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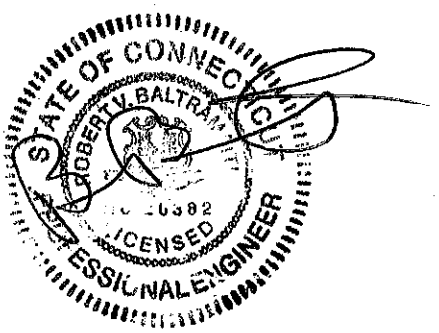


STORM WATER ANALYSIS
LONG HILL ESTATES
Rev. May 10, 2021

The existing property at 53 Long Hill Road is 20.29 acres in size and located on the south side of Long Hill Road just west of West High Street (State Route 66) in East Hampton, Connecticut. The site is presently undeveloped and the ground cover is primarily forested. The topography slopes generally from south to north with a drainage divide approximately in the center of the property.

The proposed development will consist of eight (8) single family residential homes on new lots of varying sizes. Lot sizes range from approximately 60,000 SF to 125,000 SF. The shape and size of the proposed lots is a function of providing code compliant domestic wells, protective radii, primary sub-surface sewage disposal systems and future reserve areas.

Hydraflow Hydrographs® (HH) software was used to generate computer models of the pre- and post-development scenarios. HH utilizes the methodologies set forth in the Technical Release No. 55 (TR-55) and Technical Release No. 20 (TR-20) computer model, originally developed by the Soil Conservation Service (SCS) now called the Natural Resources Conservation Service (NRCS) as well as Rational and Modified Rational Methods. The HH software predicts runoff rates based upon several factors including land use, hydrologic soil type, vegetative cover, watershed area, time of concentration rainfall data and the attenuation effects due to ponds and structures.

Presently, under *pre-development conditions*, approximately half of the site drains northeasterly to a wetland system that traverses through the northeast corner of the site and drains to an existing culvert under Long Hill Road (Analysis Point A). The remaining portion of the site drains north westerly to a roadside swale (Analysis Point B) or simply drains overland as sheetflow across the west border (Analysis Point C).

Under *post-development conditions*, the existing drainage areas will be altered but the size of the areas draining to each analysis point will be similar.

When the SCS is utilized, runoff curve numbers (CN) were developed for each drainage area for existing and post-development conditions based on existing land coverage in the sub watersheds and the underlying soils, as identified in the Soil Survey of New London County, Connecticut. The following runoff coefficients were used based on the hydrologic classification of area soils which are of hydrologic class 'C' with some class 'B' to the south:

Land Cover	**CN**
Roofs	98
Pavements	98
Grass	74
Woods (C)	70
Woods (B)	55

When the Modified Rational method is utilized, weighted runoff coefficients were determined for each drainage area utilizing the following values from Section 6 of the Town of East Hampton Street Standards:

Land Cover	**"C"**
Roofs	0.90
Pavements	0.90
Lawns (Flat)	0.17
Lawns (Steep)	0.35
Woods	0.20

Drainage areas for pre- and post-development scenarios were developed and are shown on Plan Sheet DA-1 entitled "Pre and Post Drainage Area Plan" contained in the plan set.

The times-of-concentration (Tc) were determined for both the pre- and post-development conditions using accepted practices that consider the characteristic of the watershed, its slope and travel length; a minimum time-of-concentration (Tc) of 5 minutes is utilized. Given the relatively small drainage areas, hydrographs were developed using Modified Rational methodology to determine peak flow rates and to route peak flows through the proposed stormwater management areas. To measure storm volumes, hydrographs were developed using SCS methodology. Rainfall data was taken from NOAA 14 published rainfall values; the associated 24-hour rainfall totals utilized are 3.34", 5.13", 6.25" and 7.97" for the 2-, 10-, 25- and 100-year storms, respectively.

The following table summarizes each existing and post-development drainage area:

Watershed	Area (Acres)	Tc (min)	Runoff "C"/ CN	Description
ex-POI-A	10.3	29	0.20 /69	Existing runoff east to culvert (Point A)
ex-POI-B	3.1	24	0.20 /70	Existing runoff west to roadside (Point B)
ex-POI-C	6.9	22	0.20 /67	Existing runoff west overland (Point C)
PR-DA-1	1.2	14	0.30 /73	Post Dev runoff east to culvert (Point A)
PR-DA-2	0.9	14	0.39 /77	Post Dev runoff east to culvert (Point A)
PR-DA-6	0.9	22	0.34 /72	Post Dev runoff east to culvert (Point A)
PR-DA-7	4.4	29	0.22 /67	Post Dev runoff east to culvert (Point A)
PR-DA-8A	3.5	24	0.22 /71	Post Dev runoff east to culvert (Point A)
PR-DA-8B	0.1	9	0.30 /74	Post Dev runoff east to culvert (Point A)
PR-DA-3	1.3	19	0.27 /72	Post Dev runoff west to road side (Point B)
PR-DA-9A	0.1	14	0.29 /73	Post Dev runoff west to road side (Point B)
PR-DA-4	1.7	19	0.27 /72	Post Dev runoff west overland (Point C)
PR-DA-5	3.0	22	0.25 /68	Post Dev runoff west overland (Point C)
PR-DA-10A	0.2	10	0.20 /70	Post Dev runoff west overland (Point C)
PR-DA-10B	2.5	22	0.20 /64	Post Dev runoff west overland (Point C)

Not surprisingly, the developed site is anticipated to increase the peak runoff rates and volumes from the site. To mitigate this impact, sub-surface storm water infiltration systems are proposed to accommodate rooftop water from EACH of the proposed dwellings. Each system is designed to fully accommodate the anticipated volume for a 100-year, 24-hour storm (SCS method). Each system will consist of approximately 60 feet of (12"x30") HDPE infiltration chambers on a crushed stone bed providing 243 cubic feet of storage. Appendix sheets B-1 thru B-3 contain runoff volume and storage calculations.

While this first mitigation significantly reduces the post-development impact, we would still expect an increase in peak runoff rates and volumes associated with the paved driveways and creation of lawns and other developed areas. To further mitigate this impact, the site will be developed with a series of raingardens/ bioretention areas constructed as mild depressions in the topography. These storm water management areas are designed to hold enough volume of post development runoff to meet or reduce the pre-development volume. The following table summarizes the volume holding capacity of the raingardens:

Raingarden	**Serves**	**Volume (Cu. Ft.)**	**Drains To**
SWM 1	Lot 7	1,895	Runoff east to culvert (Point A)
SWM 2	Lot 5	680	Runoff east to culvert (Point A)
SWM 3	Lot 4	2,451	Runoff west to road side (Point B)
SWM 4	Lot 1	6,242	Runoff west to road side (Point B)
SWM 5	Lot 2	3,269	Runoff west overland (Point C)
SWM 6	Lot 6	9,362	Runoff east to culvert (Point A)
SWM 7	Lot 6	3,723	Runoff east to culvert (Point A)
Total Volume		27,622	

As summarized above, the proposed raingarden/ bioretention areas offer 27,622 cubic feet (0.63 acre-feet) of on-site storage. With each of eight rooftop infiltration systems providing 243 cubic feet of additional storage, the total project storage for post-development storm water is 29,566 (0.68 acre-feet).

The raingardens were modeled as "ponds" in the HH software and post-development hydrographs were routed through the applicable ponds. The effect of the ponds will serve to greatly reduce post-development peak runoff rates and volumes. As summarized below, the mitigation measures including the rooftop infiltrators and the proposed raingarden/ bioretention areas, will fully mitigate the storm water impacts of development:

Watershed	**Existing**		**Proposed (No Detention)**		**Proposed (with Detention)**	
	Rate (cfs)	Volume (cu. ft.)	Rate (cfs)	Volume (cu. ft.)	Rate (cfs)	Volume (cu. ft.)
East to culvert (Point A)	9.5	24,707	12.0	29,623	7.2	18,028
West to roadside (Point B)	3.2	6,883	2.2	3,825	0.5	746
West overland (Point C)	7.5	14,747	9.1	18,279	4.8	9,422

Post-development hydrographs, including runoff coefficient calculations, time of concentration calculations and pond reports for the 100-year storm event are contained in Appendix A. A summary table is provided also detailing the 2-, 10-, and 25-year storms.

The maintenance of the rooftop infiltrators and raingarden/ bioretention areas will be the perpetual responsibility of the assigned property owners.

Water Quality Volume and Ground Recharge Volume

The CTDEEP Stormwater Quality Manual defines the water quality volume (WQV) as the amount of stormwater runoff from any given storm that should be captured and treated in order to remove a majority of stormwater pollutants on an average annual basis. The recommended WQV, which results in the capture and treatment of the entire runoff volume for 90 percent of the average annual storm events, is equivalent to the runoff associated with the first one-inch of rainfall. The WQV is calculated using the following equation:

WQV = (1")(R)(A)/ 12 where:

WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient = 0.05+0.009(I)
I = percent impervious cover
A = site area in acres

Based on the development plans, the impervious coverage for the site will be approximately 4.5 percent. Solving for the above equation, the recommended WQV is 0.15 acre-feet (6,632 CF).

The groundwater recharge criterion contained in the SWQM is intended to maintain pre-development annual groundwater recharge volumes by capturing and infiltrating stormwater runoff. The objective of the groundwater recharge criterion is to maintain water table levels, stream baseflow, and wetland moisture levels. The groundwater recharge volume (GRV) is the post-development design recharge volume (i.e., on a storm event basis) required to minimize the loss of annual pre-development groundwater recharge. The GRV is determined as a function of annual pre-development recharge for site-specific soils or surficial materials, average annual rainfall volume, and amount of impervious cover on a site. The GRV is calculated using the following equation:

GRV = (D)(A)(I)/ 12 where:

GRV = groundwater recharge volume (ac-ft)
D = depth of runoff to be recharged (inches)
(SWQM Table 7-4)
A = site area (acres)
I = post-development site imperviousness

Solving for the above equation, the recommended GRV is .007 acre-feet (331 CF).

The water quality volume and groundwater recharge volume provided by the site greatly exceeds the CTDEEP recommended values. WQV and GRV calculations are depicted on Appendix sheet C-1.

Roadside Culverts

To accommodate the existing roadside swale, the developer proposes to install culverts to convey swale flows under the driveways serving Lot 1, Lot 4 and Lot 7. Drainage calculations were performed to evaluate the performance of each culvert for a 10-year design storm using information and methodology contained in Hydraulic Engineering Circular HEC Number 5, Hydraulic Charts for the Selection of Highway Culverts, HEC Number10, Capacity Charts for the Hydraulic Design of Highway Culverts, and HEC Number 13, Hydraulic Design of Improved Inlets for Culverts.

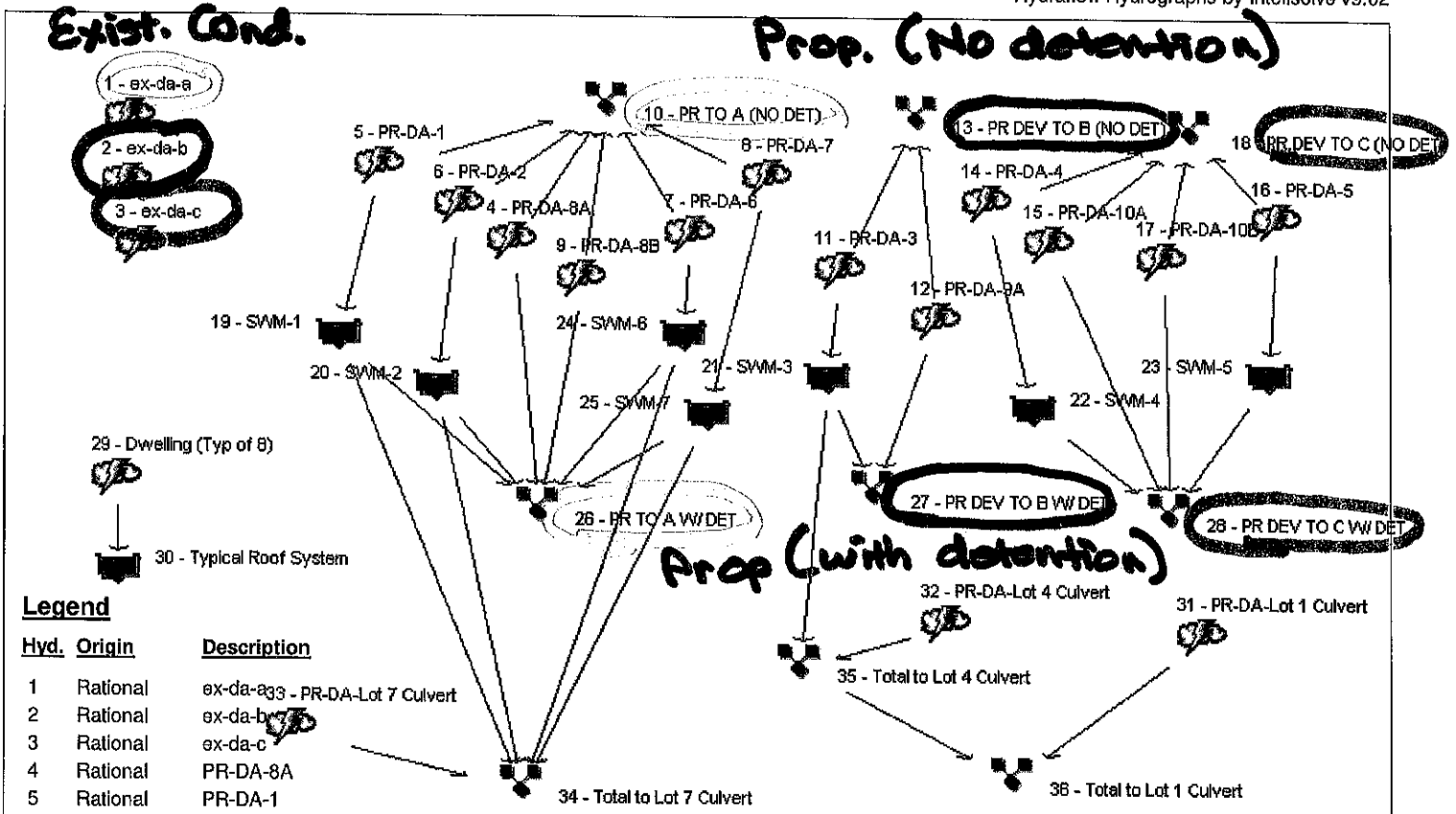
The anticipated 10-year design flow at each culvert is relatively small given the proximity of the roadway highpoint and the site stormwater retained by rooftop infiltrator systems and raingardens. The following table summarizes the performance of each proposed culvert for a 10-year storm:

	15" RCP w/ Flared Ends				Q_{10} (cfs)	Depth (Feet)	Velocity (fps)
	INV_{up}	INV_{dn}	Length (ft)	Slope (ft/ft)			
Driveway Lot 1	286.10	285.40	36	0.0194	0.8	0.5	5.1
Driveway Lot 4	288.75	288.00	32	0.0234	0.5	0.4	4.8
Driveway Lot 7	289.40	289.25	26	0.0058	1.7	0.7	4.1

Based on the calculations contained as Appendix sheet D-1 thru D-3, the proposed 15" RCP culverts are more than adequate to accommodate the design flows and flow velocities are not significant.

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.02



Legend

Hyd.	Origin	Description
1	Rational	ex-da-a
2	Rational	ex-da-b
3	Rational	ex-da-c
4	Rational	PR-DA-8A
5	Rational	PR-DA-1
6	Rational	PR-DA-2
7	Rational	PR-DA-6
8	Rational	PR-DA-7
9	Rational	PR-DA-8B
10	Combine	PR TO A (NO DET)
11	Rational	PR-DA-3
12	Rational	PR-DA-9A
13	Combine	PR DEV TO B (NO DET)
14	Rational	PR-DA-4
15	Rational	PR-DA-10A
16	Rational	PR-DA-5
17	Rational	PR-DA-10B
18	Combine	PR DEV TO C (NO DET)
19	Reservoir	SWM-1
20	Reservoir	SWM-2
21	Reservoir	SWM-3
22	Reservoir	SWM-4
23	Reservoir	SWM-5
24	Reservoir	SWM-6
25	Reservoir	SWM-7
26	Combine	PR TO A W/ DET
27	Combine	PR DEV TO B W/ DET
28	Combine	PR DEV TO C W/ DET
29	Rational	Dwelling (Typ of 8) → 2,400 S.F. roof area
30	Reservoir	Typical Roof System
31	Rational	PR-DA-Lot 1 Culvert
32	Rational	PR-DA-Lot 4 Culvert
33	Rational	PR-DA-Lot 7 Culvert
34	Combine	Total to Lot 7 Culvert
35	Combine	Total to Lot 4 Culvert
36	Combine	Total to Lot 1 Culvert

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.02

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-------	-------	4.097	-------	5.358	6.301	7.571	-------	9.466	ex-da-a
2	Rational	-------	-------	1.374	-------	1.796	2.111	2.546	-------	3.187	ex-da-b
3	Rational	-------	-------	3.209	-------	4.194	4.927	5.948	-------	7.448	ex-da-c
4	Rational	-------	-------	1.702	-------	2.225	2.614	3.153	-------	3.946	PR-DA-8A
5	Rational	-------	-------	1.023	-------	1.341	1.573	1.893	-------	2.375	PR-DA-1
6	Rational	-------	-------	0.966	-------	1.266	1.486	1.788	-------	2.243	PR-DA-2
7	Rational	-------	-------	0.712	-------	0.930	1.092	1.319	-------	1.651	PR-DA-6
8	Rational	-------	-------	1.896	-------	2.480	2.917	3.500	-------	4.376	PR-DA-7
9	Rational	-------	-------	0.105	-------	0.138	0.162	0.193	-------	0.242	PR-DA-8B
10	Combine	4, 5, 6, 7, 8, 9	-------	5.194	-------	6.795	7.983	9.611	-------	12.03	PR TO A (NO DET)
11	Rational	-------	-------	0.882	-------	1.153	1.354	1.635	-------	2.049	PR-DA-3
12	Rational	-------	-------	0.110	-------	0.144	0.169	0.203	-------	0.255	PR-DA-9A
13	Combine	11, 12	-------	0.972	-------	1.271	1.493	1.802	-------	2.258	PR DEV TO B (NO DET)
14	Rational	-------	-------	1.167	-------	1.526	1.791	2.164	-------	2.711	PR-DA-4
15	Rational	-------	-------	0.141	-------	0.186	0.218	0.260	-------	0.326	PR-DA-10A
16	Rational	-------	-------	1.738	-------	2.272	2.669	3.222	-------	4.034	PR-DA-5
17	Rational	-------	-------	1.117	-------	1.459	1.715	2.069	-------	2.590	PR-DA-10B
18	Combine	14, 15, 16, 17	-------	3.937	-------	5.147	6.046	7.298	-------	9.139	PR DEV TO C (NO DET)
19	Reservoir	5	-------	0.000	-------	0.000	0.000	0.235	-------	0.971	SWM-1
20	Reservoir	6	-------	0.551	-------	0.915	1.178	1.519	-------	2.050	SWM-2
21	Reservoir	11	-------	0.000	-------	0.000	0.000	0.000	-------	0.533	SWM-3
22	Reservoir	14	-------	0.000	-------	0.000	0.000	0.000	-------	0.000	SWM-4
23	Reservoir	16	-------	0.000	-------	0.517	1.089	1.783	-------	2.737	SWM-5
24	Reservoir	7	-------	0.000	-------	0.000	0.000	0.000	-------	0.000	SWM-6
25	Reservoir	8	-------	0.273	-------	1.144	1.691	2.382	-------	3.385	SWM-7
26	Combine	4, 9, 19, 20, ~~24, 25~~		2.269	-------	3.057	3.598	4.602	-------	7.207	PR TO A W/ DET
27	Combine	12, 21,	-------	0.110	-------	0.144	0.169	0.203	-------	0.533	PR DEV TO B W/ DET
28	Combine	15, 17, 22, 23,	-------	1.166	-------	1.524	2.077	3.218	-------	4.799	PR DEV TO C W/ DET
29	Rational	-------	-------	0.189	-------	0.252	0.295	0.342	-------	0.430	Dwelling (Typ of 8)
30	Reservoir	29	-------	0.000	-------	0.000	0.000	0.000	-------	0.000	Typical Roof System
31	Rational	-------	-------	0.208	-------	0.277	0.325	0.376	-------	0.473	PR-DA-Lot 1 Culvert
32	Rational	-------	-------	0.253	-------	0.337	0.395	0.457	-------	0.575	PR-DA-Lot 4 Culvert
33	Rational	-------	-------	0.546	-------	0.727	0.854	0.987	-------	1.241	PR-DA-Lot 7 Culvert
34	Combine	19, 20, 24, ~~25, 33~~		0.551	-------	1.144	1.691	2.526	-------	4.242	Total to Lot 7 Culvert

1.7cfs (culvert design)

Hydrograph Return Period Recap

culvert design

Hydraflow Hydrographs by Intelisolve v9.02

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
							0.5cfs				
35	Combine	21, 32,	-------	0.253	-------	0.337	0.395	0.457	-------	0.575	Total to Lot 4 Culvert
36	Combine	31, 35	-------	0.461	-------	0.614	0.720	0.833	-------	1.047	Total to Lot 1 Culvert
							0.8cfs				

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	9.466	1	29	24,707	----	------	------	ex-da-a
2	Rational	3.187	1	24	6,883	----	------	------	ex-da-b
3	Rational	7.448	1	22	14,747	----	------	------	ex-da-c
4	Rational	3.946	1	24	8,524	----	------	------	PR-DA-8A
5	Rational	2.375	1	14	2,992	----	------	------	PR-DA-1
6	Rational	2.243	1	14	2,826	----	------	------	PR-DA-2
7	Rational	1.651	1	22	3,270	----	------	------	PR-DA-6
8	Rational	4.376	1	30	11,816	----	------	------	PR-DA-7
9	Rational	0.242	1	9	196	----	------	------	PR-DA-8B
10	Combine	12.03	1	24	29,623	4, 5, 6, 7, 8, 9	------	------	PR TO A (NO DET)
11	Rational	2.049	1	19	3,504	----	------	------	PR-DA-3
12	Rational	0.255	1	14	321	----	------	------	PR-DA-9A
13	Combine	2.258	1	19	3,825	11, 12	------	------	PR DEV TO B (NO DET)
14	Rational	2.711	1	19	4,636	----	------	------	PR-DA-4
15	Rational	0.326	1	10	293	----	------	------	PR-DA-10A
16	Rational	4.034	1	22	7,988	----	------	------	PR-DA-5
17	Rational	2.590	1	23	5,362	----	------	------	PR-DA-10B
18	Combine	9.139	1	22	18,279	14, 15, 16, 17	------	------	PR DEV TO C (NO DET)
19	Reservoir	0.971	1	28	682	5	292.86	2,093	SWM-1
20	Reservoir	2.050	1	16	2,010	6	297.93	848	SWM-2
21	Reservoir	0.533	1	42	425	11	293.58	2,619	SWM-3
22	Reservoir	0.000	1	305	0	14	282.63	4,229	SWM-4
23	Reservoir	2.737	1	33	3,766	16	316.22	3,821	SWM-5
24	Reservoir	0.000	1	29	0	7	344.83	2,547	SWM-6
25	Reservoir	3.385	1	39	6,616	8	342.26	4,440	SWM-7
26	Combine	7.207	1	35	18,028	4, 9, 19, 20, 24, 25	------	------	PR TO A W/ DET
27	Combine	0.533	1	42	746	12, 21,	------	------	PR DEV TO B W/ DET
28	Combine	4.799	1	32	9,422	15, 17, 22, 23,	------	------	PR DEV TO C W/ DET
29	Rational	0.430	1	5	193	----	------	------	Dwelling (Typ of 8)
30	Reservoir	0.000	1	244	0	29	100.87	182	Typical Roof System
31	Rational	0.473	1	5	213	----	------	------	PR-DA-Lot 1 Culvert
32	Rational	0.575	1	5	259	----	------	------	PR-DA-Lot 4 Culvert
33	Rational	1.241	1	5	558	----	------	------	PR-DA-Lot 7 Culvert
34	Combine	4.242	1	36	9,867	19, 20, 24, 25, 33	----	------	Total to Lot 7 Culvert

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
35	Combine	0.575	1	5	683	21, 32,	------	------	Total to Lot 4 Culvert
36	Combine	1.047	1	5	896	31, 35	------	------	Total to Lot 1 Culvert

Hydrograph Report

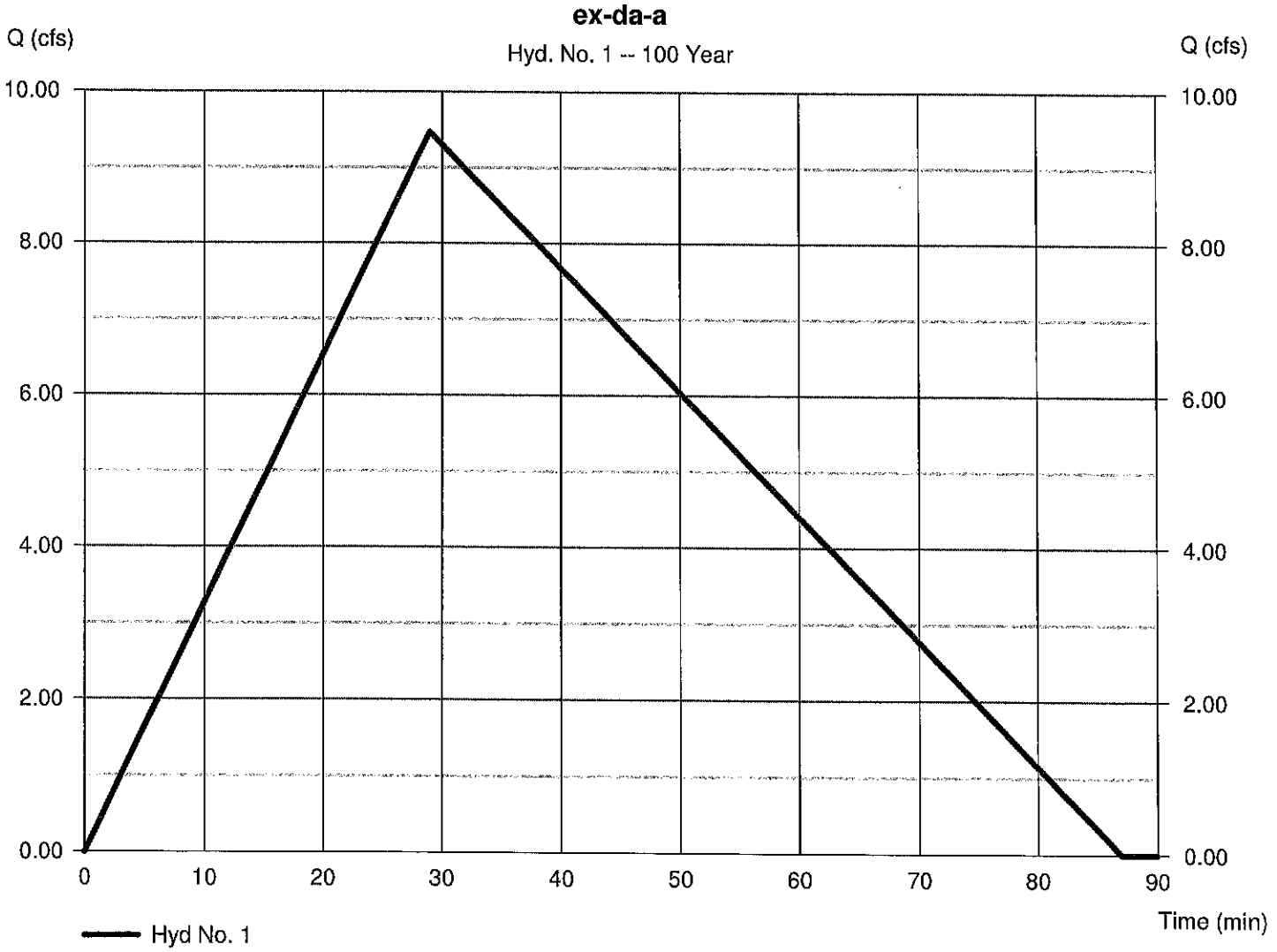
Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, May 11, 2021

Hyd. No. 1

ex-da-a

Hydrograph type	= Rational	Peak discharge	= 9.466 cfs
Storm frequency	= 100 yrs	Time to peak	= 29 min
Time interval	= 1 min	Hyd. volume	= 24,707 cuft
Drainage area	= 10.300 ac	Runoff coeff.	= 0.2
Intensity	= 4.595 in/hr	Tc by FAA	= 29.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

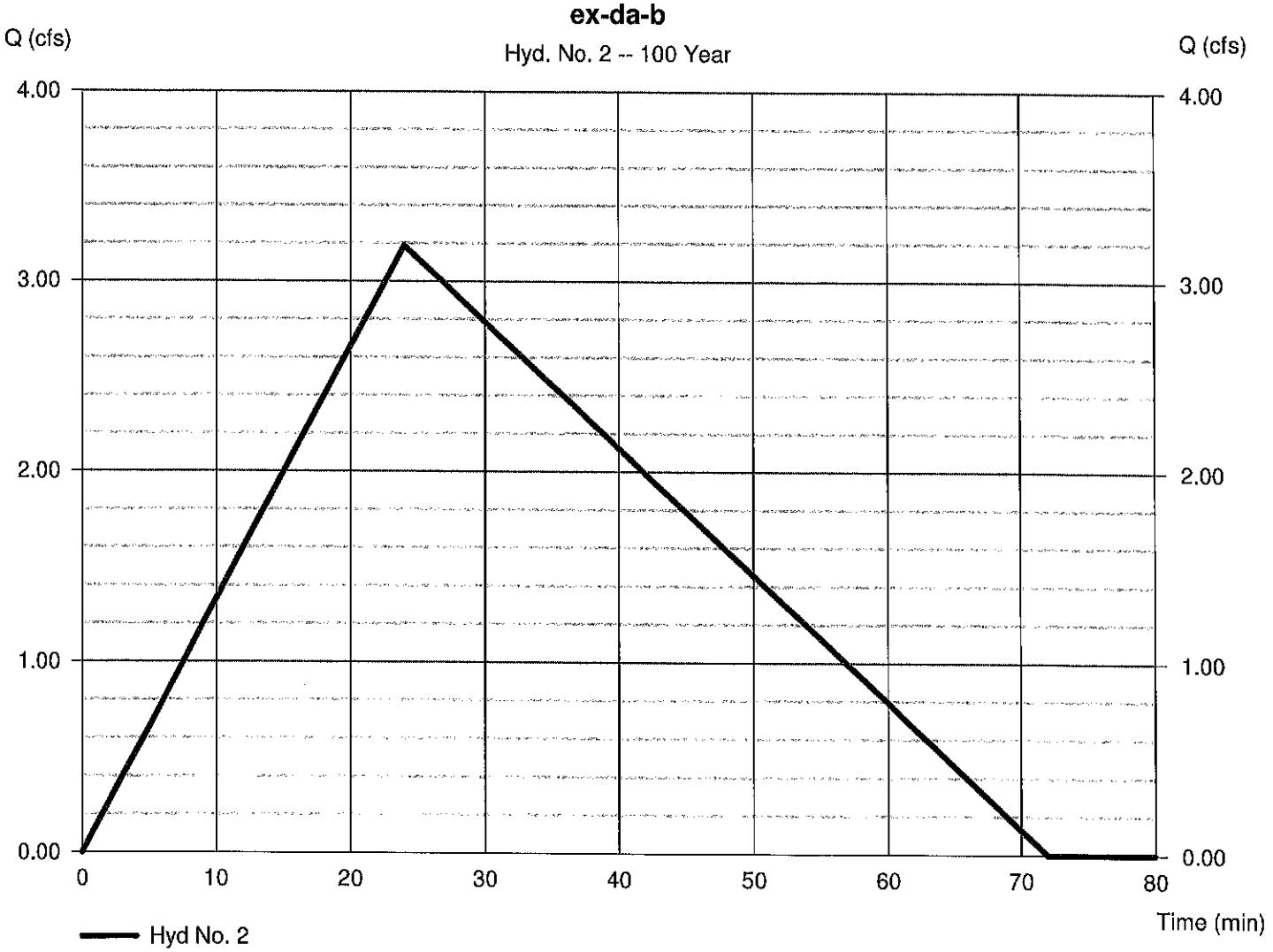


Hydrograph Report

Hyd. No. 2

ex-da-b

Hydrograph type	= Rational	Peak discharge	= 3.187 cfs
Storm frequency	= 100 yrs	Time to peak	= 24 min
Time interval	= 1 min	Hyd. volume	= 6,883 cuft
Drainage area	= 3.100 ac	Runoff coeff.	= 0.2
Intensity	= 5.140 in/hr	Tc by FAA	= 24.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

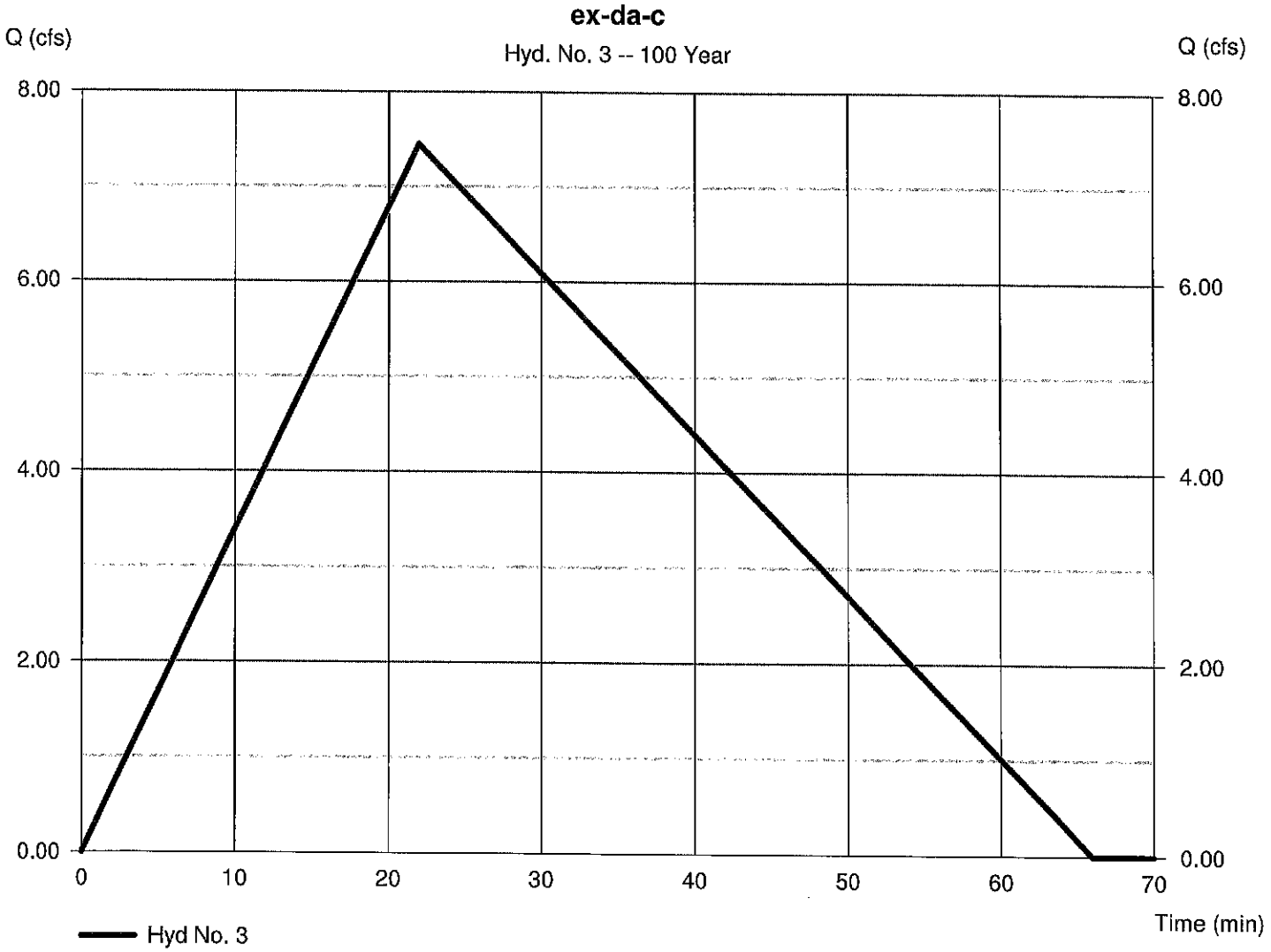


Hydrograph Report

Hyd. No. 3

ex-da-c

Hydrograph type	= Rational	Peak discharge	= 7.448 cfs
Storm frequency	= 100 yrs	Time to peak	= 22 min
Time interval	= 1 min	Hyd. volume	= 14,747 cuft
Drainage area	= 6.900 ac	Runoff coeff.	= 0.2
Intensity	= 5.397 in/hr	Tc by FAA	= 22.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

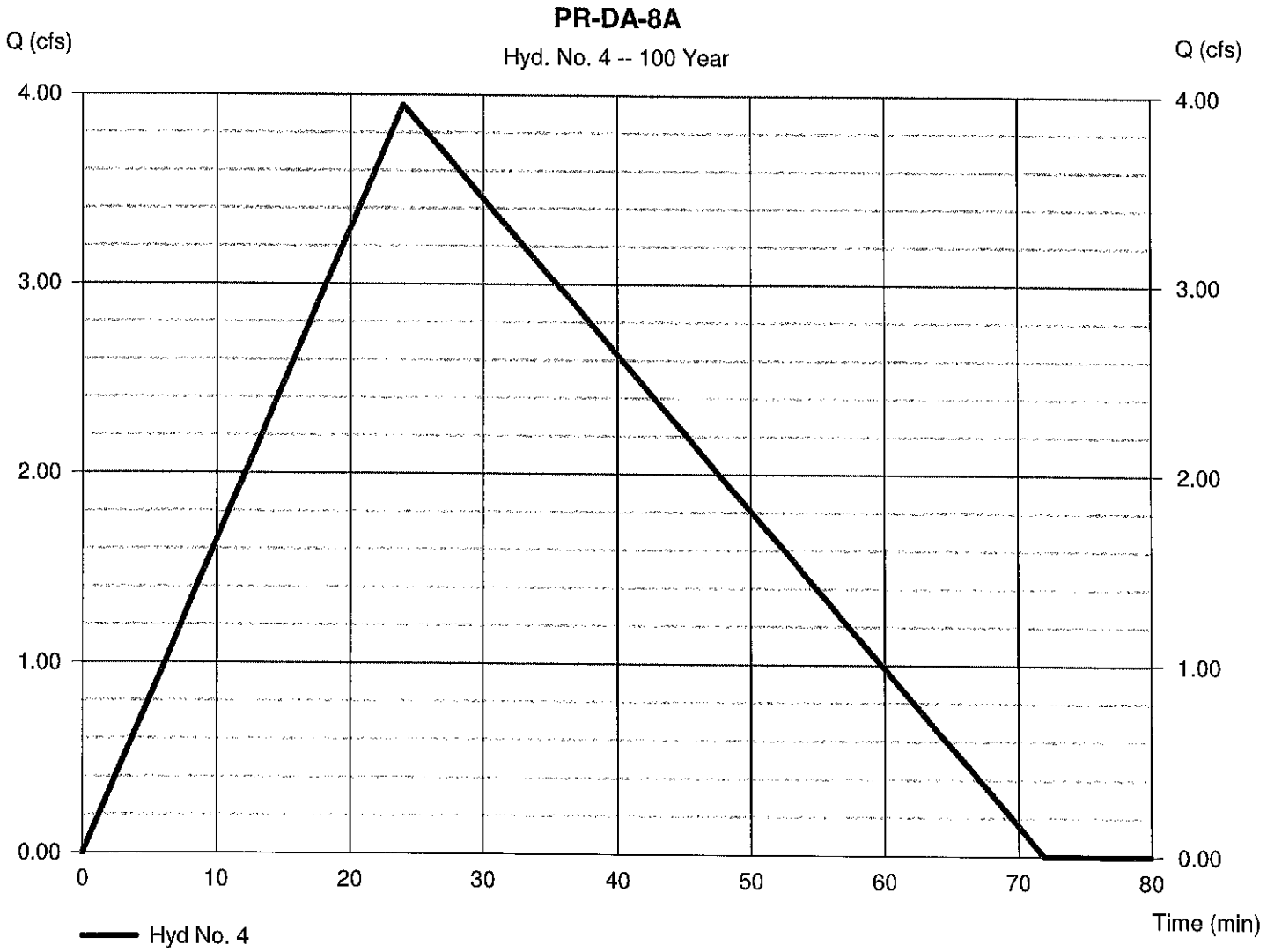
Tuesday, May 11, 2021

Hyd. No. 4

PR-DA-8A

Hydrograph type	= Rational	Peak discharge	= 3.946 cfs
Storm frequency	= 100 yrs	Time to peak	= 24 min
Time interval	= 1 min	Hyd. volume	= 8,524 cuft
Drainage area	= 3.490 ac	Runoff coeff.	= 0.22*
Intensity	= 5.140 in/hr	Tc by FAA	= 24.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.450 x 0.35) + (3.040 x 0.20)] / 3.490



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

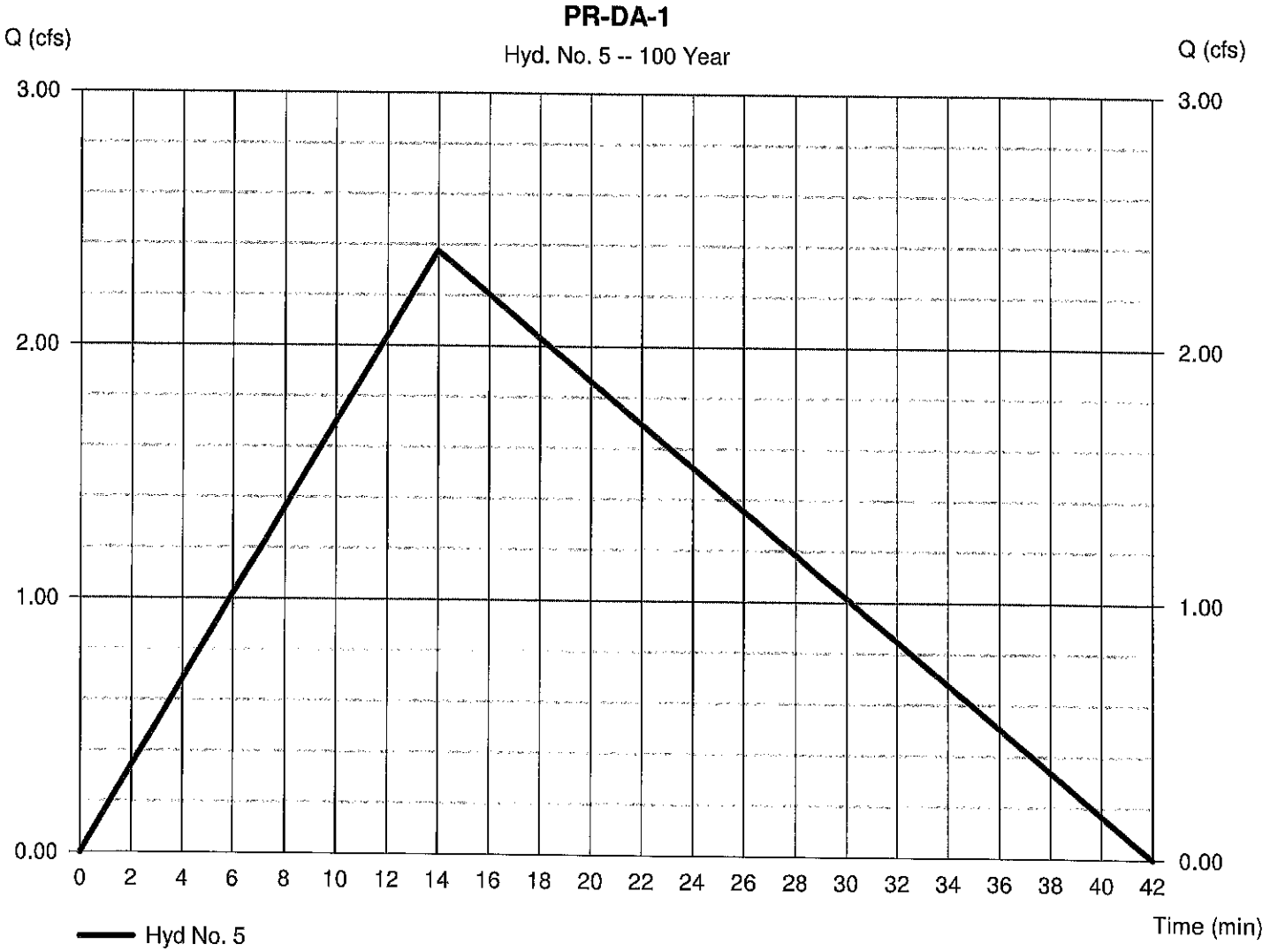
Tuesday, May 11, 2021

Hyd. No. 5

PR-DA-1

Hydrograph type	= Rational	Peak discharge	= 2.375 cfs
Storm frequency	= 100 yrs	Time to peak	= 14 min
Time interval	= 1 min	Hyd. volume	= 2,992 cuft
Drainage area	= 1.170 ac	Runoff coeff.	= 0.3*
Intensity	= 6.765 in/hr	Tc by FAA	= 14.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.080 x 0.90) + (0.430 x 0.35) + (0.660 x 0.20)] / 1.170



A-10

Hydrograph Report

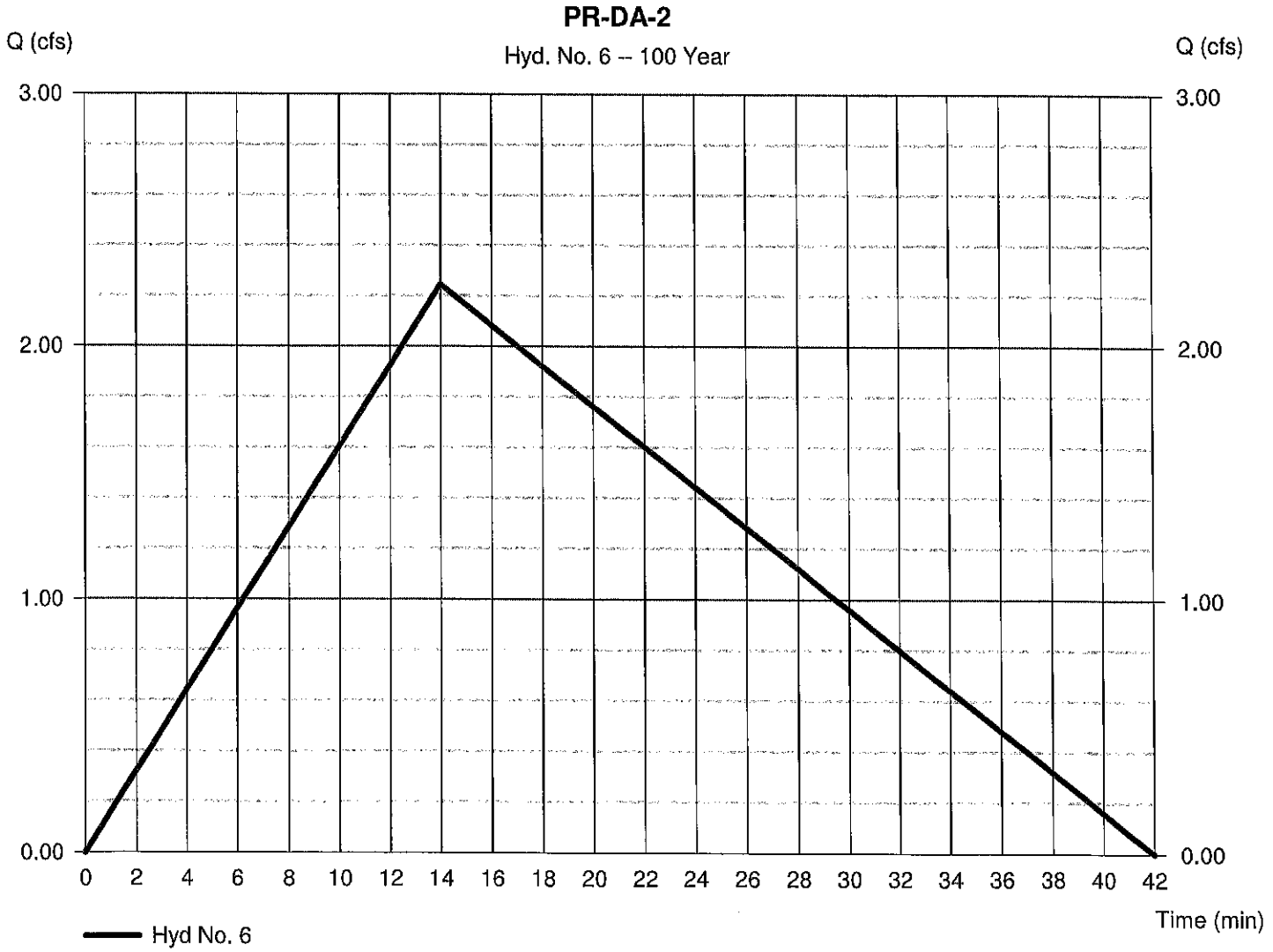
Hydraflow Hydrographs by Intelisolve v9.02 — Tuesday, May 11, 2021

Hyd. No. 6

PR-DA-2

Hydrograph type	= Rational	Peak discharge	= 2.243 cfs
Storm frequency	= 100 yrs	Time to peak	= 14 min
Time interval	= 1 min	Hyd. volume	= 2,826 cuft
Drainage area	= 0.850 ac	Runoff coeff.	= 0.39*
Intensity	= 6.765 in/hr	Tc by FAA	= 14.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.150 x 0.90) + (0.390 x 0.35) + (0.310 x 0.20)] / 0.850



A-11

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

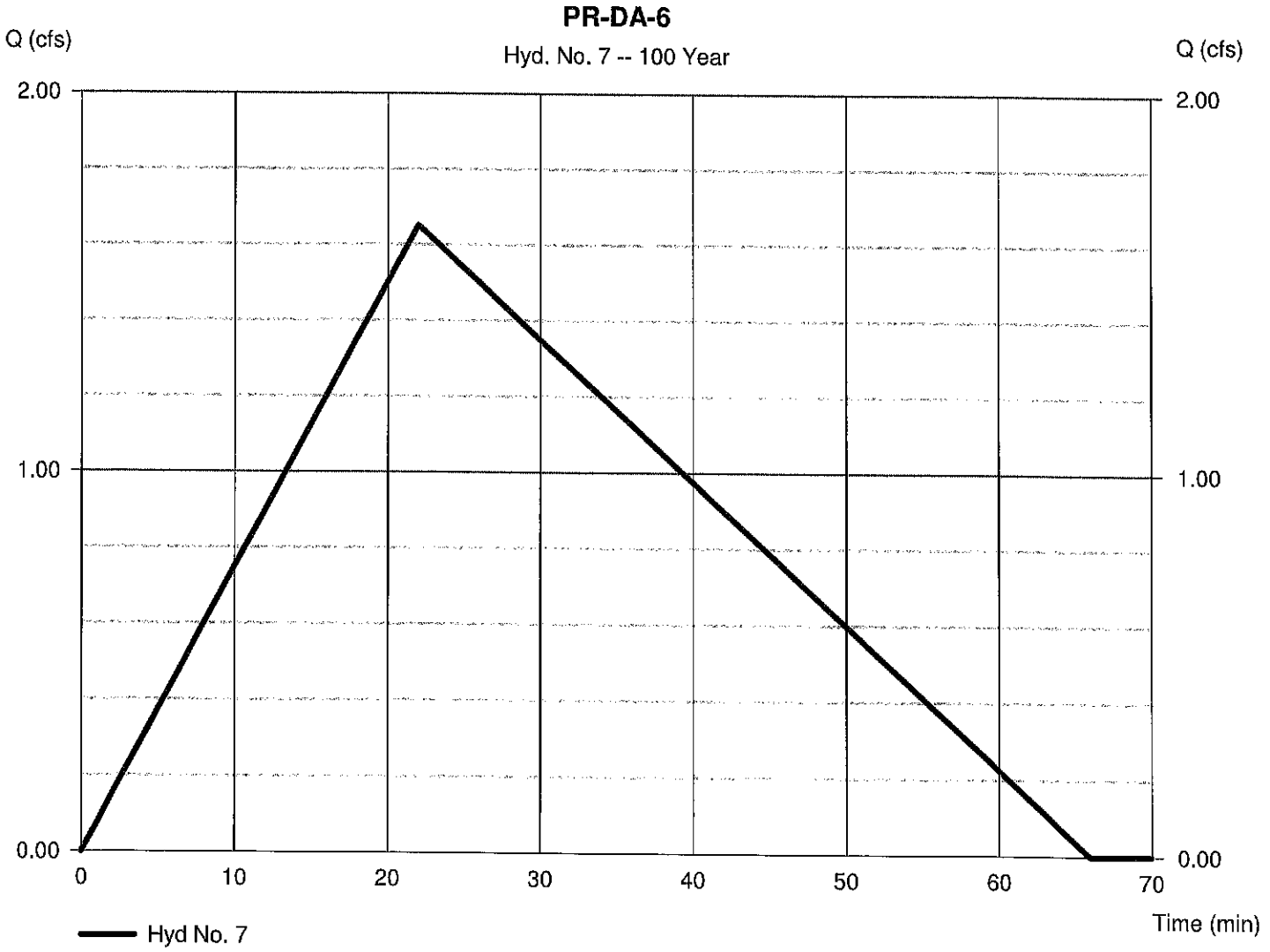
Tuesday, May 11, 2021

Hyd. No. 7

PR-DA-6

Hydrograph type	= Rational	Peak discharge	= 1.651 cfs
Storm frequency	= 100 yrs	Time to peak	= 22 min
Time interval	= 1 min	Hyd. volume	= 3,270 cuft
Drainage area	= 0.900 ac	Runoff coeff.	= 0.34*
Intensity	= 5.397 in/hr	Tc by FAA	= 22.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.100 x 0.90) + (0.400 x 0.35) + (0.400 x 0.20)] / 0.900



A-12

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

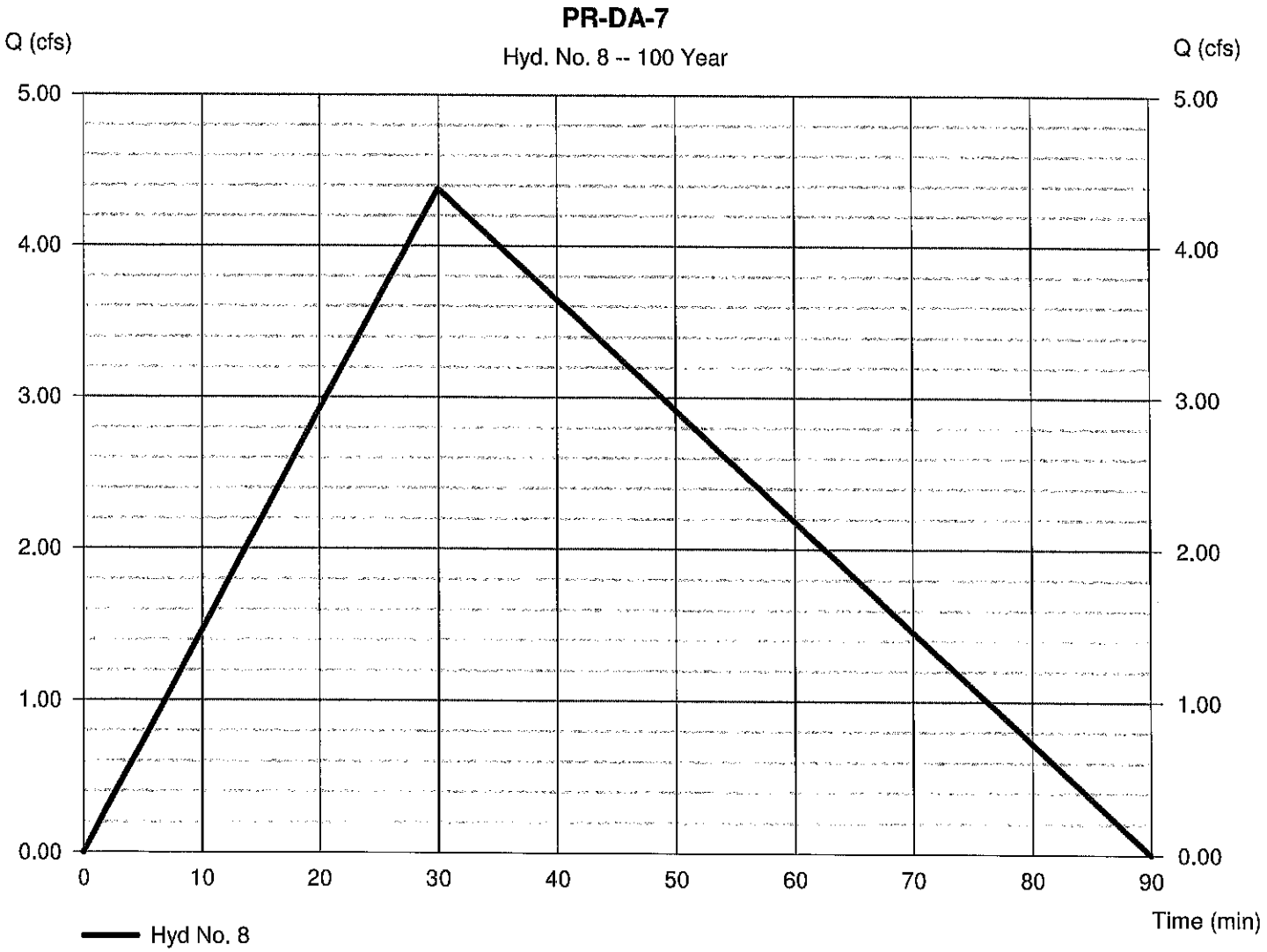
Tuesday, May 11, 2021

Hyd. No. 8

PR-DA-7

Hydrograph type	= Rational	Peak discharge	= 4.376 cfs
Storm frequency	= 100 yrs	Time to peak	= 30 min
Time interval	= 1 min	Hyd. volume	= 11,816 cuft
Drainage area	= 4.420 ac	Runoff coeff.	= 0.22*
Intensity	= 4.500 in/hr	Tc by FAA	= 30.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.060 x 0.90) + (0.270 x 0.35) + (4.090 x 0.20)] / 4.420



A-13

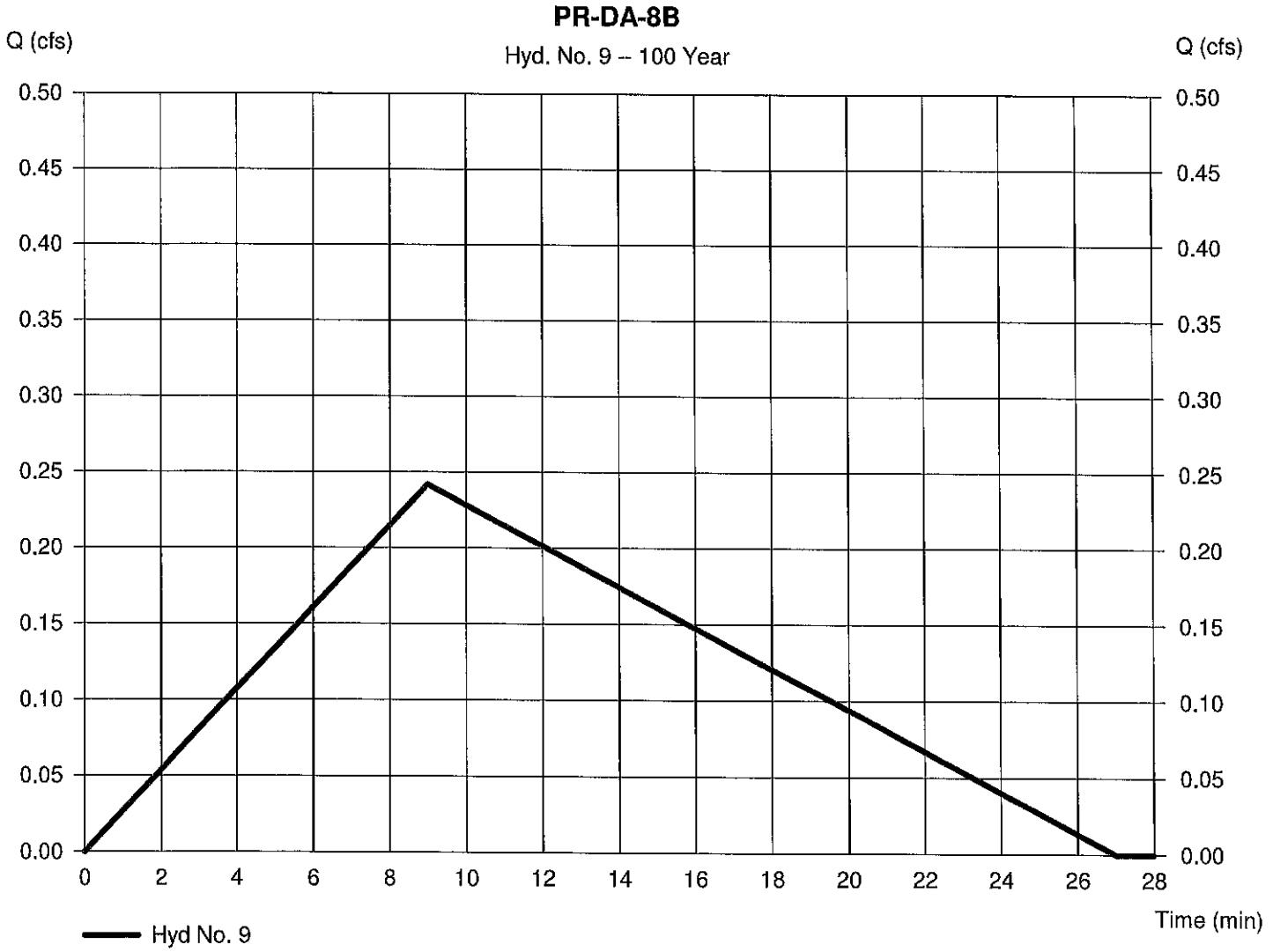
Hydrograph Report

Hyd. No. 9

PR-DA-8B

Hydrograph type	= Rational	Peak discharge	= 0.242 cfs
Storm frequency	= 100 yrs	Time to peak	= 9 min
Time interval	= 1 min	Hyd. volume	= 196 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.3*
Intensity	= 8.062 in/hr	Tc by FAA	= 9.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.020 x 0.35) + (0.010 x 0.90) + (0.070 x 0.20)] / 0.100



Hydrograph Report

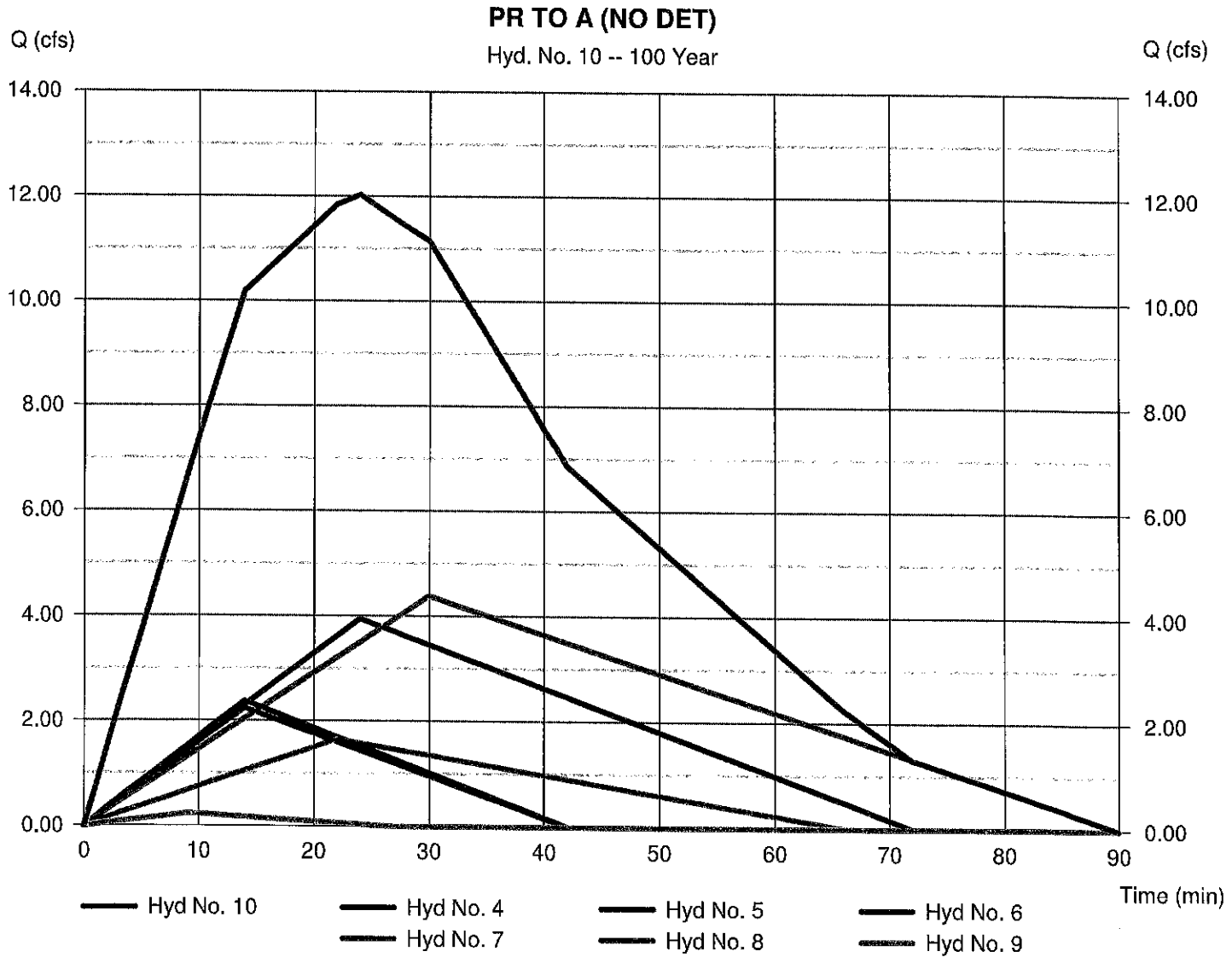
Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, May 11, 2021

Hyd. No. 10

PR TO A (NO DET)

Hydrograph type	= Combine	Peak discharge	= 12.03 cfs
Storm frequency	= 100 yrs	Time to peak	= 24 min
Time interval	= 1 min	Hyd. volume	= 29,623 cuft
Inflow hyds.	= 4, 5, 6, 7, 8, 9	Contrib. drain. area	= 10.930 ac



A-15

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

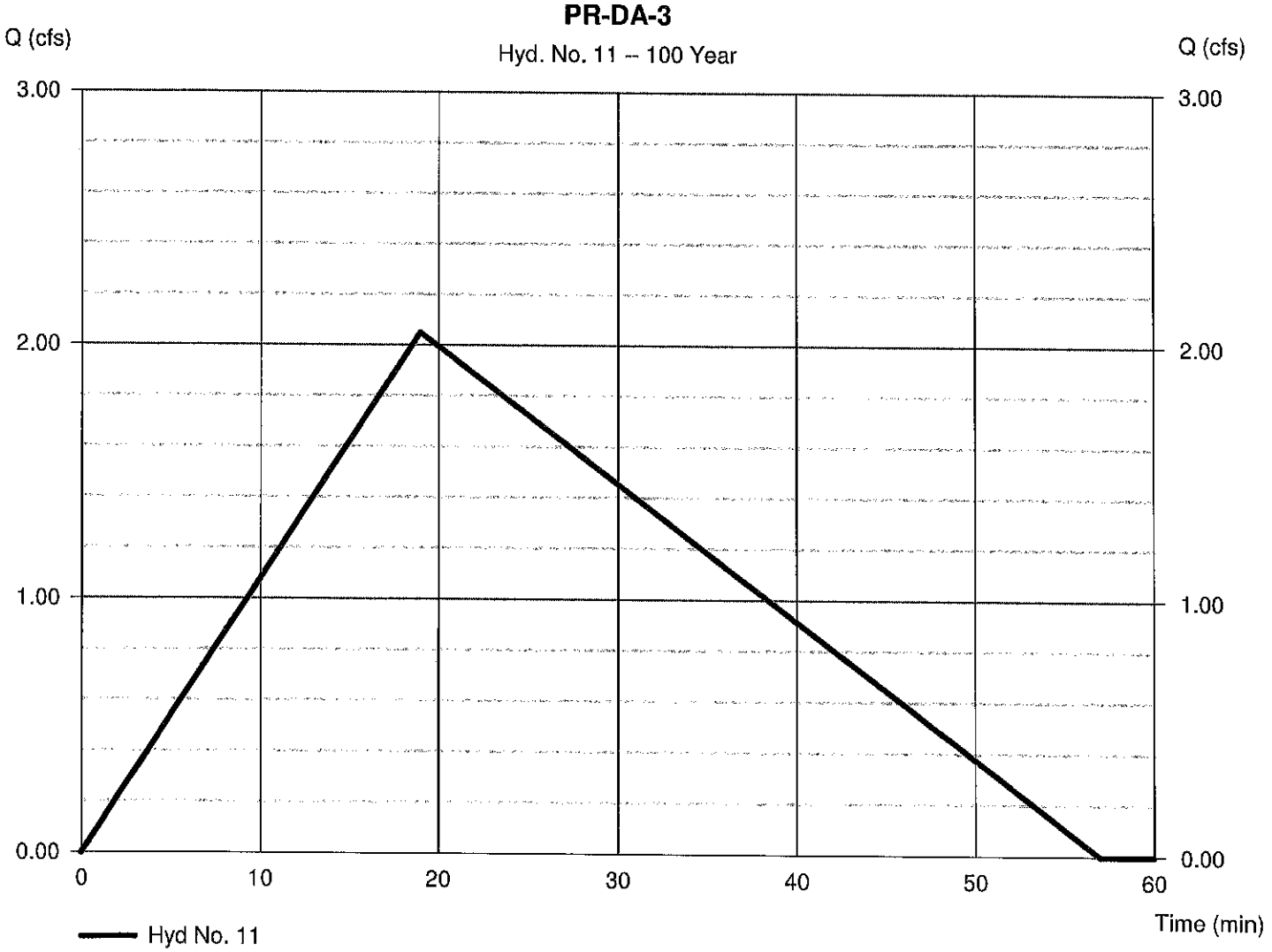
Tuesday, May 11, 2021

Hyd. No. 11

PR-DA-3

Hydrograph type	= Rational	Peak discharge	= 2.049 cfs
Storm frequency	= 100 yrs	Time to peak	= 19 min
Time interval	= 1 min	Hyd. volume	= 3,504 cuft
Drainage area	= 1.300 ac	Runoff coeff.	= 0.27*
Intensity	= 5.837 in/hr	Tc by FAA	= 19.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.050 x 0.90) + (0.400 x 0.35) + (0.850 x 0.20)] / 1.300



A-16

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

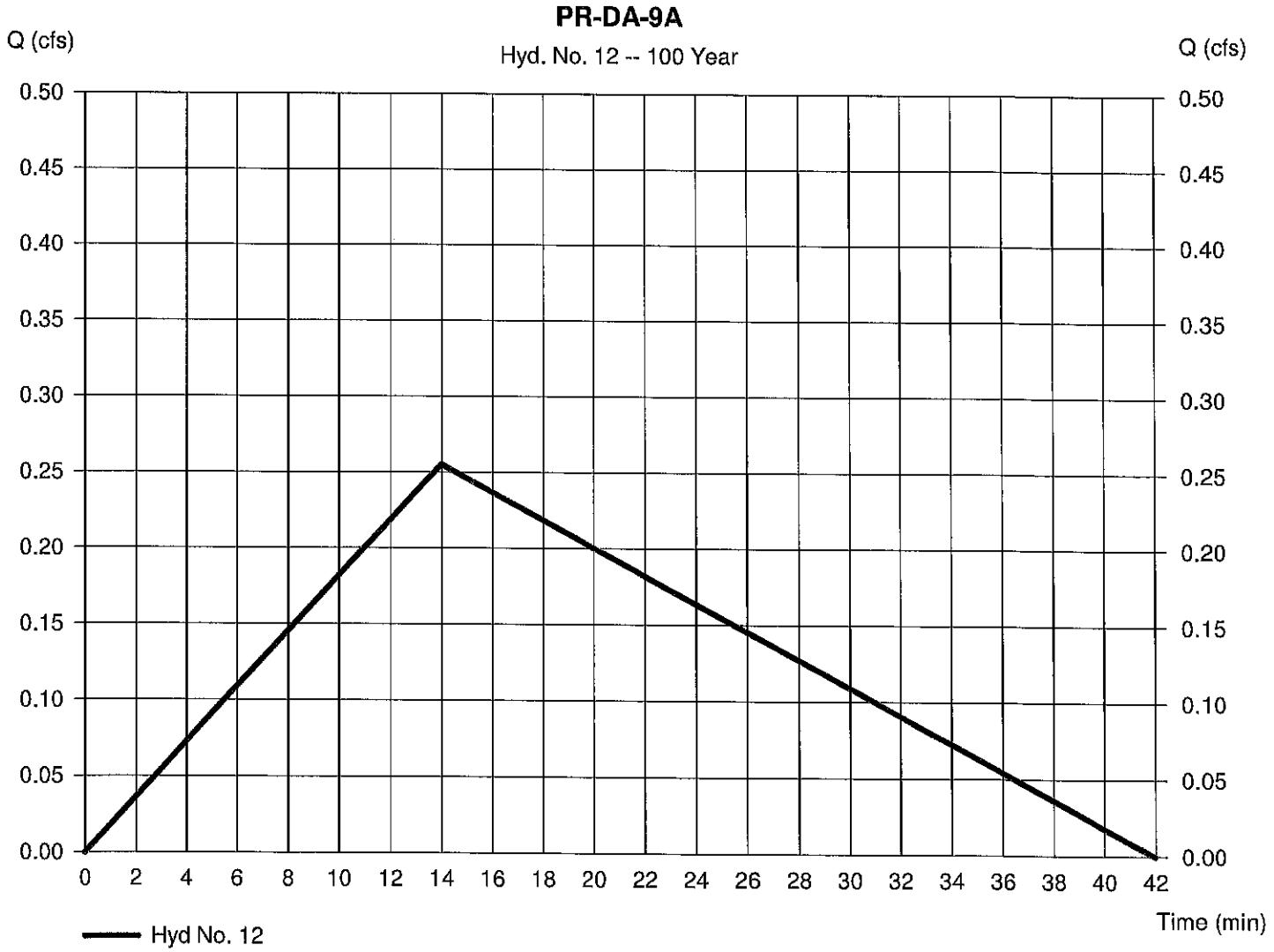
Tuesday, May 11, 2021

Hyd. No. 12

PR-DA-9A

Hydrograph type	= Rational	Peak discharge	= 0.255 cfs
Storm frequency	= 100 yrs	Time to peak	= 14 min
Time interval	= 1 min	Hyd. volume	= 321 cuft
Drainage area	= 0.130 ac	Runoff coeff.	= 0.29*
Intensity	= 6.765 in/hr	Tc by FAA	= 14.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.010 x 0.90) + (0.030 x 0.35) + (0.090 x 0.20)] / 0.130



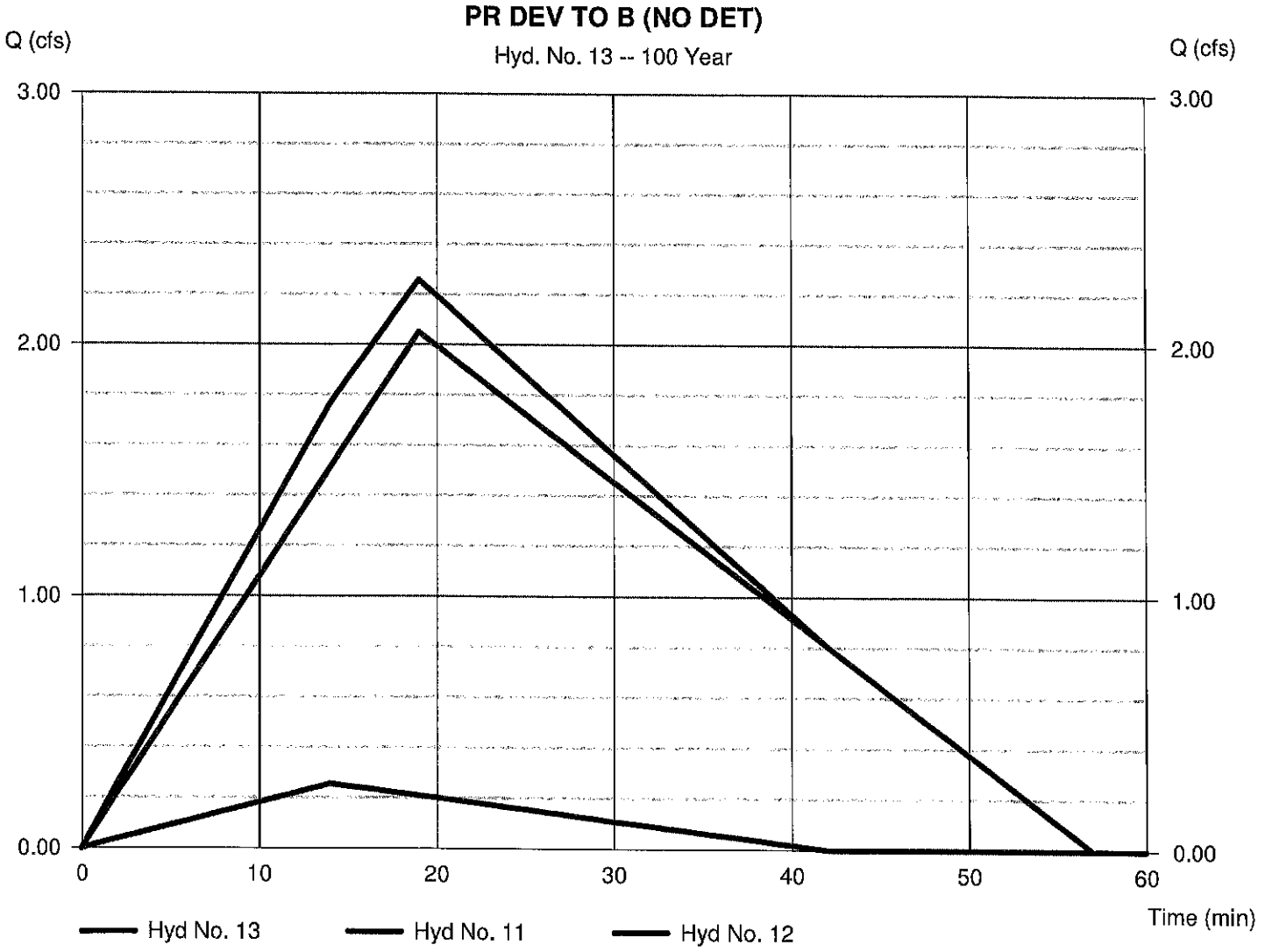
A-17

Hydrograph Report

Hyd. No. 13

PR DEV TO B (NO DET)

Hydrograph type	= Combine	Peak discharge	= 2.258 cfs
Storm frequency	= 100 yrs	Time to peak	= 19 min
Time interval	= 1 min	Hyd. volume	= 3,825 cuft
Inflow hyds.	= 11, 12	Contrib. drain. area	= 1.430 ac



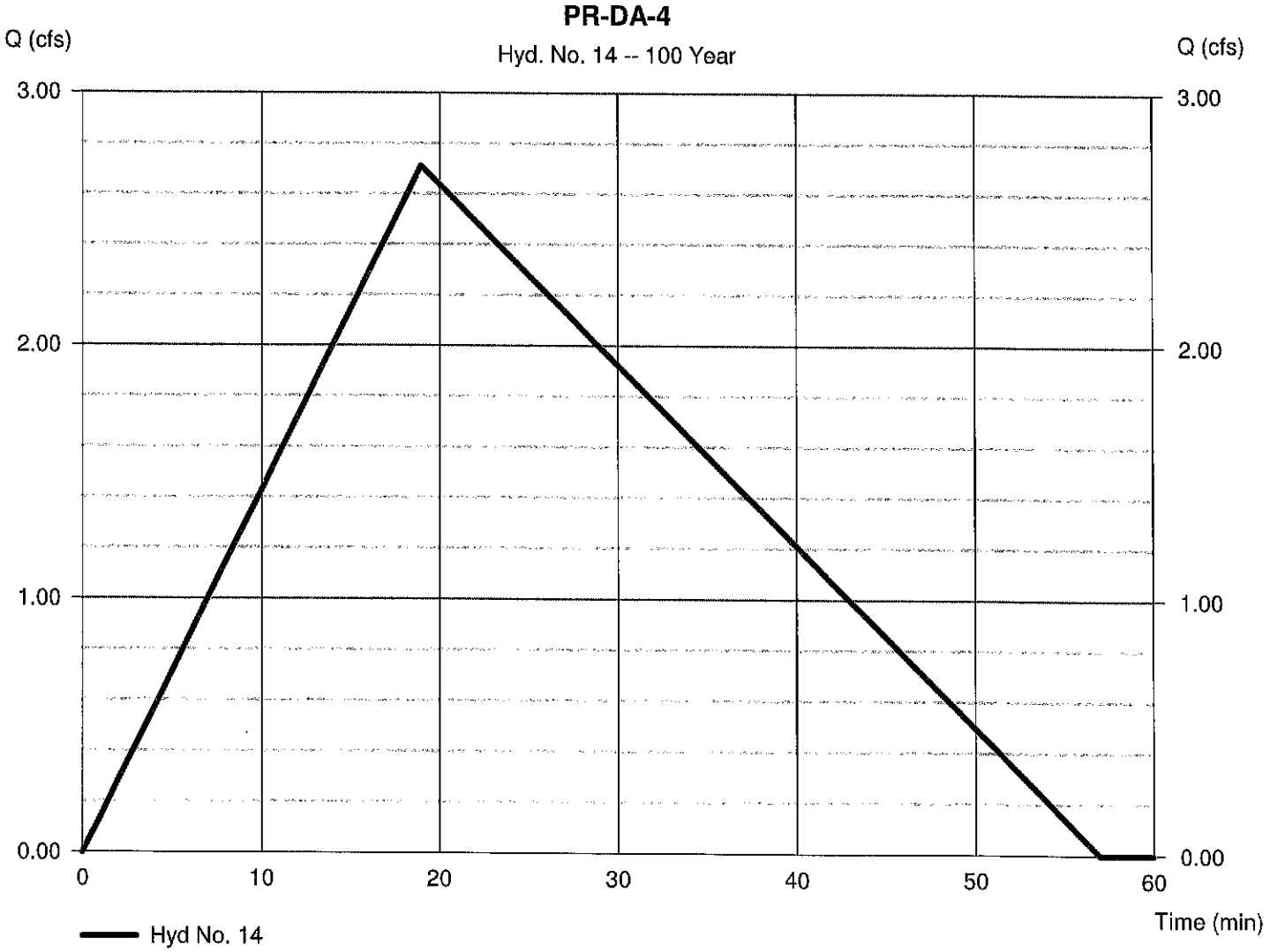
Hydrograph Report

Hyd. No. 14

PR-DA-4

Hydrograph type	= Rational	Peak discharge	= 2.711 cfs
Storm frequency	= 100 yrs	Time to peak	= 19 min
Time interval	= 1 min	Hyd. volume	= 4,636 cuft
Drainage area	= 1.720 ac	Runoff coeff.	= 0.27*
Intensity	= 5.837 in/hr	Tc by FAA	= 19.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.070 x 0.90) + (0.500 x 0.35) + (1.150 x 0.20)] / 1.720

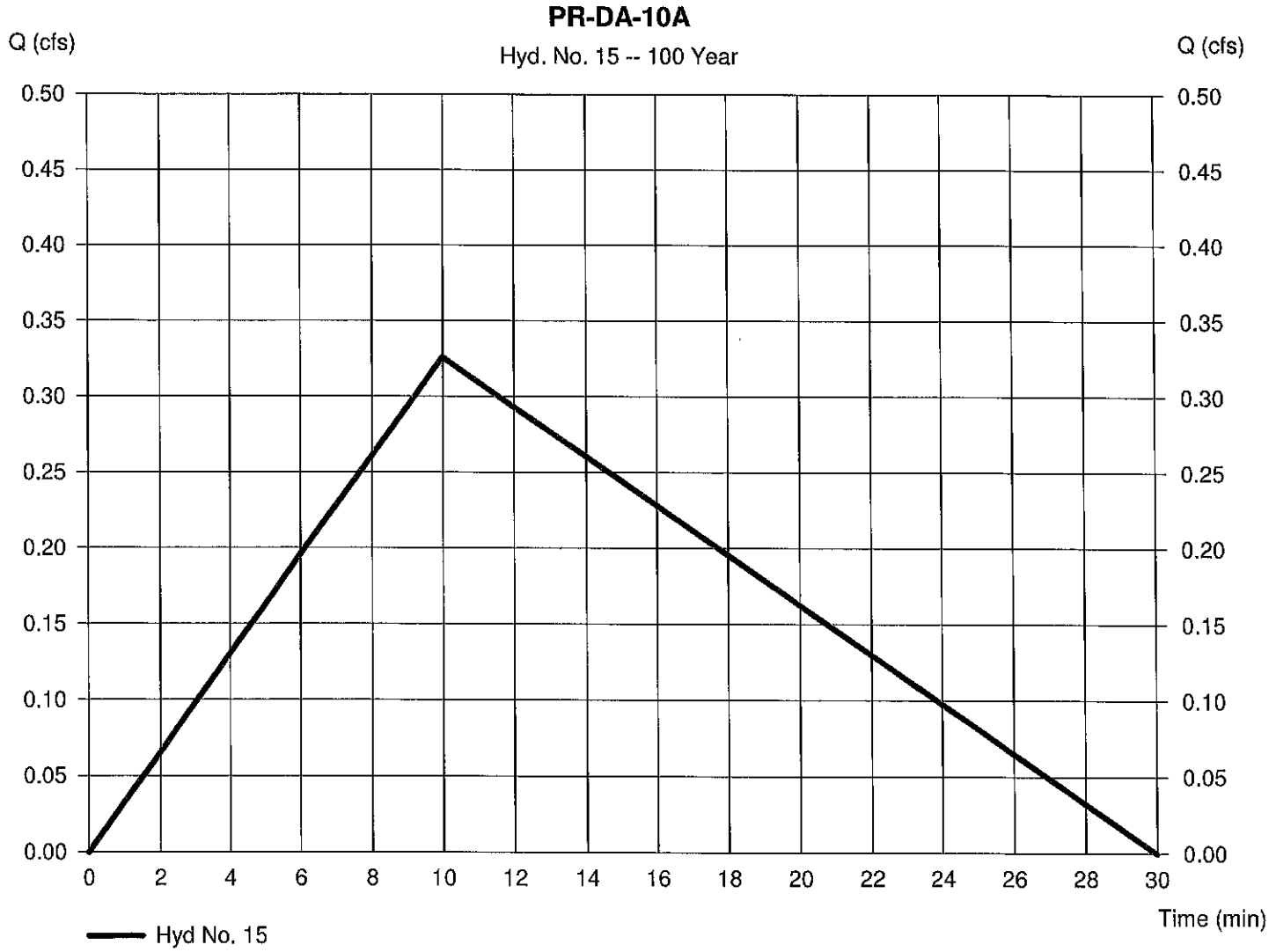


Hydrograph Report

Hyd. No. 15

PR-DA-10A

Hydrograph type	= Rational	Peak discharge	= 0.326 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 293 cuft
Drainage area	= 0.210 ac	Runoff coeff.	= 0.2
Intensity	= 7.763 in/hr	Tc by FAA	= 10.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2



A-20

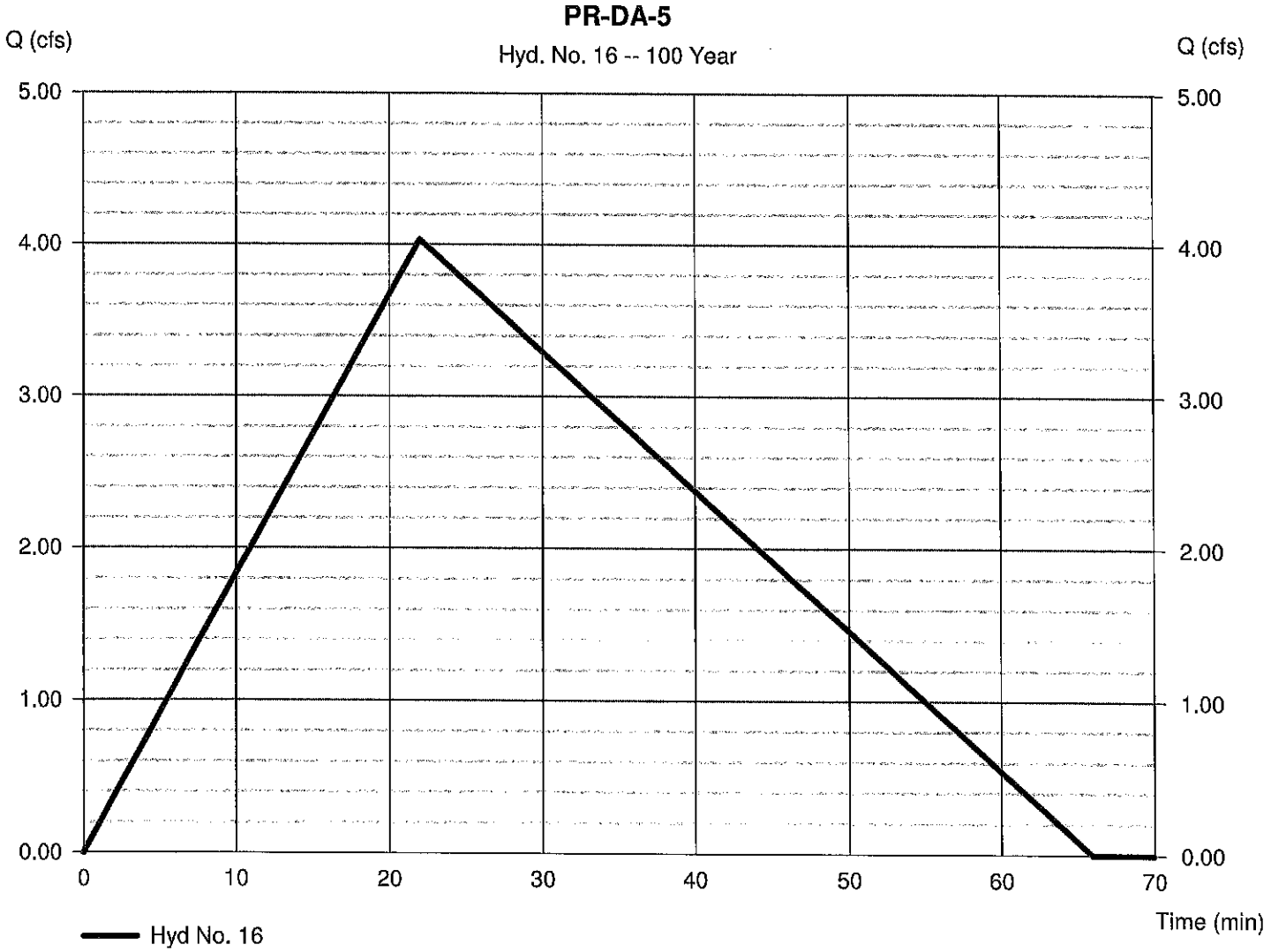
Hydrograph Report

Hyd. No. 16

PR-DA-5

Hydrograph type	= Rational	Peak discharge	= 4.034 cfs
Storm frequency	= 100 yrs	Time to peak	= 22 min
Time interval	= 1 min	Hyd. volume	= 7,988 cuft
Drainage area	= 2.990 ac	Runoff coeff.	= 0.25*
Intensity	= 5.397 in/hr	Tc by FAA	= 22.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.120 x 0.90) + (0.510 x 0.35) + (2.360 x 0.20)] / 2.990



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Hydrograph Report

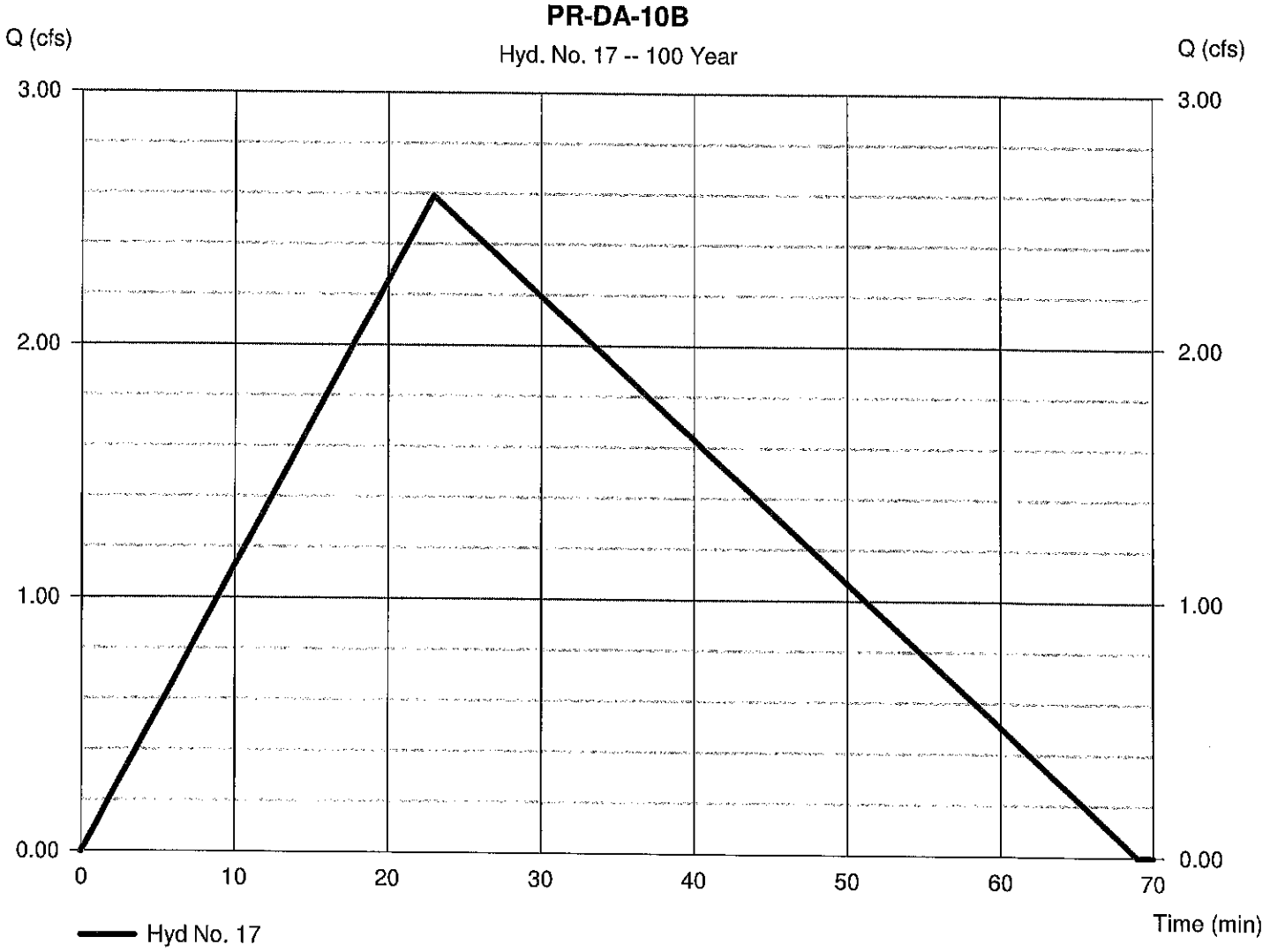
Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, May 11, 2021

Hyd. No. 17

PR-DA-10B

Hydrograph type	= Rational	Peak discharge	= 2.590 cfs
Storm frequency	= 100 yrs	Time to peak	= 23 min
Time interval	= 1 min	Hyd. volume	= 5,362 cuft
Drainage area	= 2.460 ac	Runoff coeff.	= 0.2
Intensity	= 5.265 in/hr	Tc by FAA	= 23.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2



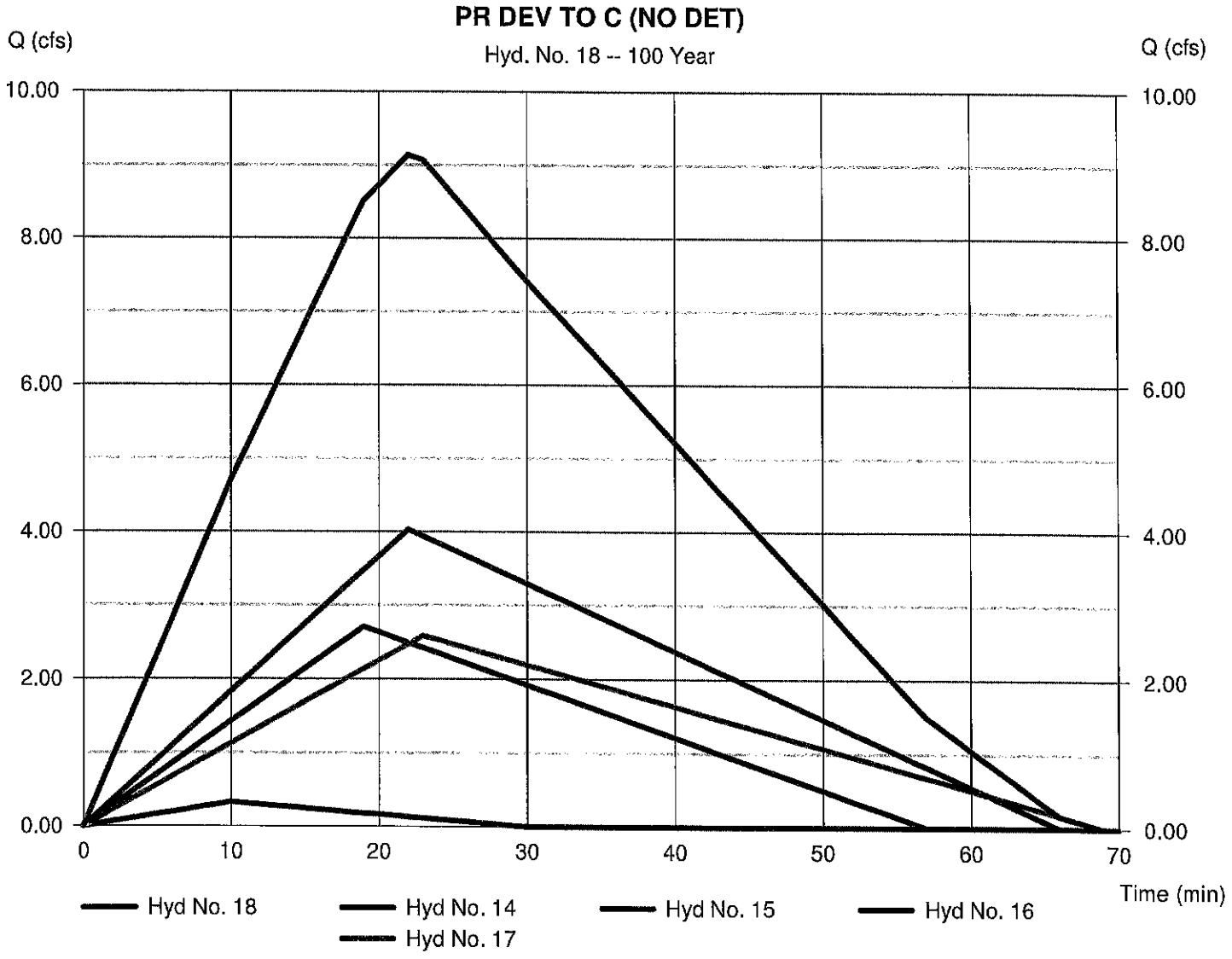
A-22

Hydrograph Report

Hyd. No. 18

PR DEV TO C (NO DET)

Hydrograph type	= Combine	Peak discharge	= 9.139 cfs
Storm frequency	= 100 yrs	Time to peak	= 22 min
Time interval	= 1 min	Hyd. volume	= 18,279 cuft
Inflow hyds.	= 14, 15, 16, 17	Contrib. drain. area	= 7.380 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

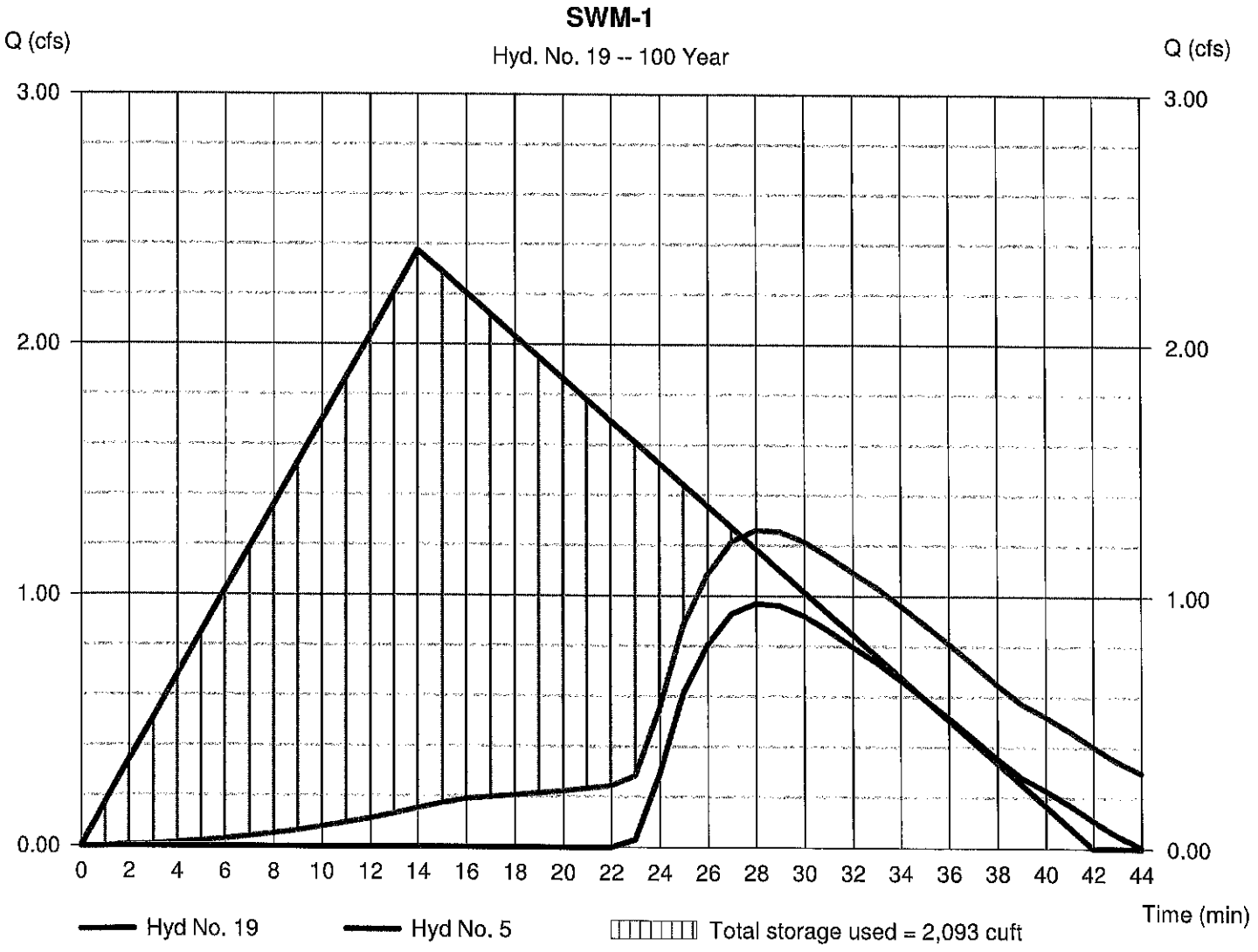
Tuesday, May 11, 2021

Hyd. No. 19

SWM-1

Hydrograph type	= Reservoir	Peak discharge	= 0.971 cfs
Storm frequency	= 100 yrs	Time to peak	= 28 min
Time interval	= 1 min	Hyd. volume	= 682 cuft
Inflow hyd. No.	= 5 - PR-DA-1	Max. Elevation	= 292.86 ft
Reservoir name	= SWM-1	Max. Storage	= 2,093 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



A-24

Pond No. 1 - SWM-1

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 291.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	291.00	435	0	0
0.50	291.50	795	303	303
1.00	292.00	1,257	509	812
1.50	292.50	1,508	690	1,502
1.75	292.75	1,639	393	1,895
2.00	293.00	1,773	426	2,321

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

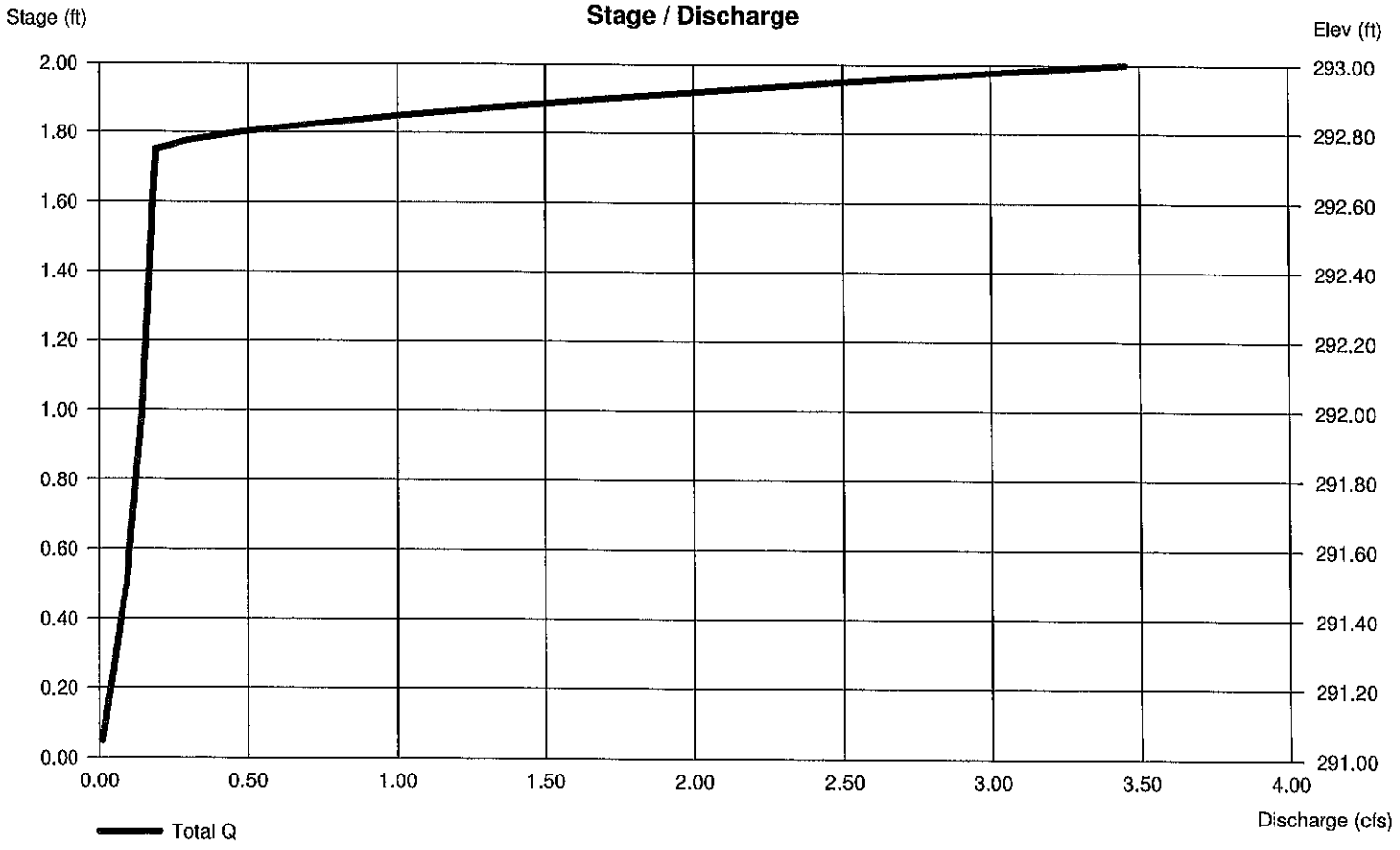
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	40.00	0.00	0.00
Crest El. (ft)	= 292.75	293.00	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 5.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



A-25

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

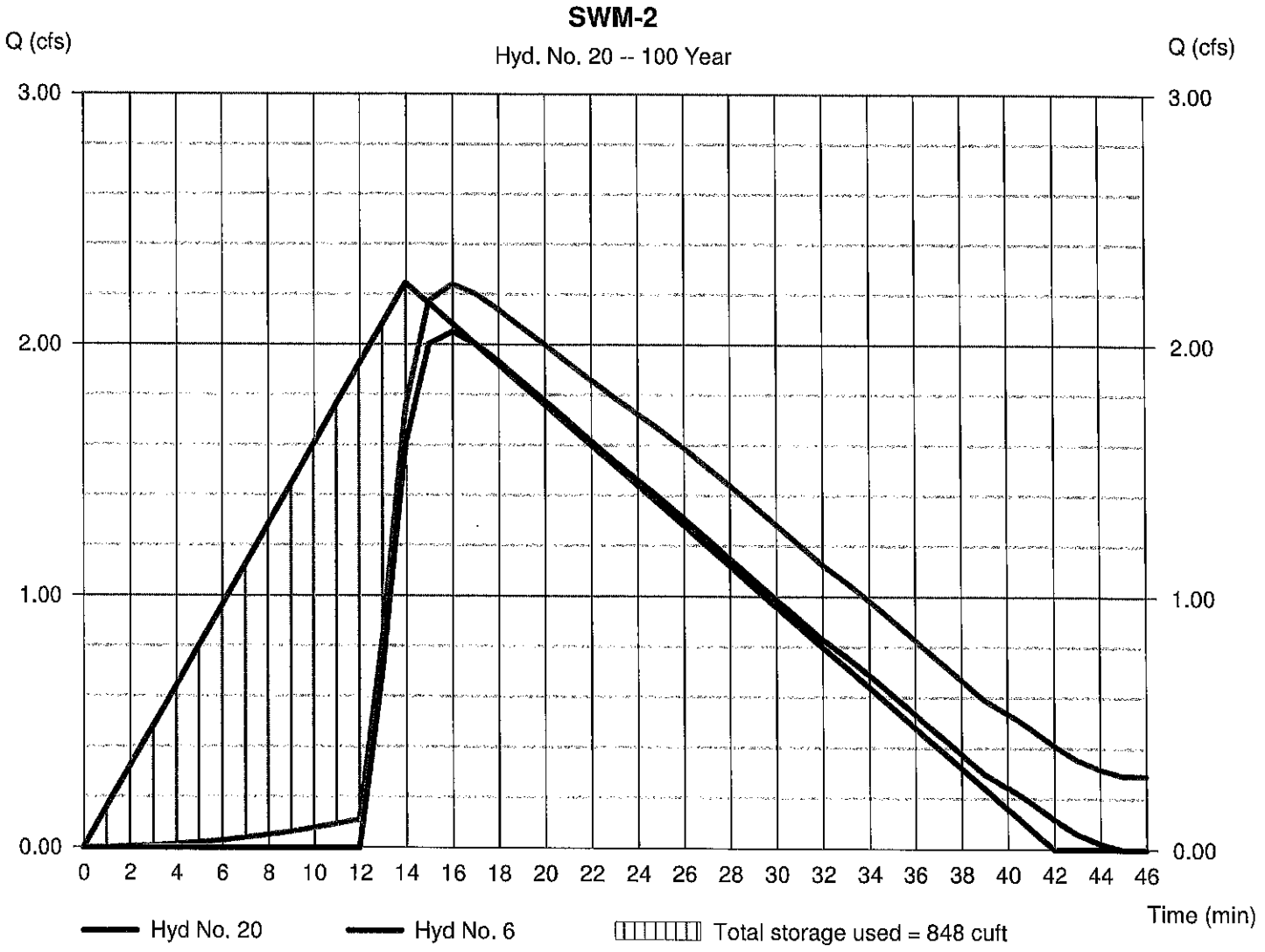
Tuesday, May 11, 2021

Hyd. No. 20

SWM-2

Hydrograph type	= Reservoir	Peak discharge	= 2.050 cfs
Storm frequency	= 100 yrs	Time to peak	= 16 min
Time interval	= 1 min	Hyd. volume	= 2,010 cuft
Inflow hyd. No.	= 6 - PR-DA-2	Max. Elevation	= 297.93 ft
Reservoir name	= SWM-2	Max. Storage	= 848 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



A-26

Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Wednesday, May 12, 2021

Pond No. 2 - SWM-2

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 294.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	294.00	375	0	0
0.50	294.50	475	212	212
1.00	295.00	550	256	468
2.00	296.00	850	695	1,162
3.00	297.00	1,200	1,020	2,182

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

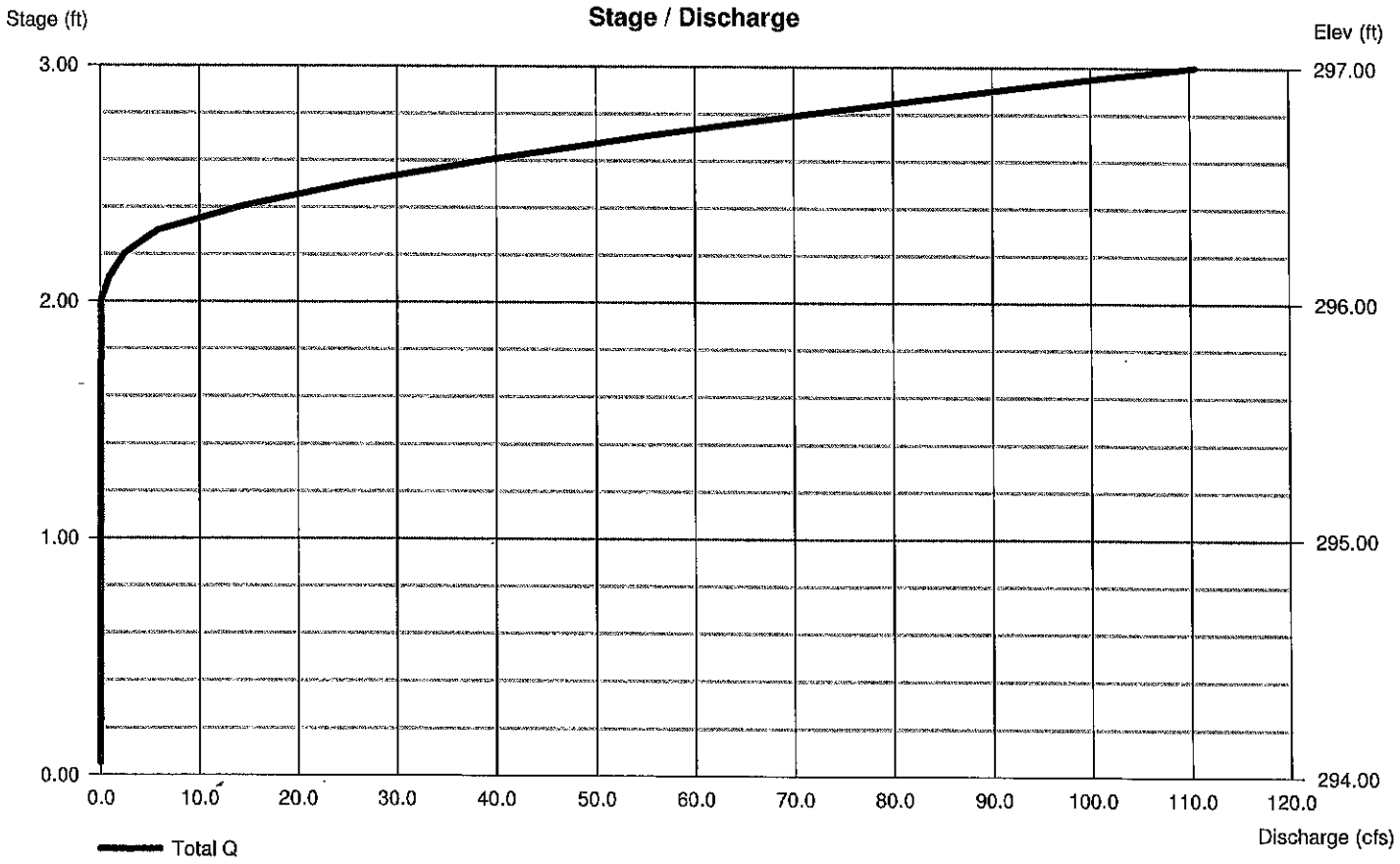
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	50.00	0.00	0.00
Crest El. (ft)	= 296.00	296.25	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(In/hr) = 5.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

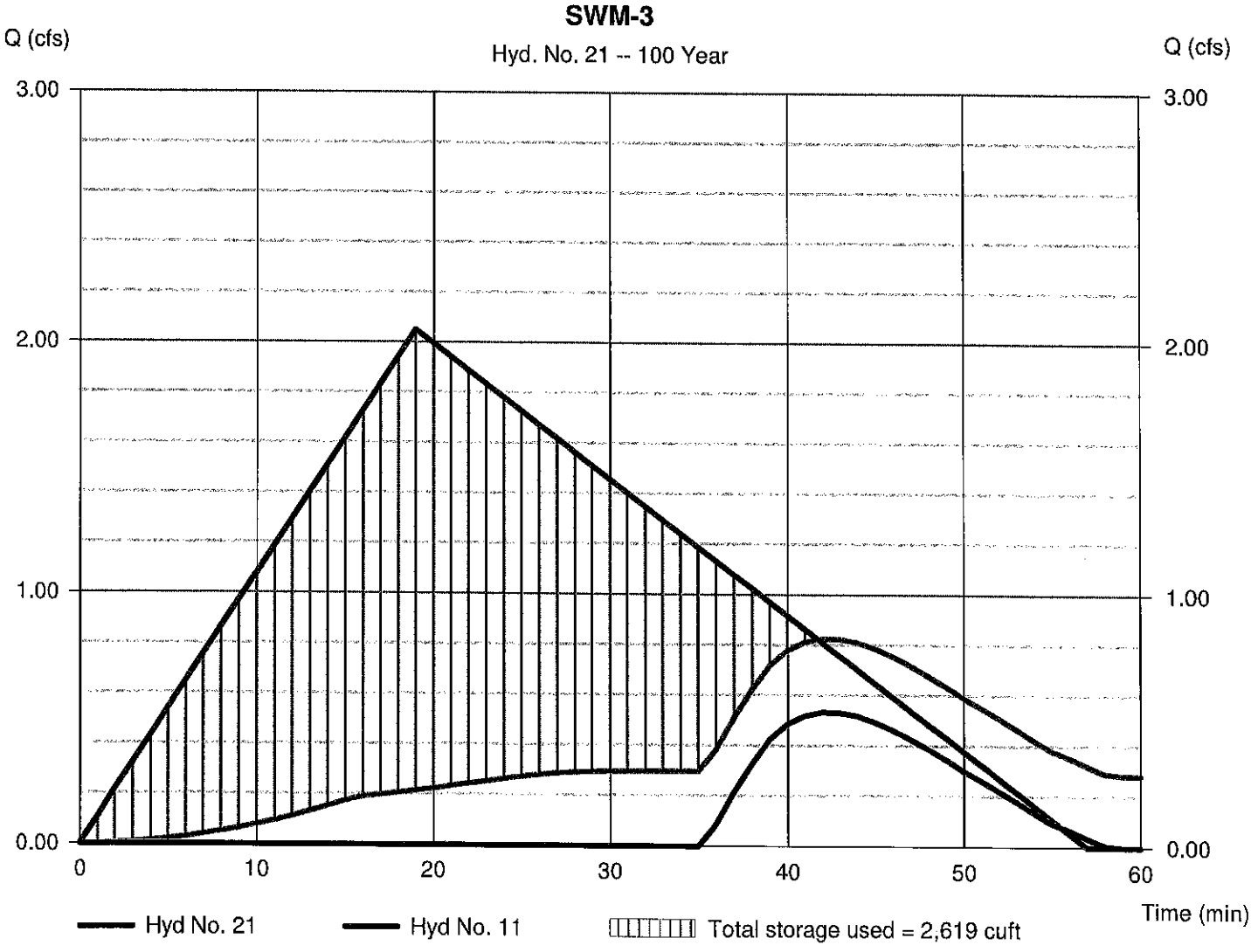
Tuesday, May 11, 2021

Hyd. No. 21

SWM-3

Hydrograph type	= Reservoir	Peak discharge	= 0.533 cfs
Storm frequency	= 100 yrs	Time to peak	= 42 min
Time interval	= 1 min	Hyd. volume	= 425 cuft
Inflow hyd. No.	= 11 - PR-DA-3	Max. Elevation	= 293.58 ft
Reservoir name	= SWM-3	Max. Storage	= 2,619 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



A-28

Pond No. 3 - SWM-3

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 292.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	291.00 292.00	1,139	0	0
1.00	292.00 293.00	1,807	1,460	1,460
1.50	292.50 293.50	2,161	991	2,451
1.75	292.75 293.75	2,343	563	3,013
2.00	293.00 294.00	2,733	634	3,647

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

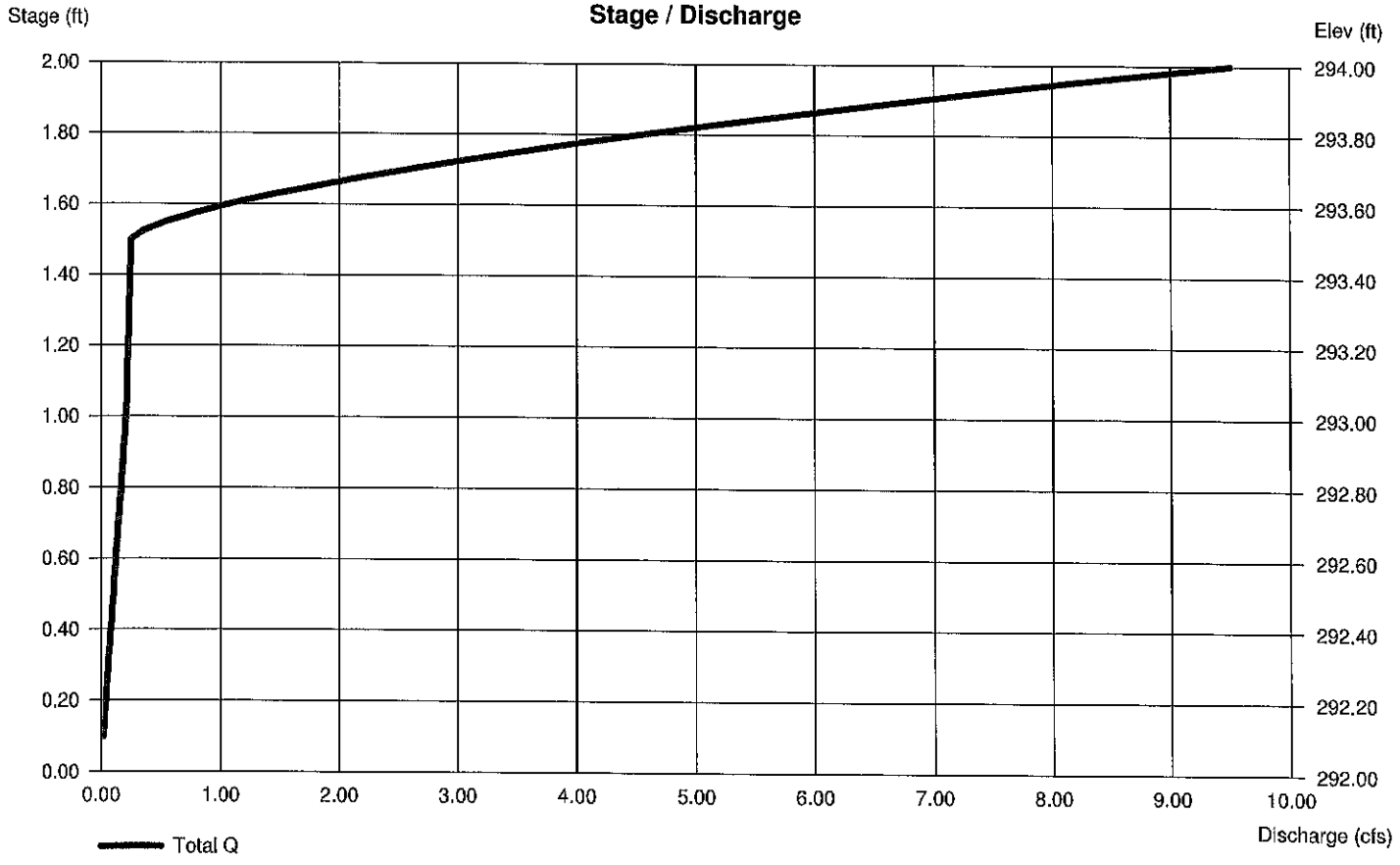
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 293.50	294.00	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 5.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

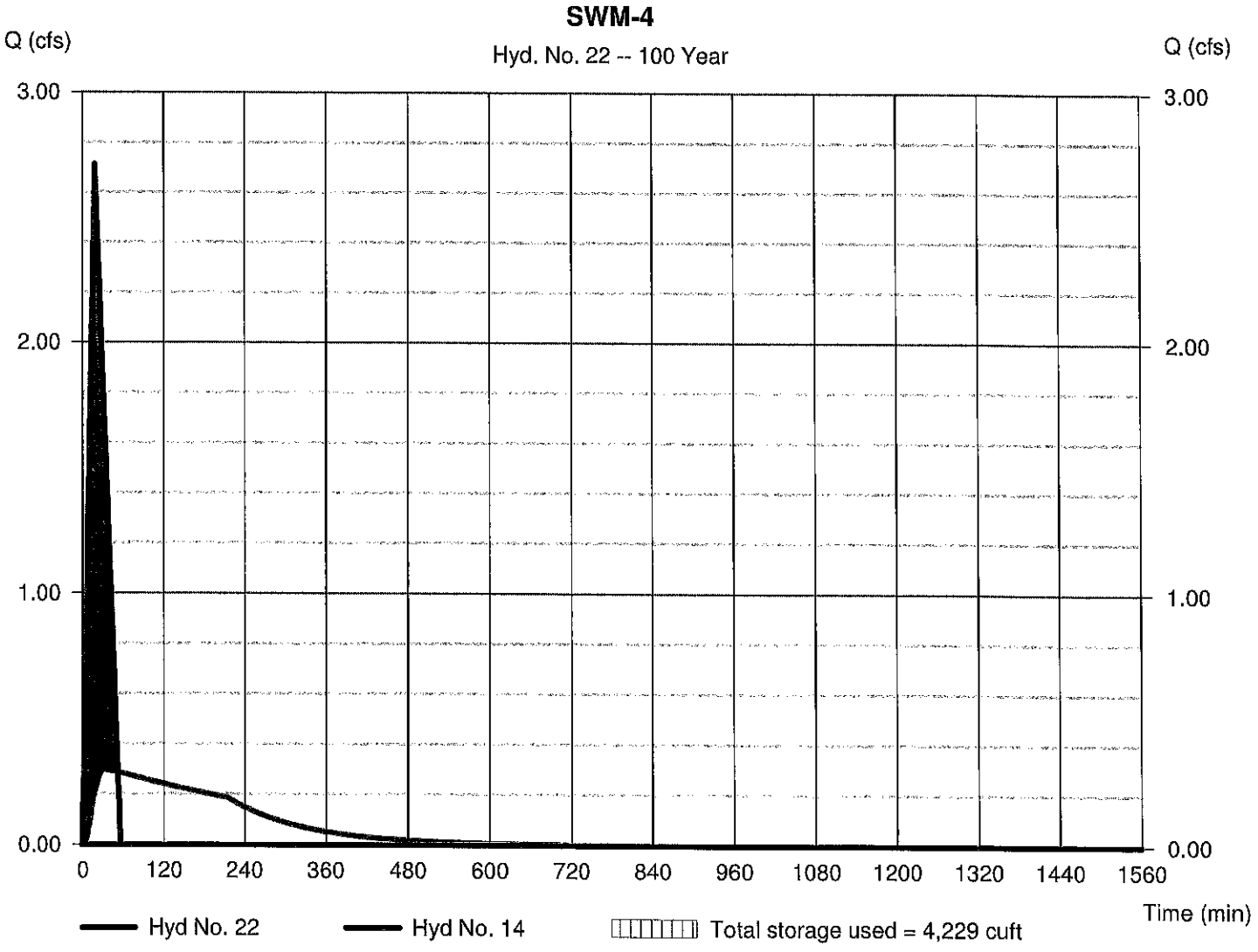
Tuesday, May 11, 2021

Hyd. No. 22

SWM-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 305 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 14 - PR-DA-4	Max. Elevation	= 282.63 ft
Reservoir name	= SWM-4	Max. Storage	= 4,229 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 4 - SWM-4

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 281.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	281.00	1,970	0	0
1.00	282.00	2,668	2,310	2,310
2.00	283.00	3,443	3,047	5,357
2.25	283.5025	3,642	885	6,242
2.50	283.50	3,845	936	7,178

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

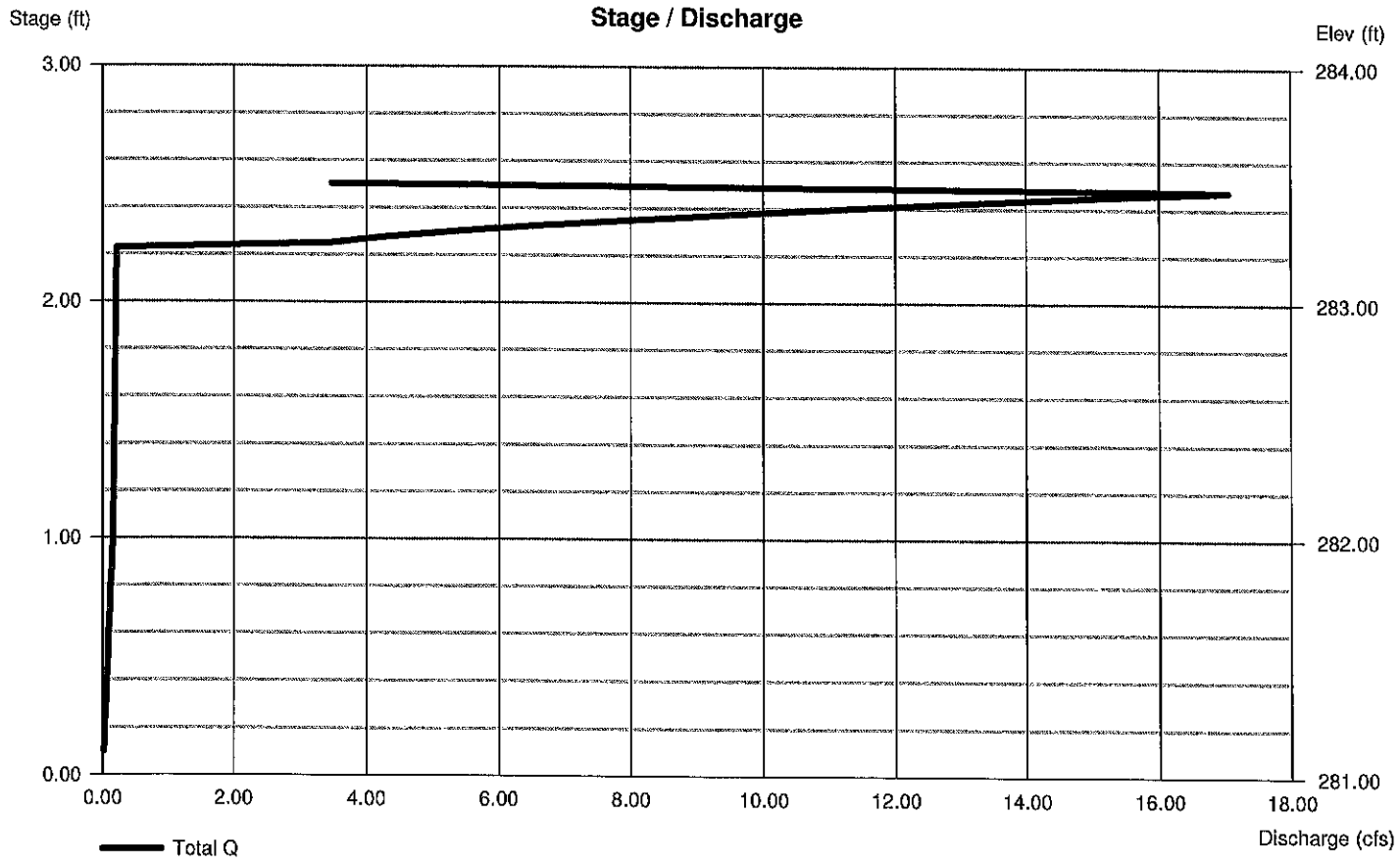
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 283.25	283.50	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 2.500 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

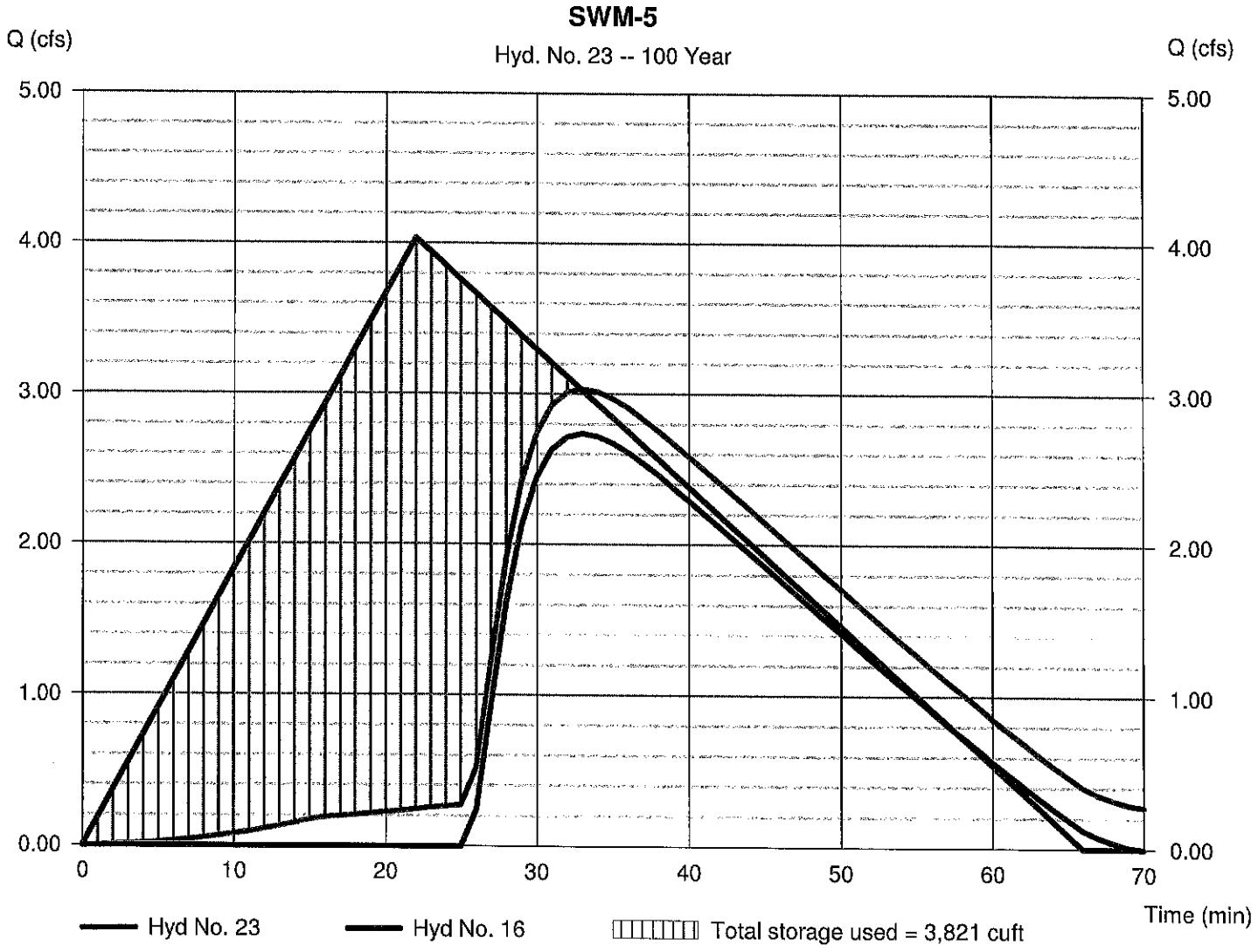
Tuesday, May 11, 2021

Hyd. No. 23

SWM-5

Hydrograph type	= Reservoir	Peak discharge	= 2.737 cfs
Storm frequency	= 100 yrs	Time to peak	= 33 min
Time interval	= 1 min	Hyd. volume	= 3,766 cuft
Inflow hyd. No.	= 16 - PR-DA-5	Max. Elevation	= 316.22 ft
Reservoir name	= SWM-5	Max. Storage	= 3,821 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 5 - SWM-5

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 314.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	314.00	984	0	0
1.00	315.00	1,612	1,285	1,285
2.00	316.00	2,381	1,984	3,269
2.25	316.25	2,572	619	3,888

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

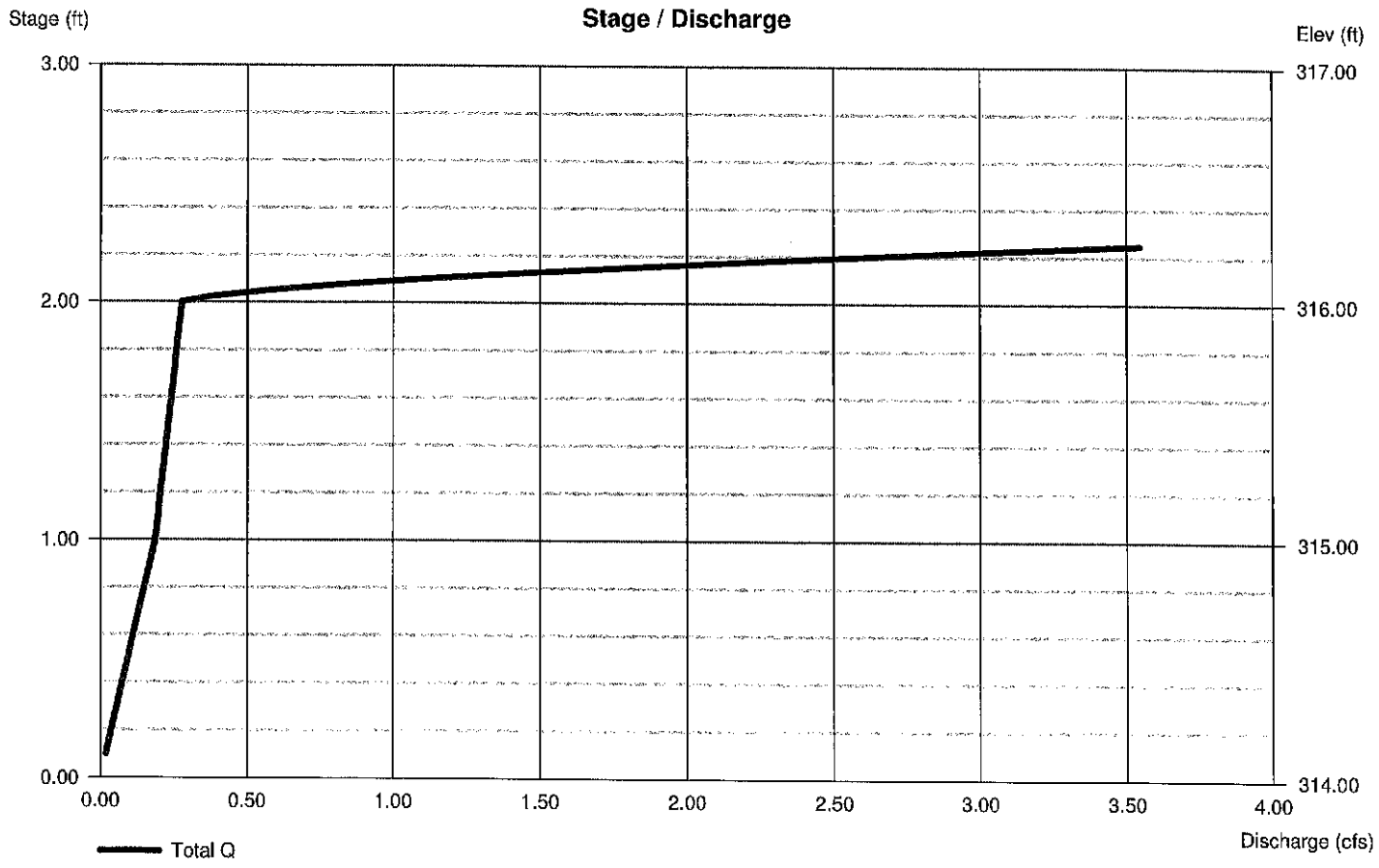
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 316.00	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) = 5.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



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Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

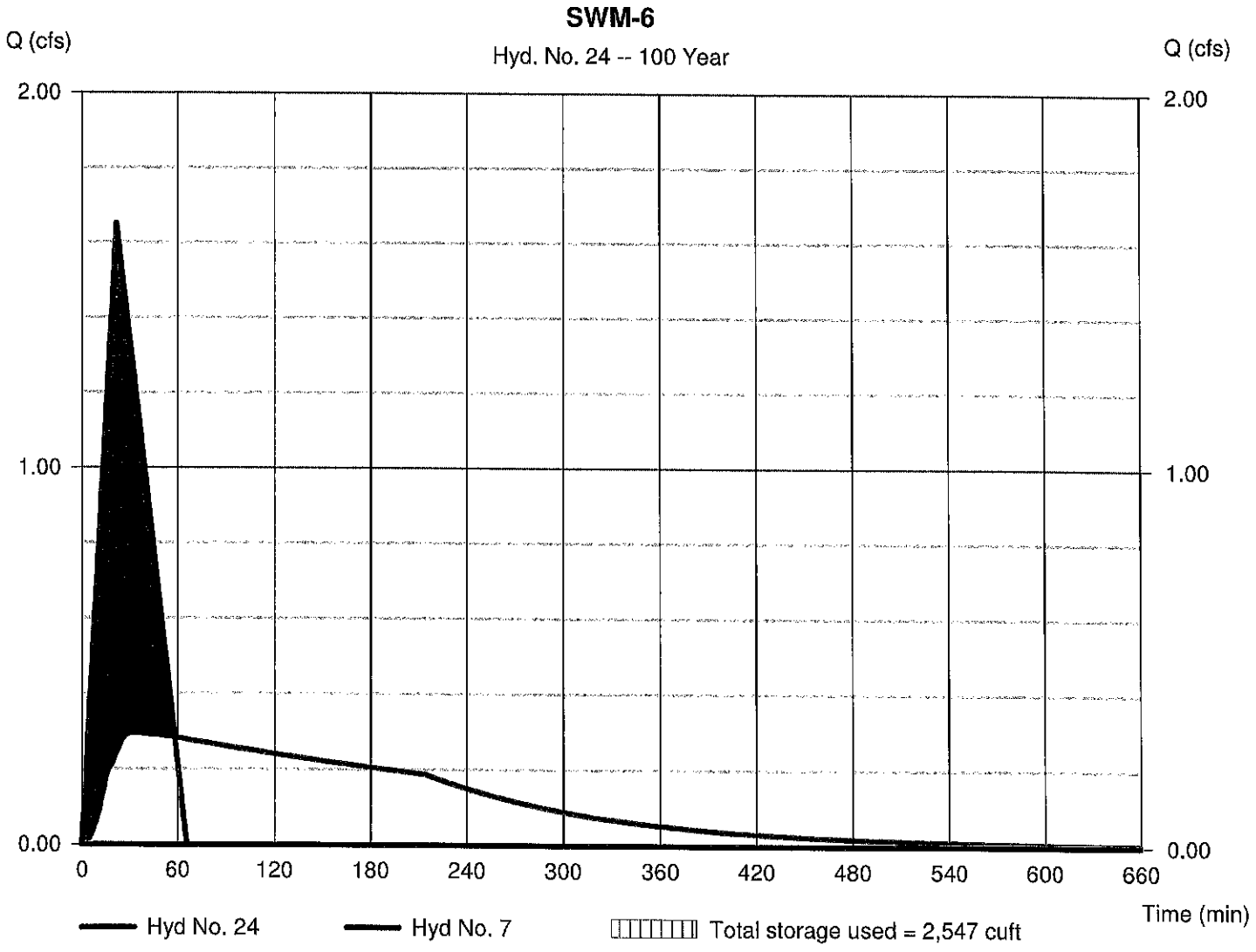
Tuesday, May 11, 2021

Hyd. No. 24

SWM-6

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 29 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 7 - PR-DA-6	Max. Elevation	= 344.83 ft
Reservoir name	= SWM-6	Max. Storage	= 2,547 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



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Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, May 11, 2021

Pond No. 6 - SWM-6

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 344.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	344.00	2,650	0	0
1.00	345.00	3,510	3,070	3,070
2.00	346.00	4,427	3,959	7,029
2.50	346.50	4,910	2,333	9,362
3.00	347.00	5,402	2,577	11,939

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

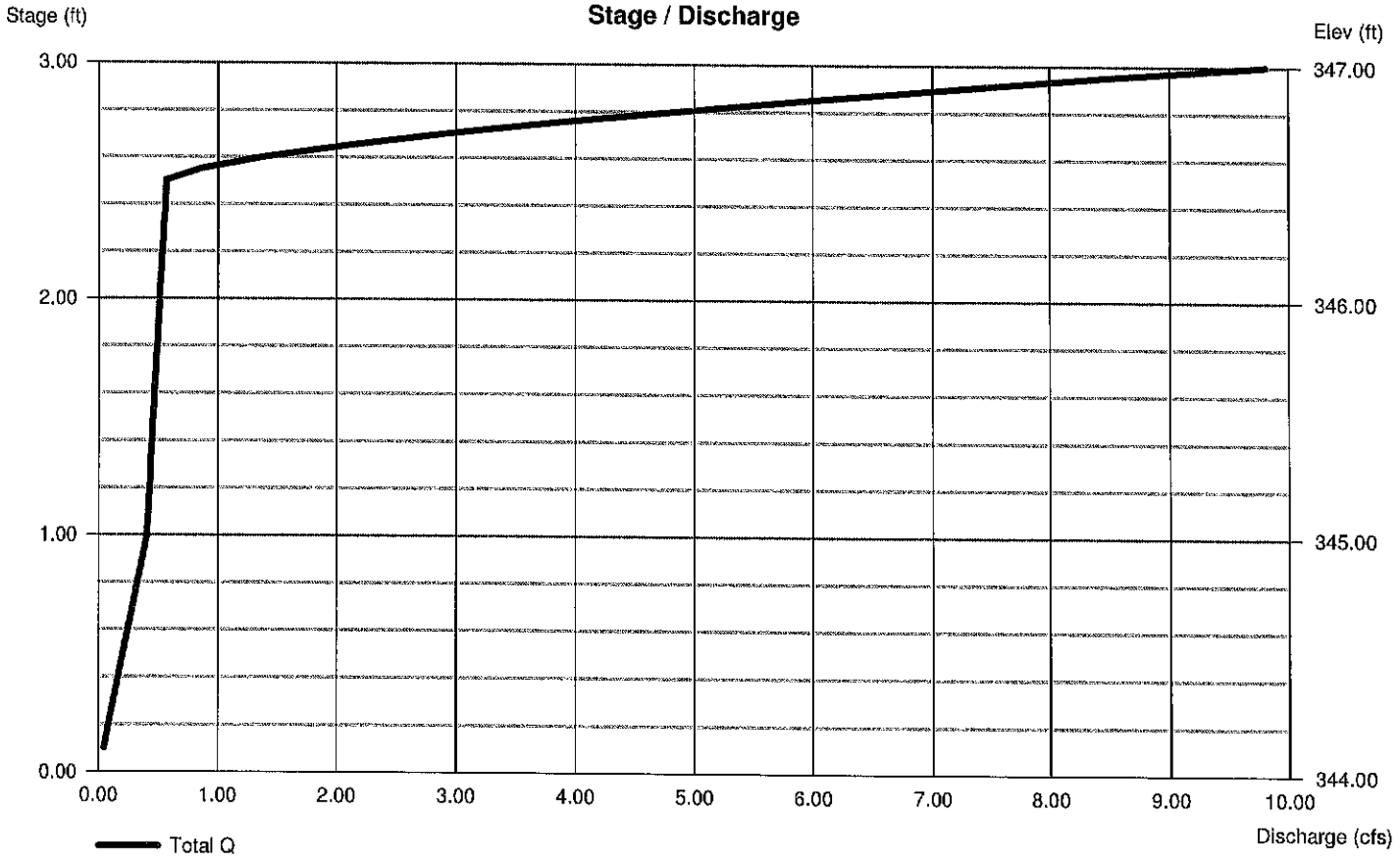
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 346.50	347.00	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 5.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



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Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

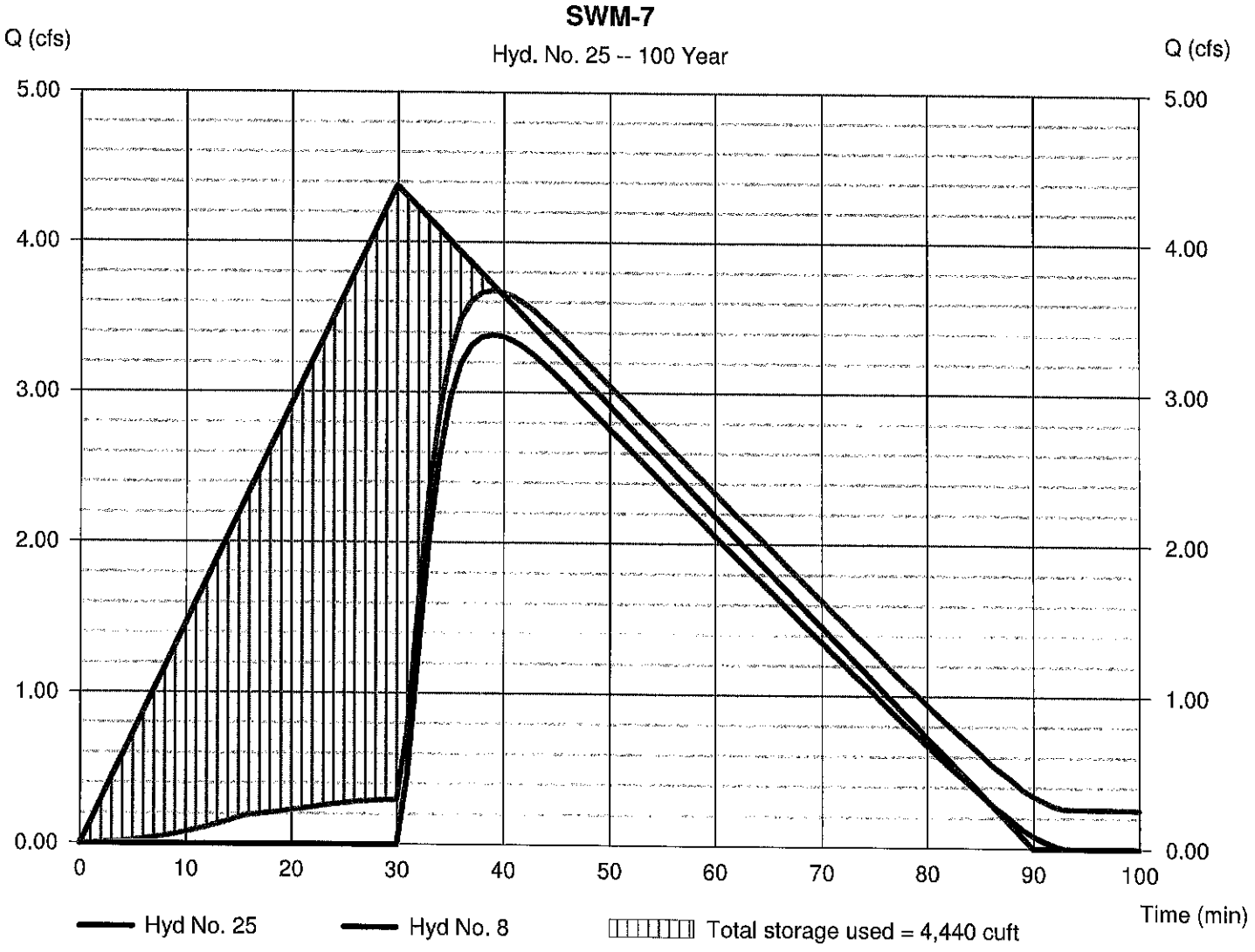
Tuesday, May 11, 2021

Hyd. No. 25

SWM-7

Hydrograph type	= Reservoir	Peak discharge	= 3.385 cfs
Storm frequency	= 100 yrs	Time to peak	= 39 min
Time interval	= 1 min	Hyd. volume	= 6,616 cuft
Inflow hyd. No.	= 8 - PR-DA-7	Max. Elevation	= 342.26 ft
Reservoir name	= SWM-7	Max. Storage	= 4,440 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



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Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, May 11, 2021

Pond No. 7 - SWM-7

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 340.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	340.00	1,108	0	0
1.00	341.00	1,860	1,468	1,468
2.00	342.00	2,675	2,255	3,723
2.25	342.25	2,890	695	4,418
3.00	343.00	4,000	2,572	6,990

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

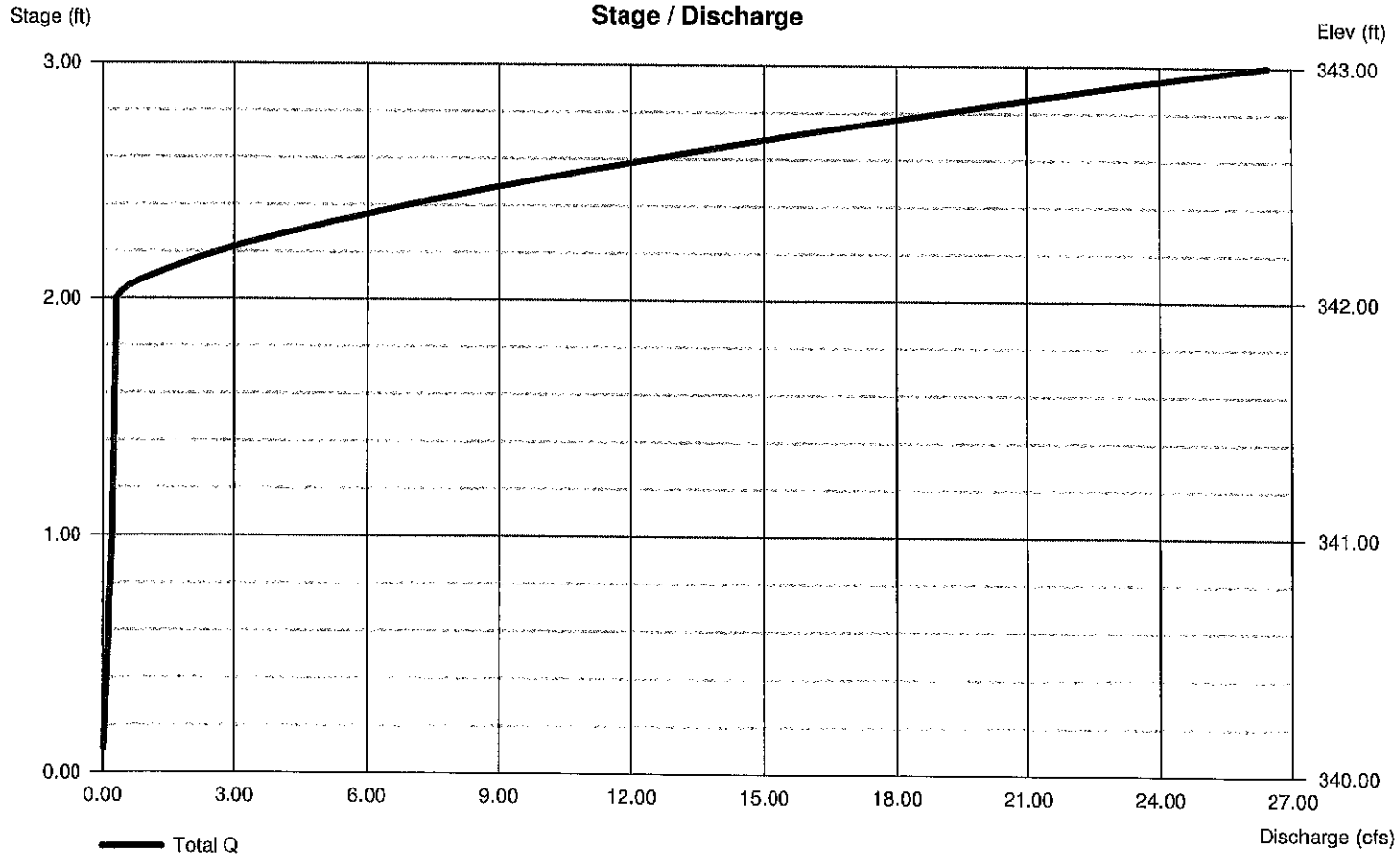
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 342.00	342.50	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) = 5.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

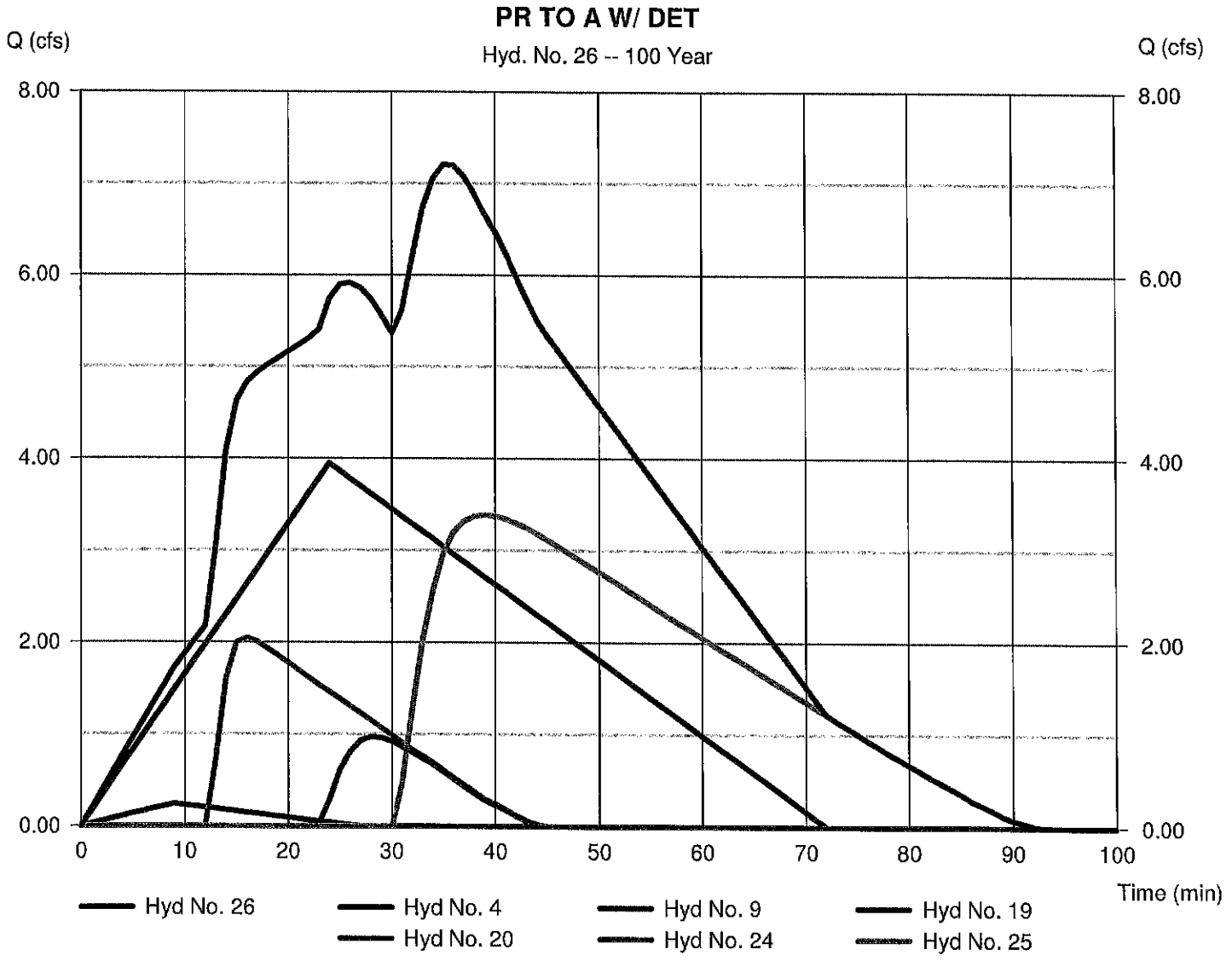


Hydrograph Report

Hyd. No. 26

PR TO A W/ DET

Hydrograph type	= Combine	Peak discharge	= 7.207 cfs
Storm frequency	= 100 yrs	Time to peak	= 35 min
Time interval	= 1 min	Hyd. volume	= 18,028 cuft
Inflow hyds.	= 4, 9, 19, 20, 24, 25	Contrib. drain. area	= 3.590 ac

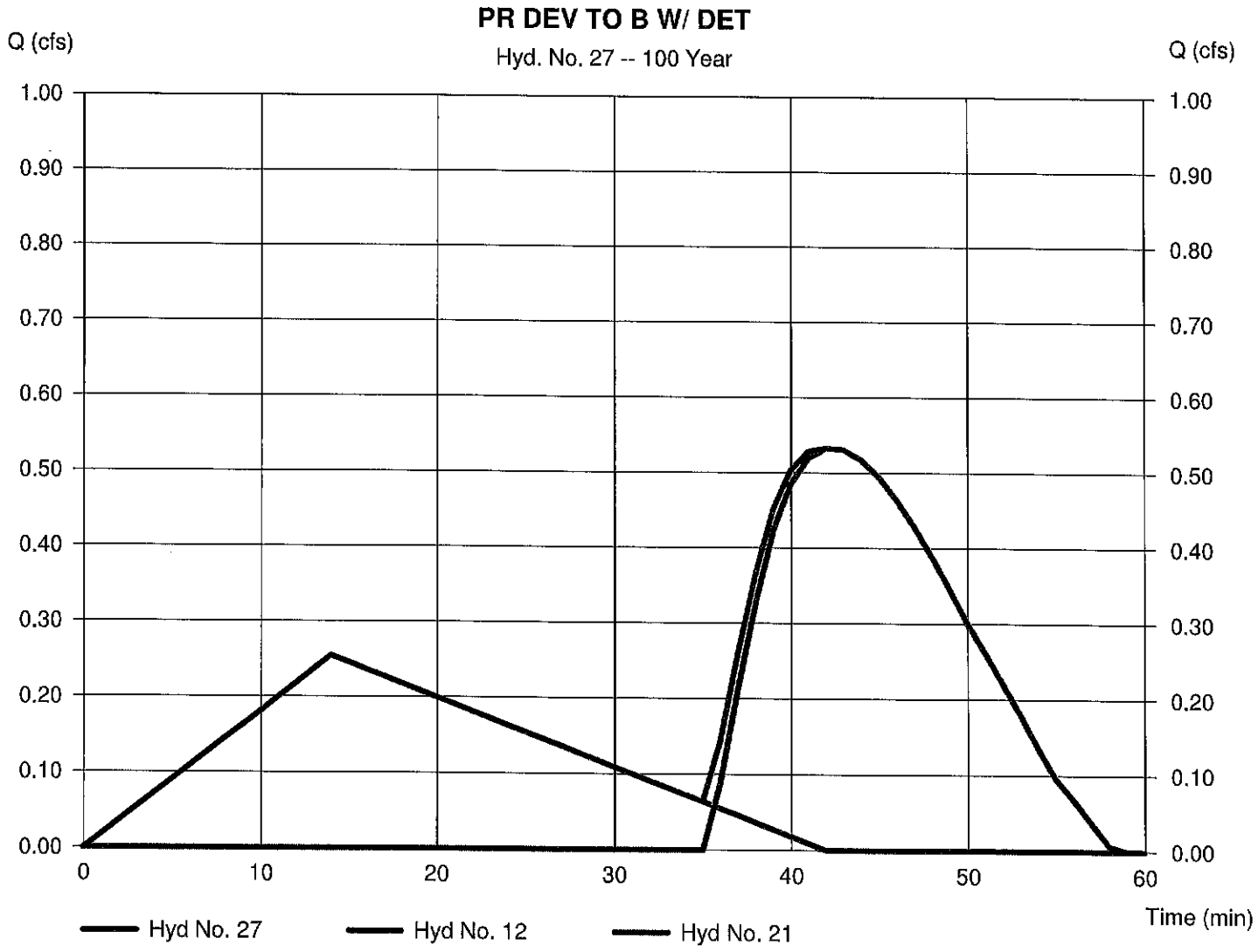


Hydrograph Report

Hyd. No. 27

PR DEV TO B W/ DET

Hydrograph type	= Combine	Peak discharge	= 0.533 cfs
Storm frequency	= 100 yrs	Time to peak	= 42 min
Time interval	= 1 min	Hyd. volume	= 746 cuft
Inflow hyds.	= 12, 21	Contrib. drain. area	= 0.130 ac

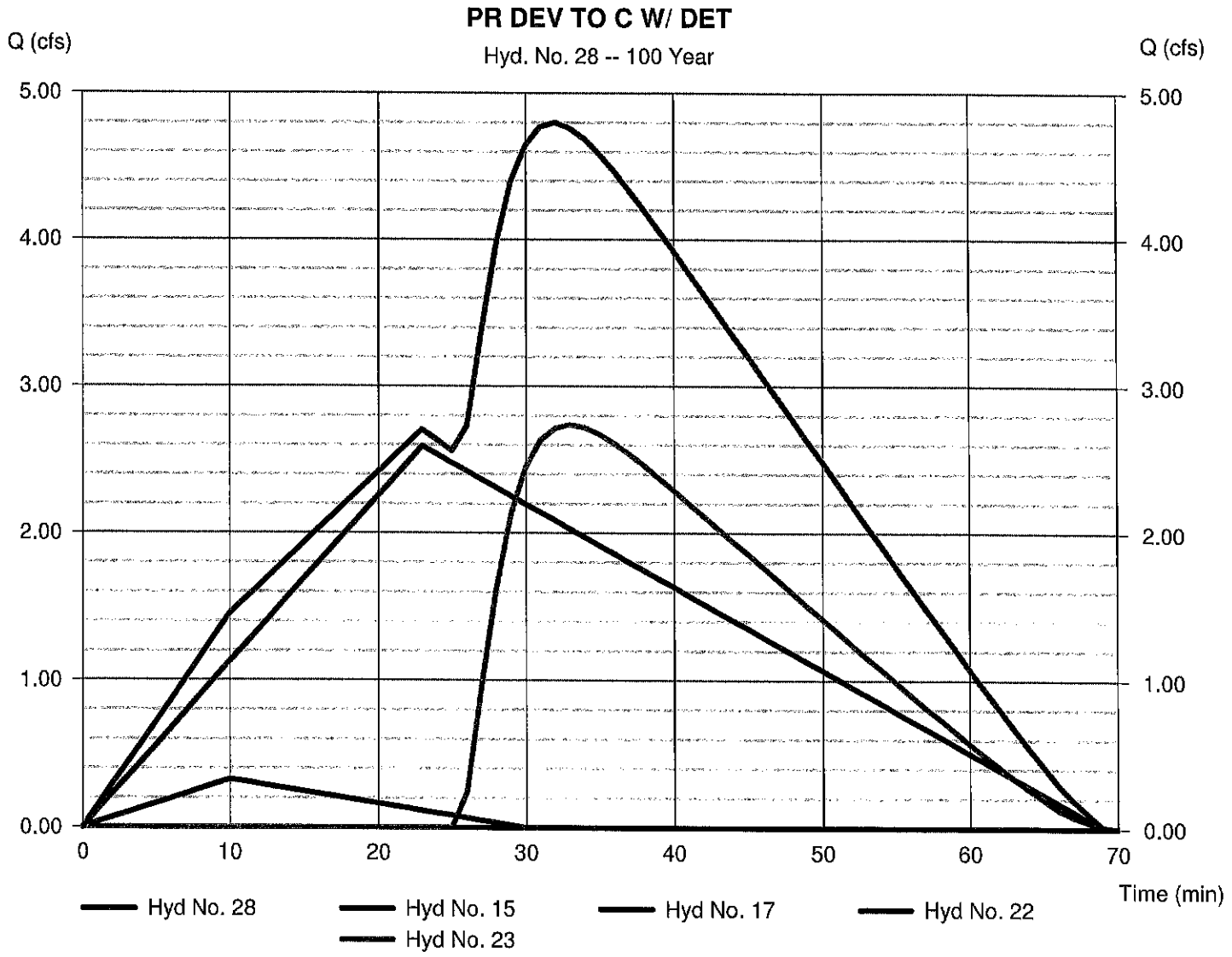


Hydrograph Report

Hyd. No. 28

PR DEV TO C W/ DET

Hydrograph type	= Combine	Peak discharge	= 4.799 cfs
Storm frequency	= 100 yrs	Time to peak	= 32 min
Time interval	= 1 min	Hyd. volume	= 9,422 cuft
Inflow hyds.	= 15, 17, 22, 23	Contrib. drain. area	= 2.670 ac

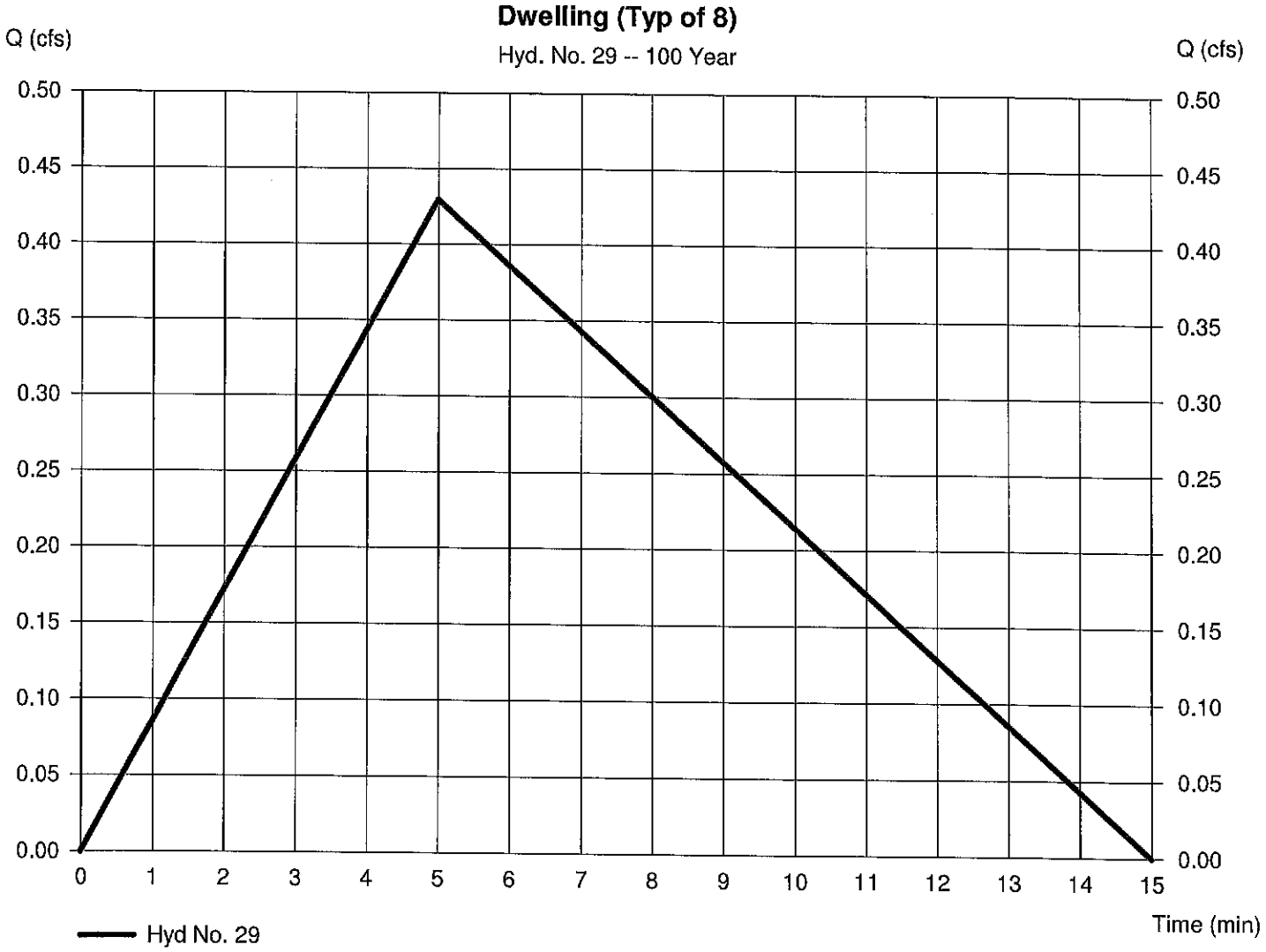


Hydrograph Report

Hyd. No. 29

Dwelling (Typ of 8)

Hydrograph type	= Rational	Peak discharge	= 0.430 cfs
Storm frequency	= 100 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 193 cuft
Drainage area	= 0.050 ac	Runoff coeff.	= 0.9
Intensity	= 9.546 in/hr	Tc by User	= 5.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

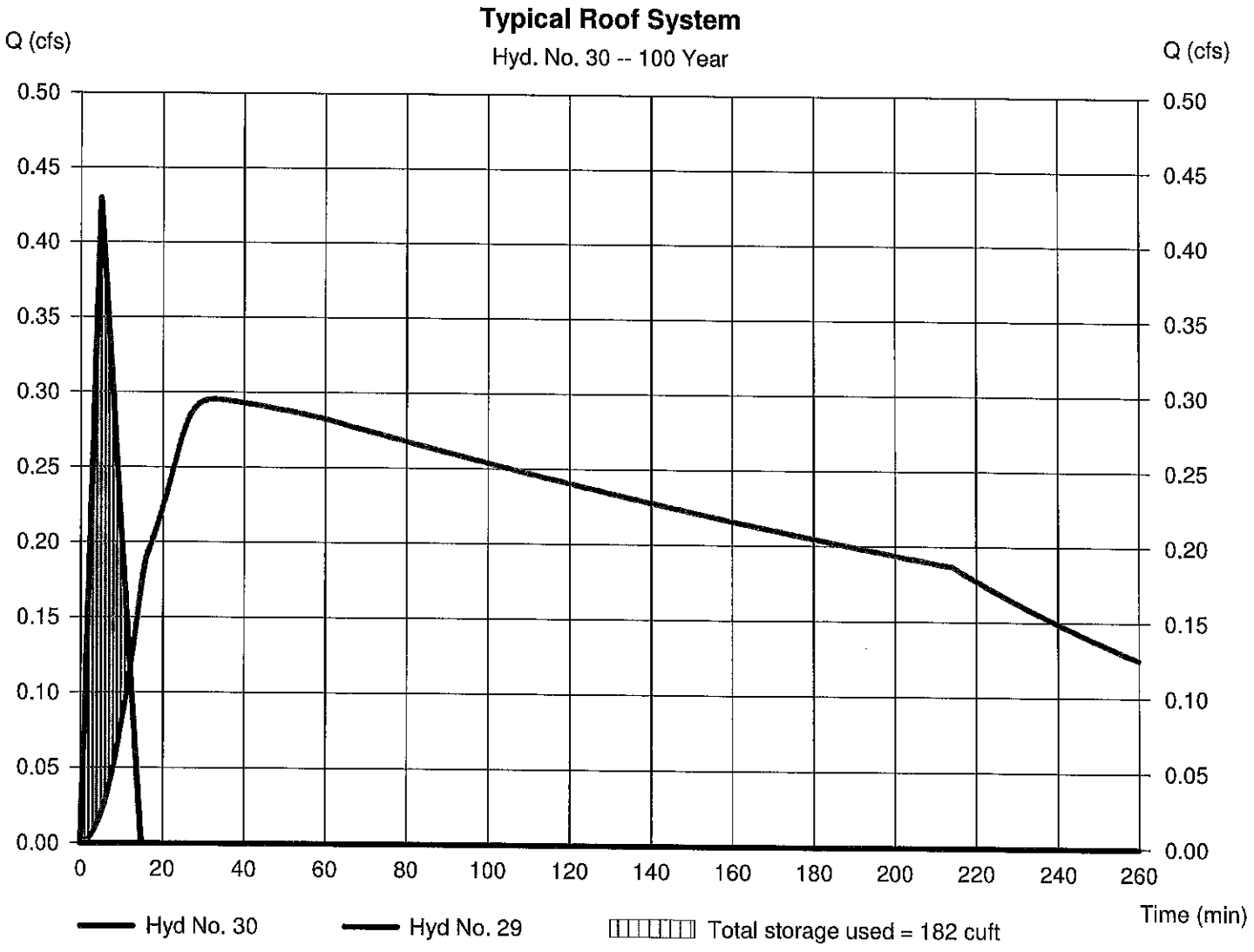
Tuesday, May 11, 2021

Hyd. No. 30

Typical Roof System

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 244 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 29 - Dwelling (Typ of 8)	Max. Elevation	= 100.87 ft
Reservoir name	= Rooftop System	Max. Storage	= 182 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



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Pond No. 8 - Rooftop System

Pond Data

UG Chambers - Invert elev. = 100.00 ft, Rise x Span = 1.00 x 2.83 ft, Barrel Len = 60.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 99.50 ft, Width = 3.83 ft, Height = 1.50 ft, Voids = 30.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	99.50	n/a	0	0
0.15	99.65	n/a	10	10
0.30	99.80	n/a	10	21
0.45	99.95	n/a	10	31
0.60	100.10	n/a	22	53
0.75	100.25	n/a	28	81
0.90	100.40	n/a	27	108
1.05	100.55	n/a	26	134
1.20	100.70	n/a	24	159
1.35	100.85	n/a	22	180
1.50	101.00	n/a	17	197

Culvert / Orifice Structures

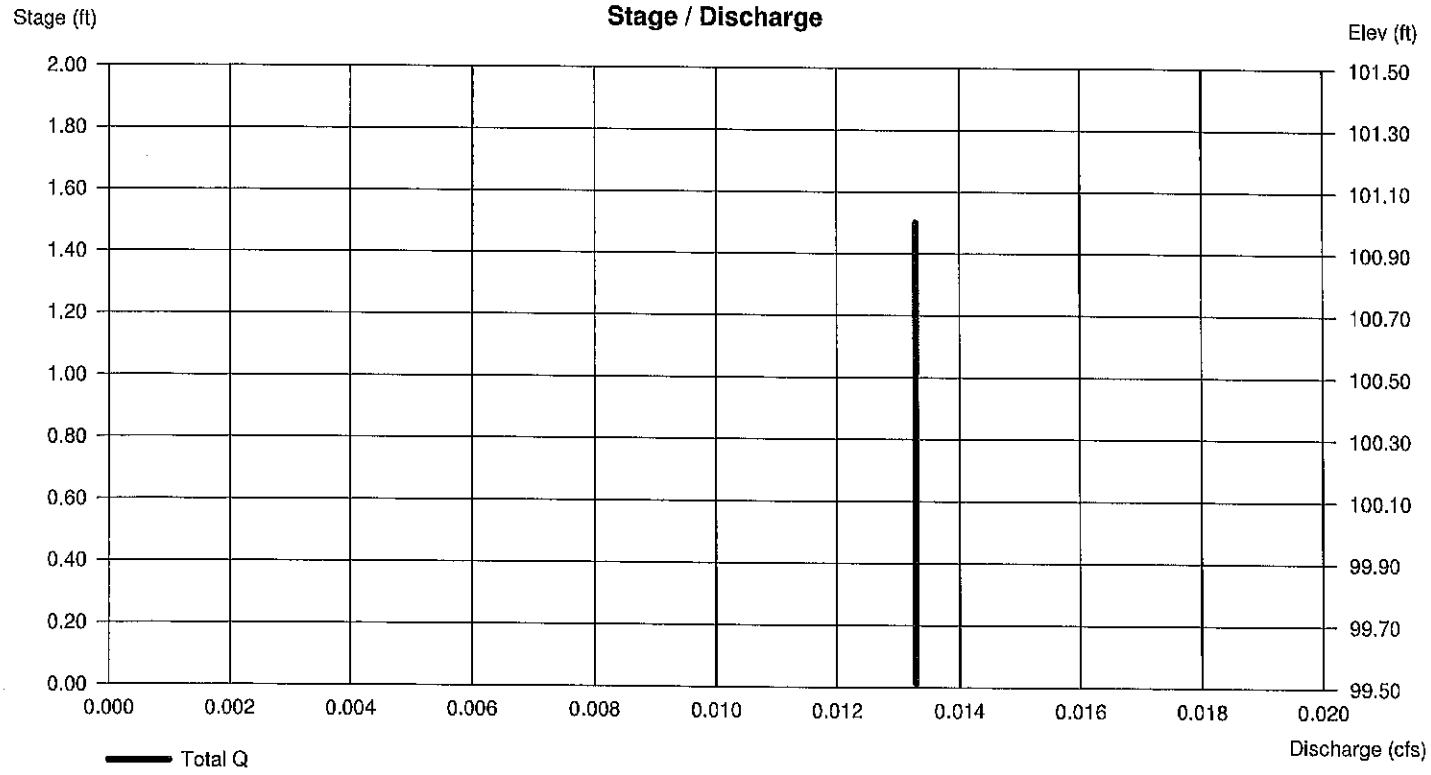
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

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

Exfil.(in/hr) = 2.500 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

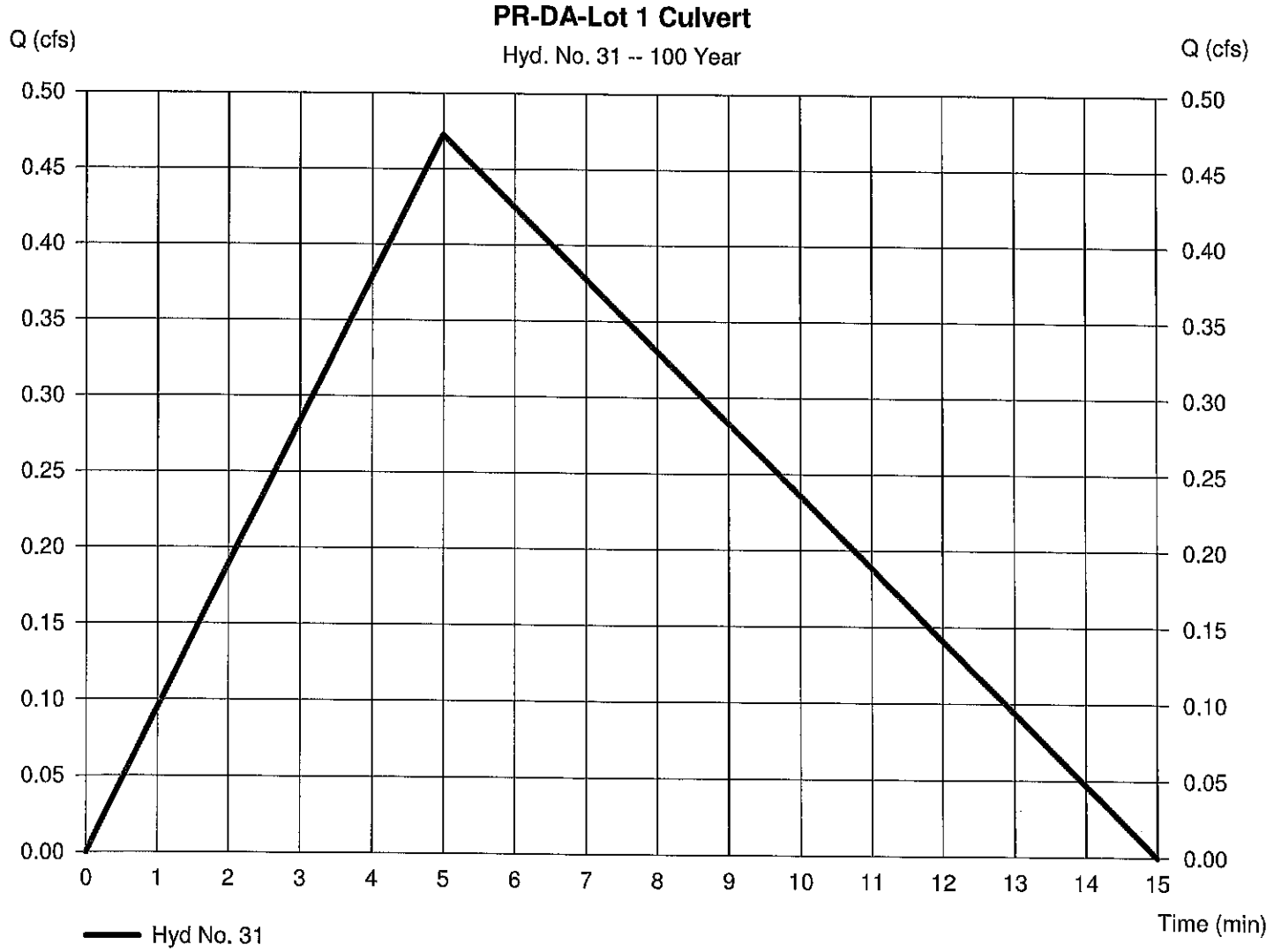
Tuesday, May 11, 2021

Hyd. No. 31

PR-DA-Lot 1 Culvert

Hydrograph type	= Rational	Peak discharge	= 0.473 cfs
Storm frequency	= 100 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 213 cuft
Drainage area	= 0.150 ac	Runoff coeff.	= 0.33*
Intensity	= 9.546 in/hr	Tc by User	= 5.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.030 x 0.90) + (0.050 x 0.17) + (0.070 x 0.20)] / 0.150



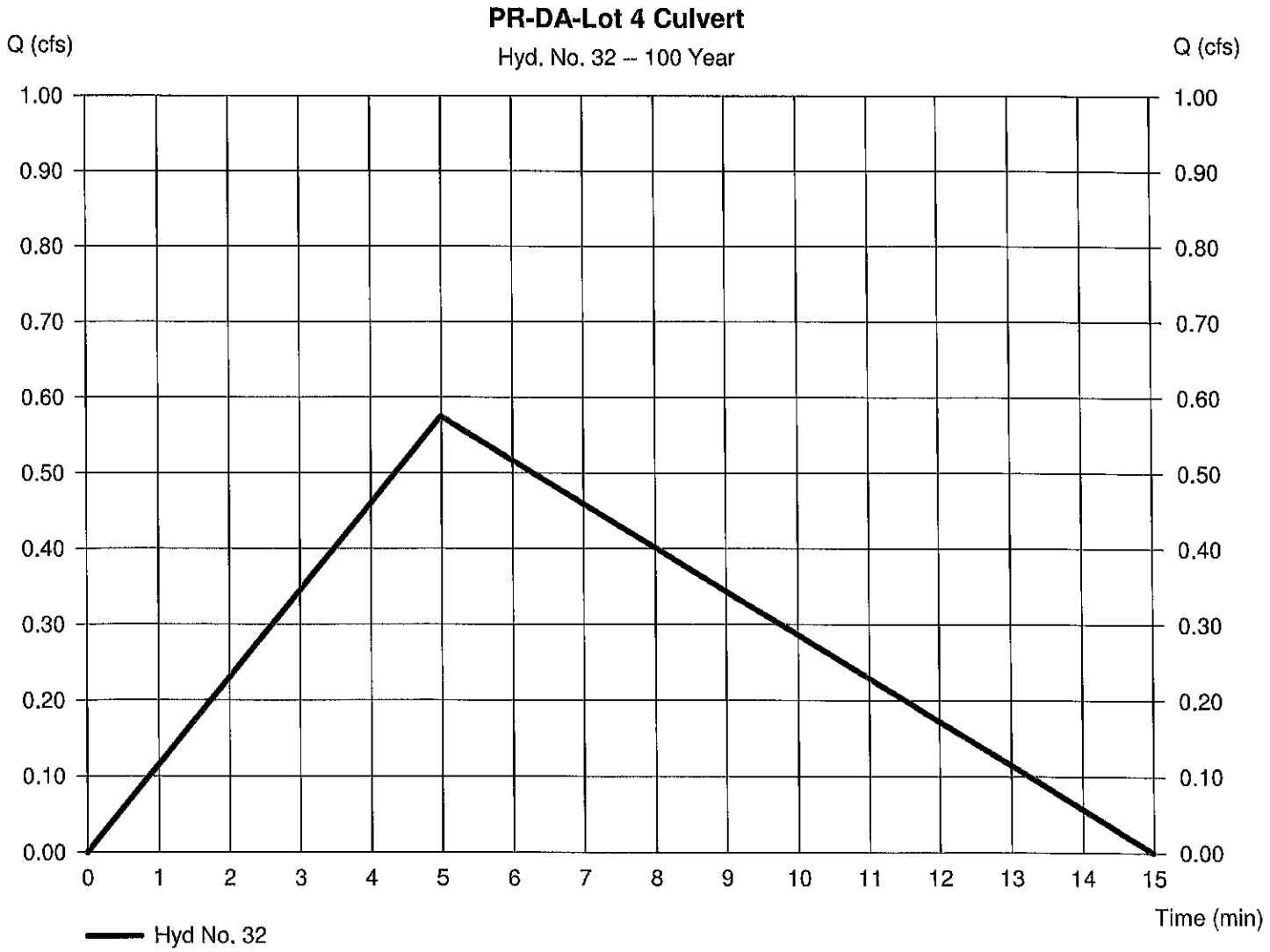
Hydrograph Report

Hyd. No. 32

PR-DA-Lot 4 Culvert

Hydrograph type	= Rational	Peak discharge	= 0.575 cfs
Storm frequency	= 100 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 259 cuft
Drainage area	= 0.140 ac	Runoff coeff.	= 0.43*
Intensity	= 9.546 in/hr	Tc by User	= 5.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.050 x 0.90) + (0.090 x 0.17)] / 0.140



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

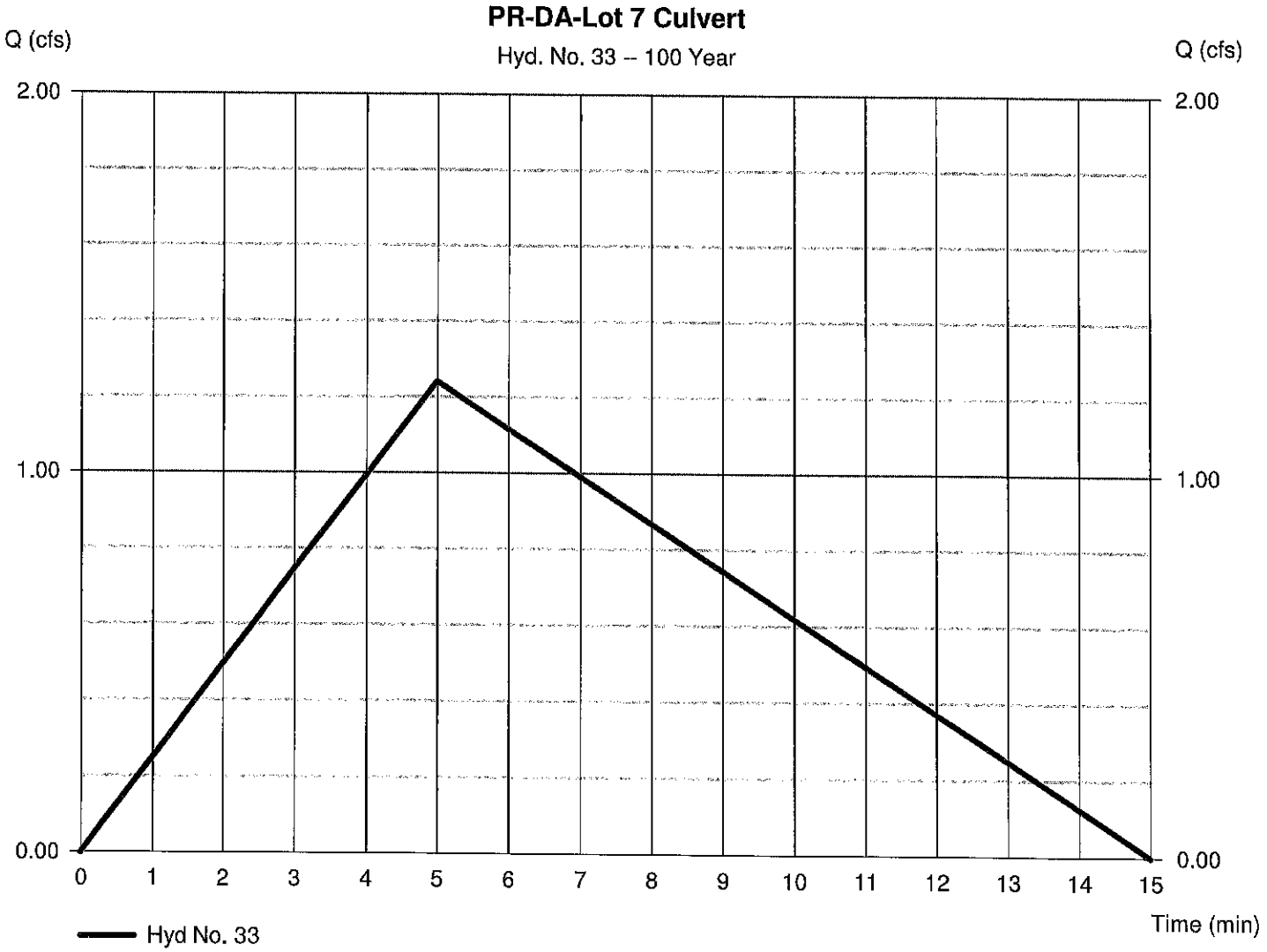
Tuesday, May 11, 2021

Hyd. No. 33

PR-DA-Lot 7 Culvert

Hydrograph type	= Rational	Peak discharge	= 1.241 cfs
Storm frequency	= 100 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 558 cuft
Drainage area	= 0.260 ac	Runoff coeff.	= 0.5*
Intensity	= 9.546 in/hr	Tc by User	= 5.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.090 x 0.90) + (0.080 x 0.40) + (0.090 x 0.20)] / 0.260



Hydrograph Report

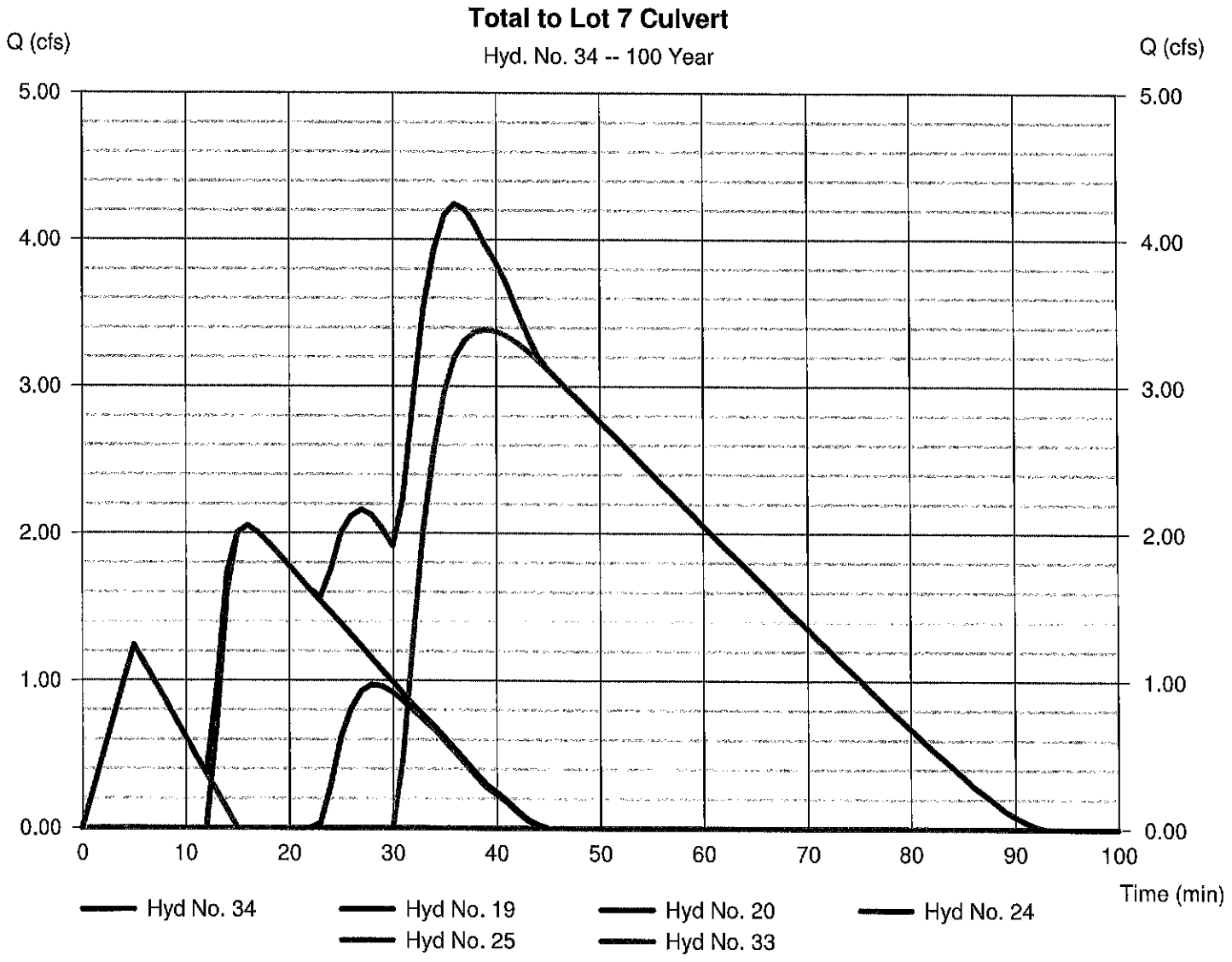
Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, May 11, 2021

Hyd. No. 34

Total to Lot 7 Culvert

Hydrograph type	= Combine	Peak discharge	= 4.242 cfs
Storm frequency	= 100 yrs	Time to peak	= 36 min
Time interval	= 1 min	Hyd. volume	= 9,867 cuft
Inflow hyds.	= 19, 20, 24, 25, 33	Contrib. drain. area	= 0.260 ac



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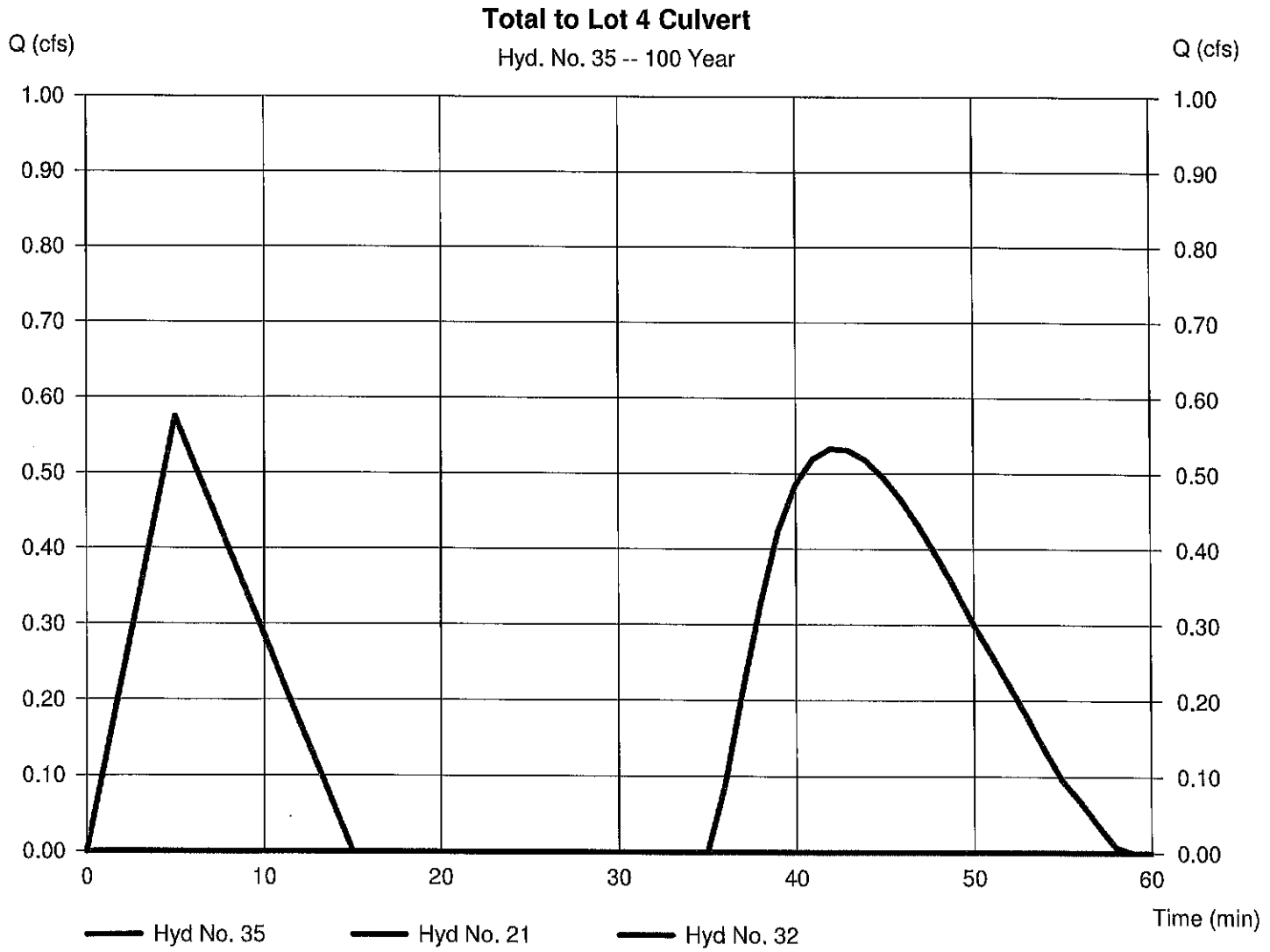
Hydrograph Report

Hyd. No. 35

Total to Lot 4 Culvert

Hydrograph type	= Combine	Peak discharge	= 0.575 cfs
Storm frequency	= 100 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 683 cuft
Inflow hyds.	= 21, 32	Contrib. drain. area	= 0.140 ac



Hydrograph Report

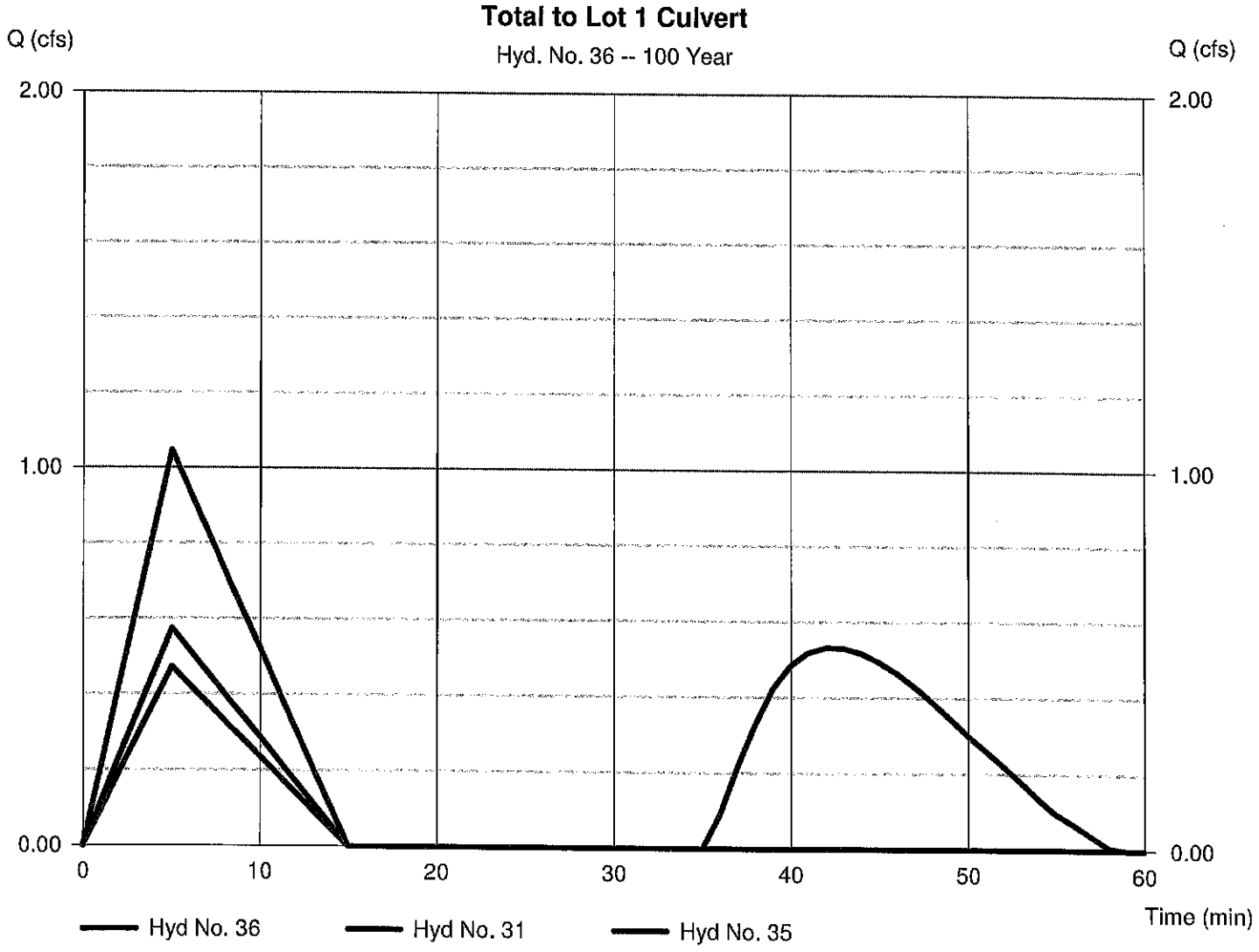
Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, May 11, 2021

Hyd. No. 36

Total to Lot 1 Culvert

Hydrograph type	= Combine	Peak discharge	= 1.047 cfs
Storm frequency	= 100 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 896 cuft
Inflow hyds.	= 31, 35	Contrib. drain. area	= 0.150 ac



Hydraflow Rainfall Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, May 11, 2021

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	38.5600	10.7000	0.8053	--------
3	0.0000	0.0000	0.0000	--------
5	41.1200	8.8000	0.7600	--------
10	45.9700	8.5000	0.7477	--------
25	119.5095	15.0000	0.9201	--------
50	114.7309	13.2000	0.8912	--------
100	155.7025	15.1000	0.9304	--------

File name: MIDDLESEX.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4.20	3.36	2.82	2.45	2.17	1.95	1.78	1.63	1.51	1.41	1.33	1.25
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.59	4.42	3.70	3.20	2.83	2.55	2.33	2.14	1.99	1.86	1.75	1.65
10	6.57	5.19	4.34	3.76	3.33	3.00	2.74	2.52	2.35	2.19	2.06	1.95
25	7.59	6.18	5.23	4.54	4.01	3.60	3.27	2.99	2.76	2.57	2.40	2.25
50	8.64	6.96	5.85	5.06	4.46	4.00	3.63	3.32	3.07	2.85	2.66	2.50
100	9.55	7.76	6.56	5.68	5.02	4.50	4.08	3.74	3.45	3.20	2.99	2.80

Tc = time in minutes. Values may exceed 60.

Precip. file name: middlesex.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.34	0.00	5.13	6.25	7.11	7.68	7.97
SCS 6-Hr	0.00	2.35	0.00	2.95	3.45	4.00	4.55	5.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

Long Hill Estates

NOAA Atlas 14, Volume 10, Version 3
Location name: East Hampton, Connecticut, USA*
Latitude: 41.5624°, Longitude: -72.5404°
Elevation: 378.96 ft**
* source: ESRI Maps
** source: USGS

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_&_aerials

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	0.334 (0.260-0.416)	0.405 (0.315-0.506)	0.521 (0.404-0.653)	0.618 (0.476-0.779)	0.751 (0.561-0.988)	0.851 (0.622-1.14)	0.956 (0.679-1.33)	1.07 (0.723-1.53)	1.24 (0.804-1.82)	1.38 (0.873-2.07)
10-min	0.473 (0.368-0.590)	0.574 (0.446-0.716)	0.739 (0.573-0.926)	0.876 (0.675-1.10)	1.06 (0.794-1.40)	1.21 (0.882-1.62)	1.36 (0.962-1.88)	1.52 (1.02-2.16)	1.76 (1.14-2.59)	1.95 (1.24-2.93)
15-min	0.556 (0.433-0.694)	0.675 (0.525-0.843)	0.869 (0.674-1.09)	1.03 (0.794-1.30)	1.25 (0.934-1.65)	1.42 (1.04-1.91)	1.59 (1.13-2.22)	1.79 (1.21-2.54)	2.07 (1.34-3.04)	2.30 (1.45-3.44)
30-min	0.760 (0.592-0.949)	0.922 (0.717-1.15)	1.19 (0.921-1.49)	1.41 (1.08-1.77)	1.71 (1.27-2.25)	1.94 (1.42-2.60)	2.17 (1.54-3.02)	2.44 (1.64-3.47)	2.82 (1.83-4.15)	3.13 (1.98-4.69)
60-min	0.964 (0.751-1.20)	1.17 (0.909-1.46)	1.50 (1.17-1.88)	1.78 (1.37-2.25)	2.16 (1.62-2.85)	2.45 (1.79-3.29)	2.75 (1.96-3.83)	3.09 (2.08-4.39)	3.57 (2.31-5.25)	3.97 (2.51-5.94)
2-hr	1.28 (1.01-1.59)	1.54 (1.21-1.91)	1.96 (1.53-2.44)	2.31 (1.80-2.89)	2.79 (2.10-3.65)	3.15 (2.33-4.21)	3.53 (2.53-4.90)	3.98 (2.69-5.61)	4.63 (3.01-6.74)	5.17 (3.28-7.68)
3-hr	1.50 (1.18-1.85)	1.79 (1.41-2.21)	2.28 (1.79-2.82)	2.68 (2.09-3.33)	3.23 (2.44-4.21)	3.64 (2.70-4.85)	4.08 (2.94-5.64)	4.60 (3.12-6.46)	5.37 (3.50-7.79)	6.02 (3.83-8.90)
6-hr	1.91 (1.52-2.34)	2.29 (1.82-2.81)	2.91 (2.31-3.58)	3.42 (2.70-4.23)	4.13 (3.15-5.34)	4.65 (3.48-6.15)	5.22 (3.79-7.17)	5.89 (4.01-8.20)	6.90 (4.51-9.93)	7.76 (4.95-11.4)
12-hr	2.37 (1.90-2.88)	2.85 (2.29-3.47)	3.65 (2.92-4.45)	4.30 (3.42-5.28)	5.21 (4.01-6.69)	5.88 (4.43-7.72)	6.61 (4.83-9.02)	7.47 (5.11-10.3)	8.78 (5.76-12.5)	9.89 (6.33-14.4)
24-hr	2.78 (2.25-3.35)	3.39 (2.75-4.09)	4.38 (3.54-5.31)	5.21 (4.18-6.35)	6.35 (4.93-8.10)	7.19 (5.46-9.38)	8.10 (5.98-11.0)	9.22 (6.33-12.6)	10.9 (7.19-15.5)	12.4 (7.96-17.9)
2-day	3.12 (2.56-3.74)	3.86 (3.16-4.62)	5.06 (4.13-6.09)	6.06 (4.91-7.33)	7.44 (5.83-9.46)	8.45 (6.49-11.0)	9.57 (7.15-13.0)	11.0 (7.57-14.9)	13.2 (8.72-18.5)	15.2 (9.76-21.6)
3-day	3.39 (2.79-4.04)	4.20 (3.45-5.01)	5.52 (4.52-6.61)	6.62 (5.39-7.96)	8.13 (6.40-10.3)	9.23 (7.12-12.0)	10.5 (7.85-14.2)	12.0 (8.31-16.3)	14.5 (9.60-20.3)	16.7 (10.8-23.7)
4-day	3.63 (3.00-4.32)	4.49 (3.71-5.34)	5.90 (4.85-7.04)	7.06 (5.77-8.47)	8.67 (6.85-10.9)	9.84 (7.62-12.7)	11.1 (8.39-15.0)	12.8 (8.87-17.3)	15.4 (10.2-21.5)	17.8 (11.5-25.1)
7-day	4.32 (3.60-5.10)	5.28 (4.39-6.24)	6.85 (5.68-8.13)	8.15 (6.71-9.72)	9.95 (7.90-12.4)	11.3 (8.75-14.4)	12.7 (9.59-17.0)	14.5 (10.1-19.4)	17.4 (11.6-24.0)	19.9 (12.9-28.0)
10-day	5.01 (4.19-5.89)	6.03 (5.04-7.10)	7.69 (6.40-9.09)	9.07 (7.50-10.8)	11.0 (8.74-13.6)	12.4 (9.63-15.7)	13.9 (10.5-18.4)	15.8 (11.0-21.0)	18.7 (12.4-25.7)	21.2 (13.7-29.6)
20-day	7.19 (6.08-8.40)	8.29 (7.00-9.69)	10.1 (8.48-11.8)	11.6 (9.65-13.6)	13.6 (10.9-16.7)	15.1 (11.8-18.9)	16.8 (12.6-21.7)	18.6 (13.1-24.5)	21.2 (14.2-28.9)	23.4 (15.2-32.5)
30-day	9.04 (7.69-10.5)	10.2 (8.64-11.8)	12.0 (10.2-14.0)	13.6 (11.4-15.9)	15.7 (12.6-19.0)	17.3 (13.5-21.4)	18.9 (14.2-24.1)	20.7 (14.6-27.1)	23.1 (15.5-31.2)	24.9 (16.3-34.4)
45-day	11.4 (9.71-13.1)	12.5 (10.7-14.5)	14.5 (12.3-16.8)	16.1 (13.6-18.8)	18.3 (14.7-22.0)	20.0 (15.6-24.4)	21.7 (16.2-27.2)	23.3 (16.5-30.3)	25.4 (17.2-34.1)	26.9 (17.6-36.9)
60-day	13.3 (11.4-15.3)	14.5 (12.4-16.7)	16.5 (14.1-19.1)	18.2 (15.4-21.1)	20.4 (16.5-24.5)	22.2 (17.4-27.0)	23.9 (17.9-29.9)	25.5 (18.2-33.1)	27.5 (18.6-36.7)	28.8 (18.8-39.3)

[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.

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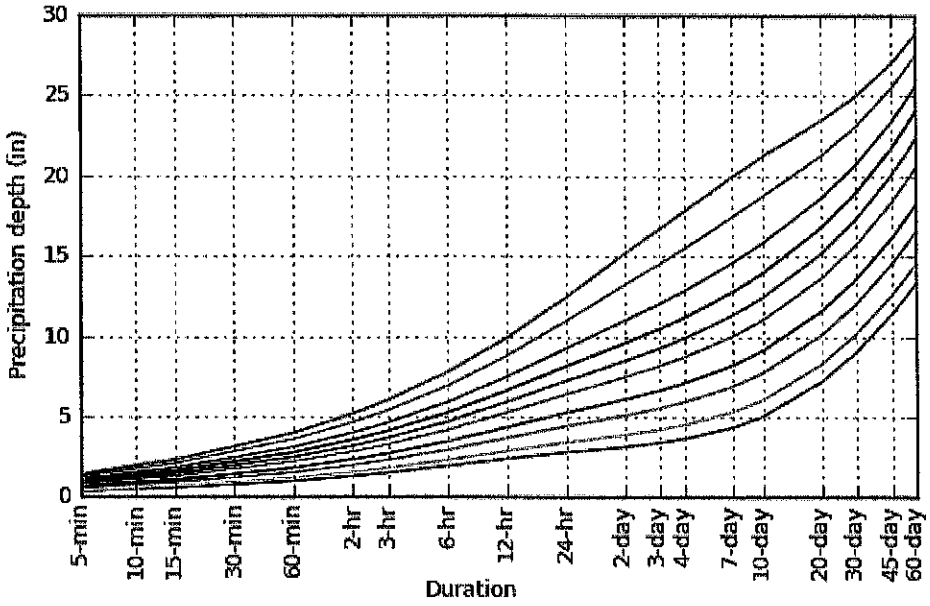
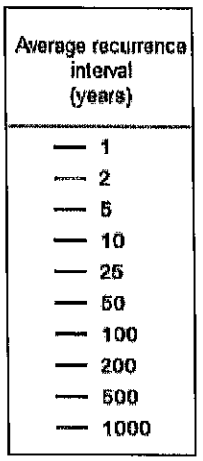
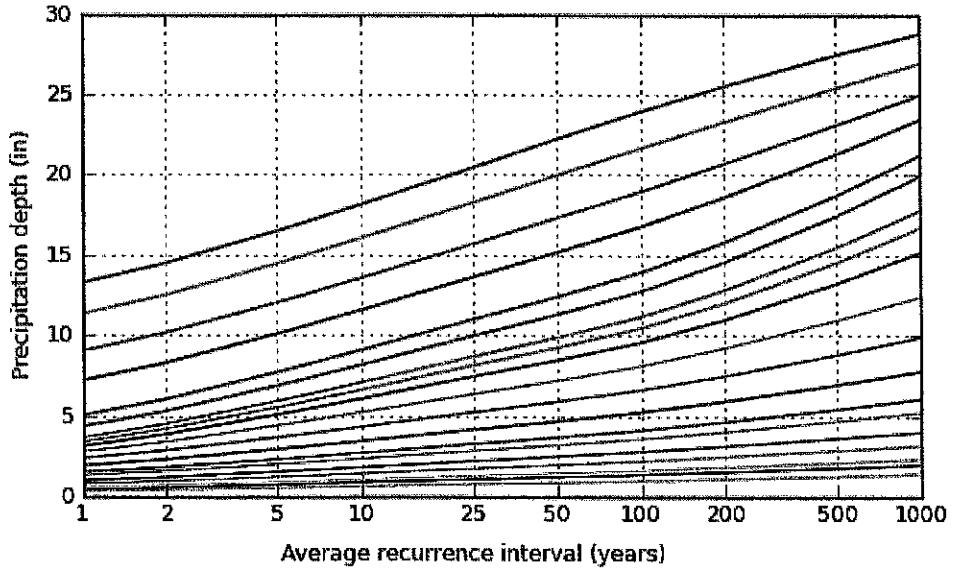
PF graphical

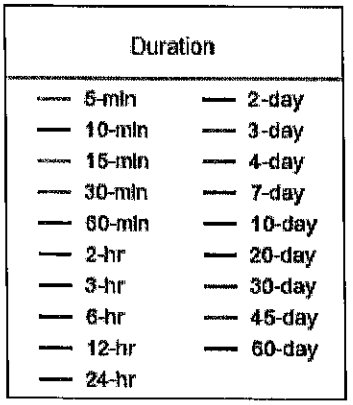
Long Hill Estates

PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.5624°, Longitude: -72.5404°









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Created (GMT): Wed May 5 21:38:14 2021

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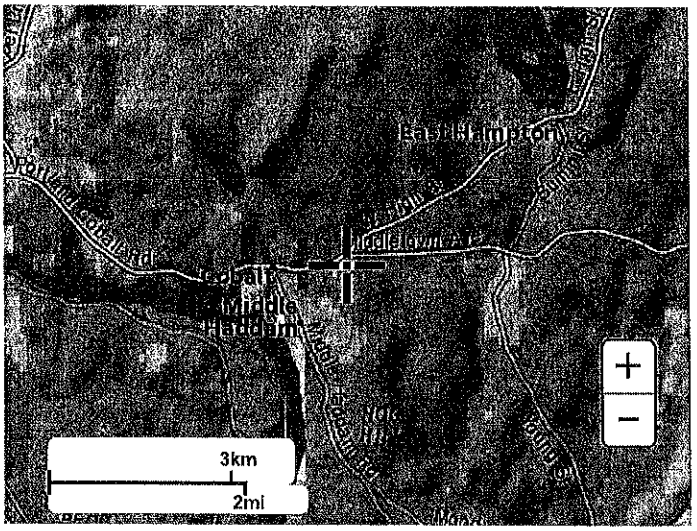
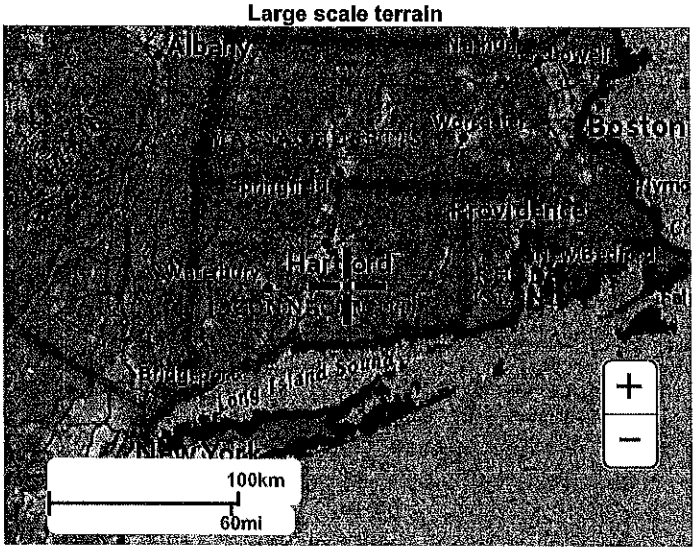
Maps & aerials

Small scale terrain

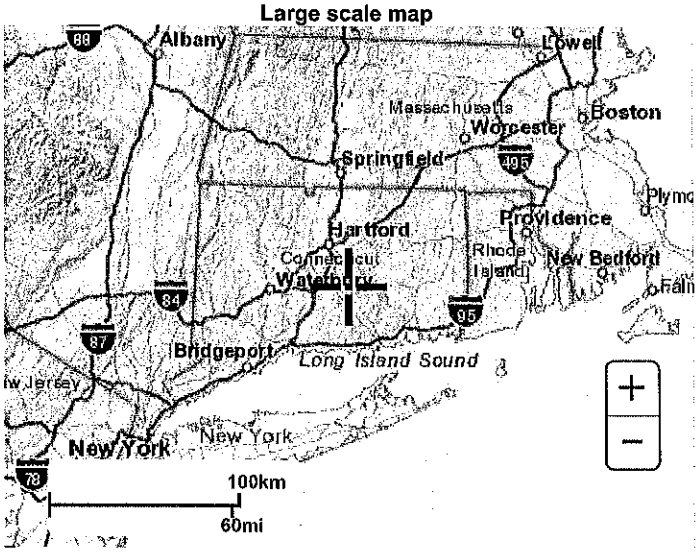
A-52



Large scale terrain



Large scale map



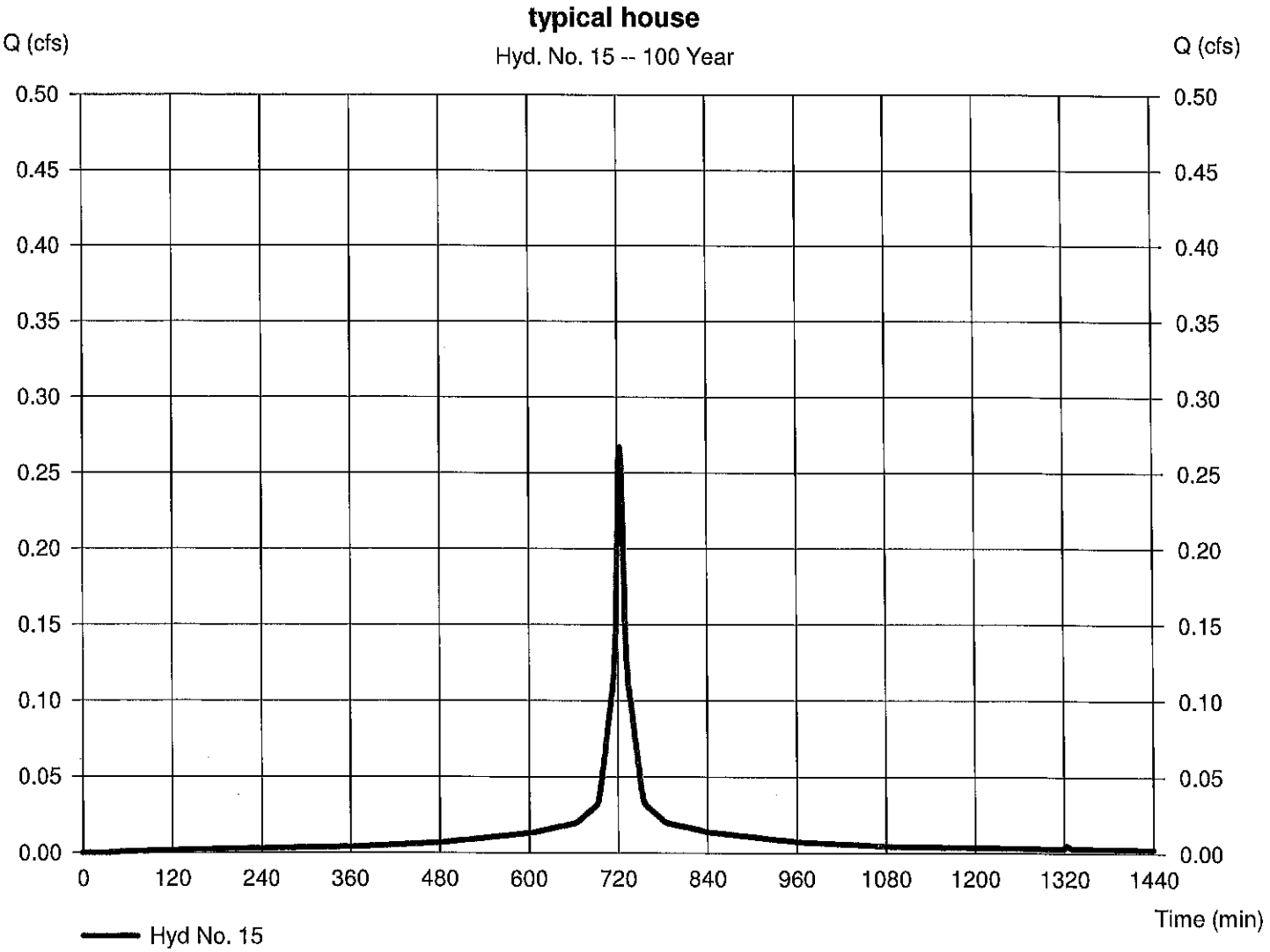
Large scale aerial

Hydrograph Report

Hyd. No. 15

typical house

Hydrograph type	= SCS Runoff	Peak discharge	= 0.267 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 955 cuft
Drainage area	= 0.033 ac =1500 SF	Curve number	= 98
Basin Slope	= 0.0 % footprint	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= ~~7.97 in~~	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Pond No. 2 - Rooftop System

Pond Data

UG Chambers - Invert elev. = 100.00 ft, Rise x Span = 1.00 x 3.00 ft, Barrel Len = 60.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 99.50 ft, Width = 5.00 ft, Height = 1.50 ft, Voids = 33.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	99.50	n/a	0	0
0.15	99.65	n/a	15	15
0.30	99.80	n/a	15	30
0.45	99.95	n/a	15	45
0.60	100.10	n/a	27	71
0.75	100.25	n/a	33	104
0.90	100.40	n/a	32	136
1.05	100.55	n/a	31	167
1.20	100.70	n/a	29	196
1.35	100.85	n/a	26	222
1.50	101.00	n/a	21	243

Culvert / Orifice Structures

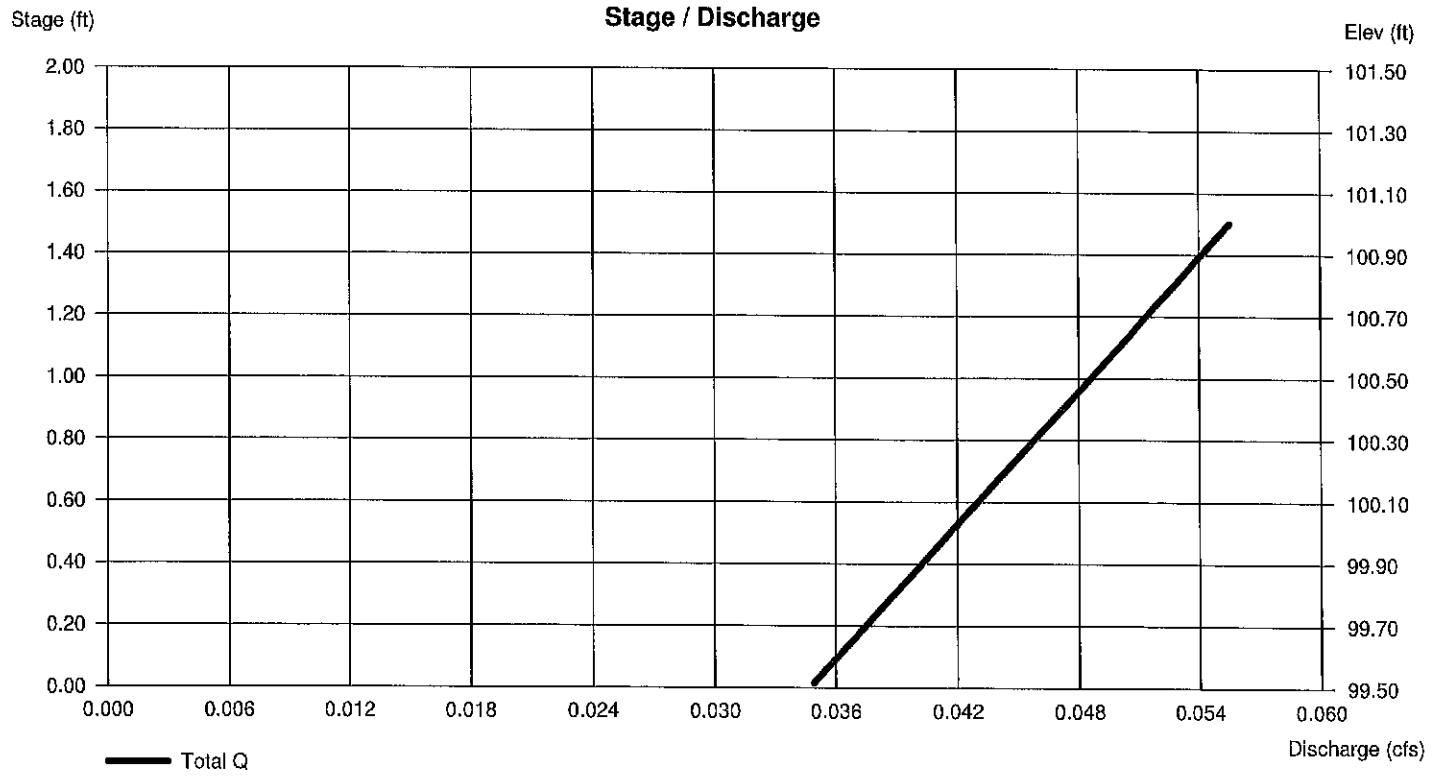
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

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

Exfil.(in/hr) = 5.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



B-3

WQV = 1" (R)(A) / 12

R = .05 + .009 (I)

I = 4.5%

R = .05 + .009 (4.5)

= .0905

= 1" (.0905)(20.29) / 12

= 0.15 ac-ft = 6,632 CU.FT.

GRV = (D)(A)(I) / 12

= (0.1)(20.29)(.045) / 12

= .007 ac-ft = 331 CU.FT.

Available Storage = 27,622 CU.FT.

Far Exceeds reccomended WQV & GRV

PROPOSED CULVERT UNDER DRIVE TO LOT 1

PROGRAM INPUT DATA

Description	Value
Culvert Diameter (ft)	1.25
FHWA Chart Number	1
FHWA Scale Number (Type of Entrance)	3
Manning's Roughness Coefficient	0.011
Entrance Loss Coefficient	0.5
Culvert Length (feet)	36
Invert (Downstream End)	285.4
Invert (Upstream End)	286.1
Culvert Slope (ft/ft)	0.0194
Starting Flow Rate (cfs)	0.5
Incremental Flow Rate (cfs)	0.1
Ending Flow Rate (cfs)	1.5
Starting Tailwater Depth (ft)	0
Incremental TW Depth (ft)	0
Ending TW Depth (ft)	0

COMPUTATION RESULTS

Flow Rate	TW Depth	Headwater		Normal	Critical	Depth at	Outlet
(cfs)	(ft)	Inlet	Outlet	Depth	Depth	Outlet	Velocity
		Control	Control	(ft)	(ft)	(ft)	(fps)
0.5	0	0.36	0	0.18	0.28	0.18	4.42
0.6	0	0.4	0	0.2	0.3	0.2	4.7
0.7	0	0.43	0	0.22	0.33	0.22	4.91
0.8	0	0.46	0	0.23	0.35	0.23	5.1
0.9	0	0.49	0	0.25	0.37	0.25	5.28
1	0	0.52	0	0.26	0.39	0.26	5.43
1.1	0	0.55	0	0.27	0.41	0.27	5.62
1.2	0	0.58	0	0.28	0.43	0.28	5.74
1.3	0	0.61	0	0.29	0.45	0.29	5.88
1.4	0	0.63	0	0.31	0.47	0.31	6
1.5	0	0.66	0	0.32	0.48	0.32	6.14

← 10yr 6" @ inlet

PROPOSED CULVERT UNDER DRIVE TO LOT 4

PROGRAM INPUT DATA

Description	Value
Culvert Diameter (ft)	1.25
FHWA Chart Number	1
FHWA Scale Number (Type of Entrance)	3
Manning's Roughness Coefficient	0.011
Entrance Loss Coefficient	0.5
Culvert Length (feet)	32
Invert (Downstream End)	288
Invert (Upstream End)	288.75
Culvert Slope (ft/ft)	0.0234
Starting Flow Rate (cfs)	0.3
Incremental Flow Rate (cfs)	0.1
Ending Flow Rate (cfs)	1.3
Starting Tailwater Depth (ft)	0
Incremental TW Depth (ft)	0
Ending TW Depth (ft)	0

COMPUTATION RESULTS

Flow Rate	TW Depth	Headwater		Normal	Critical	Depth at	Outlet
(cfs)	(ft)	Inlet	Outlet	Depth	Depth	Outlet	Velocity
		Control	Control	(ft)	(ft)	(ft)	(fps)
0.3	0	0.27	0	0.14	0.21	0.14	4.06
0.4	0	0.32	0	0.16	0.25	0.16	4.42
0.5	0	0.36	0	0.18	0.28	0.18	4.76
0.6	0	0.4	0	0.19	0.3	0.19	4.99
0.7	0	0.43	0	0.21	0.33	0.21	5.23
0.8	0	0.46	0	0.22	0.35	0.22	5.45
0.9	0	0.49	0	0.23	0.37	0.23	5.66
1	0	0.52	0	0.25	0.39	0.25	5.83
1.1	0	0.55	0	0.26	0.41	0.26	5.97
1.2	0	0.58	0	0.27	0.43	0.27	6.13
1.3	0	0.61	0	0.28	0.45	0.28	6.29

← 10-year 5" @ inlet

PROPOSED CULVERT UNDER DRIVE TO LOT 7

PROGRAM INPUT DATA

Description	Value
Culvert Diameter (ft)	1.25
FHWA Chart Number	1
FHWA Scale Number (Type of Entrance)	3
Manning's Roughness Coefficient	0.011
Entrance Loss Coefficient	0.5
Culvert Length (feet)	26
Invert (Downstream End)	289.25
Invert (Upstream End)	289.4
Culvert Slope (ft/ft)	0.0058
Starting Flow Rate (cfs)	1
Incremental Flow Rate (cfs)	0.1
Ending Flow Rate (cfs)	2
Starting Tailwater Depth (ft)	0
Incremental TW Depth (ft)	0
Ending TW Depth (ft)	0

COMPUTATION RESULTS

Flow Rate	TW Depth	Headwater		Normal	Critical	Depth at	Outlet
(cfs)	(ft)	Inlet	Outlet	Depth	Depth	Outlet	Velocity
		Control	Control	(ft)	(ft)	(ft)	(fps)
1	0	0.53	0	0.35	0.39	0.35	3.54
1.1	0	0.56	0	0.37	0.41	0.37	3.63
1.2	0	0.59	0	0.39	0.43	0.39	3.72
1.3	0	0.62	0	0.4	0.45	0.4	3.81
1.4	0	0.64	0	0.42	0.47	0.42	3.89
1.5	0	0.67	0	0.43	0.48	0.43	3.97
1.6	0	0.69	0	0.45	0.5	0.45	4.03
1.7	0	0.72	0	0.46	0.52	0.46	4.11
1.8	0	0.74	0	0.48	0.53	0.48	4.17
1.9	0	0.76	0	0.49	0.55	0.49	4.22
2	0	0.79	0	0.51	0.56	0.51	4.29

← 10-year 8½" @ inlet