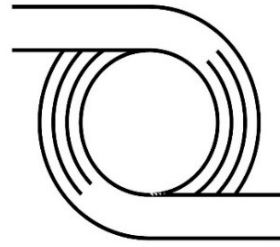




Appendix J-2

Hydrology Report



D & D ENGINEERING, INC.

Morningside High School Development

Hydrology Report

November 1, 2023

D&D Engineering, Inc.
424-351-6800

119 W. Hyde Park Boulevard
Inglewood, CA 90302

5708 Cahuenga Boulevard
North Hollywood, CA 91601



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Appendix A – Hydrology Calculations

- *50-Year 24-Hour Isohyet — Inglewood*
- *Excerpt from LA County Hydrology Manual — Proportion Impervious Data*
- *HydroCalc Worksheets for Proposed Conditions — 50-Year Storm Event*

Appendix B – Allowable Flow Rates

- *LACDPW Information Request Summary*

Appendix C – Detention Basin Calculations

- *Detention Basin Calculations from Hydraulic Toolbox*

I. Introduction

The purpose of this study is to provide a conceptual analysis of the existing and proposed 50-year storm peak flow rates from the Morningside HS project. This report will determine the hydrologic subareas and flows as well as the infrastructure necessary to accommodate the proposed runoff.

II. Project Description

The project site consists of 23.2 acres of land on the campus of Morningside High School and is located southwest of the intersection of 104th Street and 10th Avenue in the City of Inglewood. It is bounded by 104th Street to the North, 10th Avenue and Monroe Middle School to the East, existing single-family homes to the South, and the remainder of Morningside High School to the West. The proposed project consists of townhomes and the site is currently an open field with some school buildings.

III. Hydrologic Summary and Calculations

According to the Los Angeles County Department of Public Works (LACDPW) Information Request Summary (see Appendix B), the project site is allowed to discharge to the existing Project 4402 SD line along Lemoli Avenue near 108th Street and DDI #8 SD line near the intersection of 108th Street and Yukon Avenue. The Information Request Summary identifies three subareas that overlap with the proposed project site: subarea 233U, subarea 221T, and subarea 220T. The sum of the allowable flows from each subarea is summarized in Table 1 below.

Table 1: Allowable Flow Rate Summary

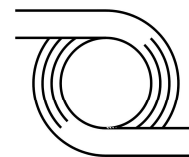
<i>LACDPW Subarea</i>	<i>Overlap Area with Project Site [Ac.]</i>	<i>Allowable Flow Rate [CFS/Ac.]</i>	<i>Allowable Flow Rate [CFS]</i>	<i>Destination Storm Drain</i>
220T	2.94	0.75	2.21	DDI #8
221T	11.12	1.00	11.12	DDI #8
233U	9.18	1.37	12.58	Project 4402
<i>Total</i>	23.2		26.0	

As shown in the table above, the project site is allowed to discharge a total of 13.3 CFS to DDI #8 and 12.6 CFS to Project 4402.

Per the LA County Hydrology Map, the 50-year Isohyet for the project site is 5.2 inches and the soil type is 13 (see Appendix A). HydroCalc was used to calculate the 50-year peak storm runoff for the existing and proposed conditions. An LA County impervious data factor of 86% was used for proposed conditions. See Figure 1: Post-Developed Hydrology Map and Table 2 below for additional information.

Table 2: Post-Developed Hydrology Summary

<i>Subarea</i>	<i>Acreage [Ac.]</i>	<i>50-Year Storm Peak Flow Rate [CFS]</i>	<i>Destination Storm Drain</i>
A	10.23	18.00	Project 4402
B	3.66	6.70	Project 4402
C	9.32	16.40	DDI #8
<i>Total</i>	23.2	41.1	



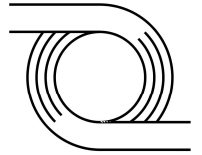
Using a network of underground detention basins, the project site will mitigate the proposed runoff to meet the allowable flow rates from LACDPW. The calculations for the detention basins can be found in Appendix C, and the inflow and outflow flow rates are summarized in Table 3 below.

Table 3: Detention Basin Hydrology Summary

	<i>Tributary Subarea</i>	<i>Detention Basin Size</i>	<i>50-Year Peak Inflow [CFS]</i>	<i>50-Year Peak Outflow [CFS]</i>	<i>Destination</i>	<i>Allowable Peak Flow [CFS]</i>
<i>Detention Basin A</i>	A	18'x76'x6', 15" orifice	18.00	12.86	Basin B	-
<i>Detention Basin B</i>	B, Basin A	35'x90'x6', 15" orifice	18.32	11.65	Project 4402	12.6
<i>Detention Basin C</i>	C	17'x84'x6', 15" orifice	16.40	11.83	DDI #8	13.3

IV. Conclusion

As shown in the sections above, the proposed project site will intercept and mitigate the 50-year storm runoff to within the allowable limits per LACDPW. To do this, the project site will use a network of underground storm drain pipes and underground detention basins. The proposed system will ultimately connect to both existing Project 4402 and DDI #8 storm drain lines. The post-detention outflow from the project site will be 11.65 CFS to Project 4402, which is less than the allowable limit of 12.6 CFS. The post-detention outflow from the project site will be 11.83 CFS to DDI #8, which is less than the allowable limit of 13.3 CFS per LACDPW.



Figures

PROPOSED HYDROLOGY

SUBAREA	ACREAGE	Q ₅₀ [CFS]
A	10.23	18.00
B	3.66	6.70
C	9.32	16.40
TOTALS	23.2	41.1

ALLOWABLE HYDROLOGY

SUBAREA*	ACREAGE	ALLOWABLE RATE [CFS/AC]	Q _{ALLOWABLE} DDI #8 [CFS]	Q _{ALLOWABLE} PROJECT 4402 [CFS]
220T	2.94	0.75	2.21	
221T	11.12	1.00	11.12	
233U	9.18	1.37		12.58
TOTALS	23.2		13.3	12.6

*SUBAREA NAMING BASED ON INFORMATION REQUEST FORM FROM LA COUNTY.

DETENTION BASIN SUMMARY

DETENTION BASIN	TRIBUTARY SUBAREAS	INFLOW Q ₅₀ [CFS]	DETENTION BASIN SIZE [CF]	BASIN OUTLET SIZE [IN]	POST-DETENTION OUTFLOW [CFS]	DESTINATION
A	A	18.00	8,200	15	12.86	BASIN B
B	B, BASIN A	18.32	18,900	15	11.65	PROJECT 4402
C	C	16.40	8,570	15	11.83	DDI #8

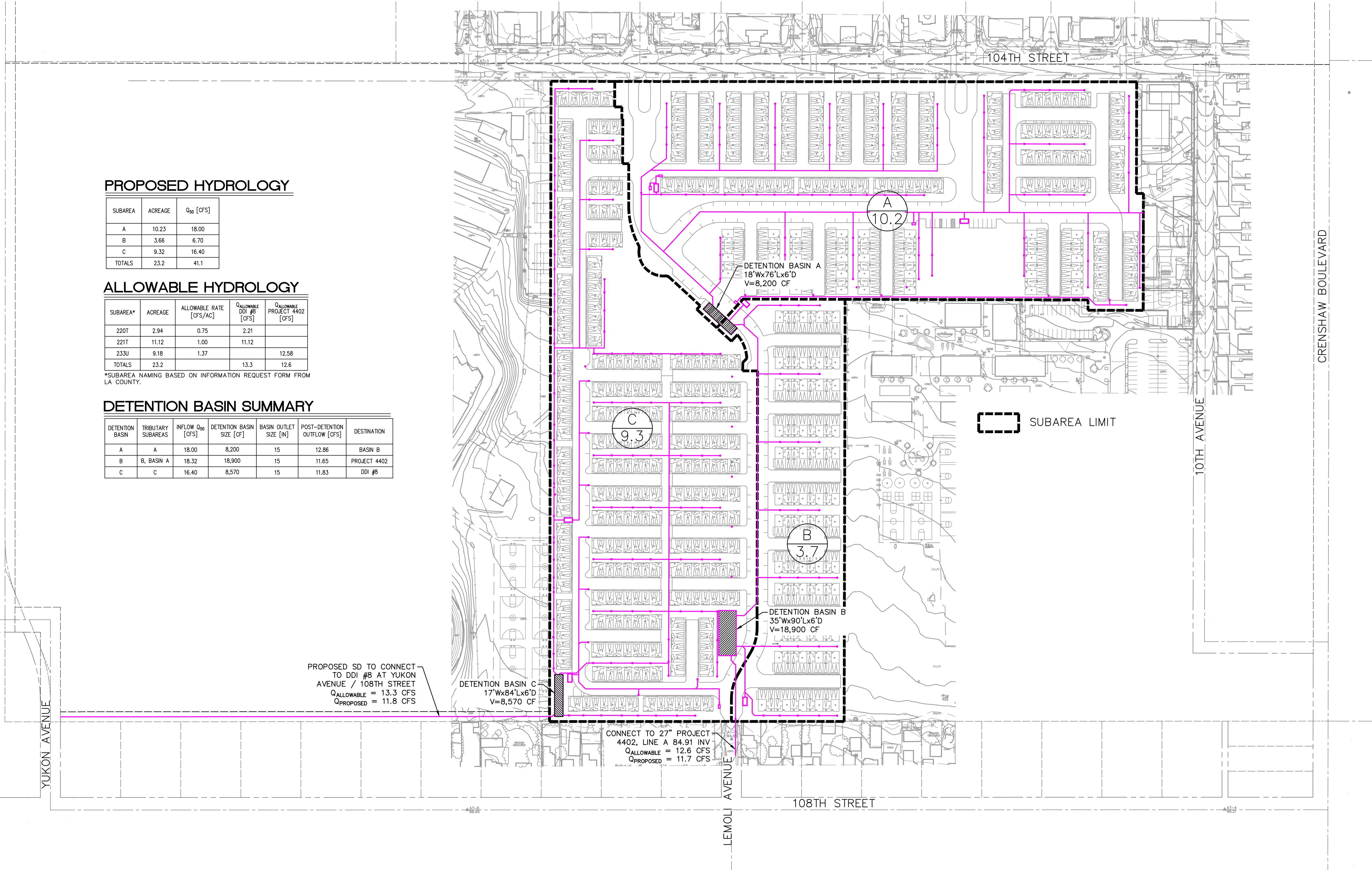


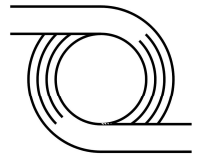
FIGURE 1

D & D ENGINEERING, INC.
119 W. HYDE PARK BLVD.
INGLEWOOD, CA 90302
Phone: 424-351-8800

MORNINGSIDE HIGH SCHOOL

SCALE:
1" = 100'
DATE:
11/01/2023
SHEET NO:
01 of 01

HYDROLOGY MAP



Appendix A

Proportion Impervious Data

Code	Land Use Description	% Impervious
1111	High-Density Single Family Residential	42
1112	Low-Density Single Family Residential	21
1121	Mixed Multi-Family Residential	74
1122	Duplexes, Triplexes and 2-or 3-Unit Condominiums and Townhouses	55
1123	Low-Rise Apartments, Condominiums, and Townhouses	86
1124	Medium-Rise Apartments and Condominiums	86
1125	High-Rise Apartments and Condominiums	90
1131	Trailer Parks and Mobile Home Courts, High-Density	91
1132	Mobile Home Courts and Subdivisions, Low-Density	42
1140	Mixed Residential	59
1151	Rural Residential, High-Density	15
1152	Rural Residential, Low-Density	10
1211	Low- and Medium-Rise Major Office Use	91
1212	High-Rise Major Office Use	91
1213	Skyscrapers	91
1221	Regional Shopping Center	95
1222	Retail Centers (Non-Strip With Contiguous Interconnected Off-Street	96
1223	Modern Strip Development	96
1224	Older Strip Development	97
1231	Commercial Storage	90
1232	Commercial Recreation	90
1233	Hotels and Motels	96
1234	Attended Pay Public Parking Facilities	91
1241	Government Offices	91
1242	Police and Sheriff Stations	91
1243	Fire Stations	91
1244	Major Medical Health Care Facilities	74
1245	Religious Facilities	82
1246	Other Public Facilities	91
1247	Non-Attended Public Parking Facilities	91
1251	Correctional Facilities	91
1252	Special Care Facilities	74
1253	Other Special Use Facilities	86
1261	Pre-Schools/Day Care Centers	68
1262	Elementary Schools	82
1263	Junior or Intermediate High Schools	82
1264	Senior High Schools	82
1265	Colleges and Universities	47
1266	Trade Schools and Professional Training Facilities	91
1271	Base (Built-up Area)	65
1271.01	Base High-Density Single Family Residential	42
1271.02	Base Duplexes, Triplexes and 2-or 3-Unit Condominiums and T	55

Peak Flow Hydrologic Analysis

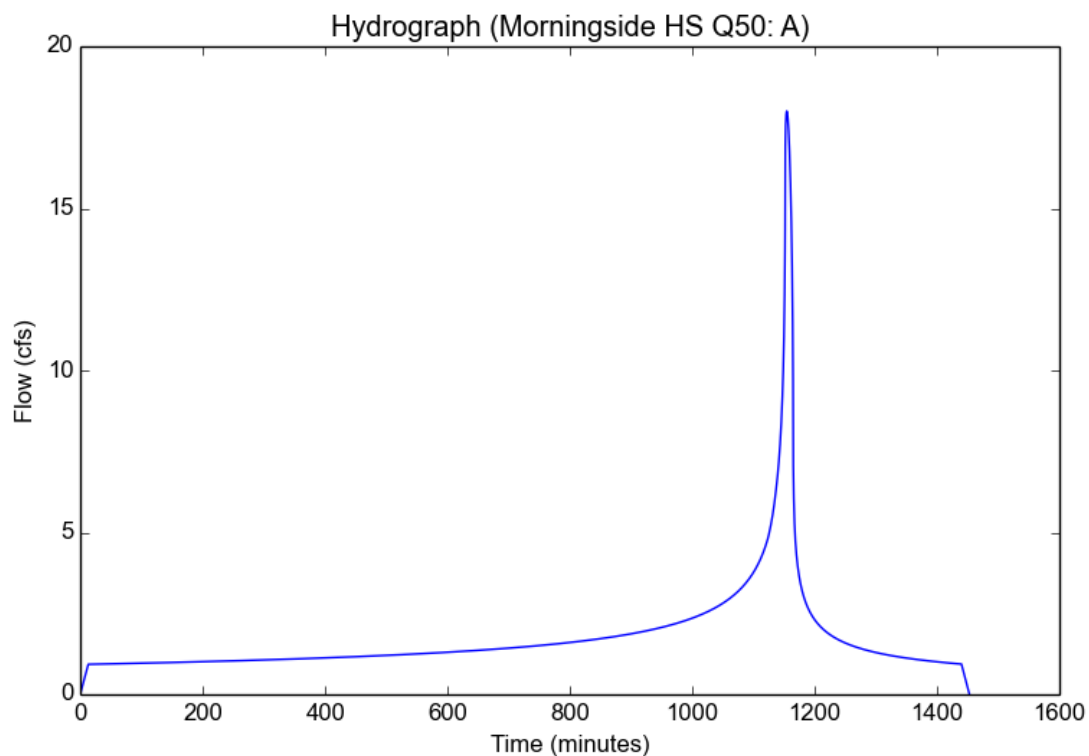
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Morningside HS Q50
Subarea ID	A
Area (ac)	10.23
Flow Path Length (ft)	1100.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.2
Percent Impervious	0.86
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.2
Peak Intensity (in/hr)	1.98
Undeveloped Runoff Coefficient (Cu)	0.8202
Developed Runoff Coefficient (Cd)	0.8888
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	18.0036
Burned Peak Flow Rate (cfs)	18.0036
24-Hr Clear Runoff Volume (ac-ft)	3.5083
24-Hr Clear Runoff Volume (cu-ft)	152822.085



Peak Flow Hydrologic Analysis

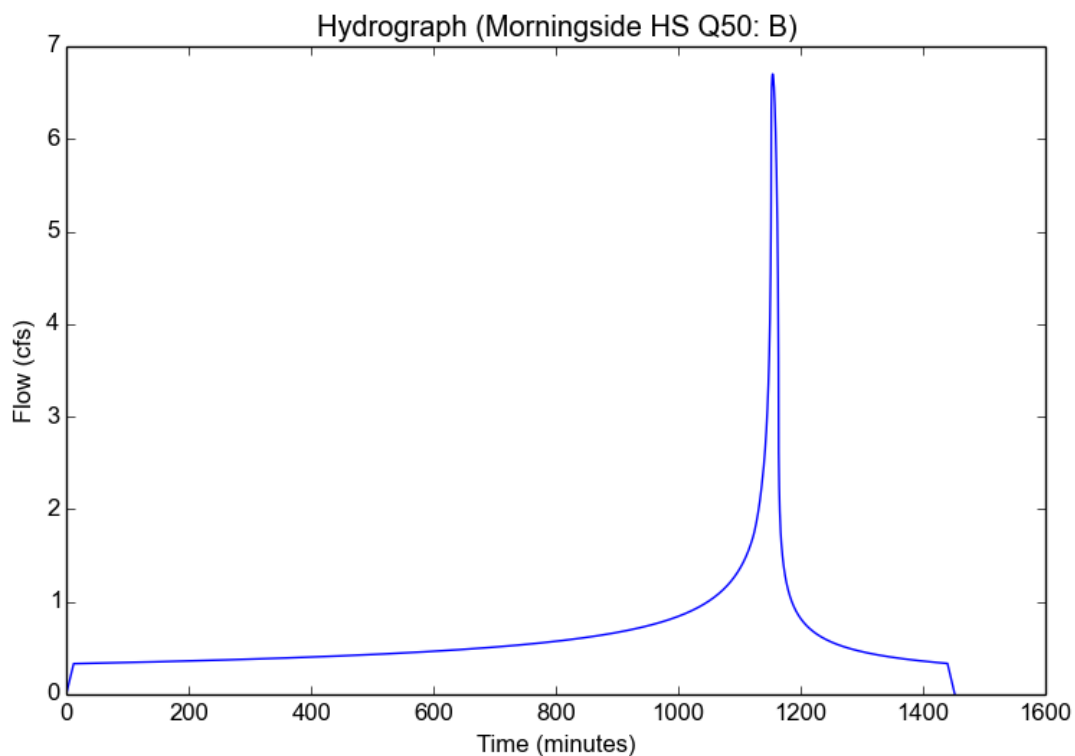
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Morningside HS Q50
Subarea ID	B
Area (ac)	3.66
Flow Path Length (ft)	1000.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.2
Percent Impervious	0.86
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.2
Peak Intensity (in/hr)	2.0559
Undeveloped Runoff Coefficient (Cu)	0.8326
Developed Runoff Coefficient (Cd)	0.8906
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	6.7012
Burned Peak Flow Rate (cfs)	6.7012
24-Hr Clear Runoff Volume (ac-ft)	1.2553
24-Hr Clear Runoff Volume (cu-ft)	54678.9658



Peak Flow Hydrologic Analysis

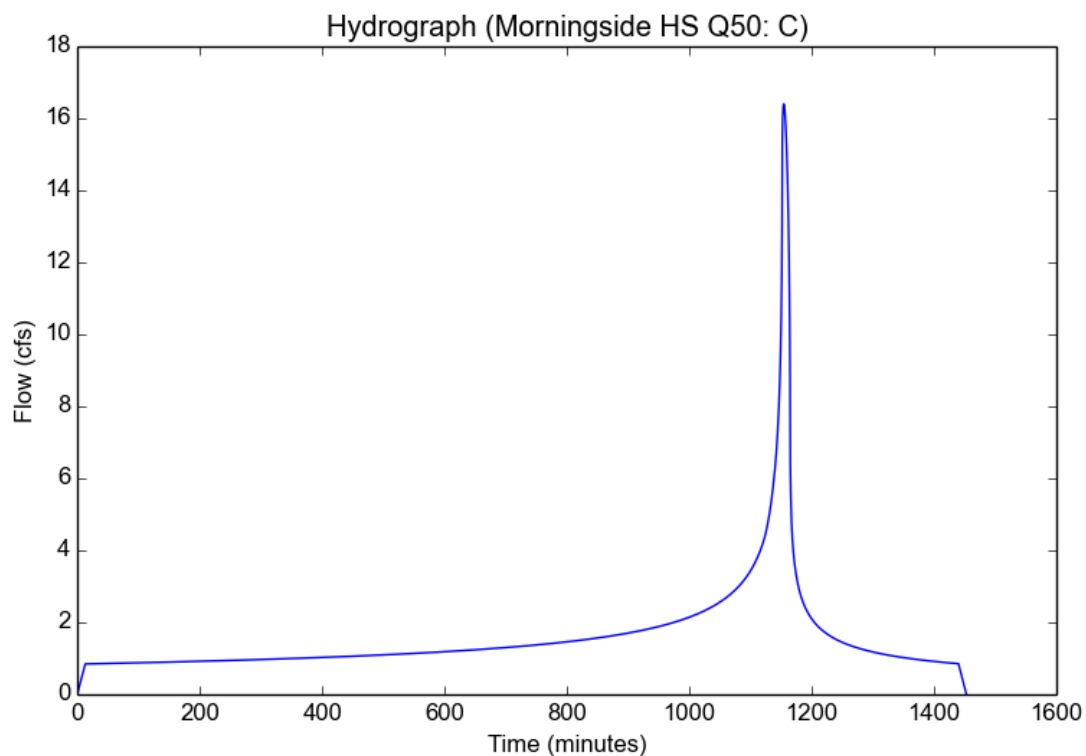
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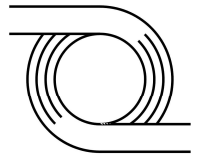
Input Parameters

Project Name	Morningside HS Q50
Subarea ID	C
Area (ac)	9.32
Flow Path Length (ft)	1100.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.2
Percent Impervious	0.86
Soil Type	13
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.2
Peak Intensity (in/hr)	1.98
Undeveloped Runoff Coefficient (Cu)	0.8202
Developed Runoff Coefficient (Cd)	0.8888
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	16.4021
Burned Peak Flow Rate (cfs)	16.4021
24-Hr Clear Runoff Volume (ac-ft)	3.1962
24-Hr Clear Runoff Volume (cu-ft)	139227.9406





Appendix B

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

DESIGN DIVISION
Hydraulic Analysis UnitOFFICIAL
RECORD DOCUMENTIssued By: Calvin Tran
Date: 7/27/22LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
DESIGN DIVISION - HYDRAULIC ANALYSIS UNIT

INFORMATION REQUEST SUMMARY

Office Use Only

☐ Sent Initials: _____
☐ Fax ☐ Email ☐ Other: _____
Date: _____ Time: _____

Public Service That Works

INFORMATION REQUESTED BY

Requester's Name: Henrik Nazarian
Company: D&D Engineering, Inc.
Phone Number: 818-269-1206 Fax Number: _____
Email: HNazarian@DandDEngineeringInc.comMethod of Contact: ☒ Walk-in ☐ Phone ☐ Fax ☒ Email ☐ Prelim. Mtg. Date: 4/12/22Intended Use: Conceptual Design for a developmentProposed Project Type: Residential high density Acreage Involved: 24.6 acresWill information be used in any litigation? ☐ YES ☒ NO
Case Info Name: _____ No: _____ Location: _____Requester's Signature: Henrik Nazarian

INFORMATION REQUESTED (Attach site map if available)

LACFCD Facility: Name: Project # 4402
Unit: 3 Line: Line A Station: 59+00
City: Inglewood
Street/Cross-street: 108th and Lemoli Avenue
Thomas Guide: Page: _____ Grid: _____ ☒ Site Map/Plans Submitted
Info. Requested: Q allowable

BELOW SECTION TO BE COMPLETED BY THE HYDRAULIC ANALYSIS UNIT

INFORMATION PROVIDED: Hydrology and hydraulic calculations for Project No. 4402 and hydrology for DDI 0008REFERENCES SEARCHED: Project No. 4402 and DDI 0008 filesCOMMENTS, ETC: Allowable Q for Project No. 4402 Subarea 233U = 1.37 CFS/AC
Allowable Q for DDI 0008 Subarea 221T = 1 CFS/AC
Allowable Q for DDI 0008 Subarea 220T = 0.75 CFS/AC

FOLLOW-UP REQUIRED: _____

INFORMATION PROVIDED BY: Calvin Tran Date: 7/27/22

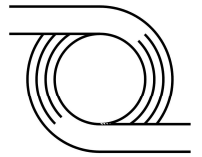
INFORMATION REVIEWED BY: _____ Date: _____



233U	
SubArea (ac):	35.4
TotalArea (ac):	35.4
SubQ50 (cfs):	48.66
TotalQ50 (cfs):	48.66
Dominguez Channel Hydrology, 2017 Project A	

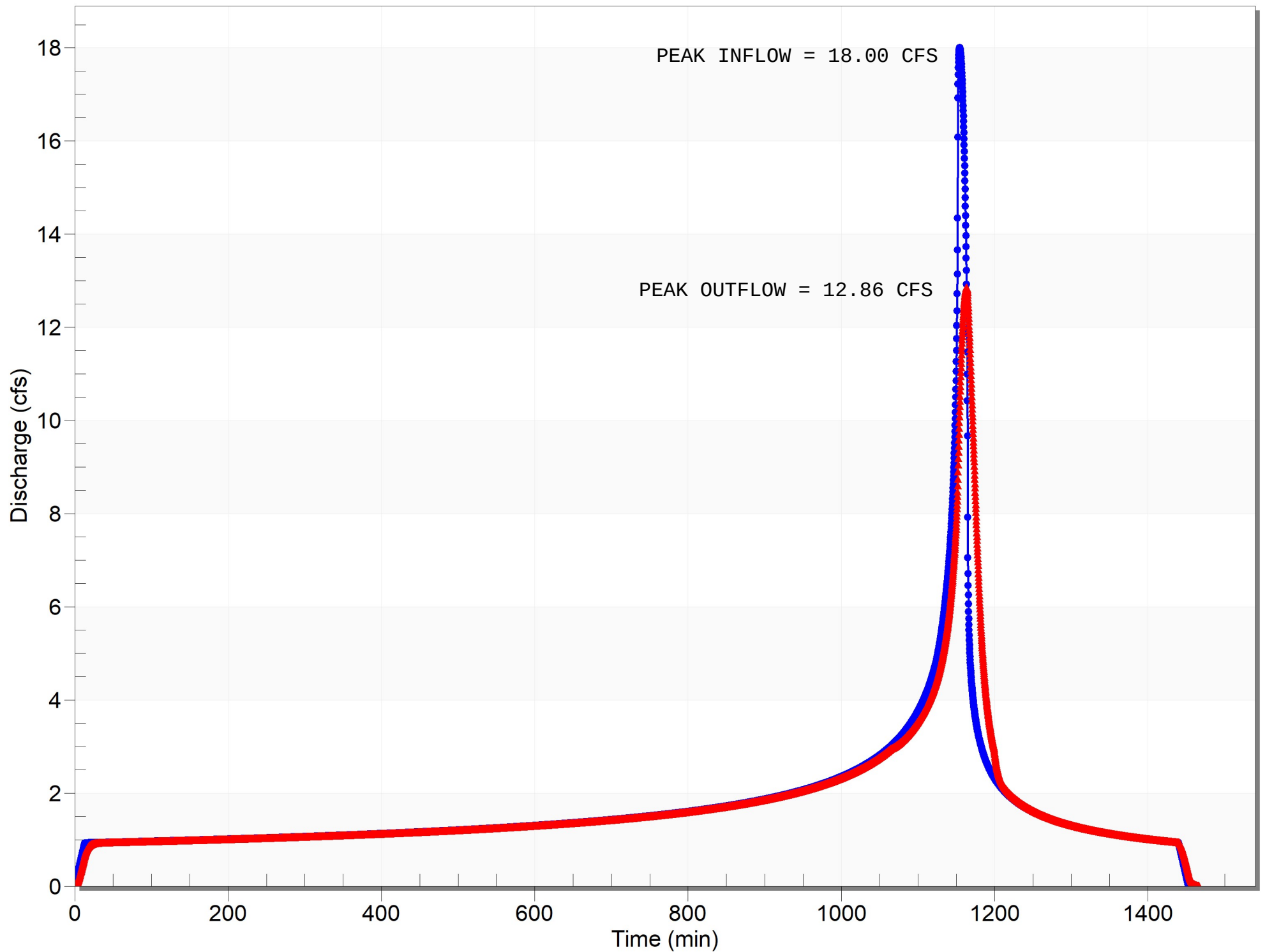




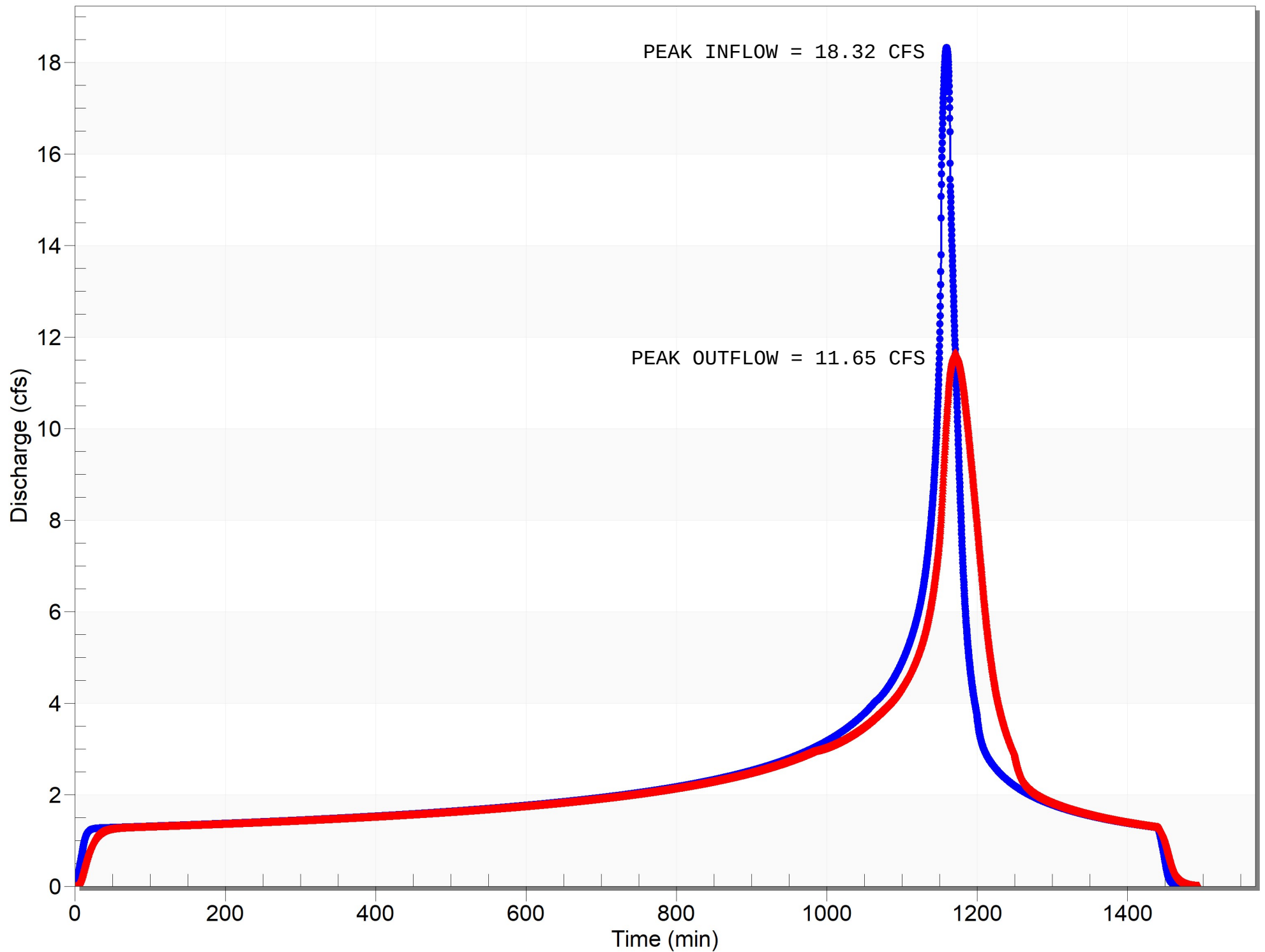


Appendix C

Detention Basin A



Detention Basin B



Detention Basin C

