} 0-1.0	Apparent	Dec-May	High.
Crosby: CrA	C	None			1.0-3.0	Apparent	Jan-Apr	High.
¹ CsB2: Crosby part	C	None			1.0-3.0	Apparent	Jan-Apr	High.
Miami part	B	None			>6.0			Moderate.
Eel: Ee	C	Frequent	Brief	Oct-Jun	3.0-6.0	Apparent	Jan-Apr	High.
Fox: FoA, FoB2, ¹ FxC2	B	None			>6.0			Moderate.
Genesee: Ge	B	Frequent	Brief	Oct-Jun	>6.0			Moderate.
Hennepin: HeF	B	None			>6.0			Moderate.
Martinsville: MgA, MgB2	B	None			>6.0			Moderate.
Miami: MmA, MmB2, MmC2, ¹ MxD2, MxE2	B	None			>6.0			Moderate.
Ockley: OcA, OcB2	B	None			>6.0			Moderate.
Rensselaer: Re	B/D	None			0-1.0	Apparent	Dec-May	High.
Shoals: Sh	C	Frequent	Brief	Oct-Jun	1.0-3.0	Apparent	Jan-Apr	High.
Sleeth: Sk	C	None			1.0-3.0	Apparent	Jan-Apr	High.
Sloan: Sn	B/D	Frequent	Long	Oct-Jun	0-0.5	Apparent	Nov-Jun	High.
Urban land: ¹ Ub:								
Brookston part	B/D	Frequent	Brief	Dec-May	0-1.0	Apparent	Dec-May	High.
¹ Ucl: Crosby part	C	None			1.0-3.0	Apparent	Jan-Apr	High.
¹ UfA: Fox part	B	None			>6.0			Moderate.
¹ UfC: Fox part	B	None			>6.0			Moderate.
¹ Ug: Genesee part	B	Frequent	Brief	Oct-Jun	>6.0			Moderate.
¹ UmB: Miami part	B	None			>6.0			Moderate.
¹ UmC: Miami part	B	None			>6.0			Moderate.
¹ Uw: Westland part	B/D	Frequent	Brief	Dec-May	0-1.0	Apparent	Dec-May	High.
Westland: We	B/D	Frequent	Brief	Dec-May	0-1.0	Apparent	Dec-May	High.
Whitaker: Wh	C	None			1.0-3.0	Apparent	Jan-Apr	High.

¹ This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 205-01: Soil and Water Features for Marion County, Indiana
(SOURCE: NRCS, Soil Survey of Marion county, Indiana, 1991)

Cover Description	Curve Numbers for Hydrologic Soil Groups				
Cover Type and Hydrologic Condition	Average Percent Impervious Area ²	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) ²		68	79	86	89
Poor condition (grass cover < 50%)		49	69	79	84
Fair condition (grass cover 50% to 75%)		39	61	74	80
Good condition (grass cover > 75%)					
Impervious Areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and Roads:					
Paved; curbs and storm drains (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Urban Districts:					
Commercial and Business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential Districts by Average Lot Size:					
0.125 acre or less (townhouses)	65	77	85	90	92
0.25 acre	38	61	75	83	87
0.33 acre	30	57	72	81	86
0.50 acre	25	54	70	80	85
1.00 acre	20	51	68	79	84
2.00 acre	12	46	65	77	82
Developing Urban Areas					
Newly graded areas (pervious area only, no vegetation)		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in <i>Table 205-04</i>).					

¹ Average runoff condition, and $I_a = 0.2S$

² The average percent impervious area shown was used to develop the composite CNs. Other assumptions are as follows: Impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. If the impervious area is not connected, the NRCS method has an adjustment to reduce the effect.

³ CNs shown are equivalent to those of pasture. Composite CNs may be computed for other combinations of open space cover type.

TABLE 205-02: Runoff Curve Numbers for Urban Areas
(SOURCE: 210-VI-TR-55, Second Ed., June 1986)

Cover Description	Curve Numbers for Hydrologic Soil Groups			
Cover Type and Hydrologic Condition	A	B	C	D
Cultivated Land (Row Crops)	72	81	88	91
With conservation treatment	62	71	78	81
Without conservation treatment				
Pasture or Range Land	68	79	86	89
Poor condition	39	61	74	80
Good condition				
Meadow	30	58	71	78
Good condition				
Wood or Forest Land				
Thin stand, poor cover, no mulch	45	66	77	83
Good cover	25	55	70	77

TABLE 205-03: Runoff Curve Numbers for Undeveloped Areas
(SOURCE: 210-VI-TR-55, Second Ed., June 1986)

Cover Description	Curve Numbers for Hydrologic Soil Groups			
Cover Type and Hydrologic Condition	A	B	C	D
Pasture, grassland or range with continuous forage for grazing.				
Poor	68	79	86	89
Fair	49	69	79	84
Good	39	61	74	80
Meadow with continuous grass, protected from grazing and generally mowed for hay.	30	58	71	78
Brush/brush-weed-grass mixture with brush being the major element.				
Poor	48	67	77	83
Fair	35	56	70	77
Good	30	48	65	73
Woods and grass combination (orchard or tree farm).				
Poor	57	73	82	86
Fair	43	65	76	82
Good	32	58	72	79
Woods				
Poor	45	66	77	83
Fair	36	60	73	79
Good	30	55	70	77
Farmsteads	59	74	82	86

TABLE 205-04: Runoff Curve Numbers for Agricultural Lands
(SOURCE: 210-VI-TR-55, Second Ed., June 1986)

**Post-Developed Drainage Conditions
(Approved from Patriot Defense Research
Park - Buildings #1 and #2 report)**

PROJECT: Patriot Defense Research Park

DATED: 9/3/21

NAME: JPH

ALLOWABLE RELEASE RATE CALCULATIONS

PRE-DEV. ONSITE BASIN
'1'

ALLOWABLE RELEASE PNT #1

Q10p = 0.5 Q10e = **2.30** cfs

Q100p = Q10e = **7.73** cfs

Time	2 YR	10 YR.	100 YR.
1 hr.	0.88	6.54	19.72
2 hr.	1.40	7.73	21.12
3 hr.	1.53	7.38	19.60
6 hr.	1.54	6.34	14.99
12 hr.	2.17	6.65	14.02
24 hr.	2.30	6.14	12.11

10p	100p
0.88	6.54
1.40	7.73
1.53	7.38
1.54	6.34
2.17	6.65
2.30	6.14

Runoff curve number (CN) and Time of Concentration (TC) Calculations

Project: Patriot Defense Research Park

By: JPH

Date: 9/3/21

Circle one: Present ☐ Developed ☒

Onsite Basin 1

Runoff curve number (CN)

Soil Name and Hydrologic Group	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/	Area (in acres)	Product of CN x area
Br 'B'	Urban Disticts (Industrial) (72% impervious coverage)	88	13.65	1201.2
CrA, CsB2, MnB2 - 'C'	Urban Disticts (Industrial) (72% impervious coverage)	91	15.74	1432.3
				0.0
				0.0
				0.0
				0.0
				0.0
	Impervious Areas	98	0.11	10.8
		Totals=	29.50	2644.32

CN (weighted) = $\frac{\text{Total Product}}{\text{Total Area}}$
 CN (weighted) = $\frac{2644.3}{29.5}$
 CN (weighted) = **89.6**
 US CN = **90**

Time of Concentration

Sheet Flow	$T.C. = \frac{0.01}{2.64^{0.50}} \times \left(\frac{0.17}{0.50\%^{0.40}} \times 100 \right)^{0.80} =$					21 Minutes
Shallow Concentrated	Paved:	$T.C. = 20.3 \times 1.00\%^{0.5} =$	2.03 ft/sec			2 Minutes
			213 feet			
Channel Flow	Unpaved:	$T.C. = 16.1 \times 0.80\%^{0.5} =$	1.44 ft/sec			0 Minutes
			1.44 ft/sec			
Channel Flow	X-sec	1.77	Mann 'N'	0.013	2.52 ft/sec	10 Minutes
	Wet Per.	4.71				
	Hyd. R. =	0.38	Flow Length	1577 feet		
	Chan. Slope	0.18%				
Minimum T/C = 5 Minutes					T/c Total=	33 Minutes

Pond Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:16 PM

Pond No. 2 - Detention Pond 1 w/ Tailw

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	752.00	45,416	0	0
1.00	753.00	48,621	47,019	47,019
2.00	754.00	52,961	50,791	97,810
3.00	755.00	58,444	55,703	153,512
4.00	756.00	65,890	62,167	215,679
5.00	757.00	74,842	70,366	286,045
6.00	758.00	83,177	79,010	365,055
7.00	759.00	91,484	87,331	452,385
8.00	760.00	99,849	95,667	548,052
9.00	761.00	108,303	104,076	652,128

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise (in)	= 12.00	3.00	7.00	0.00
Span (in)	= 12.00	3.00	7.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 752.00	752.00	753.90	0.00
Length (ft)	= 146.00	0.50	0.50	0.00
Slope (%)	= 1.36	0.50	0.50	0.00
N-Value	= .011	.011	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 11.70	0.00	0.00	0.00
Crest El. (ft)	= 756.30	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

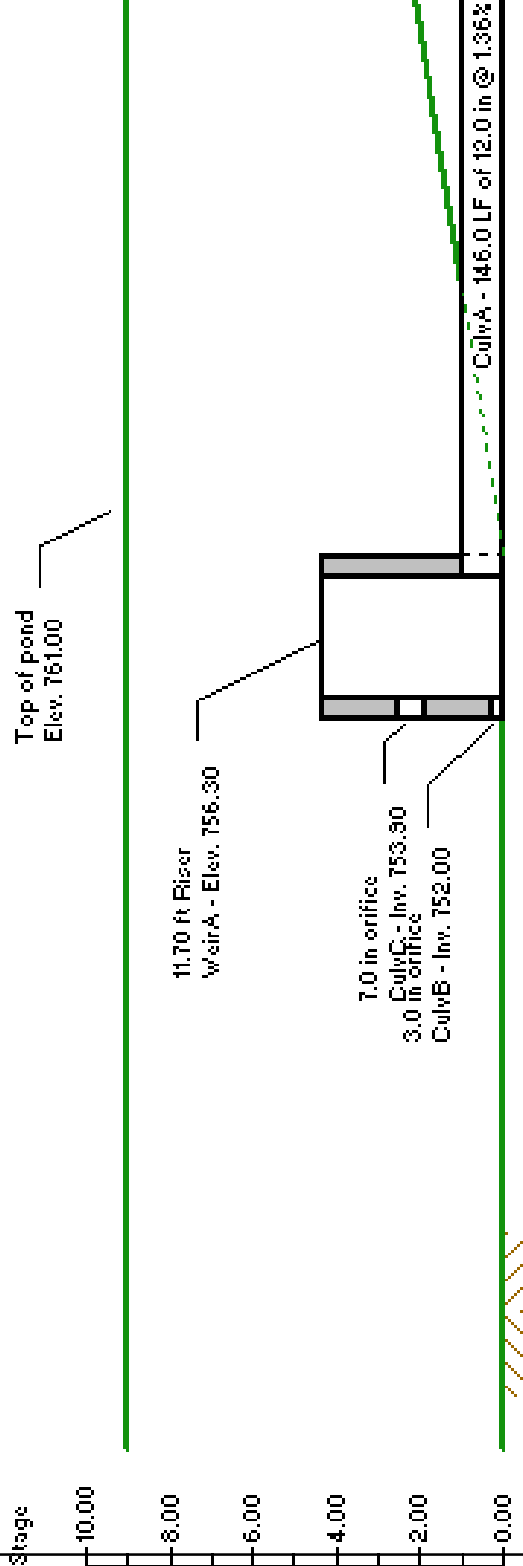
Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 758.80 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0	752.00	0.00	0.00	0.00	---	0.00	---	---	---	---	0.00
1.00	47,019	753.00	0.00	0.00	0.00	---	0.00	---	---	---	---	0.00
2.00	97,810	754.00	0.00	0.00	0.00	---	0.00	---	---	---	---	0.00
3.00	153,512	755.00	0.00	0.00	0.00	---	0.00	---	---	---	---	0.00
4.00	215,679	756.00	0.00	0.00	0.00	---	0.00	---	---	---	---	0.00
5.00	286,045	757.00	0.00	0.00	0.00	---	0.00	---	---	---	---	0.00
6.00	365,055	758.00	0.00	0.00	0.00	---	0.00	---	---	---	---	0.00
7.00	452,385	759.00	1.29	0.00	0.00	---	0.00	---	---	---	---	1.29
8.00	548,052	760.00	3.17	0.00	0.00	---	0.00	---	---	---	---	3.17
9.00	652,128	761.00	4.29	0.00	0.00	---	0.00	---	---	---	---	4.29

Detention Pond 1 w/ Tailw



Section
NTS

* Side slope estimated average from contours

Project Name: Patriot Defense Research Park Project # 21008

Water Quality - Detention Pond

Option #1

20% of Runoff from a 1.25" storm event

$$\text{Volume} = 54,537 \text{ c.f.} \times 0.20 = \boxed{10,907 \text{ c.f.} \leq \text{USE}}$$

Option #2

20% of a 0.50" direct runoff

$$\text{Volume} = 29.5 \text{ ac.} \times \frac{43560 \text{ s.f.}}{1 \text{ ac.}} \times \frac{144 \text{ s.-in.}}{1 \text{ s.f.}} \times 0.50\text{-in}$$

$$= 92,521,440 \text{ c.in} = 53,543 \text{ c.f.}$$

$$= 53,543 \text{ c.f.} \times 0.20 = 10,709 \text{ c.f.}$$

Peak storm event happens at 1.24 inch storm event

Storm event that provides	10,907	c.f. is a	1.25	inch storm event
Peak occurs at	24.25	hrs for the	1.25	inch storm event

$$24.25 \text{ hrs} + 24.0 \text{ hrs} = 48.25 \text{ hrs}$$

$$\text{Pond Elevation at } 48.25 \text{ hrs} = 752.59 \text{ n.p. } 752.00$$

$$\text{Pond Storage Volume at } 48.25 \text{ hrs} = 27,741 \text{ c.f.} > 10,907 \text{ c.f.}$$

$$\frac{1}{47,019} = \frac{0.59}{27,741}$$

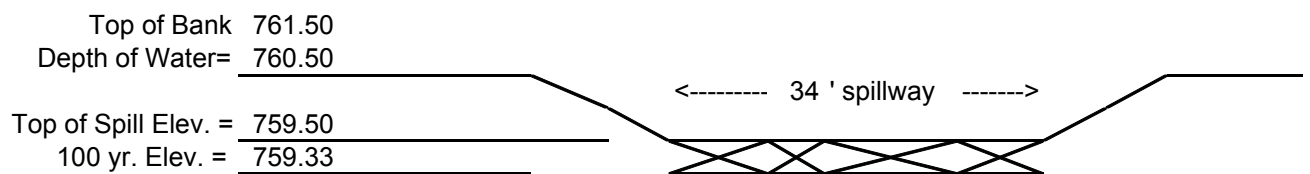
PROJECT NAME: Patriot Defense Research Park
Emergency spillway calculation Pond

Peak 100 Yr. Inflow = 71.54 c.f.s.

$$1.25 \times 71.54 \text{ c.f.s.} = 89.4$$

Weir Equation: $Q = C L H^{3/2}$
Where Q = outflow
L = length of weir
C = discharge coefficient
H = hydraulic head over weir

$$89.425 \text{ c.f.s.} = 2.6 (L)^{1/2}$$
$$L = 34.39'$$



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	18.05	1	40	52,507	----	-----	-----	Post Onsite 1 - 1 hr.
2	SCS Runoff	17.62	1	50	74,366	----	-----	-----	Post Onsite 1 - 2 hr.
3	SCS Runoff	15.83	1	58	88,016	----	-----	-----	Post Onsite 1 - 3 hr.
4	SCS Runoff	11.13	1	72	114,605	----	-----	-----	Post Onsite 1 - 6 hr.
5	SCS Runoff	9.81	1	325	153,456	----	-----	-----	Post Onsite 1 - 12 hr.
6	SCS Runoff	6.94	1	937	176,279	----	-----	-----	Post Onsite 1 - 24 hr.
7	Reservoir	0.22	1	106	29,982	1	753.09	51,642	Thru Pond 1 - 1 hr.
8	Reservoir	0.26	1	164	37,898	2	753.50	72,649	Thru Pond 1 - 2 hr.
9	Reservoir	0.29	1	223	42,017	3	753.76	85,394	Thru Pond 1 - 3 hr.
10	Reservoir	0.56	1	395	51,704	4	754.19	108,116	Thru Pond 1 - 6 hr.
11	Reservoir	1.17	1	741	77,916	5	754.61	131,994	Thru Pond 1 - 12 hr.
12	Reservoir	1.28	1	1456	87,151	6	754.72	138,128	Thru Pond 1 - 24 hr.
13	Reservoir	0.00	1	0	0	1	753.11	52,507	Thru Pond1w/TW - 1 hr.
14	Reservoir	0.00	1	0	0	2	753.54	74,366	Thru Pond1w/TW - 2 hr.
15	Reservoir	0.00	1	0	0	3	753.81	88,016	Thru Pond1w/TW - 3 hr.
16	Reservoir	0.00	1	0	0	4	754.30	114,605	Thru Pond1w/TW - 6 hr.
17	Reservoir	0.00	1	0	0	5	755.00	153,456	Thru Pond1w/TW - 12hr.
18	Reservoir	0.00	1	0	0	6	755.37	176,279	Thru Pond1w/TW - 24hr.
21008post.gpw					Return Period: 2 Year			Tuesday, Sep 7 2021, 2:42 PM	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:44 PM

Hyd. No. 1

Post Onsite 1 - 1 hr.

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.05 cfs
Storm frequency	=	2 yrs	Time interval	=	1 min
Drainage area	=	29.50 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	33.0 min
Total precip.	=	1.25 in	Distribution	=	Huff-1st
Storm duration	=	1 hrs	Shape factor	=	484

Hydrograph Volume = 52,507 cuft

(Printed values >= 85% of Qp.)

Hydrograph Discharge Table

Time -- Outflow
(hrs cfs)

0.52	15.65
0.53	16.17
0.55	16.63
0.57	17.02
0.58	17.32
0.60	17.58
0.62	17.77
0.63	17.91
0.65	18.00
0.67	18.05 <<
0.68	18.05
0.70	18.01
0.72	17.93
0.73	17.82
0.75	17.67
0.77	17.49
0.78	17.26
0.80	17.01
0.82	16.74
0.83	16.44
0.85	16.14
0.87	15.81
0.88	15.46

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:47 PM

Hyd. No. 12

Thru Pond 1 - 24 hr.

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Inflow hyd. No. = 6
Max. Elevation = 754.72 ft

Peak discharge = 1.28 cfs
Time interval = 1 min
Reservoir name = Detention Pond 1
Max. Storage = 138,128 cuft

Storage Indication method used.

Outflow hydrograph volume = 87,151 cuft

(Printed values >= 99% of Qp.)

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
23.73	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.75	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.77	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.78	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.80	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.82	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.83	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.85	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.87	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.88	1.75	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.90	1.75	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.27
23.92	1.75	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
23.93	1.75	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
23.95	1.75	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
23.97	1.75	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
23.98	1.75	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.00	1.75	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.02	1.75	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.03	1.74	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.05	1.74	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.07	1.72	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.08	1.71	754.72	1.28	0.34	0.94	----	----	----	----	----	----	1.28
24.10	1.69	754.72	1.28	0.34	0.94	----	----	----	----	----	----	1.28
24.12	1.66	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.13	1.64	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.15	1.61	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.17	1.57	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.18	1.54	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.20	1.50	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.22	1.45	754.72	1.29	0.35	0.94	----	----	----	----	----	----	1.28
24.23	1.41	754.72	1.29	0.35	0.94	----	----	----	----	----	----	1.28
24.25	1.36	754.72	1.29	0.35	0.94	----	----	----	----	----	----	1.28
24.27	1.31	754.72	1.29	0.35	0.94	----	----	----	----	----	----	1.28 <<
24.28	1.25	754.72	1.29	0.35	0.94	----	----	----	----	----	----	1.28
24.30	1.19	754.72	1.29	0.35	0.94	----	----	----	----	----	----	1.28
24.32	1.13	754.72	1.29	0.35	0.94	----	----	----	----	----	----	1.28
24.33	1.06	754.72	1.29	0.35	0.94	----	----	----	----	----	----	1.28
24.35	1.00	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
24.37	0.93	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.38	0.87	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.40	0.82	754.72	1.29	0.34	0.94	----	----	----	----	----	----	1.28
24.42	0.76	754.72	1.28	0.34	0.94	----	----	----	----	----	----	1.28
24.43	0.70	754.72	1.28	0.34	0.94	----	----	----	----	----	----	1.28
24.45	0.65	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.47	0.60	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.48	0.55	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.50	0.51	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.52	0.46	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.53	0.42	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.28
24.55	0.38	754.72	1.28	0.34	0.93	----	----	----	----	----	----	1.27
24.57	0.34	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
24.58	0.31	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
24.60	0.27	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
24.62	0.24	754.71	1.28	0.34	0.93	----	----	----	----	----	----	1.27
24.63	0.21	754.71	1.27	0.34	0.93	----	----	----	----	----	----	1.27

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:48 PM

Hyd. No. 18

Thru Pond1w/TW - 24hr.

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Inflow hyd. No. = 6
Max. Elevation = 755.37 ft

Peak discharge = 0.00 cfs
Time interval = 1 min
Reservoir name = Detention Pond 1
Max. Storage = 176,279 cuft

Storage Indication method used.

Outflow hydrograph volume = 0 cuft

...End

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	39.76	1	38	112,786	----	-----	-----	Post Onsite 1 - 1 hr.
2	SCS Runoff	37.97	1	47	153,366	----	-----	-----	Post Onsite 1 - 2 hr.
3	SCS Runoff	33.35	1	54	176,264	----	-----	-----	Post Onsite 1 - 3 hr.
4	SCS Runoff	24.11	1	61	222,901	----	-----	-----	Post Onsite 1 - 6 hr.
5	SCS Runoff	17.08	1	302	270,476	----	-----	-----	Post Onsite 1 - 12 hr.
6	SCS Runoff	11.80	1	936	318,729	----	-----	-----	Post Onsite 1 - 24 hr.
7	Reservoir	0.64	1	104	53,012	1	754.24	110,905	Thru Pond 1 - 1 hr.
8	Reservoir	1.42	1	157	84,151	2	754.88	146,785	Thru Pond 1 - 2 hr.
9	Reservoir	1.65	1	214	103,086	3	755.18	164,760	Thru Pond 1 - 3 hr.
10	Reservoir	1.96	1	387	142,372	4	755.66	194,361	Thru Pond 1 - 6 hr.
11	Reservoir	2.18	1	739	180,349	5	756.05	219,256	Thru Pond 1 - 12 hr.
12	Reservoir	2.30	1	1454	209,402	6	756.28	235,731	Thru Pond 1 - 24 hr.
13	Reservoir	0.00	1	0	0	1	754.27	112,786	Thru Pond1w/TW - 1 hr.
14	Reservoir	0.00	1	0	0	2	755.00	153,366	Thru Pond1w/TW - 2 hr.
15	Reservoir	0.00	1	0	0	3	755.37	176,264	Thru Pond1w/TW - 3 hr.
16	Reservoir	0.00	1	0	0	4	756.10	222,901	Thru Pond1w/TW - 6 hr.
17	Reservoir	0.00	1	0	0	5	756.78	270,476	Thru Pond1w/TW - 12hr.
18	Reservoir	0.00	1	0	0	6	757.41	318,729	Thru Pond1w/TW - 24hr.
21008post.gpw					Return Period: 10 Year			Tuesday, Sep 7 2021, 2:42 PM	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:45 PM

Hyd. No. 1

Post Onsite 1 - 1 hr.

Hydrograph type	=	SCS Runoff	Peak discharge	=	39.76 cfs
Storm frequency	=	10 yrs	Time interval	=	1 min
Drainage area	=	29.50 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	33.0 min
Total precip.	=	1.96 in	Distribution	=	Huff-1st
Storm duration	=	1 hrs	Shape factor	=	484

Hydrograph Volume = 112,786 cuft

(Printed values >= 85% of Qp.)

Hydrograph Discharge Table

Time -- Outflow
(hrs cfs)

0.48	34.64
0.50	35.82
0.52	36.85
0.53	37.70
0.55	38.40
0.57	38.94
0.58	39.32
0.60	39.59
0.62	39.73
0.63	39.76 <<
0.65	39.70
0.67	39.53
0.68	39.27
0.70	38.94
0.72	38.54
0.73	38.06
0.75	37.51
0.77	36.89
0.78	36.19
0.80	35.45
0.82	34.65
0.83	33.81

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:47 PM

Hyd. No. 12

Thru Pond 1 - 24 hr.

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Inflow hyd. No. = 6
Max. Elevation = 756.28 ft

Peak discharge = 2.30 cfs
Time interval = 1 min
Reservoir name = Detention Pond 1
Max. Storage = 235,731 cuft

Storage Indication method used.

Outflow hydrograph volume = 209,402 cuft

(Printed values >= 99% of Qp.)

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
20.55	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.57	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.58	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.60	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.62	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.63	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.65	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.67	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.68	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.70	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.72	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.73	2.84	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.75	2.84	756.25	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.77	2.84	756.25	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.78	2.84	756.25	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.80	2.84	756.25	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.82	2.84	756.25	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.83	2.84	756.25	2.28	0.43	1.84	----	----	----	----	----	----	2.28
20.85	2.84	756.25	2.29	0.43	1.85	----	----	----	----	----	----	2.28
20.87	2.84	756.25	2.29	0.43	1.85	----	----	----	----	----	----	2.28
20.88	2.84	756.25	2.29	0.43	1.85	----	----	----	----	----	----	2.28
20.90	2.84	756.25	2.29	0.43	1.85	----	----	----	----	----	----	2.28
20.92	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
20.93	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
20.95	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
20.97	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
20.98	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.00	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.02	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.03	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.05	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.07	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.08	2.84	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.10	2.84	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.12	2.84	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.13	2.84	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.15	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.17	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
21.18	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.20	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28
21.22	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.23	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.25	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.27	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.28	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.30	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.32	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.33	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.35	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.37	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.38	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.40	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.42	2.85	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.43	2.85	756.27	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.45	2.85	756.27	2.29	0.44	1.85	----	----	----	----	----	----	2.29
21.47	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.48	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.50	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.52	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.53	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.55	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.57	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.58	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.60	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.62	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
21.63	2.84	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.65	2.84	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.67	2.83	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.68	2.82	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.70	2.81	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.72	2.80	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.73	2.78	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.75	2.77	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.77	2.75	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.78	2.73	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.80	2.71	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.82	2.69	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.83	2.66	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.85	2.63	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.87	2.61	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.88	2.58	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.90	2.54	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.92	2.51	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.93	2.47	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.95	2.44	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.97	2.41	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
21.98	2.37	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.00	2.34	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.02	2.31	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
22.03	2.28	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.05	2.25	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.07	2.23	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.08	2.20	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.10	2.18	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.12	2.15	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.13	2.13	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.15	2.11	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.17	2.09	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.18	2.07	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.20	2.05	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.22	2.03	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.23	2.02	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.25	2.00	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.27	1.99	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.28	1.97	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.30	1.96	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.32	1.95	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.33	1.94	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.35	1.93	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.37	1.92	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.38	1.92	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.40	1.91	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.42	1.91	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.43	1.91	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.45	1.90	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.47	1.90	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.48	1.90	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.50	1.90	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.52	1.90	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
22.53	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.55	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.57	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.58	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.60	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.62	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.63	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.65	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.67	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.68	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.70	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.72	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.73	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.75	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.77	1.90	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
22.78	1.90	756.27	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.80	1.90	756.27	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.82	1.91	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.83	1.91	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.85	1.91	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.87	1.92	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
22.88	1.93	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.90	1.94	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.92	1.95	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.93	1.97	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.95	1.98	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.97	2.00	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
22.98	2.02	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.00	2.04	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.02	2.07	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.03	2.09	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.05	2.12	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.07	2.15	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.08	2.18	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.10	2.21	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.12	2.25	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.13	2.28	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.15	2.32	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.17	2.35	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.18	2.38	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.20	2.41	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.22	2.45	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.23	2.47	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.25	2.50	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.27	2.53	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.28	2.56	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.30	2.58	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.32	2.61	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.33	2.63	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.35	2.65	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.37	2.67	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.38	2.69	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.40	2.71	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.42	2.73	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.43	2.74	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.45	2.76	756.27	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.47	2.77	756.27	2.29	0.44	1.85	----	----	----	----	----	----	2.29
23.48	2.79	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.50	2.80	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.52	2.81	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.53	2.82	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.55	2.83	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.57	2.84	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.58	2.84	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.60	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.62	2.85	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.63	2.86	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.65	2.86	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
23.67	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.68	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.70	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.72	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
23.73	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.75	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.77	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.78	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.80	2.86	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.82	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.83	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.85	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.87	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.88	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.90	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.92	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
23.93	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
23.95	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
23.97	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
23.98	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.00	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.02	2.86	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.03	2.85	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.05	2.83	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.07	2.81	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.08	2.78	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.10	2.75	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.12	2.71	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.13	2.67	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.15	2.62	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.17	2.57	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.18	2.51	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.20	2.44	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.22	2.37	756.28 <<	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.23	2.30	756.29	2.31	0.44	1.86	----	----	----	----	----	----	2.30 <<
24.25	2.21	756.28 <<	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.27	2.13	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.28	2.04	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.30	1.94	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.32	1.84	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.33	1.73	756.28	2.31	0.44	1.86	----	----	----	----	----	----	2.30
24.35	1.62	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.37	1.52	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.38	1.42	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.40	1.33	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.42	1.24	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.43	1.15	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.30
24.45	1.06	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
24.47	0.98	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
24.48	0.90	756.28	2.30	0.44	1.86	----	----	----	----	----	----	2.29
24.50	0.83	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
24.52	0.76	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
24.53	0.69	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
24.55	0.62	756.27	2.30	0.44	1.86	----	----	----	----	----	----	2.29
24.57	0.56	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29

Continues on next page...

Thru Pond 1 - 24 hr.

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
24.58	0.50	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
24.60	0.45	756.27	2.30	0.44	1.85	----	----	----	----	----	----	2.29
24.62	0.39	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
24.63	0.34	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
24.65	0.30	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
24.67	0.26	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.29
24.68	0.22	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28
24.70	0.18	756.26	2.29	0.44	1.85	----	----	----	----	----	----	2.28
24.72	0.15	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
24.73	0.12	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
24.75	0.09	756.25	2.29	0.44	1.85	----	----	----	----	----	----	2.28
24.77	0.07	756.25	2.29	0.43	1.85	----	----	----	----	----	----	2.28
24.78	0.05	756.25	2.28	0.43	1.84	----	----	----	----	----	----	2.28
24.80	0.03	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
24.82	0.02	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28
24.83	0.01	756.24	2.28	0.43	1.84	----	----	----	----	----	----	2.28

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:48 PM

Hyd. No. 18

Thru Pond1w/TW - 24hr.

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Inflow hyd. No. = 6
Max. Elevation = 757.41 ft

Peak discharge = 0.00 cfs
Time interval = 1 min
Reservoir name = Detention Pond 1
Max. Storage = 318,729 cuft

Storage Indication method used.

Outflow hydrograph volume = 0 cuft

...End

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	71.54	1	36	199,129	----	-----	-----	Post Onsite 1 - 1 hr.
2	SCS Runoff	66.32	1	45	260,376	----	-----	-----	Post Onsite 1 - 2 hr.
3	SCS Runoff	58.33	1	50	297,524	----	-----	-----	Post Onsite 1 - 3 hr.
4	SCS Runoff	42.55	1	55	361,333	----	-----	-----	Post Onsite 1 - 6 hr.
5	SCS Runoff	26.66	1	300	428,936	----	-----	-----	Post Onsite 1 - 12 hr.
6	SCS Runoff	18.20	1	936	515,678	----	-----	-----	Post Onsite 1 - 24 hr.
7	Reservoir	1.94	1	100	123,638	1	755.63	192,749	Thru Pond 1 - 1 hr.
8	Reservoir	3.87	1	151	177,488	2	756.42	244,961	Thru Pond 1 - 2 hr.
9	Reservoir	6.79	1	199	212,871	3	756.66	262,004	Thru Pond 1 - 3 hr.
10	Reservoir	6.90	1	325	273,486	4	756.76	269,327	Thru Pond 1 - 6 hr.
11	Reservoir	7.09	1	549	334,819	5	757.04	289,078	Thru Pond 1 - 12 hr.
12	Reservoir	7.26	1	1102	403,245	6	757.33	312,198	Thru Pond 1 - 24 hr.
13	Reservoir	0.00	1	0	0	1	755.73	199,129	Thru Pond1w/TW - 1 hr.
14	Reservoir	0.00	1	0	0	2	756.64	260,377	Thru Pond1w/TW - 2 hr.
15	Reservoir	0.00	1	0	0	3	757.15	297,524	Thru Pond1w/TW - 3 hr.
16	Reservoir	0.00	1	0	0	4	757.95	361,333	Thru Pond1w/TW - 6 hr.
17	Reservoir	0.00	1	0	0	5	758.73	428,936	Thru Pond1w/TW - 12hr.
18	Reservoir	2.10	1	1463	80,738	6	759.33	483,726	Thru Pond1w/TW - 24hr.
21008post.gpw					Return Period: 100 Year			Tuesday, Sep 7 2021, 2:43 PM	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:46 PM

Hyd. No. 1

Post Onsite 1 - 1 hr.

Hydrograph type	= SCS Runoff	Peak discharge	= 71.54 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 29.50 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 33.0 min
Total precip.	= 2.88 in	Distribution	= Huff-1st
Storm duration	= 1 hrs	Shape factor	= 484

Hydrograph Volume = 199,129 cuft

(Printed values >= 85% of Qp.)

Hydrograph Discharge Table

Time -- Outflow (hrs cfs)

0.47	63.09
0.48	65.12
0.50	66.88
0.52	68.35
0.53	69.52
0.55	70.42
0.57	71.05
0.58	71.39
0.60	71.54 <<
0.62	71.49
0.63	71.24
0.65	70.82
0.67	70.25
0.68	69.51
0.70	68.65
0.72	67.67
0.73	66.57
0.75	65.35
0.77	64.01
0.78	62.55
0.80	61.00

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:47 PM

Hyd. No. 12

Thru Pond 1 - 24 hr.

Hydrograph type = Reservoir
Storm frequency = 100 yrs
Inflow hyd. No. = 6
Max. Elevation = 757.33 ft

Peak discharge = 7.26 cfs
Time interval = 1 min
Reservoir name = Detention Pond 1
Max. Storage = 312,198 cuft

Storage Indication method used.

Outflow hydrograph volume = 403,245 cuft

(Printed values >= 99% of Qp.)

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
17.02	12.04	757.22	7.21	0.02	0.13	----	7.04	----	----	----	----	7.19
17.03	11.92	757.23	7.21	0.02	0.13	----	7.04	----	----	----	----	7.20
17.05	11.81	757.23	7.21	0.02	0.13	----	7.05	----	----	----	----	7.20
17.07	11.68	757.23	7.21	0.02	0.13	----	7.05	----	----	----	----	7.20
17.08	11.54	757.24	7.22	0.02	0.13	----	7.05	----	----	----	----	7.20
17.10	11.40	757.24	7.22	0.02	0.13	----	7.06	----	----	----	----	7.21
17.12	11.25	757.24	7.22	0.02	0.13	----	7.06	----	----	----	----	7.21
17.13	11.09	757.24	7.22	0.02	0.12	----	7.06	----	----	----	----	7.21
17.15	10.93	757.25	7.22	0.02	0.12	----	7.07	----	----	----	----	7.21
17.17	10.78	757.25	7.22	0.02	0.12	----	7.07	----	----	----	----	7.21
17.18	10.64	757.25	7.23	0.02	0.12	----	7.07	----	----	----	----	7.22
17.20	10.50	757.26	7.23	0.02	0.12	----	7.07	----	----	----	----	7.22
17.22	10.36	757.26	7.23	0.02	0.12	----	7.07	----	----	----	----	7.22
17.23	10.23	757.26	7.23	0.02	0.12	----	7.08	----	----	----	----	7.22
17.25	10.11	757.26	7.23	0.02	0.12	----	7.08	----	----	----	----	7.22
17.27	9.98	757.26	7.23	0.02	0.12	----	7.08	----	----	----	----	7.23
17.28	9.87	757.27	7.23	0.02	0.12	----	7.08	----	----	----	----	7.23
17.30	9.76	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
17.32	9.65	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
17.33	9.55	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
17.35	9.45	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
17.37	9.36	757.28	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
17.38	9.27	757.28	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
17.40	9.19	757.28	7.24	0.02	0.12	----	7.09	----	----	----	----	7.24
17.42	9.11	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
17.43	9.04	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
17.45	8.97	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
17.47	8.91	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
17.48	8.85	757.29	7.25	0.02	0.12	----	7.10	----	----	----	----	7.24
17.50	8.80	757.29	7.25	0.02	0.12	----	7.10	----	----	----	----	7.24
17.52	8.75	757.29	7.25	0.02	0.12	----	7.10	----	----	----	----	7.24
17.53	8.71	757.29	7.25	0.02	0.12	----	7.10	----	----	----	----	7.24
17.55	8.67	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.24
17.57	8.64	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.24
17.58	8.61	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
17.60	8.59	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
17.62	8.57	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
17.63	8.55	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
17.65	8.54	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
17.67	8.54	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
17.68	8.54	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
17.70	8.54	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
17.72	8.54	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
17.73	8.54	757.30	7.25	0.02	0.12	----	7.12	----	----	----	----	7.25
17.75	8.54	757.30	7.25	0.02	0.12	----	7.12	----	----	----	----	7.25
17.77	8.54	757.30	7.26	0.02	0.12	----	7.12	----	----	----	----	7.25
17.78	8.54	757.30	7.26	0.02	0.11	----	7.12	----	----	----	----	7.25
17.80	8.54	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.25
17.82	8.54	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.25
17.83	8.54	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.25
17.85	8.55	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.25
17.87	8.55	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
17.88	8.55	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
17.90	8.55	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
17.92	8.55	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
17.93	8.55	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
17.95	8.55	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
17.97	8.55	757.32	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
17.98	8.55	757.32	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.00	8.55	757.32	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.02	8.55	757.32	7.26	0.02	0.11	----	7.13	----	----	----	----	7.26
18.03	8.54	757.32	7.26	0.02	0.11	----	7.13	----	----	----	----	7.26
18.05	8.52	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.07	8.50	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.08	8.47	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.10	8.44	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.12	8.40	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.13	8.36	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.15	8.31	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.17	8.26	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.18	8.20	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.20	8.14	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.22	8.07	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.23	7.99	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.25	7.91	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.27	7.83	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.28	7.73	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.30	7.64	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.32	7.54	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.33	7.43	757.33 <<	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.35	7.32	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.37	7.22	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26 <<
18.38	7.13	757.33 <<	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.40	7.03	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.42	6.94	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.43	6.85	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.45	6.77	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.47	6.69	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.48	6.61	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
18.50	6.53	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.52	6.46	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.53	6.40	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.55	6.33	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.57	6.27	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.58	6.21	757.33	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.60	6.15	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.62	6.10	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.63	6.05	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.65	6.01	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.67	5.97	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.68	5.93	757.32	7.27	0.02	0.11	----	7.13	----	----	----	----	7.26
18.70	5.89	757.32	7.26	0.02	0.11	----	7.13	----	----	----	----	7.26
18.72	5.86	757.32	7.26	0.02	0.11	----	7.13	----	----	----	----	7.26
18.73	5.83	757.32	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.75	5.80	757.32	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.77	5.78	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.78	5.76	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.80	5.75	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.82	5.73	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.83	5.72	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.85	5.72	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.26
18.87	5.71	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.25
18.88	5.71	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.25
18.90	5.72	757.31	7.26	0.02	0.11	----	7.12	----	----	----	----	7.25
18.92	5.72	757.30	7.26	0.02	0.12	----	7.12	----	----	----	----	7.25
18.93	5.72	757.30	7.26	0.02	0.12	----	7.12	----	----	----	----	7.25
18.95	5.72	757.30	7.25	0.02	0.12	----	7.12	----	----	----	----	7.25
18.97	5.72	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
18.98	5.72	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
19.00	5.72	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
19.02	5.72	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
19.03	5.72	757.30	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
19.05	5.72	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
19.07	5.72	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
19.08	5.72	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.25
19.10	5.72	757.29	7.25	0.02	0.12	----	7.11	----	----	----	----	7.24
19.12	5.72	757.29	7.25	0.02	0.12	----	7.10	----	----	----	----	7.24
19.13	5.72	757.29	7.25	0.02	0.12	----	7.10	----	----	----	----	7.24
19.15	5.72	757.29	7.25	0.02	0.12	----	7.10	----	----	----	----	7.24
19.17	5.72	757.29	7.25	0.02	0.12	----	7.10	----	----	----	----	7.24
19.18	5.72	757.29	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
19.20	5.72	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
19.22	5.72	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
19.23	5.71	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
19.25	5.70	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
19.27	5.69	757.28	7.24	0.02	0.12	----	7.10	----	----	----	----	7.24
19.28	5.68	757.28	7.24	0.02	0.12	----	7.09	----	----	----	----	7.24
19.30	5.66	757.28	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
19.32	5.64	757.28	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
19.33	5.62	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
19.35	5.60	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
19.37	5.57	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
19.38	5.54	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
19.40	5.51	757.27	7.24	0.02	0.12	----	7.09	----	----	----	----	7.23
19.42	5.48	757.27	7.23	0.02	0.12	----	7.08	----	----	----	----	7.23
19.43	5.44	757.27	7.23	0.02	0.12	----	7.08	----	----	----	----	7.23
19.45	5.40	757.27	7.23	0.02	0.12	----	7.08	----	----	----	----	7.23
19.47	5.35	757.26	7.23	0.02	0.12	----	7.08	----	----	----	----	7.22
19.48	5.31	757.26	7.23	0.02	0.12	----	7.08	----	----	----	----	7.22
19.50	5.26	757.26	7.23	0.02	0.12	----	7.08	----	----	----	----	7.22
19.52	5.21	757.26	7.23	0.02	0.12	----	7.08	----	----	----	----	7.22
19.53	5.16	757.26	7.23	0.02	0.12	----	7.08	----	----	----	----	7.22
19.55	5.10	757.26	7.23	0.02	0.12	----	7.07	----	----	----	----	7.22
19.57	5.05	757.26	7.23	0.02	0.12	----	7.07	----	----	----	----	7.22
19.58	5.00	757.25	7.23	0.02	0.12	----	7.07	----	----	----	----	7.22
19.60	4.96	757.25	7.22	0.02	0.12	----	7.07	----	----	----	----	7.22
19.62	4.91	757.25	7.22	0.02	0.12	----	7.07	----	----	----	----	7.21
19.63	4.87	757.25	7.22	0.02	0.12	----	7.07	----	----	----	----	7.21
19.65	4.82	757.25	7.22	0.02	0.12	----	7.06	----	----	----	----	7.21
19.67	4.78	757.24	7.22	0.02	0.12	----	7.06	----	----	----	----	7.21
19.68	4.74	757.24	7.22	0.02	0.13	----	7.06	----	----	----	----	7.21
19.70	4.71	757.24	7.22	0.02	0.13	----	7.06	----	----	----	----	7.21
19.72	4.67	757.24	7.22	0.02	0.13	----	7.06	----	----	----	----	7.21
19.73	4.64	757.24	7.22	0.02	0.13	----	7.05	----	----	----	----	7.20
19.75	4.60	757.24	7.21	0.02	0.13	----	7.05	----	----	----	----	7.20
19.77	4.57	757.23	7.21	0.02	0.13	----	7.05	----	----	----	----	7.20
19.78	4.54	757.23	7.21	0.02	0.13	----	7.05	----	----	----	----	7.20
19.80	4.52	757.23	7.21	0.02	0.13	----	7.05	----	----	----	----	7.20
19.82	4.49	757.23	7.21	0.02	0.13	----	7.05	----	----	----	----	7.20
19.83	4.47	757.22	7.21	0.02	0.13	----	7.04	----	----	----	----	7.20
19.85	4.44	757.22	7.21	0.02	0.13	----	7.04	----	----	----	----	7.19
19.87	4.42	757.22	7.21	0.02	0.13	----	7.04	----	----	----	----	7.19

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:48 PM

Hyd. No. 18

Thru Pond1w/TW - 24hr.

Hydrograph type = Reservoir
Storm frequency = 100 yrs
Inflow hyd. No. = 6
Max. Elevation = 759.33 ft

Peak discharge = 2.10 cfs
Time interval = 1 min
Reservoir name = Detention Pond 1
Max. Storage = 483,726 cuft

Storage Indication method used.

Outflow hydrograph volume = 80,738 cuft

(Printed values >= 99% of Qp.)

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
24.13	4.02	759.32	2.08	----	----	----	----	----	----	----	----	2.08
24.15	3.95	759.32	2.08	----	----	----	----	----	----	----	----	2.08
24.17	3.87	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.18	3.78	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.20	3.68	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.22	3.58	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.23	3.46	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.25	3.34	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.27	3.21	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.28	3.07	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.30	2.92	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.32	2.77	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.33	2.61	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.35	2.45	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.37	2.30	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.38	2.15	759.33 <<	2.10	----	----	----	----	----	----	----	----	2.10 <<
24.40	2.00	759.33 <<	2.10	----	----	----	----	----	----	----	----	2.10
24.42	1.87	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.43	1.73	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.45	1.60	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.47	1.48	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.48	1.36	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.50	1.25	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.52	1.14	759.33	2.10	----	----	----	----	----	----	----	----	2.10
24.53	1.04	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.55	0.94	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.57	0.84	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.58	0.76	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.60	0.67	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.62	0.59	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.63	0.52	759.32	2.09	----	----	----	----	----	----	----	----	2.09
24.65	0.45	759.32	2.08	----	----	----	----	----	----	----	----	2.08
24.67	0.39	759.32	2.08	----	----	----	----	----	----	----	----	2.08

...End

Water Quality Calculations
(Approved from Patriot Defense Research
Park - Buildings #1 and #2 report)

Project Name: Patriot Defense Research Park Project # 21008

Water Quality - Detention Pond

Option #1

20% of Runoff from a 1.25" storm event

$$\text{Volume} = 54,537 \text{ c.f.} \times 0.20 = \boxed{10,907 \text{ c.f.} \leq \text{USE}}$$

Option #2

20% of a 0.50" direct runoff

$$\text{Volume} = 29.5 \text{ ac.} \times \frac{43560 \text{ s.f.}}{1 \text{ ac.}} \times \frac{144 \text{ s.-in.}}{1 \text{ s.f.}} \times 0.50\text{-in}$$

$$= 92,521,440 \text{ c.in} = 53,543 \text{ c.f.}$$

$$= 53,543 \text{ c.f.} \times 0.20 = 10,709 \text{ c.f.}$$

Peak storm event happens at 1.24 inch storm event

Storm event that provides	10,907	c.f. is a	1.25	inch storm event
Peak occurs at	24.25	hrs for the	1.25	inch storm event

$$24.25 \text{ hrs} + 24.0 \text{ hrs} = 48.25 \text{ hrs}$$

$$\text{Pond Elevation at } 48.25 \text{ hrs} = 752.59 \text{ n.p. } 752.00$$

$$\text{Pond Storage Volume at } 48.25 \text{ hrs} = 27,741 \text{ c.f.} > 10,907 \text{ c.f.}$$

$$\frac{1}{47,019} = \frac{0.59}{27,741}$$

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	1.35	3	360	54,537	----	-----	-----	Post Onsite 1 - WQ 1.25IN EVENT
2	SCS Runoff	1.33	3	360	53,733	----	-----	-----	Post Onsite 1 - WQ 0.5IN EVENT
4	Reservoir	0.20	3	1455	50,372	1	752.90	42,538	Thru Pond - 1 hr.
21008post-wq.gpw					Return Period: 2 Year			Tuesday, Sep 7 2021, 2:24 PM	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Sep 7 2021, 2:24 PM

Hyd. No. 4

Thru Pond - 1 hr.

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Inflow hyd. No. = 1
Max. Elevation = 752.90 ft

Peak discharge = 0.20 cfs
Time interval = 3 min
Reservoir name = Detention Pond 1
Max. Storage = 42,538 cuft

Storage Indication method used.

Outflow hydrograph volume = 50,372 cuft

(Printed values >= 10% of Qp.)

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
3.20	1.07	752.11	0.02	0.02	----	----	----	----	----	----	----	0.02
3.25	1.08	752.11	0.02	0.02	----	----	----	----	----	----	----	0.02
3.30	1.10	752.12	0.03	0.02	----	----	----	----	----	----	----	0.02
3.35	1.11	752.12	0.03	0.03	----	----	----	----	----	----	----	0.03
3.40	1.13	752.12	0.03	0.03	----	----	----	----	----	----	----	0.03
3.45	1.15	752.13	0.03	0.03	----	----	----	----	----	----	----	0.03
3.50	1.16	752.13	0.03	0.03	----	----	----	----	----	----	----	0.03
3.55	1.18	752.14	0.03	0.03	----	----	----	----	----	----	----	0.03
3.60	1.19	752.14	0.04	0.03	----	----	----	----	----	----	----	0.03
3.65	1.20	752.15	0.04	0.04	----	----	----	----	----	----	----	0.04
3.70	1.20	752.15	0.04	0.04	----	----	----	----	----	----	----	0.04
3.75	1.20	752.15	0.04	0.04	----	----	----	----	----	----	----	0.04
3.80	1.19	752.16	0.04	0.04	----	----	----	----	----	----	----	0.04
3.85	1.18	752.16	0.05	0.04	----	----	----	----	----	----	----	0.04
3.90	1.18	752.17	0.05	0.05	----	----	----	----	----	----	----	0.05
3.95	1.18	752.17	0.05	0.05	----	----	----	----	----	----	----	0.05
4.00	1.18	752.18	0.05	0.05	----	----	----	----	----	----	----	0.05
4.05	1.18	752.18	0.05	0.05	----	----	----	----	----	----	----	0.05
4.10	1.19	752.18	0.05	0.05	----	----	----	----	----	----	----	0.05
4.15	1.20	752.19	0.06	0.05	----	----	----	----	----	----	----	0.05
4.20	1.21	752.19	0.06	0.06	----	----	----	----	----	----	----	0.06
4.25	1.22	752.20	0.06	0.06	----	----	----	----	----	----	----	0.06
4.30	1.23	752.20	0.06	0.06	----	----	----	----	----	----	----	0.06
4.35	1.25	752.21	0.06	0.06	----	----	----	----	----	----	----	0.06
4.40	1.26	752.21	0.07	0.06	----	----	----	----	----	----	----	0.06
4.45	1.27	752.22	0.07	0.06	----	----	----	----	----	----	----	0.06
4.50	1.28	752.22	0.07	0.07	----	----	----	----	----	----	----	0.07
4.55	1.29	752.23	0.07	0.07	----	----	----	----	----	----	----	0.07
4.60	1.30	752.23	0.07	0.07	----	----	----	----	----	----	----	0.07
4.65	1.31	752.23	0.07	0.07	----	----	----	----	----	----	----	0.07
4.70	1.32	752.24	0.07	0.07	----	----	----	----	----	----	----	0.07
4.75	1.32	752.24	0.08	0.07	----	----	----	----	----	----	----	0.07
4.80	1.33	752.25	0.08	0.08	----	----	----	----	----	----	----	0.08
4.85	1.34	752.25	0.08	0.08	----	----	----	----	----	----	----	0.08
4.90	1.33	752.26	0.08	0.08	----	----	----	----	----	----	----	0.08
4.95	1.32	752.26	0.08	0.08	----	----	----	----	----	----	----	0.08
5.00	1.30	752.27	0.08	0.08	----	----	----	----	----	----	----	0.08
5.05	1.29	752.27	0.08	0.08	----	----	----	----	----	----	----	0.08

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
22.95	0.29	752.88	0.20	0.19	----	----	----	----	----	----	----	0.19
23.00	0.34	752.88	0.20	0.19	----	----	----	----	----	----	----	0.19
23.05	0.37	752.88	0.20	0.19	----	----	----	----	----	----	----	0.19
23.10	0.40	752.88	0.20	0.19	----	----	----	----	----	----	----	0.19
23.15	0.43	752.88	0.20	0.19	----	----	----	----	----	----	----	0.19
23.20	0.45	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
23.25	0.46	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
23.30	0.46	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
23.35	0.46	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
23.40	0.46	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
23.45	0.46	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
23.50	0.46	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
23.55	0.46	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
23.60	0.46	752.89	0.20	0.20	----	----	----	----	----	----	----	0.20
23.65	0.46	752.89	0.20	0.20	----	----	----	----	----	----	----	0.20
23.70	0.46	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
23.75	0.47	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
23.80	0.47	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
23.85	0.47	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
23.90	0.47	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
23.95	0.47	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.00	0.47	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.05	0.44	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.10	0.40	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.15	0.34	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.20	0.25	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.25	0.18	752.90 <<	0.20	0.20	----	----	----	----	----	----	----	0.20 <<
24.30	0.12	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.35	0.07	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.40	0.04	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.45	0.01	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.50	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.55	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.60	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.65	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.70	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.75	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.80	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.85	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.90	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
24.95	0.00	752.90	0.20	0.20	----	----	----	----	----	----	----	0.20
25.00	0.00	752.89	0.20	0.20	----	----	----	----	----	----	----	0.20
25.05	0.00	752.89	0.20	0.20	----	----	----	----	----	----	----	0.20
25.10	0.00	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
25.15	0.00	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
25.20	0.00	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
25.25	0.00	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
25.30	0.00	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
25.35	0.00	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
25.40	0.00	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19
25.45	0.00	752.89	0.20	0.19	----	----	----	----	----	----	----	0.19

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Hydrograph Discharge Table

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Storm Sewer Calculations

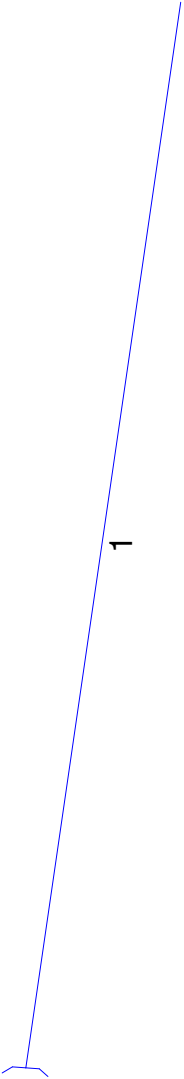
Laugle Building #2

Storm Sewer Calculations

STR. #		Ac.	(%)	Coefficient	
603	Weighted "C" Factor =	Prop./Fut. Roof	1.90 27%	x 0.90 =	0.24
		Prop./Fut. Pavement	2.60 37%	x 0.85 =	0.32
Area =		Lawn/Landscape	2.51 36%	x 0.20 =	0.07
7.01 Acres				Weighted 'C'	0.63

"T/C" = 5 Minute Time of Concentration used for Industrial

Hydraflow Plan View



Project file: 602-603 Storm Design.stm

IDF file: MARION.IDF

No. Lines: 1

03-02-2023

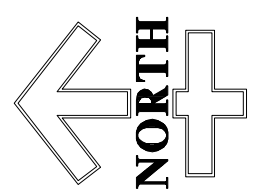
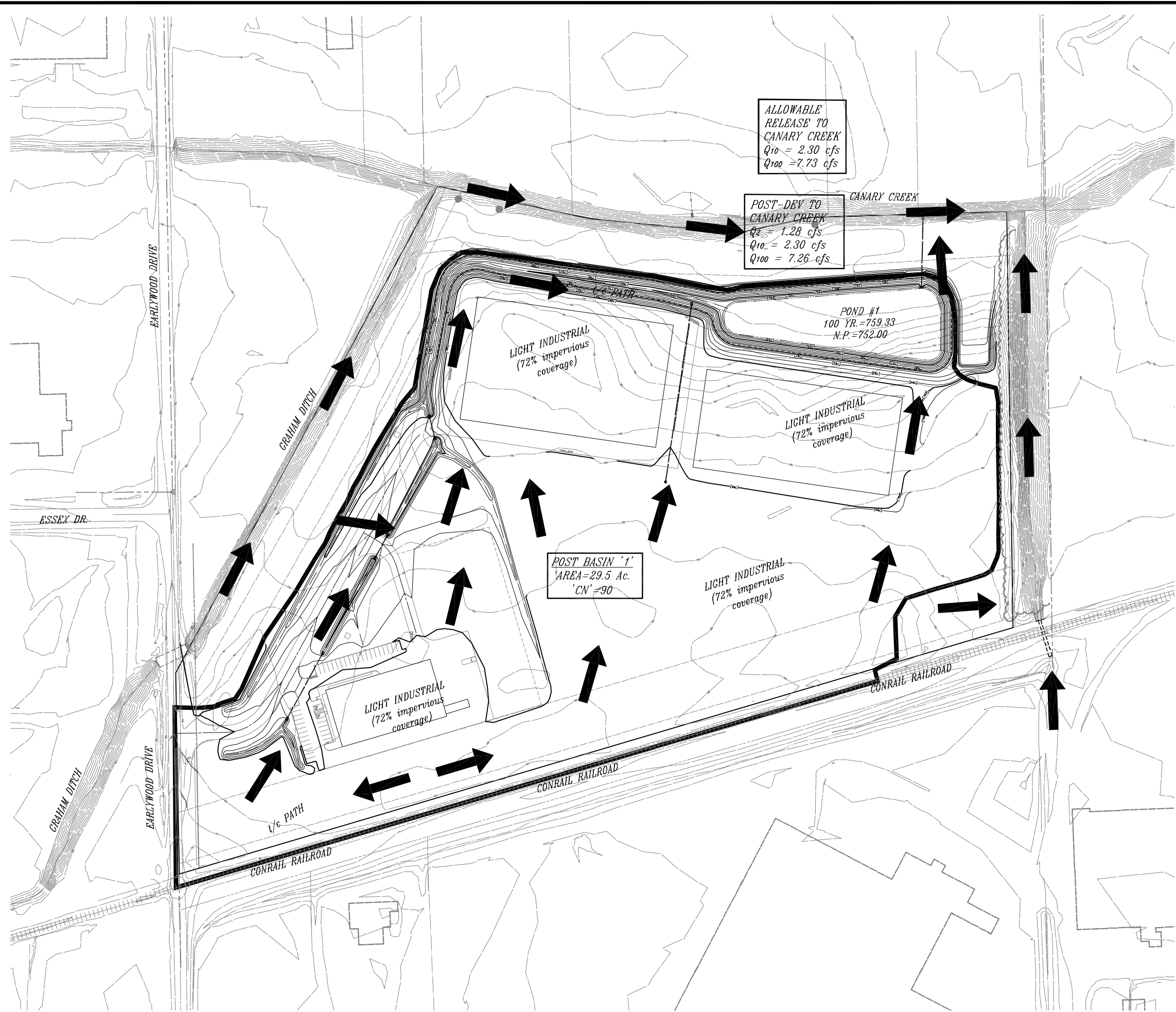
Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	603	30.84	30 c	361.0	757.00	759.50	0.693	758.86	761.37	0.00	End
Project File: 602-603 Storm Design.stm		IDF File: MARION.IDF				Total No. Lines: 1			Run Date: 03-02-2023		
NOTES: c = circular; e = elliptical; b = box; Return period = 10 Yrs.; * Indicates surcharge condition.											

Hydraflow Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	361.0	7.01	7.01	0.63	4.42	4.42	5.0	5.0	7.0	30.84	34.13	7.87	30	0.69	759.50	757.00	761.37	758.86	764.00	0.00	603
Project File: 602-603 Storm Design.stm					IDF File: MARION.IDF				Total number of lines: 1				Run Date: 03-02-2023									
NOTES: Intensity = 57.92 / (Inlet time + 9.10) ^ 0.80; Return period = 10 Yrs. ; Initial tailwater elevation = 758.86 (ft)																						

Watershed Delineation Maps



ALLOWABLE
RELEASE TO
CANARY CREEK
 $Q_{10} = 2.30$ cfs
 $Q_{100} = 7.73$ cfs

POST-DEV TO
CANARY CREEK
 $Q_2 = 1.28$ cfs
 $Q_{10} = 2.30$ cfs
 $Q_{100} = 7.26$ cfs

POST BASIN '1'
AREA=29.5 Ac.
'CN' =90

LIGHT INDUSTRIAL
(72% impervious
coverage)

LIGHT INDUSTRIAL
(72% impervious
coverage)

LIGHT INDUSTRIAL
(72% impervious
coverage)

LIGHT INDUSTRIAL
(72% impervious
coverage)

POND #1
100 YR.=759.33
N.P.=752.00

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PROJECT		SYMBOL	SCALE	REVISION	DATE
PATRIOT DEFENSE RESEARCH PARK		1" = 200'	DRAWN		
CITY OF FRANKLIN, JOHNSON COUNTY, INDIANA		JPH	CHECKED		
TITLE		JKS	CERTIFIED		
POST-DEVELOPMENT DRAINAGE MAP					

PROJECTS *plus*

GREENWOOD SURVEYING COMPANY

SITE ENGINEERING-LAND SURVEYING-CONSTRUCTION LAYOUT
1255 Airport Parkway, Suite 200
Franklin, Indiana 46143
(317) 882-5003

JOB NUMBER	21008
SHEET	1
OF	1
SHEETS	
DATE	SEPTEMBER 3, 2021

