APPENDIX M

Engineering Reports

M.1 | SIGNATURE EAST – ENGINEER'S REPORT

M.2 | SIGNATURE EAST – SITE DRAWINGS

M.3 | SIGNATURE SOUTH – ENGINEER'S REPORT

M.4 | SIGNATURE SOUTH – SITE DRAWINGS

APPENDIX M.3

Signature South – Engineer's Report

APPENDIX D
Post-Development Quantity Hydrographs

Tailwater Determination

Offsite Watershed Analysis – HydroCAD
Associated Water Surface Elevation (HEC-RAS)
Conveyance System Analysis with Tailwater

Tailwater Determination
Offsite Watershed Analysis – HydroCAD



LEGEND

J-9

L-4A

NOTE AND REFERENCES.:
1. DRAINAGE AREA BOUNDARIES SHOWN FOR GRAPHICAL PURPOSES ONLY.
2. DRAINAGE AREAS ARE BASED ON PLAN CALLED "HYDROLOGIC MODEL SCHEMATIC," DATED JULY 2003, AND "DRAINAGE AREA MAP" PREPARED BY DEWBERRY-GOODKIND, INC.

Date	Description	No.

REVISIONS

SIGNATURE MARC GALLAGHER DATE SIGNED
PROFESSIONAL ENGINEER NJ Lic. No.
24GE04479800

LANGAN
21 Penn Plaza, 360 West 31st Street, 8th Floor, New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. S.A.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
FIRST AVIATION SERVICES EXPANSION PROJECT
BOROUGH OF TETERBORO
BERGEN COUNTY NEW JERSEY

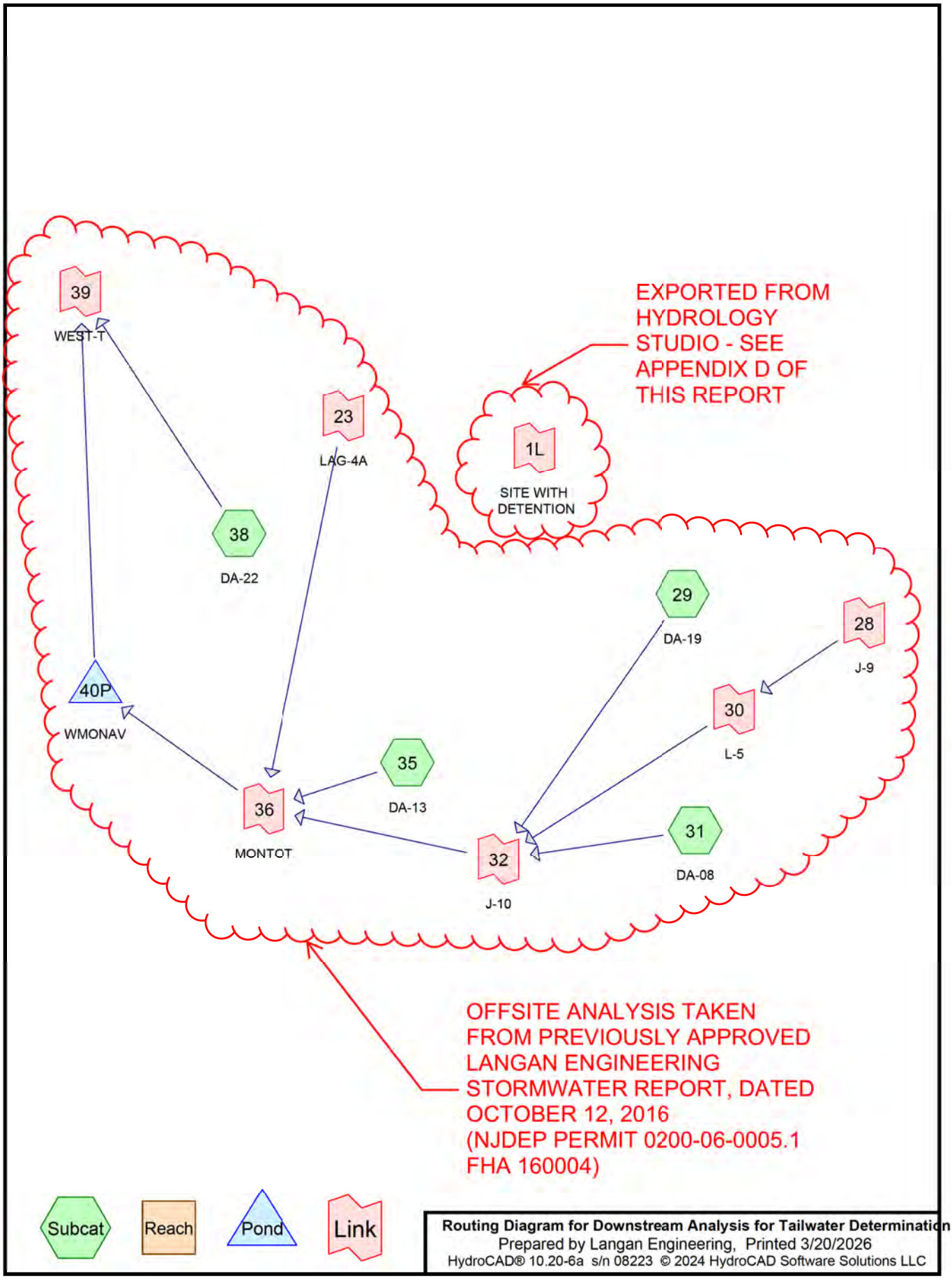
Drawing Title
OFF-SITE WATERSHED ANALYSIS

Project No.	Drawing No.
1642424	CG400
Date: 9/23/2016	
Scale: 1" = 250'	
Drawn By: VP / Checked By: LM	

PROJECT NO. 1642424

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Filename: \\langan.com\data\NYC\data4\001642424\cadd data - 001642424\sheetfiles\SWMR\001642424-CG400-0101.dwg Date: 10/14/2016 Time: 12:07 User: dlofrisco Style Table: Langan.stb Layout: CG400



Routing Diagram for Downstream Analysis for Tailwater Determination
Prepared by Langan Engineering, Printed 3/20/2026
HydroCAD® 10.20-6a s/n 08223 © 2024 HydroCAD Software Solutions LLC

Summary for Subcatchment 29: DA-19

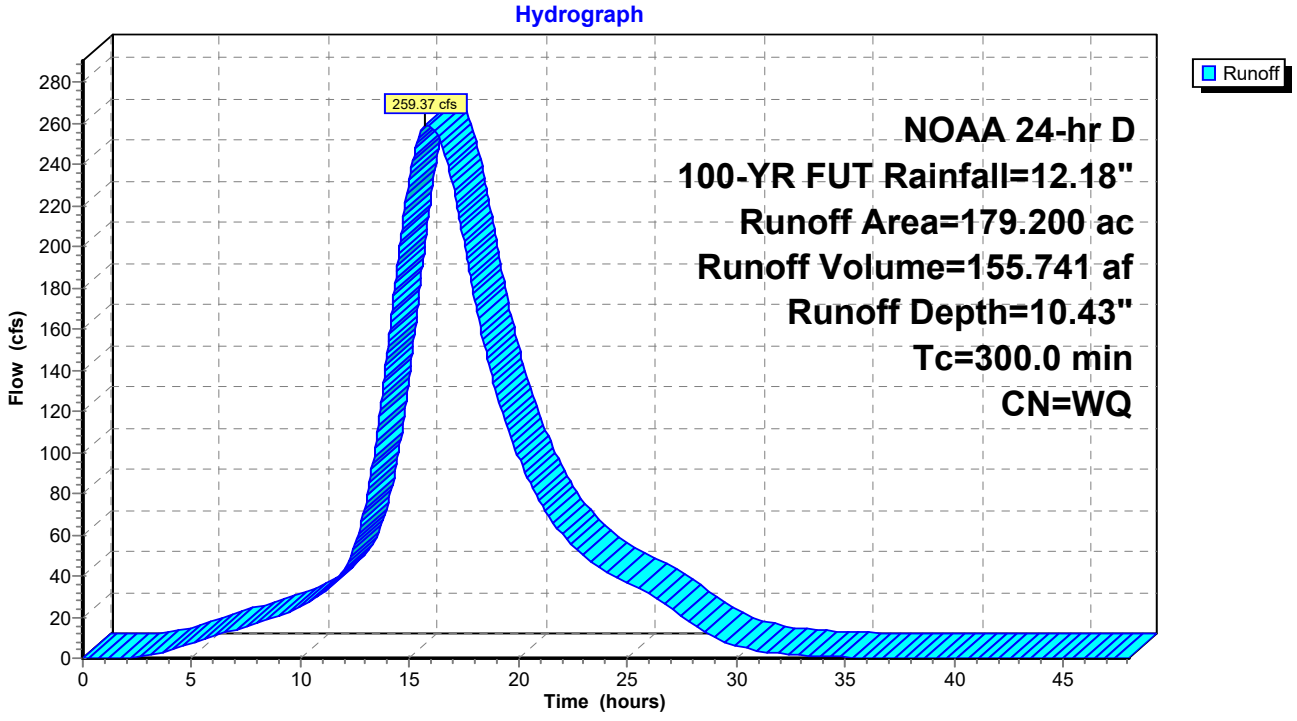
Runoff = 259.37 cfs @ 15.68 hrs, Volume= 155.741 af, Depth=10.43"
Routed to Link 32 : J-10

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs
NOAA 24-hr D 100-YR FUT Rainfall=12.18"

	Area (ac)	CN	Description
*	109.310	98	
*	69.890	69	
	179.200		Weighted Average
	69.890	69	39.00% Pervious Area
	109.310	98	61.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
300.0					**Direct Entry,**

Subcatchment 29: DA-19



Summary for Subcatchment 31: DA-08

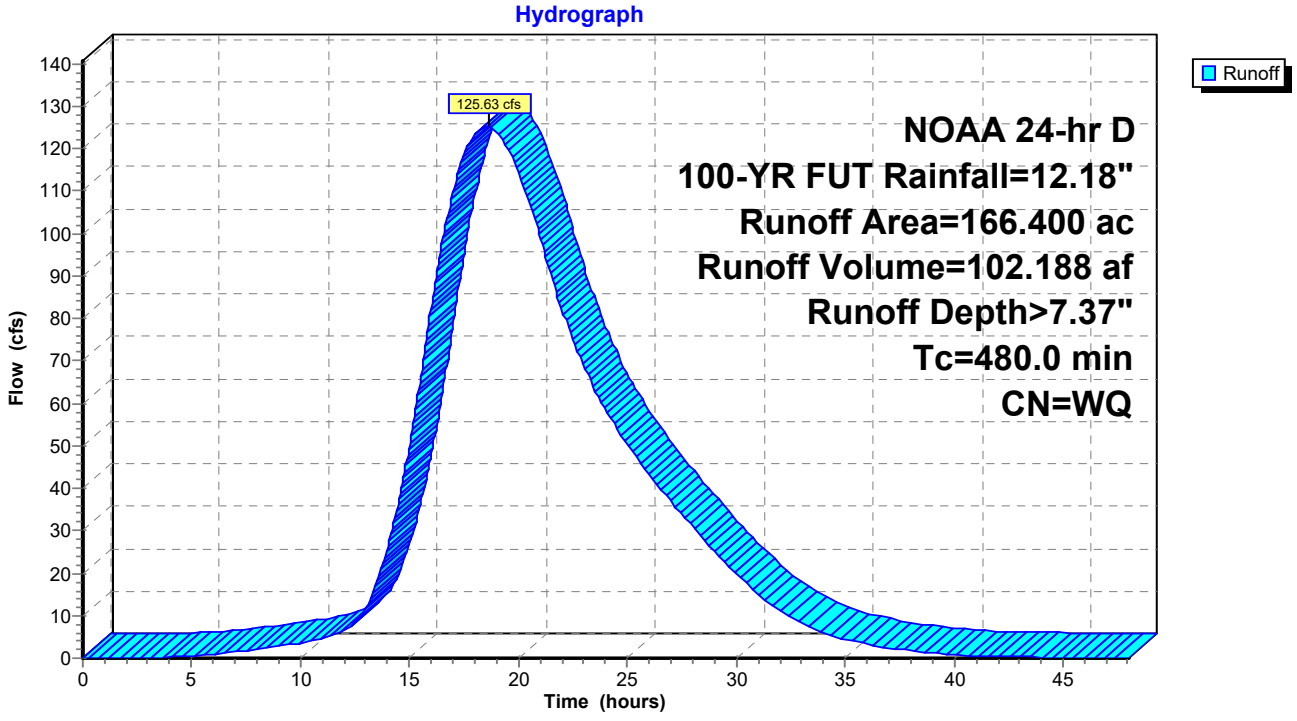
Runoff = 125.63 cfs @ 18.66 hrs, Volume= 102.188 af, Depth> 7.37"
Routed to Link 32 : J-10

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs
NOAA 24-hr D 100-YR FUT Rainfall=12.18"

	Area (ac)	CN	Description
*	141.440	59	
*	24.960	98	
	166.400		Weighted Average
	141.440	59	85.00% Pervious Area
	24.960	98	15.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
480.0					**Direct Entry,**

Subcatchment 31: DA-08



Summary for Subcatchment 35: DA-13

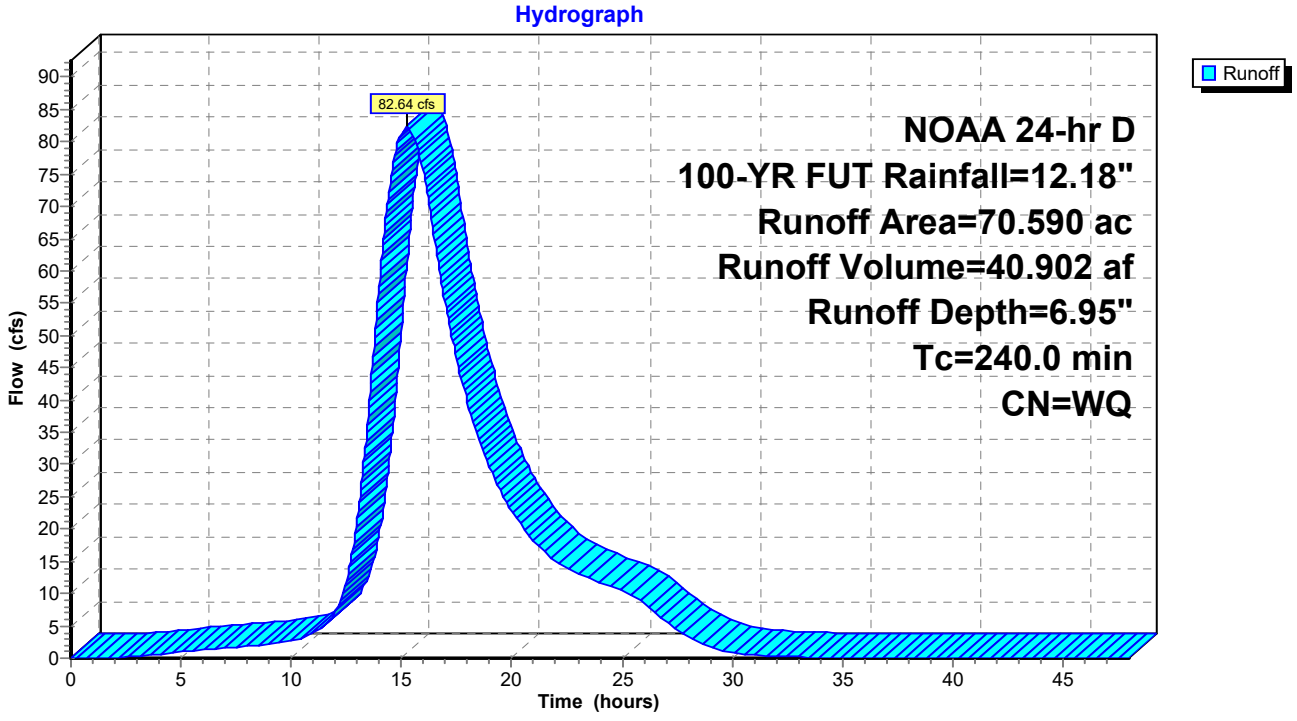
Runoff = 82.64 cfs @ 15.20 hrs, Volume= 40.902 af, Depth= 6.95"
Routed to Link 36 : MONTOT

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs
NOAA 24-hr D 100-YR FUT Rainfall=12.18"

	Area (ac)	CN	Description
*	10.370	98	
*	60.220	56	
	70.590		Weighted Average
	60.220	56	85.31% Pervious Area
	10.370	98	14.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
240.0					**Direct Entry,**

Subcatchment 35: DA-13



Summary for Subcatchment 38: DA-22

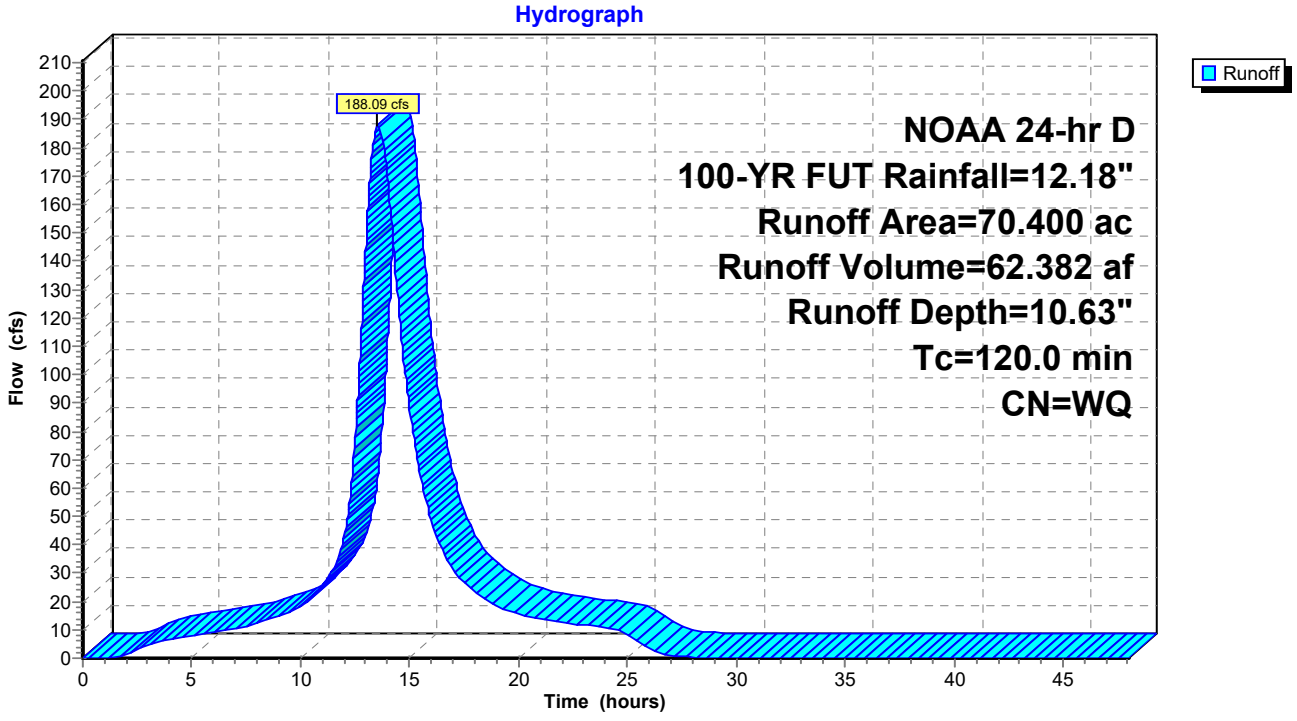
Runoff = 188.09 cfs @ 13.48 hrs, Volume= 62.382 af, Depth=10.63"
Routed to Link 39 : WEST-T

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs
NOAA 24-hr D 100-YR FUT Rainfall=12.18"

	Area (ac)	CN	Description
*	17.600	60	
*	52.800	98	
	70.400		Weighted Average
	17.600	60	25.00% Pervious Area
	52.800	98	75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
120.0					**Direct Entry,**

Subcatchment 38: DA-22



Summary for Pond 40P: WMONAV

Inflow Area = 416.190 ac, 34.75% Impervious, Inflow Depth = 24.05" for 100-YR FUT event
Inflow = 924.96 cfs @ 17.51 hrs, Volume= 834.037 af
Outflow = 561.95 cfs @ 21.22 hrs, Volume= 834.908 af, Atten= 39%, Lag= 223.1 min
Primary = 561.95 cfs @ 21.22 hrs, Volume= 834.908 af
Routed to Link 39 : WEST-T

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs
Starting Elev= 98.00' Surf.Area= 1.250 ac Storage= 0.833 af
Peak Elev= 104.43' @ 21.22 hrs Surf.Area= 152.522 ac Storage= 192.323 af (191.489 af above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 166.7 min (1,336.3 - 1,169.5)

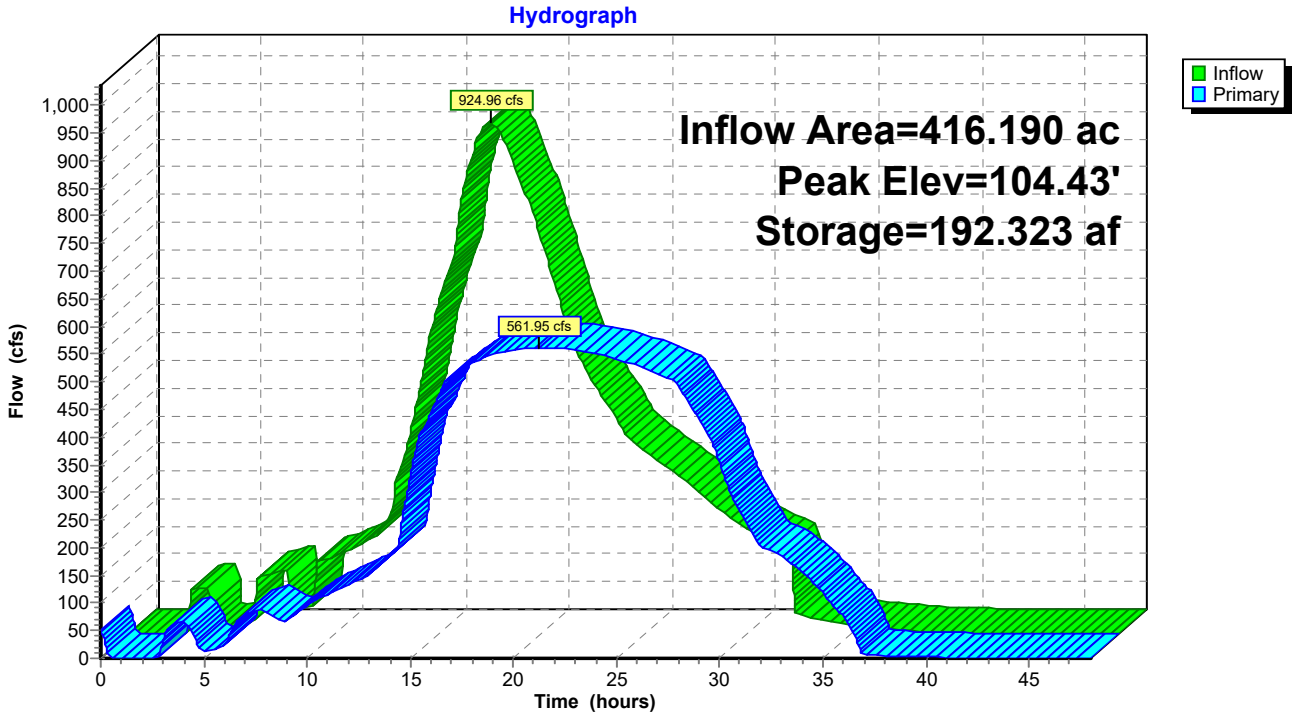
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	306.054 af	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
96.00	0.000	0.000	0.000	0.000
100.00	5.000	6.667	6.667	5.001
102.00	19.000	22.498	29.165	19.001
103.00	56.000	35.873	65.038	56.001
104.00	95.000	74.646	139.684	95.001
105.00	250.000	166.370	306.054	250.002

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**Special & User-Defined** Elev. (feet) 96.00 100.00 102.50 103.00 103.50 105.00 Disch. (cfs) 0.000 100.000 200.000 400.000 500.000 600.000

Primary OutFlow Max=561.95 cfs @ 21.22 hrs HW=104.43' TW=0.00' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 561.95 cfs)

Pond 40P: WMONAV



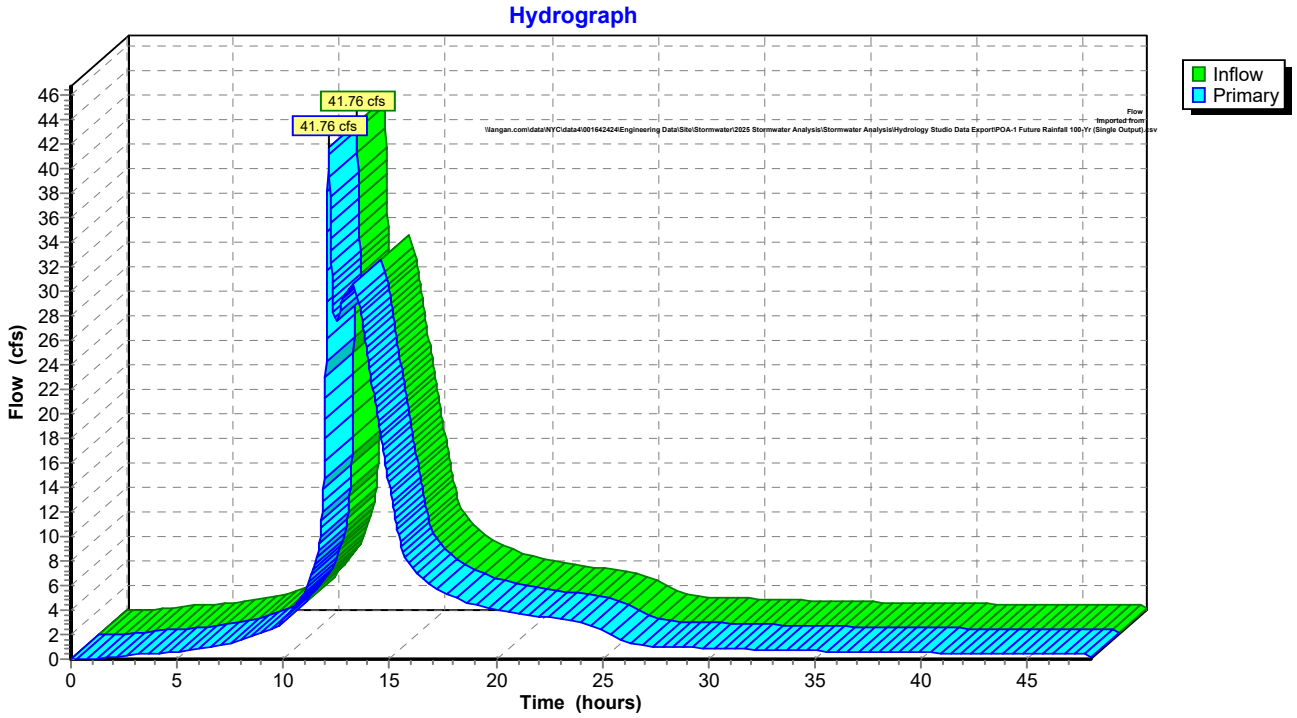
Summary for Link 1L: SITE WITH DETENTION

Inflow = 41.76 cfs @ 12.13 hrs, Volume= 13.633 af
Primary = 41.76 cfs @ 12.13 hrs, Volume= 13.633 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 10L

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs

Flow Imported from \\langan.com\data\NYC\data4\001642424\Engineering Data\Site\Stormwater\2025 Stormwater An

Link 1L: SITE WITH DETENTION



Summary for Link 23: LAG-4A

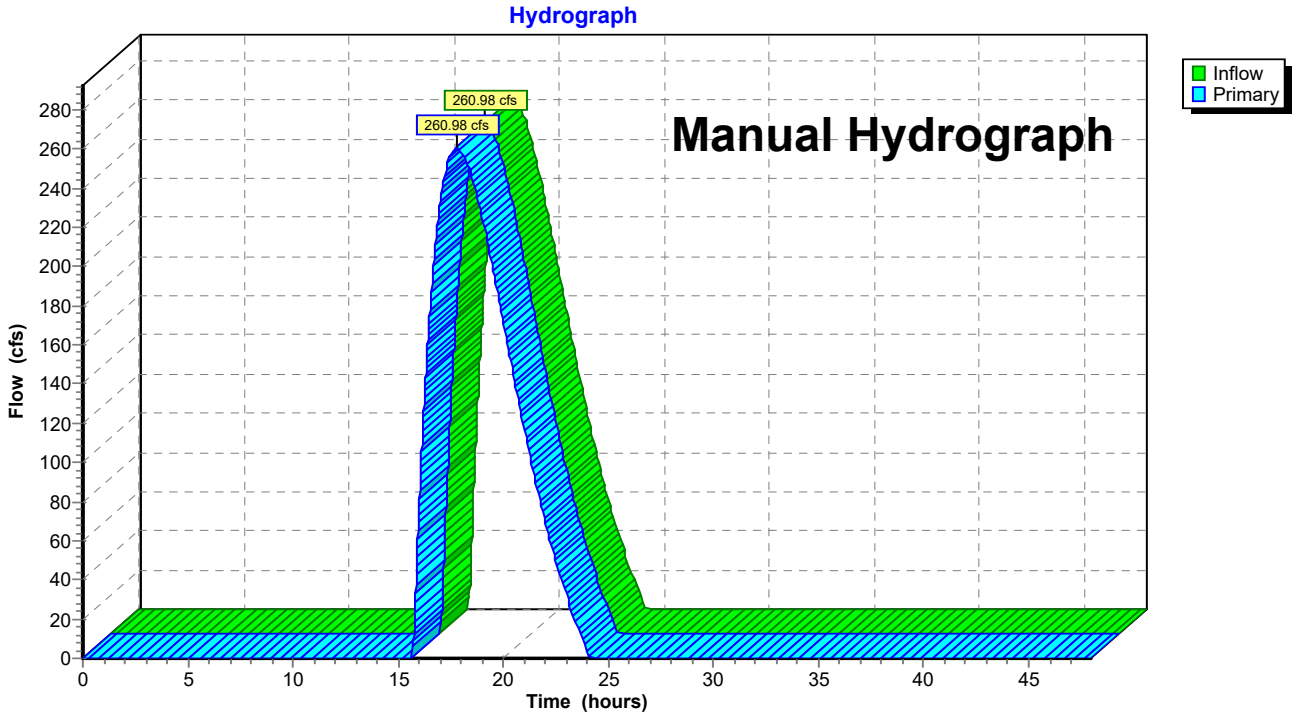
Inflow = 260.98 cfs @ 17.80 hrs, Volume= 97.694 af
Primary = 260.98 cfs @ 17.80 hrs, Volume= 97.694 af, Atten= 0%, Lag= 0.0 min
Routed to Link 36 : MONTOT

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs

100-YR FUT 243 Point manual hydrograph, To= 0.00 hrs, dt= 0.10 hrs, cfs =

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.00	48.00
74.00	98.00	120.00	140.00	157.00	174.00	188.00	201.00	212.00	222.00
231.00	238.00	244.00	249.00	254.00	257.00	259.00	260.00	261.00	260.00
260.00	258.00	256.00	253.00	250.00	247.00	243.00	239.00	235.00	230.00
226.00	221.00	216.00	211.00	205.00	200.00	195.00	189.00	184.00	178.00
172.00	167.00	161.00	156.00	150.00	145.00	139.00	134.00	128.00	123.00
118.00	113.00	108.00	103.00	98.00	93.00	88.00	84.00	79.00	75.00
70.00	66.00	62.00	58.00	54.00	50.00	47.00	43.00	40.00	36.00
33.00	30.00	26.00	23.00	20.00	18.00	15.00	12.00	9.00	7.00
4.00	2.00	0.00							

Link 23: LAG-4A



Summary for Link 28: J-9

Inflow = 312.00 cfs @ 17.40 hrs, Volume= 437.512 af
Primary = 312.00 cfs @ 17.40 hrs, Volume= 437.512 af, Atten= 0%, Lag= 0.0 min
Routed to Link 30 : L-5

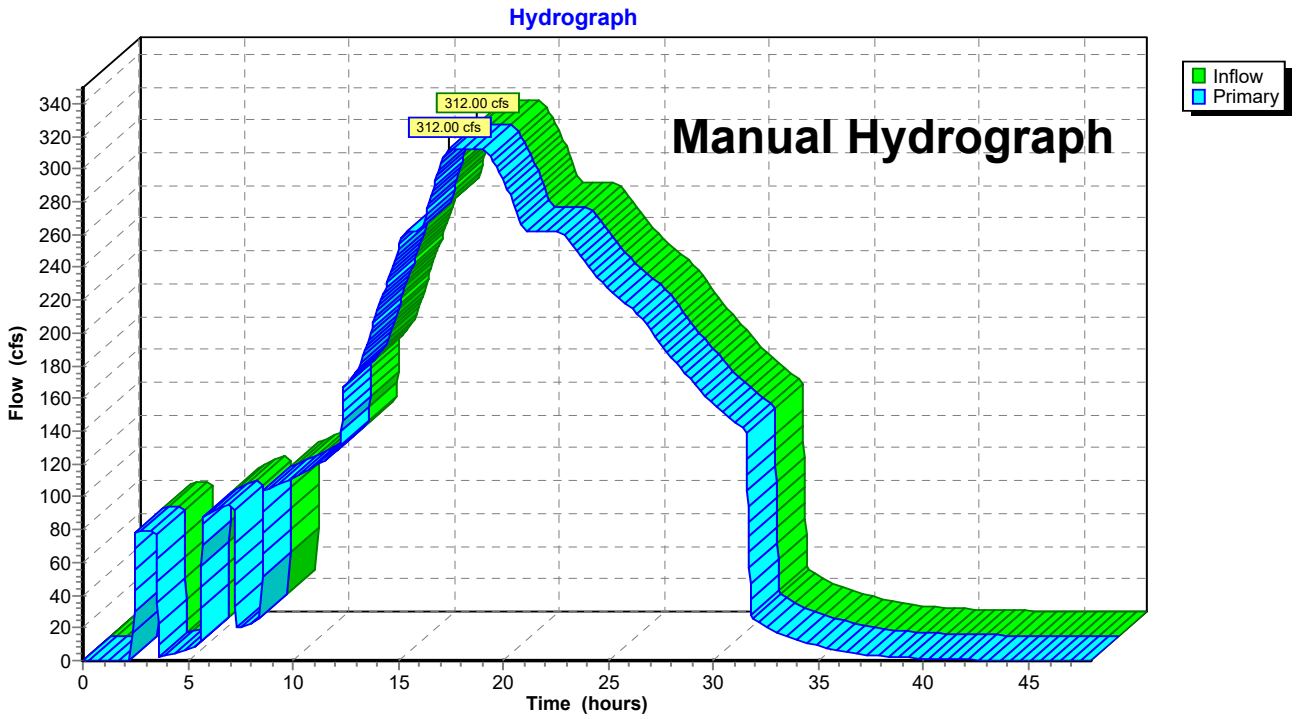
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs

100-YR FUT 480 Point manual hydrograph, To= 0.00 hrs, dt= 0.10 hrs, cfs =

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	78.00	79.00	79.00	79.00	79.00
79.00	79.00	79.00	79.00	80.00	80.00	2.00	2.00	3.00	3.00
3.00	3.00	4.00	4.00	4.00	5.00	5.00	6.00	6.00	7.00
7.00	7.00	8.00	8.00	9.00	9.00	10.00	88.00	89.00	89.00
90.00	90.00	91.00	92.00	92.00	93.00	93.00	94.00	94.00	95.00
95.00	96.00	96.00	19.00	19.00	20.00	21.00	21.00	22.00	22.00
23.00	23.00	24.00	24.00	25.00	25.00	104.00	104.00	105.00	105.00
106.00	106.00	107.00	107.00	108.00	108.00	109.00	110.00	110.00	111.00
111.00	112.00	113.00	113.00	114.00	114.00	115.00	116.00	117.00	117.00
118.00	119.00	120.00	121.00	122.00	122.00	123.00	124.00	126.00	127.00
128.00	129.00	130.00	131.00	167.00	168.00	170.00	171.00	173.00	175.00
176.00	179.00	181.00	184.00	187.00	191.00	195.00	199.00	204.00	209.00
214.00	217.00	220.00	223.00	226.00	230.00	234.00	238.00	242.00	246.00
250.00	255.00	260.00	262.00	262.00	262.00	262.00	262.00	262.00	262.00
262.00	262.00	265.00	270.00	276.00	280.00	285.00	289.00	293.00	297.00
301.00	304.00	307.00	309.00	312.00	312.00	312.00	312.00	312.00	312.00
312.00	312.00	312.00	312.00	312.00	312.00	312.00	312.00	312.00	312.00
312.00	312.00	312.00	310.00	308.00	306.00	304.00	301.00	299.00	297.00
294.00	291.00	288.00	285.00	282.00	279.00	275.00	272.00	268.00	265.00
262.00	262.00	262.00	262.00	262.00	262.00	262.00	262.00	262.00	262.00
262.00	262.00	262.00	262.00	262.00	262.00	262.00	262.00	262.00	261.00
259.00	257.00	255.00	253.00	252.00	250.00	248.00	246.00	245.00	243.00
241.00	240.00	238.00	237.00	235.00	234.00	232.00	231.00	229.00	228.00
227.00	226.00	225.00	223.00	222.00	221.00	220.00	219.00	218.00	217.00
216.00	215.00	214.00	213.00	212.00	210.00	209.00	207.00	205.00	203.00
202.00	200.00	198.00	197.00	195.00	193.00	192.00	190.00	189.00	187.00
186.00	184.00	183.00	181.00	179.00	178.00	176.00	175.00	173.00	172.00
171.00	169.00	168.00	166.00	165.00	164.00	162.00	161.00	159.00	158.00
157.00	156.00	155.00	154.00	152.00	151.00	150.00	149.00	148.00	147.00
146.00	145.00	144.00	143.00	142.00	141.00	140.00	83.00	26.00	25.00
24.00	24.00	23.00	22.00	21.00	21.00	20.00	19.00	18.00	18.00
17.00	17.00	16.00	16.00	15.00	15.00	14.00	14.00	13.00	13.00
12.00	12.00	12.00	12.00	11.00	11.00	10.00	10.00	10.00	10.00
9.00	9.00	8.00	8.00	8.00	8.00	7.00	7.00	7.00	7.00
6.00	6.00	6.00	6.00	5.00	5.00	5.00	5.00	4.00	4.00
4.00	4.00	4.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
3.00	3.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Link 28: J-9

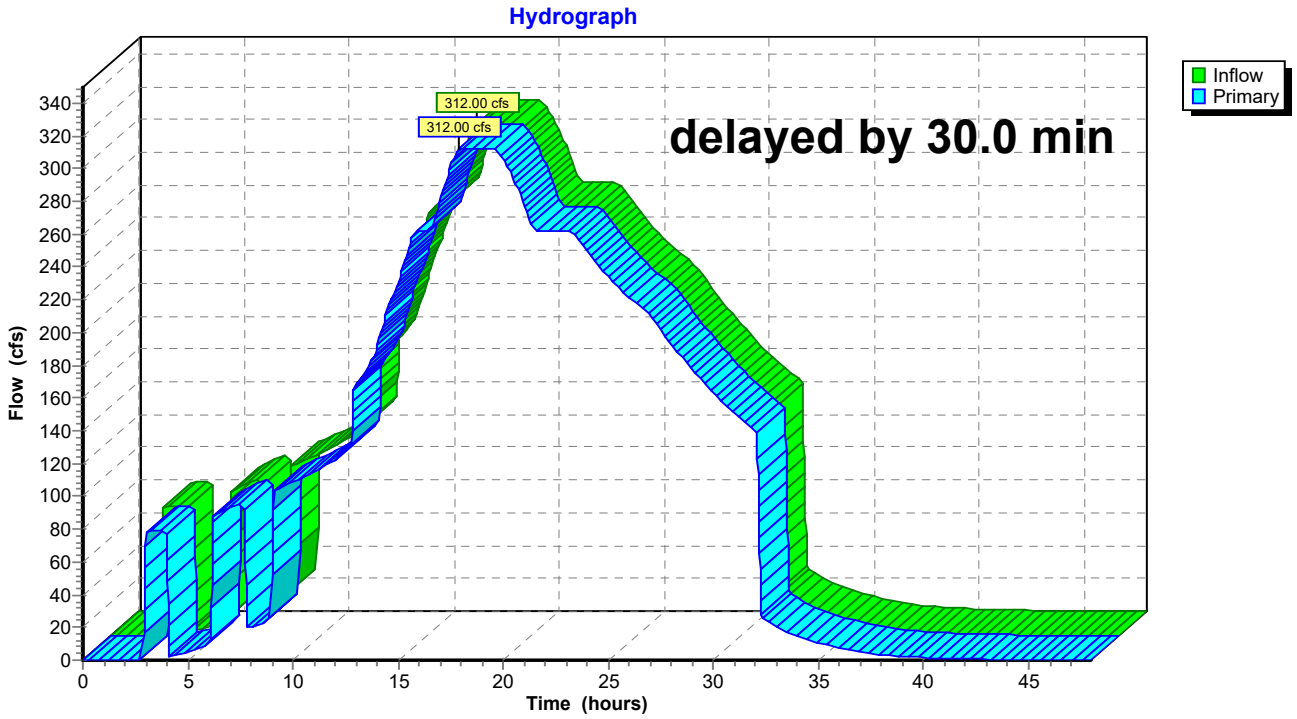


Summary for Link 30: L-5

Inflow = 312.00 cfs @ 17.40 hrs, Volume= 437.512 af
Primary = 312.00 cfs @ 17.90 hrs, Volume= 437.512 af, Atten= 0%, Lag= 30.1 min
Routed to Link 32 : J-10

Primary outflow = Inflow delayed by 30.0 min, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs

Link 30: L-5

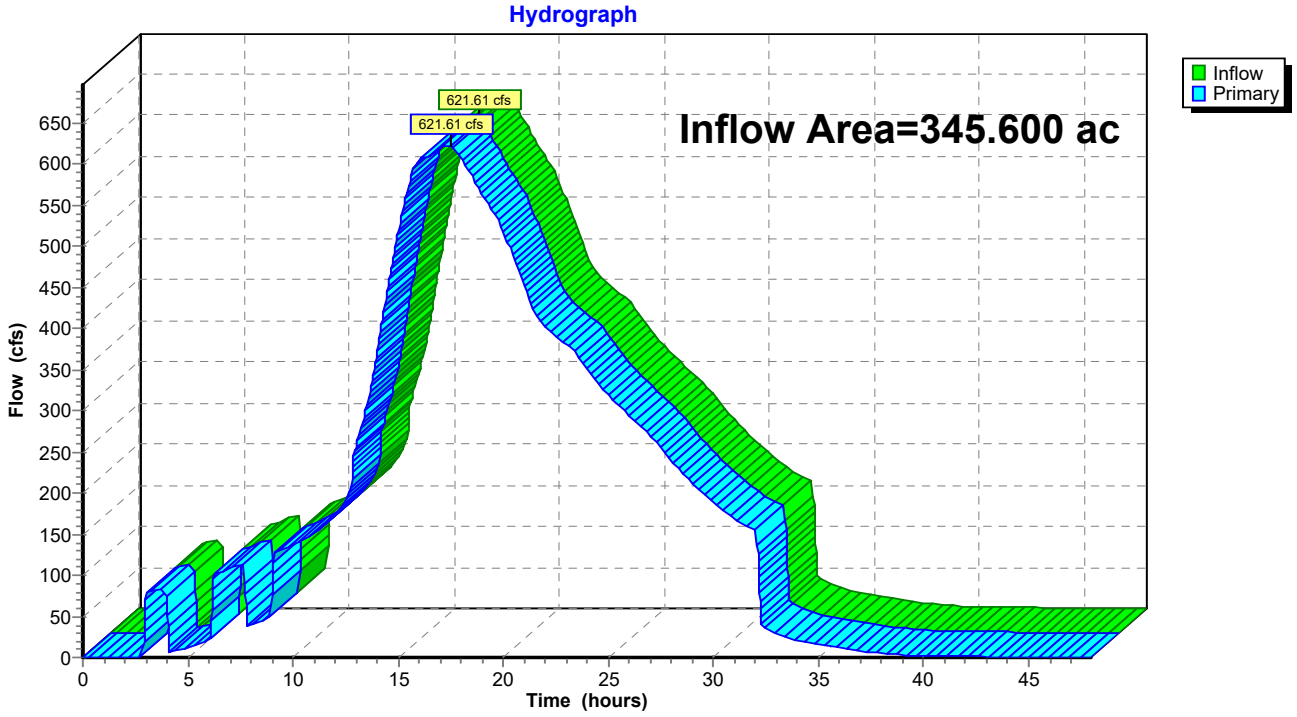


Summary for Link 32: J-10

Inflow Area = 345.600 ac, 38.85% Impervious, Inflow Depth = 24.15" for 100-YR FUT event
Inflow = 621.61 cfs @ 17.48 hrs, Volume= 695.441 af
Primary = 621.61 cfs @ 17.48 hrs, Volume= 695.441 af, Atten= 0%, Lag= 0.0 min
Routed to Link 36 : MONTOT

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs

Link 32: J-10

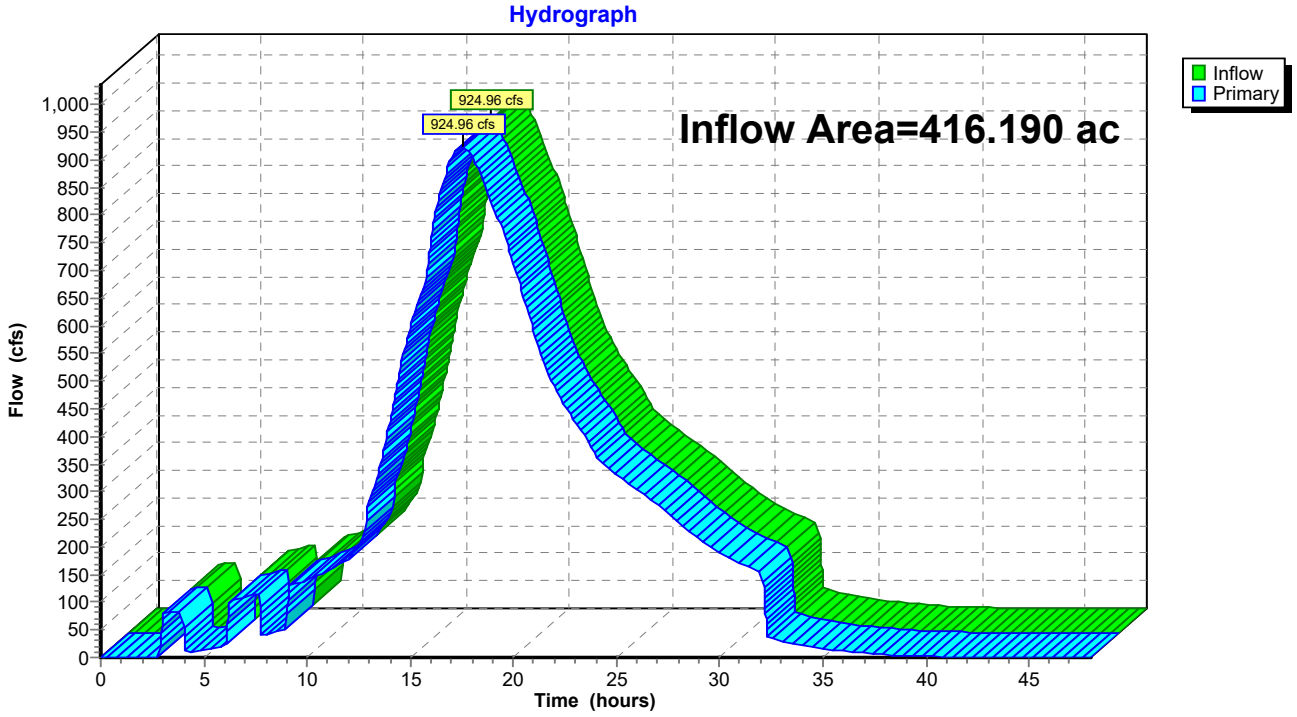


Summary for Link 36: MONTOT

Inflow Area = 416.190 ac, 34.75% Impervious, Inflow Depth = 24.05" for 100-YR FUT event
Inflow = 924.96 cfs @ 17.51 hrs, Volume= 834.037 af
Primary = 924.96 cfs @ 17.51 hrs, Volume= 834.037 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 40P : WMONAV

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs

Link 36: MONTOT

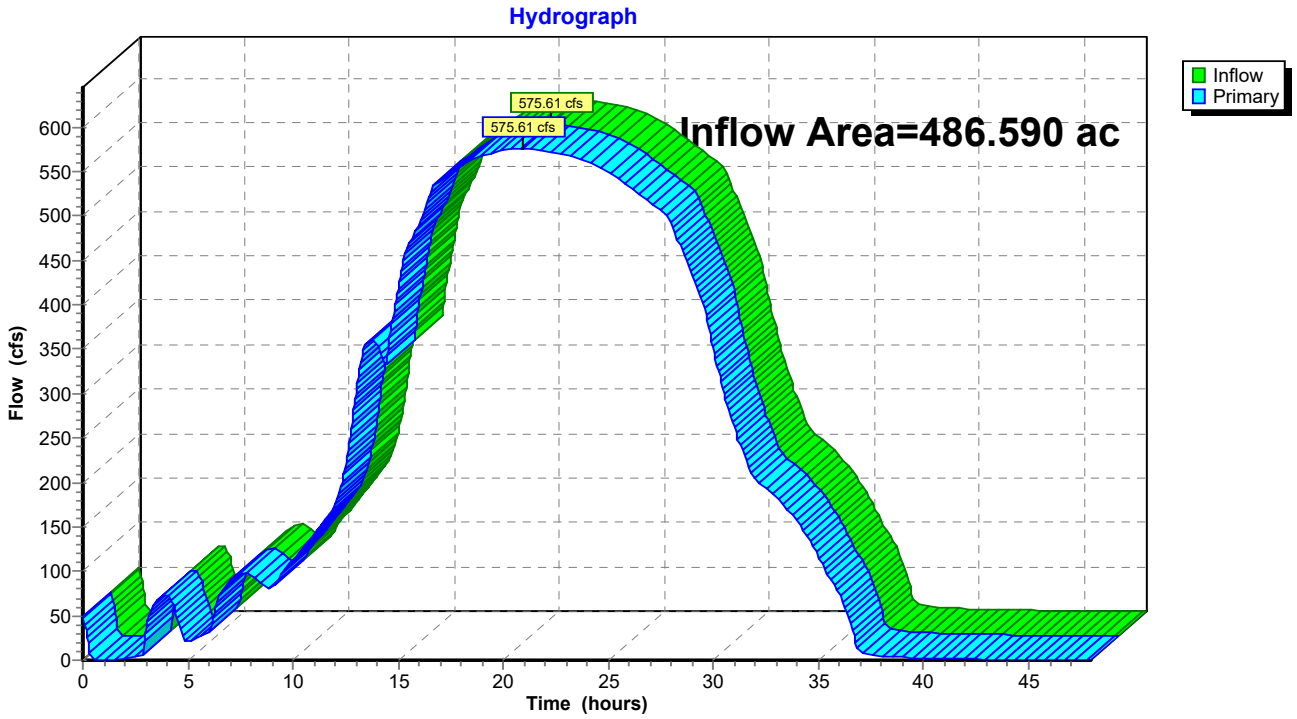


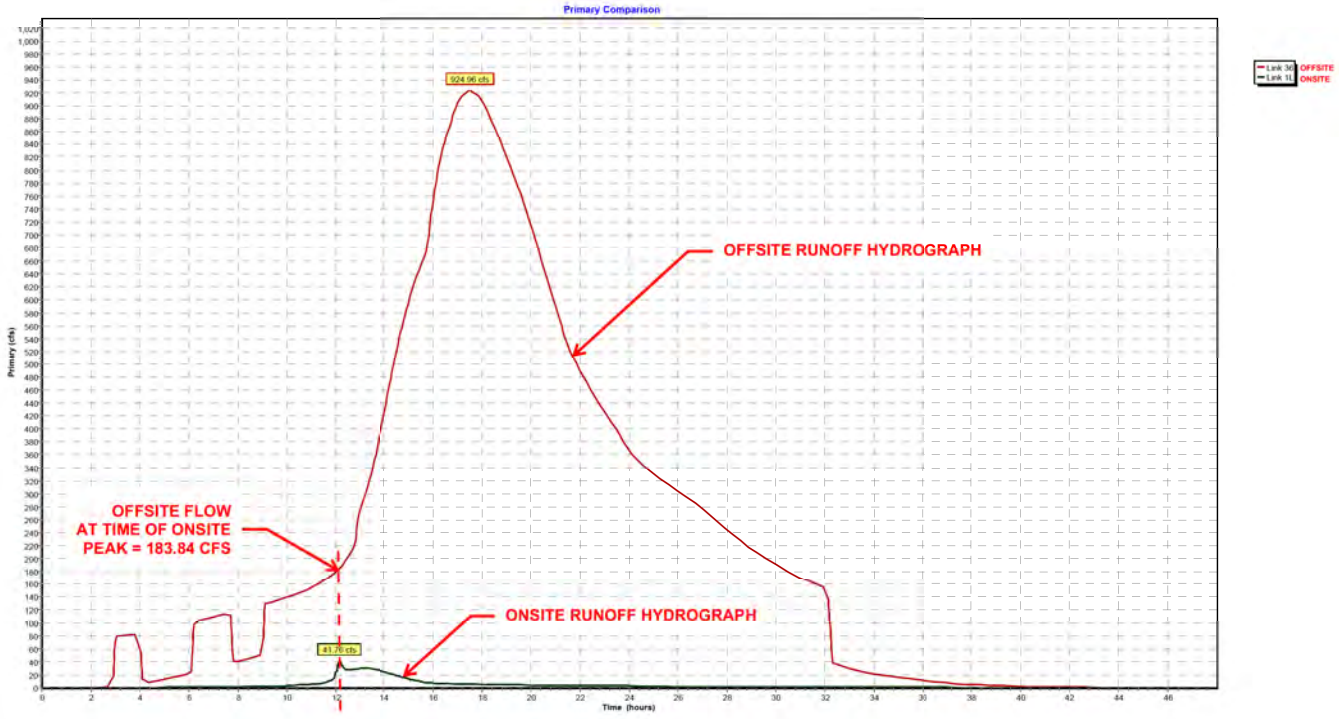
Summary for Link 39: WEST-T

Inflow Area = 486.590 ac, 40.58% Impervious, Inflow Depth = 22.13" for 100-YR FUT event
Inflow = 575.61 cfs @ 20.94 hrs, Volume= 897.290 af
Primary = 575.61 cfs @ 20.94 hrs, Volume= 897.290 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.0167 hrs

Link 39: WEST-T




Primary Comparison
924.96 cfs
OFFSITE RUNOFF HYDROGRAPH
OFFSITE FLOW
AT TIME OF ONSITE
PEAK = 183.84 CFS
ONSITE RUNOFF HYDROGRAPH
Primary (cfs)
Time (hours)
Link 30: OFFSITE
Link 11: ONSITE

Primary Comparison

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
0.00	0.00	0.00	1.74	0.14	0.13	3.47	81.74	0.41
0.03	0.00	0.00	1.77	0.15	0.13	3.51	81.84	0.42
0.07	0.00	0.00	1.80	0.17	0.14	3.54	81.94	0.42
0.10	0.00	0.00	1.84	0.18	0.14	3.57	82.03	0.43
0.13	0.00	0.00	1.87	0.20	0.15	3.61	82.13	0.43
0.17	0.00	0.00	1.90	0.21	0.16	3.64	82.23	0.44
0.20	0.00	0.00	1.94	0.23	0.16	3.67	82.33	0.44
0.23	0.00	0.00	1.97	0.25	0.17	3.71	82.44	0.44
0.27	0.00	0.00	2.00	0.26	0.17	3.74	82.56	0.45
0.30	0.00	0.00	2.04	0.29	0.18	3.77	82.67	0.45
0.33	0.00	0.00	2.07	0.31	0.19	3.81	82.86	0.46
0.37	0.00	0.00	2.10	0.34	0.19	3.84	83.31	0.46
0.40	0.00	0.00	2.14	0.36	0.20	3.87	83.76	0.47
0.43	0.00	0.00	2.17	0.39	0.20	3.91	84.14	0.47
0.47	0.00	0.00	2.20	0.42	0.21	3.94	84.25	0.48
0.50	0.00	0.00	2.24	0.45	0.22	3.97	84.37	0.48
0.53	0.00	0.00	2.27	0.47	0.22	4.01	78.25	0.48
0.57	0.00	0.00	2.30	0.50	0.23	4.04	52.32	0.49
0.60	0.00	0.00	2.34	0.53	0.24	4.07	26.39	0.49
0.63	0.00	0.00	2.37	0.57	0.24	4.11	6.86	0.50
0.67	0.00	0.00	2.40	0.61	0.25	4.14	6.99	0.50
0.70	0.00	0.01	2.44	0.65	0.25	4.18	7.12	0.51
0.73	0.00	0.01	2.47	0.69	0.26	4.21	7.33	0.51
0.77	0.00	0.01	2.51	0.74	0.26	4.24	7.79	0.52
0.80	0.00	0.01	2.54	0.78	0.27	4.28	8.25	0.52
0.83	0.00	0.01	2.57	0.82	0.28	4.31	8.62	0.52
0.87	0.01	0.01	2.61	0.86	0.28	4.34	8.75	0.53
0.90	0.01	0.02	2.64	0.90	0.29	4.38	8.89	0.53
0.94	0.01	0.02	2.67	0.95	0.29	4.41	9.03	0.54
0.97	0.01	0.02	2.71	1.01	0.30	4.44	9.17	0.54
1.00	0.01	0.03	2.74	1.07	0.30	4.48	9.30	0.55
1.04	0.01	0.03	2.77	1.13	0.31	4.51	9.44	0.55
1.07	0.01	0.03	2.81	1.19	0.31	4.54	9.58	0.56
1.10	0.01	0.04	2.84	1.25	0.32	4.58	9.72	0.56
1.14	0.02	0.04	2.87	1.30	0.32	4.61	9.95	0.56
1.17	0.02	0.04	2.91	5.89	0.33	4.64	10.42	0.57
1.20	0.02	0.05	2.94	32.00	0.33	4.68	10.89	0.57
1.24	0.02	0.05	2.97	58.11	0.34	4.71	11.27	0.58
1.27	0.03	0.05	3.01	79.61	0.34	4.74	11.41	0.58
1.30	0.03	0.06	3.04	80.02	0.35	4.78	11.56	0.59
1.34	0.03	0.06	3.07	80.44	0.35	4.81	11.70	0.59
1.37	0.04	0.07	3.11	80.79	0.36	4.84	11.84	0.60
1.40	0.05	0.07	3.14	80.87	0.36	4.88	11.99	0.60
1.44	0.06	0.08	3.17	80.94	0.37	4.91	12.23	0.61
1.47	0.06	0.08	3.21	81.02	0.37	4.94	12.71	0.61
1.50	0.07	0.09	3.24	81.11	0.38	4.98	13.19	0.62
1.54	0.08	0.09	3.27	81.19	0.38	5.01	13.57	0.63
1.57	0.08	0.10	3.31	81.27	0.39	5.04	13.72	0.63
1.60	0.09	0.10	3.34	81.35	0.39	5.08	13.86	0.64
1.64	0.10	0.11	3.37	81.45	0.40	5.11	14.11	0.64
1.67	0.11	0.11	3.41	81.55	0.40	5.14	14.59	0.65
1.70	0.13	0.12	3.44	81.64	0.41	5.18	15.07	0.66

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
5.21	15.44	0.66	6.95	109.25	1.10	8.68	47.65	1.91
5.24	15.59	0.67	6.98	109.72	1.12	8.72	47.97	1.93
5.28	15.73	0.67	7.01	110.04	1.13	8.75	48.14	1.95
5.31	15.98	0.68	7.05	110.17	1.14	8.78	48.30	1.97
5.34	16.46	0.69	7.08	110.30	1.15	8.82	48.64	1.98
5.38	16.95	0.69	7.11	110.57	1.16	8.85	49.14	2.00
5.41	17.32	0.70	7.15	111.03	1.18	8.88	49.64	2.03
5.44	17.47	0.70	7.18	111.49	1.19	8.92	49.96	2.04
5.48	17.62	0.71	7.21	111.81	1.20	8.95	50.12	2.06
5.51	17.77	0.72	7.25	111.93	1.22	8.98	50.30	2.08
5.54	17.92	0.72	7.28	112.06	1.23	9.02	64.68	2.10
5.58	18.07	0.73	7.31	112.33	1.24	9.05	91.23	2.12
5.61	18.33	0.74	7.35	112.79	1.26	9.08	117.77	2.14
5.64	18.81	0.74	7.38	113.26	1.27	9.12	129.98	2.16
5.68	19.29	0.75	7.41	113.58	1.29	9.15	130.16	2.18
5.71	19.65	0.76	7.45	113.71	1.30	9.18	130.33	2.21
5.74	19.79	0.77	7.48	113.84	1.32	9.22	130.69	2.22
5.78	19.93	0.77	7.51	114.12	1.33	9.25	131.20	2.25
5.81	20.19	0.78	7.55	114.59	1.34	9.29	131.71	2.27
5.85	20.67	0.79	7.58	115.05	1.36	9.32	132.04	2.29
5.88	21.15	0.80	7.62	115.37	1.37	9.35	132.22	2.32
5.91	21.51	0.80	7.65	115.50	1.39	9.39	132.42	2.34
5.95	21.65	0.81	7.68	115.63	1.40	9.42	132.81	2.36
5.98	21.80	0.82	7.72	103.90	1.42	9.45	133.34	2.39
6.01	22.06	0.83	7.75	78.32	1.43	9.49	133.87	2.41
6.05	22.54	0.84	7.78	52.73	1.45	9.52	134.22	2.43
6.08	23.02	0.85	7.82	39.15	1.46	9.55	134.42	2.46
6.11	32.89	0.85	7.85	39.28	1.48	9.59	134.62	2.49
6.15	59.08	0.86	7.88	39.41	1.50	9.62	135.01	2.51
6.18	85.28	0.87	7.92	39.70	1.51	9.65	135.55	2.54
6.21	101.92	0.88	7.95	40.16	1.53	9.69	136.10	2.57
6.25	102.40	0.89	7.98	40.62	1.55	9.72	136.46	2.59
6.28	102.88	0.90	8.02	41.09	1.56	9.75	136.68	2.62
6.31	103.23	0.91	8.05	41.57	1.58	9.79	136.90	2.67
6.35	103.37	0.92	8.08	42.04	1.60	9.82	137.31	2.78
6.38	103.50	0.93	8.12	42.35	1.61	9.85	137.87	2.91
6.41	103.76	0.93	8.15	42.50	1.63	9.89	138.42	3.02
6.45	104.23	0.94	8.18	42.64	1.65	9.92	138.78	3.09
6.48	104.70	0.95	8.22	42.94	1.66	9.95	139.01	3.18
6.51	105.03	0.96	8.25	43.42	1.68	9.99	139.23	3.27
6.55	105.17	0.97	8.28	43.89	1.70	10.02	139.67	3.33
6.58	105.30	0.98	8.32	44.20	1.71	10.05	140.26	3.40
6.61	105.57	0.99	8.35	44.34	1.73	10.09	140.84	3.47
6.65	106.04	1.00	8.38	44.49	1.75	10.12	141.43	3.52
6.68	106.51	1.01	8.42	44.80	1.76	10.15	142.02	3.59
6.71	106.97	1.02	8.45	45.28	1.78	10.19	142.62	3.65
6.75	107.44	1.04	8.48	45.76	1.80	10.22	143.01	3.69
6.78	107.91	1.05	8.52	46.06	1.82	10.25	143.28	3.75
6.81	108.24	1.06	8.55	46.21	1.84	10.29	143.54	3.81
6.85	108.37	1.07	8.58	46.36	1.86	10.32	144.01	3.86
6.88	108.51	1.08	8.62	46.68	1.87	10.35	144.62	3.92
6.91	108.78	1.09	8.65	47.16	1.89	10.39	145.24	3.97

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
10.42	145.65	4.02	12.16	185.21	**40.83**	13.89	406.73	25.60
10.45	145.94	4.08	12.19	186.57	37.83	13.93	412.93	25.22
10.49	146.24	4.14	12.22	188.18	35.63	13.96	419.20	24.88
10.52	146.74	4.18	12.26	189.88	33.39	13.99	425.46	24.47
10.55	147.36	4.25	12.29	191.75	31.38	14.03	431.84	24.08
10.59	147.98	4.32	12.32	193.45	30.13	14.06	438.23	23.74
10.62	148.61	4.38	12.36	195.29	28.89	14.09	444.63	23.34
10.65	149.23	4.48	12.39	197.21	27.91	14.13	451.03	22.95
10.69	149.90	4.58	12.42	199.13	27.56	14.16	457.22	22.64
10.72	150.38	4.65	12.46	201.06	27.38	14.20	463.38	22.24
10.75	150.74	4.75	12.49	202.98	27.36	14.23	469.81	21.89
10.79	151.10	4.85	12.53	204.90	27.44	14.26	476.30	21.59
10.82	151.67	4.92	12.56	207.01	27.57	14.30	482.78	21.22
10.86	152.36	5.02	12.59	209.17	27.76	14.33	489.27	20.86
10.89	153.05	5.13	12.63	211.33	27.98	14.36	495.65	20.57
10.92	153.52	5.21	12.66	213.49	28.24	14.40	502.01	20.20
10.96	153.89	5.31	12.69	216.01	28.54	14.43	508.28	19.84
10.99	154.26	5.42	12.73	218.63	28.83	14.46	514.55	19.55
11.02	154.87	5.51	12.76	221.26	29.10	14.50	520.80	19.18
11.06	155.60	5.63	12.79	224.05	29.40	14.53	526.49	18.82
11.09	156.34	5.77	12.83	235.74	29.57	14.56	532.09	18.52
11.12	157.08	5.88	12.86	250.40	29.69	14.60	537.68	18.15
11.16	157.81	6.02	12.89	264.89	29.81	14.63	543.28	17.78
11.19	158.55	6.17	12.93	270.69	29.93	14.66	548.86	17.49
11.22	159.31	6.29	12.96	273.66	30.02	14.70	553.65	17.13
11.26	160.08	6.45	12.99	276.64	30.05	14.73	558.32	16.77
11.29	160.85	6.62	13.03	280.31	30.13	14.76	562.98	16.48
11.32	161.40	6.75	13.06	284.19	30.20	14.80	567.65	16.11
11.36	161.89	6.92	13.09	288.23	30.30	14.83	572.31	15.75
11.39	162.41	7.10	13.13	292.08	30.41	14.86	576.98	15.46
11.42	163.16	7.24	13.16	295.85	30.49	14.90	581.65	15.10
11.46	164.01	7.43	13.19	299.62	30.59	14.93	586.60	14.73
11.49	164.88	7.62	13.23	303.64	30.68	14.96	591.58	14.45
11.52	165.76	7.81	13.26	307.75	30.73	15.00	596.53	14.09
11.56	166.64	8.16	13.29	311.85	30.75	15.03	600.76	13.72
11.59	167.51	8.51	13.33	315.95	30.73	15.06	604.88	13.45
11.62	168.39	8.83	13.36	320.75	30.64	15.10	608.99	13.09
11.66	169.27	9.20	13.39	325.73	30.47	15.13	613.11	12.73
11.69	170.20	9.60	13.43	330.45	30.25	15.16	617.23	12.46
11.72	171.15	9.97	13.46	335.10	30.01	15.20	621.34	12.11
11.76	172.17	10.54	13.49	339.76	29.71	15.23	625.13	11.78
11.79	173.21	11.18	13.53	344.94	29.42	15.26	628.88	11.52
11.82	174.26	11.83	13.56	350.25	29.13	15.30	632.62	11.18
11.86	175.30	12.69	13.59	355.56	28.77	15.33	636.35	10.86
11.89	176.34	13.94	13.63	360.74	28.43	15.36	639.52	10.62
11.92	177.15	16.10	13.66	365.88	28.13	15.40	642.61	10.31
11.96	177.86	19.56	13.69	371.37	27.75	15.43	645.71	10.01
11.99	178.57	23.09	13.73	377.21	27.40	15.46	648.80	9.79
12.02	179.75	26.23	13.76	383.11	27.09	15.50	651.89	9.53
12.06	181.11	31.70	13.79	389.00	26.71	15.53	655.27	9.29
12.09	182.48	38.12	13.83	394.90	26.34	15.56	658.68	9.12
12.12	183.84	**41.65**	13.86	400.80	26.01	15.60	662.09	8.94

FLOW IN WEST RISER DITCH AT TIME OF PEAK DISCHARGE FROM ONSITE STORMWATER MANAGEMENT SYSTEM

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
15.63	665.50	8.78	17.37	922.38	5.63	19.10	809.33	4.39
15.66	668.88	8.67	17.40	923.51	5.60	19.14	806.04	4.37
15.70	671.42	8.53	17.43	924.00	5.56	19.17	802.74	4.35
15.73	678.93	8.40	17.47	924.49	5.54	19.21	799.44	4.34
15.76	686.57	8.30	17.50	**924.95**	5.50	19.24	796.09	4.32
15.80	694.18	8.18	17.54	924.77	5.47	19.27	792.74	4.30
15.83	704.35	8.07	17.57	924.60	5.45	19.31	789.34	4.29
15.87	714.64	7.99	17.60	924.38	5.41	19.34	785.68	4.27
15.90	724.94	7.89	17.64	923.66	5.38	19.37	782.14	4.26
15.93	734.28	7.79	17.67	922.92	5.36	19.41	778.65	4.24
15.97	743.58	7.71	17.70	922.09	5.33	19.44	775.45	4.22
16.00	752.84	7.62	17.74	920.94	5.30	19.47	772.25	4.21
16.03	760.91	7.54	17.77	919.80	5.27	19.51	769.06	4.20
16.07	768.90	7.47	17.80	918.63	5.24	19.54	765.86	4.18
16.10	776.89	7.39	17.84	917.15	5.22	19.57	762.67	4.17
16.13	784.23	7.31	17.87	915.68	5.19	19.61	759.42	4.15
16.17	791.55	7.25	17.90	914.19	5.16	19.64	755.90	4.14
16.20	798.87	7.18	17.94	912.08	5.13	19.67	752.39	4.13
16.23	805.54	7.10	17.97	909.97	5.11	19.71	748.89	4.12
16.27	812.19	7.05	18.00	907.83	5.08	19.74	745.10	4.10
16.30	818.69	6.98	18.04	905.26	5.06	19.77	741.23	4.09
16.33	824.17	6.92	18.07	902.70	5.03	19.81	737.30	4.08
16.37	829.01	6.87	18.10	900.14	5.01	19.84	733.09	4.06
16.40	833.79	6.81	18.14	897.56	4.98	19.87	728.89	4.05
16.43	838.57	6.75	18.17	894.89	4.96	19.91	724.68	4.04
16.47	843.35	6.70	18.20	892.19	4.94	19.94	720.48	4.03
16.50	848.13	6.65	18.24	889.19	4.91	19.97	716.27	4.02
16.53	851.92	6.59	18.27	886.19	4.89	20.01	712.16	4.01
16.57	855.53	6.55	18.30	883.18	4.87	20.04	708.39	3.99
16.60	859.16	6.50	18.34	880.21	4.84	20.07	704.62	3.98
16.63	863.40	6.45	18.37	877.45	4.82	20.11	700.72	3.97
16.67	867.65	6.41	18.40	874.70	4.80	20.14	696.28	3.96
16.70	871.68	6.37	18.44	871.98	4.78	20.17	691.84	3.95
16.73	875.65	6.32	18.47	869.26	4.76	20.21	687.55	3.94
16.77	879.64	6.28	18.50	866.51	4.74	20.24	683.78	3.93
16.80	883.64	6.24	18.54	863.46	4.71	20.27	680.00	3.92
16.83	887.70	6.19	18.57	860.40	4.69	20.31	676.10	3.91
16.87	891.77	6.16	18.60	857.35	4.67	20.34	671.95	3.90
16.90	895.82	6.12	18.64	854.30	4.65	20.37	667.86	3.89
16.93	898.90	6.08	18.67	851.24	4.63	20.41	663.77	3.88
16.97	901.97	6.05	18.70	848.13	4.61	20.44	659.68	3.87
17.00	905.00	6.01	18.74	845.03	4.59	20.47	655.59	3.86
17.03	907.39	5.97	18.77	841.93	4.57	20.51	651.43	3.85
17.07	909.74	5.94	18.80	838.78	4.55	20.54	647.01	3.84
17.10	911.92	5.90	18.84	835.34	4.53	20.57	642.59	3.83
17.13	913.44	5.86	18.87	831.90	4.52	20.61	638.25	3.83
17.17	914.96	5.83	18.90	828.51	4.50	20.64	634.17	3.82
17.20	916.47	5.79	18.94	825.41	4.48	20.67	630.11	3.81
17.23	917.66	5.76	18.97	822.32	4.46	20.71	626.06	3.80
17.27	918.85	5.73	19.00	819.21	4.44	20.74	621.76	3.79
17.30	920.04	5.69	19.04	815.91	4.42	20.77	617.46	3.78
17.33	921.22	5.66	19.07	812.62	4.41	20.81	613.22	3.77

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
20.84	609.16	3.76	22.58	451.18	3.36	24.32	352.15	2.87
20.88	605.11	3.76	22.61	449.21	3.35	24.35	350.96	2.85
20.91	601.06	3.75	22.65	447.02	3.34	24.38	349.77	2.83
20.94	597.00	3.74	22.68	444.86	3.34	24.42	348.58	2.81
20.98	592.95	3.73	22.71	442.86	3.33	24.45	347.38	2.78
21.01	588.82	3.72	22.75	441.08	3.32	24.48	346.19	2.76
21.04	584.47	3.71	22.78	439.30	3.31	24.52	345.15	2.74
21.08	580.13	3.71	22.81	437.39	3.31	24.55	344.30	2.71
21.11	575.88	3.70	22.85	435.27	3.30	24.58	343.46	2.68
21.14	571.87	3.69	22.88	433.15	3.29	24.62	342.47	2.66
21.18	567.86	3.68	22.91	431.16	3.29	24.65	341.30	2.63
21.21	563.76	3.68	22.95	429.40	3.28	24.68	340.14	2.61
21.24	559.42	3.67	22.98	427.67	3.27	24.72	339.15	2.58
21.28	555.08	3.66	23.01	425.94	3.26	24.75	338.34	2.55
21.31	550.83	3.65	23.05	424.23	3.25	24.78	337.53	2.52
21.34	546.87	3.64	23.08	422.51	3.25	24.82	336.56	2.50
21.38	543.05	3.64	23.11	420.67	3.24	24.85	335.40	2.46
21.41	539.22	3.63	23.15	418.62	3.23	24.88	334.25	2.43
21.44	535.39	3.62	23.18	416.57	3.22	24.92	333.26	2.41
21.48	531.56	3.61	23.21	414.65	3.22	24.95	332.43	2.38
21.51	528.03	3.61	23.25	412.94	3.21	24.98	331.61	2.34
21.54	525.20	3.60	23.28	411.23	3.20	25.02	330.62	2.32
21.58	522.37	3.59	23.31	409.38	3.20	25.05	329.44	2.29
21.61	519.65	3.58	23.35	407.35	3.19	25.08	328.28	2.25
21.64	517.16	3.57	23.38	405.36	3.18	25.12	327.30	2.23
21.68	514.67	3.57	23.41	403.36	3.17	25.15	326.48	2.19
21.71	512.11	3.56	23.45	401.36	3.16	25.18	325.66	2.16
21.74	509.31	3.55	23.48	399.39	3.16	25.22	324.67	2.13
21.78	506.51	3.54	23.51	397.32	3.15	25.25	323.52	2.10
21.81	503.81	3.54	23.55	395.05	3.14	25.28	322.37	2.06
21.84	501.35	3.53	23.58	392.78	3.13	25.32	321.39	2.03
21.88	498.91	3.52	23.61	390.52	3.13	25.35	320.57	2.00
21.91	496.45	3.51	23.65	388.25	3.12	25.38	319.75	1.97
21.94	493.76	3.51	23.68	385.98	3.11	25.42	318.93	1.94
21.98	491.07	3.50	23.71	383.72	3.10	25.45	318.11	1.91
22.01	488.52	3.49	23.75	381.46	3.10	25.48	317.29	1.87
22.04	486.25	3.48	23.78	379.20	3.09	25.52	316.47	1.85
22.08	483.98	3.47	23.81	377.22	3.08	25.55	315.65	1.82
22.11	481.71	3.47	23.85	375.62	3.07	25.58	314.83	1.79
22.14	479.44	3.46	23.88	374.03	3.06	25.62	314.02	1.76
22.18	477.17	3.45	23.91	372.15	3.06	25.65	313.23	1.74
22.21	474.90	3.44	23.95	369.88	3.05	25.68	312.43	1.71
22.24	472.63	3.44	23.98	367.62	3.04	25.72	311.43	1.69
22.28	470.36	3.43	24.01	365.54	3.03	25.75	310.28	1.66
22.31	468.09	3.42	24.05	363.68	3.01	25.78	309.13	1.63
22.34	465.82	3.41	24.08	361.83	3.00	25.82	308.16	1.61
22.38	463.56	3.40	24.11	359.98	2.98	25.85	307.34	1.59
22.41	461.33	3.40	24.15	358.12	2.97	25.89	306.52	1.56
22.44	459.14	3.39	24.18	356.27	2.95	25.92	305.68	1.54
22.48	456.96	3.38	24.22	354.87	2.93	25.95	304.85	1.52
22.51	454.89	3.37	24.25	354.01	2.91	25.99	304.01	1.49
22.55	453.03	3.37	24.28	353.16	2.89	26.02	303.17	1.48

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
26.05	302.33	1.46	27.79	251.01	1.01	29.53	201.64	0.92
26.09	301.48	1.43	27.82	249.94	1.01	29.56	200.63	0.92
26.12	300.63	1.42	27.86	248.76	1.01	29.59	199.63	0.92
26.15	299.79	1.40	27.89	247.58	1.01	29.63	198.88	0.92
26.19	298.94	1.38	27.92	246.39	1.01	29.66	198.20	0.92
26.22	298.10	1.37	27.96	245.21	1.01	29.69	197.54	0.91
26.25	297.25	1.35	27.99	244.03	1.00	29.73	196.64	0.91
26.29	296.41	1.33	28.02	243.09	1.00	29.76	195.66	0.91
26.32	295.56	1.32	28.06	242.27	1.00	29.79	194.68	0.91
26.35	294.70	1.30	28.09	241.45	1.00	29.83	193.95	0.91
26.39	293.82	1.29	28.12	240.41	1.00	29.86	193.30	0.91
26.42	292.94	1.27	28.16	239.25	0.99	29.89	192.67	0.90
26.45	292.05	1.26	28.19	238.10	0.99	29.93	192.04	0.90
26.49	291.17	1.24	28.22	237.18	0.99	29.96	191.41	0.90
26.52	290.28	1.23	28.26	236.36	0.99	29.99	190.78	0.90
26.55	289.39	1.22	28.29	235.53	0.99	30.03	189.91	0.90
26.59	288.51	1.21	28.32	234.48	0.99	30.06	188.97	0.89
26.62	287.62	1.20	28.36	233.34	0.98	30.09	188.03	0.89
26.65	286.74	1.19	28.39	232.20	0.98	30.13	187.35	0.89
26.69	285.86	1.18	28.42	231.29	0.98	30.16	186.75	0.89
26.72	284.99	1.17	28.46	230.49	0.98	30.19	186.14	0.89
26.75	284.12	1.16	28.49	229.68	0.98	30.23	185.27	0.89
26.79	283.26	1.15	28.52	228.64	0.97	30.26	184.33	0.88
26.82	282.39	1.14	28.56	227.51	0.97	30.29	183.40	0.88
26.85	281.52	1.13	28.59	226.38	0.97	30.33	182.72	0.88
26.89	280.65	1.12	28.62	225.48	0.97	30.36	182.13	0.88
26.92	279.58	1.11	28.66	224.69	0.97	30.39	181.53	0.88
26.95	278.38	1.11	28.69	223.91	0.97	30.43	180.95	0.88
26.99	277.17	1.10	28.72	222.90	0.96	30.46	180.37	0.87
27.02	276.16	1.09	28.76	221.80	0.96	30.49	179.79	0.87
27.05	275.27	1.08	28.79	220.70	0.96	30.53	179.21	0.87
27.09	274.38	1.08	28.82	219.62	0.96	30.56	178.63	0.87
27.12	273.29	1.07	28.86	218.54	0.96	30.59	178.05	0.87
27.15	272.06	1.07	28.89	217.47	0.96	30.63	177.47	0.87
27.19	270.84	1.06	28.92	216.64	0.95	30.66	176.89	0.86
27.22	269.62	1.06	28.96	215.90	0.95	30.69	176.32	0.86
27.25	268.40	1.05	28.99	215.16	0.95	30.73	175.76	0.86
27.29	267.17	1.05	29.02	214.19	0.95	30.76	175.19	0.86
27.32	265.95	1.04	29.06	213.13	0.95	30.79	174.62	0.86
27.35	264.74	1.04	29.09	212.08	0.94	30.83	173.78	0.86
27.39	263.53	1.04	29.12	211.27	0.94	30.86	172.88	0.85
27.42	262.54	1.04	29.16	210.55	0.94	30.90	171.99	0.85
27.45	261.66	1.03	29.19	209.83	0.94	30.93	171.37	0.85
27.49	260.79	1.03	29.23	208.87	0.94	30.96	170.82	0.85
27.52	259.71	1.03	29.26	207.81	0.94	31.00	170.28	0.85
27.56	258.51	1.03	29.29	206.77	0.93	31.03	169.74	0.84
27.59	257.30	1.02	29.33	205.96	0.93	31.06	169.21	0.84
27.62	256.10	1.02	29.36	205.28	0.93	31.10	168.67	0.84
27.66	254.90	1.02	29.39	204.60	0.93	31.13	168.14	0.84
27.69	253.70	1.02	29.43	203.93	0.93	31.16	167.60	0.84
27.72	252.71	1.02	29.46	203.25	0.93	31.20	167.06	0.84
27.76	251.86	1.02	29.49	202.57	0.92	31.23	166.53	0.83

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
31.26	165.99	0.83	33.00	30.66	0.74	34.74	17.39	0.67
31.30	165.46	0.83	33.03	30.22	0.74	34.77	17.33	0.67
31.33	164.92	0.83	33.07	29.77	0.74	34.80	17.25	0.67
31.36	164.40	0.83	33.10	29.34	0.74	34.84	16.86	0.67
31.40	163.87	0.83	33.13	28.90	0.74	34.87	16.47	0.67
31.43	163.35	0.82	33.17	28.47	0.74	34.90	16.11	0.67
31.46	162.82	0.82	33.20	28.04	0.74	34.94	16.06	0.66
31.50	162.31	0.82	33.23	27.60	0.73	34.97	16.00	0.66
31.53	161.80	0.82	33.27	27.17	0.73	35.00	15.91	0.66
31.56	161.28	0.82	33.30	26.74	0.73	35.04	15.53	0.66
31.60	160.77	0.81	33.33	26.63	0.73	35.07	15.14	0.66
31.63	160.26	0.81	33.37	26.54	0.73	35.10	14.78	0.66
31.66	159.74	0.81	33.40	26.43	0.73	35.14	14.73	0.66
31.70	159.24	0.81	33.43	26.02	0.72	35.17	14.68	0.66
31.73	158.73	0.81	33.47	25.59	0.72	35.20	14.62	0.65
31.76	158.22	0.81	33.50	25.17	0.72	35.24	14.58	0.65
31.80	157.71	0.80	33.53	25.07	0.72	35.27	14.53	0.65
31.83	157.21	0.80	33.57	24.97	0.72	35.30	14.48	0.65
31.86	156.70	0.80	33.60	24.87	0.72	35.34	14.44	0.65
31.90	156.19	0.80	33.63	24.46	0.72	35.37	14.39	0.65
31.93	155.69	0.80	33.67	24.04	0.71	35.40	14.30	0.65
31.96	155.18	0.80	33.70	23.63	0.71	35.44	13.93	0.65
32.00	154.67	0.79	33.73	23.55	0.71	35.47	13.55	0.65
32.03	154.19	0.79	33.77	23.46	0.71	35.50	13.21	0.64
32.06	153.72	0.79	33.80	23.37	0.71	35.54	13.16	0.64
32.10	152.80	0.79	33.83	22.96	0.71	35.57	13.12	0.64
32.13	135.51	0.79	33.87	22.54	0.71	35.60	13.03	0.64
32.16	116.33	0.78	33.90	22.13	0.70	35.64	12.65	0.64
32.20	97.15	0.78	33.93	22.05	0.70	35.67	12.27	0.64
32.23	77.97	0.78	33.97	21.97	0.70	35.70	11.94	0.64
32.26	58.79	0.78	34.00	21.88	0.70	35.74	11.89	0.64
32.30	40.06	0.78	34.03	21.46	0.70	35.77	11.85	0.64
32.33	37.90	0.78	34.07	21.05	0.70	35.80	11.81	0.63
32.36	37.43	0.77	34.10	20.65	0.70	35.84	11.77	0.63
32.40	36.96	0.77	34.13	20.57	0.69	35.87	11.73	0.63
32.43	36.48	0.77	34.17	20.51	0.69	35.91	11.69	0.63
32.46	36.01	0.77	34.20	20.42	0.69	35.94	11.65	0.63
32.50	35.54	0.77	34.24	20.02	0.69	35.97	11.61	0.63
32.53	35.38	0.77	34.27	19.62	0.69	36.01	11.52	0.63
32.57	35.25	0.77	34.30	19.23	0.69	36.04	11.14	0.63
32.60	35.12	0.76	34.34	19.16	0.69	36.07	10.77	0.63
32.63	34.68	0.76	34.37	19.10	0.69	36.11	10.45	0.62
32.67	34.22	0.76	34.40	19.01	0.68	36.14	10.41	0.62
32.70	33.76	0.76	34.44	18.61	0.68	36.17	10.37	0.62
32.73	33.31	0.76	34.47	18.21	0.68	36.21	10.33	0.62
32.77	32.85	0.76	34.50	17.83	0.68	36.24	10.30	0.62
32.80	32.40	0.75	34.54	17.76	0.68	36.27	10.26	0.62
32.83	31.95	0.75	34.57	17.70	0.68	36.31	10.22	0.62
32.87	31.49	0.75	34.60	17.63	0.68	36.34	10.19	0.62
32.90	31.05	0.75	34.64	17.56	0.67	36.37	10.16	0.61
32.93	30.91	0.75	34.67	17.50	0.67	36.41	10.06	0.61
32.97	30.79	0.75	34.70	17.44	0.67	36.44	9.70	0.61

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
36.47	9.33	0.61	38.21	4.63	0.56	39.95	2.79	0.52
36.51	9.02	0.61	38.24	4.61	0.56	39.98	2.78	0.52
36.54	8.99	0.61	38.28	4.59	0.56	40.01	2.64	0.52
36.57	8.96	0.61	38.31	4.57	0.56	40.05	2.30	0.51
36.61	8.92	0.61	38.34	4.54	0.56	40.08	1.96	0.51
36.64	8.89	0.61	38.38	4.52	0.56	40.11	1.75	0.51
36.67	8.85	0.61	38.41	4.50	0.55	40.15	1.74	0.51
36.71	8.82	0.60	38.44	4.48	0.55	40.18	1.73	0.51
36.74	8.79	0.60	38.48	4.46	0.55	40.21	1.72	0.51
36.77	8.76	0.60	38.51	4.44	0.55	40.25	1.71	0.51
36.81	8.66	0.60	38.54	4.43	0.55	40.28	1.70	0.51
36.84	8.29	0.60	38.58	4.41	0.55	40.31	1.69	0.51
36.87	7.93	0.60	38.61	4.28	0.55	40.35	1.68	0.51
36.91	7.64	0.60	38.64	3.93	0.55	40.38	1.67	0.51
36.94	7.61	0.60	38.68	3.58	0.55	40.41	1.67	0.50
36.97	7.58	0.60	38.71	3.33	0.55	40.45	1.66	0.50
37.01	7.55	0.60	38.74	3.32	0.55	40.48	1.65	0.50
37.04	7.52	0.59	38.78	3.30	0.54	40.51	1.64	0.50
37.07	7.49	0.59	38.81	3.28	0.54	40.55	1.63	0.50
37.11	7.46	0.59	38.84	3.26	0.54	40.58	1.62	0.50
37.14	7.43	0.59	38.88	3.24	0.54	40.61	1.62	0.50
37.17	7.40	0.59	38.91	3.22	0.54	40.65	1.61	0.50
37.21	7.29	0.59	38.94	3.21	0.54	40.68	1.60	0.50
37.24	6.93	0.59	38.98	3.19	0.54	40.71	1.60	0.50
37.27	6.57	0.59	39.01	3.17	0.54	40.75	1.59	0.50
37.31	6.28	0.59	39.04	3.16	0.54	40.78	1.58	0.50
37.34	6.25	0.59	39.08	3.14	0.54	40.81	1.58	0.50
37.37	6.23	0.58	39.11	3.12	0.54	40.85	1.57	0.49
37.41	6.20	0.58	39.14	3.10	0.54	40.88	1.56	0.49
37.44	6.18	0.58	39.18	3.09	0.53	40.92	1.56	0.49
37.47	6.15	0.58	39.21	3.07	0.53	40.95	1.55	0.49
37.51	6.13	0.58	39.25	3.05	0.53	40.98	1.54	0.49
37.54	6.10	0.58	39.28	3.04	0.53	41.02	1.54	0.49
37.58	6.08	0.58	39.31	3.02	0.53	41.05	1.53	0.49
37.61	6.05	0.58	39.35	3.00	0.53	41.08	1.53	0.49
37.64	6.03	0.58	39.38	2.99	0.53	41.12	1.52	0.49
37.68	6.00	0.58	39.41	2.97	0.53	41.15	1.51	0.49
37.71	5.98	0.57	39.45	2.95	0.53	41.18	1.51	0.49
37.74	5.96	0.57	39.48	2.94	0.53	41.22	1.50	0.49
37.78	5.93	0.57	39.51	2.93	0.53	41.25	1.50	0.49
37.81	5.82	0.57	39.55	2.92	0.53	41.28	1.49	0.48
37.84	5.46	0.57	39.58	2.91	0.52	41.32	1.48	0.48
37.88	5.10	0.57	39.61	2.90	0.52	41.35	1.48	0.48
37.91	4.84	0.57	39.65	2.89	0.52	41.38	1.47	0.48
37.94	4.81	0.57	39.68	2.88	0.52	41.42	1.47	0.48
37.98	4.79	0.57	39.71	2.87	0.52	41.45	1.46	0.48
38.01	4.77	0.57	39.75	2.86	0.52	41.48	1.46	0.48
38.04	4.74	0.56	39.78	2.85	0.52	41.52	1.45	0.48
38.08	4.72	0.56	39.81	2.84	0.52	41.55	1.44	0.48
38.11	4.70	0.56	39.85	2.83	0.52	41.58	1.44	0.48
38.14	4.68	0.56	39.88	2.82	0.52	41.62	1.43	0.48
38.18	4.66	0.56	39.91	2.80	0.52	41.65	1.43	0.48

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)	Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
41.68	1.42	0.48	43.42	0.23	0.45	45.16	0.12	0.43
41.72	1.42	0.48	43.45	0.23	0.45	45.19	0.12	0.43
41.75	1.41	0.48	43.49	0.22	0.45	45.22	0.11	0.43
41.78	1.41	0.48	43.52	0.22	0.45	45.26	0.11	0.43
41.82	1.41	0.47	43.55	0.22	0.45	45.29	0.11	0.43
41.85	1.40	0.47	43.59	0.21	0.45	45.32	0.11	0.43
41.88	1.40	0.47	43.62	0.21	0.45	45.36	0.11	0.43
41.92	1.39	0.47	43.65	0.21	0.45	45.39	0.11	0.43
41.95	1.39	0.47	43.69	0.20	0.45	45.42	0.10	0.43
41.98	1.38	0.47	43.72	0.20	0.45	45.46	0.10	0.43
42.02	1.38	0.47	43.75	0.20	0.44	45.49	0.10	0.43
42.05	1.37	0.47	43.79	0.20	0.44	45.52	0.10	0.43
42.08	1.37	0.47	43.82	0.20	0.44	45.56	0.10	0.43
42.12	1.37	0.47	43.85	0.19	0.44	45.59	0.10	0.43
42.15	1.36	0.47	43.89	0.19	0.44	45.62	0.10	0.43
42.18	1.36	0.47	43.92	0.19	0.44	45.66	0.10	0.43
42.22	1.35	0.47	43.95	0.19	0.44	45.69	0.09	0.43
42.25	1.35	0.47	43.99	0.18	0.44	45.72	0.09	0.43
42.28	1.34	0.47	44.02	0.18	0.44	45.76	0.09	0.43
42.32	1.34	0.47	44.05	0.18	0.44	45.79	0.09	0.42
42.35	1.34	0.47	44.09	0.18	0.44	45.82	0.09	0.42
42.38	1.33	0.47	44.12	0.18	0.44	45.86	0.09	0.42
42.42	1.33	0.46	44.15	0.17	0.44	45.89	0.09	0.42
42.45	1.32	0.46	44.19	0.17	0.44	45.93	0.08	0.42
42.48	1.32	0.46	44.22	0.17	0.44	45.96	0.08	0.42
42.52	1.32	0.46	44.26	0.17	0.44	45.99	0.08	0.42
42.55	1.31	0.46	44.29	0.16	0.44	46.03	0.08	0.42
42.59	1.31	0.46	44.32	0.16	0.44	46.06	0.08	0.42
42.62	1.30	0.46	44.36	0.16	0.44	46.09	0.08	0.42
42.65	1.30	0.46	44.39	0.16	0.44	46.13	0.08	0.42
42.69	1.30	0.46	44.42	0.16	0.44	46.16	0.08	0.42
42.72	1.29	0.46	44.46	0.15	0.44	46.19	0.08	0.42
42.75	1.29	0.46	44.49	0.15	0.44	46.23	0.07	0.42
42.79	1.29	0.46	44.52	0.15	0.44	46.26	0.07	0.42
42.82	1.10	0.46	44.56	0.15	0.43	46.29	0.07	0.42
42.85	0.76	0.46	44.59	0.15	0.43	46.33	0.07	0.42
42.89	0.42	0.46	44.62	0.14	0.43	46.36	0.07	0.42
42.92	0.27	0.46	44.66	0.14	0.43	46.39	0.07	0.42
42.95	0.27	0.46	44.69	0.14	0.43	46.43	0.07	0.42
42.99	0.27	0.46	44.72	0.14	0.43	46.46	0.07	0.42
43.02	0.26	0.46	44.76	0.14	0.43	46.49	0.07	0.42
43.05	0.26	0.45	44.79	0.13	0.43	46.53	0.07	0.42
43.09	0.26	0.45	44.82	0.13	0.43	46.56	0.06	0.42
43.12	0.25	0.45	44.86	0.13	0.43	46.59	0.06	0.42
43.15	0.25	0.45	44.89	0.13	0.43	46.63	0.06	0.42
43.19	0.25	0.45	44.92	0.13	0.43	46.66	0.06	0.42
43.22	0.25	0.45	44.96	0.13	0.43	46.69	0.06	0.42
43.25	0.24	0.45	44.99	0.12	0.43	46.73	0.06	0.42
43.29	0.24	0.45	45.02	0.12	0.43	46.76	0.06	0.42
43.32	0.24	0.45	45.06	0.12	0.43	46.79	0.06	0.42
43.35	0.23	0.45	45.09	0.12	0.43	46.83	0.06	0.42
43.39	0.23	0.45	45.12	0.12	0.43	46.86	0.06	0.42

Primary Comparison (continued)

Time (hours)	OFFSITE Link 36 (cfs)	ONSITE Link 1L (cfs)
46.89	0.05	0.42
46.93	0.05	0.42
46.96	0.05	0.42
46.99	0.05	0.42
47.03	0.05	0.42
47.06	0.05	0.41
47.09	0.05	0.41
47.13	0.05	0.41
47.16	0.05	0.41
47.19	0.05	0.41
47.23	0.05	0.41
47.26	0.05	0.41
47.29	0.04	0.41
47.33	0.04	0.41
47.36	0.04	0.41
47.39	0.04	0.41
47.43	0.04	0.41
47.46	0.04	0.41
47.49	0.04	0.41
47.53	0.04	0.41
47.56	0.04	0.41
47.60	0.04	0.41
47.63	0.04	0.41
47.66	0.04	0.41
47.70	0.04	0.41
47.73	0.03	0.41
47.76	0.03	0.41
47.80	0.03	0.41
47.83	0.03	0.41
47.86	0.03	0.41
47.90	0.03	0.41
47.93	0.03	0.41
47.96	0.03	0.41
48.00	0.03	0.09

Tailwater Determination

Associated Water Surface Elevation (HEC-RAS)

Application for New Jersey Department of Environmental Protection
Stream Encroachment Permit and Water Quality Certification

Vincent Place Stormwater Pumping Station And Housing Units

Borough of Teterboro, Bergen County

July 2003
(Revised: March 2004)

(Volume 2 of 2)

Submitted to:
New Jersey Department of Environmental Protection

Prepared By:
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Peter H. Black
Professional Engineer N.J. Lic. No. 26358

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OFFSITE HYDRAULIC IMPACTS

OFFSITE HYDRAULIC IMPACTS

In conjunction with the proposed pumping station reconstruction, offsite hydraulic impacts were evaluated for locations upstream and downstream of the new facility along the West Riser Ditch.

Investigations include a comparison of the 2-, 10- and 100-year storm peak water surface elevations for existing and proposed project conditions along the west Riser Ditch extending from the tide gates (6,000 ft downstream of the project) to the Malcolm Avenue Bridge (1500 ft upstream of the project).

A summary of the difference in peak water surface elevations at analysis points upstream and downstream of the project is provided in the attached table.

No increase in water surface elevations is proposed for the 2-, 10- and 100-year storm events.

Borough of Teterboro
Bergen County, New Jersey

Vincent Place Stormwater Pumping Station and Housing Units

West Riser Ditch - Peak Water Surface Elevation Summary

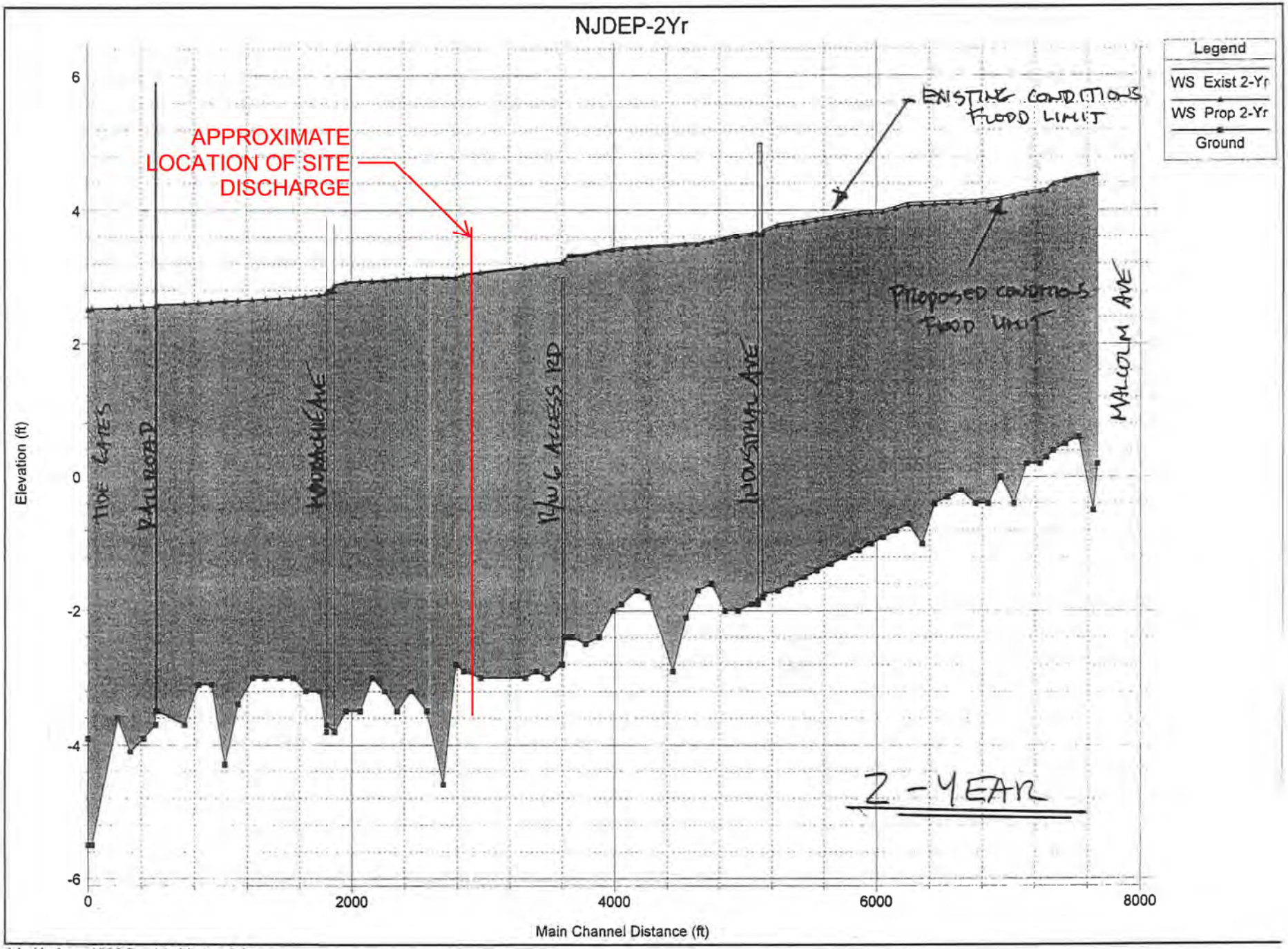
Location	HEC-RAS River Sta. (Ft)	2-Year Storm Existing (feet)	2-Year Storm Proposed (feet)	2-Year Storm *Difference (feet)*	10-Year Storm Existing (feet)	10-Year Storm Proposed (feet)	10-Year Storm *Difference (feet)*	100-Year Storm Existing (feet)	100-Year Storm Proposed (feet)	100-Year Storm *Difference (feet)*	Comment
Malcolm Avenue	7625	4.55	4.53	*-0.02*	4.90	4.89	*-0.01*	5.39	5.39	*0.00*	(see note 4)
500 ft upstream of PS	6795	4.17	4.13	*-0.04*	4.50	4.49	*-0.01*	5.06	5.06	*0.00*	
405 ft upstream of PS	6700	4.15	4.11	*-0.04*	4.48	4.48	*0.00*	5.05	5.05	*0.00*	
295 ft upstream of PS	6590	4.14	4.09	*-0.05*	4.46	4.46	*0.00*	5.04	5.03	*-0.01*	
195 ft upstream of PS	6490	4.14	4.09	*-0.05*	4.46	4.46	*0.00*	5.04	5.04	*0.00*	
95 ft upstream of PS	6390	4.13	4.08	*-0.05*	4.45	4.45	*0.00*	5.03	5.03	*0.00*	
Upper Limit of PS Site	6295	4.12	4.08	*-0.04*	4.44	4.44	*0.00*	5.01	5.01	*0.00*	
Adjacent to Pump Sta.	6190	4.11	4.07	*-0.04*	4.43	4.43	*0.00*	4.99	4.99	*0.00*	
Lower Limit of PS Site	6095	4.06	4.01	*-0.05*	4.38	4.37	*-0.01*	4.94	4.94	*0.00*	
95 ft downstream of PS	6000	4.00	3.96	*-0.04*	4.32	4.32	*0.00*	4.90	4.90	*0.00*	
185 ft downstream of PS	5910	3.99	3.95	*-0.04*	4.31	4.31	*0.00*	4.90	4.90	*0.00*	
500 ft downstream of PS	5815	3.98	3.94	*-0.04*	4.30	4.29	*-0.01*	4.90	4.90	*0.00*	
280 ft downstream of PS	5710	3.95	3.90	*-0.05*	4.27	4.26	*-0.01*	4.87	4.87	*0.00*	
485 ft downstream of PS	5610	3.91	3.87	*-0.04*	4.23	4.23	*0.00*	4.83	4.83	*0.00*	
590 ft downstream of PS	5505	3.88	3.84	*-0.04*	4.20	4.19	*-0.01*	4.80	4.80	*0.00*	
Industrial Avenue	5088	3.67	3.64	*-0.03*	3.99	3.99	*0.00*	4.64	4.63	*-0.01*	
Runway 6 Access Rd	3585	3.28	3.25	*-0.03*	3.67	3.66	*-0.01*	4.21	4.21	*0.00*	
Moonachie Avenue	1735	2.89	2.87	*-0.02*	3.23	3.22	*-0.01*	3.77	3.76	*-0.01*	
Tide Gates	96	2.50	2.50	-----	2.60	2.60	-----	2.80	2.80	-----	

Notes:

1. Existing = existing conditions without new pumping station.
2. Proposed = proposed conditions with new pumping station. Pumping rate for 10- and 100-year storm does not exceed existing conditions pumping rate of 112 cfs.
3. Elevations are in feet (NAVD, 1988). NAVD elevation + 1.04 ft = NGVD elevation.
4. Note that flow from the West Riser Ditch overflows into the storage ditch upstream of the pump station, thereby draining to the stormwater pumping station to be pumped back into the West Riser Ditch again (re-circulation). Actual water levels and differentials may be lower than indicated, and are beyond modeling accuracy.
5. HEC-RAS river station as measures from confluence of West Riser Ditch with Berrys Creek.

HEC-RAS Model

2-Year Storm
(Existing and Proposed Conditions)



1 in Horiz. = 1000 ft 1 in Vert. = 2 ft

2-YEAR

HEC-RAS Plan: NJDEP-2Yr River: West Riser Ditch Reach: Main Branch

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)
Main Branch	7625	120.00	0.20	4.55		4.59	0.000298	1.61	75.96	30.46	35.00
Main Branch	7625	120.00	0.20	4.53		4.57	0.000305	1.63	75.24	30.28	35.00
Main Branch	7590	120.00	-0.50	4.54		4.58	0.000299	1.61	74.39	26.11	110.00
Main Branch	7590	120.00	-0.50	4.52		4.56	0.000307	1.63	73.77	26.03	110.00
Main Branch	7480	120.00	0.60	4.50		4.55	0.000397	1.80	69.99	36.56	100.00
Main Branch	7480	120.00	0.60	4.47		4.52	0.000410	1.82	69.04	36.10	100.00
Main Branch	7380	120.00	0.50	4.45		4.51	0.000464	1.99	69.51	49.39	90.00
Main Branch	7380	120.00	0.50	4.42		4.49	0.000481	2.01	68.12	47.53	90.00
Main Branch	7290	120.00	0.40	4.41		4.46	0.000611	1.89	68.32	50.51	50.00
Main Branch	7290	120.00	0.40	4.38		4.43	0.000643	1.92	66.78	49.32	50.00
Main Branch	7240	120.00	0.30	4.32		4.42	0.000933	2.62	59.40	57.52	50.00
Main Branch	7240	120.00	0.30	4.28		4.39	0.000985	2.68	57.34	56.38	50.00
Main Branch	7190	120.00	0.20	4.30		4.37	0.000592	2.16	73.39	57.50	100.00
Main Branch	7190	120.00	0.20	4.27		4.34	0.000623	2.21	71.28	56.31	100.00
Main Branch	7090	120.00	0.20	4.27		4.31	0.000325	1.65	90.41	70.33	100.00
Main Branch	7090	120.00	0.20	4.23		4.28	0.000343	1.68	87.71	69.21	100.00
Main Branch	6990	120.00	-0.40	4.23		4.28	0.000298	1.68	72.21	29.25	100.00
Main Branch	6990	120.00	-0.40	4.19		4.24	0.000311	1.71	71.04	28.48	100.00
Main Branch	6890	120.00	0.00	4.19		4.25	0.000431	1.86	64.44	24.19	95.00
Main Branch	6890	120.00	0.00	4.15		4.21	0.000451	1.89	63.42	24.05	95.00
Main Branch	6795	120.00	-0.40	4.17		4.21	0.000342	1.67	71.65	26.70	95.00
Main Branch	6795	120.00	-0.40	4.13		4.17	0.000358	1.70	70.49	26.52	95.00
Main Branch	6700	120.00	-0.40	4.15		4.18	0.000198	1.41	85.10	26.99	110.00
Main Branch	6700	120.00	-0.40	4.11		4.14	0.000206	1.43	83.90	26.86	110.00
Main Branch	6590	120.00	-0.20	4.14		4.17	0.000213	1.38	87.25	31.52	100.00
Main Branch	6590	120.00	-0.20	4.09		4.12	0.000223	1.40	85.83	31.32	100.00
Main Branch	6490	120.00	-0.30	4.14		4.15	0.000064	0.76	167.13	93.20	100.00
Main Branch	6490	120.00	-0.30	4.09		4.10	0.000068	0.77	162.96	90.22	100.00
Main Branch	6390	120.00	-0.40	4.13		4.15	0.000126	1.04	114.86	42.77	95.00
Main Branch	6390	120.00	-0.40	4.08		4.10	0.000132	1.06	112.91	42.50	95.00
Main Branch	6295	120.00	-1.00	4.12		4.13	0.000085	0.94	127.43	40.95	105.00
Main Branch	6295	120.00	-1.00	4.08		4.09	0.000088	0.96	125.56	40.67	105.00
Main Branch	6190	120.00	-0.70	4.11		4.13	0.000073	0.96	124.97	31.33	95.00
Main Branch	6190	120.00	-0.70	4.07		4.08	0.000075	0.97	123.53	31.24	95.00
Main Branch	6095	232.00	-0.80	4.06		4.11	0.000242	1.75	132.72	33.26	95.00
Main Branch	6095	225.00	-0.80	4.01		4.06	0.000235	1.71	131.24	33.15	95.00
Main Branch	6000	232.00	-0.90	4.00	1.09	4.07	0.000400	2.12	109.39	32.08	90.00
Main Branch	6000	225.00	-0.90	3.96	1.05	4.03	0.000389	2.08	108.01	31.92	90.00
Main Branch	5910	232.00	-1.00	3.99	0.93	4.04	0.000270	1.69	137.28	44.68	95.00
Main Branch	5910	225.00	-1.00	3.95	0.90	3.99	0.000265	1.66	135.37	44.34	95.00
Main Branch	5815	232.00	-1.10	3.98		4.00	0.000152	1.23	191.11	80.88	115.00
Main Branch	5815	225.00	-1.10	3.94		3.96	0.000150	1.21	187.68	79.83	115.00
Main Branch	5710	232.00	-1.20	3.95		3.98	0.000223	1.50	154.47	50.63	100.00
Main Branch	5710	225.00	-1.20	3.90		3.94	0.000218	1.48	152.36	50.45	100.00
Main Branch	5610	232.00	-1.30	3.91		3.96	0.000253	1.80	128.77	34.77	105.00

2-YEAR

HEC-RAS Plan: NJDEP-2Yr River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)
Main Branch	5610	225.00	-1.30	3.87		3.92	0.000246	1.77	127.36	34.64	105.00
Main Branch	5505	232.00	-1.40	3.88		3.93	0.000244	1.84	126.03	30.91	100.00
Main Branch	5505	225.00	-1.40	3.84		3.89	0.000236	1.80	124.81	30.83	100.00
Main Branch	5405	232.00	-1.50	3.85		3.91	0.000314	2.00	116.25	31.63	100.00
Main Branch	5405	225.00	-1.50	3.81		3.87	0.000305	1.96	115.04	31.42	100.00
Main Branch	5305	232.00	-1.60	3.82		3.87	0.000232	1.75	132.59	35.07	100.00
Main Branch	5305	225.00	-1.60	3.78		3.83	0.000224	1.71	131.27	34.93	100.00
Main Branch	5205	232.00	-1.70	3.80		3.85	0.000252	1.73	134.14	37.06	105.00
Main Branch	5205	225.00	-1.70	3.76		3.81	0.000243	1.69	132.77	36.82	105.00
Main Branch	5100	232.00	-1.75	3.71		3.80	0.000504	2.41	96.19	27.28	11.00
Main Branch	5100	225.00	-1.75	3.68		3.77	0.000487	2.36	95.27	27.18	11.00
Main Branch	5089	232.00	-1.80	3.70	0.77	3.79	0.000503	2.41	96.29	27.24	1.00
Main Branch	5089	225.00	-1.80	3.67	0.73	3.75	0.000485	2.36	95.39	27.14	1.00
Main Branch	5088	232.00	-1.80	3.67	0.71	3.79	0.000576	2.72	85.38	28.90	1.00
Main Branch	5088	225.00	-1.80	3.64	0.67	3.75	0.000556	2.66	84.45	28.65	1.00
Main Branch	5071	Bridge									
Main Branch	5054	232.00	-1.85	3.65	0.63	3.77	0.000814	2.70	85.85	28.73	1.00
Main Branch	5054	225.00	-1.85	3.62	0.58	3.73	0.000785	2.65	84.95	28.48	1.00
Main Branch	5053	232.00	-1.90	3.69	0.09	3.75	0.000334	1.95	119.21	34.62	48.00
Main Branch	5053	225.00	-1.90	3.66	0.06	3.71	0.000321	1.91	118.07	34.39	48.00
Main Branch	5005	232.00	-1.90	3.66	0.68	3.72	0.000472	1.94	124.64	51.06	105.00
Main Branch	5005	225.00	-1.90	3.63	0.63	3.69	0.000458	1.90	122.99	50.65	105.00
Main Branch	4900	232.00	-2.00	3.64		3.67	0.000233	1.50	177.12	150.23	100.00
Main Branch	4900	225.00	-2.00	3.61		3.64	0.000227	1.47	172.43	142.04	100.00
Main Branch	4800	232.00	-2.00	3.60		3.65	0.000404	1.83	157.58	100.41	100.00
Main Branch	4800	225.00	-2.00	3.57		3.61	0.000393	1.79	154.49	98.63	100.00
Main Branch	4700	232.00	-1.60	3.55		3.60	0.000348	1.74	139.69	88.64	105.00
Main Branch	4700	225.00	-1.60	3.52		3.57	0.000336	1.71	137.10	83.45	105.00
Main Branch	4595	232.00	-1.70	3.51		3.56	0.000376	1.85	161.79	160.46	90.00
Main Branch	4595	225.00	-1.70	3.48		3.53	0.000365	1.81	157.19	156.35	90.00
Main Branch	4505	232.00	-2.10	3.51		3.52	0.000123	1.09	456.98	323.13	100.00
Main Branch	4505	225.00	-2.10	3.48		3.50	0.000121	1.08	447.51	322.01	100.00
Main Branch	4405	232.00	-2.90	3.49		3.52	0.000132	1.25	269.24	222.61	185.00
Main Branch	4405	225.00	-2.90	3.47		3.49	0.000128	1.22	262.84	219.92	185.00
Main Branch	4220	232.00	-1.80	3.48		3.50	0.000121	1.21	352.62	274.26	90.00
Main Branch	4220	225.00	-1.80	3.45		3.47	0.000118	1.19	344.82	272.81	90.00
Main Branch	4130	232.00	-1.70	3.47		3.48	0.000087	1.04	439.72	256.48	115.00
Main Branch	4130	225.00	-1.70	3.44		3.45	0.000085	1.02	432.51	255.30	115.00
Main Branch	4015	232.00	-1.90	3.45		3.46	0.000095	1.08	411.81	221.72	65.00
Main Branch	4015	225.00	-1.90	3.42		3.43	0.000092	1.06	405.76	220.39	65.00
Main Branch	3950	232.00	-2.00	3.43		3.45	0.000128	1.25	315.49	202.68	105.00
Main Branch	3950	225.00	-2.00	3.40		3.42	0.000123	1.23	310.14	200.39	105.00
Main Branch	3845	232.00	-2.40	3.40		3.43	0.000185	1.40	188.69	77.44	105.00
Main Branch	3845	225.00	-2.40	3.37		3.40	0.000178	1.37	186.76	76.67	105.00

2-YEAR

HEC-RAS Plan: NJDEP-2Yr River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)
Main Branch	3740	232.00	-2.50	3.35		3.40	0.000299	1.76	143.36	105.34	100.00
Main Branch	3740	225.00	-2.50	3.33		3.37	0.000286	1.72	140.98	99.84	100.00
Main Branch	3640	232.00	-2.40	3.35		3.36	0.000242	0.92	254.00	159.96	30.00
Main Branch	3640	225.00	-2.40	3.32		3.34	0.000237	0.90	250.33	158.49	30.00
Main Branch	3610	232.00	-2.40	3.34		3.35	0.000231	0.90	298.15	302.32	25.00
Main Branch	3610	225.00	-2.40	3.32		3.33	0.000226	0.88	291.27	296.67	25.00
Main Branch	3586	232.00	-2.40	3.27	-0.29	3.33	0.000438	1.91	157.47	254.32	1.00
Main Branch	3586	225.00	-2.40	3.25	-0.33	3.31	0.000422	1.87	152.30	249.28	1.00
Main Branch	3585	232.00	-2.40	3.28	-0.28	3.33	0.000319	1.90	157.60	254.45	1.00
Main Branch	3585	225.00	-2.40	3.25	-0.32	3.30	0.000307	1.87	152.39	249.37	1.00
Main Branch	3575	Bridge									
Main Branch	3565	232.00	-2.80	3.24	-0.68	3.29	0.000394	1.85	155.13	246.14	1.00
Main Branch	3565	225.00	-2.80	3.22	-0.72	3.27	0.000360	1.82	149.10	240.05	1.00
Main Branch	3564	232.00	-2.80	3.23	-0.68	3.29	0.000397	1.86	153.21	244.21	109.00
Main Branch	3564	225.00	-2.80	3.21	-0.72	3.26	0.000383	1.82	147.26	238.16	109.00
Main Branch	3455	286.00	-3.00	3.21		3.25	0.000244	1.67	290.18	398.15	85.00
Main Branch	3455	279.00	-3.00	3.19		3.23	0.000240	1.65	280.56	387.30	85.00
Main Branch	3370	286.00	-2.90	3.20		3.22	0.000185	1.23	466.23	565.69	85.00
Main Branch	3370	279.00	-2.90	3.17		3.19	0.000184	1.23	452.51	558.73	85.00
Main Branch	3285	286.00	-3.00	3.16		3.20	0.000275	1.54	295.31	337.81	340.00
Main Branch	3285	279.00	-3.00	3.14		3.17	0.000270	1.53	287.42	331.40	340.00
Main Branch	2945	286.00	-3.00	3.08		3.12	0.000205	1.57	306.44	218.57	130.00
Main Branch	2945	279.00	-3.00	3.06		3.09	0.000200	1.54	301.72	216.84	130.00
Main Branch	2815	286.00	-2.90	3.05		3.08	0.000188	1.55	281.96	182.87	60.00
Main Branch	2815	279.00	-2.90	3.03		3.06	0.000182	1.52	278.22	181.95	60.00
Main Branch	2755	286.00	-2.80	3.00		3.07	0.000384	2.11	167.31	73.61	95.00
Main Branch	2755	279.00	-2.80	2.98		3.05	0.000372	2.07	165.95	73.34	95.00
Main Branch	2660	286.00	-4.60	3.01		3.03	0.000117	1.33	484.98	362.23	125.00
Main Branch	2660	279.00	-4.60	2.99		3.01	0.000114	1.31	478.12	359.23	125.00
Main Branch	2535	286.00	-3.50	3.00		3.01	0.000056	0.84	876.56	583.71	120.00
Main Branch	2535	279.00	-3.50	2.99		2.99	0.000054	0.83	865.55	580.16	120.00
Main Branch	2315	286.00	-3.20	2.99		3.00	0.000067	0.94	634.38	399.12	105.00
Main Branch	2315	279.00	-3.20	2.98		2.98	0.000065	0.93	627.00	397.59	105.00
Main Branch	2210	286.00	-3.50	2.98		2.99	0.000084	0.85	462.50	298.24	95.00
Main Branch	2210	279.00	-3.50	2.96		2.97	0.000081	0.83	457.15	290.31	95.00
Main Branch	2115	286.00	-3.20	2.96		2.99	0.000134	1.28	350.63	195.88	95.00
Main Branch	2115	279.00	-3.20	2.95		2.97	0.000130	1.26	347.20	194.91	95.00
Main Branch	2020	286.00	-3.00	2.96		2.97	0.000090	1.02	597.19	415.62	90.00
Main Branch	2020	279.00	-3.00	2.94		2.95	0.000088	1.01	590.05	412.29	90.00
Main Branch	1930	286.00	-3.50	2.95		2.96	0.000049	0.83	651.08	340.32	110.00
Main Branch	1930	279.00	-3.50	2.93		2.94	0.000048	0.81	645.33	338.39	110.00
Main Branch	1820	286.00	-3.50	2.93		2.94	0.000059	0.89	620.87	287.42	85.00
Main Branch	1820	279.00	-3.50	2.92		2.92	0.000057	0.88	616.19	286.84	85.00
Main Branch	1736	286.00	-3.80	2.89	-1.17	2.93	0.000170	1.45	197.58	43.52	1.00
Main Branch	1736	279.00	-3.80	2.88	-1.21	2.91	0.000163	1.42	196.94	43.48	1.00

APPROXIMATE SITE LOCATION →

USE AVERAGE WATER SURFACE ELEVATION

2-YEAR

HEC-RAS Plan: NJDEP-2Yr River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Length Chnl (ft)
Main Branch	1735	286.00	-3.80	2.89	-2.32	2.91	0.000065	1.22	234.24	43.79	62.00
Main Branch	1735	279.00	-3.80	2.87	-2.34	2.90	0.000062	1.19	233.60	43.75	62.00
Main Branch	1705	Culvert									
Main Branch	1675	286.00	-3.70	2.78	-2.32	2.80	0.000094	1.18	241.54	44.52	1.00
Main Branch	1675	279.00	-3.70	2.77	-2.34	2.79	0.000090	1.16	241.12	44.49	1.00
Main Branch	1674	286.00	-3.80	2.76	-1.30	2.79	0.000186	1.51	189.08	41.45	54.00
Main Branch	1674	279.00	-3.80	2.75	-1.33	2.78	0.000178	1.48	188.72	41.43	54.00
Main Branch	1620	270.00	-3.20	2.73		2.78	0.000267	1.64	164.14	42.64	105.00
Main Branch	1620	264.00	-3.20	2.73		2.77	0.000256	1.61	163.82	42.61	105.00
Main Branch	1515	273.00	-3.20	2.71		2.75	0.000277	1.66	164.48	43.59	95.00
Main Branch	1515	267.00	-3.20	2.70		2.74	0.000266	1.63	164.20	43.56	95.00
Main Branch	1420	273.00	-3.00	2.70		2.74	0.000245	1.57	173.50	45.54	100.00
Main Branch	1420	267.00	-3.00	2.69		2.73	0.000236	1.54	173.23	45.52	100.00
Main Branch	1320	273.00	-3.00	2.69		2.71	0.000167	1.30	210.02	55.64	110.00
Main Branch	1320	267.00	-3.00	2.68		2.71	0.000160	1.27	209.72	55.61	110.00
Main Branch	1210	273.00	-3.00	2.67		2.70	0.000139	1.22	230.38	70.01	100.00
Main Branch	1210	267.00	-3.00	2.67		2.69	0.000133	1.20	230.06	69.91	100.00
Main Branch	1110	273.00	-3.00	2.66		2.67	0.000072	0.98	306.29	79.42	110.00
Main Branch	1110	267.00	-3.00	2.66		2.67	0.000069	0.96	305.97	79.42	110.00
Main Branch	1000	273.00	-3.40	2.65		2.67	0.000105	1.14	240.51	54.56	100.00
Main Branch	1000	267.00	-3.40	2.64		2.66	0.000101	1.11	240.33	54.55	100.00
Main Branch	900	273.00	-4.30	2.64		2.65	0.000057	0.89	308.24	64.33	100.00
Main Branch	900	267.00	-4.30	2.63		2.64	0.000055	0.87	307.59	64.28	100.00
Main Branch	800	273.00	-3.10	2.63		2.65	0.000079	1.01	273.60	69.01	100.00
Main Branch	800	267.00	-3.10	2.62		2.64	0.000076	0.99	272.94	68.88	100.00
Main Branch	700	273.00	-3.10	2.62		2.64	0.000104	1.08	252.82	62.48	105.00
Main Branch	700	267.00	-3.10	2.61		2.63	0.000101	1.06	252.26	62.44	105.00
Main Branch	595	273.00	-3.70	2.60		2.62	0.000079	0.92	323.47	103.97	205.00
Main Branch	595	267.00	-3.70	2.60		2.61	0.000076	0.90	322.58	103.92	205.00
Main Branch	491	273.00	-3.50	2.59	-2.18	2.61	0.000067	0.99	276.33	49.00	1.00
Main Branch	491	267.00	-3.50	2.58	-2.20	2.60	0.000064	0.97	275.94	49.00	1.00
Main Branch	490	273.00	-3.50	2.59	-2.18	2.60	0.000022	0.79	344.18	66.75	1.00
Main Branch	490	267.00	-3.50	2.58	-2.20	2.59	0.000022	0.78	343.65	66.74	1.00
Main Branch	485	Bridge									
Main Branch	480	273.00	-3.50	2.57	-2.18	2.58	0.000023	0.80	342.63	66.72	1.00
Main Branch	480	267.00	-3.50	2.56	-2.20	2.57	0.000022	0.78	342.23	66.72	1.00
Main Branch	479	273.00	-3.70	2.56	-2.13	2.58	0.000078	1.04	262.29	49.33	89.00
Main Branch	479	267.00	-3.70	2.56	-2.15	2.57	0.000074	1.02	262.02	49.32	89.00
Main Branch	390	273.00	-3.90	2.55		2.57	0.000078	0.88	311.49	85.21	100.00
Main Branch	390	267.00	-3.90	2.55		2.56	0.000075	0.86	311.09	85.17	100.00
Main Branch	290	273.00	-4.10	2.55		2.56	0.000078	0.91	298.75	76.96	95.00
Main Branch	290	267.00	-4.10	2.54		2.55	0.000075	0.89	298.44	76.92	95.00
Main Branch	195	273.00	-3.60	2.54		2.55	0.000065	0.80	341.18	93.46	195.00
Main Branch	195	267.00	-3.60	2.54		2.54	0.000062	0.78	340.86	93.43	195.00

2-YEAR

HEC-RAS Plan: NJDEP-2Yr River: West Riser Ditch Reach: Main Branch (Continued)

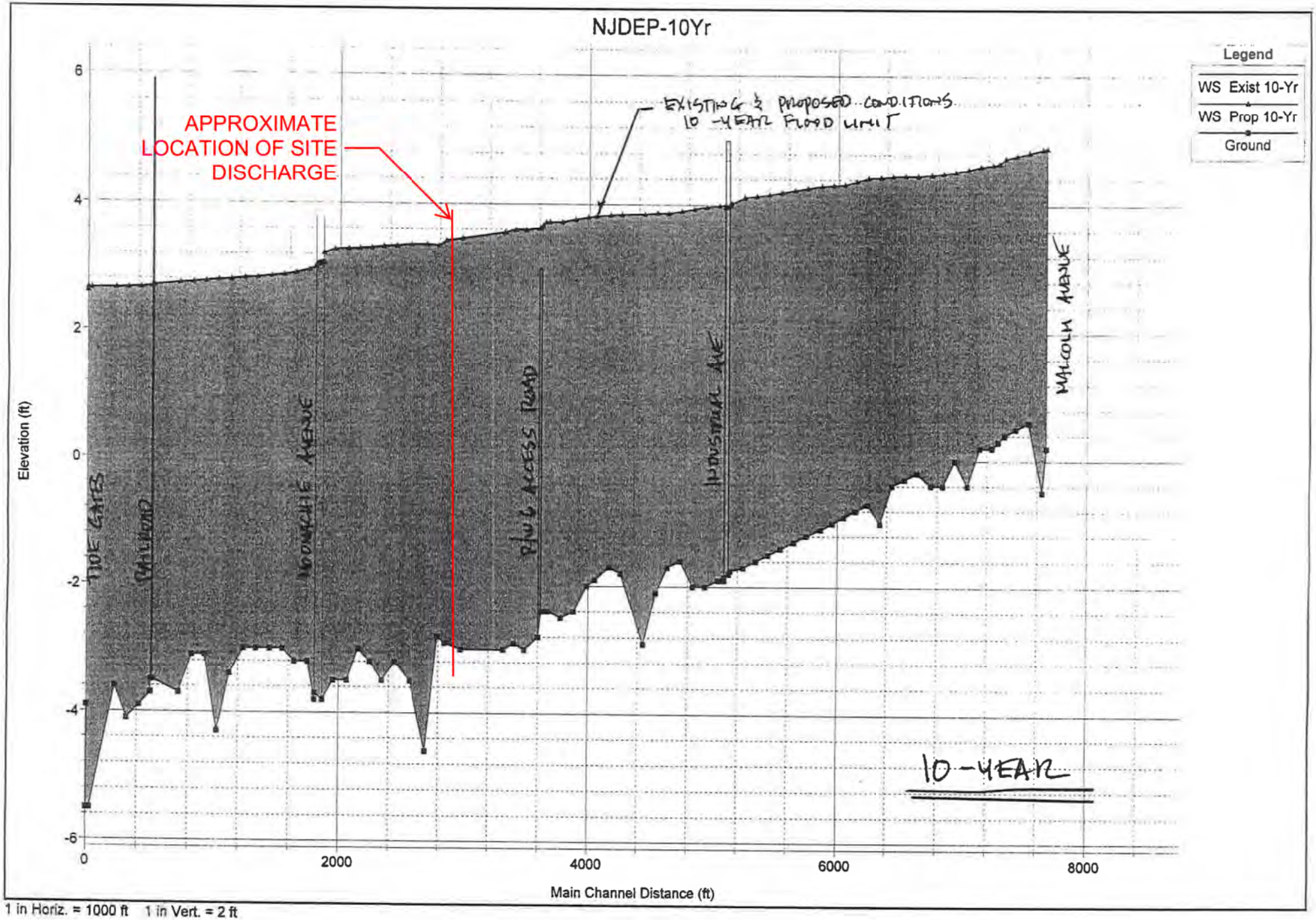
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)
Main Branch	125	273.00	-5.50	2.53		2.54	0.000028	0.70	392.40	69.39	28.00
Main Branch	125	267.00	-5.50	2.53		2.54	0.000027	0.68	392.22	69.37	28.00
Main Branch	97	273.00	-5.50	2.52		2.53	0.000030	0.71	385.37	69.34	1.00
Main Branch	97	267.00	-5.50	2.52		2.53	0.000029	0.69	385.22	69.32	1.00
Main Branch	96	273.00	-3.90	2.50	-2.58	2.53	0.000044	1.36	200.96	69.03	
Main Branch	96	267.00	-3.90	2.50	-2.59	2.53	0.000042	1.33	200.96	69.03	

PROFILE 1 : EXISTING CONDITIONS

PROFILE 2 : PROPOSED CONDITIONS

HEC-RAS Model

10-Year Storm
(Existing and Proposed Conditions)


NJDEP-10Yr
Legend
WS Exist 10-Yr
WS Prop 10-Yr
Ground
APPROXIMATE LOCATION OF SITE DISCHARGE
EXISTING & PROPOSED CONDITIONS 10-YEAR FLOOD LIMIT
TIDE GATES
CHELSEA
MONMOUTH AVENUE
PLUG ACCESS ROAD
INDUSTRIAL AVE
MALCOLM AVENUE
10-YEAR
Elevation (ft)
6
4
2
0
-2
-4
-6
0
2000
4000
6000
8000
Main Channel Distance (ft)
1 in Horiz. = 1000 ft
1 in Vert. = 2 ft

10 - YEAR

HEC-RAS Plan: NJDEP-10Yr River: West Riser Ditch Reach: Main Branch

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)
Main Branch	7625	150.00	0.20	4.90		4.95	0.000330	1.78	86.91	33.06	35.00
Main Branch	7625	150.00	0.20	4.89		4.94	0.000331	1.78	86.83	33.05	35.00
Main Branch	7590	150.00	-0.50	4.88		4.93	0.000337	1.80	83.50	27.12	110.00
Main Branch	7590	150.00	-0.50	4.88		4.93	0.000337	1.80	83.44	27.11	110.00
Main Branch	7480	150.00	0.60	4.83		4.89	0.000415	1.97	83.26	42.41	100.00
Main Branch	7480	150.00	0.60	4.83		4.89	0.000417	1.97	83.15	42.37	100.00
Main Branch	7380	150.00	0.50	4.78		4.85	0.000484	2.15	89.36	70.94	90.00
Main Branch	7380	150.00	0.50	4.78		4.85	0.000485	2.16	89.17	70.77	90.00
Main Branch	7290	150.00	0.40	4.74		4.80	0.000563	1.98	87.66	63.80	50.00
Main Branch	7290	150.00	0.40	4.74		4.80	0.000565	1.99	87.48	63.80	50.00
Main Branch	7240	150.00	0.30	4.66		4.76	0.000878	2.70	80.68	65.67	50.00
Main Branch	7240	150.00	0.30	4.66		4.76	0.000882	2.70	80.46	65.66	50.00
Main Branch	7190	150.00	0.20	4.64		4.71	0.000579	2.27	94.79	67.13	100.00
Main Branch	7190	150.00	0.20	4.64		4.71	0.000582	2.27	94.56	67.12	100.00
Main Branch	7090	150.00	0.20	4.61		4.66	0.000321	1.74	115.95	80.15	100.00
Main Branch	7090	150.00	0.20	4.61		4.65	0.000323	1.75	115.67	80.04	100.00
Main Branch	6990	150.00	-0.40	4.57		4.62	0.000333	1.89	83.28	38.15	100.00
Main Branch	6990	150.00	-0.40	4.56		4.62	0.000334	1.89	83.14	38.02	100.00
Main Branch	6890	150.00	0.00	4.52		4.59	0.000481	2.07	72.61	25.26	95.00
Main Branch	6890	150.00	0.00	4.52		4.59	0.000483	2.07	72.51	25.25	95.00
Main Branch	6795	150.00	-0.40	4.50		4.55	0.000385	1.86	80.61	27.99	95.00
Main Branch	6795	150.00	-0.40	4.49		4.55	0.000387	1.86	80.50	27.97	95.00
Main Branch	6700	150.00	-0.40	4.48		4.52	0.000234	1.59	94.06	27.97	110.00
Main Branch	6700	150.00	-0.40	4.48		4.52	0.000235	1.60	93.95	27.96	110.00
Main Branch	6590	150.00	-0.20	4.46		4.50	0.000240	1.54	97.75	33.72	100.00
Main Branch	6590	150.00	-0.20	4.46		4.50	0.000241	1.54	97.61	33.65	100.00
Main Branch	6490	150.00	-0.30	4.46		4.48	0.000068	0.84	201.00	114.58	100.00
Main Branch	6490	150.00	-0.30	4.46		4.47	0.000068	0.84	200.53	114.31	100.00
Main Branch	6390	150.00	-0.40	4.45		4.47	0.000142	1.16	129.00	44.72	95.00
Main Branch	6390	150.00	-0.40	4.45		4.47	0.000143	1.16	128.81	44.69	95.00
Main Branch	6295	150.00	-1.00	4.44		4.46	0.000101	1.06	140.86	42.91	105.00
Main Branch	6295	150.00	-1.00	4.44		4.45	0.000102	1.07	140.68	42.89	105.00
Main Branch	6190	150.00	-0.70	4.43		4.45	0.000091	1.11	135.01	31.94	95.00
Main Branch	6190	150.00	-0.70	4.43		4.44	0.000091	1.11	134.87	31.93	95.00
Main Branch	6095	262.00	-0.80	4.38		4.43	0.000248	1.83	143.38	34.02	95.00
Main Branch	6095	262.00	-0.80	4.37		4.42	0.000248	1.83	143.23	34.01	95.00
Main Branch	6000	262.00	-0.90	4.32	1.24	4.40	0.000398	2.19	119.74	33.36	90.00
Main Branch	6000	262.00	-0.90	4.32	1.24	4.39	0.000399	2.19	119.59	33.33	90.00
Main Branch	5910	262.00	-1.00	4.31	1.07	4.36	0.000253	1.73	151.92	47.55	95.00
Main Branch	5910	262.00	-1.00	4.31	1.07	4.35	0.000254	1.73	151.70	47.50	95.00
Main Branch	5815	262.00	-1.10	4.30		4.32	0.000136	1.24	218.55	90.69	115.00
Main Branch	5815	262.00	-1.10	4.29		4.32	0.000137	1.25	218.12	90.54	115.00
Main Branch	5710	262.00	-1.20	4.27		4.30	0.000211	1.53	170.89	52.02	100.00
Main Branch	5710	262.00	-1.20	4.26		4.30	0.000212	1.54	170.63	52.00	100.00
Main Branch	5610	262.00	-1.30	4.23		4.29	0.000255	1.87	140.05	35.78	105.00

10-YEAR

HEC-RAS Plan: NJDEP-10Yr River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Length Chnl (ft)
Main Branch	5610	262.00	-1.30	4.23		4.28	0.000256	1.87	139.87	35.76	105.00
Main Branch	5505	262.00	-1.40	4.20		4.26	0.000250	1.93	136.01	31.55	100.00
Main Branch	5505	262.00	-1.40	4.19		4.25	0.000251	1.93	135.84	31.54	100.00
Main Branch	5405	262.00	-1.50	4.16		4.23	0.000311	2.08	126.63	33.35	100.00
Main Branch	5405	262.00	-1.50	4.16		4.23	0.000312	2.08	126.46	33.32	100.00
Main Branch	5305	262.00	-1.60	4.14		4.19	0.000236	1.82	143.97	36.25	100.00
Main Branch	5305	262.00	-1.60	4.14		4.19	0.000236	1.82	143.78	36.23	100.00
Main Branch	5205	262.00	-1.70	4.12		4.17	0.000257	1.79	146.28	39.08	105.00
Main Branch	5205	262.00	-1.70	4.11		4.16	0.000258	1.79	146.07	39.04	105.00
Main Branch	5100	262.00	-1.75	4.03		4.13	0.000506	2.50	104.93	28.23	11.00
Main Branch	5100	262.00	-1.75	4.02		4.12	0.000508	2.50	104.77	28.21	11.00
Main Branch	5089	262.00	-1.80	4.02	0.94	4.11	0.000504	2.49	105.06	28.19	1.00
Main Branch	5089	262.00	-1.80	4.01	0.94	4.11	0.000506	2.50	104.89	28.18	1.00
Main Branch	5088	262.00	-1.80	3.99	0.91	4.11	0.000569	2.76	95.01	31.36	1.00
Main Branch	5088	262.00	-1.80	3.99	0.91	4.11	0.000572	2.76	94.82	31.31	1.00
Main Branch	5071	Bridge									
Main Branch	5054	262.00	-1.85	3.97	0.81	4.09	0.000807	2.75	95.43	31.19	1.00
Main Branch	5054	262.00	-1.85	3.97	0.81	4.08	0.000811	2.75	95.24	31.14	1.00
Main Branch	5053	262.00	-1.90	4.01	0.25	4.07	0.000338	2.01	130.62	36.77	48.00
Main Branch	5053	262.00	-1.90	4.00	0.25	4.07	0.000340	2.01	130.40	36.73	48.00
Main Branch	5005	262.00	-1.90	3.99	0.85	4.05	0.000443	1.97	141.97	55.14	105.00
Main Branch	5005	262.00	-1.90	3.98	0.85	4.04	0.000446	1.98	141.63	55.06	105.00
Main Branch	4900	262.00	-2.00	3.97		4.01	0.000208	1.50	242.05	234.75	100.00
Main Branch	4900	262.00	-2.00	3.97		4.00	0.000210	1.51	240.55	233.67	100.00
Main Branch	4800	262.00	-2.00	3.94		3.98	0.000334	1.76	248.90	366.74	100.00
Main Branch	4800	262.00	-2.00	3.93		3.98	0.000338	1.77	246.42	365.35	100.00
Main Branch	4700	262.00	-1.60	3.91		3.95	0.000307	1.72	204.59	253.13	105.00
Main Branch	4700	262.00	-1.60	3.90		3.95	0.000309	1.72	202.80	250.07	105.00
Main Branch	4595	262.00	-1.70	3.88		3.92	0.000312	1.77	240.91	294.41	90.00
Main Branch	4595	262.00	-1.70	3.87		3.91	0.000315	1.78	238.73	291.12	90.00
Main Branch	4505	262.00	-2.10	3.88		3.89	0.000092	1.00	577.25	337.09	100.00
Main Branch	4505	262.00	-2.10	3.87		3.88	0.000093	1.01	574.74	336.80	100.00
Main Branch	4405	262.00	-2.90	3.86		3.88	0.000114	1.22	357.52	263.07	185.00
Main Branch	4405	262.00	-2.90	3.85		3.87	0.000115	1.23	355.54	262.22	185.00
Main Branch	4220	262.00	-1.80	3.85		3.87	0.000097	1.14	458.31	293.21	90.00
Main Branch	4220	262.00	-1.80	3.84		3.86	0.000098	1.15	456.08	292.83	90.00
Main Branch	4130	262.00	-1.70	3.84		3.85	0.000072	1.00	538.38	272.08	115.00
Main Branch	4130	262.00	-1.70	3.83		3.84	0.000073	1.00	536.29	271.76	115.00
Main Branch	4015	262.00	-1.90	3.82		3.83	0.000081	1.05	498.28	239.88	65.00
Main Branch	4015	262.00	-1.90	3.82		3.83	0.000081	1.05	496.41	239.50	65.00
Main Branch	3950	262.00	-2.00	3.80		3.82	0.000110	1.23	397.83	235.18	105.00
Main Branch	3950	262.00	-2.00	3.80		3.81	0.000111	1.23	395.95	234.49	105.00
Main Branch	3845	262.00	-2.40	3.77		3.80	0.000173	1.42	234.40	194.09	105.00
Main Branch	3845	262.00	-2.40	3.76		3.79	0.000175	1.42	232.82	190.68	105.00

10-YEAR

HEC-RAS Plan: NJDEP-10Yr River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Length Chnl (ft)
Main Branch	3740	262.00	-2.50	3.73		3.78	0.000273	1.75	200.10	187.03	100.00
Main Branch	3740	262.00	-2.50	3.72		3.77	0.000275	1.76	198.51	185.56	100.00
Main Branch	3640	262.00	-2.40	3.73		3.74	0.000171	0.83	323.20	225.94	30.00
Main Branch	3640	262.00	-2.40	3.72		3.73	0.000173	0.84	321.27	222.90	30.00
Main Branch	3610	262.00	-2.40	3.73		3.73	0.000147	0.77	435.68	431.93	25.00
Main Branch	3610	262.00	-2.40	3.72		3.73	0.000150	0.78	431.95	427.41	25.00
Main Branch	3586	262.00	-2.40	3.68	-0.13	3.72	0.000329	1.72	281.82	361.44	1.00
Main Branch	3586	262.00	-2.40	3.67	-0.13	3.71	0.000333	1.73	278.43	358.98	1.00
Main Branch	3585	262.00	-2.40	3.67	-0.12	3.71	0.000232	1.68	279.41	359.69	1.00
Main Branch	3585	262.00	-2.40	3.66	-0.12	3.70	0.000235	1.69	276.02	357.23	1.00
Main Branch	3575	Bridge									
Main Branch	3565	262.00	-2.80	3.63	-0.51	3.67	0.000313	1.70	271.24	349.26	1.00
Main Branch	3565	262.00	-2.80	3.62	-0.51	3.66	0.000317	1.71	267.97	346.81	1.00
Main Branch	3564	262.00	-2.80	3.63	-0.51	3.67	0.000316	1.71	268.60	347.28	109.00
Main Branch	3564	262.00	-2.80	3.62	-0.51	3.66	0.000320	1.72	265.31	344.80	109.00
Main Branch	3455	388.00	-3.00	3.60		3.65	0.000255	1.81	480.76	571.13	85.00
Main Branch	3455	388.00	-3.00	3.59		3.64	0.000259	1.82	475.16	567.75	85.00
Main Branch	3370	388.00	-2.90	3.60		3.62	0.000171	1.25	724.50	716.35	85.00
Main Branch	3370	388.00	-2.90	3.59		3.61	0.000174	1.26	717.46	712.40	85.00
Main Branch	3285	388.00	-3.00	3.56		3.60	0.000297	1.67	456.75	478.57	340.00
Main Branch	3285	388.00	-3.00	3.55		3.59	0.000302	1.68	451.78	474.34	340.00
Main Branch	2945	388.00	-3.00	3.47		3.51	0.000246	1.81	397.24	280.19	130.00
Main Branch	2945	388.00	-3.00	3.46		3.50	0.000249	1.82	394.03	273.98	130.00
Main Branch	2815	388.00	-2.90	3.43		3.48	0.000231	1.81	388.19	446.61	60.00
Main Branch	2815	388.00	-2.90	3.42		3.47	0.000234	1.82	382.80	445.48	60.00
Main Branch	2755	388.00	-2.80	3.36		3.45	0.000513	2.57	224.20	356.42	95.00
Main Branch	2755	388.00	-2.80	3.34		3.44	0.000520	2.59	219.58	355.50	95.00
Main Branch	2660	388.00	-4.60	3.37		3.40	0.000157	1.61	651.25	614.32	125.00
Main Branch	2660	388.00	-4.60	3.36		3.39	0.000160	1.63	643.25	613.24	125.00
Main Branch	2535	388.00	-3.50	3.37		3.38	0.000063	0.94	1101.40	644.54	120.00
Main Branch	2535	388.00	-3.50	3.36		3.36	0.000064	0.95	1093.03	643.54	120.00
Main Branch	2315	388.00	-3.20	3.35		3.37	0.000081	1.09	784.09	439.45	105.00
Main Branch	2315	388.00	-3.20	3.34		3.35	0.000082	1.09	778.32	435.78	105.00
Main Branch	2210	388.00	-3.50	3.34		3.35	0.000099	0.99	594.91	430.94	95.00
Main Branch	2210	388.00	-3.50	3.33		3.34	0.000101	1.00	589.14	429.57	95.00
Main Branch	2115	388.00	-3.20	3.32		3.35	0.000173	1.53	426.41	236.79	95.00
Main Branch	2115	388.00	-3.20	3.30		3.33	0.000176	1.54	423.18	235.16	95.00
Main Branch	2020	388.00	-3.00	3.31		3.32	0.000107	1.18	755.82	482.53	90.00
Main Branch	2020	388.00	-3.00	3.29		3.31	0.000109	1.18	749.16	480.38	90.00
Main Branch	1930	388.00	-3.50	3.30		3.31	0.000064	0.99	778.54	388.70	110.00
Main Branch	1930	388.00	-3.50	3.29		3.30	0.000065	0.99	773.13	386.71	110.00
Main Branch	1820	388.00	-3.50	3.29		3.30	0.000076	1.07	735.28	406.53	85.00
Main Branch	1820	388.00	-3.50	3.28		3.29	0.000077	1.08	729.56	404.57	85.00
Main Branch	1736	388.00	-3.80	3.23	-0.87	3.28	0.000254	1.83	212.28	44.44	1.00
Main Branch	1736	388.00	-3.80	3.21	-0.87	3.27	0.000256	1.83	211.63	44.40	1.00

APPROXIMATE SITE LOCATION →

USE AVERAGE WATER SURFACE ELEVATION

10-YEAR

HEC-RAS Plan: NJDEP-10Yr River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)
Main Branch	1735	388.00	-3.80	3.23	-1.99	3.27	0.000100	1.56	249.52	44.70	62.00
Main Branch	1735	388.00	-3.80	3.22	-1.99	3.26	0.000101	1.56	248.87	44.66	62.00
Main Branch	1705	Culvert									
Main Branch	1675	388.00	-3.70	3.05	-2.01	3.08	0.000151	1.53	253.38	45.11	1.00
Main Branch	1675	388.00	-3.70	3.03	-2.01	3.07	0.000152	1.54	252.71	45.07	1.00
Main Branch	1674	388.00	-3.80	3.01	-0.96	3.07	0.000293	1.94	199.68	42.11	54.00
Main Branch	1674	388.00	-3.80	3.00	-0.96	3.06	0.000295	1.95	199.05	42.07	54.00
Main Branch	1620	390.00	-3.20	2.97		3.04	0.000470	2.24	174.07	43.43	105.00
Main Branch	1620	384.00	-3.20	2.95		3.03	0.000460	2.21	173.45	43.38	105.00
Main Branch	1515	395.00	-3.20	2.92		3.00	0.000490	2.28	173.67	44.78	95.00
Main Branch	1515	390.00	-3.20	2.90		2.98	0.000483	2.25	173.05	44.70	95.00
Main Branch	1420	395.00	-3.00	2.88		2.96	0.000448	2.17	182.07	46.30	100.00
Main Branch	1420	390.00	-3.00	2.87		2.94	0.000441	2.15	181.45	46.25	100.00
Main Branch	1320	395.00	-3.00	2.86		2.91	0.000306	1.80	219.94	56.33	110.00
Main Branch	1320	390.00	-3.00	2.85		2.90	0.000301	1.78	219.21	56.28	110.00
Main Branch	1210	395.00	-3.00	2.84		2.88	0.000251	1.69	242.44	73.50	100.00
Main Branch	1210	390.00	-3.00	2.83		2.87	0.000247	1.67	241.52	73.23	100.00
Main Branch	1110	395.00	-3.00	2.83		2.86	0.000134	1.36	319.74	79.68	110.00
Main Branch	1110	390.00	-3.00	2.82		2.84	0.000132	1.35	318.75	79.66	110.00
Main Branch	1000	395.00	-3.40	2.81		2.84	0.000198	1.59	249.18	55.35	100.00
Main Branch	1000	390.00	-3.40	2.79		2.83	0.000195	1.57	248.52	55.09	100.00
Main Branch	900	395.00	-4.30	2.80		2.82	0.000109	1.24	318.27	65.00	100.00
Main Branch	900	390.00	-4.30	2.79		2.81	0.000107	1.23	317.50	64.95	100.00
Main Branch	800	395.00	-3.10	2.78		2.81	0.000149	1.42	284.07	71.07	100.00
Main Branch	800	390.00	-3.10	2.77		2.80	0.000146	1.40	283.25	70.91	100.00
Main Branch	700	395.00	-3.10	2.76		2.80	0.000197	1.51	261.86	63.09	105.00
Main Branch	700	390.00	-3.10	2.75		2.78	0.000194	1.49	261.15	63.04	105.00
Main Branch	595	395.00	-3.70	2.74		2.77	0.000146	1.28	337.92	104.83	205.00
Main Branch	595	390.00	-3.70	2.73		2.76	0.000144	1.27	336.78	104.76	205.00
Main Branch	491	395.00	-3.50	2.71	-1.86	2.74	0.000132	1.40	281.96	49.00	1.00
Main Branch	491	390.00	-3.50	2.70	-1.87	2.73	0.000129	1.39	281.46	49.00	1.00
Main Branch	490	395.00	-3.50	2.71	-1.76	2.73	0.000044	1.12	352.10	66.88	1.00
Main Branch	490	390.00	-3.50	2.70	-1.76	2.72	0.000043	1.11	351.41	66.87	1.00
Main Branch	485	Bridge									
Main Branch	480	395.00	-3.50	2.70	-1.83	2.72	0.000044	1.12	351.46	66.87	1.00
Main Branch	480	390.00	-3.50	2.69	-1.87	2.71	0.000043	1.11	350.80	66.86	1.00
Main Branch	479	395.00	-3.70	2.69	-1.81	2.72	0.000151	1.47	268.46	49.44	89.00
Main Branch	479	390.00	-3.70	2.68	-1.82	2.71	0.000148	1.46	268.00	49.43	89.00
Main Branch	390	395.00	-3.90	2.68		2.70	0.000149	1.23	322.06	86.25	100.00
Main Branch	390	390.00	-3.90	2.66		2.69	0.000146	1.21	320.99	86.15	100.00
Main Branch	290	395.00	-4.10	2.67		2.69	0.000150	1.28	308.17	77.98	95.00
Main Branch	290	390.00	-4.10	2.65		2.68	0.000148	1.27	306.96	77.85	95.00
Main Branch	195	395.00	-3.60	2.66		2.68	0.000122	1.12	352.46	94.78	195.00
Main Branch	195	390.00	-3.60	2.65		2.67	0.000120	1.11	351.67	94.66	195.00

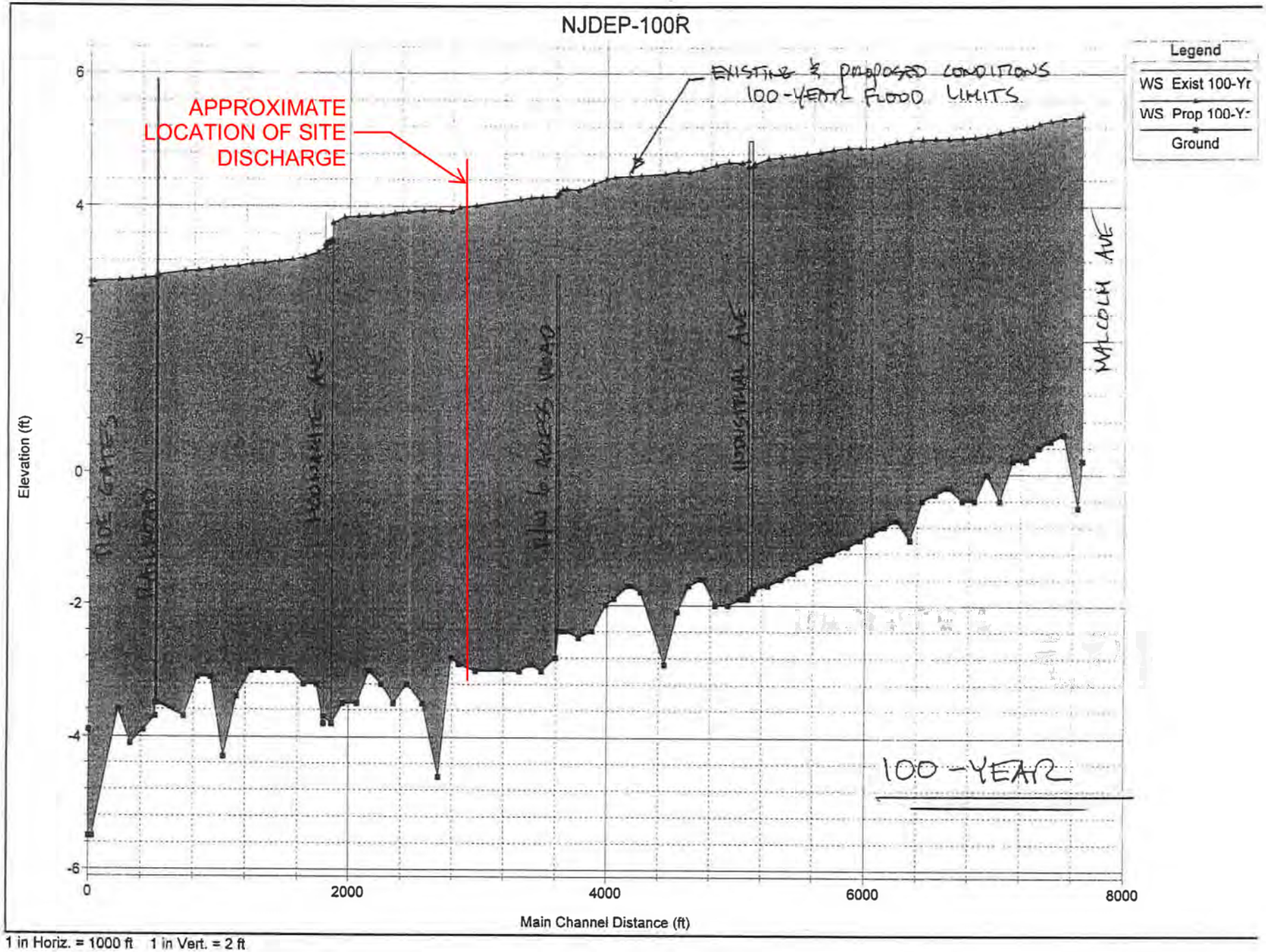
10-YEAR

HEC-RAS Plan: NJDEP-10Yr River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Length Chnl (ft)
Main Branch	125	395.00	-5.50	2.65		2.66	0.000056	0.99	400.67	70.16	28.00
Main Branch	125	390.00	-5.50	2.65		2.66	0.000055	0.97	400.58	70.15	28.00
Main Branch	97	395.00	-5.50	2.65		2.66	0.000059	1.00	394.01	70.14	1.00
Main Branch	97	390.00	-5.50	2.65		2.66	0.000058	0.99	393.92	70.13	1.00
Main Branch	96	395.00	-3.90	2.60	-2.21	2.66	0.000087	1.94	204.10	69.68	
Main Branch	96	390.00	-3.90	2.60	-2.22	2.66	0.000085	1.91	204.10	69.68	

HEC-RAS Model

100-Year Storm
(Existing and Proposed Conditions)


NJDEP-100R
APPROXIMATE LOCATION OF SITE DISCHARGE
EXISTING & PROPOSED CONDITIONS 100-YEAR FLOOD LIMITS
Legend
WS Exist 100-Yr
WS Prop 100-Yr
Ground
TIDE GATES
RAILROAD
HOBOKEN AVE
RR to ACCESS ROAD
INDUSTRIAL AVE
MALCOLM AVE
100-YEAR
Elevation (ft)
6
4
2
0
-2
-4
-6
0
2000
4000
6000
8000
Main Channel Distance (ft)
1 in Horiz. = 1000 ft 1 in Vert. = 2 ft

100-YEAR

HEC-RAS Plan: NJDEP100R River: West Riser Ditch Reach: Main Branch

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)
Main Branch	7625	185.00	0.20	5.39		5.44	0.000304	1.87	104.97	42.40	35.00
Main Branch	7625	185.00	0.20	5.39		5.44	0.000305	1.87	104.92	42.36	35.00
Main Branch	7590	185.00	-0.50	5.37		5.43	0.000335	1.91	97.00	28.55	110.00
Main Branch	7590	185.00	-0.50	5.37		5.42	0.000335	1.91	96.96	28.54	110.00
Main Branch	7480	185.00	0.60	5.33		5.39	0.000367	2.02	106.62	51.11	100.00
Main Branch	7480	185.00	0.60	5.33		5.39	0.000368	2.02	106.54	51.09	100.00
Main Branch	7380	185.00	0.50	5.30		5.36	0.000392	2.10	134.43	104.51	90.00
Main Branch	7380	185.00	0.50	5.30		5.36	0.000392	2.10	134.27	104.41	90.00
Main Branch	7290	185.00	0.40	5.26		5.31	0.000407	1.89	121.00	64.86	50.00
Main Branch	7290	185.00	0.40	5.26		5.31	0.000408	1.89	120.89	64.86	50.00
Main Branch	7240	185.00	0.30	5.21		5.28	0.000617	2.45	116.93	66.79	50.00
Main Branch	7240	185.00	0.30	5.21		5.28	0.000618	2.46	116.81	66.79	50.00
Main Branch	7190	185.00	0.20	5.19		5.25	0.000426	2.11	132.06	68.28	100.00
Main Branch	7190	185.00	0.20	5.19		5.25	0.000427	2.12	131.94	68.27	100.00
Main Branch	7090	185.00	0.20	5.17		5.21	0.000244	1.67	164.90	96.59	100.00
Main Branch	7090	185.00	0.20	5.17		5.20	0.000245	1.67	164.72	96.53	100.00
Main Branch	6990	185.00	-0.40	5.13		5.18	0.000301	1.95	109.74	57.72	100.00
Main Branch	6990	185.00	-0.40	5.13		5.18	0.000301	1.95	109.63	57.64	100.00
Main Branch	6890	185.00	0.00	5.09		5.16	0.000437	2.12	87.32	27.09	95.00
Main Branch	6890	185.00	0.00	5.08		5.15	0.000438	2.12	87.27	27.08	95.00
Main Branch	6795	185.00	-0.40	5.06		5.12	0.000334	1.91	97.88	32.96	95.00
Main Branch	6795	185.00	-0.40	5.06		5.12	0.000334	1.91	97.81	32.95	95.00
Main Branch	6700	185.00	-0.40	5.05		5.09	0.000225	1.67	112.55	45.06	110.00
Main Branch	6700	185.00	-0.40	5.05		5.09	0.000225	1.67	112.45	45.01	110.00
Main Branch	6590	185.00	-0.20	5.04		5.08	0.000210	1.58	121.45	46.88	100.00
Main Branch	6590	185.00	-0.20	5.03		5.07	0.000210	1.58	121.35	46.87	100.00
Main Branch	6490	185.00	-0.30	5.04		5.05	0.000054	0.83	275.69	135.00	100.00
Main Branch	6490	185.00	-0.30	5.04		5.05	0.000054	0.83	275.40	135.00	100.00
Main Branch	6390	185.00	-0.40	5.03		5.05	0.000121	1.19	157.14	53.79	95.00
Main Branch	6390	185.00	-0.40	5.03		5.05	0.000121	1.19	157.03	53.75	95.00
Main Branch	6295	185.00	-1.00	5.01		5.03	0.000098	1.11	166.45	46.43	105.00
Main Branch	6295	185.00	-1.00	5.01		5.03	0.000098	1.11	166.35	46.42	105.00
Main Branch	6190	185.00	-0.70	4.99		5.01	0.000096	1.21	153.23	33.02	95.00
Main Branch	6190	185.00	-0.70	4.99		5.01	0.000097	1.21	153.15	33.02	95.00
Main Branch	6095	297.00	-0.80	4.94		5.00	0.000221	1.82	163.13	35.39	95.00
Main Branch	6095	297.00	-0.80	4.94		4.99	0.000222	1.82	163.04	35.38	95.00
Main Branch	6000	297.00	-0.90	4.90	1.40	4.97	0.000328	2.13	139.95	36.70	90.00
Main Branch	6000	297.00	-0.90	4.90	1.40	4.97	0.000328	2.13	139.86	36.69	90.00
Main Branch	5910	297.00	-1.00	4.90	1.23	4.94	0.000189	1.66	181.92	53.93	95.00
Main Branch	5910	297.00	-1.00	4.90	1.23	4.94	0.000189	1.66	181.79	53.91	95.00
Main Branch	5815	297.00	-1.10	4.90		4.93	0.000096	1.17	277.74	104.85	115.00
Main Branch	5815	297.00	-1.10	4.90		4.92	0.000096	1.17	277.49	104.80	115.00
Main Branch	5710	297.00	-1.20	4.87		4.90	0.000163	1.46	203.04	54.63	100.00
Main Branch	5710	297.00	-1.20	4.87		4.90	0.000164	1.46	202.90	54.62	100.00
Main Branch	5610	297.00	-1.30	4.83		4.88	0.000217	1.83	162.10	37.68	105.00

PROFILE 1 = EXISTING CONDITIONS; PROFILE 2 = PROPOSED CONDITIONS

100-YEAR

HEC-RAS Plan: NJDEP100R River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Length Chnl (ft)
Main Branch	5610	297.00	-1.30	4.83		4.88	0.000217	1.83	162.01	37.67	105.00
Main Branch	5505	297.00	-1.40	4.80		4.86	0.000215	1.91	155.92	34.85	100.00
Main Branch	5505	297.00	-1.40	4.80		4.86	0.000216	1.91	155.83	34.83	100.00
Main Branch	5405	297.00	-1.50	4.78		4.84	0.000257	2.03	148.05	36.64	100.00
Main Branch	5405	297.00	-1.50	4.77		4.84	0.000257	2.03	147.95	36.63	100.00
Main Branch	5305	297.00	-1.60	4.76		4.81	0.000201	1.78	167.01	38.52	100.00
Main Branch	5305	297.00	-1.60	4.76		4.80	0.000201	1.78	166.91	38.51	100.00
Main Branch	5205	297.00	-1.70	4.74		4.79	0.000219	1.73	171.76	43.01	105.00
Main Branch	5205	297.00	-1.70	4.74		4.78	0.000219	1.73	171.65	42.99	105.00
Main Branch	5100	297.00	-1.75	4.66		4.75	0.000417	2.41	123.32	30.13	11.00
Main Branch	5100	297.00	-1.75	4.66		4.75	0.000418	2.41	123.24	30.12	11.00
Main Branch	5089	297.00	-1.80	4.65	1.13	4.74	0.000416	2.41	123.43	30.09	1.00
Main Branch	5089	297.00	-1.80	4.65	1.13	4.74	0.000417	2.41	123.35	30.08	1.00
Main Branch	5088	297.00	-1.80	4.64	1.11	4.74	0.000401	2.55	119.82	45.87	1.00
Main Branch	5088	297.00	-1.80	4.63	1.11	4.73	0.000402	2.55	119.69	45.80	1.00
Main Branch	5071	Bridge									
Main Branch	5054	514.00	-1.85	4.62	2.21	4.91	0.001711	4.39	120.01	45.42	1.00
Main Branch	5054	513.00	-1.85	4.61	2.21	4.91	0.001709	4.39	119.88	45.35	1.00
Main Branch	5053	514.00	-1.90	4.71	1.34	4.87	0.000807	3.25	157.99	41.46	48.00
Main Branch	5053	513.00	-1.90	4.71	1.34	4.87	0.000806	3.25	157.87	41.45	48.00
Main Branch	5005	514.00	-1.90	4.68	1.88	4.82	0.000944	3.15	195.87	100.01	105.00
Main Branch	5005	513.00	-1.90	4.67	1.88	4.82	0.000943	3.15	195.56	99.82	105.00
Main Branch	4900	514.00	-2.00	4.68		4.74	0.000337	2.13	493.58	424.49	100.00
Main Branch	4900	513.00	-2.00	4.68		4.74	0.000337	2.13	492.18	424.35	100.00
Main Branch	4800	514.00	-2.00	4.64		4.69	0.000418	2.21	549.16	459.61	100.00
Main Branch	4800	513.00	-2.00	4.64		4.69	0.000419	2.21	547.62	459.54	100.00
Main Branch	4700	514.00	-1.60	4.58		4.65	0.000472	2.38	446.46	417.32	105.00
Main Branch	4700	513.00	-1.60	4.58		4.65	0.000472	2.38	445.04	416.89	105.00
Main Branch	4595	514.00	-1.70	4.54		4.60	0.000485	2.41	467.08	371.86	90.00
Main Branch	4595	513.00	-1.70	4.53		4.60	0.000485	2.41	465.79	371.77	90.00
Main Branch	4505	514.00	-2.10	4.55		4.56	0.000151	1.42	810.59	353.14	100.00
Main Branch	4505	513.00	-2.10	4.54		4.56	0.000151	1.42	809.38	353.10	100.00
Main Branch	4405	514.00	-2.90	4.51		4.55	0.000216	1.84	544.58	304.66	185.00
Main Branch	4405	513.00	-2.90	4.51		4.55	0.000216	1.84	543.55	304.17	185.00
Main Branch	4220	514.00	-1.80	4.48		4.52	0.000191	1.75	662.96	370.00	90.00
Main Branch	4220	513.00	-1.80	4.48		4.51	0.000191	1.75	661.70	370.00	90.00
Main Branch	4130	514.00	-1.70	4.47		4.49	0.000142	1.52	726.06	330.32	115.00
Main Branch	4130	513.00	-1.70	4.47		4.49	0.000142	1.52	724.93	330.00	115.00
Main Branch	4015	514.00	-1.90	4.44		4.47	0.000157	1.59	748.95	483.42	65.00
Main Branch	4015	513.00	-1.90	4.44		4.46	0.000157	1.59	747.29	483.25	65.00
Main Branch	3950	514.00	-2.00	4.42		4.45	0.000220	1.88	642.19	484.89	105.00
Main Branch	3950	513.00	-2.00	4.41		4.45	0.000221	1.88	640.50	484.82	105.00
Main Branch	3845	514.00	-2.40	4.34		4.41	0.000382	2.23	401.47	369.98	105.00
Main Branch	3845	513.00	-2.40	4.34		4.41	0.000382	2.23	400.19	368.67	105.00

100 - YEAR

HEC-RAS Plan: NJDEP100R River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Length Chnl (ft)
Main Branch	3740	514.00	-2.50	4.25		4.36	0.000612	2.77	344.60	360.75	100.00
Main Branch	3740	513.00	-2.50	4.25		4.35	0.000612	2.76	343.31	359.75	100.00
Main Branch	3640	514.00	-2.40	4.27		4.29	0.000268	1.20	531.09	543.31	30.00
Main Branch	3640	513.00	-2.40	4.26		4.28	0.000269	1.20	529.14	541.33	30.00
Main Branch	3610	514.00	-2.40	4.26		4.28	0.000204	1.05	717.77	550.00	25.00
Main Branch	3610	513.00	-2.40	4.26		4.28	0.000205	1.05	715.78	550.00	25.00
Main Branch	3586	514.00	-2.40	4.21	1.10	4.26	0.000502	2.22	648.66	922.81	1.00
Main Branch	3586	513.00	-2.40	4.20	1.10	4.26	0.000504	2.22	644.95	921.20	1.00
Main Branch	3585	514.00	-2.40	4.21	1.11	4.26	0.000320	2.07	652.79	924.58	1.00
Main Branch	3585	513.00	-2.40	4.21	1.11	4.25	0.000322	2.07	648.98	922.94	1.00
Main Branch	3575	Bridge									
Main Branch	3565	514.00	-2.80	4.17	0.74	4.22	0.000507	2.26	615.91	908.18	1.00
Main Branch	3565	513.00	-2.80	4.16	0.74	4.22	0.000510	2.26	611.63	906.61	1.00
Main Branch	3564	514.00	-2.80	4.16	0.74	4.21	0.000516	2.28	607.33	905.04	109.00
Main Branch	3564	513.00	-2.80	4.15	0.74	4.21	0.000519	2.28	603.02	903.46	109.00
Main Branch	3455	514.00	-3.00	4.15		4.18	0.000193	1.70	822.03	684.82	85.00
Main Branch	3455	513.00	-3.00	4.14		4.17	0.000193	1.70	818.74	682.64	85.00
Main Branch	3370	514.00	-2.90	4.14		4.15	0.000121	1.12	1145.80	823.44	85.00
Main Branch	3370	513.00	-2.90	4.13		4.14	0.000121	1.12	1141.81	823.00	85.00
Main Branch	3285	514.00	-3.00	4.11		4.13	0.000232	1.55	765.23	635.07	340.00
Main Branch	3285	513.00	-3.00	4.10		4.13	0.000232	1.56	762.08	633.45	340.00
Main Branch	2945	514.00	-3.00	4.02		4.06	0.000224	1.86	711.43	670.71	130.00
Main Branch	2945	513.00	-3.00	4.01		4.05	0.000225	1.87	707.85	670.32	130.00
Main Branch	2815	514.00	-2.90	3.99		4.03	0.000207	1.85	650.76	498.60	60.00
Main Branch	2815	513.00	-2.90	3.98		4.02	0.000208	1.85	648.09	498.10	60.00
Main Branch	2755	514.00	-2.80	3.93		4.01	0.000441	2.58	455.51	483.68	95.00
Main Branch	2755	513.00	-2.80	3.92		4.00	0.000443	2.58	452.76	481.98	95.00
Main Branch	2660	514.00	-4.60	3.95		3.97	0.000121	1.50	1020.45	659.41	125.00
Main Branch	2660	513.00	-4.60	3.94		3.96	0.000121	1.51	1016.77	659.06	125.00
Main Branch	2535	514.00	-3.50	3.94		3.95	0.000053	0.93	1485.41	694.40	120.00
Main Branch	2535	513.00	-3.50	3.94		3.94	0.000053	0.93	1481.53	693.84	120.00
Main Branch	2315	514.00	-3.20	3.93		3.94	0.000078	1.15	1080.19	594.99	105.00
Main Branch	2315	513.00	-3.20	3.92		3.93	0.000079	1.15	1076.83	594.12	105.00
Main Branch	2210	514.00	-3.50	3.91		3.92	0.000093	1.06	885.83	582.39	95.00
Main Branch	2210	513.00	-3.50	3.90		3.92	0.000094	1.06	882.50	582.15	95.00
Main Branch	2115	514.00	-3.20	3.87		3.91	0.000190	1.72	614.22	484.63	95.00
Main Branch	2115	513.00	-3.20	3.86		3.90	0.000191	1.73	611.40	483.04	95.00
Main Branch	2020	514.00	-3.00	3.87		3.88	0.000093	1.18	1116.64	814.62	90.00
Main Branch	2020	513.00	-3.00	3.86		3.88	0.000093	1.19	1111.88	811.17	90.00
Main Branch	1930	514.00	-3.50	3.86		3.87	0.000067	1.09	1018.22	477.33	110.00
Main Branch	1930	513.00	-3.50	3.85		3.86	0.000067	1.09	1015.40	475.55	110.00
Main Branch	1820	514.00	-3.50	3.85		3.86	0.000090	1.25	992.07	582.65	85.00
Main Branch	1820	513.00	-3.50	3.84		3.86	0.000091	1.25	988.57	581.98	85.00
Main Branch	1736	514.00	-3.80	3.76	-0.51	3.83	0.000328	2.18	237.88	75.37	1.00
Main Branch	1736	513.00	-3.80	3.75	-0.51	3.83	0.000327	2.17	237.45	73.38	1.00

APPROXIMATE SITE LOCATION →

USE AVERAGE WATER SURFACE ELEVATION

100 - YEAR

HEC-RAS Plan: NJDEP100R River: West Riser Ditch Reach: Main Branch (Continued)

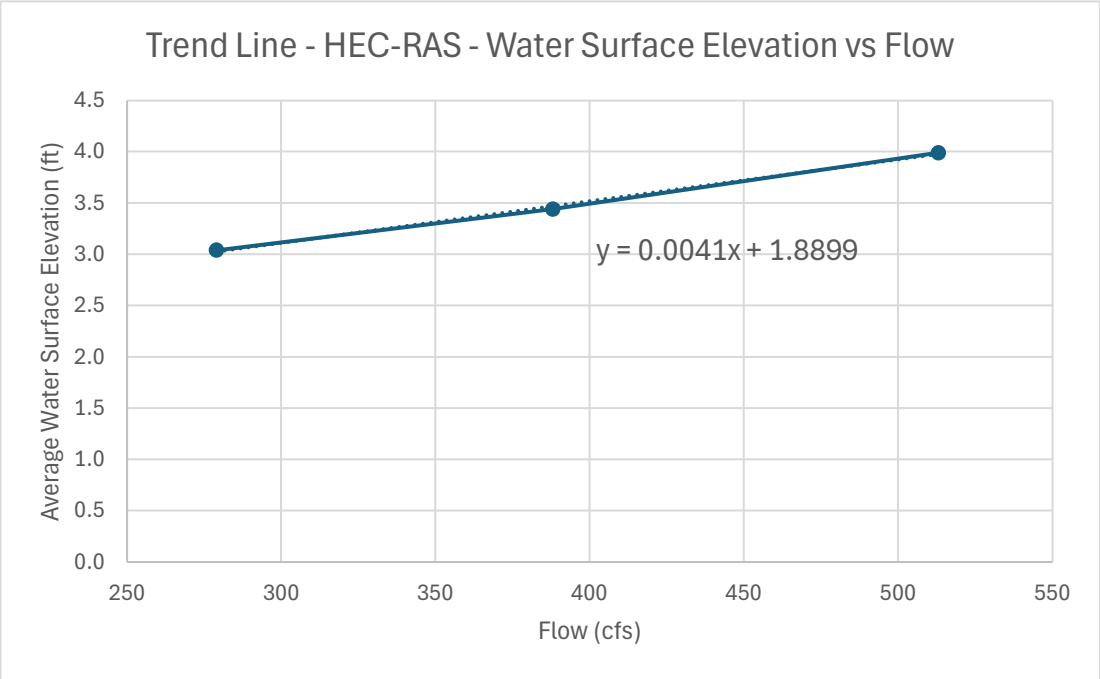
Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Length Chnl (ft)
Main Branch	1735	514.00	-3.80	3.77	-1.63	3.82	0.000135	1.88	273.71	46.09	62.00
Main Branch	1735	513.00	-3.80	3.76	-1.63	3.82	0.000135	1.88	273.44	46.08	62.00
Main Branch	1705	Culvert									
Main Branch	1675	514.00	-3.70	3.44	-1.67	3.50	0.000217	1.89	271.33	45.99	1.00
Main Branch	1675	513.00	-3.70	3.44	-1.67	3.49	0.000217	1.89	271.13	45.98	1.00
Main Branch	1674	514.00	-3.80	3.39	-0.60	3.48	0.000410	2.38	215.85	43.08	54.00
Main Branch	1674	513.00	-3.80	3.39	-0.61	3.48	0.000410	2.38	215.66	43.07	54.00
Main Branch	1620	514.00	-3.20	3.33		3.44	0.000635	2.70	190.03	44.68	105.00
Main Branch	1620	513.00	-3.20	3.32		3.44	0.000634	2.70	189.87	44.67	105.00
Main Branch	1515	522.00	-3.20	3.26		3.38	0.000659	2.76	189.46	46.75	95.00
Main Branch	1515	520.00	-3.20	3.26		3.38	0.000655	2.75	189.32	46.73	95.00
Main Branch	1420	522.00	-3.00	3.22		3.33	0.000618	2.64	197.76	47.66	100.00
Main Branch	1420	520.00	-3.00	3.22		3.32	0.000615	2.63	197.62	47.65	100.00
Main Branch	1320	522.00	-3.00	3.19		3.27	0.000422	2.19	238.69	57.59	110.00
Main Branch	1320	520.00	-3.00	3.19		3.26	0.000419	2.18	238.54	57.58	110.00
Main Branch	1210	522.00	-3.00	3.17		3.23	0.000336	2.06	267.37	80.22	100.00
Main Branch	1210	520.00	-3.00	3.16		3.23	0.000335	2.05	267.16	80.17	100.00
Main Branch	1110	522.00	-3.00	3.16		3.20	0.000187	1.67	349.93	117.46	110.00
Main Branch	1110	520.00	-3.00	3.15		3.20	0.000186	1.67	349.63	117.45	110.00
Main Branch	1000	522.00	-3.40	3.11		3.17	0.000282	1.96	267.84	63.64	100.00
Main Branch	1000	520.00	-3.40	3.11		3.17	0.000280	1.95	267.70	63.64	100.00
Main Branch	900	522.00	-4.30	3.10		3.14	0.000160	1.54	338.19	66.32	100.00
Main Branch	900	520.00	-4.30	3.10		3.14	0.000159	1.54	338.04	66.31	100.00
Main Branch	800	522.00	-3.10	3.08		3.12	0.000213	1.75	305.23	71.84	100.00
Main Branch	800	520.00	-3.10	3.07		3.12	0.000212	1.75	305.09	71.83	100.00
Main Branch	700	522.00	-3.10	3.05		3.10	0.000282	1.86	280.21	64.30	105.00
Main Branch	700	520.00	-3.10	3.05		3.10	0.000281	1.86	280.09	64.29	105.00
Main Branch	595	522.00	-3.70	3.04		3.07	0.000201	1.57	368.95	106.65	205.00
Main Branch	595	520.00	-3.70	3.04		3.07	0.000200	1.56	368.76	106.64	205.00
Main Branch	491	522.00	-3.50	2.98	-1.57	3.03	0.000200	1.77	295.34	49.00	1.00
Main Branch	491	520.00	-3.50	2.98	-1.57	3.03	0.000198	1.76	295.27	49.00	1.00
Main Branch	490	522.00	-3.50	2.99	-1.52	3.02	0.000065	1.41	370.55	67.17	1.00
Main Branch	490	520.00	-3.50	2.99	-1.52	3.02	0.000065	1.40	370.46	67.17	1.00
Main Branch	485	Bridge									
Main Branch	480	522.00	-3.50	2.97	-1.52	3.00	0.000066	1.41	369.52	67.16	1.00
Main Branch	480	520.00	-3.50	2.97	-1.52	3.00	0.000065	1.41	369.43	67.16	1.00
Main Branch	479	522.00	-3.70	2.95	-1.52	3.00	0.000229	1.86	281.37	49.68	89.00
Main Branch	479	520.00	-3.70	2.95	-1.52	3.00	0.000228	1.85	281.32	49.68	89.00
Main Branch	390	522.00	-3.90	2.93		2.97	0.000212	1.52	344.76	93.86	100.00
Main Branch	390	520.00	-3.90	2.93		2.97	0.000210	1.51	344.66	93.81	100.00
Main Branch	290	522.00	-4.10	2.91		2.95	0.000222	1.59	327.34	80.01	95.00
Main Branch	290	520.00	-4.10	2.91		2.95	0.000220	1.59	327.28	80.01	95.00
Main Branch	195	522.00	-3.60	2.90		2.93	0.000176	1.39	375.38	98.34	195.00
Main Branch	195	520.00	-3.60	2.90		2.93	0.000174	1.39	375.31	98.32	195.00

100-YEAR

HEC-RAS Plan: NJDEP100R River: West Riser Ditch Reach: Main Branch (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Length Chnl (ft)
Main Branch	125	522.00	-5.50	2.88		2.91	0.000088	1.25	417.12	71.66	28.00
Main Branch	125	520.00	-5.50	2.88		2.90	0.000087	1.25	417.08	71.66	28.00
Main Branch	97	522.00	-5.50	2.88		2.90	0.000093	1.27	410.36	71.64	1.00
Main Branch	97	520.00	-5.50	2.88		2.90	0.000092	1.27	410.32	71.63	1.00
Main Branch	96	522.00	-3.90	2.80	-1.86	2.90	0.000138	2.48	210.38	70.99	
Main Branch	96	520.00	-3.90	2.80	-1.86	2.89	0.000137	2.47	210.38	70.99	

Flow (cfs)	Average Water Surface Elevation (ft)
279	3.0
388	3.4
513	4.0
Using Trendline	
184	2.6



Trend line developed from HEC-RAS summary sheets from the "Vincent Place Stormwater Pumping Station and Housing Units" technical report Volume 2 of 2, revised through March 2004 and prepared by Dewberry-Goodkind, Inc. (NJDEP File No. 0262-03-0001.1 FHA 030001)

Tailwater Determination

Conveyance System Analysis with Tailwater

Plan View

Stormwater Studio 2026 v 3.0.0.41

Project Name:

03-19-2026

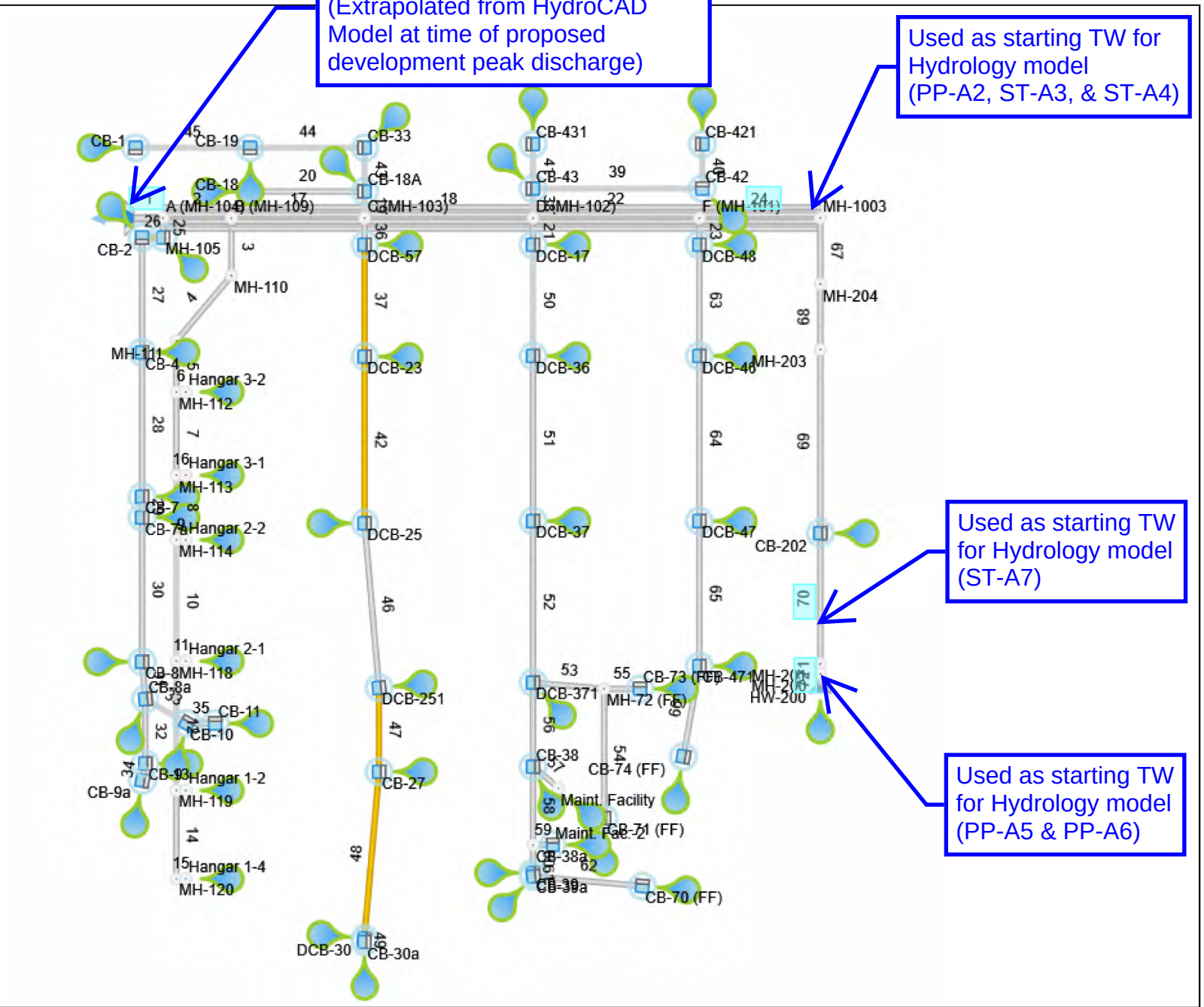
TW = 2.60

(Extrapolated from HydroCAD Model at time of proposed development peak discharge)

Used as starting TW for Hydrology model (PP-A2, ST-A3, & ST-A4)

Used as starting TW for Hydrology model (ST-A7)

Used as starting TW for Hydrology model (PP-A5 & PP-A6)



Storm Sewer Tabulation

Stormwater Studio 2026 v 3.0.0.41

TW in West Riser Ditch

Project Name:

03-19-2026

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Junct-A (MH-104)	41.07	0.000	34.630	0.00	0.00	29.38	0.0	118.76	1.89	55.57	120.84	2.00	36x141e	0.10	-0.59	-0.63	2.61	2.60	4.75	4.50	1
Junction-B (MH-109)	95.00	0.000	32.560	0.00	0.00	27.51	0.0	117.90	1.90	52.28	88.95	1.85	36 (4b)	0.09	-0.50	-0.59	2.81	2.78	4.75	4.75	2
MH-110	80.00	0.000	3.600	0.00	0.00	3.42	0.0	11.09	6.57	22.46	51.09	3.18	36	0.50	-0.10	-0.50	2.90	2.87	5.75	4.75	3
MH-111	119.00	0.000	3.600	0.00	0.00	3.42	0.0	10.48	6.71	22.96	36.28	3.25	36	0.25	0.20	-0.10	3.15	3.04	6.70	5.75	4
MH-112	71.00	0.000	3.600	0.00	0.00	3.42	0.0	10.12	6.80	23.26	36.38	3.29	36	0.25	0.38	0.20	3.38	3.32	6.70	6.70	5
H3-2	13.00	0.600	0.600	0.95	0.57	0.57	6.0	6.00	8.09	4.61	3.86	5.87	12	1.00	3.24	3.11	4.30	4.11	6.75	6.70	6
MH-113	116.00	0.000	3.000	0.00	0.00	2.85	0.0	9.64	6.92	19.74	22.21	4.02	30	0.25	0.67	0.38	4.03	3.80	6.70	6.70	7
MH-114	90.00	0.000	2.400	0.00	0.00	2.28	0.0	9.05	7.08	16.15	28.60	2.55	24x38r	0.26	0.90	0.67	4.73	4.66	6.70	6.70	8
H2-2	13.00	0.600	0.600	0.95	0.57	0.57	6.0	6.00	8.09	4.61	9.45	5.87	12	6.00	3.20	2.42	4.94	4.75	6.75	6.70	9
MH-118	169.00	0.000	1.800	0.00	0.00	1.71	0.0	8.16	7.34	12.56	15.07	3.17	19x30r	0.25	1.32	0.90	5.42	5.13	6.70	6.70	10
H2-1	13.00	0.600	0.600	0.95	0.57	0.57	6.0	6.00	8.09	4.61	10.91	5.87	12	8.00	3.24	2.20	5.83	5.64	6.75	6.70	11
MH-119	180.00	0.000	1.200	0.00	0.00	1.14	0.0	6.82	7.78	8.87	15.12	2.24	19x30r	0.25	1.77	1.32	6.26	6.10	7.15	6.70	12
H1-2	13.00	0.600	0.600	0.95	0.57	0.57	6.0	6.00	8.09	4.61	12.20	5.87	12	10.00	4.08	2.78	6.57	6.38	7.25	7.15	13
MH-120	123.00	0.000	0.600	0.00	0.00	0.57	0.0	6.04	8.08	4.60	5.71	2.61	18	0.25	2.08	1.77	7.01	6.81	7.20	7.15	14
H1-1	13.00	0.600	0.600	0.95	0.57	0.57	6.0	6.00	8.09	4.61	12.20	5.87	12	10.00	4.48	3.18	7.36	7.17	7.25	7.20	15
H3-1	13.00	0.600	0.600	0.95	0.57	0.57	6.0	6.00	8.09	4.61	6.68	5.87	12	3.00	3.20	2.81	4.41	4.22	6.75	6.70	16
Junct-C (MH-103)	186.00	0.000	28.960	0.00	0.00	24.09	0.0	116.01	1.92	46.24	92.37	1.64	36 (4b)	0.10	-0.31	-0.50	3.03	2.98	4.50	4.75	17
Junct-D (MH-102)	234.00	0.000	22.660	0.00	0.00	18.42	0.0	112.94	1.95	35.94	90.61	1.27	36 (4b)	0.10	-0.08	-0.31	3.24	3.20	4.75	4.50	18
CB-18A	37.00	0.360	2.470	0.90	0.32	2.22	6.0	11.37	6.50	14.46	25.79	2.78	22x34r	0.35	-0.18	-0.31	3.15	3.11	4.50	4.50	19
CB-18	160.00	0.630	0.630	0.90	0.57	0.57	6.0	6.00	8.09	4.59	4.95	3.74	15	0.50	0.62	-0.18	3.92	3.23	4.50	4.50	20
DCB-17	37.00	0.710	5.140	0.90	0.64	4.63	6.0	12.44	6.27	29.06	31.84	5.92	30	0.51	0.11	-0.08	3.03	2.87	4.95	4.75	21
Junction-F (MH-101)	232.00	0.000	14.440	0.00	0.00	11.02	0.0	107.99	2.00	22.08	92.95	0.78	36 (4b)	0.10	0.16	-0.08	3.42	3.41	4.95	4.75	22

Notes: IDF File = Teterboro IDF Values.IDF, Return Period = 100-yrs. r = rectangular e = elliptical a = arch

Storm Sewer Tabulation

Stormwater Studio 2026 v 3.0.0.41

Used as starting TW for Hydrology model (PP-A2, ST-A3, & ST-A4)

Project Name:

03-19-2026

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
DCB-48	37.00	0.750	3.320	0.90	0.68	2.99	6.0	11.99	6.37	19.03	31.84	3.88	30	0.51	0.35	0.16	3.51	3.45	4.95	4.95	23
MH-1003 to MH	169.00	0.000	11.120	0.00	0.00	8.03	0.0	103.18	2.06	16.55	91.66	0.59	36 (4b)	0.10	0.33	0.16	3.68	3.67	5.00	4.95	24
MH-105 (CB)	27.00	0.100	2.070	0.90	0.09	1.86	6.0	10.72	6.65	12.40	17.00	3.95	24	0.48	-0.46	-0.59	2.66	2.59	5.50	4.75	25
CB-2	30.00	0.200	1.970	0.90	0.18	1.77	6.0	10.59	6.68	11.85	11.84	3.77	24	0.23	-0.29	-0.36	2.96	2.89	5.50	5.50	26
CB-4	160.00	0.220	1.770	0.90	0.20	1.59	6.0	9.83	6.88	10.95	12.25	3.49	24	0.25	0.21	-0.19	3.51	3.19	5.30	5.50	27
CB-7	201.00	0.220	1.550	0.90	0.20	1.40	6.0	8.77	7.16	9.99	12.22	3.18	24	0.25	0.81	0.31	3.98	3.65	5.30	5.30	28
CB-7a	29.00	0.190	1.330	0.90	0.17	1.20	6.0	8.60	7.21	8.63	12.04	2.75	24	0.24	0.98	0.91	4.14	4.10	5.30	5.30	29
CB-8	201.00	0.250	1.140	0.90	0.23	1.03	6.0	7.26	7.63	7.83	12.22	2.49	24	0.25	1.59	1.09	4.43	4.22	5.95	5.30	30
CB-8a	52.00	0.100	0.890	0.90	0.09	0.80	6.0	6.82	7.79	6.24	12.25	1.99	24	0.25	1.82	1.69	4.56	4.53	5.30	5.95	31
CB-9	90.00	0.100	0.420	0.90	0.09	0.38	6.0	6.21	8.01	3.03	3.46	2.47	15	0.24	2.14	1.92	4.84	4.67	5.95	5.30	32
CB-10	68.00	0.220	0.370	0.90	0.20	0.33	6.0	6.32	7.97	2.65	2.98	2.98	8x16r	0.54	4.08	3.71	4.86	4.62	5.92	5.30	33
CB-10	24.00	0.320	0.320	0.90	0.29	0.29	6.0	6.00	8.09	2.33	3.50	1.90	15	0.25	2.30	2.24	4.97	4.94	5.43	5.95	34
CB-9a	39.00	0.150	0.150	0.90	0.14	0.14	6.0	6.00	8.09	1.09	1.70	2.00	10	0.51	4.28	4.08	5.11	5.04	6.37	5.92	35
CB-57	37.00	0.510	3.830	0.90	0.46	3.45	6.0	9.49	6.96	24.00	26.34	4.89	30	0.35	-0.18	-0.31	2.97	2.86	4.95	4.50	36
DCB-23	156.00	0.370	3.320	0.90	0.33	2.99	6.0	9.11	7.07	21.12	16.41	6.72	24	0.45	0.52	-0.18	3.94	2.78	6.00	4.95	37
CB-43	41.00	0.320	3.080	0.90	0.29	2.77	6.0	8.12	7.36	20.39	27.94	3.22	24x38r	0.24	0.03	-0.07	3.31	3.26	4.50	4.75	38
CB-42	236.00	0.400	1.700	0.90	0.36	1.53	6.0	6.43	7.93	12.13	21.76	2.33	22x34r	0.25	0.62	0.03	3.70	3.52	4.50	4.50	39
CB-421	62.00	1.300	1.300	0.90	1.17	1.17	6.0	6.00	8.09	9.47	15.36	2.39	19x30r	0.26	0.78	0.62	3.91	3.84	4.02	4.50	40
CB-431	62.00	1.060	1.060	0.90	0.95	0.95	6.0	6.00	8.09	7.72	22.11	1.49	22x34r	0.26	0.30	0.14	3.59	3.57	4.02	4.50	41
DCB-25	232.00	0.930	2.950	0.90	0.84	2.66	6.0	8.48	7.25	19.25	15.51	6.13	24	0.40	1.45	0.52	5.87	4.44	6.00	6.00	42
CB-33	61.00	0.670	1.480	0.90	0.60	1.33	6.0	10.65	6.67	8.88	28.06	1.40	24x38r	0.25	-0.03	-0.18	3.43	3.42	4.10	4.50	43
CB-19	160.00	0.500	0.810	0.90	0.45	0.73	6.0	8.64	7.20	5.25	15.12	1.33	19x30r	0.25	0.37	-0.03	3.68	3.64	4.10	4.10	44

Notes: IDF File = Teterboro IDF Values.IDF, Return Period = 100-yrs. r = rectangular e = elliptical a = arch

Storm Sewer Tabulation

Project Name:

Stormwater Studio 2026 v 3.0.0.41

03-19-2026

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
CB-1	160.00	0.310	0.310	0.90	0.28	0.28	6.0	6.00	8.09	2.26	7.04	1.01	14x23r	0.25	0.77	0.37	3.75	3.71	4.10	4.10	45
DCB-251	230.00	0.670	2.020	0.90	0.60	1.82	6.0	7.59	7.52	13.68	14.54	4.35	24	0.35	2.26	1.45	7.22	6.50	6.00	6.00	46
CB-27	117.00	0.460	1.350	0.90	0.41	1.22	6.0	7.09	7.69	9.34	8.54	3.88	21	0.25	2.55	2.26	7.85	7.50	6.50	6.00	47
DCB-30	233.00	0.610	0.890	0.90	0.55	0.80	6.0	6.03	8.08	6.47	5.68	3.66	18	0.25	3.13	2.55	8.82	8.06	6.35	6.50	48
CB-30a	5.00	0.280	0.280	0.90	0.25	0.25	6.0	6.00	8.09	2.04	3.86	2.60	12	1.00	3.18	3.13	9.06	9.04	6.35	6.35	49
DCB-36	155.00	0.310	4.430	0.90	0.28	3.99	6.0	11.66	6.44	25.72	38.00	3.27	27x42r	0.25	0.60	0.21	3.78	3.61	6.25	4.95	50
DCB-37	230.00	1.330	4.120	0.90	1.20	3.72	6.0	10.74	6.65	24.70	28.77	4.16	33	0.25	1.28	0.70	4.24	3.82	6.50	6.25	51
DCB-371	225.00	0.930	2.790	0.90	0.84	2.52	6.0	9.69	6.91	17.40	22.17	3.55	30	0.25	1.94	1.38	4.84	4.49	6.50	6.50	52
MH-72	100.00	0.000	0.250	0.00	0.00	0.23	0.0	8.25	7.32	1.65	2.73	2.10	12	0.50	2.54	2.04	5.35	5.17	7.20	6.50	53
CB-71	180.00	0.100	0.100	0.90	0.09	0.09	6.0	6.00	8.09	0.73	1.68	1.34	10	0.50	3.46	2.56	5.62	5.45	7.13	7.20	54
CB-73	50.00	0.150	0.150	0.90	0.14	0.14	6.0	6.00	8.09	1.09	1.68	2.00	10	0.50	2.81	2.56	5.52	5.42	6.95	7.20	55
CB-38	117.00	0.480	1.610	0.90	0.43	1.46	6.0	9.09	7.07	10.30	12.20	3.28	24	0.25	2.33	2.04	5.28	5.07	6.41	6.50	56
Maint. Facility	47.00	0.140	0.140	0.95	0.13	0.13	6.0	6.00	8.09	1.08	5.99	2.72	10	6.38	7.00	4.00	7.46	5.51	7.25	6.41	57
CB-38a	109.00	0.000	0.990	0.00	0.00	0.89	0.0	8.22	7.33	6.53	12.19	2.08	24	0.25	2.70	2.43	5.58	5.51	7.18	6.41	58
Maint. Fac. -2	28.00	0.190	0.190	0.90	0.17	0.17	6.0	6.00	8.09	1.38	3.86	1.76	12	1.00	3.08	2.80	5.74	5.70	7.00	7.18	59
CB-39	39.00	0.400	0.800	0.90	0.36	0.72	6.0	8.00	7.39	5.32	8.15	3.01	18	0.51	3.00	2.80	5.69	5.61	6.41	7.18	60
CB-39a	5.00	0.260	0.400	0.90	0.23	0.36	6.0	7.96	7.40	2.67	7.00	2.17	15	1.00	2.96	2.91	5.85	5.85	6.41	6.41	61
CB-70	153.00	0.140	0.140	0.90	0.13	0.13	6.0	6.00	8.09	1.02	2.74	1.30	12	0.50	3.83	3.06	6.07	5.96	6.93	6.41	62
DCB-46	155.00	0.340	2.570	0.90	0.31	2.31	6.0	11.16	6.55	15.15	22.29	3.09	30	0.25	0.83	0.44	3.92	3.74	6.25	4.95	63
DCB-47	230.00	1.520	2.230	0.90	1.37	2.01	6.0	9.80	6.88	13.81	22.31	2.81	30	0.25	1.51	0.93	4.25	4.03	6.50	6.25	64
CB-471	202.00	0.610	0.710	0.90	0.55	0.64	6.0	7.60	7.52	4.81	12.31	1.53	24	0.25	2.12	1.61	4.47	4.39	6.57	6.50	65
CB-74	128.00	0.100	0.100	0.90	0.09	0.09	6.0	6.00	8.09	0.73	1.19	1.34	10	0.25	2.82	2.50	4.63	4.51	6.73	6.57	66

Notes: IDF File = Teterboro IDF Values.IDF, Return Period = 100-yrs. r = rectangular e = elliptical a = arch

Storm Sewer Tabulation

Stormwater Studio 2026 v 3.0.0.41

Project Name:

03-19-2026

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
MH204 to MH-1003	92.00	0.000	11.120	0.00	0.00	8.03	0.0	102.53	2.07	16.61	39.36	2.35	36	0.30	0.60	0.33	3.74	3.69	5.84	5.00	67
MH-203 to MH-204	91.00	0.000	11.120	0.00	0.00	8.03	0.0	101.88	2.08	16.67	39.54	2.36	36	0.30	0.87	0.60	3.84	3.80	6.92	5.84	68
CB-202 to MH-203	256.00	0.120	11.120	0.92	0.11	8.03	6.0	100.24	2.10	16.84	39.65	2.60	36	0.30	1.64	0.87	4.00	3.89	8.16	6.92	69
MH-201 to CB-202	182.00	0.000	11.000	0.00	0.00	7.92	0.0	99.18	2.11	16.71	39.72	2.87	36	0.30	2.19	1.64	4.29	4.23	7.81	8.16	70
MH-200 to MH-201	14.00	0.000	11.000	0.00	0.00	7.92	0.0	99.10	2.11	16.72	38.62	2.85	36	0.29	2.23	2.19	4.53	4.53	8.22	7.81	71
HW200 to MH200	16.20	11.000	11.000	0.72	7.92	7.92	99.0	99.00	2.11	16.73	40.14	2.67	36	0.31	2.28	2.23	4.74	4.74	8.24	8.22	72

Used as starting TW for Hydrology model (ST-A7)

Used as starting TW for Hydrology model (PP-A5 & PP-A6)

Notes: IDF File = Teterboro IDF Values.IDF, Return Period = 100-yrs.