

**Storm Drainage Computations
140 Troy Road
Site Plan of Development
South Windsor, Connecticut**

Prepared by:

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April 30, 2021



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1. Introduction

UW Realty VII, LLC is proposing to develop a 0.77acre parcel of land located at 140 Troy Road in South Windsor, Connecticut. The proposed work will disturb approximately 16,348 SF (0.38 acre) of the parcel. The proposed development will include construction of a new duplex-house with an associated paved driveway, subsurface utilities, and landscaping. Refer to the site plan drawings, entitled – “140 Troy Road ~Site Plan of Development / Special Exception ~ 140 Troy Road, South Windsor, Connecticut ~ GIS PIN: 9000140” prepared by Design Professionals, Inc, dated April 29, 2021”, as amended, for information regarding the proposed property development.

2. Pre vs Post Development Comparisons

The surficial characteristics of the site can primarily be classified as a woodland area. The entire site drains from north to south across the parcel and abutting properties to the south, ultimately reaching the storm water catchment system in Sullivan Avenue.

To establish a hydrologic comparison between pre- and post-development conditions, an evaluation was performed to quantify the increase in stormwater volume for the parcel during a 10-year storm event. The Rational method as outlined in the ConnDOT Drainage Manual, was followed in predicting the peak rates of runoff and volumes. Hydraflow Hydrographs (version 2020) computer modeling software was used as application. Refer to Appendix A for the pre-developed conditions watershed computations.

3. Post Development Site Conditions

The new duplex-home proposed by UW Realty VII, LLC will slightly increase the impervious coverage on the parcel. To control the increase in stormwater volume due to increased impervious coverage, one rain garden is proposed. The raingarden was sized to provide a total storage volume equal to the projected increase in stormwater volume leaving the parcel for the 10-year storm. Our analysis demonstrated an increase of about 356 cft for this storm event. The proposed rain garden was sized to provide at minimum 358 cft of storage. Existing and proposed watershed analysis computations can be found in Appendix A. The Stage storage report for the raingarden is also included in Appendix B.

4. Analysis of Results

Hydraulic conditions related to storm drainage were evaluated for both proposed and existing conditions using Hydraflow Hydrographs (version 2018) computer modeling software to determine peak discharge rates of runoff leaving the developed site. Based on modeling from existing conditions, one discharge location was identified as a point of interest for assessing downstream effects. The following table contains the data generated from the Hydraflow software:

TABLE 1				
Peak Volume of Stormwater Discharge				
Runoff Volume				
Watershed Area	Storm Event (Year)	Pre-developed Condition (ft³)	Post-developed Condition (ft³)	Net Change Rate of Runoff (ft³)
140 Troy Road Property Boundary	10	372	728	+356

As indicated by the analysis results the stormwater runoff volume for the parcel is expected to increase because of the proposed development. The proposed rain garden will store the overall stormwater volume increase. Additional runoff entering the rain garden once full will continue to sheet flow across the southern property boundary just as it does today. Existing and Proposed Hydrographs for are included in Appendix A of this report.

5. Conclusion

It is our opinion that the proposed stormwater management design as presented herein and on the accompanying site plans, will not pose any significant detrimental impacts to the environment surrounding the site.

APPENDIX A
Watershed Computations
(Pre & Post-Development Conditions)

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

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	0.620	1	10	372	-----	-----	-----	Existing
2	Rational	1.214	1	10	728	-----	-----	-----	Proposed
4620 - HydroFlow.gpw					Return Period: 10 Year			Friday, 04 / 30 / 2021	

Hydrograph Report

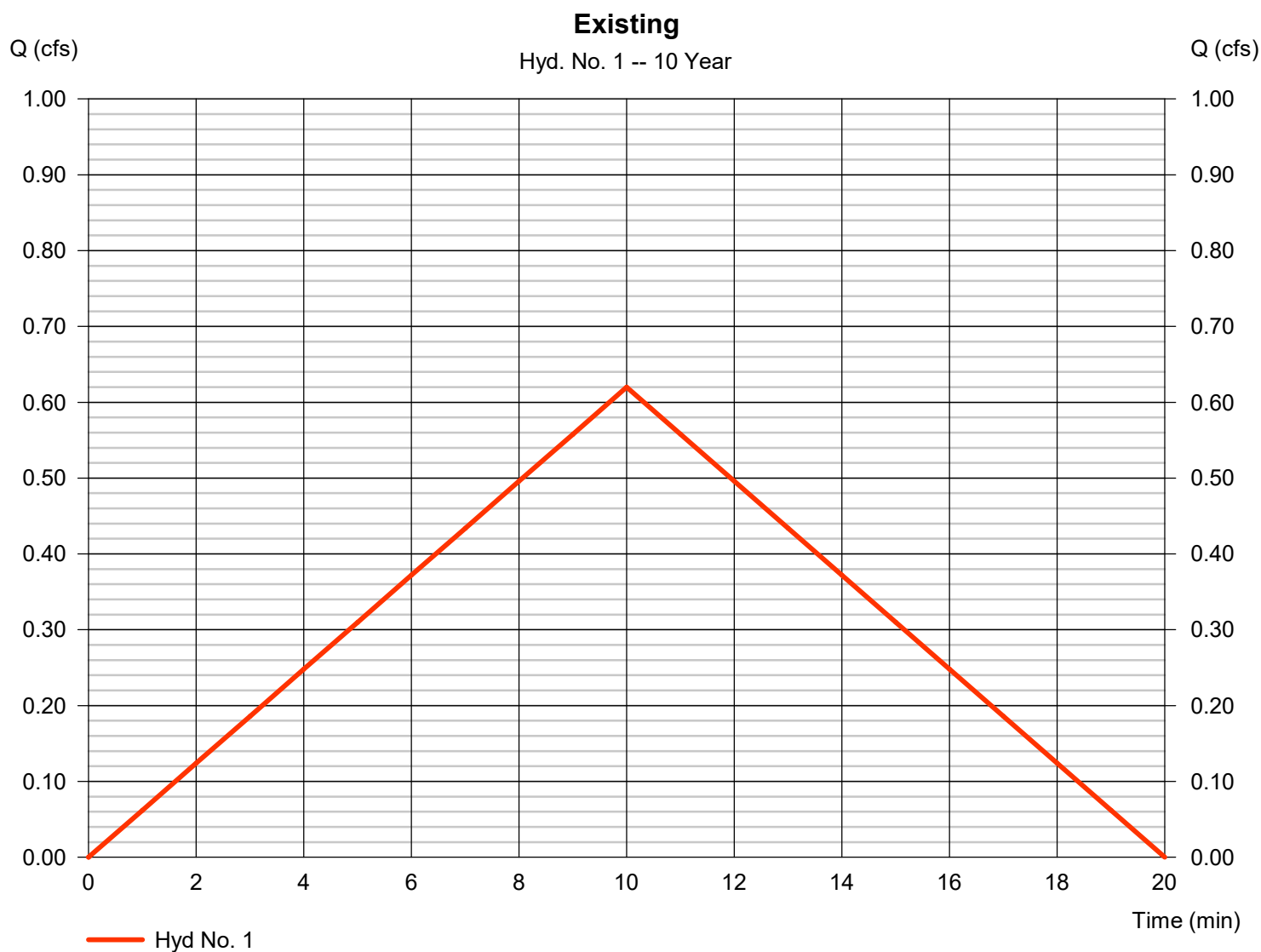
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 04 / 30 / 2021

Hyd. No. 1

Existing

Hydrograph type	= Rational	Peak discharge	= 0.620 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 372 cuft
Drainage area	= 0.770 ac	Runoff coeff.	= 0.15
Intensity	= 5.367 in/hr	Tc by TR55	= 10.00 min
IDF Curve	= SampleFHA.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

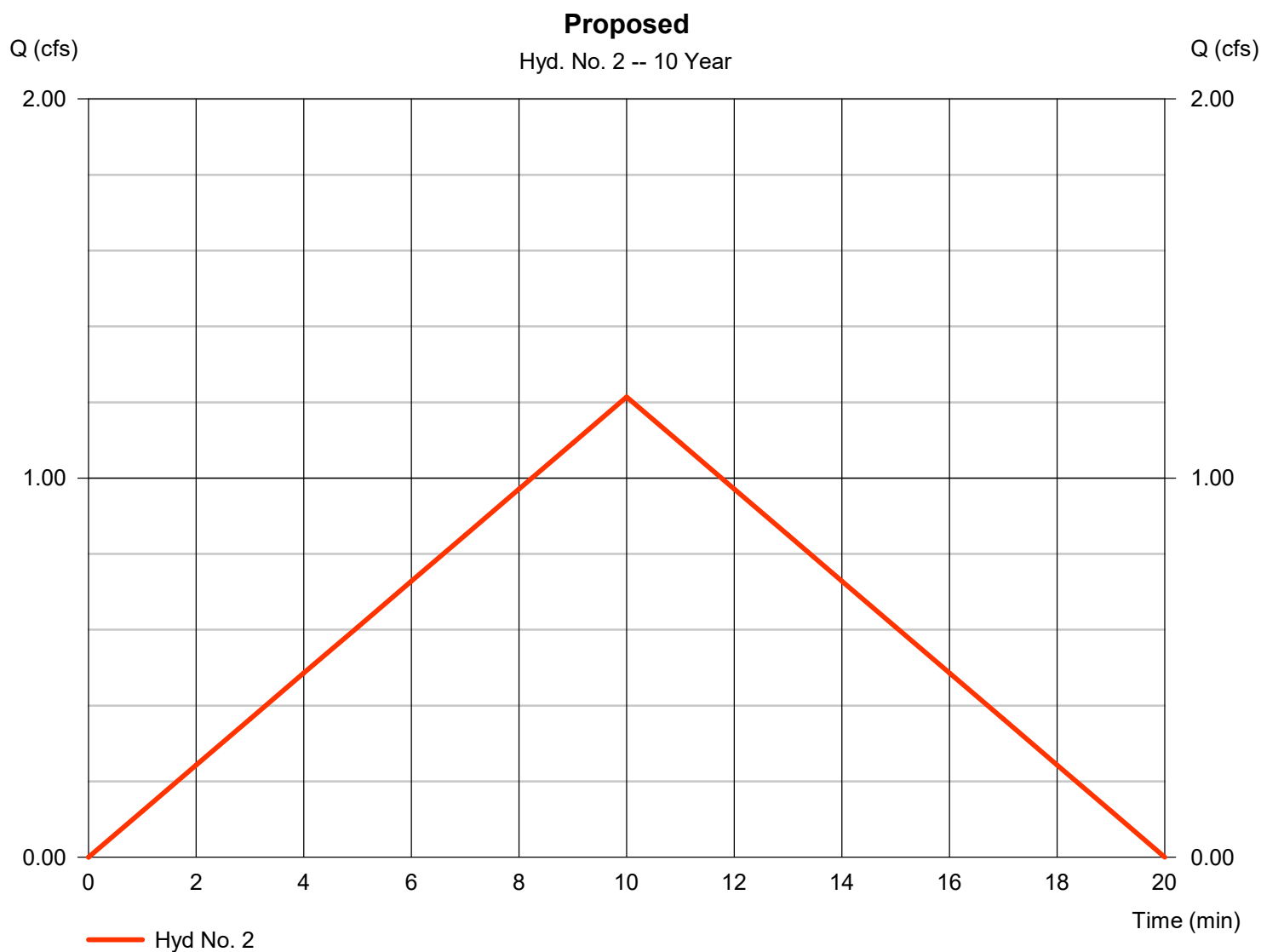
Friday, 04 / 30 / 2021

Hyd. No. 2

Proposed

Hydrograph type	= Rational	Peak discharge	= 1.214 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 728 cuft
Drainage area	= 0.780 ac	Runoff coeff.	= 0.29*
Intensity	= 5.367 in/hr	Tc by User	= 10.00 min
IDF Curve	= SampleFHA.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = $[(0.400 \times 0.15) + (0.270 \times 0.25) + (0.110 \times 0.90)] / 0.780$



APPENDIX B
Rain Garden Stage Storage

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 04 / 30 / 2021

Pond No. 1 - Rain Garden

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 92.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	92.00	228	0	0
1.00	93.00	507	358	358

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	= .000	.000	.000	n/a
Orifice Coeff.	= 0.00	0.00	0.00	0.00
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.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

