SAMS, LARKIN, HUFF & BALLI

A LIMITED LIABILITY PARTNERSHIP

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December 4, 2017

VIA HAND DELIVERY & EMAIL:

Mr. Ken Suddreth, Director
Community Development Department
City of Smyrna
3180 Atlanta Road
Smyrna, GA 30080

Re: Applications of Epic Homes, LLC to Annex and Rezone a 4.2 ± Acre Tract from R-20 (Cobb County) to RAD – Conditional (City of Smyrna) - No. Z17-023

Dear Ken:

As you know, this firm represents Epic Homes, LLC ("Epic") concerning the above-captioned Applications. The Applications were previously tabled and are now scheduled to be heard and considered by the Smyrna Planning & Zoning Board on December 11, 2017 and, thereafter, by the Mayor and City Council on January 16, 2018.

With respect to the foregoing, enclosed please find copies of the following:

1. The requisite number of copies of a revised plan which has been prepared in accordance with discussions with you and your staff.

2. Architectural renderings/elevations depicting the architectural style and composition of the homes to be built on the subject property.

3. A Conceptual Stormwater Management Report prepared by Terrabuild, USA, dated November 20, 2017.

Consistent with the discussions which we have established with the City's Professional Staff and others and taking those issues into consideration, this letter will serve as Epic's expression of agreement with the following stipulations which, upon the Applications being approved, shall become conditions and a part of the grant of the requested Rezoning and Annexation and binding upon the subject property thereafter. The referenced stipulations are as follows, to wit:

1. The stipulations and conditions set forth herein shall replace and supersede in full any and all prior stipulations and conditions in whatsoever form which are currently in place concerning the property which constitutes the subject matter of the above-captioned Applications.

2. The Annexation and Rezoning of the subject property shall be from R-20 (Cobb County) to RAD – Conditional (City of Smyrna) in substantial conformity to the site plan which is being submitted concurrently concurrently herewith.

3. The subject property shall be developed for the construction of fifteen (15) custom, quality-built single-family detached homes upon 4.2 acres at a density of 3.57 units per acre. [1]

4. The size of the homes shall range from a minimum of 2,600 square feet and upwards and will contain 3 - 4 full bedrooms and 2.5 to 3 baths.

5. The architectural style and composition of the homes shall be in substantial conformity to the architectural renderings/elevations which are being resubmitted concurrently herewith. The composition of said homes shall meet City Code requirements and shall consist of a mixture of either brick, stacked stone, cedar/hardi shake and/or hardi plank siding.

6. Each of the homes shall have, at a minimum, an attached, two-car garage which shall be designed at all times to accommodate at least two (2) vehicles. The driveways shall be a minimum of twenty-two feet (22') in length to accommodate the parking of two (2) additional vehicles.

7. All of the homes within the proposed residential community shall be "For Sale" homes which shall be reflected in the Mandatory Homeowners Association ("HOA") and the Declaration of Covenants, Conditions and Restrictions ("CCRs") which shall include, among other components, strict architectural controls.

   The Mandatory HOA shall be responsible for the upkeep and maintenance of all common areas, tree preservation areas, required community Open Space, the Stormwater management facility (detention/water quality) and landscaping.

[1] Price points are anticipated ranging from $400,000.00 to $450,000.00 and greater.

8. A third-party management company shall be hired to manage the day-to-day operations of the HOA. The third-party management company shall also be responsible for the management of all association monies as well as ensuring that the association is properly insured until such time as the HOA makes a determination that it can undertake such responsibilities.

9. The submission of a Landscape Plan during the Plan Review process which shall be subject to staff review and approval and which shall include, but not necessarily be limited to, the following:

    a. The Landscape Plan shall be prepared, stamped and signed by a Georgia Registered Landscape Architect or a degreed Horticulturist for common areas and other components of the residential community which shall be identified during the Plan Review process.

    b. All HVAC systems and home utilities within the community shall either be underground or screened from view by way of fencing and/or landscaping.

    c. The installation of sod in the front, side and rear yards.

    d. The stormwater management facilities shall be landscaped and positioned appropriately in order to be attractive to homes inside and outside of the proposed residential community.

    e. Compliance with the City's current Tree Preservation & Replacement Ordinance and substantial conformity to the Tree Survey/Tree Protection/Tree Replacement plans which were submitted concurrently with the Application for Rezoning. All required tree protection measures shall be adhered to during the construction and the buildout of the proposed residential community.

    f. As shown on the revised site plan, the perimeter of the subject property adjacent to rights-of-way and contiguous to Concord Park Subdivision shall be landscaped in a fashion consistent with the City's Arborist's recommendations and subject to the Arborist's review and approval.

10. Subject to recommendations from the City Engineer concerning hydrology, stormwater management and downstream considerations, including recommendations regarding the ultimate positioning and configuration of on-site detention and water quality. Additionally, detention for the community shall be designed to meet all of the City's stormwater codes, and subject to review and approval by the City Engineer. The conceptual Stormwater Management Report, dated November 20, 2017 is attached.

11. Compliance with the City of Smyrna's Public Works Director's comments and recommendations concerning water and sewer service and sewer capacity, all of which are located within Cobb County's unincorporated boundaries.

12. Compliance with the City of Smyrna Fire Marshall's recommendations with respect to Life-Safety and Fire Prevention issues, including the following:

    a. Providing a turning model for the site to ensure that Fire Trucks are able to access the subject property.

    b. Compliance with the City's turning performance analysis utilized for this type of single-family detached residential development.

13. The .217 acre (9,450 sq. ft.) tract of land located at the intersection of Concord Road and Old Concord Road shall be incorporated into the subject property's Open Space and managed as the balance of the subject property by the Mandatory HOA and subject to the CCRs.

14. Setbacks shall be as follows:

    a. Twenty-five foot (25') front setbacks.

    b. Five foot (5') side setbacks.

    c. Twenty-five foot (25') rear setbacks.

These stipulations/conditions represent Epic's acknowledgement that this Single-Family Detached Residential Development is in keeping with the City's plans for the future development of properties along this corridor and in keeping with the City's strategic plan for the expansion of the City Limits. In that regard, this Annexation and Rezoning request is entirely appropriate from a Land Use Planning Perspective.

Please do not hesitate to contact me should you or your Staff require further information or documentation prior to the formulation of Staff Analysis and Recommendations and the Applications being heard and considered by the Planning & Zoning Board and then the Mayor and City Council. With kind regards and best wishes for the holiday season, I am

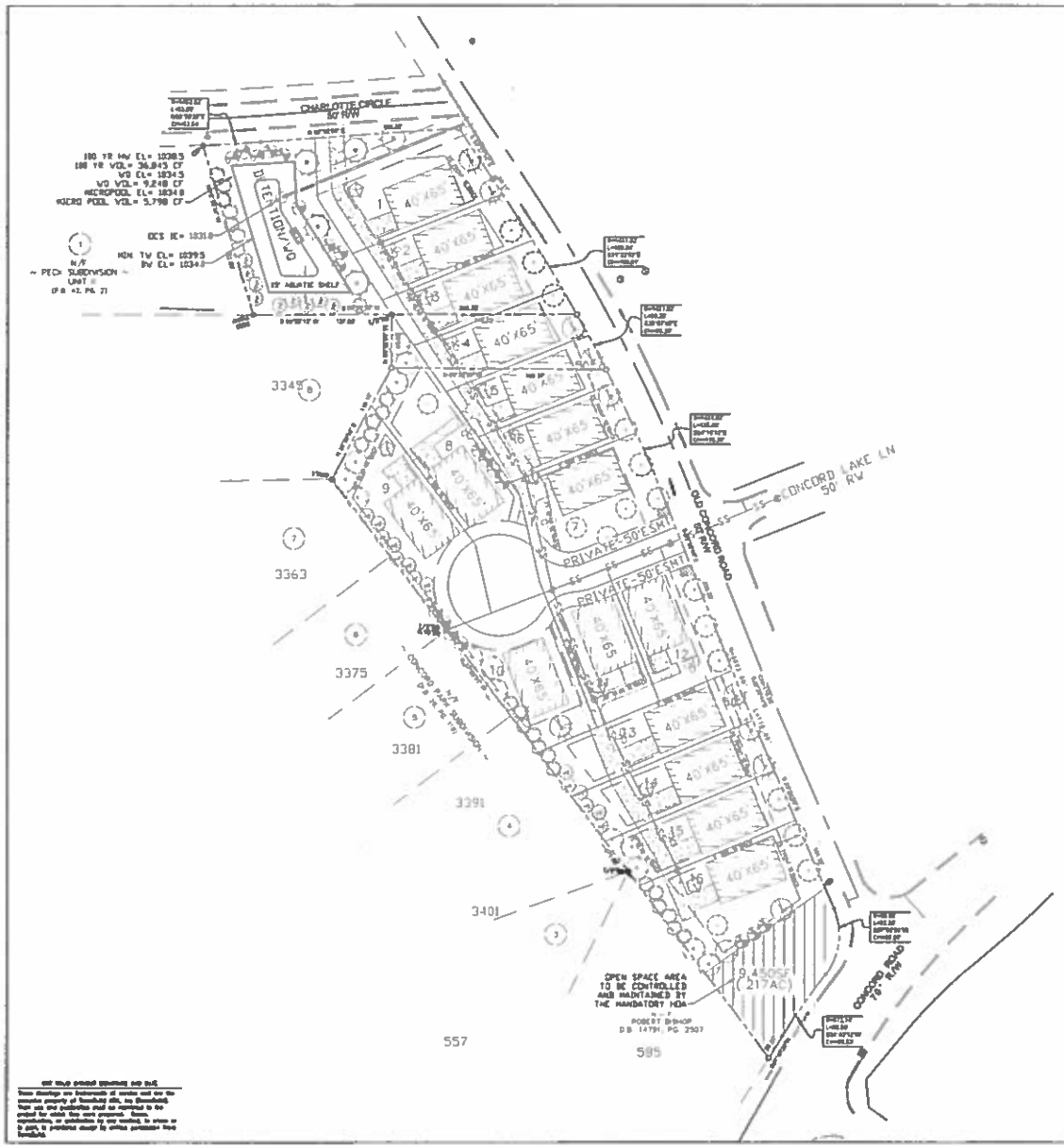
Very truly yours,

SAMS, LARKIN, HUFF & BALLI, LLP

Garvis L. Sams, Jr.
gsams@slhb-law.com

GLS, Jr./dls
Attachments

cc: Honorable Max Bacon, Mayor (via email w/attachments)
Members, Smyrna City Council (via email w/attachments)
Members, Planning & Zoning Board (via email w/attachments
Ms. Tammi Saddler Jones, City Administrator (via email w/attachments)
Scott A. Cochran, Esq. (via email w/attachments)
Mr. Eric Randall, P.E., City Engineer (via email w/attachments)
Mr. Timothy Grubaugh, Deputy Fire Marshall (via email w/attachments)
Mr. Scott Stokes, Public Works Director (via email w/attachments)
Ms. Terri Graham, City Clerk (via email w/attachments)
Mr. Russell Martin, AICP, Senior Planner (via email w/attachments)
Mr. Joey Hipps, Epic Homes (via email w/attachments)
Parks F. Huff, Esq. (via email w/attachments)



LOCATION MAP

LAND USE TABLE

SITE ACREAGE	4.2 ACRES+/-
TO BE DEDICATED TO COBB COUNTY	9,450 SF(.217AC)

SETBACKS:

FRONT	25'
SIDE	5'
REAR	25'

NORTH
STATE PLANE GA.WEST
GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

CLIENT

EPIC HOME, LLC

804 HARRISON GROVE LANE
DARIETTA, GA 30064
Phone: 770.231.7719

PROJECT

Project Title & Graphic

Project Location

TerraBuild PROJECT NO. 617000

TerraBuild USA, Inc.
P.O. BOX 881
Lilburn, Georgia 30048
Office: 770.908.7019
www.TerraBuildUSA.com

SEAL

GEORGIA
REGISTERED
LANDSCAPE
ARCHITECT

DESIGNED BY

DRAWN BY

CHECKED BY

APPROVED BY

DATE 11-13-2017

REVISIONS 11-23-2017

12-04-2017

DRAWING TITLE

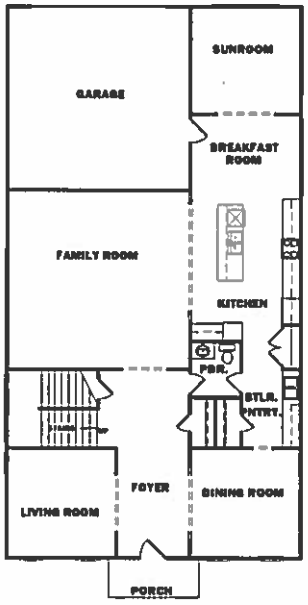
ANNEXATION PLAT FOR OLD CONCORD RD

DRAWING NUMBER

TerraBuild USA, Inc. ENVISION PLAN DESIGN BUILD MANAGE

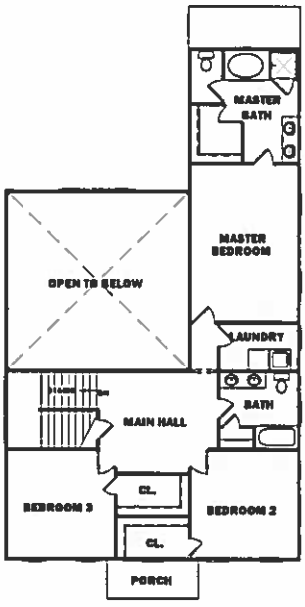
ALS DESIGN &
DRAFTING

1825 Barrett Lakes Blvd. Suite 200
Kennesaw, GA 30144
(770) 590-1300
als@alsdesign.biz



The Hull
3014 sq. ft.,
3 Bedrooms, 2.5 Bathrooms,
2 Car Garage

First Floor Plan



Second Floor Plan

ALS DESIGN &
DRAFTING

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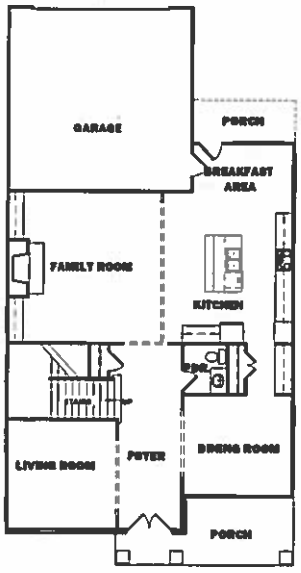
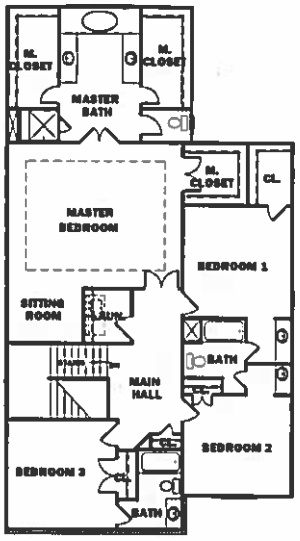
Kennesaw, GA 30144
(770) 590-1300
als@alsdesign.biz



The McAllister
3145 sq. ft.,
4 Bedrooms, 3.5 Bathrooms,
2 Car Garage

First Floor Plan



Second Floor Plan

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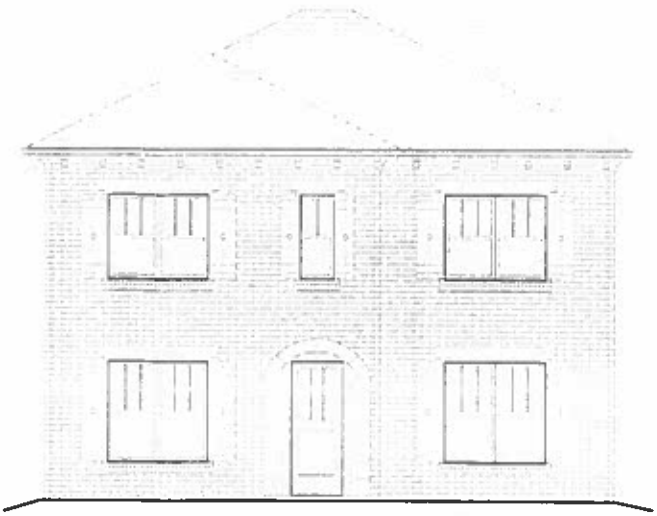
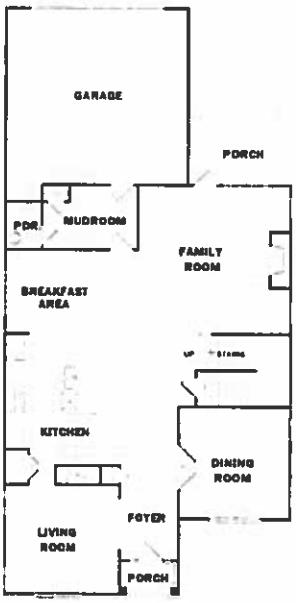
als@alsdesign.biz

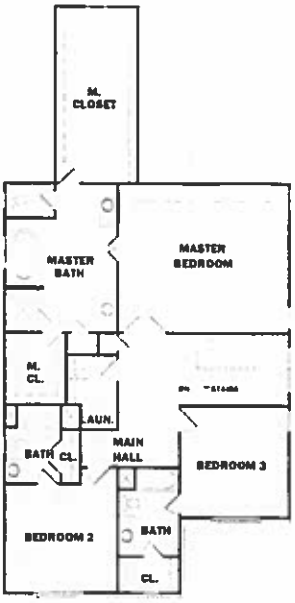




The Bailey
3177 sq. ft.,
3 Bedrooms, 3.5 Bathrooms,
2 Car Garage

First Floor Plan

Second Floor Plan



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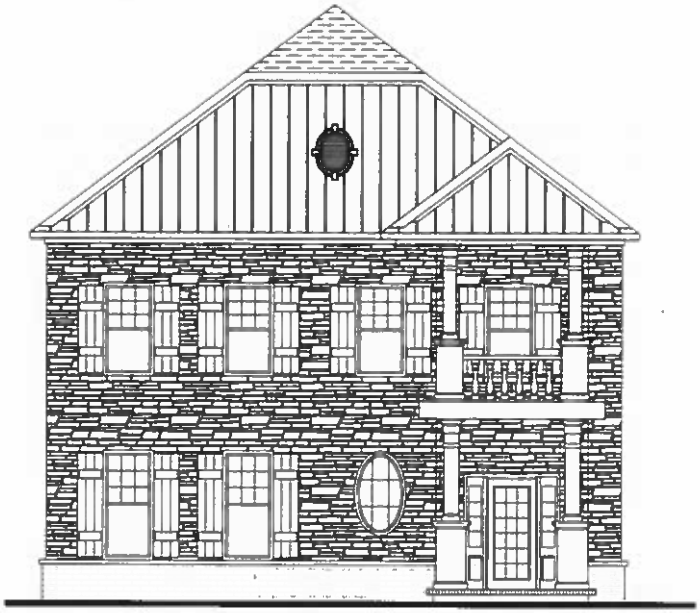
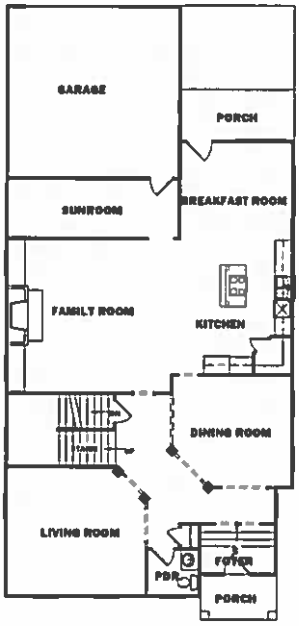
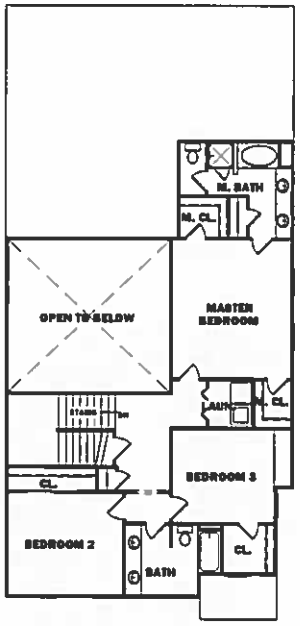




The Willowbrooke
2787 sq. ft.,
3 Bedrooms, 2.5
Bathrooms,
2 Car Garage

First Floor Plan

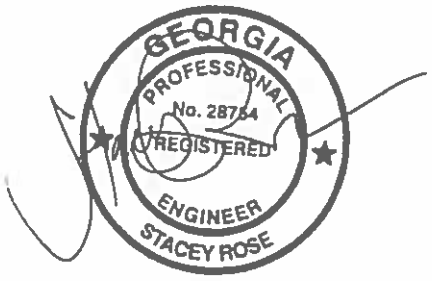


Second Floor Plan

RE-ZONING
STORMWATER MANAGEMENT
REPORT
FOR
OLD CONCORD ROAD TRACT

CITY OF SMYRNA
COBB COUNTY, GEORGIA

November 20, 2017



PREPARED BY:
STACEY ROSE, P.E.
GA P.E. # 28754

Terrabuild, USA
PO Box 601
Lilburn, Georgia 30048
770-900-7619

EXECUTIVE SUMMARY

The following analysis provides a conceptual overview of the hydrologic impact that will result from developing Old Concord Road Tract, a residential community in the City of Smyrna at the northwest corner of Old Concord and Concord Roads. Detailed analysis and design will be performed with submittal of the land disturbance permit.

In general, the primary hydrologic impact of development is an increase in peak storm water runoff rates from the site. Left unmitigated, this increase in peak runoff rates has the potential of increasing downstream flooding. This analysis provides an assessment of the increases to the peak rates of flow due to development and proposes site improvements in a manner consistent with the current drainage policies and regulations of the City of Holly Spring's Post-Development Stormwater Management Ordinance.

PROJECT DESCRIPTION

Currently the 4.21-acre site contains two residential properties with five existing building structures, asphalt driveways and open grassed area with moderately sloping terrain. Existing stormwater runoff discharges the site via four drainage basins. The following conceptual report has only analyzed the main drainage basin (hereon referred to as Drainage Basin A) since all proposed runoff will ultimately discharge the site via this basin. Currently Drainage Basin A contains 2.24 acres and discharges the site via a defined swale along Old Concord Road and into an existing 15" RCP culvert located at the northeast corner of the site. In an effort to be conservative Existing Basin A has been modeled with a curve number of 55 to reflect pre-developed wooded conditions in the basin.

Proposed improvements to the site includes (16) 40'x65' detached single family residential homes with accessory private drives and one Stormwater Management Pond that will discharge into the existing 15" RCP culvert.

Curve Number Calculations - Post A						
Location	*Condition*	*CN*	*Acreage*	*CN * Acreage*		Impervious Area Breakdown
Site	Impervious	98	1.59	155.35		Units 16 * 2,600 = 41,600 sf
Site	Landscaped	61	1.91	116.51		Private Drives = 27,450 sf
TOTAL			**3.50**	271.86	**78**	**Total** **69,050 sf**

For the purpose of a conceptual analysis it has been assumed that all proposed improvements to the site will discharge into the proposed Stormwater Pond. The proposed Stormwater Pond has been modeled to ensure the post-developed discharge rates into the existing 15" RCP culvert do not exceed the pre-developed discharge rates into the culvert.

Summary of Flows			
Storm Frequency (yr)	Pre-developed Peak Runoff (cfs)	Post-developed Peak Runoff (cfs)	Peak Flow Reduction
2	1.26	1.05	16.48%
5	2.32	1.32	43.15%
10	3.56	1.89	46.93%
25	5.40	3.47	35.75%
50	6.89	4.98	27.64%
100	8.45	6.66	21.24%

The proposed Stormwater Pond has been designed to provide approximately 36,650 cf of storage to accommodate the 100 year storm event.

Water Quality / Channel Protection

The proposed Stormwater Pond has also been designed to provide the required water quality volume (6,996 cf) with a micro pool as per the attached calculations. One-year channel protection has not been provided since the routed peak rate of flow from the facility during the one year storm event is less than 2.0 cfs. Please refer to section 2.2.4.2 of the 2016 Georgia Stormwater Management Manual.

HYDROLOGIC EVALUATION

Hydrologic data for our evaluation is based on field reconnaissance of the property, a watershed delineation of the existing topography utilizing field run surveys and the Cobb County GIS website. The SCS Hydrologic Methodology was applied using the Type II rainfall distribution for the 24 hour storm in Atlanta, Georgia for the 1, 2, 5, 10, 25, 50 and 100 year storm events. All T_c values were calculated using standard SCS methodology for overland, shallow concentrated and channel flow and weighted curve number calculations have been determined based on Table 3.1.5-1 of the Georgia Stormwater Management Manual. Analysis for all hydrologic models was performed using *Hydraflow Hydrograph Extension for Autocad Civl 3D 2009* software program, version 6.066 by Autodesk, Inc.

WATER QUALITY DESIGN

PROPOSED STORMWATER POND

The Water Quality Volume (WQ_v) is defined as:

$$WQ_v = 1.2\,(R_v)\,A_s / 12$$

$$Rv = 0.05 + I\,(0.009)$$

I = % imp. as a whole number

A_s = Onsite Area to be treated

Micropool Storage = 25% of the total provided WQ_v

A_s =	3.50
I =	45%
R_v =	0.4582

WQ_v Required =	6,996	cf
WQ_v Provided =	**9,248**	**cf**
WQ_v ie =	1031.0	ft
WQ_v ponding el =	**1034.5**	**ft**
Micropool Vol Required (25% WQ_v) =	1,749	cf
Micropool Vol Provided =	5,798	cf
Micropool ponding el =	**1034.0**	**ft**

The water quality orifice was calculated using the following equation:

$A = (V/t) / (C \times (2g(H/2)^{0.5}))$

g =	32.2	ft/s/s
C =	0.6	
H =	0.5	ft
t =	86,400	sec
Total WQ_v =	9,248	cf
WQ_v used for Micropool =	5,798	cf
WQ_v to pass through orifice =	3,450	cf
Area required =	0.0166	sf
Diameter required =	2	in
Diameter provided =	**2**	**in**
Invert el =	**1034.00**	**ft**

Hydrograph Return Period Recap

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

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	SCS Runoff	------	0.449	1.256	------	2.320	3.563	5.401	6.888	8.451	A pre
2	SCS Runoff	------	6.842	9.654	------	12.59	15.59	19.66	22.74	25.83	A post
3	Reservoir	2	0.706	1.049	------	1.319	1.891	3.470	4.984	6.656	Stormwater Pond

Hydrograph Summary Report

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

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	SCS Runoff	1.256	1	723	4,498	------	------	------	A pre
2	SCS Runoff	9.654	1	721	24,399	------	------	------	A post
3	Reservoir	1.049	1	755	23,864	2	1035.69	17,456	Stormwater Pond

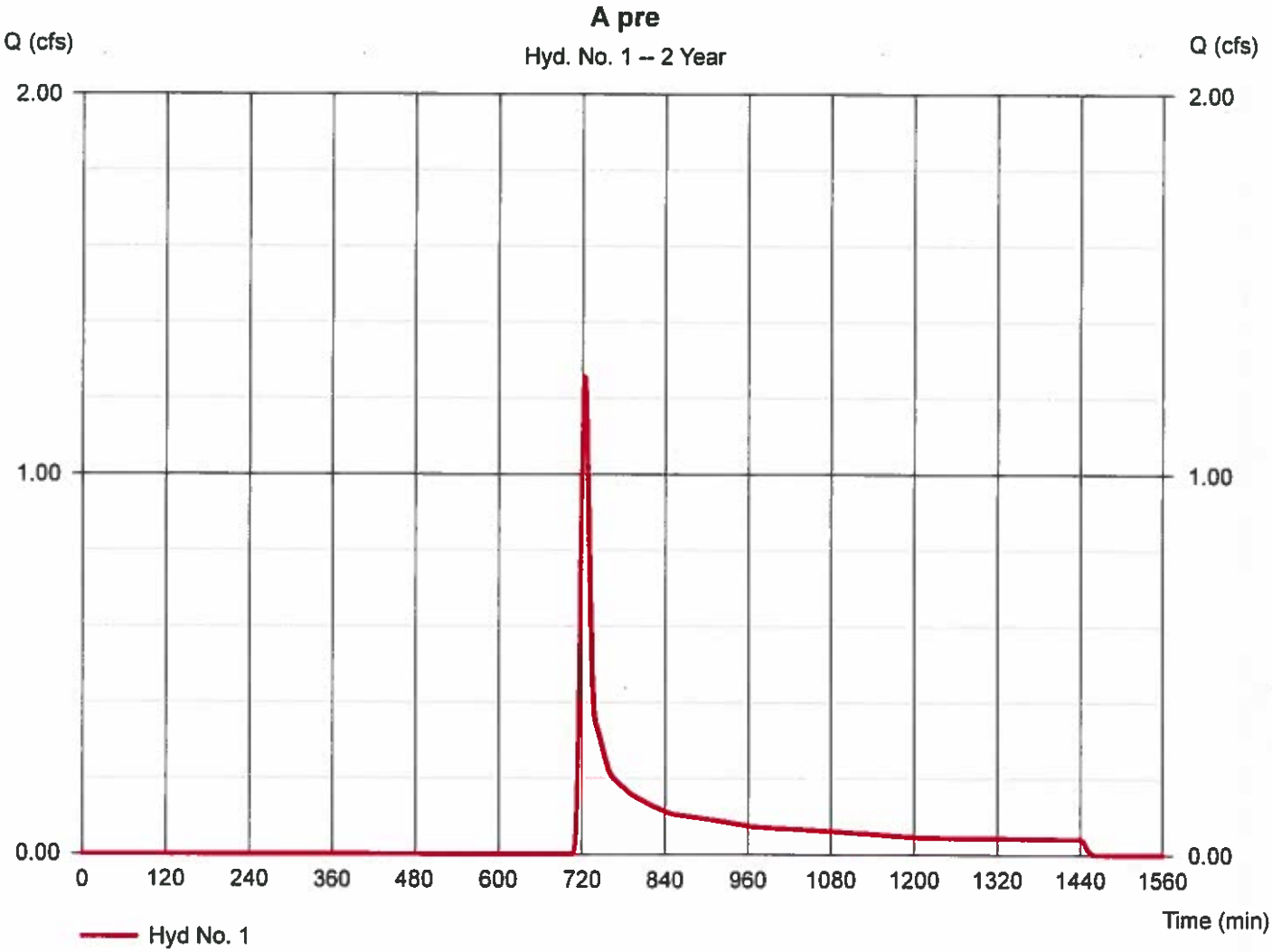
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 1

A pre

Hydrograph type	= SCS Runoff	Peak discharge	= 1.256 cfs
Storm frequency	= 2 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 4,498 cuft
Drainage area	= 2.240 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 4.08 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 1

A pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.08		0.00		0.00		
Land slope (%)	= 2.20		0.00		0.00		
Travel Time (min)	**= 8.35**	**+**	**0.00**	**+**	**0.00**	**=**	**8.35**
Shallow Concentrated Flow							
Flow length (ft)	= 740.00		0.00		0.00		
Watercourse slope (%)	= 4.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 3.42		0.00		0.00		
Travel Time (min)	**= 3.60**	**+**	**0.00**	**+**	**0.00**	**=**	**3.60**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	= 0.00		0.00		0.00		
Flow length (ft)	= 0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 12.00 min

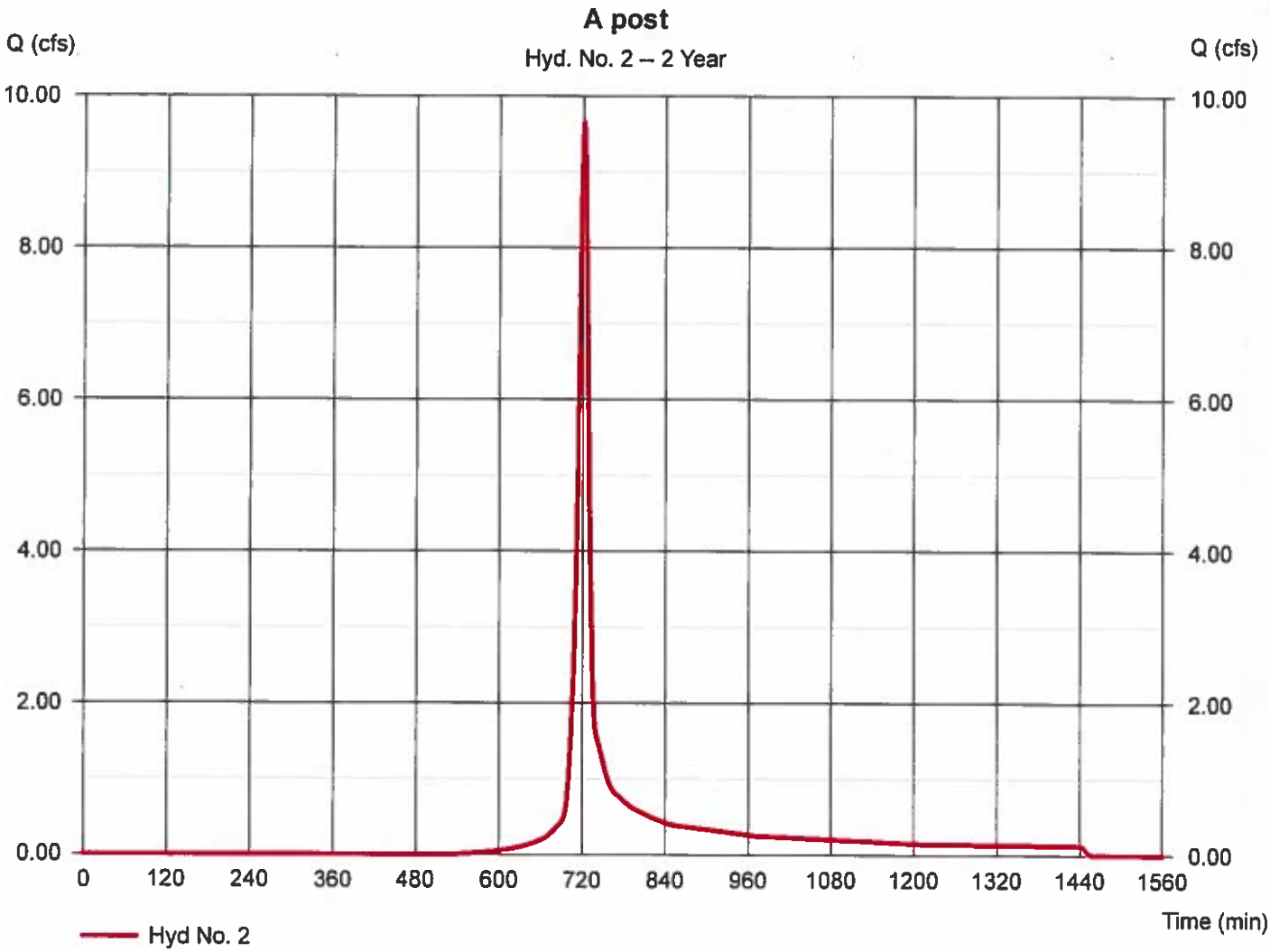
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 2

A post

Hydrograph type	= SCS Runoff	Peak discharge	= 9.654 cfs
Storm frequency	= 2 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 24,399 cuft
Drainage area	= 3.500 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 4.08 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 2

A post

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.08		0.00		0.00		
Land slope (%)	= 2.20		0.00		0.00		
Travel Time (min)	**= 8.35**	**+**	**0.00**	**+**	**0.00**	**=**	**8.35**
Shallow Concentrated Flow							
Flow length (ft)	= 740.00		0.00		0.00		
Watercourse slope (%)	= 4.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 3.42		0.00		0.00		
Travel Time (min)	**= 3.60**	**+**	**0.00**	**+**	**0.00**	**=**	**3.60**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	= 0.00		0.00		0.00		
Flow length (ft)	= 0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 12.00 min

Hydrograph Report

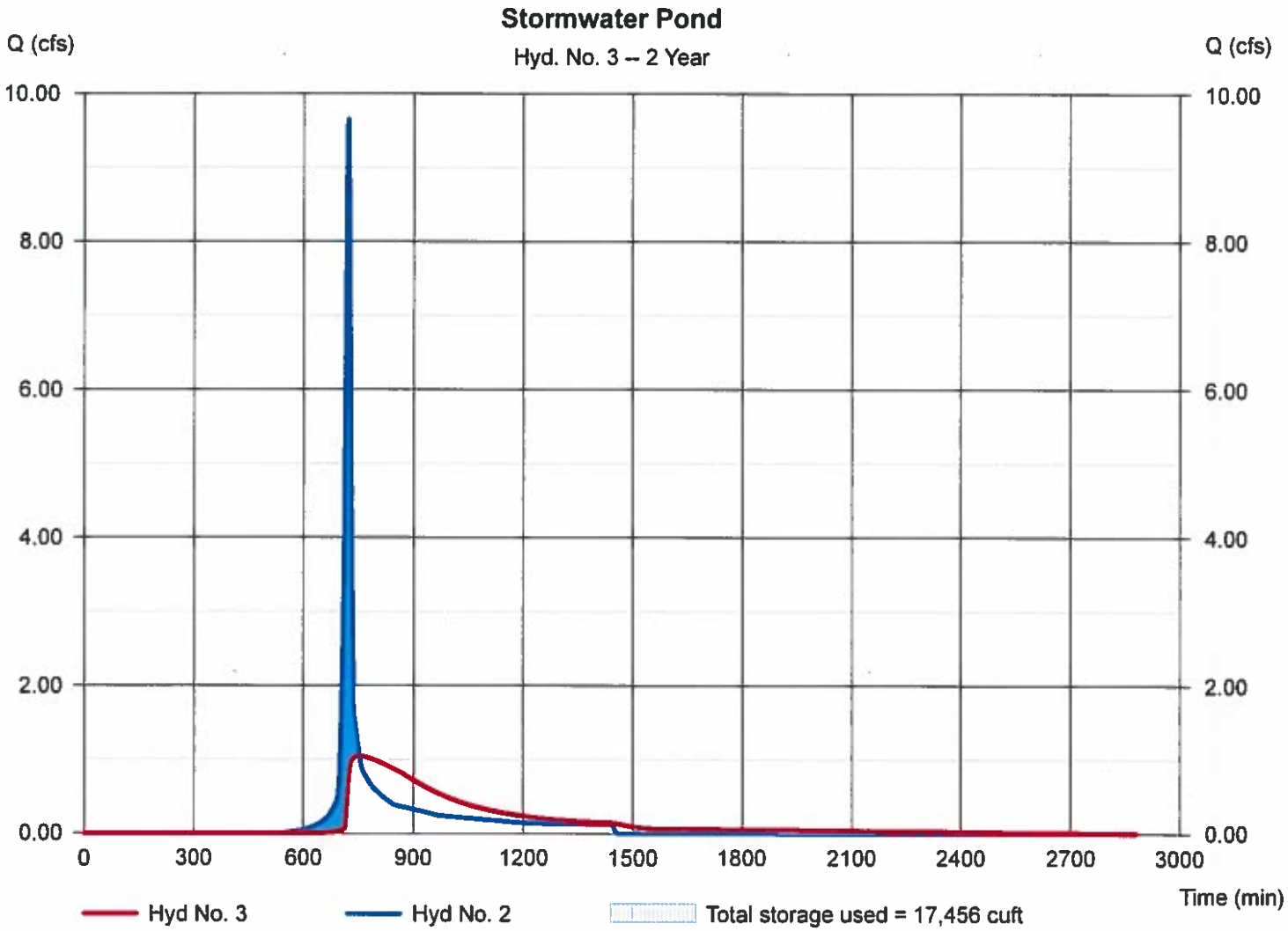
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 3

Stormwater Pond

Hydrograph type	= Reservoir	Peak discharge	= 1.049 cfs
Storm frequency	= 2 yrs	Time to peak	= 755 min
Time interval	= 1 min	Hyd. volume	= 23,864 cuft
Inflow hyd. No.	= 2 - A post	Max. Elevation	= 1035.69 ft
Reservoir name	= Stormwater Pond for Zoning	Max. Storage	= 17,456 cuft

Storage Indication method used. Wet pond routing start elevation = 1034.00 ft.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Pond No. 1 - Stormwater Pond for Zoning

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1031.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1031.00	00	0	0
2.00	1033.00	2,200	1,467	1,467
3.00	1034.00	6,900	4,332	5,798
3.50	1034.50	6,900	3,450	9,248
7.50	1038.50	6,900	27,597	36,845
8.50	1039.50	6,900	6,899	43,744

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	2.00	6.00	0.00
Span (in)	= 15.00	2.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 1030.50	1034.00	1034.50	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	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.50	0.00	0.00
Crest El. (ft)	= 0.00	1036.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= No	Yes	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	1031.00	0.00	0.00	0.00	---	---	0.00	---	---	---	---	0.000
2.00	1,467	1033.00	1.13 ic	0.00	0.00	---	---	0.00	---	---	---	---	0.000
3.00	5,798	1034.00	1.13 ic	0.00	0.00	---	---	0.00	---	---	---	---	0.000
3.50	9,248	1034.50	1.13 ic	0.07 ic	0.00	---	---	0.00	---	---	---	---	0.068
7.50	36,845	1038.50	6.76 ic	0.22 ic	1.83 ic	---	---	4.71	---	---	---	---	6.761
8.50	43,744	1039.50	10.95 ic	0.23 ic	2.06 ic	---	---	8.65	---	---	---	---	10.95

Hydrograph Summary Report

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

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	SCS Runoff	2.320	1	723	7,061	----	----	----	A pre
2	SCS Runoff	12.59	1	721	31,801	----	----	----	A post
3	Reservoir	1.319	1	755	31,250	2	1036.27	21,465	Stormwater Pond

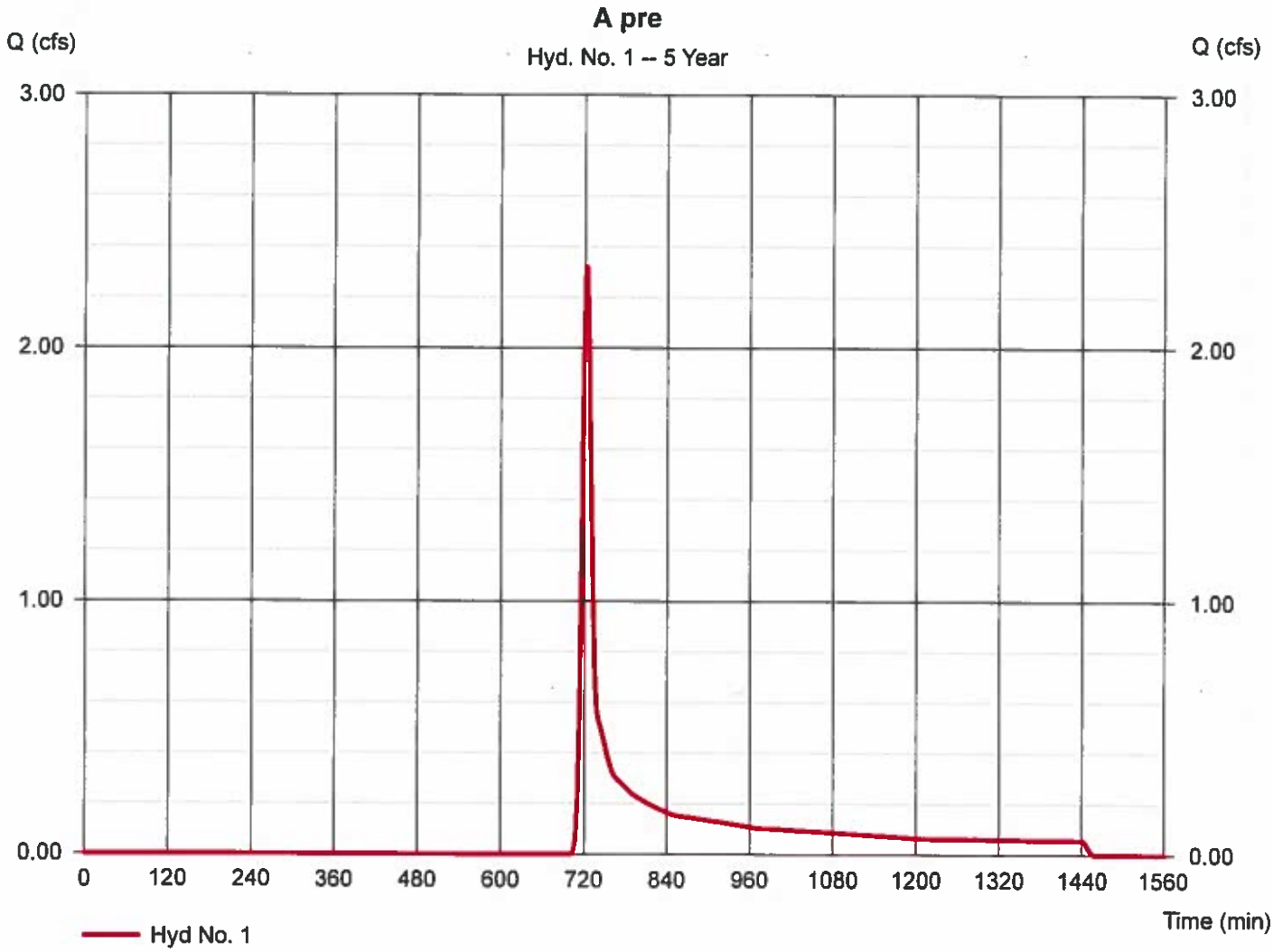
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 1

A pre

Hydrograph type	= SCS Runoff	Peak discharge	= 2.320 cfs
Storm frequency	= 5 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 7,061 cuft
Drainage area	= 2.240 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 4.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



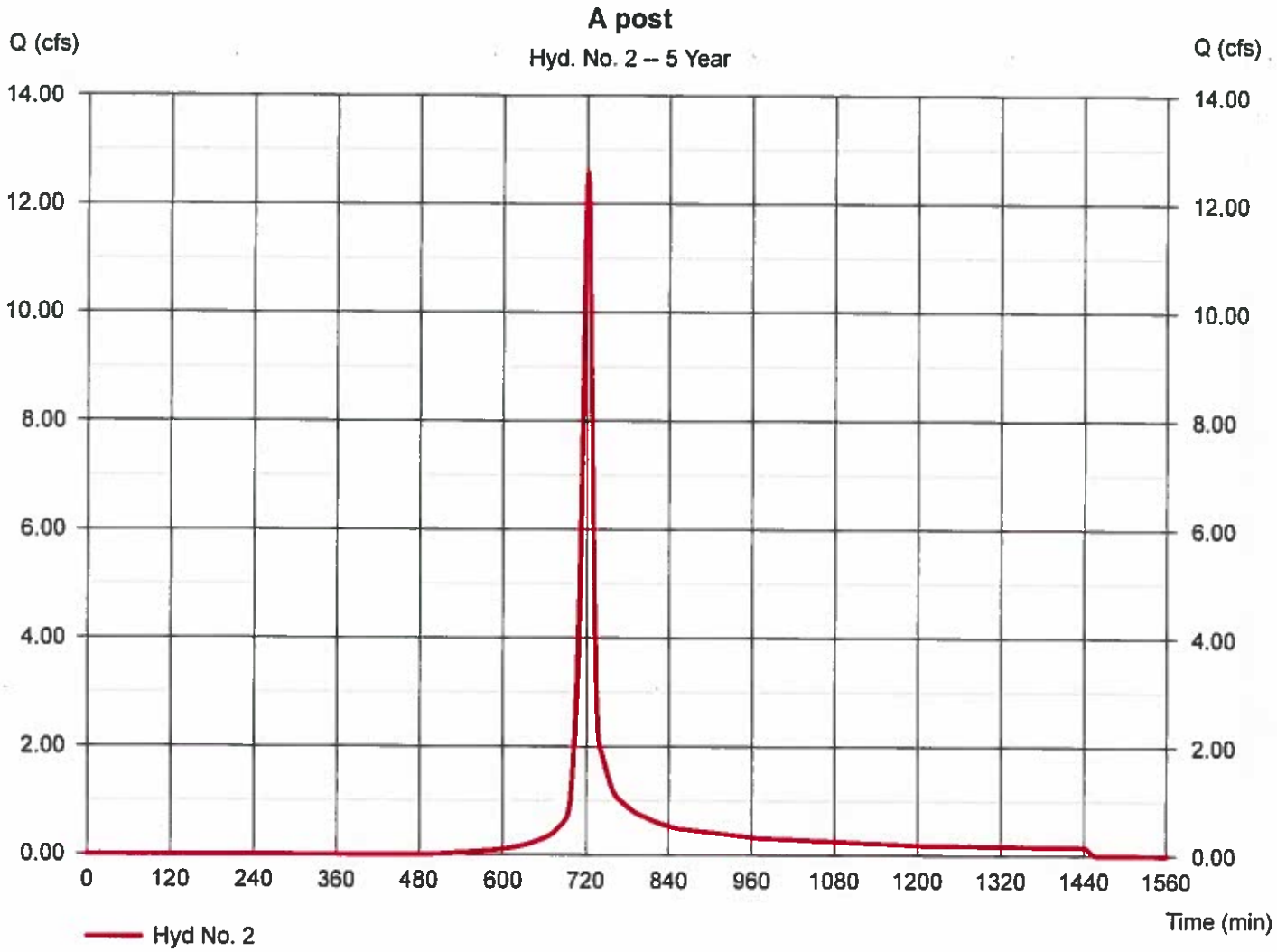
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 2

A post

Hydrograph type	= SCS Runoff	Peak discharge	= 12.59 cfs
Storm frequency	= 5 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 31,801 cuft
Drainage area	= 3.500 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 4.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

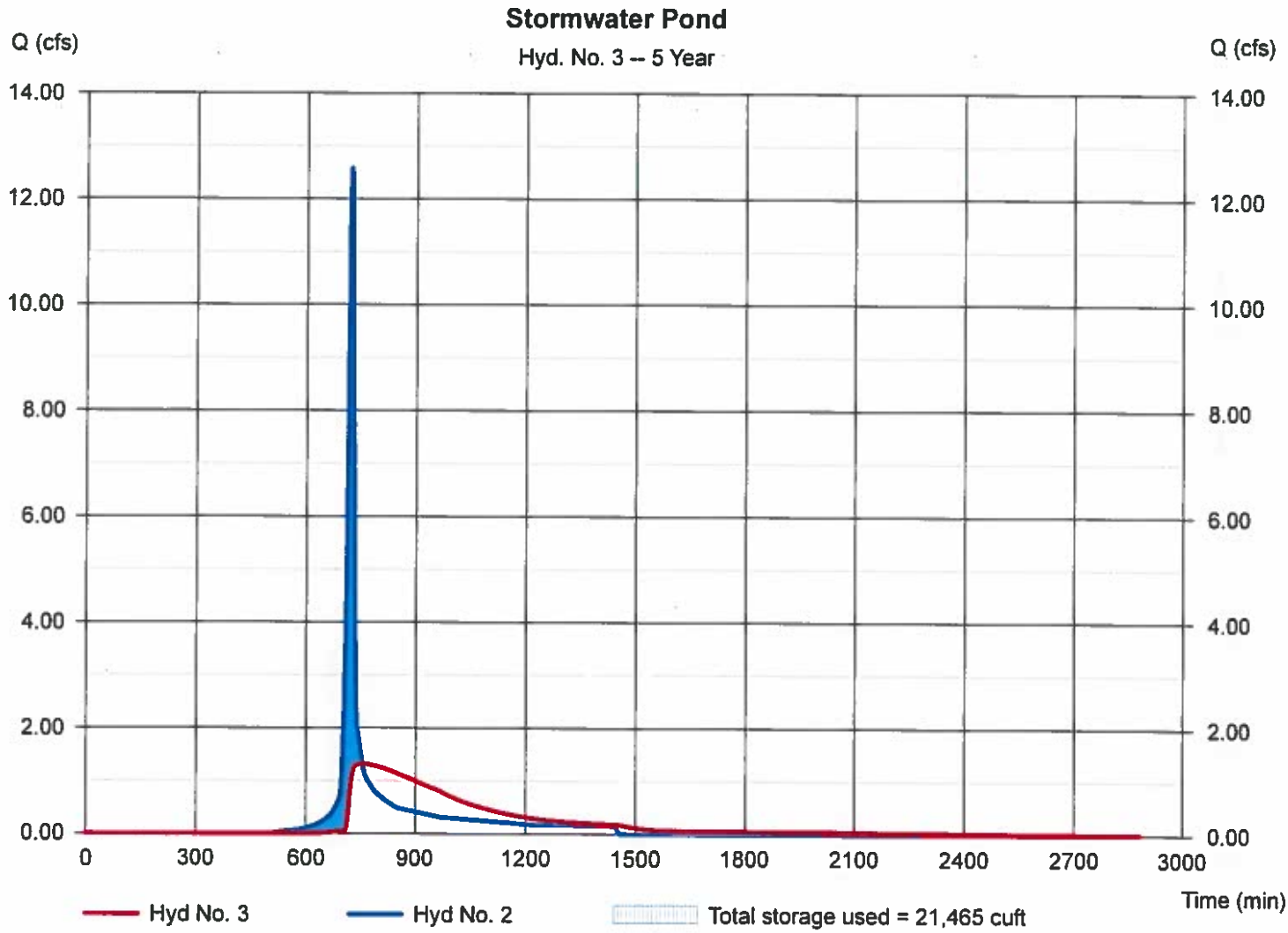
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 3

Stormwater Pond

Hydrograph type	= Reservoir	Peak discharge	= 1.319 cfs
Storm frequency	= 5 yrs	Time to peak	= 755 min
Time interval	= 1 min	Hyd. volume	= 31,250 cuft
Inflow hyd. No.	= 2 - A post	Max. Elevation	= 1036.27 ft
Reservoir name	= Stormwater Pond for Zoning	Max. Storage	= 21,465 cuft

Storage Indication method used. Wet pond routing start elevation = 1034.00 ft.



Hydrograph Summary Report

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

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	SCS Runoff	3.563	1	722	10,006	------	----	----	A pre
2	SCS Runoff	15.59	1	721	39,500	----	------	----	A post
3	Reservoir	1.891	1	749	38,935	2	1036.84	25,355	Stormwater Pond

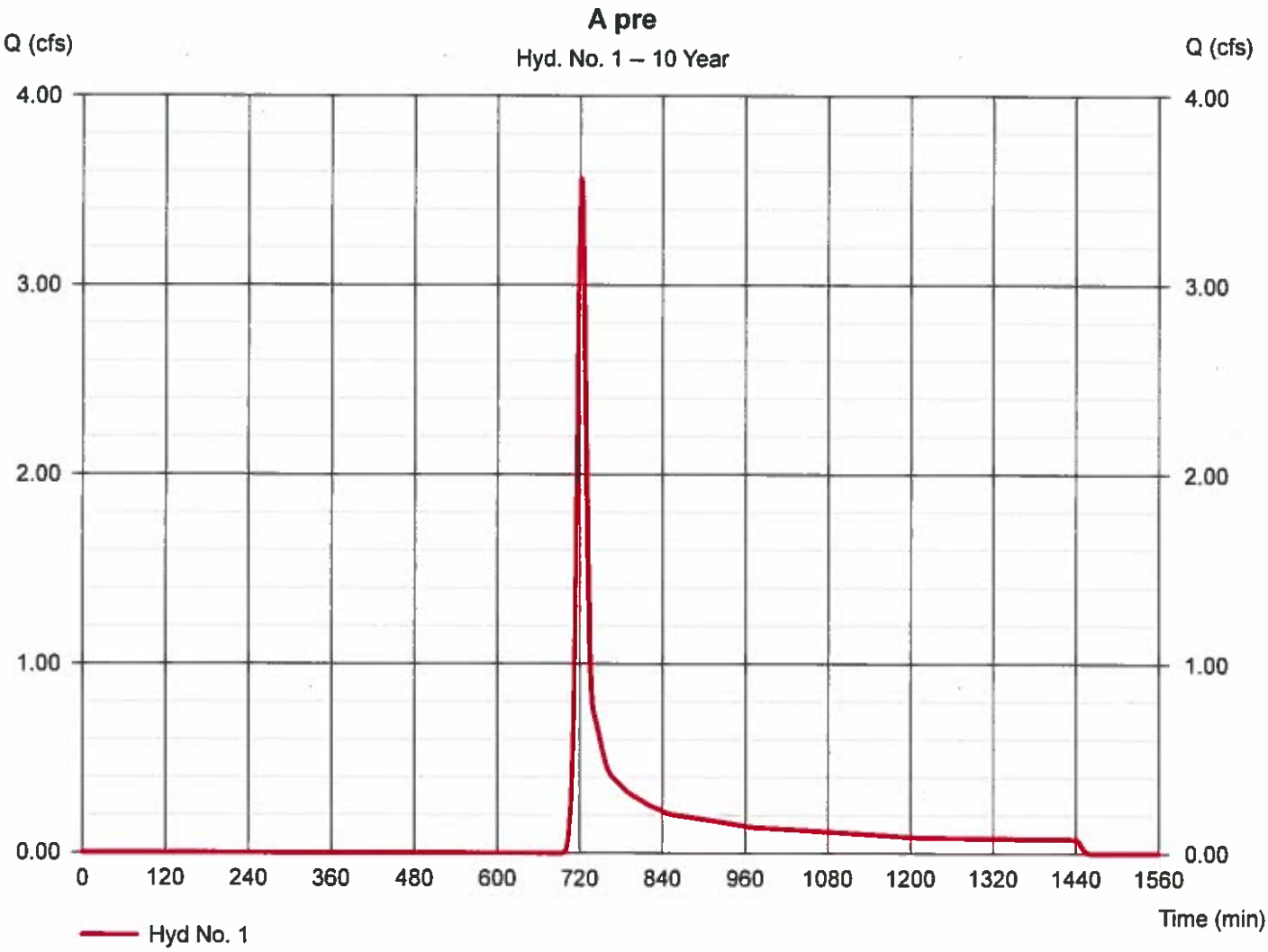
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 1

A pre

Hydrograph type	= SCS Runoff	Peak discharge	= 3.563 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 1 min	Hyd. volume	= 10,006 cuft
Drainage area	= 2.240 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 5.52 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



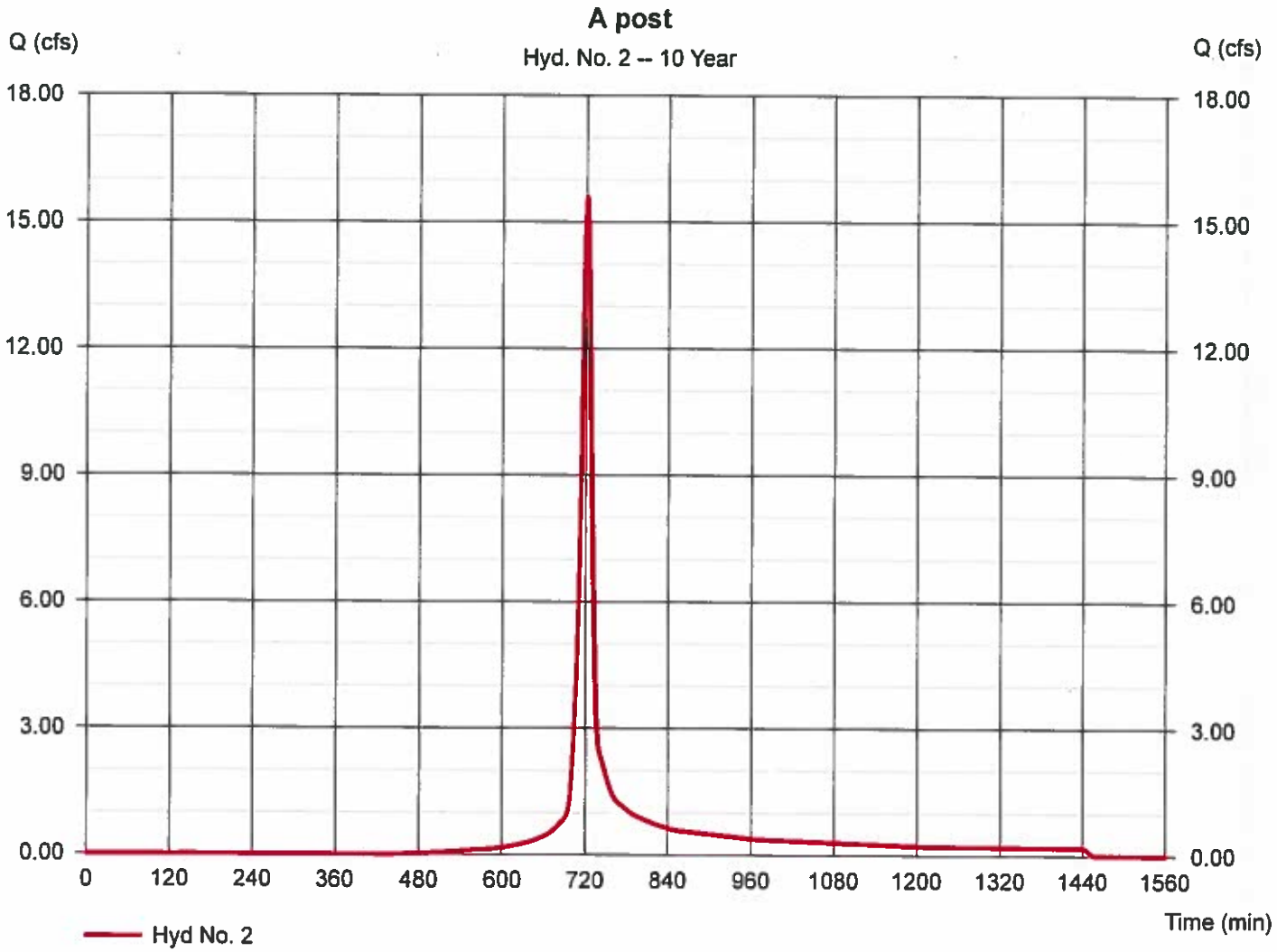
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 2

A post

Hydrograph type	= SCS Runoff	Peak discharge	= 15.59 cfs
Storm frequency	= 10 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 39,500 cuft
Drainage area	= 3.500 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 5.52 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

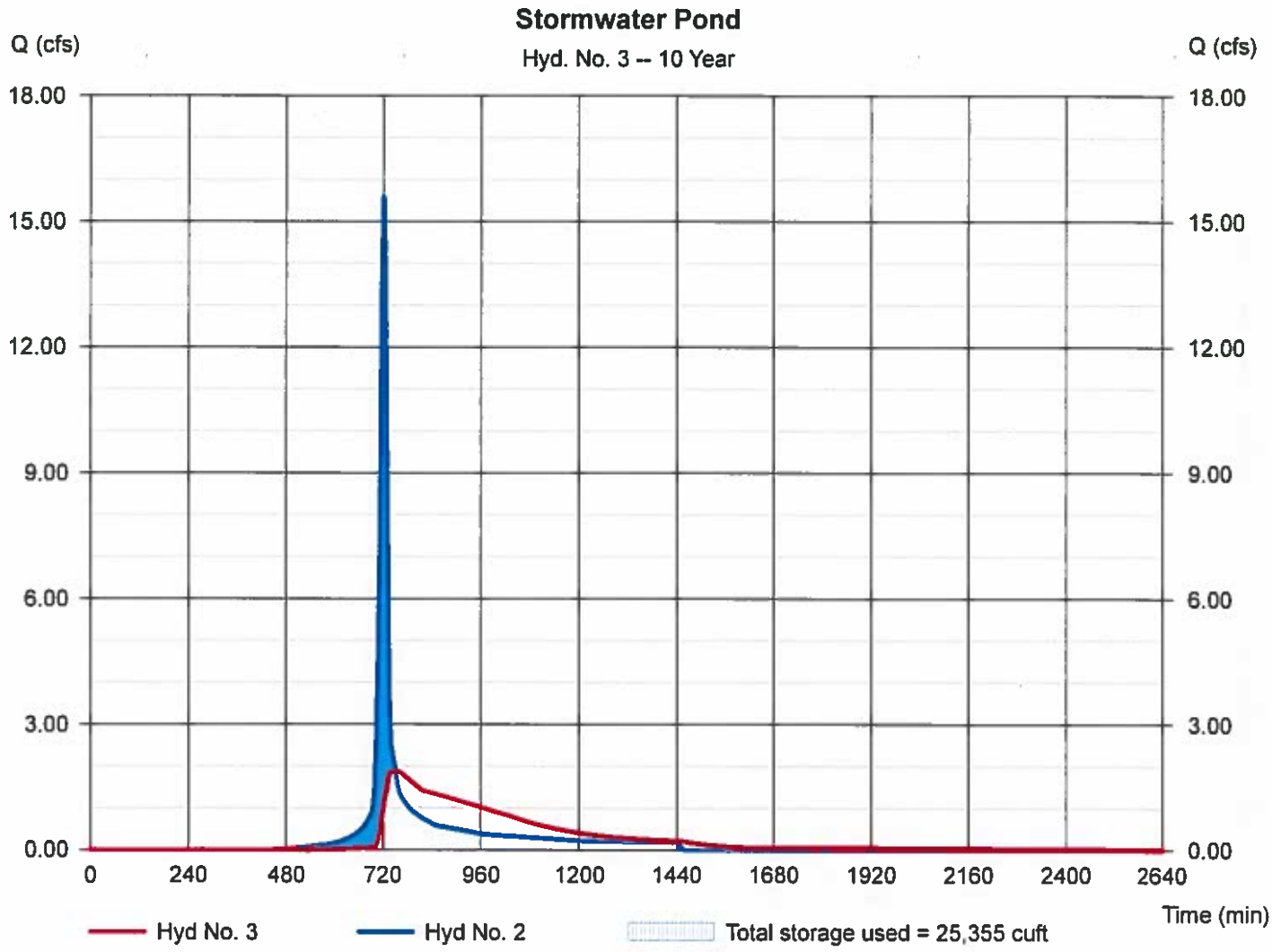
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 3

Stormwater Pond

Hydrograph type	= Reservoir	Peak discharge	= 1.891 cfs
Storm frequency	= 10 yrs	Time to peak	= 749 min
Time interval	= 1 min	Hyd. volume	= 38,935 cuft
Inflow hyd. No.	= 2 - A post	Max. Elevation	= 1036.84 ft
Reservoir name	= Stormwater Pond for Zoning	Max. Storage	= 25,355 cuft

Storage Indication method used. Wet pond routing start elevation = 1034.00 ft.



Hydrograph Summary Report

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

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	SCS Runoff	5.401	1	722	14,417	----	----	------	A pre
2	SCS Runoff	19.66	1	721	50,101	----	------	------	A post
3	Reservoir	3.470	1	737	49,519	2	1037.51	29,993	Stormwater Pond

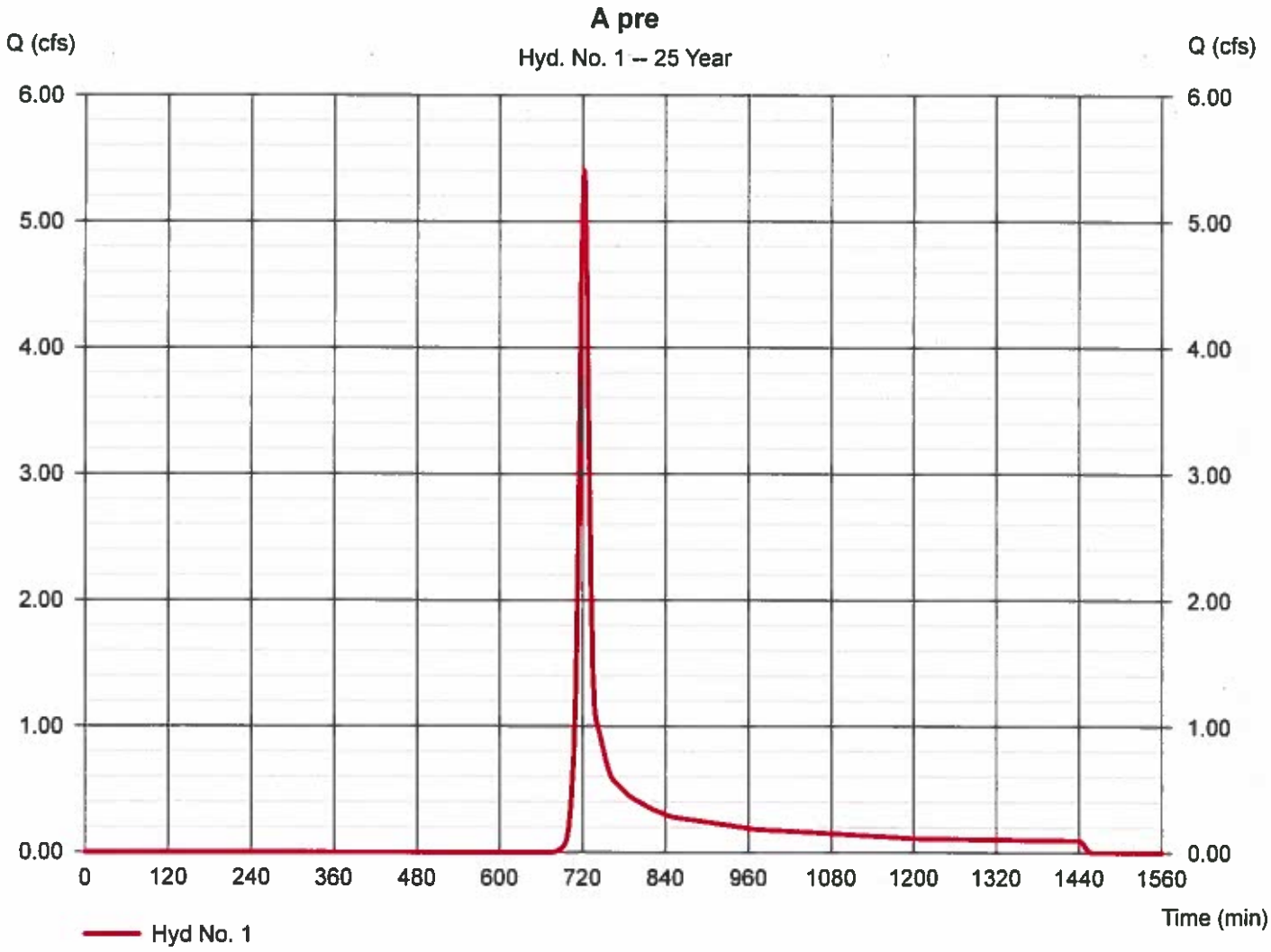
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 1

A pre

Hydrograph type	= SCS Runoff	Peak discharge	= 5.401 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 1 min	Hyd. volume	= 14,417 cuft
Drainage area	= 2.240 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 6.48 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



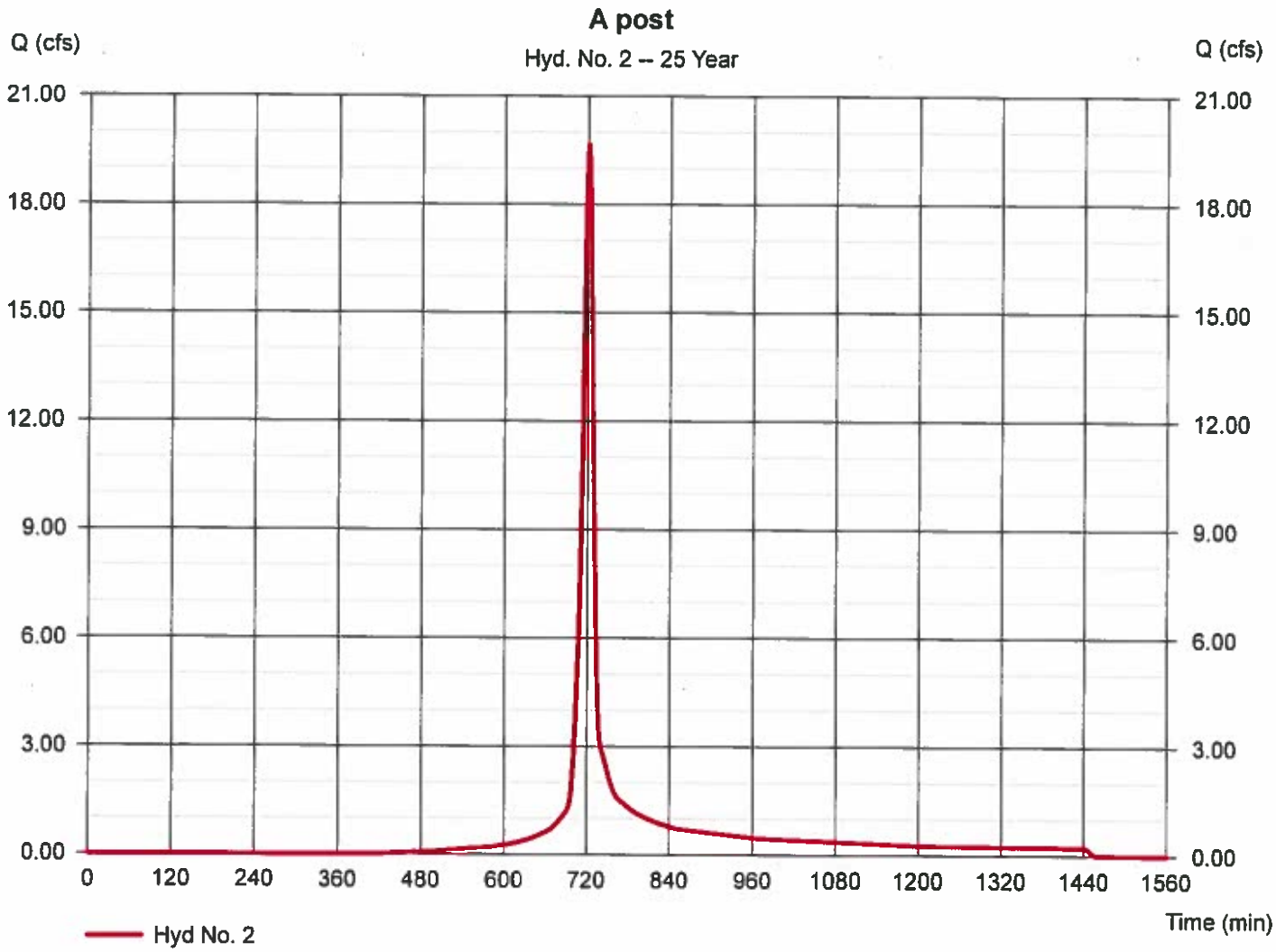
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 2

A post

Hydrograph type	= SCS Runoff	Peak discharge	= 19.66 cfs
Storm frequency	= 25 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 50,101 cuft
Drainage area	= 3.500 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 6.48 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

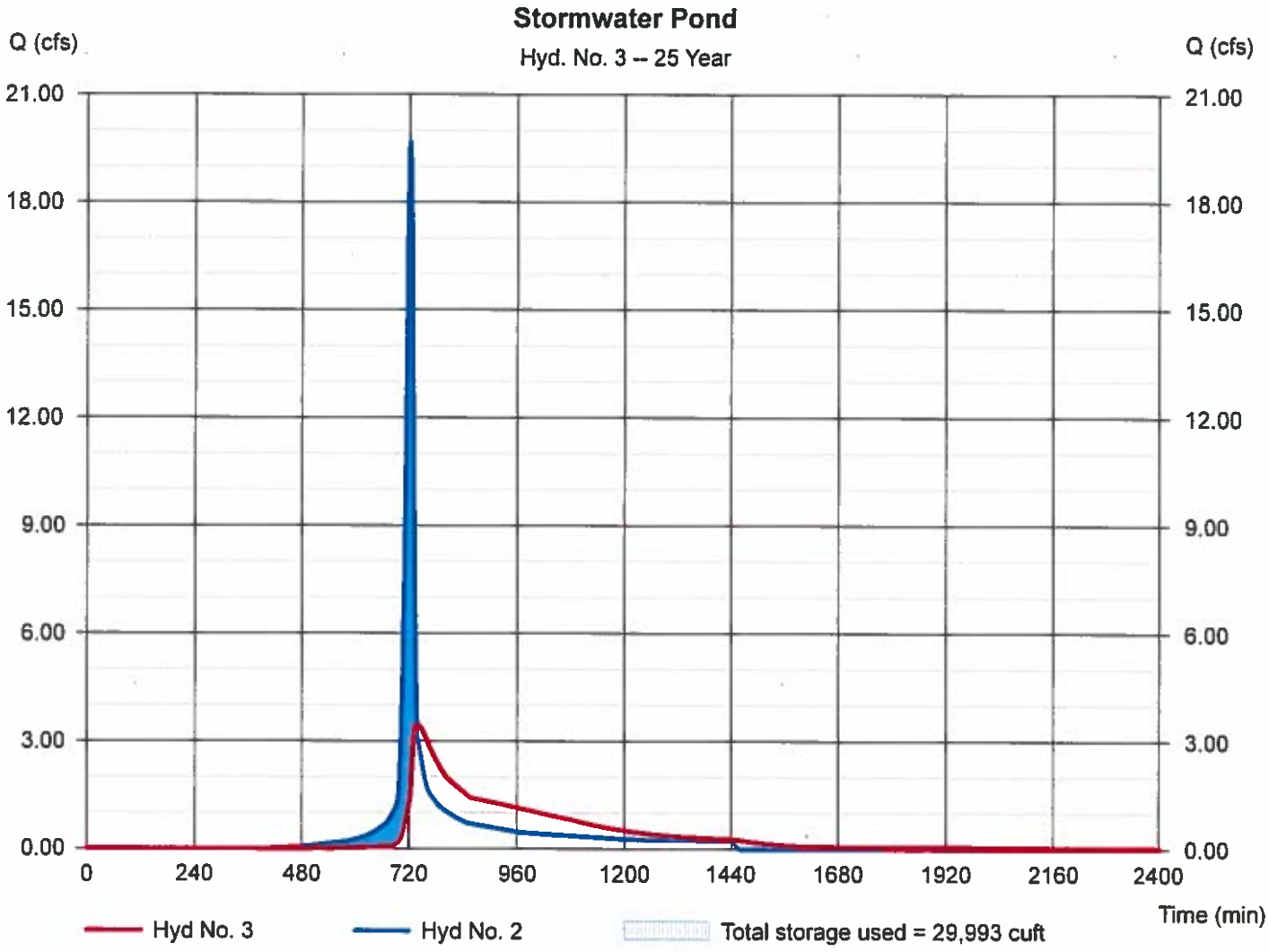
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 3

Stormwater Pond

Hydrograph type	= Reservoir	Peak discharge	= 3.470 cfs
Storm frequency	= 25 yrs	Time to peak	= 737 min
Time interval	= 1 min	Hyd. volume	= 49,519 cuft
Inflow hyd. No.	= 2 - A post	Max. Elevation	= 1037.51 ft
Reservoir name	= Stormwater Pond for Zoning	Max. Storage	= 29,993 cuft

Storage Indication method used. Wet pond routing start elevation = 1034.00 ft.



Hydrograph Summary Report

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

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	SCS Runoff	6.888	1	722	18,025	—	—	—	A pre
2	SCS Runoff	22.74	1	721	58,238	—	—	-----	A post
3	Reservoir	4.984	1	735	57,646	2	1038.00	33,390	Stormwater Pond

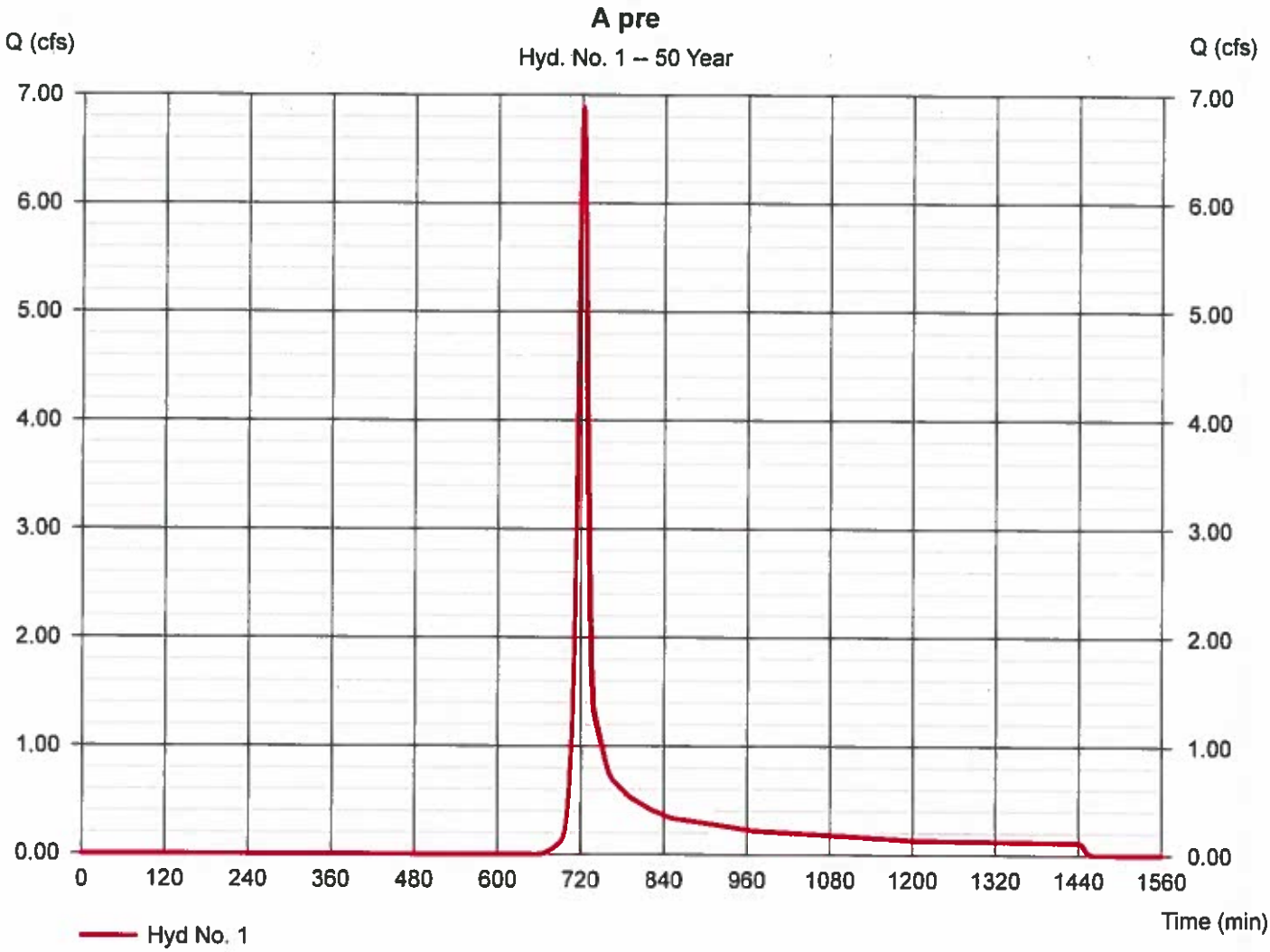
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 1

A pre

Hydrograph type	= SCS Runoff	Peak discharge	= 6.888 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 1 min	Hyd. volume	= 18,025 cuft
Drainage area	= 2.240 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 7.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



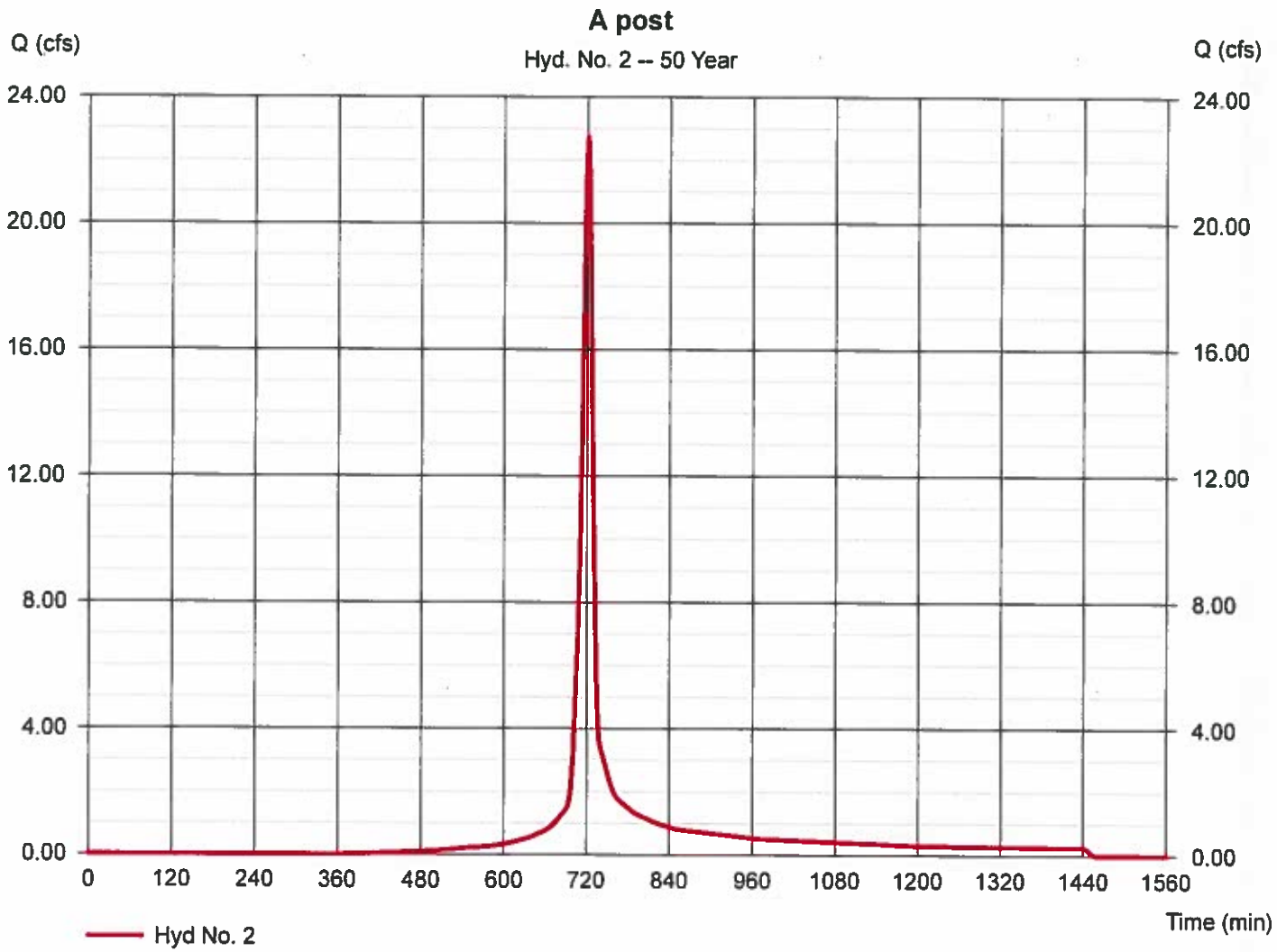
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 2

A post

Hydrograph type	= SCS Runoff	Peak discharge	= 22.74 cfs
Storm frequency	= 50 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 58,238 cuft
Drainage area	= 3.500 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 7.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

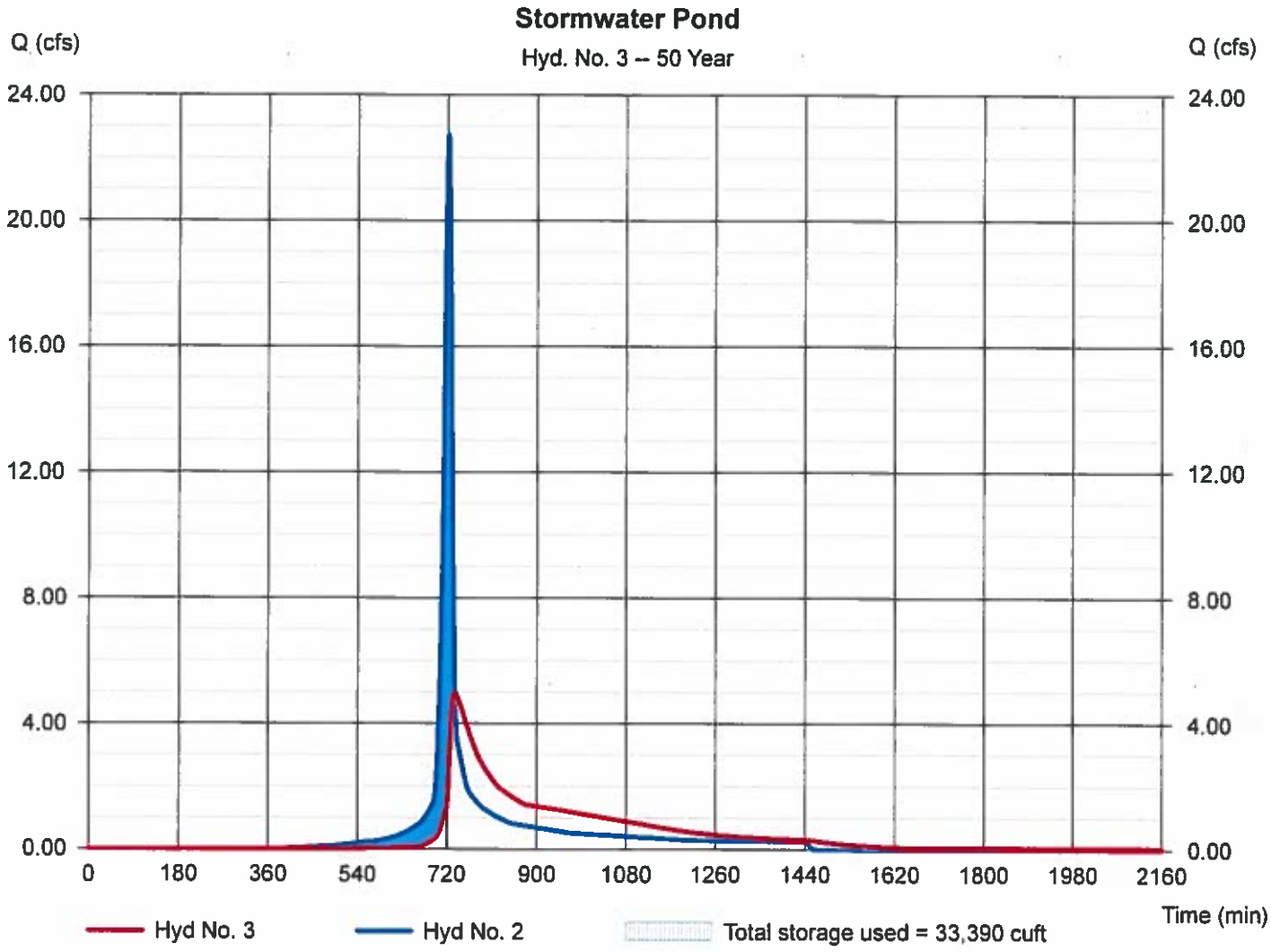
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 3

Stormwater Pond

Hydrograph type	= Reservoir	Peak discharge	= 4.984 cfs
Storm frequency	= 50 yrs	Time to peak	= 735 min
Time interval	= 1 min	Hyd. volume	= 57,646 cuft
Inflow hyd. No.	= 2 - A post	Max. Elevation	= 1038.00 ft
Reservoir name	= Stormwater Pond for Zoning	Max. Storage	= 33,390 cuft

Storage Indication method used. Wet pond routing start elevation = 1034.00 ft.



Hydrograph Summary Report

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

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	SCS Runoff	8.451	1	722	21,848	----	----	------	A pre
2	SCS Runoff	25.83	1	721	66,499	------	------	----	A post
3	Reservoir	6.656	1	734	65,897	2	1038.47	36,646	Stormwater Pond

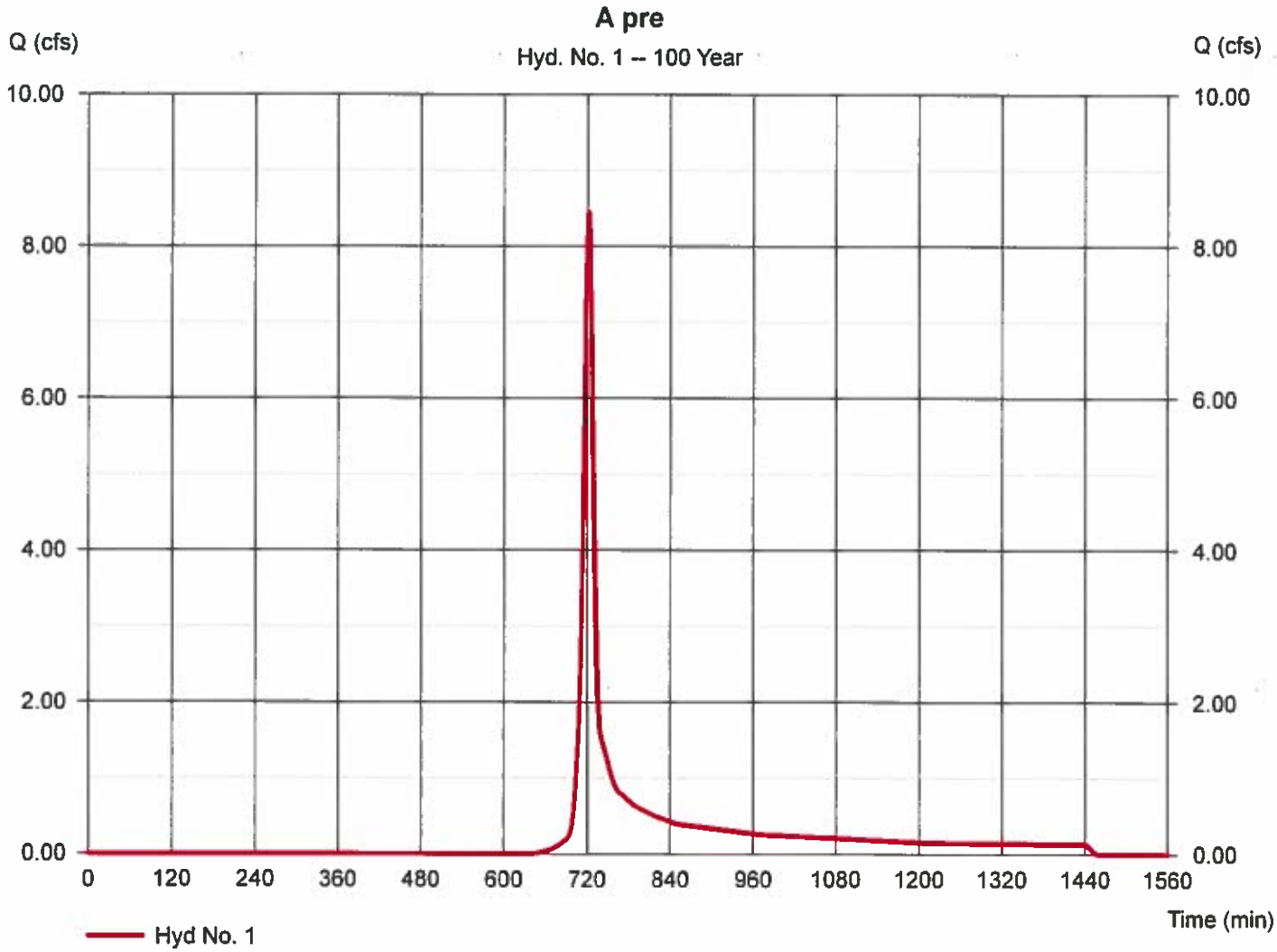
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 1

A pre

Hydrograph type	= SCS Runoff	Peak discharge	= 8.451 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 1 min	Hyd. volume	= 21,848 cuft
Drainage area	= 2.240 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



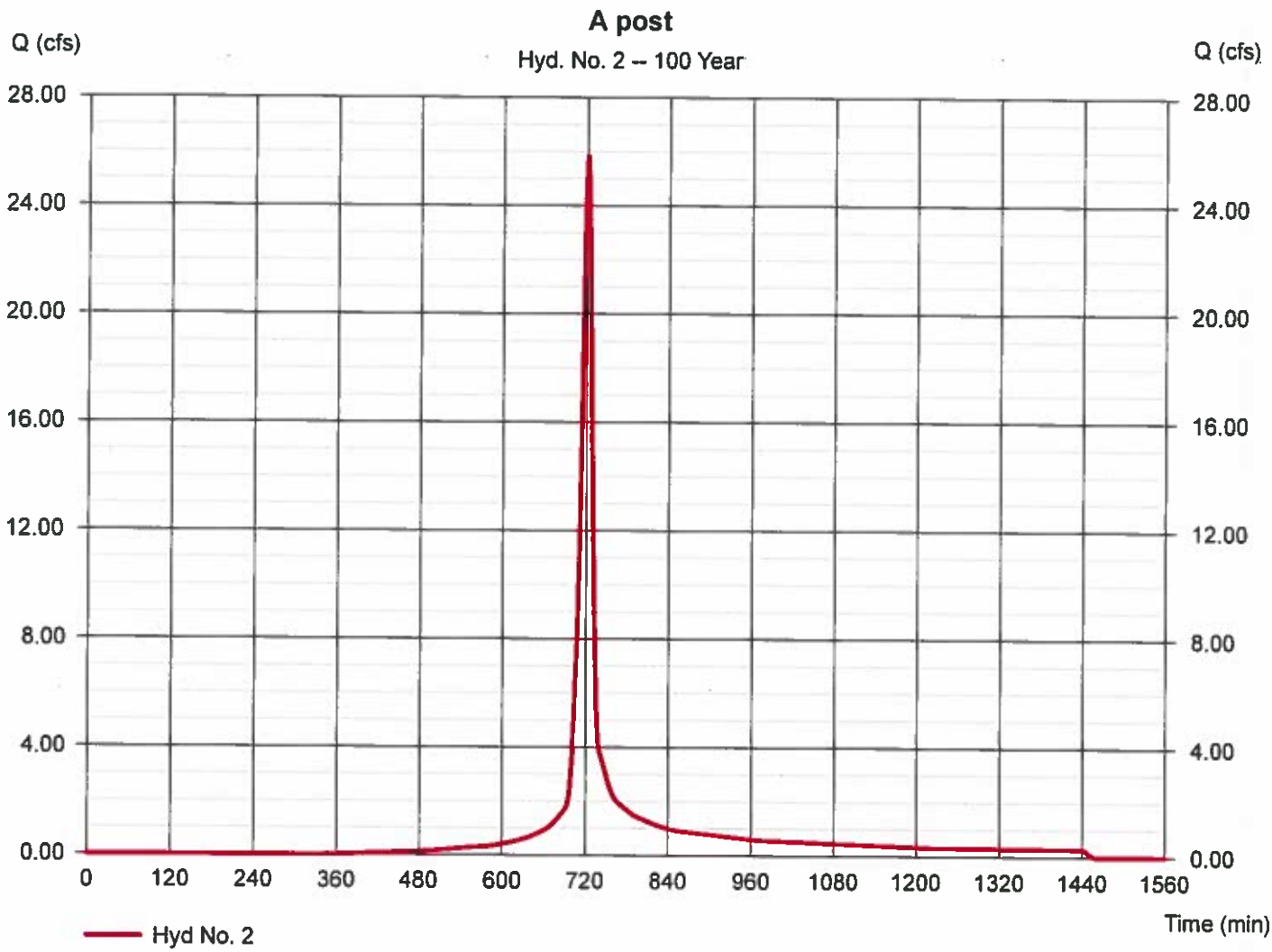
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 2

A post

Hydrograph type	= SCS Runoff	Peak discharge	= 25.83 cfs
Storm frequency	= 100 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 66,499 cuft
Drainage area	= 3.500 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.00 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

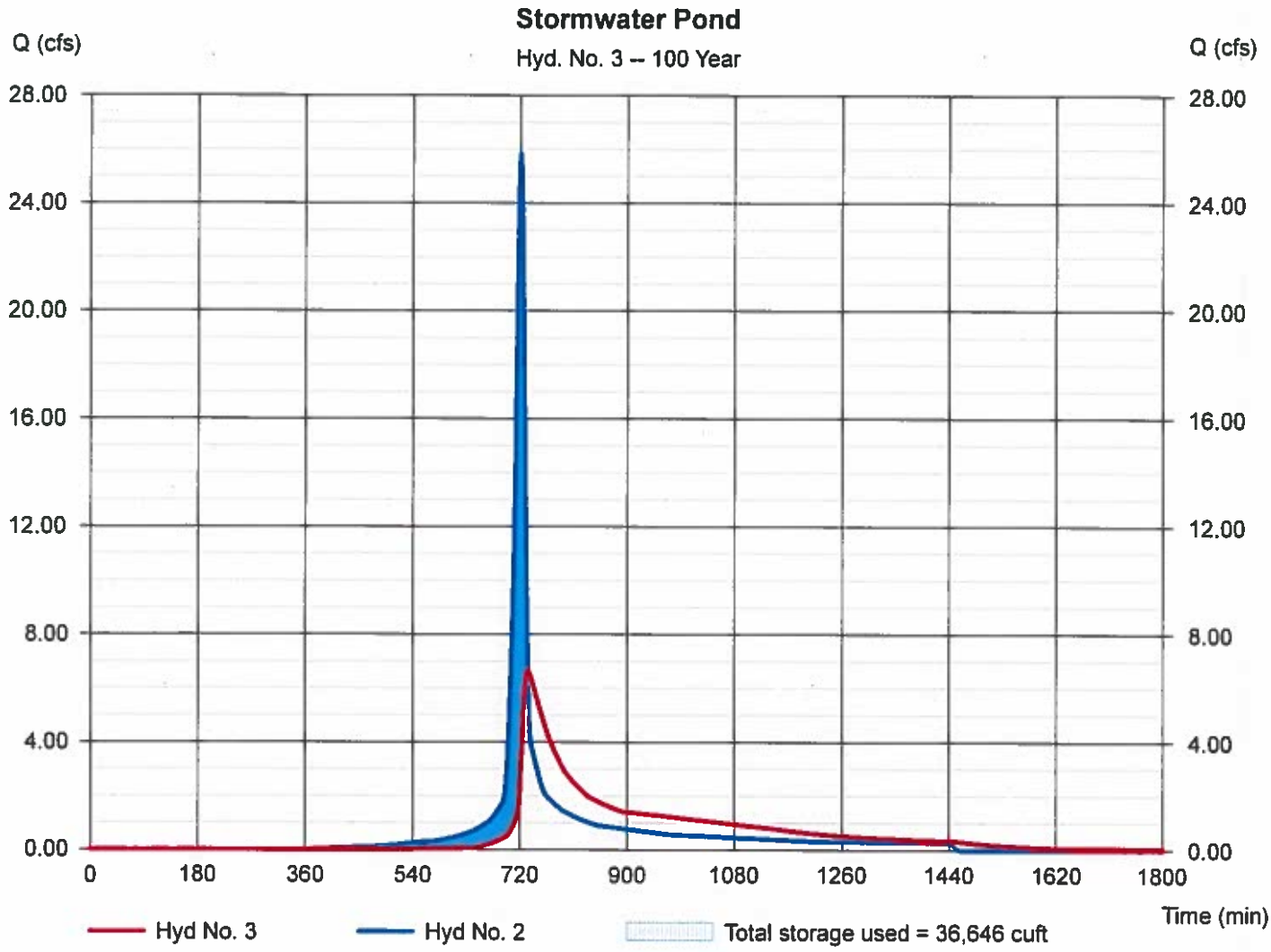
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Saturday, Nov 18, 2017

Hyd. No. 3

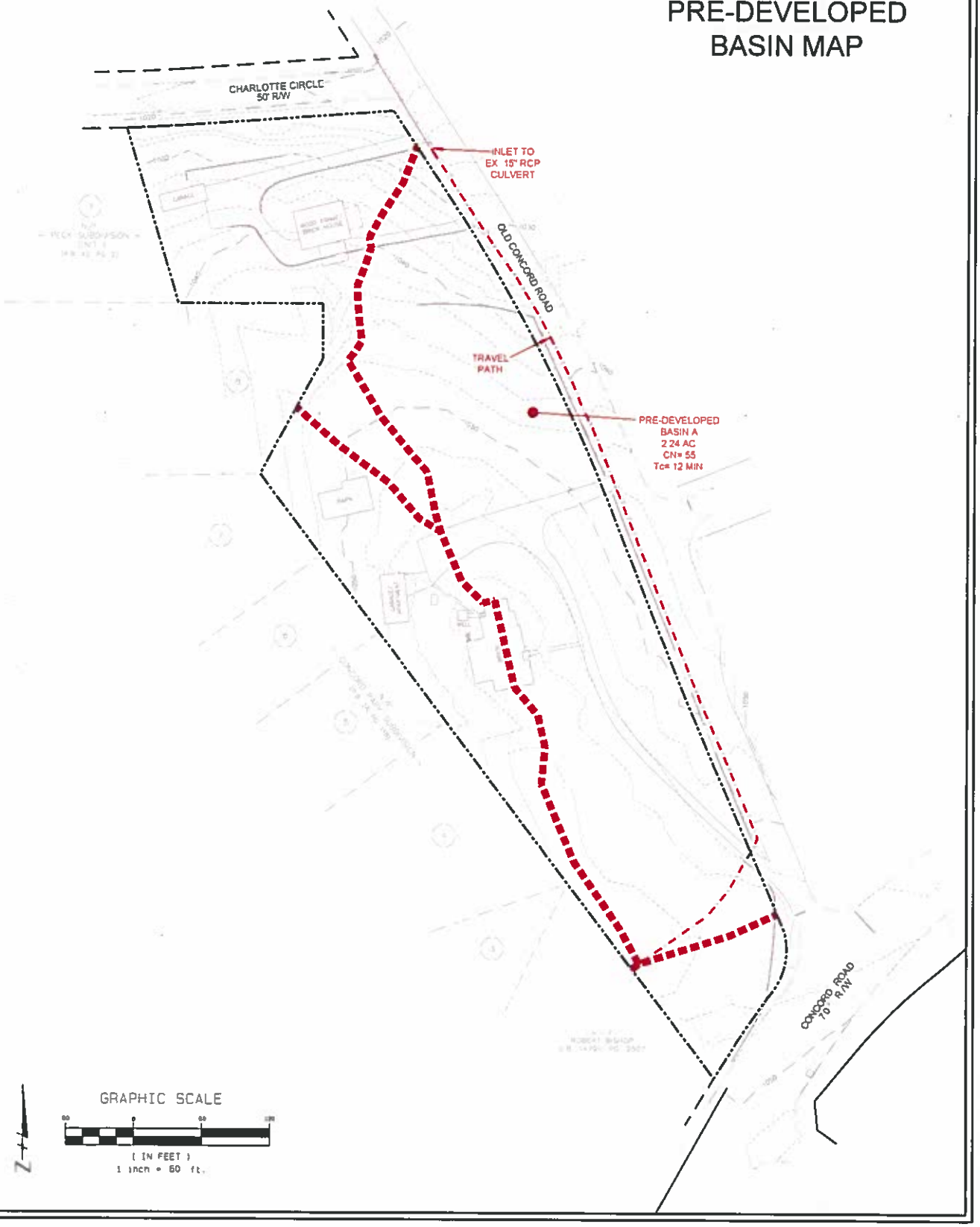
Stormwater Pond

Hydrograph type	= Reservoir	Peak discharge	= 6.656 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 1 min	Hyd. volume	= 65,897 cuft
Inflow hyd. No.	= 2 - A post	Max. Elevation	= 1038.47 ft
Reservoir name	= Stormwater Pond for Zoning	Max. Storage	= 36,646 cuft

Storage Indication method used. Wet pond routing start elevation = 1034.00 ft.



OLD CONCORD ROAD TRACT
PRE-DEVELOPED BASIN MAP



OLD CONCORD ROAD TRACT
PRE-DEVELOPED BASIN MAP