

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Tuesday, Aug 1, 2023

Hyd. No. 6

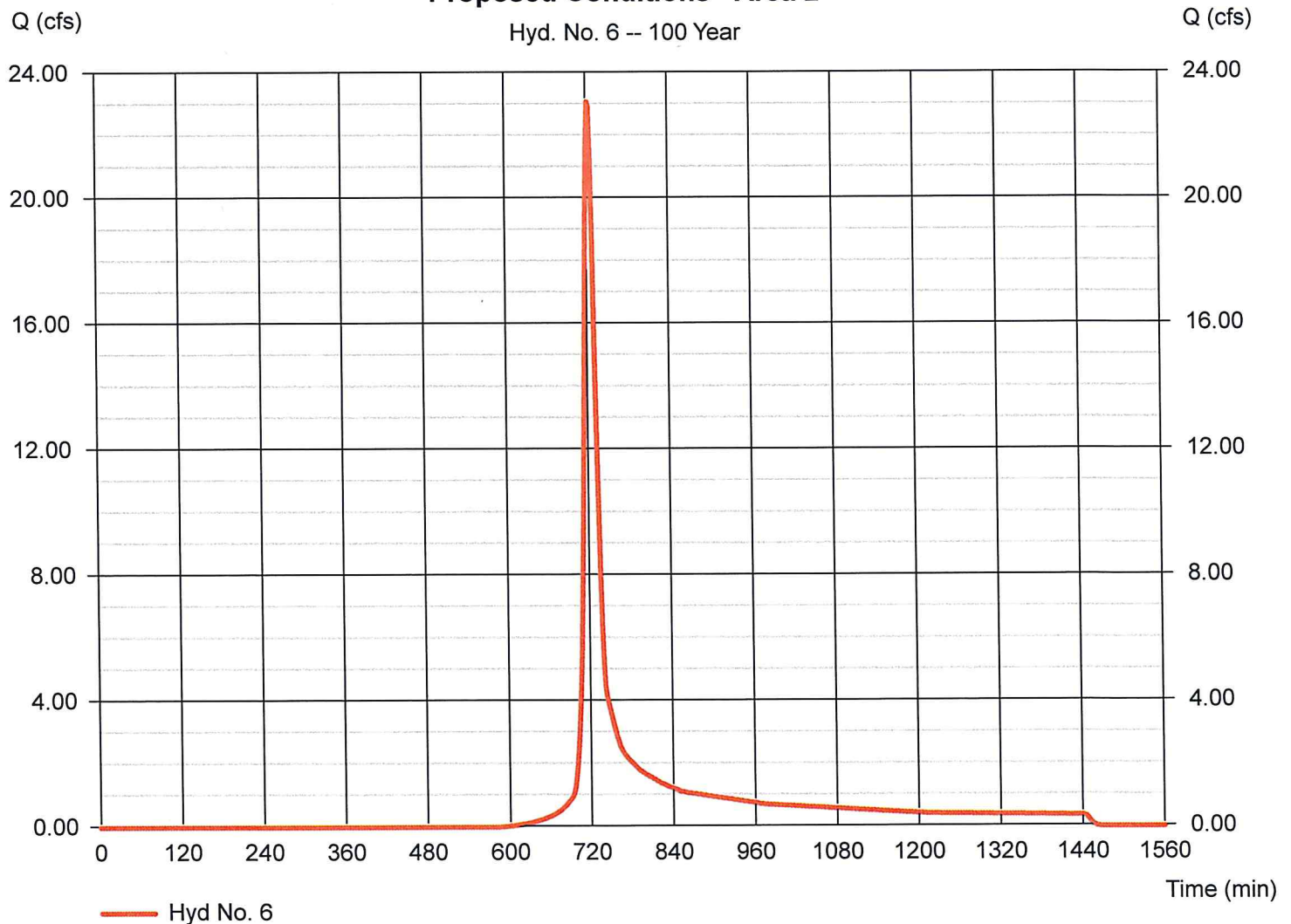
Proposed Conditions - Area 2

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 5.800 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 7.67 in
 Storm duration = 24 hrs

Peak discharge = 23.09 cfs
 Time to peak = 722 min
 Hyd. volume = 65,588 cuft
 Curve number = 61*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 16.50 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(1.200 x 83) + (4.600 x 55)] / 5.800

Proposed Conditions - Area 2



Hydrograph Report

44

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Tuesday, Aug 1, 2023

Hyd. No. 7

Forebay 2

Hydrograph type = Reservoir

Storm frequency = 100 yrs

Time interval = 2 min

Inflow hyd. No. = 6 - Proposed Conditions - Area 2

Reservoir name = Forbay #2

Peak discharge = 23.04 cfs

Time to peak = 724 min

Hyd. volume = 62,391 cuft

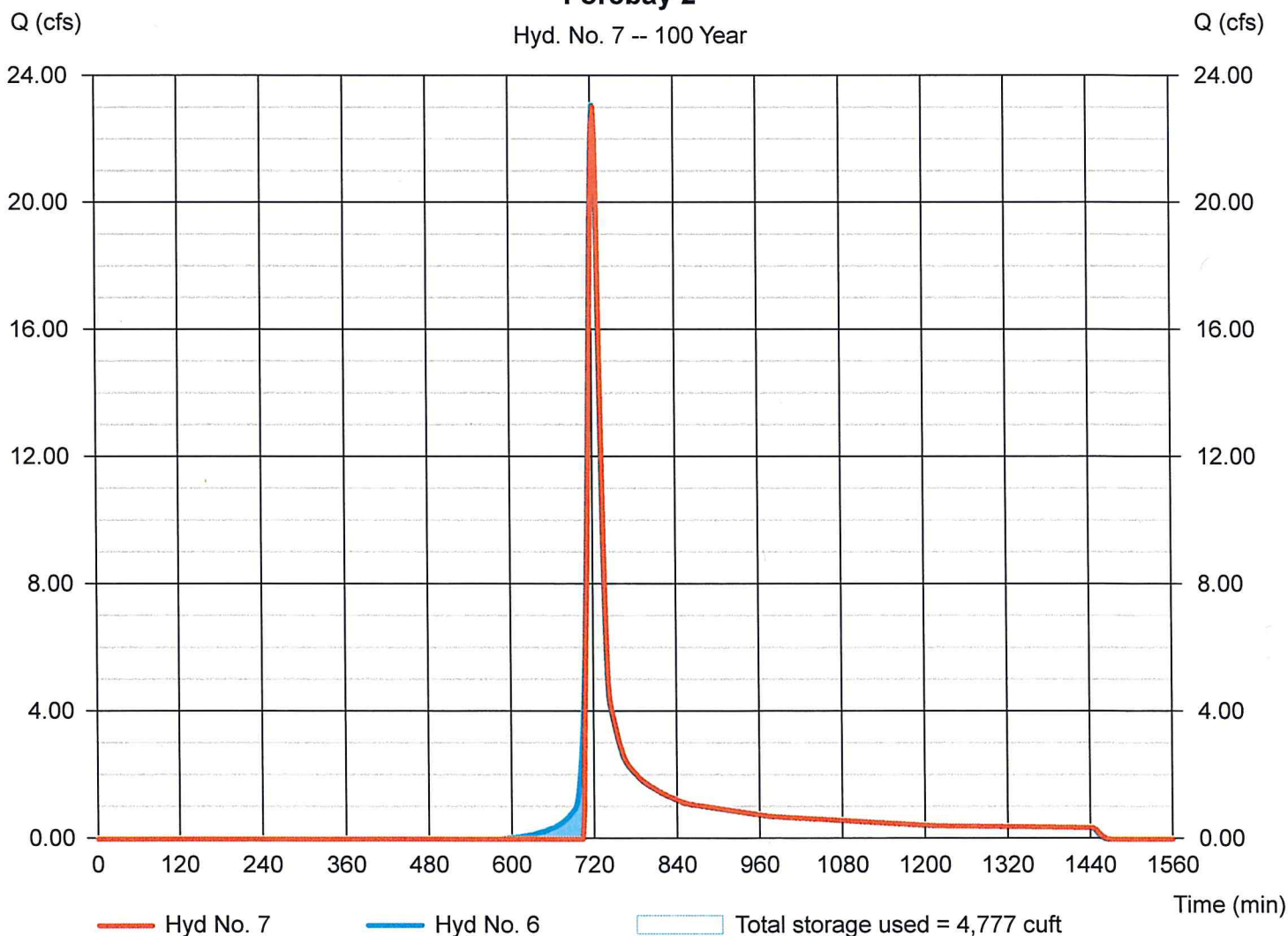
Max. Elevation = 39.28 ft

Max. Storage = 4,777 cuft

Storage Indication method used.

Forebay 2

Hyd. No. 7 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Tuesday, Aug 1, 2023

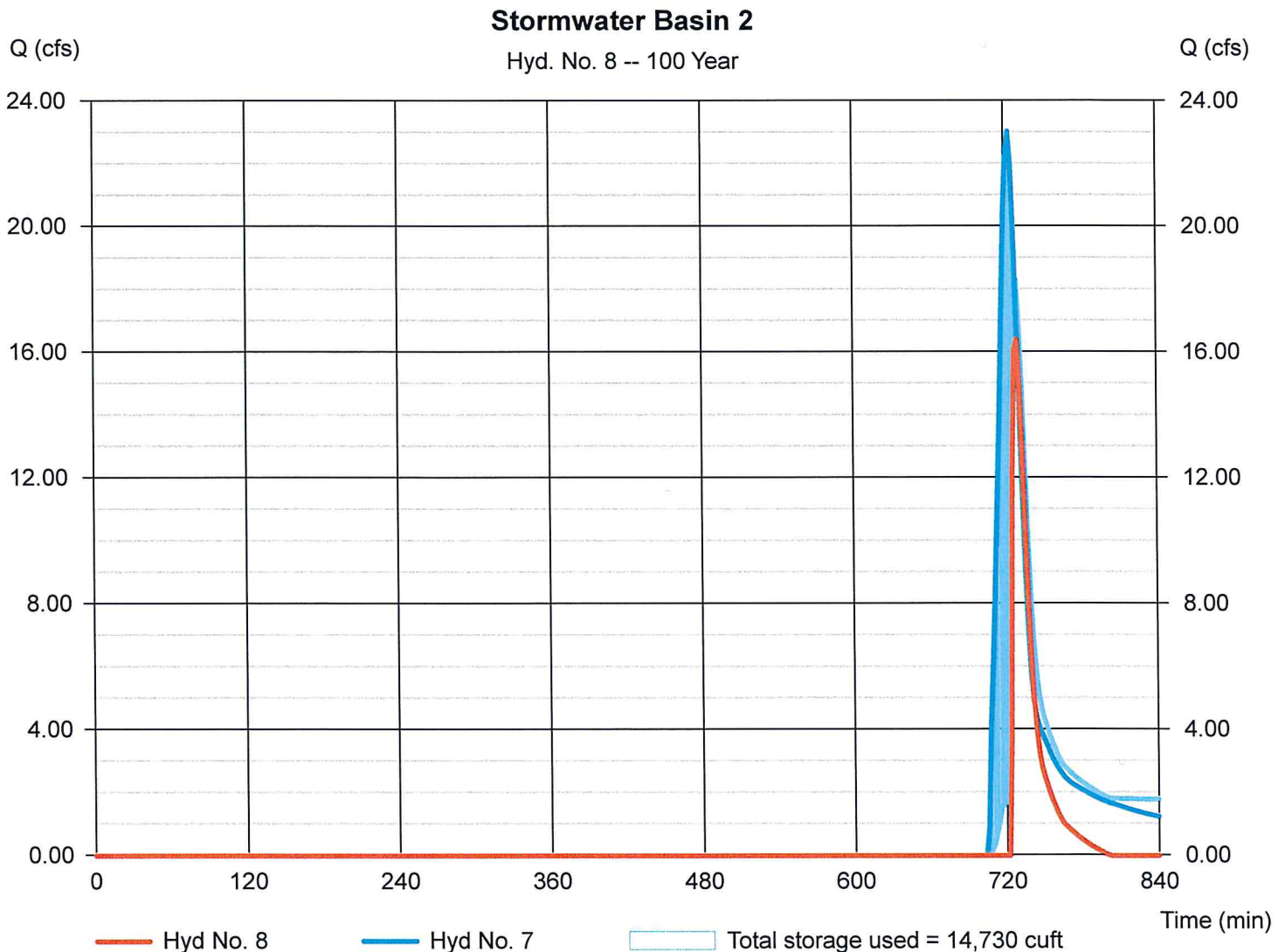
Hyd. No. 8

Stormwater Basin 2

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - Forebay 2
 Reservoir name = Stormwater Basin 2

Peak discharge = 16.39 cfs
 Time to peak = 730 min
 Hyd. volume = 16,567 cuft
 Max. Elevation = 39.13 ft
 Max. Storage = 14,730 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Thursday, May 25, 2023

Pond No. 4 - Forebay #1

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 36.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	36.00	4,365	0	0
1.00	37.00	5,392	4,869	4,869
2.00	38.00	6,420	5,898	10,767
3.00	39.00	7,430	6,918	17,685
4.00	40.00	8,440	7,929	25,614

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 38.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	36.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	4,869	37.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	10,767	38.00	---	---	---	---	0.00	---	---	---	---	---	0.000
3.00	17,685	39.00	---	---	---	---	11.77	---	---	---	---	---	11.77
4.00	25,614	40.00	---	---	---	---	61.18	---	---	---	---	---	61.18

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Thursday, May 25, 2023

Pond No. 1 - Stormwater Basin 1

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 36.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	36.00	5,072	0	0
1.00	37.00	5,725	5,395	5,395
2.00	38.00	6,377	6,047	11,442
3.00	39.00	7,278	6,822	18,264
4.00	40.00	8,180	7,724	25,988

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 38.50	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	36.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	5,395	37.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	11,442	38.00	---	---	---	---	0.00	---	---	---	---	---	0.000
3.00	18,264	39.00	---	---	---	---	9.19	---	---	---	---	---	9.192
4.00	25,988	40.00	---	---	---	---	47.77	---	---	---	---	---	47.77

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Thursday, May 25, 2023

Pond No. 5 - Forbay #2

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 36.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	36.00	622	0	0
1.00	37.00	1,142	869	869
2.00	38.00	1,663	1,394	2,263
3.00	39.00	2,083	1,869	4,132
4.00	40.00	2,504	2,290	6,422

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 38.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	36.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	869	37.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	2,263	38.00	---	---	---	---	0.00	---	---	---	---	---	0.000
3.00	4,132	39.00	---	---	---	---	11.77	---	---	---	---	---	11.77
4.00	6,422	40.00	---	---	---	---	61.18	---	---	---	---	---	61.18

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Thursday, May 25, 2023

Pond No. 2 - Stormwater Basin 2

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 36.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	36.00	3,890	0	0
1.00	37.00	4,410	4,147	4,147
2.00	38.00	4,940	4,672	8,819
3.00	39.00	5,478	5,206	14,025
4.00	40.00	6,024	5,748	19,773

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 38.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 15.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	36.00	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.00	4,147	37.00	---	---	---	---	0.00	---	---	---	1.531	---	1.531
2.00	8,819	38.00	---	---	---	---	0.00	---	---	---	1.715	---	1.715
3.00	14,025	39.00	---	---	---	---	11.77	---	---	---	1.902	---	13.68
4.00	19,773	40.00	---	---	---	---	61.18	---	---	---	2.092	---	63.27

GREEN SITE DESIGN LLC

Civil • Structural • Survey
317 Main Street
NORWICH, CONNECTICUT 06360
(860) 892-1380

PROJECT NAME: _____

PROJECT NO: _____ SHEET NO. _____ OF _____

BY: _____ DATE _____

SCALE: _____

SWALE ABOVE RETAINING WALL:

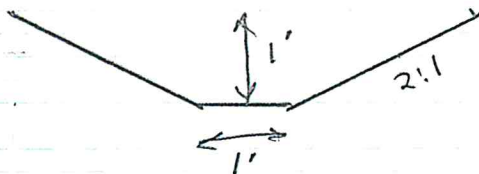
AREA = 2.0 ACRES

C = 0.2 (GOLF COURSE)

$T_c = 10$ MINUTES

$I_{25} = 6.15$

$Q_{25} = 2.5$ CFS



$$S = 4\% = 0.04$$

$$n = 0.04$$

WHEN THE SWALE IS HALF FULL,

$$A = 1 \text{ SF} \quad P = 3.2 \text{ FT}$$

MANININGS:

$$Q = A \left(\frac{1.486}{n} \right) R^{2/3} S^{1/2}$$

$$Q = 1 \left(\frac{1.486}{0.04} \right) \left(\frac{1}{3.2} \right)^{2/3} (0.04)^{1/2}$$

$$Q = 3.4 \text{ CFS}$$

SWALE HAS CAPACITY TO
HANDLE THE 25 YEAR STORM



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.341 (0.266-0.430)	0.407 (0.317-0.514)	0.515 (0.399-0.652)	0.605 (0.466-0.769)	0.728 (0.544-0.958)	0.821 (0.600-1.10)	0.918 (0.652-1.26)	1.03 (0.691-1.43)	1.18 (0.767-1.70)	1.31 (0.830-1.91)
10-min	0.483 (0.376-0.610)	0.577 (0.449-0.728)	0.730 (0.566-0.924)	0.857 (0.660-1.09)	1.03 (0.770-1.36)	1.16 (0.851-1.56)	1.30 (0.924-1.79)	1.46 (0.980-2.03)	1.68 (1.09-2.40)	1.86 (1.18-2.71)
15-min	0.569 (0.443-0.717)	0.679 (0.528-0.857)	0.859 (0.666-1.09)	1.01 (0.777-1.28)	1.21 (0.906-1.60)	1.37 (1.00-1.83)	1.53 (1.09-2.11)	1.71 (1.15-2.39)	1.97 (1.28-2.83)	2.18 (1.38-3.18)
30-min	0.798 (0.621-1.01)	0.952 (0.740-1.20)	1.20 (0.932-1.52)	1.41 (1.09-1.80)	1.70 (1.27-2.24)	1.92 (1.40-2.56)	2.15 (1.52-2.95)	2.40 (1.62-3.35)	2.76 (1.79-3.97)	3.06 (1.94-4.46)
60-min	1.03 (0.799-1.30)	1.23 (0.953-1.55)	1.55 (1.20-1.96)	1.82 (1.40-2.31)	2.19 (1.64-2.88)	2.47 (1.80-3.30)	2.76 (1.96-3.80)	3.09 (2.08-4.31)	3.56 (2.30-5.10)	3.94 (2.49-5.74)
2-hr	1.35 (1.06-1.69)	1.60 (1.26-2.01)	2.02 (1.58-2.54)	2.37 (1.84-3.00)	2.85 (2.14-3.73)	3.21 (2.36-4.27)	3.59 (2.57-4.92)	4.03 (2.72-5.58)	4.66 (3.03-6.64)	5.19 (3.30-7.50)
3-hr	1.56 (1.23-1.95)	1.86 (1.46-2.32)	2.34 (1.84-2.94)	2.74 (2.14-3.45)	3.30 (2.49-4.29)	3.71 (2.74-4.91)	4.15 (2.98-5.67)	4.65 (3.16-6.42)	5.40 (3.52-7.65)	6.02 (3.83-8.66)
6-hr	1.99 (1.58-2.47)	2.36 (1.87-2.93)	2.97 (2.34-3.69)	3.47 (2.72-4.33)	4.16 (3.15-5.38)	4.67 (3.47-6.15)	5.22 (3.77-7.08)	5.86 (3.99-8.03)	6.80 (4.45-9.56)	7.58 (4.84-10.8)
12-hr	2.47 (1.97-3.04)	2.92 (2.33-3.60)	3.67 (2.91-4.53)	4.28 (3.38-5.32)	5.14 (3.92-6.59)	5.77 (4.31-7.53)	6.44 (4.68-8.67)	7.22 (4.94-9.82)	8.37 (5.50-11.7)	9.32 (5.98-13.2)
24-hr	2.90 (2.33-3.55)	3.46 (2.77-4.23)	4.36 (3.48-5.35)	5.11 (4.06-6.30)	6.15 (4.72-7.84)	6.92 (5.20-8.98)	7.74 (5.66-10.4)	8.70 (5.98-11.7)	10.1 (6.68-14.0)	11.3 (7.28-15.9)
2-day	3.26 (2.63-3.96)	3.92 (3.16-4.77)	5.00 (4.02-6.10)	5.90 (4.71-7.22)	7.14 (5.52-9.06)	8.06 (6.10-10.4)	9.05 (6.66-12.1)	10.2 (7.06-13.7)	12.0 (7.95-16.5)	13.5 (8.73-18.8)
3-day	3.54 (2.87-4.28)	4.26 (3.45-5.16)	5.44 (4.38-6.60)	6.41 (5.14-7.81)	7.76 (6.02-9.80)	8.75 (6.65-11.3)	9.83 (7.26-13.0)	11.1 (7.69-14.8)	13.1 (8.67-17.9)	14.7 (9.53-20.4)
4-day	3.80 (3.09-4.59)	4.56 (3.70-5.51)	5.80 (4.69-7.02)	6.83 (5.49-8.30)	8.25 (6.42-10.4)	9.30 (7.08-11.9)	10.4 (7.73-13.8)	11.8 (8.17-15.7)	13.8 (9.20-18.8)	15.6 (10.1-21.5)
7-day	4.54 (3.71-5.45)	5.38 (4.39-6.46)	6.75 (5.48-8.12)	7.88 (6.37-9.52)	9.44 (7.38-11.8)	10.6 (8.11-13.5)	11.8 (8.79-15.5)	13.3 (9.27-17.6)	15.5 (10.4-21.0)	17.4 (11.3-23.8)
10-day	5.27 (4.32-6.30)	6.15 (5.04-7.36)	7.59 (6.19-9.10)	8.78 (7.11-10.6)	10.4 (8.16-13.0)	11.6 (8.92-14.7)	12.9 (9.61-16.8)	14.5 (10.1-19.0)	16.7 (11.1-22.4)	18.5 (12.1-25.3)
20-day	7.51 (6.19-8.91)	8.44 (6.96-10.0)	9.97 (8.18-11.9)	11.2 (9.16-13.4)	13.0 (10.2-15.9)	14.3 (11.0-17.8)	15.7 (11.6-20.0)	17.1 (12.0-22.2)	19.0 (12.8-25.4)	20.6 (13.5-27.9)
30-day	9.36 (7.76-11.1)	10.3 (8.54-12.2)	11.9 (9.81-14.1)	13.2 (10.8-15.7)	15.0 (11.8-18.3)	16.4 (12.6-20.2)	17.8 (13.1-22.4)	19.1 (13.5-24.8)	20.8 (14.1-27.7)	22.1 (14.5-29.8)
45-day	11.6 (9.69-13.7)	12.7 (10.5-14.9)	14.3 (11.8-16.9)	15.7 (12.9-18.6)	17.6 (13.9-21.2)	19.1 (14.6-23.3)	20.5 (15.1-25.5)	21.7 (15.4-27.9)	23.2 (15.7-30.6)	24.2 (15.9-32.5)
60-day	13.5 (11.3-15.9)	14.6 (12.2-17.1)	16.3 (13.5-19.2)	17.8 (14.6-21.0)	19.7 (15.6-23.8)	21.3 (16.4-25.9)	22.7 (16.8-28.2)	24.0 (17.0-30.7)	25.4 (17.2-33.4)	26.2 (17.3-35.1)

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

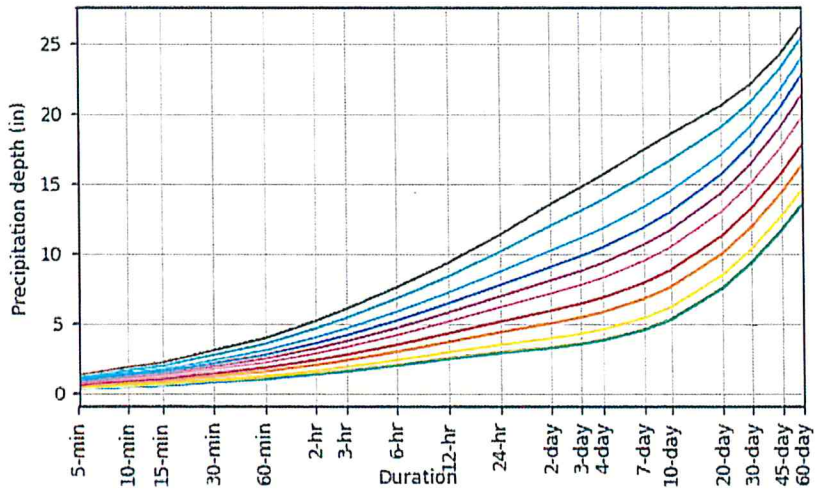
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper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

Please refer to NOAA Atlas 14 document for more information.

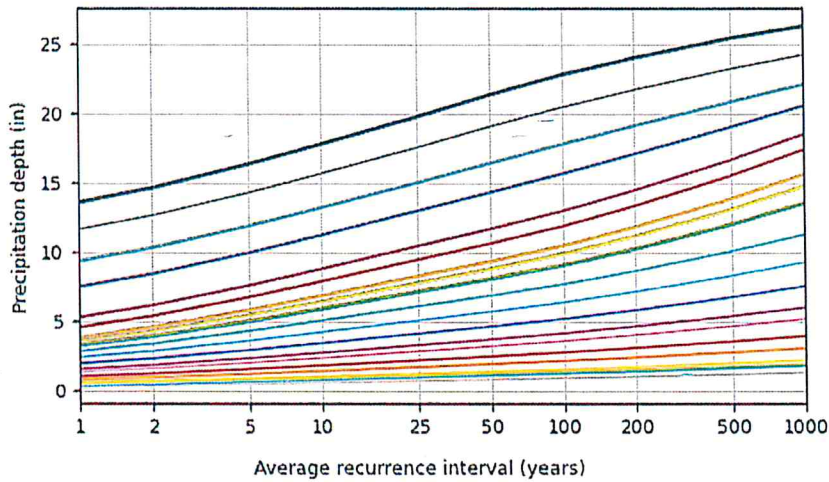
[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.4960°, Longitude: -72.1077°



Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000



Duration
5-min
10-min
15-min
30-min
60-min
2-hr
3-hr
6-hr
12-hr
24-hr
2-day
3-day
4-day
7-day
10-day
20-day
30-day
45-day
60-day

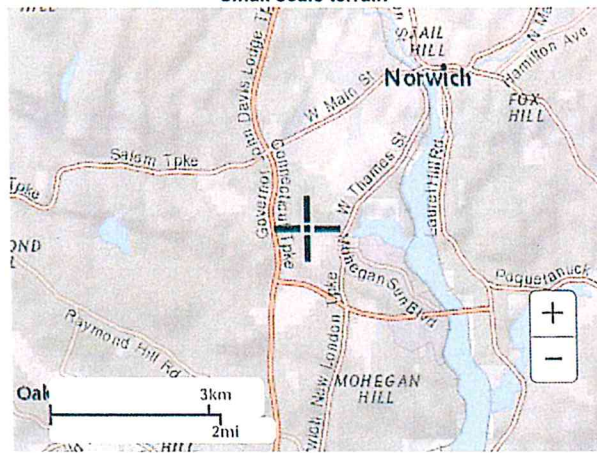
NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu May 25 13:32:00 2023

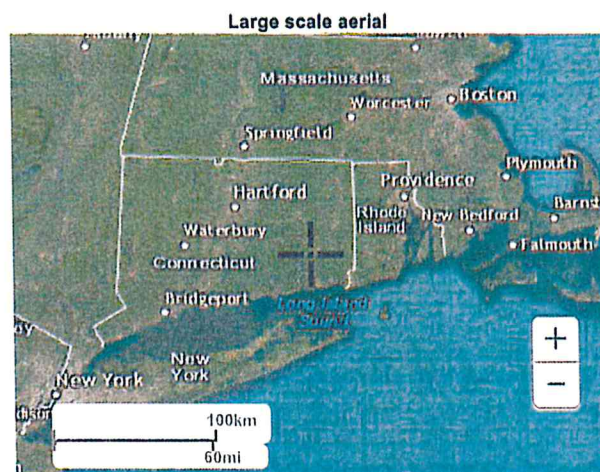
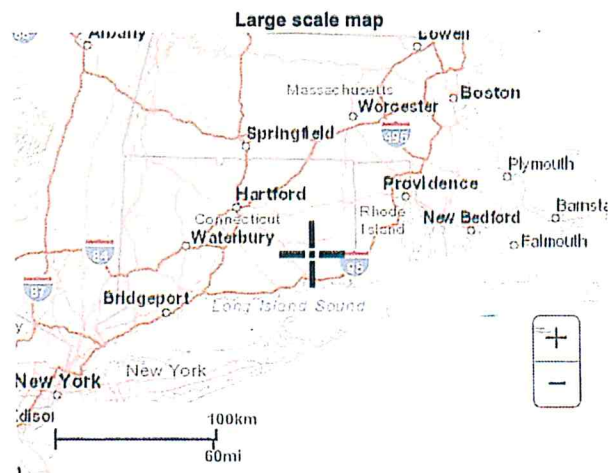
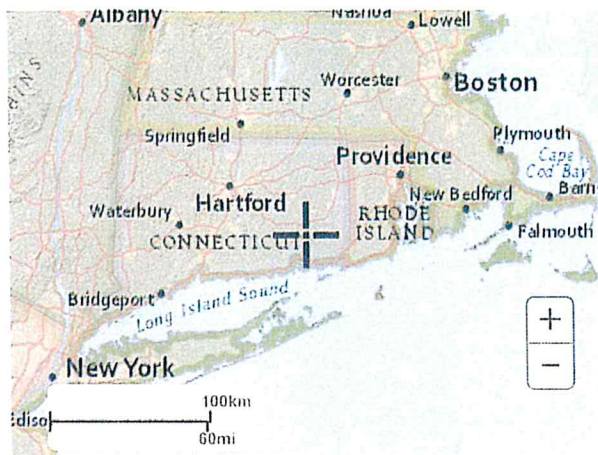
[Back to Top](#)

Maps & aerals

Small scale terrain



Large scale terrain



[Back to Top](#)

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

[Disclaimer](#)