Jarmel Kizel
ARCHITECTS AND ENGINEERS INC.

STORMWATER MANAGEMENT REPORT

FOR

14 SECOND STREET

MIXED-USE DEVELOPMENT

14 Second Street
Block 1905, Lot 2
Township of South Orange Village
Essex County, New Jersey

Prepared by
Jarmel Kizel Architects & Engineers, Inc.

Prepared For:
Y Group, LLC
90 Grand Street
Hoboken, NJ 07030

Jarmel Kizel Project No. YGROUP-S-16-145
Dated: March 30, 2017

Gerard P. Gesario, PE
Professional Engineer
N.J. License No. GE038255

Signature

ARCHITECTURE
ENGINEERING
SPACE PLANNING
INTERIOR DESIGN
IMPLEMENTATION SERVICES

PRINCIPALS
MARVIN JARMEL, IIDA
MATTHEW B. JARMEL, AIA, MBA
IRWIN H. KIZEL, AIA, PP
RICHARD A. JARMEL, PE

NJ STATE BOARD OF ARCHITECTS
CERTIFICATE OF AUTHORIZATION NUMBER 161

NJ STATE BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION NUMBER GA278177

42 Okner Parkway
Livingston, NJ 07039

TEL: (973) 994-9669
FAX: (973) 994-4069

www.jarmelkizel.com

Table of Contents

FIGURES

APPENDICES

INTRODUCTION

This report has been prepared on behalf of the applicant, Y Group, LLC, in support of their application for the construction of a mixed-use building located at 14 Second Street in South Orange Village, Essex County, New Jersey. The purpose of this report is to demonstrate compliance with the local stormwater management regulations applicable to this project.

PROJECT DESCRIPTION

14 2nd Street is located along the south side of 2nd street roughly 100 feet east of the intersection with Sloan Street in South Orange Village, Essex County, New Jersey. See Figure 1, Site Location Map. The parcel is designated as Lot 2 in Block 1905 on the tax maps. The property is a rectangular shaped lot with an area of 8,304 square feet. To the west of the lot is a Wells Fargo bank, to the east is a 2-story, 2-family residential structure. Directly across the street is a public access parking lot.

The proposed project will create a first floor retail space of 560 square feet. Eight (8) residential apartments will be constructed in 3 stories above the retail first floor. Covered parking below the residential units will be provided for thirteen (13) vehicles.

The Site development will increase the amount of impervious surface from the previously developed conditions thus increasing the amount of stormwater runoff leaving the site. In order to mitigate the increase in runoff, the project will a below grade detention tank system.

PROPOSED STORMWATER MANAGEMENT

Existing Site Conditions

The site is located along the south side of 2nd street roughly 100 feet east of the intersection with Sloan Street in South Orange Village, Essex County, New Jersey. Although the site is vacant today, the lot previously contained 2-story structure and single story garage structure. These were both recently demolished. See Figure 2, 2012 Aerial Image.

The 0.19 acre, divided into two (2) watershed areas, site slopes predominantly to the north and toward 2nd Street with a small area draining to the west onto the adjacent lot 1 commercial property. Area 1 on the enclosed Existing Conditions Drainage Area Map is 0.15 acres and

drains toward 2nd Street. Area 2 on the enclosed Existing Conditions Drainage Area Map is 0.04 acres and drains toward the adjacent lot 1. Existing peak flow rates for the watershed areas are provided in Table 1 below.

Table 1: Existing Peak Flows

Storm Event	Existing Peak Flow (cfs)	
	Pre-Developed to POA 1	Pre-Developed to POA 2
2-YR	0.386	0.071
10-YR	0.542	0.100
25-YR	0.623	0.115
100-YR	0.755	0.139

Proposed Site Conditions

The proposed development structure will cover nearly 100 percent of the lot. Runoff to the adjacent lot 1 commercial property will be nearly eliminated as the developed conditions area drainage toward this lot is reduced to 0.01 acres. Nearly all of the remaining site area, 0.17 acres, will be covered by the building structure. Runoff will be collected via roof drains and directed to the proposed storm detention tank. The proposed tank will be located below grade in the northwest corner of the covered parking lot. A very small area of the site, 0.02 acres, bypasses the collection system and drains directly toward 2nd Street. Developed peak flow rates for the watershed areas are provided in Table 2 below.

Table 2: Developed Peak Flows

Storm Event	Developed Peak Flow (cfs)		
	Developed to Storage	Developed to POA 2	Developed Bypass
2-YR	0.470	0.014	0.036
10-YR	0.659	0.019	0.051
25-YR	0.758	0.022	0.059
100-YR	0.949	0.027	0.071

Water Quantity Design

A comparison of the existing and proposed peak flow rates summarized in Tables 1 and 2 above indicate an increase in runoff toward 2nd Street. In order to mitigate the increase in runoff to reduce the developed peak flow rates to the same or less than the existing peak flow rates, a small detention tank is proposed. The runoff from the area bypassing the detention tank system was subtracted from the existing peak flow rates toward 2nd Street in order to determine the allowable routed peak flow rates. The proposed tank will be located below grade in the northwest corner of the covered parking lot. The tank will release collected storm runoff through a 3 ¼-inch diameter low flow orifice and a secondary 6-inch weir set above the low flow orifice. The routed peak discharges through the detention structure result in a reduction of peak flows such that the developed peak flow toward 2nd Street is less than the existing peak flow toward 2nd Street.

Table 3 below summarizes the existing peak flow rates, developed peak flow rates and the actual routed outflows from the proposed detention tank.

Table 3 – Summary of Peak Discharges and Routed Outflow – 2nd Street

Storm Event	Existing Peak Flow (cfs)	Bypass Peak Flow (cfs)	Allowable Routed Peak Flow (cfs)	Actual Routed Peak Discharge (cfs)	Peak Flow Reduction %
2-YR	0.386	0.036	0.350	0.321	7.5%
10-YR	0.542	0.051	0.491	0.415	14.0%
25-YR	0.623	0.059	0.564	0.457	17.2%
100-YR	0.755	0.071	0.684	0.664	2.6%

The routed outflow from the detention basin will discharge to a proposed new manhole in 2nd Street and will require the construction of roughly 95 linear feet of 15-inch concrete pipe to connect into the nearest storm inlet located at the intersection of Sloan Street.

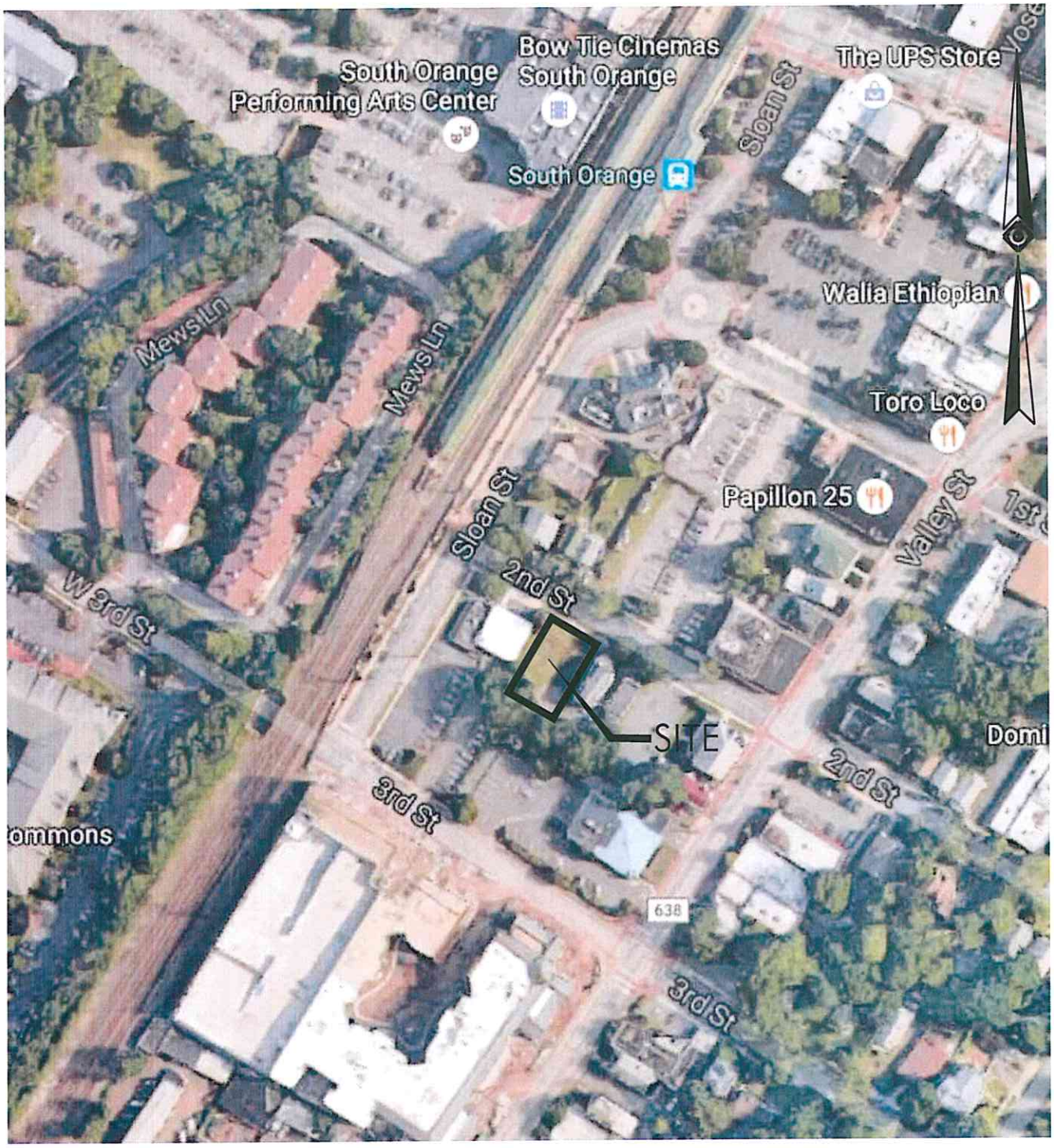
Conclusion

As per the requirements for a site development, there shall be no increase, as compared to the preconstruction condition, in the peak runoff rates of stormwater leaving the site for the 2, 10, 25, and 100-year storm events. As is demonstrated in the tables presented in this report, stormwater runoff leaving the site will be reduced.

It is our opinion based on the above and enclosed calculations and supplemental information that the proposed improvements are designed in accordance with local, county and state standards. The measures and design provided herein and as shown on the Preliminary\Final Site Plan Drawings submitted as part of this application are intended to prevent or limit the impact of the proposed development on the site and the surrounding areas with respect to stormwater quantity control.

FIGURE 1

SITE LOCATION MAP



S:\PROJECTS\YGROUP-S-16-145 MULTI-FAMILY, 14 2ND ST, SOUTH ORANGE NJ\DESIGN DATA\SWM\FIGURE 1 SITE LOCATION MAP.DWG GGESARIO PLOTTED: 03/30/2017

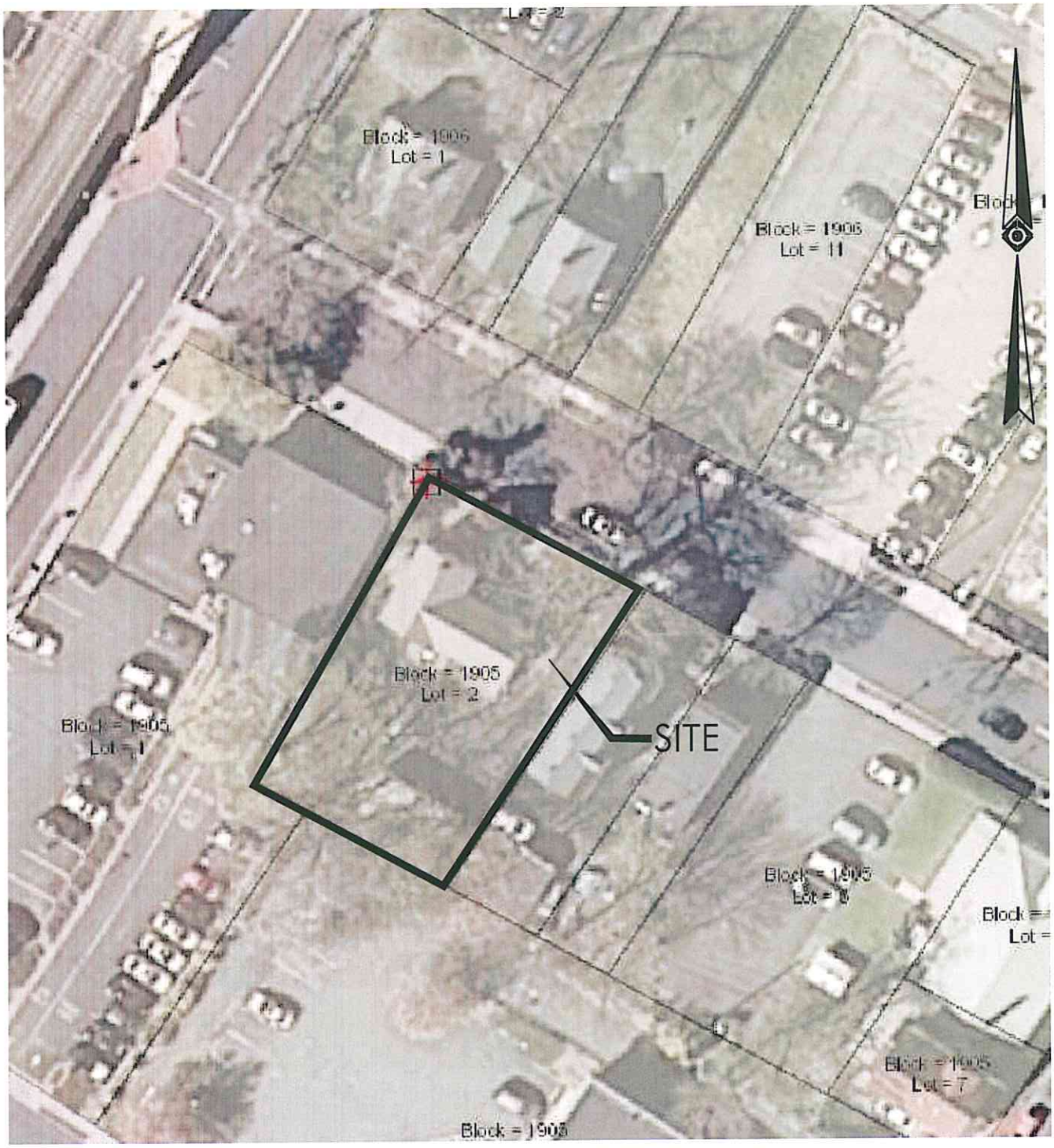
Jarmel Kizel
ARCHITECTS AND ENGINEERS INC.
42 OKNER PARKWAY
LIVINGSTON, NEW JERSEY 07039
TEL: 973-994-9669
FAX:973-994-4069
www.jarmelkizel.com

Project: **Y GROUP 14 2nd STREET SOUTH ORANGE VILLAGE ESSEX COUNTY, NJ**	Drawing Name: **SITE LOCATION MAP**
Project Number: **YGROUP-S-16-145**	Scale: **1"=200'**
Drawing Number: **Figure-1**	
Drawn By: **GPG**	Approved By:
Initial Date: **3/30/17**	

FIGURE 2

2012 AERIAL IMAGE

S:\PROJECTS\YGROUP-S-16-145 MULTI-FAMILY, 14 2ND ST, SOUTH ORANGE NJ\DESIGN DATA\SWM\FIGURE 2 2012 AERIAL IMAGE.DWG GGESARIO PLOTTED: 03/30/2017

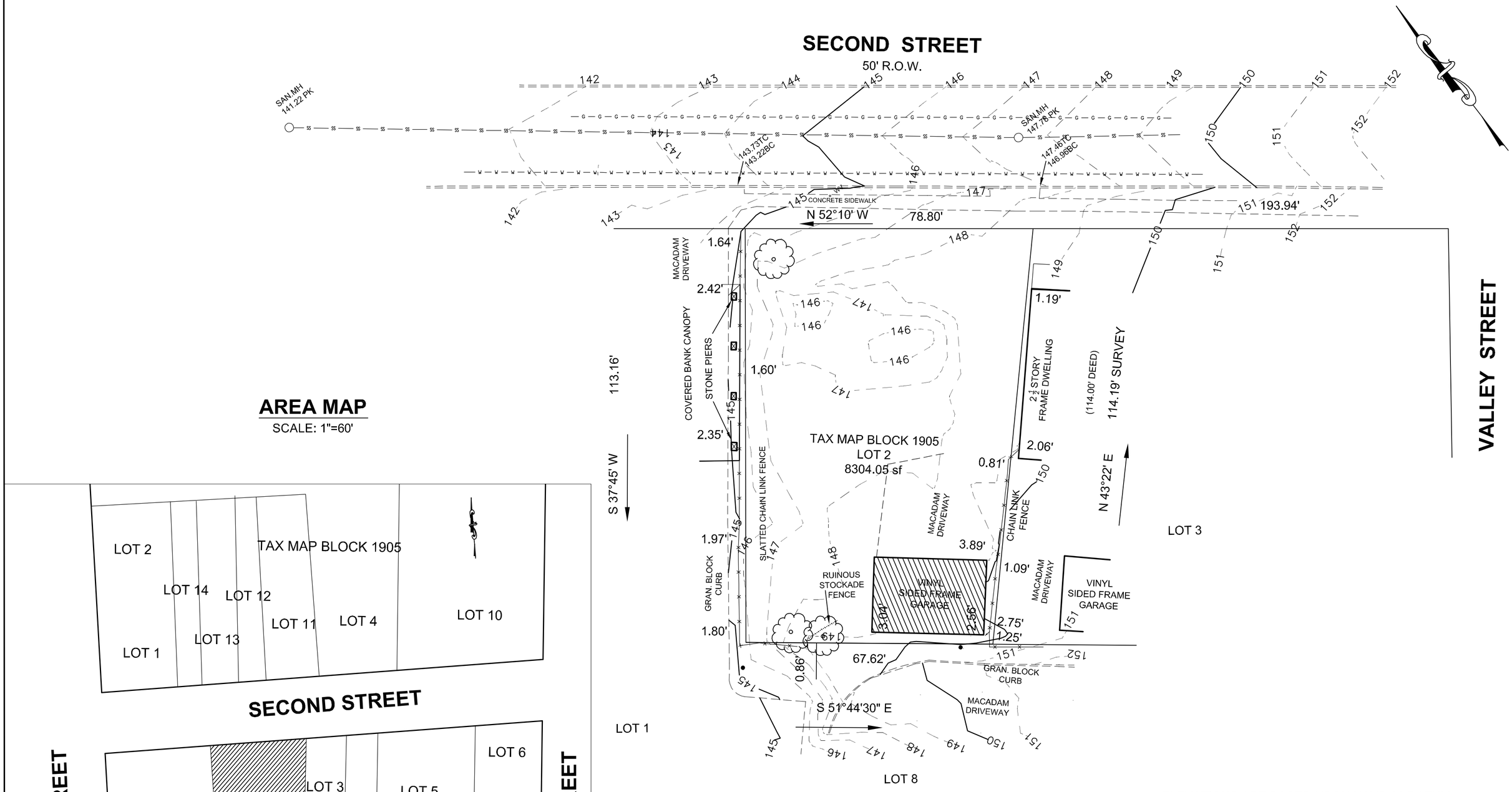


Jarmel Kizel
ARCHITECTS AND ENGINEERS INC.
42 OKNER PARKWAY
LIVINGSTON, NEW JERSEY 07039
TEL: 973-994-9669
FAX:973-994-4069
www.jarmelkizel.com

Project: **Y GROUP 14 2nd STREET SOUTH ORANGE VILLAGE ESSEX COUNTY, NJ**	Drawing Name: **2012 AERIAL IMAGE**
Project Number: **YGROUP-S-16-145**	Scale: **1"=50'**
Drawn By: **GPG**	Approved By:
Drawing Number: **Figure-2**	
Initial Date: **3/30/17**	

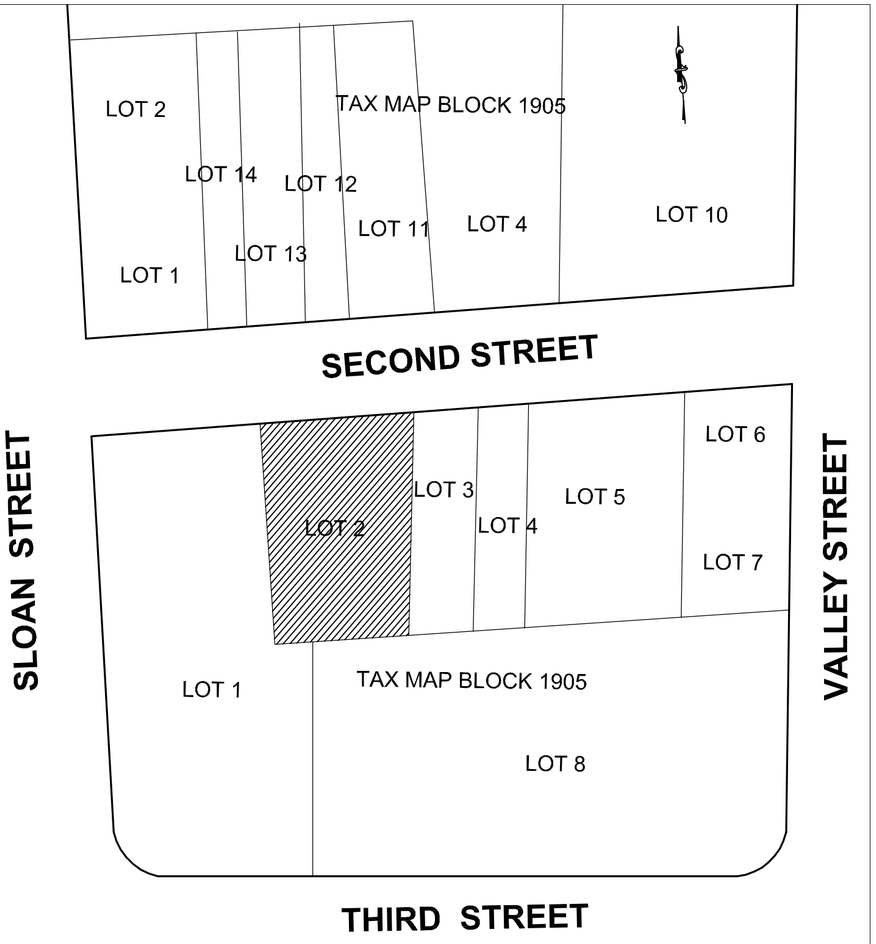
FIGURE 3

BOUNDARY AND TOPOGRAPHIC SURVEY



AREA MAP

SCALE: 1"=60'



ELEVATIONS ARE BASED UPON NAVD 88 DATUM

No liabilty is assumed by the certifying surveyor for the use of this survey by any other party not shown on the certification hereon or for use of this survey with a survey affidavit. Certifications are not transferable to additional institutions or subsequent owners. This survey plat used without the impression of a raised seal of the surveyor shall invalidate this survey plat. **The use of this survey along with a survey affidavit is prohibited.**

The property has not been staked in accordance with instructions. A written waiver and direction not to set corner markers has been obtained from the ultimate owner pursuant to P.L. 2003, c.14 (NJSA 45:8-36.3) and 13:40-5.1(d).

TAX BLOCK: 1905 | LOT: 2 | ADDRESS: 14 SECOND STREET

CERTIFIED TO:

The Y Group, LLC;
Commonwealth Land Title Company, LLC;
BCB Community Bank, a New Jersey Chartered Bank, its successors and/or assigns aas their interest may appear;
Joseph P. Brennan, Jr., Esq.

TITLE No:

MAP OF PROPERTY SITUATED IN THE
TWP OF SOUTH ORANGE VILLAGE
ESSEX COUNTY, NJ

JOB No. 16-141
REV. DATE
DATE SEPT. 30, 2016
SCALE 1" = 20'

JMH ASSOCIATES
403-0830
FAX 403-0803
P.O. BOX 30
CALDWELL, N.J. 07006

JAMES M. HELB, PE,PLS,PP
PROFESSIONAL ENGINEER & PROFESSIONAL LAND SURVEYOR — NJ LICENSE No 24272
PROFESSIONAL PLANNER — NJ LICENSE No 3832

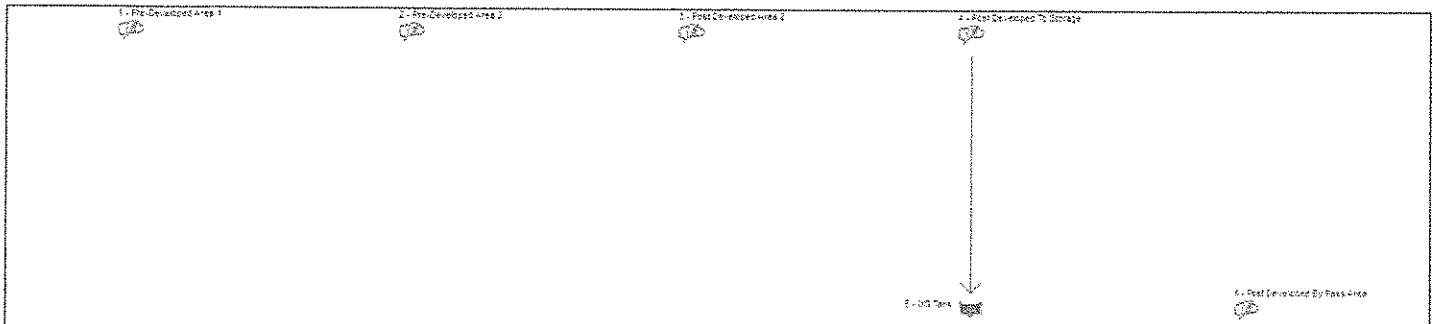
DATE

APPENDIX A

EXISTING & PROPOSED PEAK FLOW HYDROGRAPHS

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.1



Legend

Hyd.	Origin	Description
1	Rational	Pre-Developed Area 1
2	Rational	Pre-Developed Area 2
3	Rational	Post Developed Area 2
4	Mod. Rational	Post Developed To Storage
5	Reservoir	UG Tank
6	Rational	Post Developed By Pass Area

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

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	-------	-------	0.386	-------	-------	0.542	0.623	-------	0.755	Pre-Developed Area 1
2	Rational	-------	-------	0.071	-------	-------	0.100	0.115	-------	0.139	Pre-Developed Area 2
3	Rational	-------	-------	0.014	-------	-------	0.019	0.022	-------	0.027	Post Developed Area 2
4	Mod. Rational	-------	-------	0.470	-------	-------	0.659	0.758	-------	0.949	Post Developed To Storage
5	Reservoir	4	-------	0.321	-------	-------	0.415	0.457	-------	0.664	UG Tank
6	Rational	-------	-------	0.036	-------	-------	0.051	0.059	-------	0.071	Post Developed By Pass Area

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	0.386	1	10	232	----	------	------	Pre-Developed Area 1
2	Rational	0.071	1	10	43	----	------	------	Pre-Developed Area 2
3	Rational	0.014	1	10	8	----	------	------	Post Developed Area 2
4	Mod. Rational	0.470	1	10	592	----	------	------	Post Developed To Storage
5	Reservoir	0.321	1	24	574	4	143.58	268	UG Tank
6	Rational	0.036	1	10	22	----	------	------	Post Developed By Pass Area

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	0.542	1	10	325	----	------	------	Pre-Developed Area 1
2	Rational	0.100	1	10	60	----	------	------	Pre-Developed Area 2
3	Rational	0.019	1	10	12	----	------	------	Post Developed Area 2
4	Mod. Rational	0.659	1	10	870	----	------	------	Post Developed To Storage
5	Reservoir	0.415	1	26	852	4	144.48	421	UG Tank
6	Rational	0.051	1	10	31	----	------	------	Post Developed By Pass Area

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	0.623	1	10	374	----	------	------	Pre-Developed Area 1
2	Rational	0.115	1	10	69	----	------	------	Pre-Developed Area 2
3	Rational	0.022	1	10	13	----	------	------	Post Developed Area 2
4	Mod. Rational	0.758	1	10	1,000	----	------	------	Post Developed To Storage
5	Reservoir	0.457	1	26	982	4	144.95	501	UG Tank
6	Rational	0.059	1	10	35	----	------	------	Post Developed By Pass Area

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	0.755	1	10	453	----	------	------	Pre-Developed Area 1
2	Rational	0.139	1	10	84	----	------	------	Pre-Developed Area 2
3	Rational	0.027	1	10	16	----	------	------	Post Developed Area 2
4	Mod. Rational	0.949	1	10	1,253	----	------	------	Post Developed To Storage
5	Reservoir	0.664	1	25	1,235	4	145.79	645	UG Tank
6	Rational	0.071	1	10	43	----	------	------	Post Developed By Pass Area

Hydrograph Report

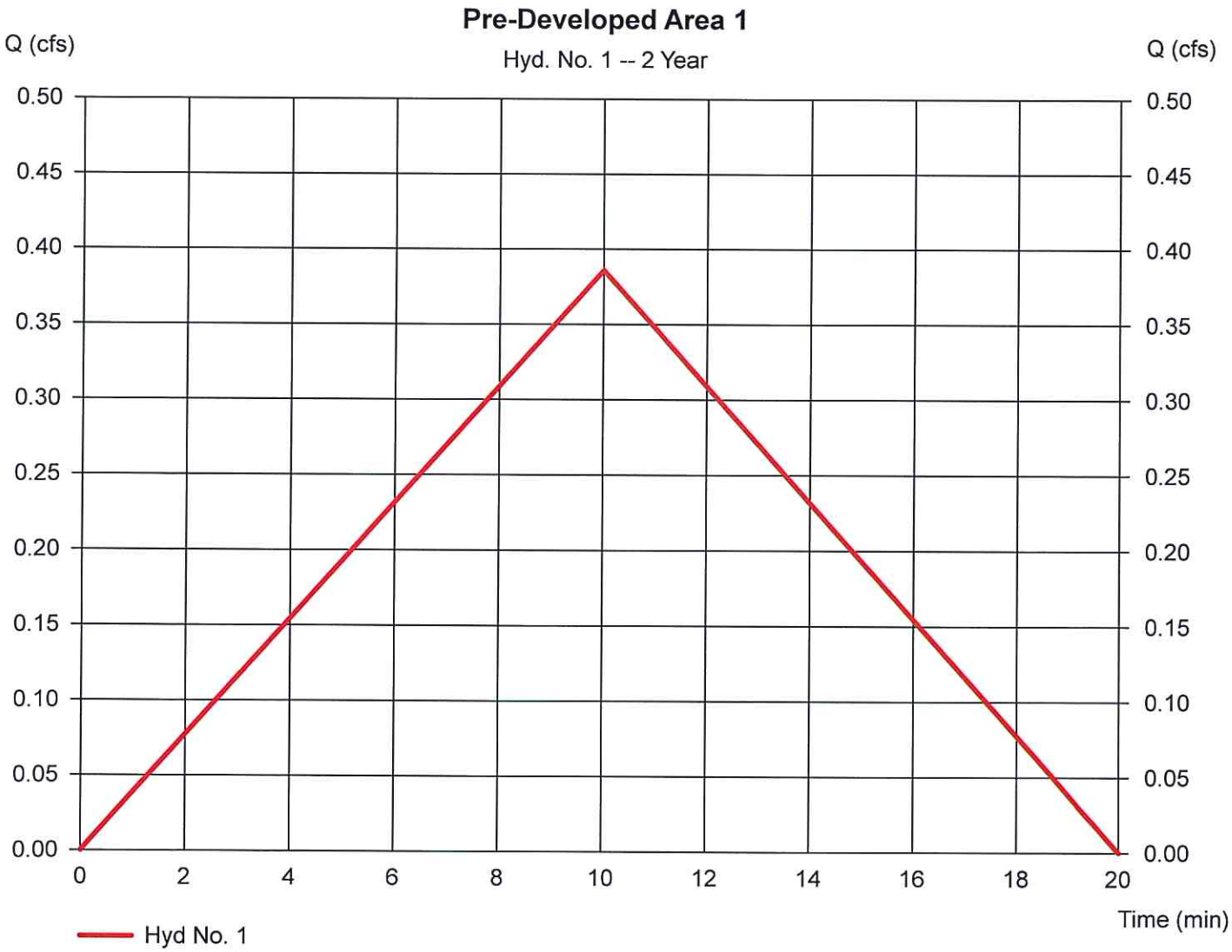
Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 1

Pre-Developed Area 1

Hydrograph type	= Rational	Peak discharge	= 0.386 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 232 cuft
Drainage area	= 0.150 ac	Runoff coeff.	= 0.65*
Intensity	= 3.959 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.074 x 0.35) + (0.076 x 0.95)] / 0.150



Hydrograph Report

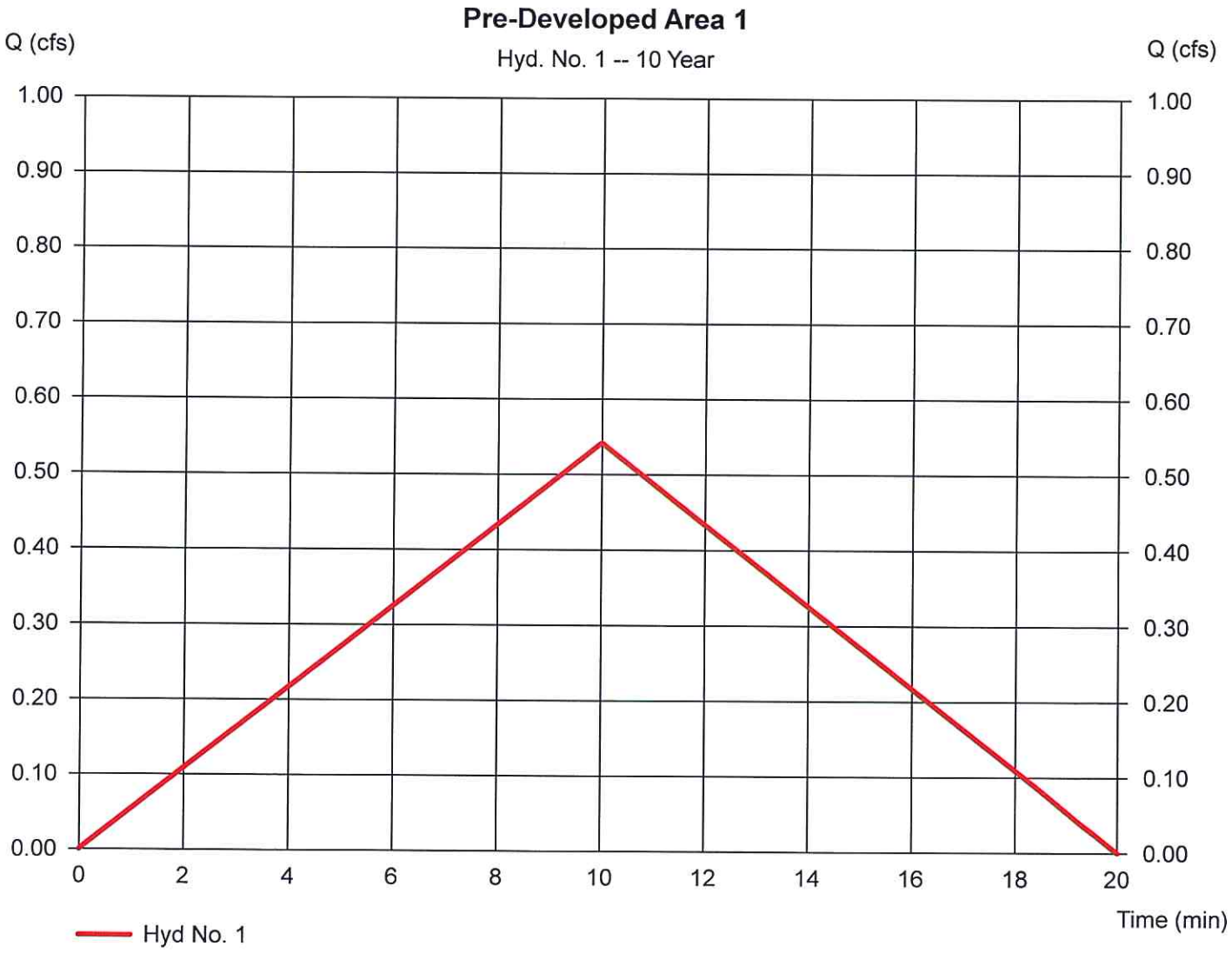
Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 1

Pre-Developed Area 1

Hydrograph type	= Rational	Peak discharge	= 0.542 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 325 cuft
Drainage area	= 0.150 ac	Runoff coeff.	= 0.65*
Intensity	= 5.555 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.074 x 0.35) + (0.076 x 0.95)] / 0.150



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

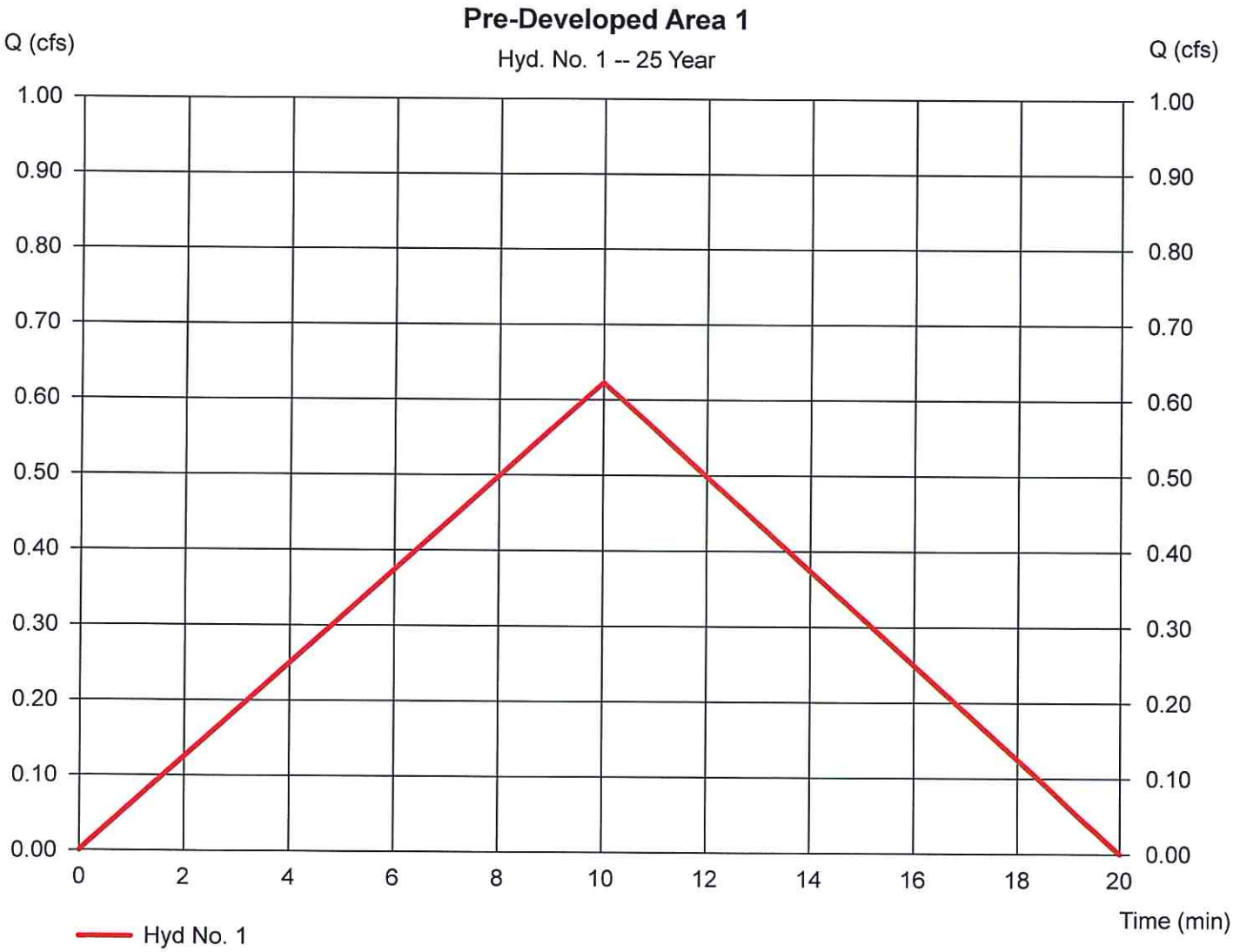
Thursday, Mar 30, 2017

Hyd. No. 1

Pre-Developed Area 1

Hydrograph type	= Rational	Peak discharge	= 0.623 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 374 cuft
Drainage area	= 0.150 ac	Runoff coeff.	= 0.65*
Intensity	= 6.386 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.074 x 0.35) + (0.076 x 0.95)] / 0.150



Hydrograph Report

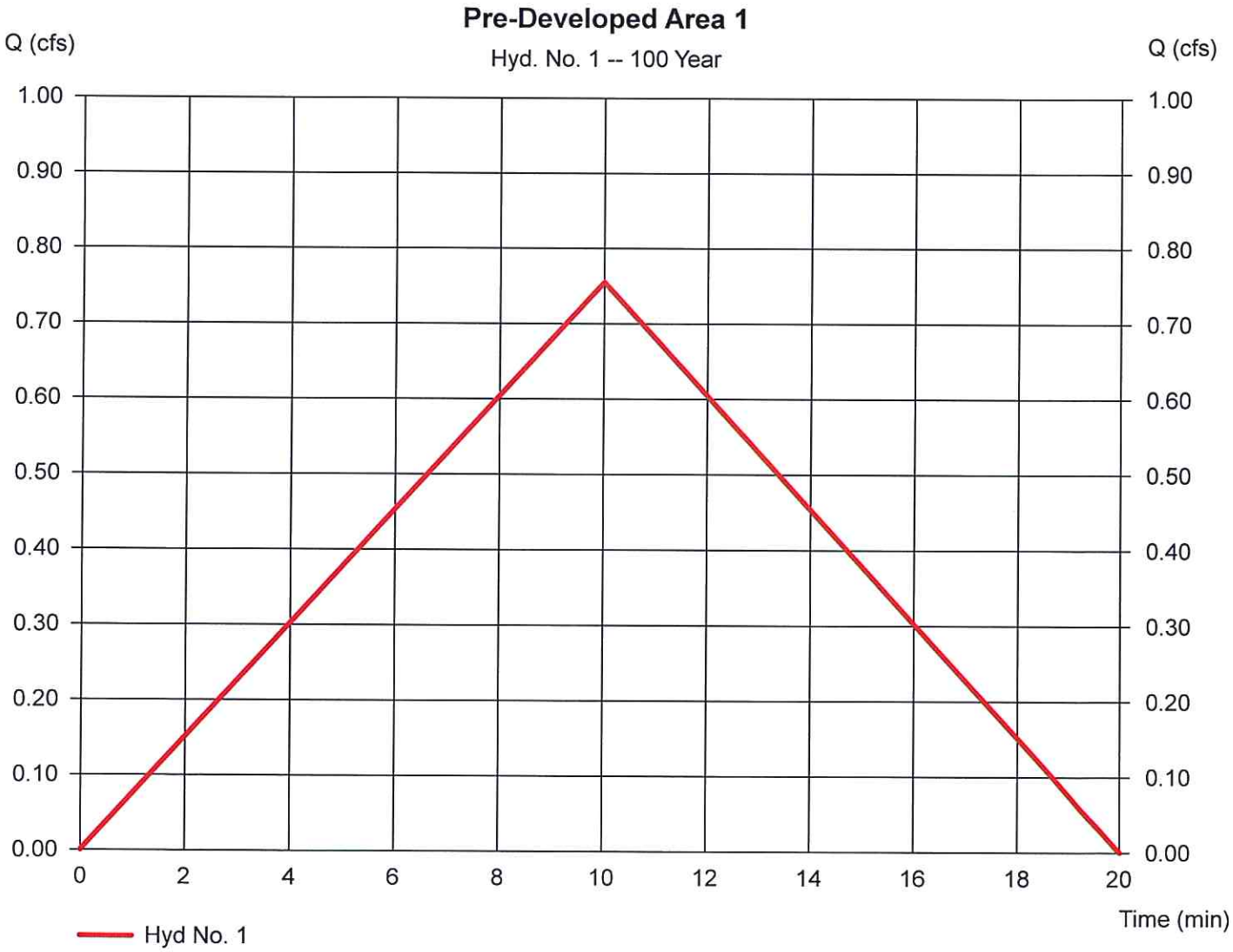
Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 1

Pre-Developed Area 1

Hydrograph type	= Rational	Peak discharge	= 0.755 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 453 cuft
Drainage area	= 0.150 ac	Runoff coeff.	= 0.65*
Intensity	= 7.744 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.074 x 0.35) + (0.076 x 0.95)] / 0.150



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

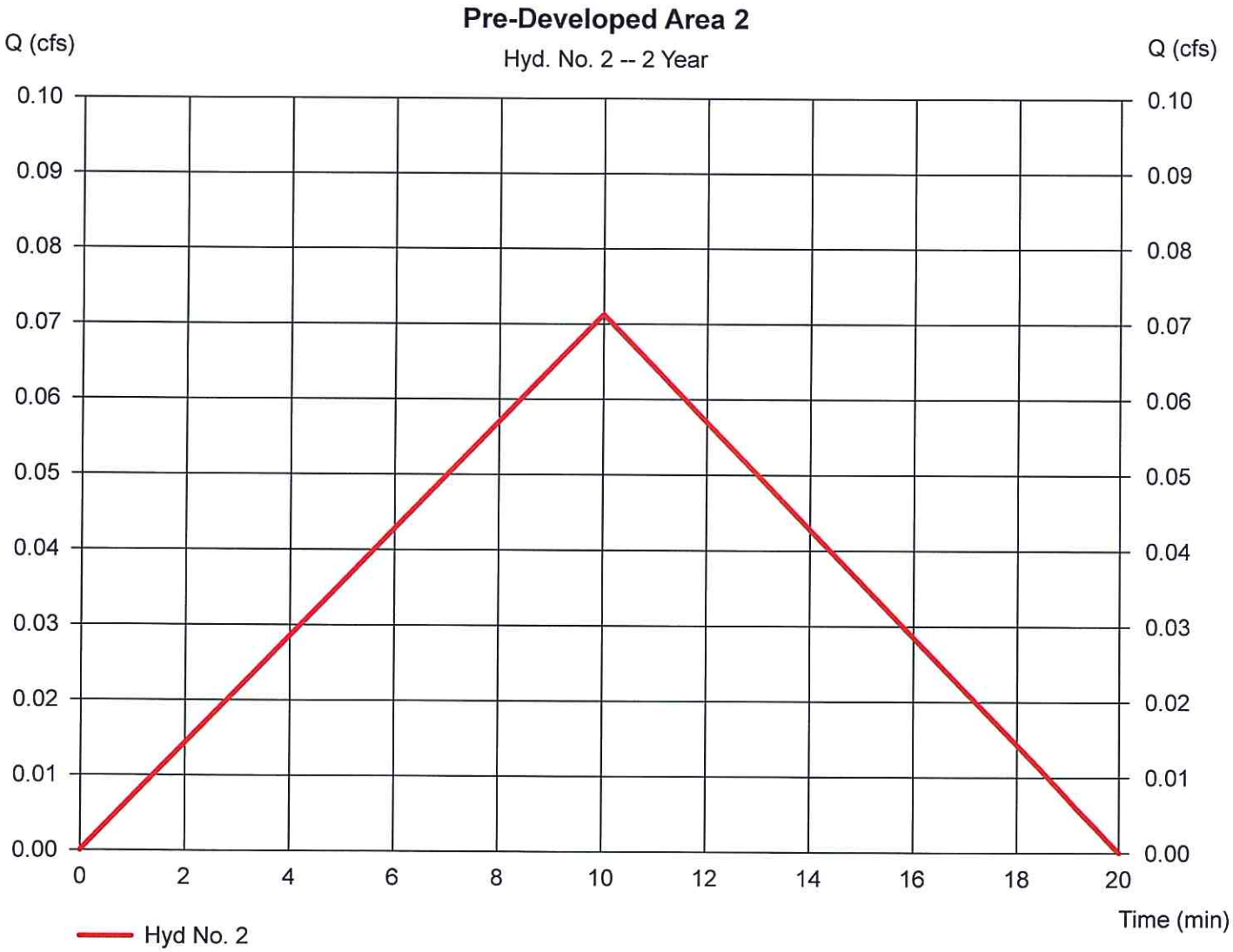
Thursday, Mar 30, 2017

Hyd. No. 2

Pre-Developed Area 2

Hydrograph type	= Rational	Peak discharge	= 0.071 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 43 cuft
Drainage area	= 0.040 ac	Runoff coeff.	= 0.45*
Intensity	= 3.959 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.034 x 0.35) + (0.007 x 0.95)] / 0.040



Hydrograph Report

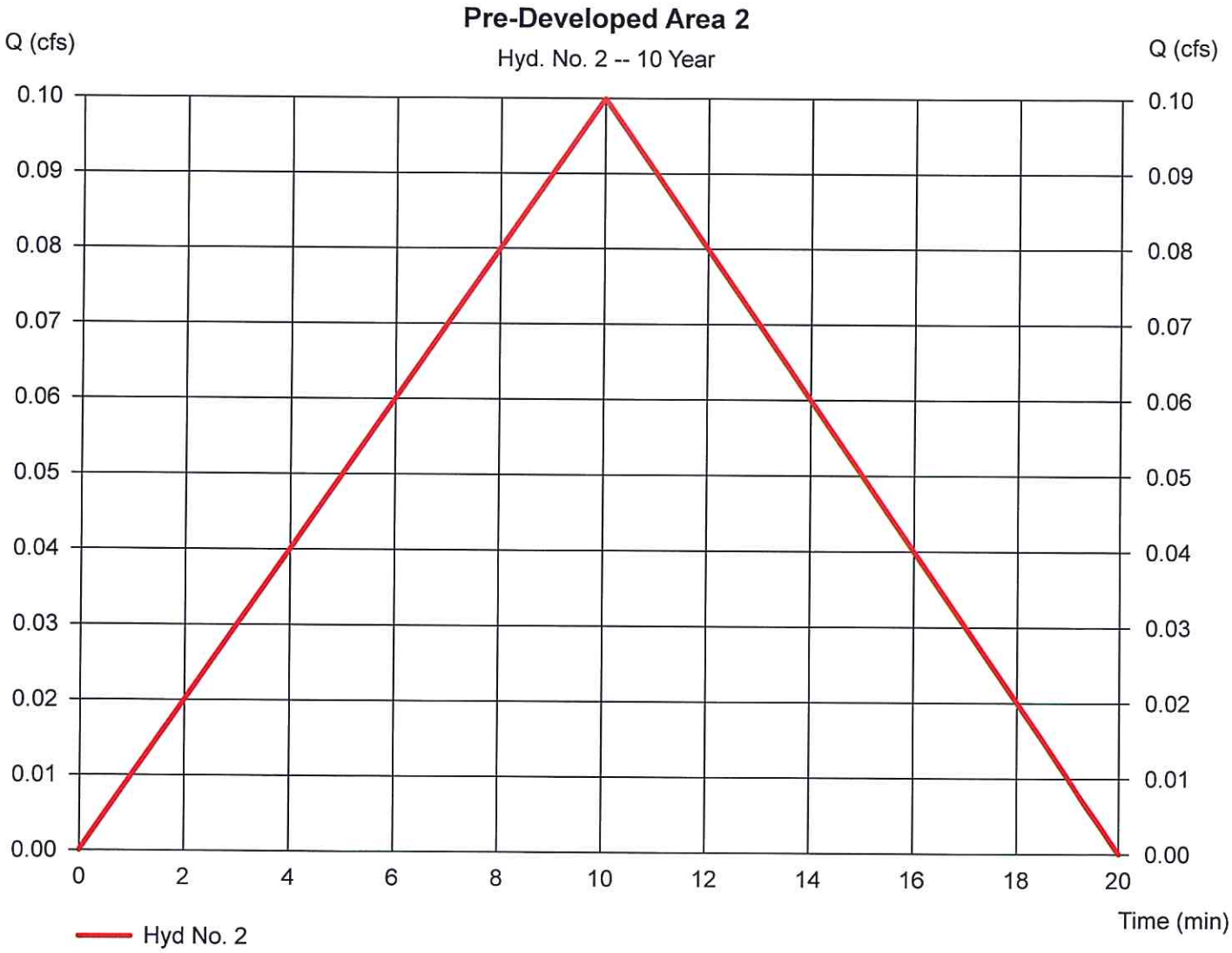
Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 2

Pre-Developed Area 2

Hydrograph type	= Rational	Peak discharge	= 0.100 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 60 cuft
Drainage area	= 0.040 ac	Runoff coeff.	= 0.45*
Intensity	= 5.555 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.034 x 0.35) + (0.007 x 0.95)] / 0.040



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

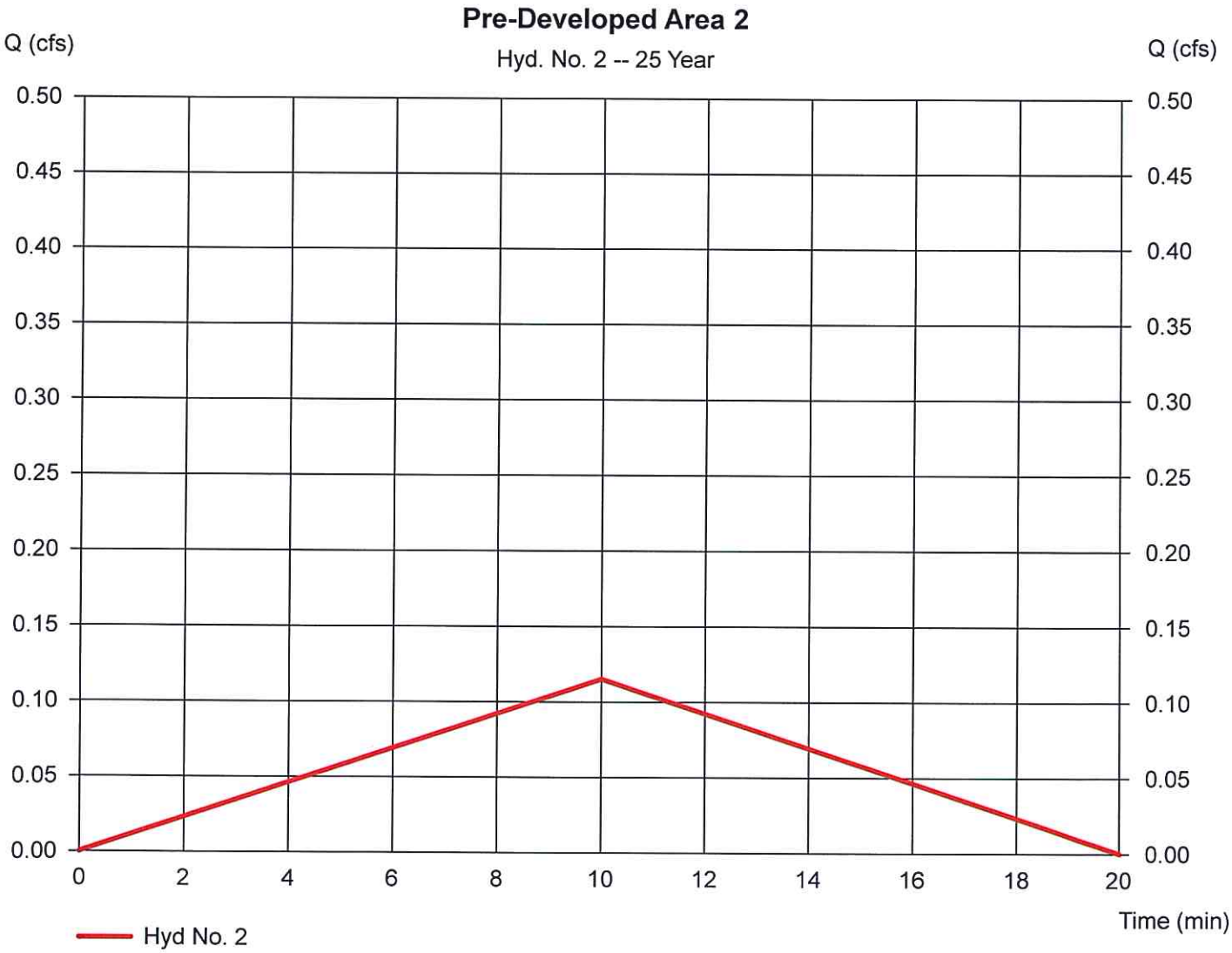
Thursday, Mar 30, 2017

Hyd. No. 2

Pre-Developed Area 2

Hydrograph type	= Rational	Peak discharge	= 0.115 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 69 cuft
Drainage area	= 0.040 ac	Runoff coeff.	= 0.45*
Intensity	= 6.386 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.034 x 0.35) + (0.007 x 0.95)] / 0.040



Hydrograph Report

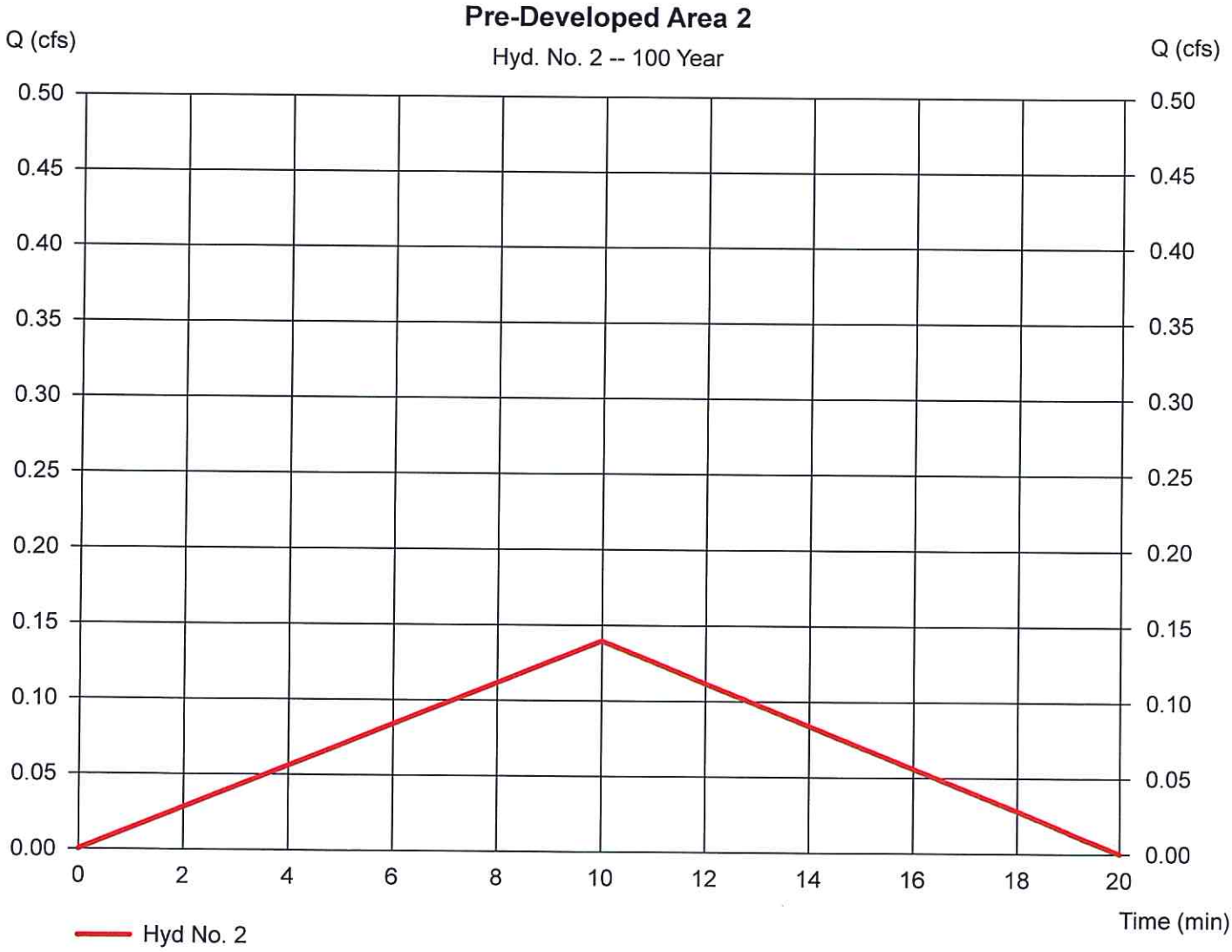
Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 2

Pre-Developed Area 2

Hydrograph type	= Rational	Peak discharge	= 0.139 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 84 cuft
Drainage area	= 0.040 ac	Runoff coeff.	= 0.45*
Intensity	= 7.744 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.034 x 0.35) + (0.007 x 0.95)] / 0.040



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Thursday, Mar 30, 2017

Hyd. No. 3

Post Developed Area 2

Hydrograph type	= Rational	Peak discharge	= 0.014 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 8 cuft
Drainage area	= 0.010 ac	Runoff coeff.	= 0.35*
Intensity	= 3.959 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.010 x 0.35)] / 0.010

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

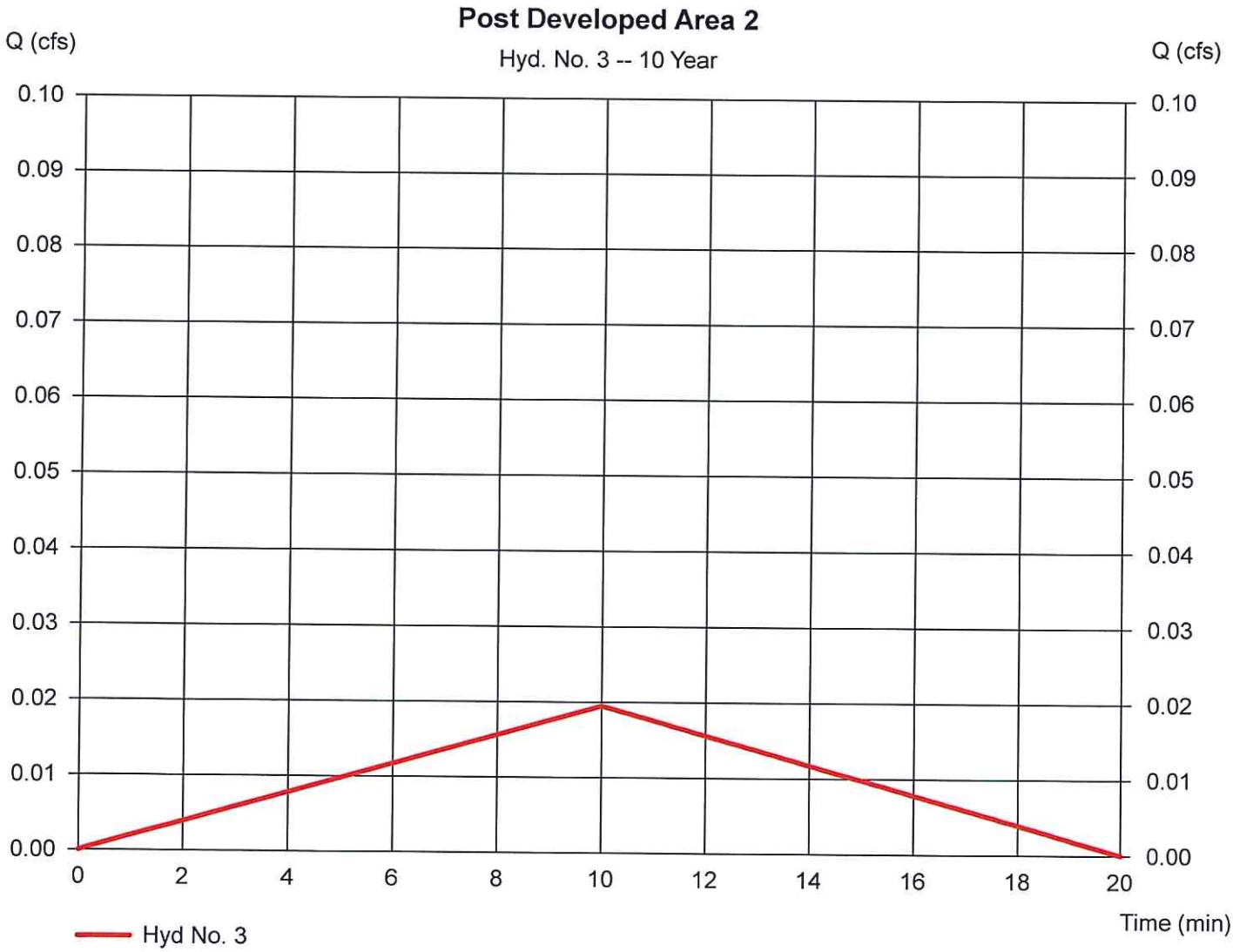
Thursday, Mar 30, 2017

Hyd. No. 3

Post Developed Area 2

Hydrograph type	= Rational	Peak discharge	= 0.019 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 12 cuft
Drainage area	= 0.010 ac	Runoff coeff.	= 0.35*
Intensity	= 5.555 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.010 x 0.35)] / 0.010



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

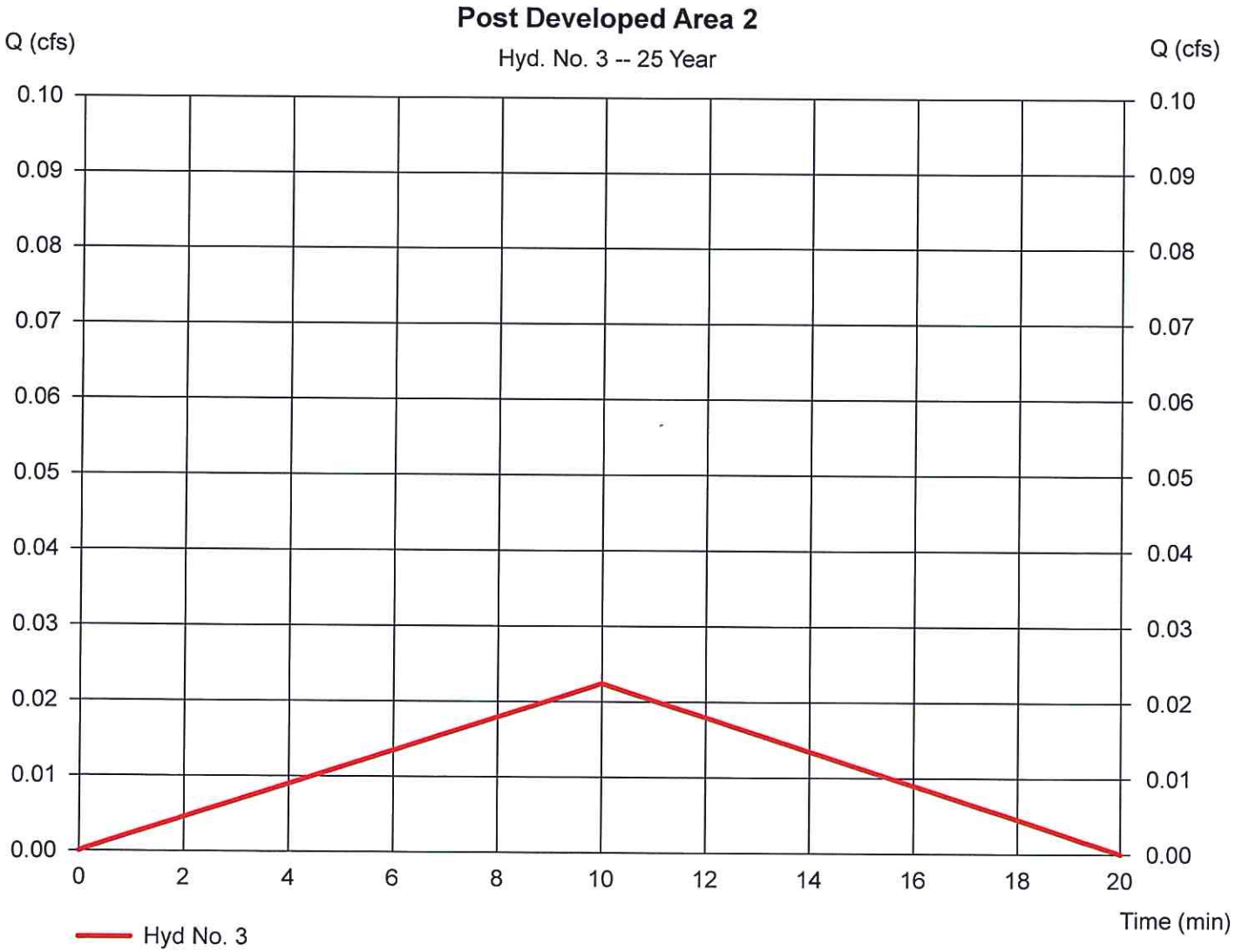
Thursday, Mar 30, 2017

Hyd. No. 3

Post Developed Area 2

Hydrograph type	= Rational	Peak discharge	= 0.022 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 13 cuft
Drainage area	= 0.010 ac	Runoff coeff.	= 0.35*
Intensity	= 6.386 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.010 x 0.35)] / 0.010



Hydrograph Report

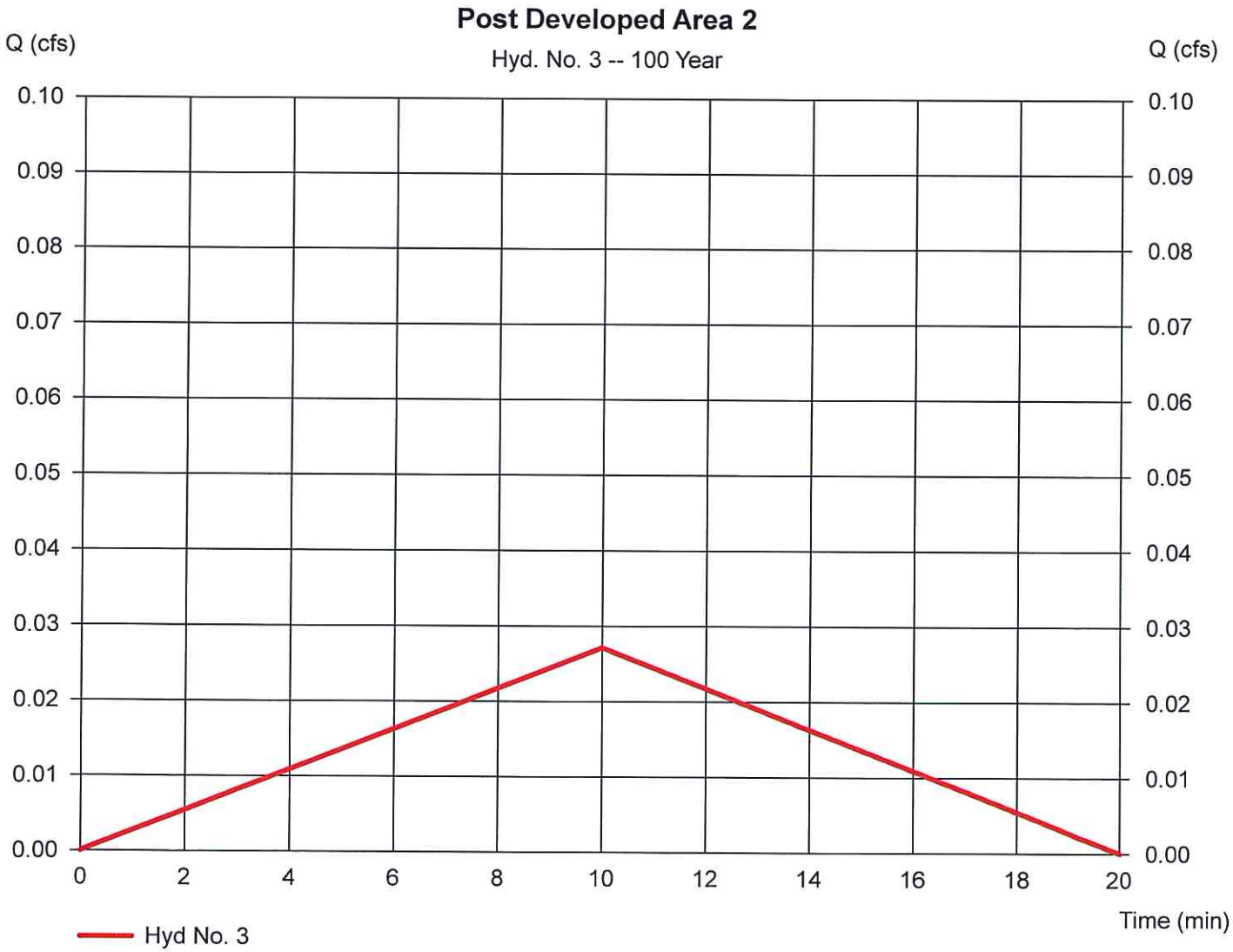
Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 3

Post Developed Area 2

Hydrograph type	= Rational	Peak discharge	= 0.027 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 16 cuft
Drainage area	= 0.010 ac	Runoff coeff.	= 0.35*
Intensity	= 7.744 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.010 x 0.35)] / 0.010



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 6

Post Developed By Pass Area

Hydrograph type	= Rational	Peak discharge	= 0.036 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 22 cuft
Drainage area	= 0.020 ac	Runoff coeff.	= 0.46
Intensity	= 3.959 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 6

Post Developed By Pass Area

Hydrograph type	= Rational	Peak discharge	= 0.051 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 31 cuft
Drainage area	= 0.020 ac	Runoff coeff.	= 0.46
Intensity	= 5.555 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Thursday, Mar 30, 2017

Hyd. No. 6

Post Developed By Pass Area

Hydrograph type	= Rational	Peak discharge	= 0.059 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 35 cuft
Drainage area	= 0.020 ac	Runoff coeff.	= 0.46
Intensity	= 6.386 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1

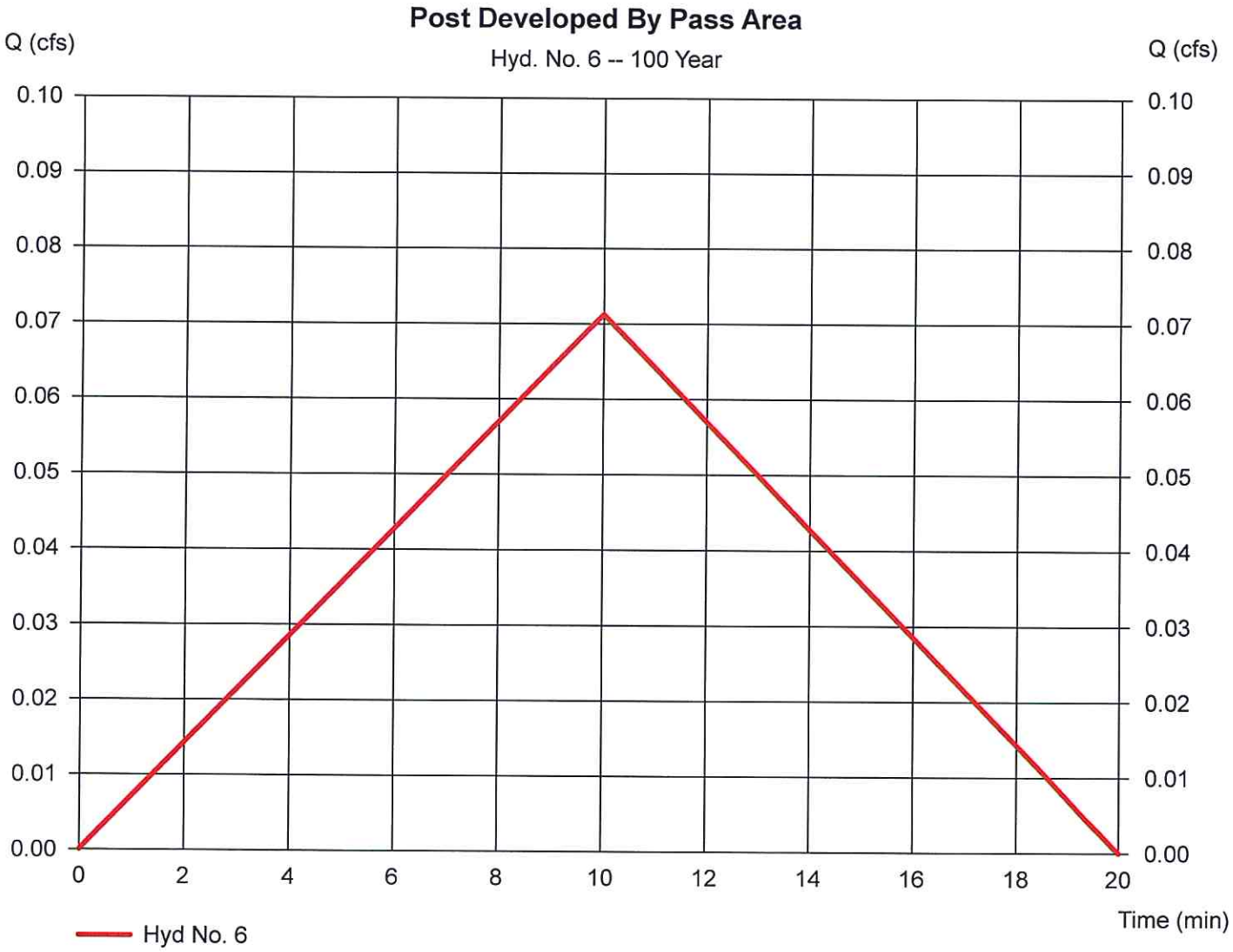
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 6

Post Developed By Pass Area

Hydrograph type	= Rational	Peak discharge	= 0.071 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 43 cuft
Drainage area	= 0.020 ac	Runoff coeff.	= 0.46
Intensity	= 7.744 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Asc/Rec limb fact	= 1/1



APPENDIX B

POND ROUTING CALCULATIONS

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 4

Post Developed To Storage

Hydrograph type	= Mod. Rational	Peak discharge	= 0.470 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 592 cuft
Drainage area	= 0.190 ac	Runoff coeff.	= 0.89*
Intensity	= 2.780 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Storm duration	= 2.1 x Tc
Target Q	= 0.390 cfs	Est. Req'd Storage	= 222 cuft

* Composite (Area/C) = [(0.020 x 0.35) + (0.170 x 0.95)] / 0.190

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

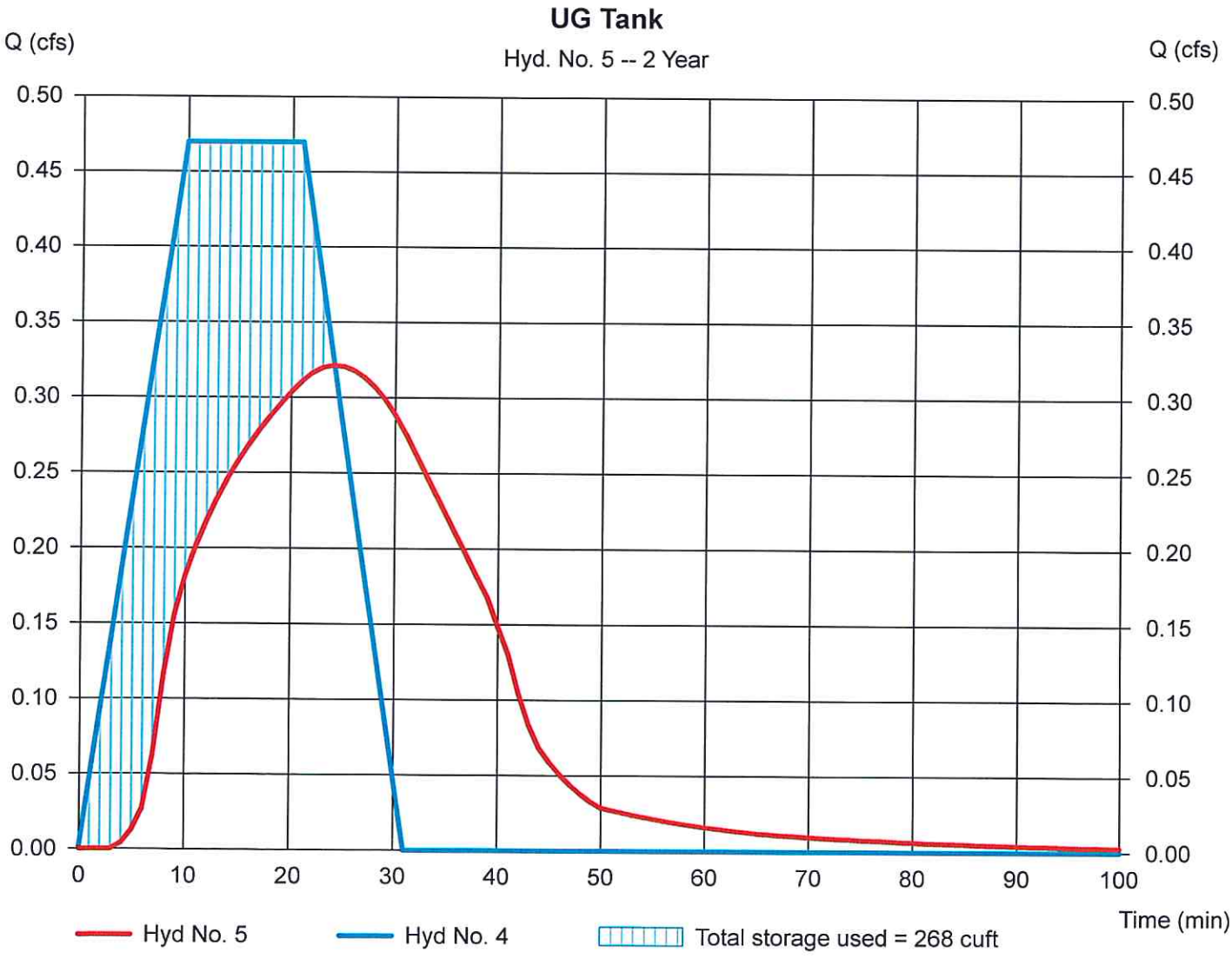
Thursday, Mar 30, 2017

Hyd. No. 5

UG Tank

Hydrograph type	= Reservoir	Peak discharge	= 0.321 cfs
Storm frequency	= 2 yrs	Time to peak	= 24 min
Time interval	= 1 min	Hyd. volume	= 574 cuft
Inflow hyd. No.	= 4 - Post Developed To Storage	Max. Elevation	= 143.58 ft
Reservoir name	= <New Pond>	Max. Storage	= 268 cuft

Storage Indication method used.



Hydrograph Report

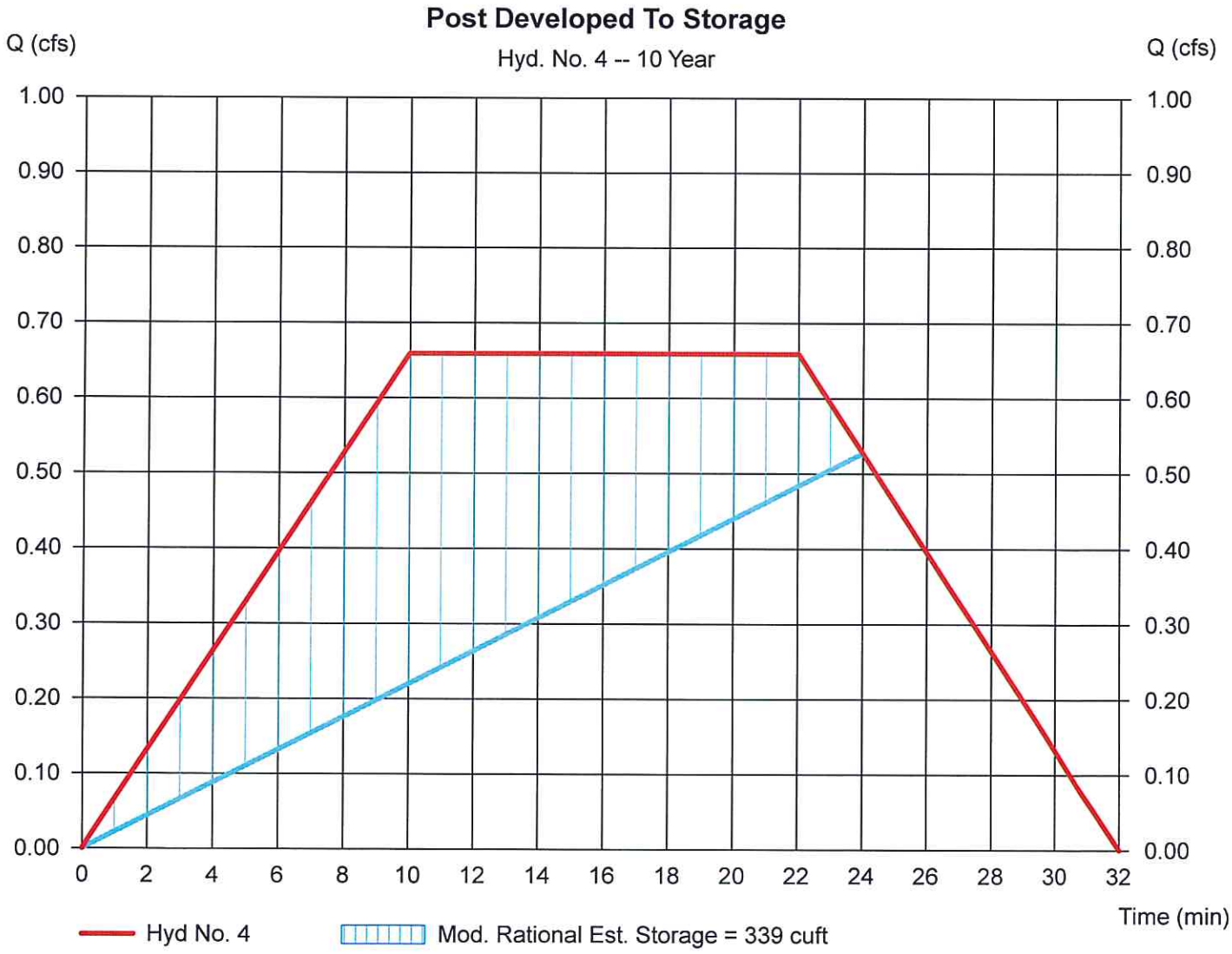
Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 4

Post Developed To Storage

Hydrograph type	= Mod. Rational	Peak discharge	= 0.659 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 870 cuft
Drainage area	= 0.190 ac	Runoff coeff.	= 0.89*
Intensity	= 3.898 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Storm duration	= 2.2 x Tc
Target Q	= 0.540 cfs	Est. Req'd Storage	= 339 cuft

* Composite (Area/C) = [(0.020 x 0.35) + (0.170 x 0.95)] / 0.190



Hydrograph Report

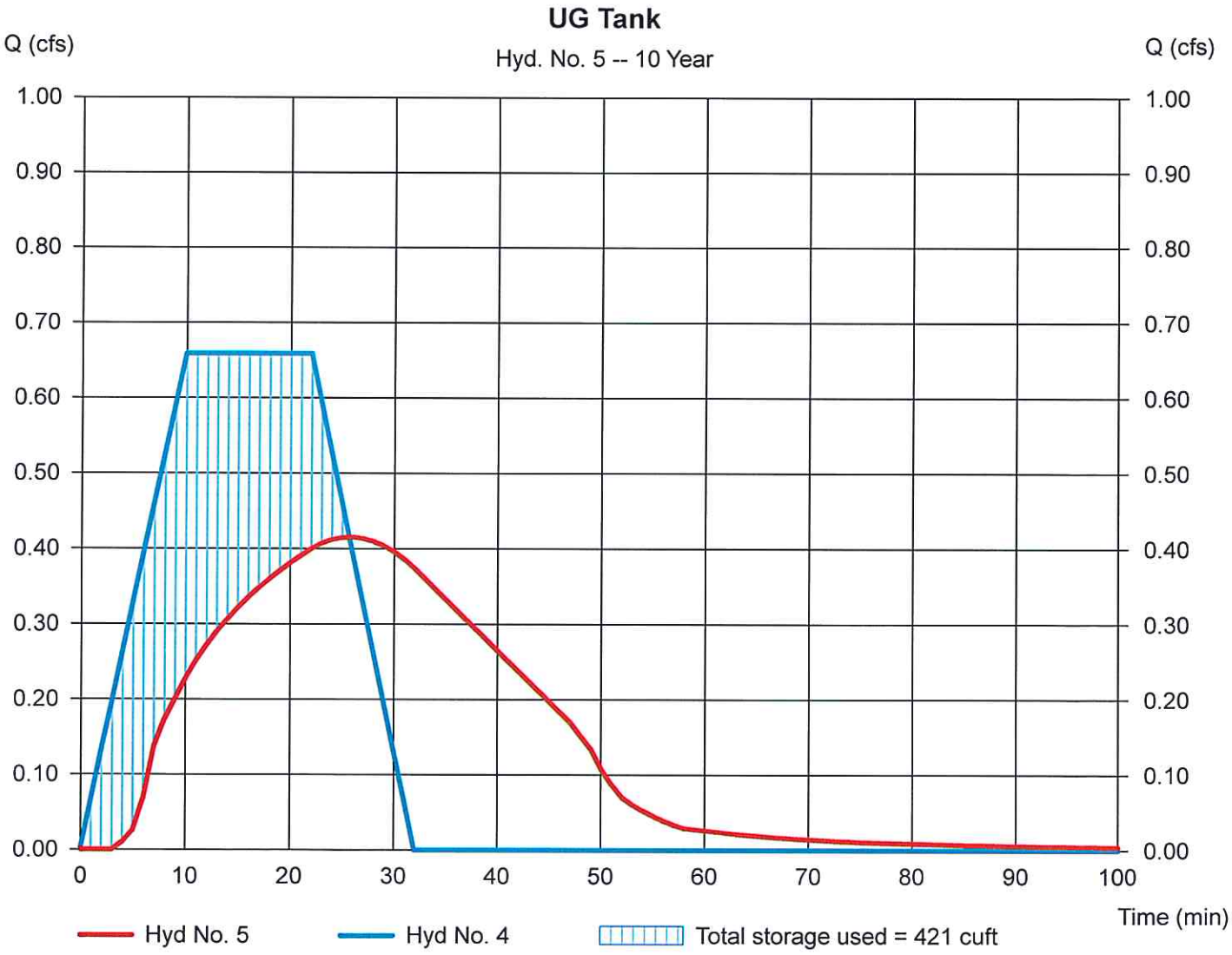
Hydraflow Hydrographs by Intelisolve v9.1 — Thursday, Mar 30, 2017

Hyd. No. 5

UG Tank

Hydrograph type	= Reservoir	Peak discharge	= 0.415 cfs
Storm frequency	= 10 yrs	Time to peak	= 26 min
Time interval	= 1 min	Hyd. volume	= 852 cuft
Inflow hyd. No.	= 4 - Post Developed To Storage	Max. Elevation	= 144.48 ft
Reservoir name	= <New Pond>	Max. Storage	= 421 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

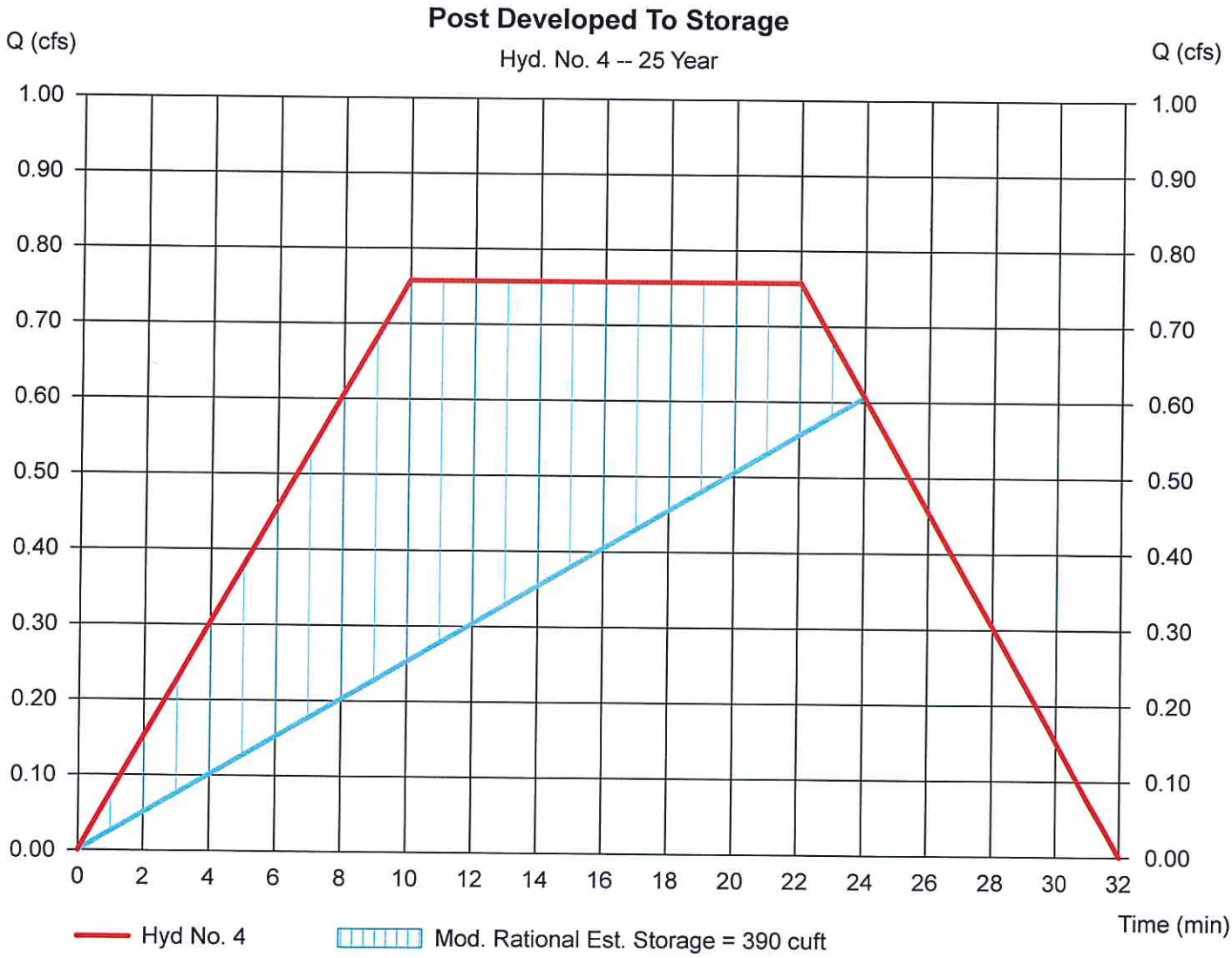
Thursday, Mar 30, 2017

Hyd. No. 4

Post Developed To Storage

Hydrograph type	= Mod. Rational	Peak discharge	= 0.758 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,000 cuft
Drainage area	= 0.190 ac	Runoff coeff.	= 0.89*
Intensity	= 4.481 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Storm duration	= 2.2 x Tc
Target Q	= 0.620 cfs	Est. Req'd Storage	= 390 cuft

* Composite (Area/C) = [(0.020 x 0.35) + (0.170 x 0.95)] / 0.190



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

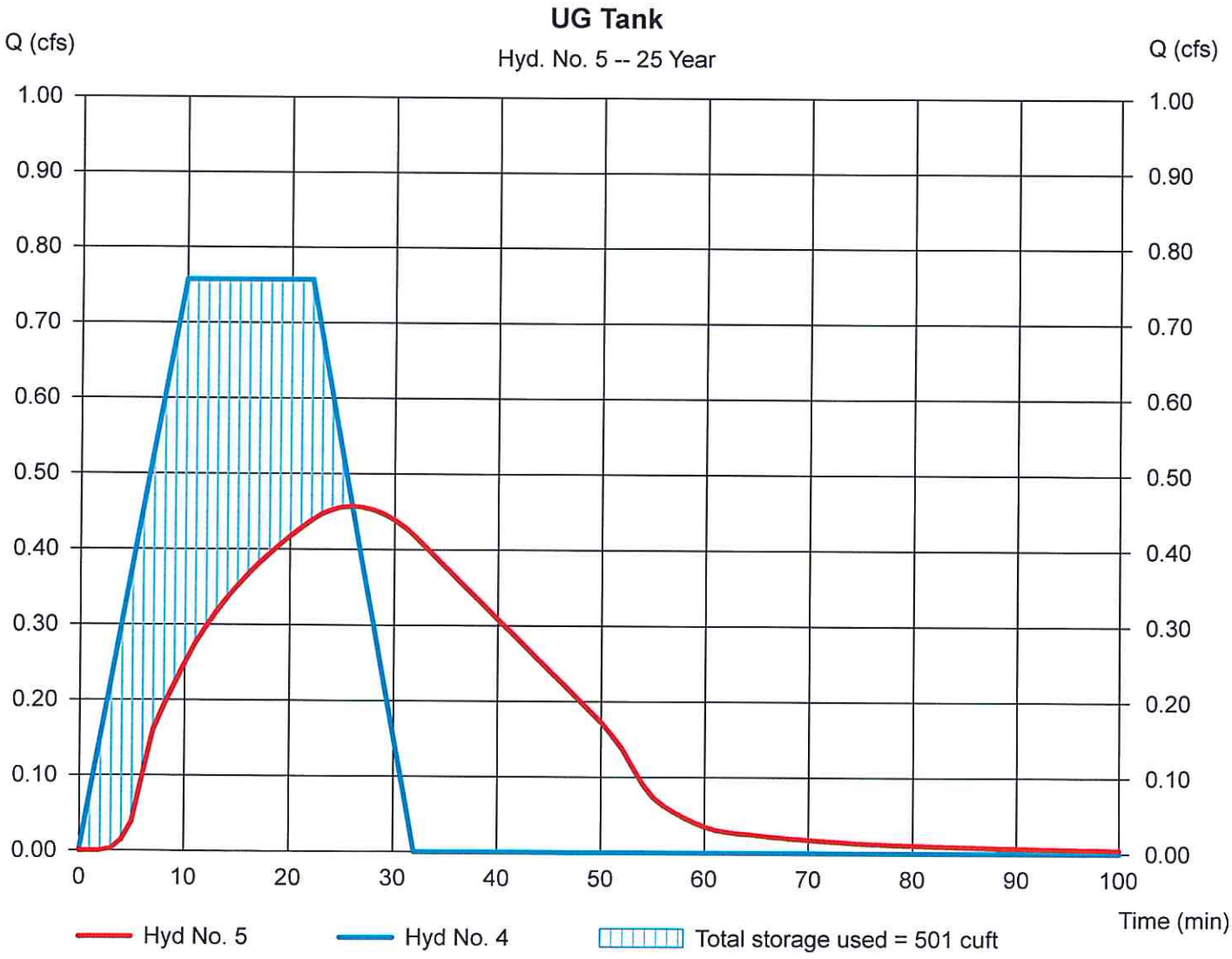
Thursday, Mar 30, 2017

Hyd. No. 5

UG Tank

Hydrograph type	= Reservoir	Peak discharge	= 0.457 cfs
Storm frequency	= 25 yrs	Time to peak	= 26 min
Time interval	= 1 min	Hyd. volume	= 982 cuft
Inflow hyd. No.	= 4 - Post Developed To Storage	Max. Elevation	= 144.95 ft
Reservoir name	= <New Pond>	Max. Storage	= 501 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

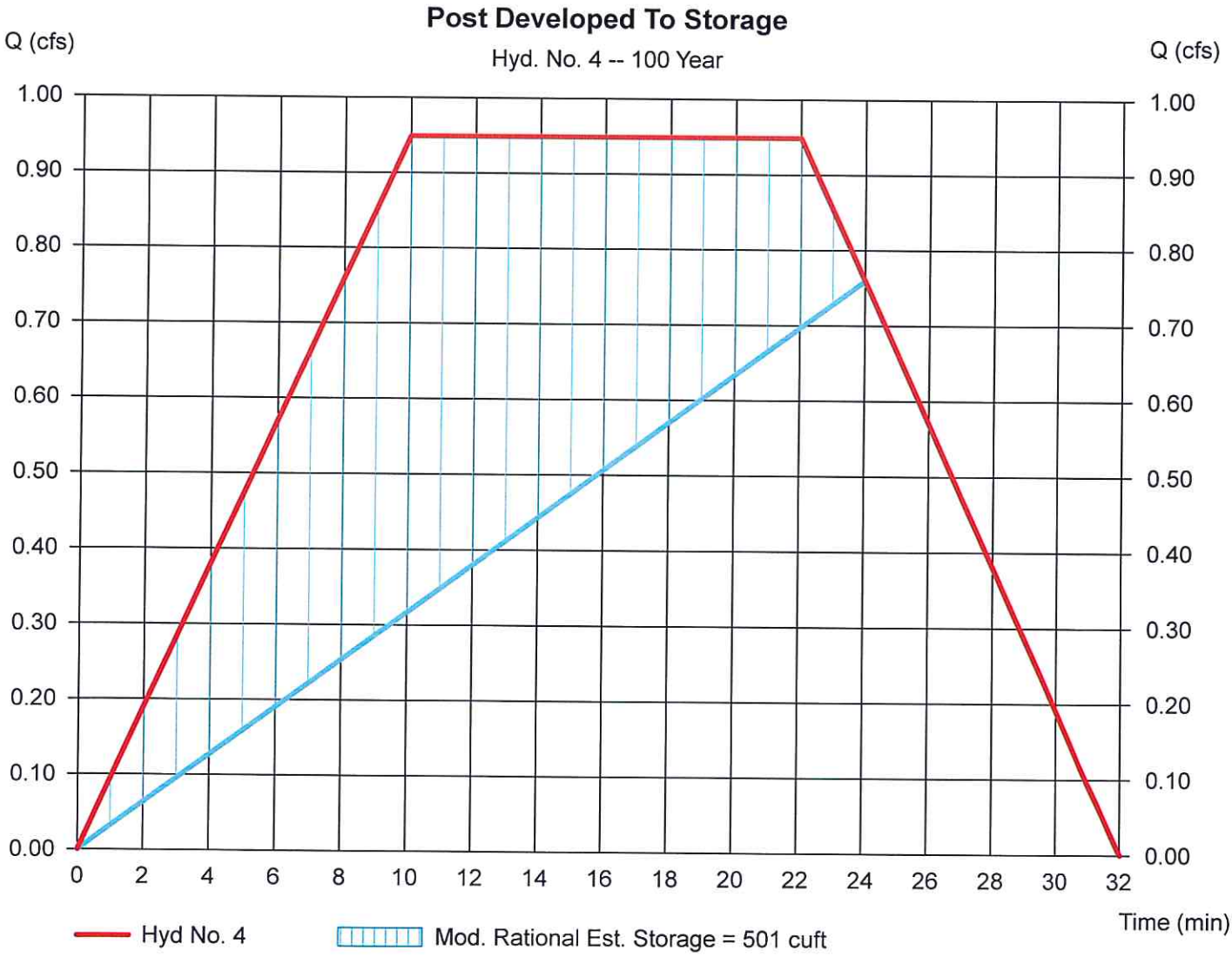
Thursday, Mar 30, 2017

Hyd. No. 4

Post Developed To Storage

Hydrograph type	= Mod. Rational	Peak discharge	= 0.949 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,253 cuft
Drainage area	= 0.190 ac	Runoff coeff.	= 0.89*
Intensity	= 5.614 in/hr	Tc by User	= 10.00 min
IDF Curve	= trenton1986.idf	Storm duration	= 2.2 x Tc
Target Q	= 0.760 cfs	Est. Req'd Storage	= 501 cuft

* Composite (Area/C) = [(0.020 x 0.35) + (0.170 x 0.95)] / 0.190



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

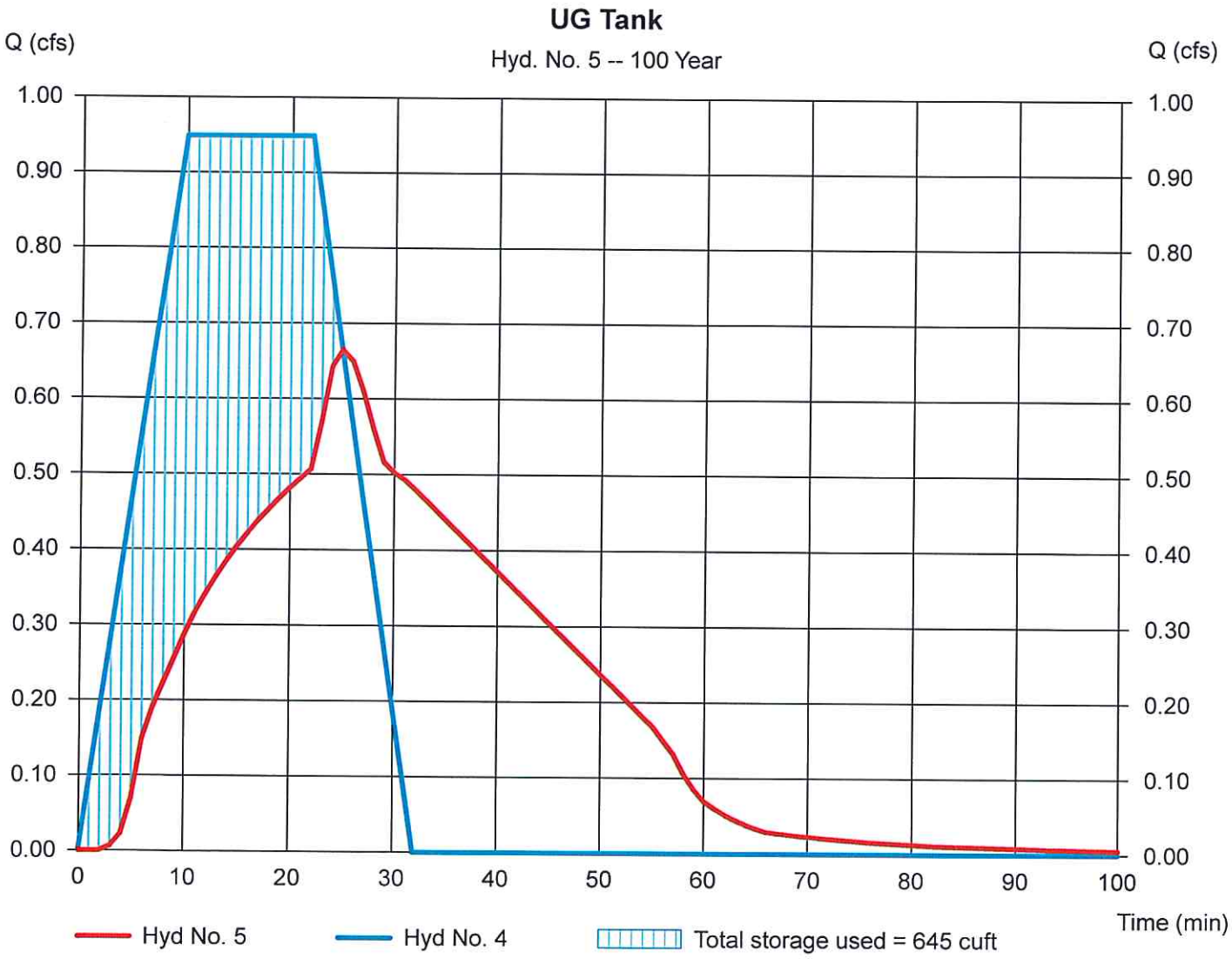
Thursday, Mar 30, 2017

Hyd. No. 5

UG Tank

Hydrograph type	= Reservoir	Peak discharge	= 0.664 cfs
Storm frequency	= 100 yrs	Time to peak	= 25 min
Time interval	= 1 min	Hyd. volume	= 1,235 cuft
Inflow hyd. No.	= 4 - Post Developed To Storage	Max. Elevation	= 145.79 ft
Reservoir name	= <New Pond>	Max. Storage	= 645 cuft

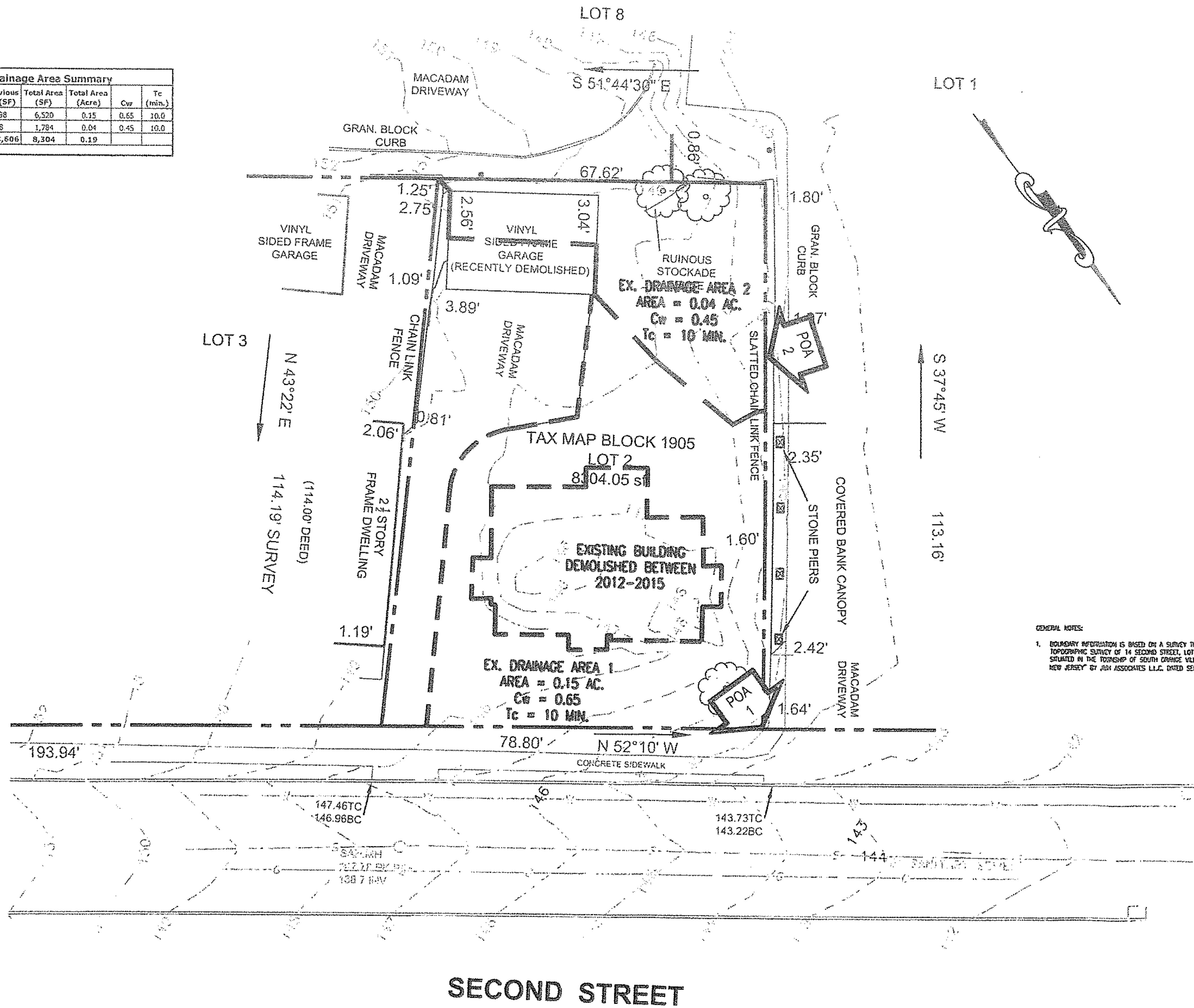
Storage Indication method used.



APPENDIX C

EXISTING & PROPOSED DRAINAGE AREA PLANS

Existing Drainage Area Summary						
Drainage Area	Pervious Area (SF)	Impervious Area (SF)	Total Area (SF)	Total Area (Acre)	Cw	Tc (min.)
1	3,222	3,298	6,520	0.15	0.65	10.0
2	1,477	308	1,784	0.04	0.45	10.0
Total	4,699	3,606	8,304	0.19		



GENERAL NOTES:

1. BOUNDARY INFORMATION IS BASED ON A SURVEY TITLED "BOUNDARY AND TOPOGRAPHIC SURVEY OF 14 SECOND STREET, LOT 2 AND, BLOCK 1905, SITUATED IN THE TOWNSHIP OF SOUTH ORANGE VILLAGE, ESSEX COUNTY, NEW JERSEY" BY JAH ASSOCIATES L.L.C. DATED SEPTEMBER 30, 2016.

Jarmel Kizel
ARCHITECTS AND ENGINEERS INC.
42 OKNER PARKWAY
LIVINGSTON, NEW JERSEY 07039
TEL: 973-994-9669
FAX: 973-994-4069
www.jarmelkizel.com

Architecture
Engineering
Interior Design
Implementation Services

ISSUE

NO.	DATE	DESCRIPTION	INT.
1	2/21/17	FOR COMPLETENESS REVIEW	GPG

REVISION

NO.	DATE	DESCRIPTION	INT.

Project: MIXED-USE DEVELOPMENT
14 SECOND STREET
TOWNSHIP OF SOUTH ORANGE
ESSEX COUNTY, NJ
BLOCK 1905, LOT 2

Project No.: YGROUP-S-16-145 | Scale: 1" = 20'

Drawn By: ACS | Approved By: GPG

Drawing Name: EXISTING DRAINAGE AREA MAP

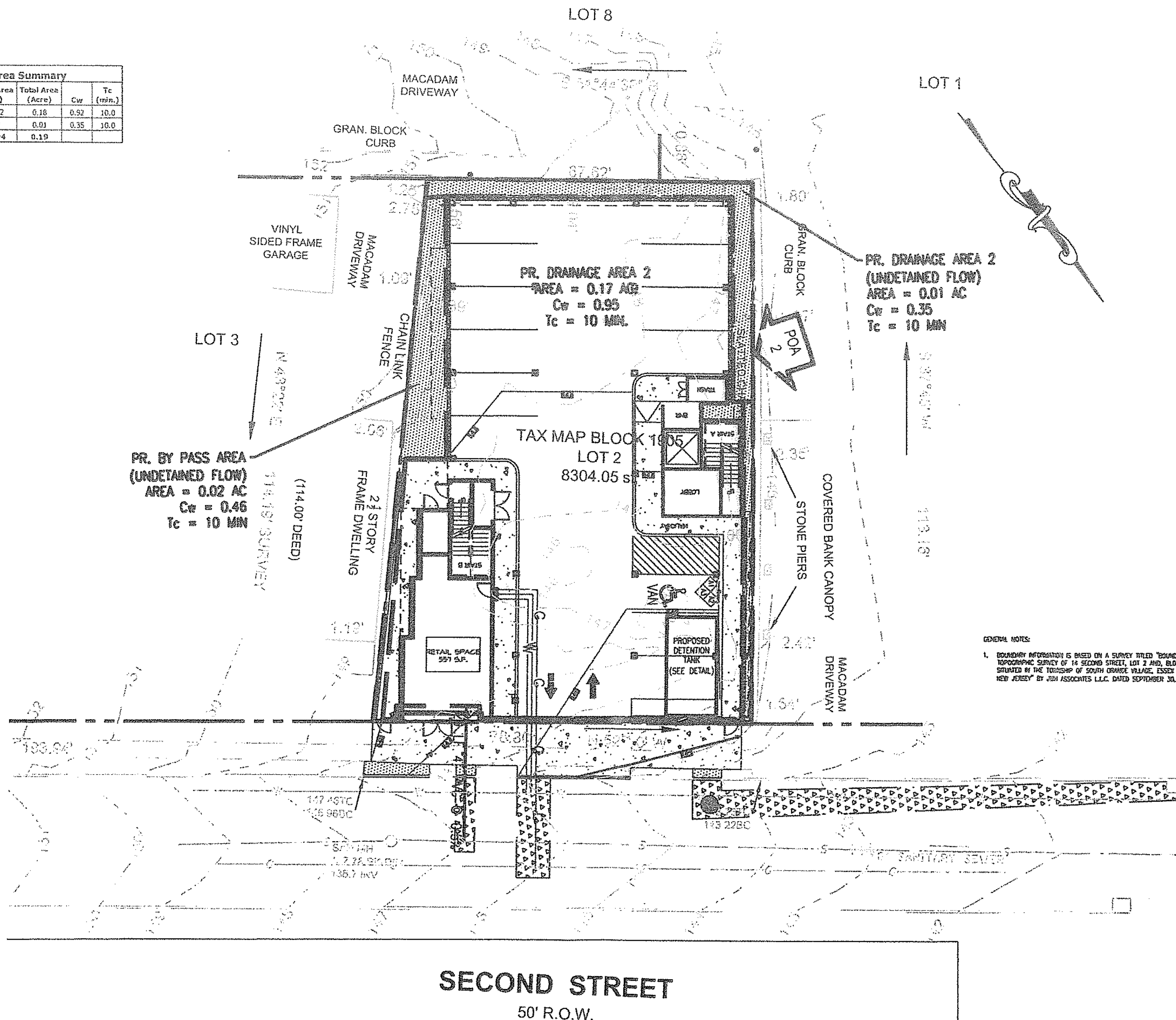
Drawing Number: FIGURE 4

Sheet No. 1 of 1

Initial Date: FEBRUARY 2, 2017

GERARD P. GESARIO
PROFESSIONAL ENGINEER
N.J. LIC. #GE038255

Proposed Drainage Area Summary						
Drainage Area	Pervious Area (SF)	Impervious Area (SF)	Total Area (SF)	Total Area (Acre)	Cw	Tc (min.)
1	738	7,224	7,962	0.18	0.92	10.0
2	342	0	342	0.01	0.35	10.0
Total	1,080	7,224	8,304	0.19		



GENERAL NOTES:

1. BOUNDARY INFORMATION IS BASED ON A SURVEY TITLED "BOUNDARY AND TOPOGRAPHIC SURVEY OF 14 SECOND STREET, LOT 2 AND, BLOCK 1905, SITUATED IN THE TOWNSHIP OF SOUTH ORANGE VILLAGE, ESSEX COUNTY, NEW JERSEY" BY JSH ASSOCIATES L.L.C. DATED SEPTEMBER 30, 2016.

Jarmel Kizel
ARCHITECTS AND ENGINEERS INC.
42 OKNER PARKWAY
LIVINGSTON, NEW JERSEY 07039
TEL: 973-994-9669
FAX: 973-994-4069
www.jarmelkizel.com

Architecture
Engineering
Interior Design
Implementation Services

ISSUE

NO.	DATE	DESCRIPTION	INT.
1	2/31/17	FOR COMPLETENESS REVIEW	GPG

REVISION

NO.	DATE	DESCRIPTION	INT.

Project: MIXED-USE DEVELOPMENT
14 SECOND STREET
TOWNSHIP OF SOUTH ORANGE
ESSEX COUNTY, NJ
BLOCK 1905, LOT 2

Project No: YGROUP-S-16-145	Scale: 1" = 20'
Drawn By: ACS	Approved By: GPG

Drawing Name: PROPOSED DRAINAGE AREA MAP

Drawing Number: FIGURE 5

Sheet No: 1 of: 1

Initial Date: FEBRUARY 2, 2017

GERARD P. GESARIO
PROFESSIONAL ENGINEER
N.J. LIC. #GE038255