

**Storm Drainage Computations
Miller Heights
Subdivision Plan
73 Miller Road
South Windsor, Connecticut**

Prepared by:

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November 22, 2021



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1. Introduction

Jacques Construction, LLC is proposing to develop a 4.52 acre parcel of land located at 73 Miller Road in South Windsor, Connecticut. The proposed work will disturb approximately 61,845 SF± (1.42 acre) of the parcel. The proposed development will include construction of two new single-family (existing home to be razed) with an associated paved driveways, subsurface utilities, and landscaping. Refer to the site plan drawings, entitled – “Miller Heights Subdivision ~ 73 Miller Road, South Windsor, Connecticut, prepared by Design Professionals, Inc, dated November 22, 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 woodland and grass areas that are common for residential properties. One existing house, shed, and gravel driveway apron are the only impervious surface onsite. These existing features are proposed to be removed during construction. Woodlands make up most of the parcel area. The existing topography onsite indicated a ridgeline exists onsite that sheds stormwater to across the North, East, and Westerly property lines.

To establish a hydrologic comparison between pre- and post-development conditions, an evaluation was performed to quantify the increase in stormwater volume on both proposed lots 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. Drainage area limits considered followed the proposed property boundaries for the two lots. A drainage area map showing existing and proposed conditions is included as **Appendix B** of this report. Refer to **Appendix A** for the pre-developed conditions watershed computations.

3. Post Development Site Conditions

The two new homes proposed by Jacques Construction, LLC will slightly increase the impervious coverage of the proposed lot areas. To control the increase in stormwater volume due to increased impervious coverage, rain gardens are proposed for both lots. The raingardens were sized to provide a total storage volume equal to the projected increase in stormwater volume for the two lot areas during a the 10-year storm event. Our analysis demonstrated an increase of about 760 cft for Lot 1 and 741 cft for Lot 2 during this storm event. The proposed rain gardens for Lots 1 and 2 were sized to provide 765 cft and 788 cft of storage respectively. Proposed condition computations can be found in **Appendix A**. Stage storage reports for the raingarden are included on the drainage area map found 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 2020) computer modeling software to determine the total runoff volume leaving the developed site. The following table contains the data generated from the Hydraflow software:

TABLE 1				
Peak Volume of Stormwater Discharge				
Watershed Area	Storm Event (Year)	Runoff Volume		
		Pre-developed Condition (ft³)	Post-developed Condition (ft³)	Net Change Rate of Runoff (ft³)
Proposed Lot 1	10	1,352	2,112	+760
Proposed Lot 2	10	1,500	2,241	+741

5. Conclusion

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

APPENDIX A
Drainage Area Computations
(Pre & Post Development Conditions)

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

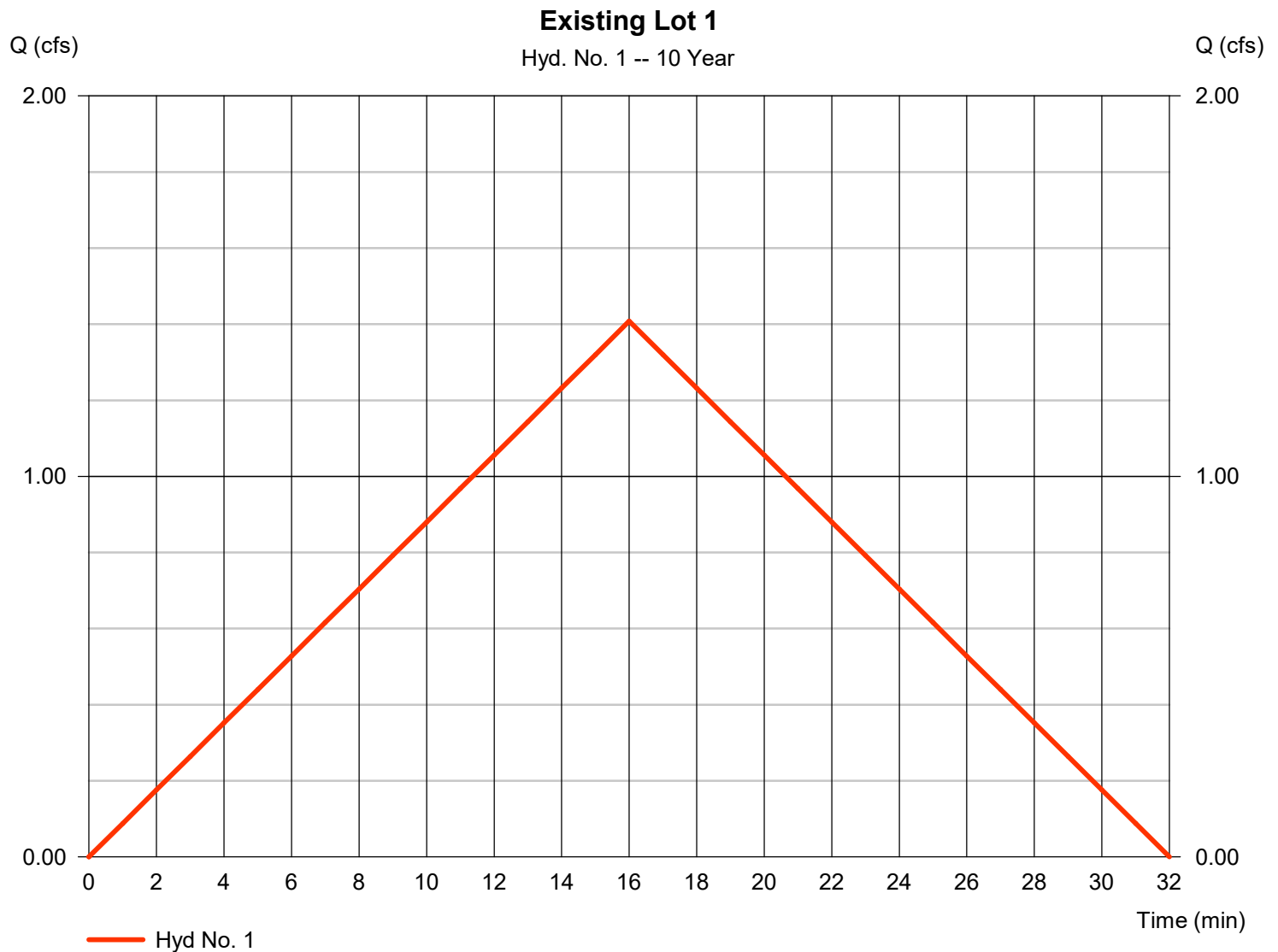
Wednesday, 11 / 17 / 2021

Hyd. No. 1

Existing Lot 1

Hydrograph type	= Rational	Peak discharge	= 1.408 cfs
Storm frequency	= 10 yrs	Time to peak	= 16 min
Time interval	= 1 min	Hyd. volume	= 1,352 cuft
Drainage area	= 2.140 ac	Runoff coeff.	= 0.16*
Intensity	= 4.112 in/hr	Tc by TR55	= 16.00 min
IDF Curve	= SampleFHA.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = $[(2.048 \times 0.15) + (0.074 \times 0.25) + (0.017 \times 0.90)] / 2.140$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

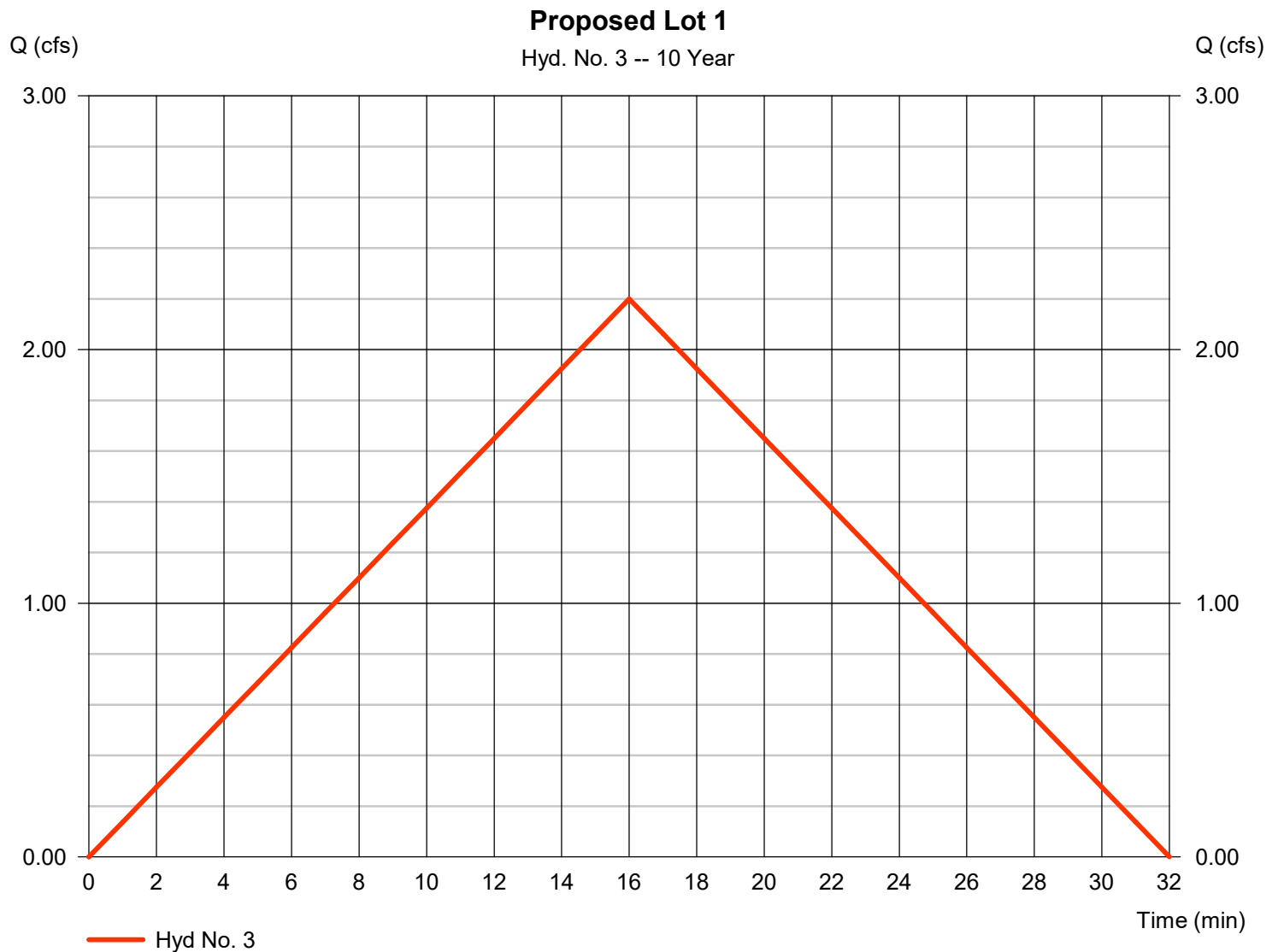
Wednesday, 11 / 17 / 2021

Hyd. No. 3

Proposed Lot 1

Hydrograph type	= Rational	Peak discharge	= 2.200 cfs
Storm frequency	= 10 yrs	Time to peak	= 16 min
Time interval	= 1 min	Hyd. volume	= 2,112 cuft
Drainage area	= 2.140 ac	Runoff coeff.	= 0.25*
Intensity	= 4.112 in/hr	Tc by TR55	= 16.00 min
IDF Curve	= SampleFHA.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = $[(1.440 \times 0.15) + (0.490 \times 0.25) + (0.210 \times 0.90)] / 2.140$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

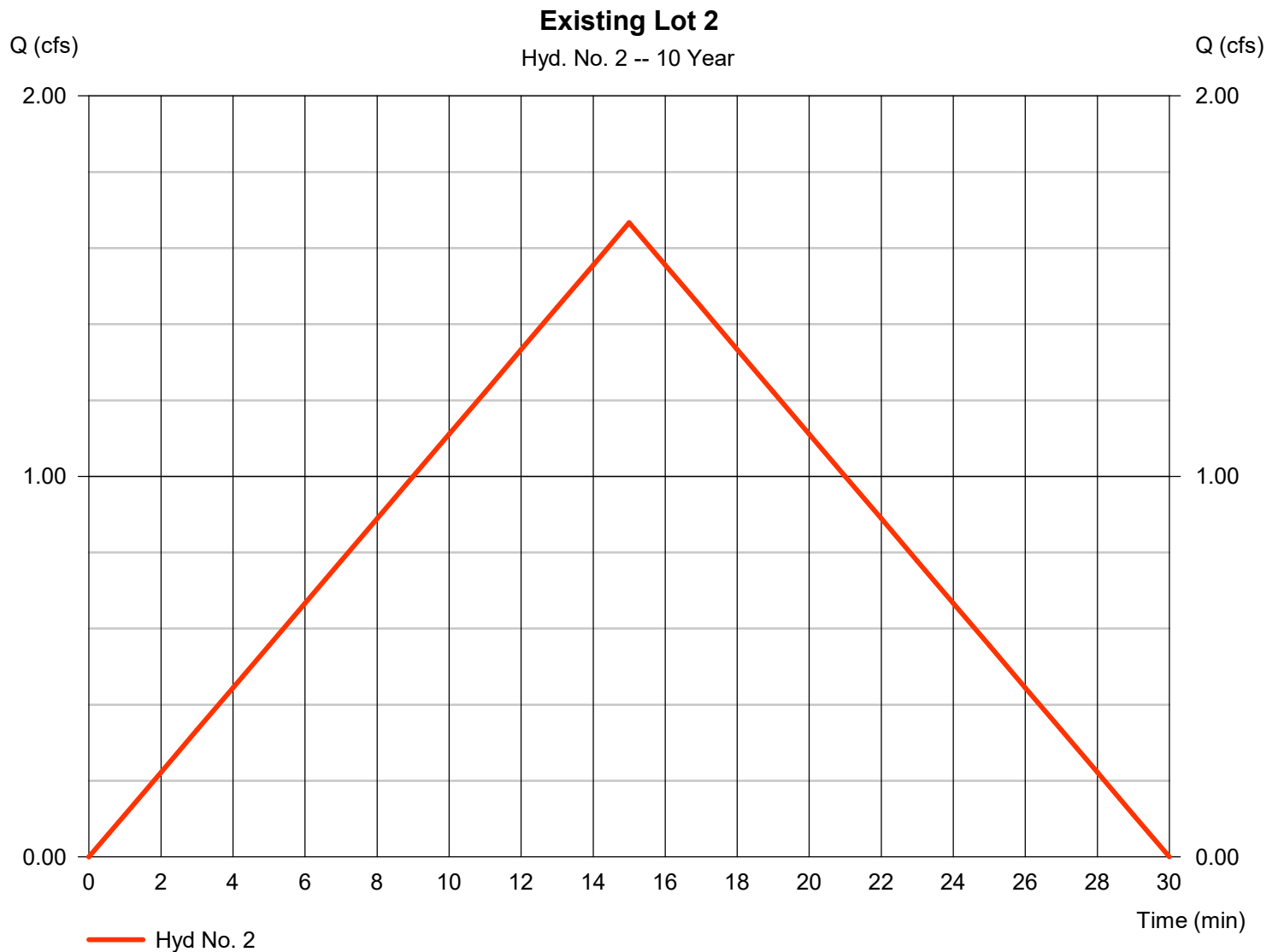
Wednesday, 11 / 17 / 2021

Hyd. No. 2

Existing Lot 2

Hydrograph type	= Rational	Peak discharge	= 1.667 cfs
Storm frequency	= 10 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 1,500 cuft
Drainage area	= 2.440 ac	Runoff coeff.	= 0.16*
Intensity	= 4.269 in/hr	Tc by TR55	= 15.00 min
IDF Curve	= SampleFHA.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = $[(2.219 \times 0.15) + (0.201 \times 0.25) + (0.016 \times 0.90)] / 2.440$



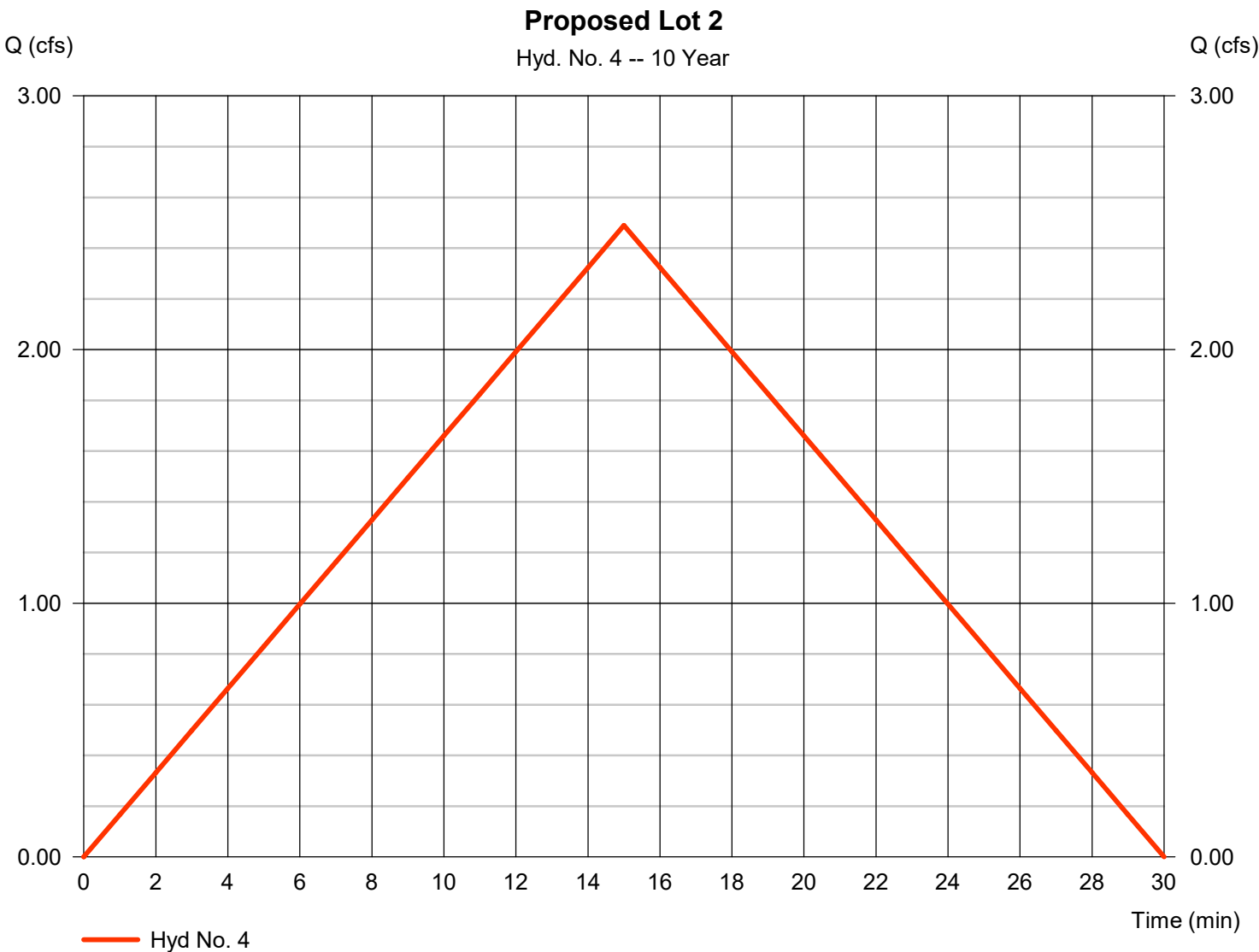
Hydrograph Report

Hyd. No. 4

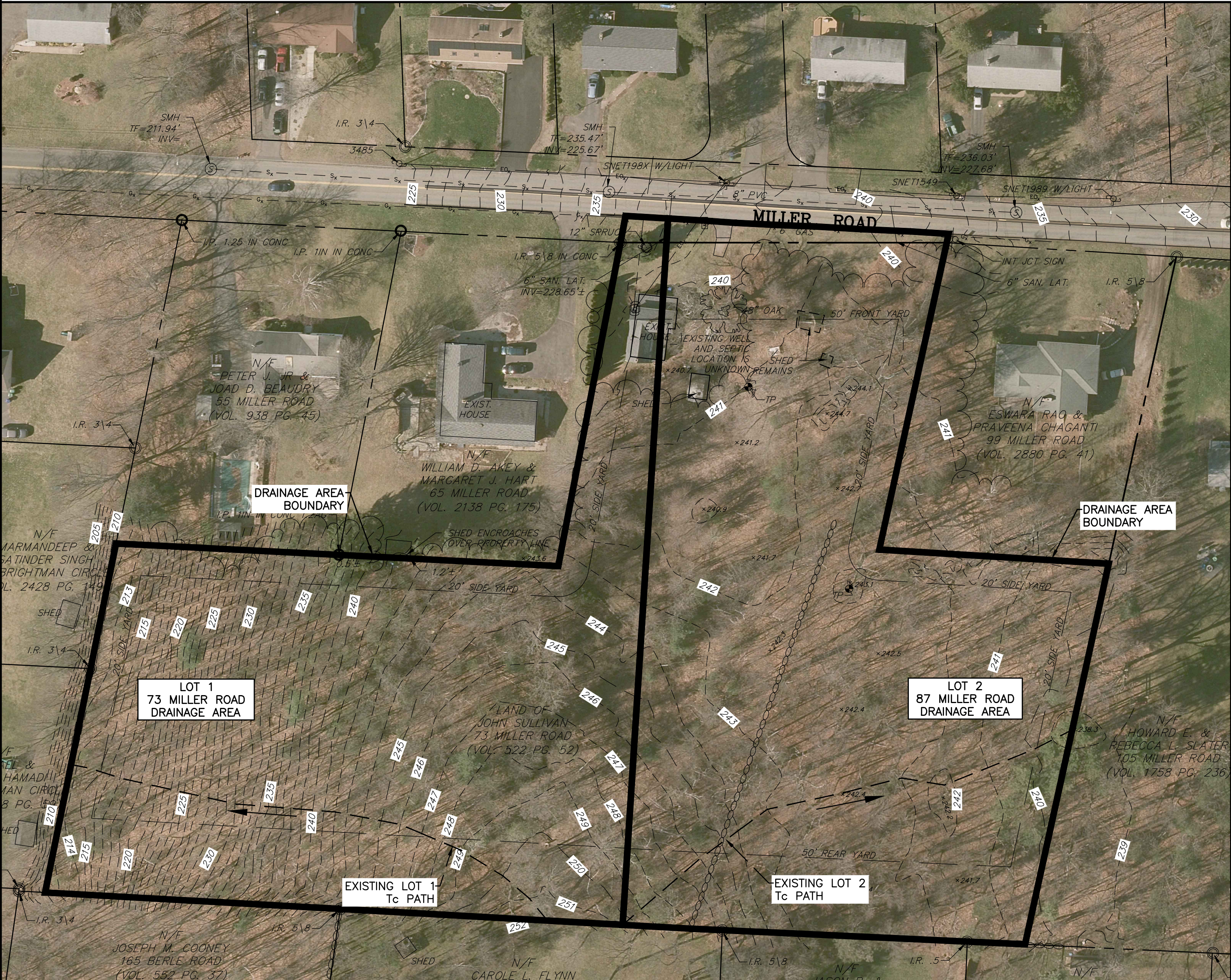
Proposed Lot 2

Hydrograph type	= Rational	Peak discharge	= 2.490 cfs
Storm frequency	= 10 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 2,241 cuft
Drainage area	= 2.430 ac	Runoff coeff.	= 0.24*
Intensity	= 4.269 in/hr	Tc by User	= 15.00 min
IDF Curve	= SampleFHA.idf	Asc/Rec limb fact	= 1/1

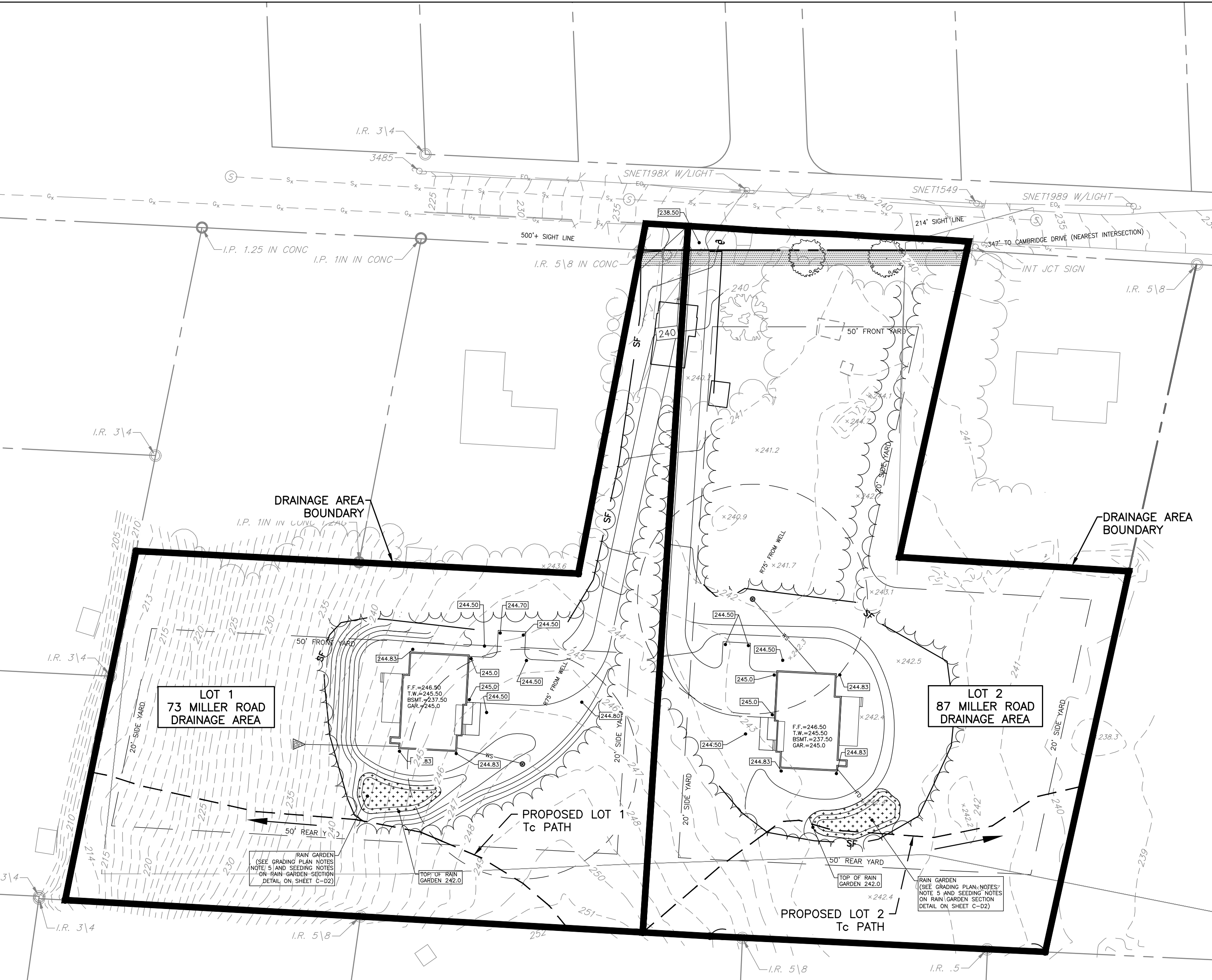
* Composite (Area/C) = [(1.560 x 0.15) + (0.674 x 0.25) + (0.198 x 0.90)] / 2.430



APPENDIX B
Drainage Area Map
(with Rain Garden Stage Storage Reports)



EXISTING CONDITIONS



PROPOSED CONDITIONS

LOT 1 RAIN GARDEN STAGE STORAGE TABLE						
ELEV	AREA (sq. ft.)	DEPT H (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
241.00	583.91	N/A	N/A	0.00	N/A	0.00
242.00	962.82	1.00	773.36	773.36	765.51	765.51

LOT 1 RAIN GARDEN DESIGN
THE RAIN GARDEN WAS SIZED TO ACCOMMODATE THE INCREASE IN STORMWATER RUNOFF VOLUME FOR A 10-YEAR STORM EVENT.

THE TOTAL RUNOFF VOLUME FOR THE SITE IS EXPECTED TO INCREASE BY 760 CFT AS A RESULT OF THE PROPOSED HOUSE AND ASSOCIATED DRIVEWAY AREAS.

THE PROPOSED RAIN GARDEN AREA, WILL PROVIDE APPROXIMATELY 765 CFT OF STORAGE.

LOT 2 RAIN GARDEN STAGE STORAGE TABLE						
ELEV	AREA (sq. ft.)	DEPT H (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
241.00	599.77	N/A	N/A	0.00	N/A	0.00
242.00	993.30	1.00	796.54	796.54	788.31	788.31

LOT 2 RAIN GARDEN DESIGN
THE RAIN GARDEN WAS SIZED TO ACCOMMODATE THE INCREASE IN STORMWATER RUNOFF VOLUME FOR A 10-YEAR STORM EVENT.

THE TOTAL RUNOFF VOLUME FOR THE SITE IS EXPECTED TO INCREASE BY 741 CFT AS A RESULT OF THE PROPOSED HOUSE AND ASSOCIATED DRIVEWAY AREAS.

THE PROPOSED RAIN GARDEN AREA, WILL PROVIDE APPROXIMATELY 788 CFT OF STORAGE.

PROPERTY OWNER:
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SOUTH WINDSOR, CT 06074

APPLICANT:
JOHN JACQUES
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REFERENCES:
THIS PLAN REFERS TO THE FOLLOWING:
1. PLAN ENTITLED "PROPERTY & TOPOGRAPHIC SURVEY, LAND OF JOHN SULLIVAN, #73 MILLER ROAD, SOUTH WINDSOR, CONNECTICUT" DATED 10-1-21 PREPARED BY DESIGN PROFESSIONALS, INC.



DRAINAGE AREA MAPS

C-DA1
SHEET 1 OF 1

REVISIONS

BY

DATE

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SOUTH WINDSOR, CT

PREPARED FOR:
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