DRAINAGE AREA LIMITS FROM CITY OF NORTHAMPTON

TIME OF CONCENTRATION PATH (TYP.)

NRCS SOIL BOUNDARY (TYP.)

BELGRADE SILT LOAM
HSG C

UDORTHENTS
USE HSG B

RAYNHAM SILT LOAM
HSG C/D
USE HSG D

AMOSTOWN-WINDSOR
URBAN LAND COMPLEX
HSG A & B
USE HSG B

AMOSTOWN-WINDSOR
URBAN LAND COMPLEX
HSG A & B
USE HSG B

NORTH ST/WOODMONT RD/
BIKE TRAIL/NORTHERN AVE
DRAINAGE AREA
AREA 'B' FROM CITY MAPPING

INDUSTRIAL DRIVE DRAINAGE AREA
AREA 'A' FROM CITY MAPPING

WOODMONT ROAD CULVERT

A

B

C

D

E

F

BRADFORD BROOK

UNNAMED ROAD

INDUSTRIAL DRIVE

KING STREET

BATES STREET

CROSBY LANE

SHERMAN

DAY AV.

GRANT AVENUE

ELIZABETH STREET

NORTHERN AVENUE

NORTH STREET

VIEW AVENUE

WOODMONT ROAD

BRADFORD STREET

PERKINS AVENUE

Berkshire Design Group

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8 View Avenue
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EXISTING DRAINAGE AREAS TO WOODMONT RD CULVERT

Revisions

Date: March 21, 2025	Sheet Number SK-007
Scale: 1"=300'	
Drawn By: CC	

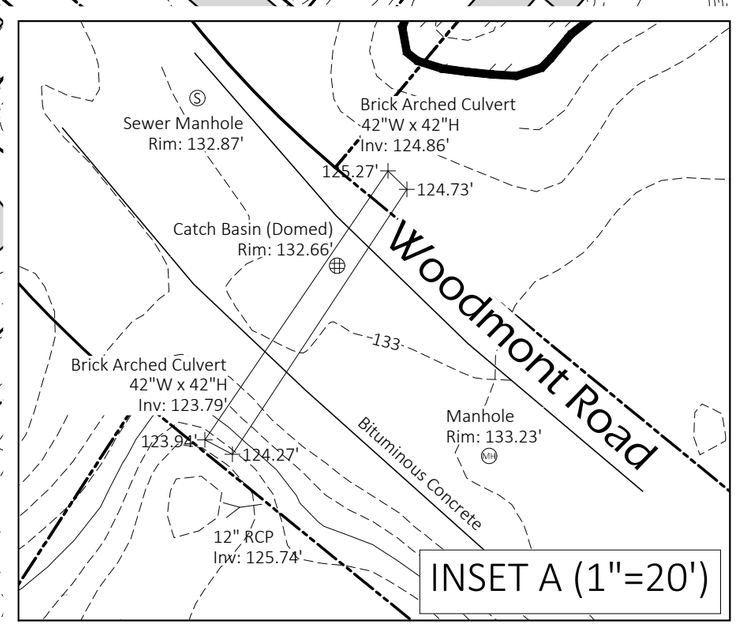
F:\NORTHAMPTON – VIEW AVE\DESIGN PROCESS\ENGINEERING\STORMWATER REPORT\25.03.21 100 YEAR FLOOD ANALYSIS\25.163 D-EXIST-LARGESCALE-EXIST.DWG PLOT DATE: 3/21/2025

THE BOUNDARY OF BORDERING LAND SUBJECT TO FLOODING TO BE AT ELEVATION 130.04',

APPROX. SITE LIMIT OF WORK

130
132
128
126
134
136
138

INSET A



INSET A (1"=20')

SCALE 1"=100'-0" (if printed full size @ 11" x 17")

0 50' 100' 200' 300'

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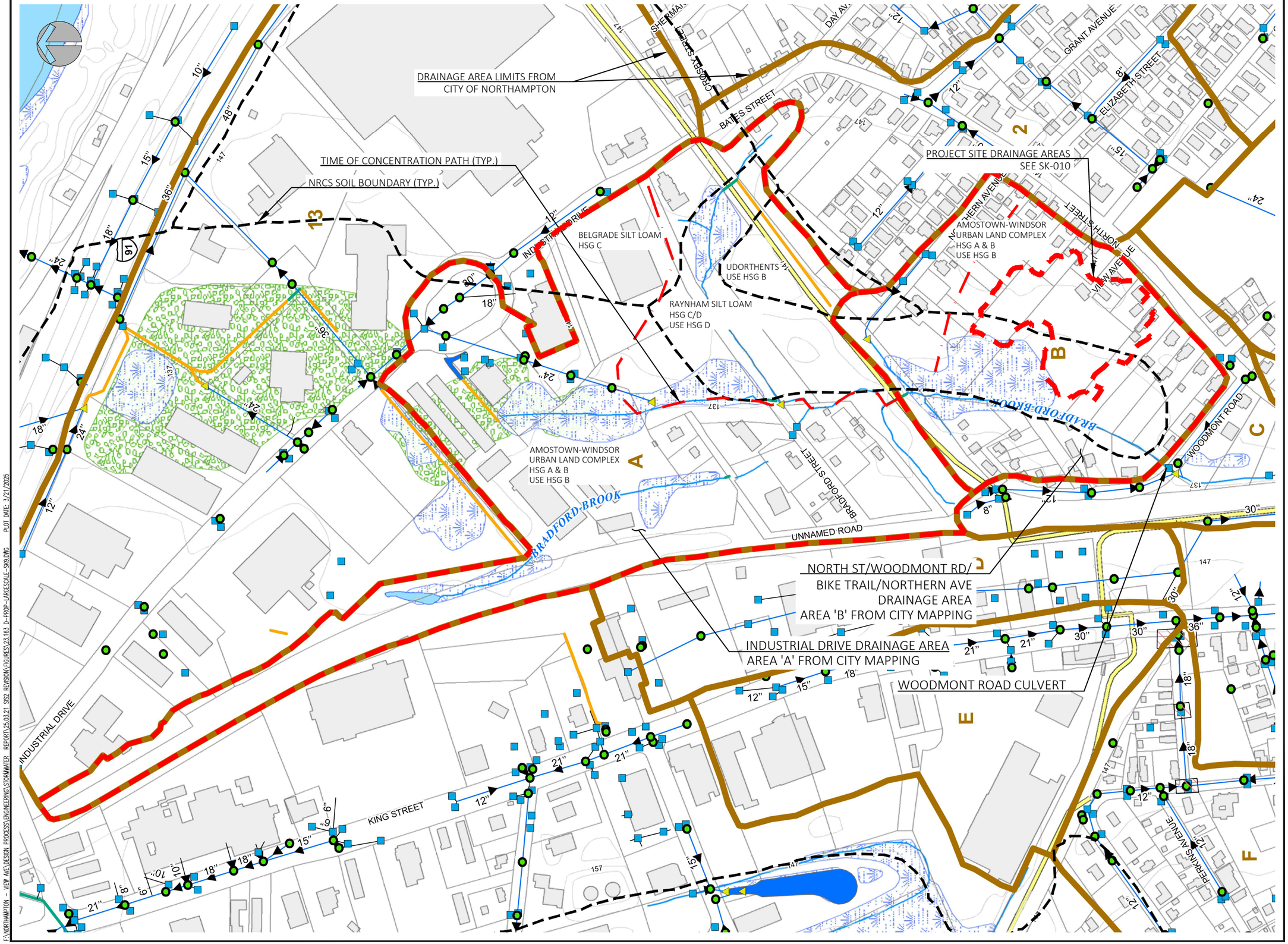
WOODMONT ROAD
CULVERT FLOOD STORAGE
BASIN

Revisions

Date: March 21, 2025
Scale: 1"=100'
Drawn By: CC

Sheet Number
SK-008

F:\NORTHAMPTON - VIEW AVE\DESIGN PROCESS\ENGINEERING\STORMWATER REPORT\25.03.21 100 YEAR FLOOD ANALYSIS\23.163 D-EXIST-FLOODSTORAGE.DWG PLOT DATE: 3/21/2025



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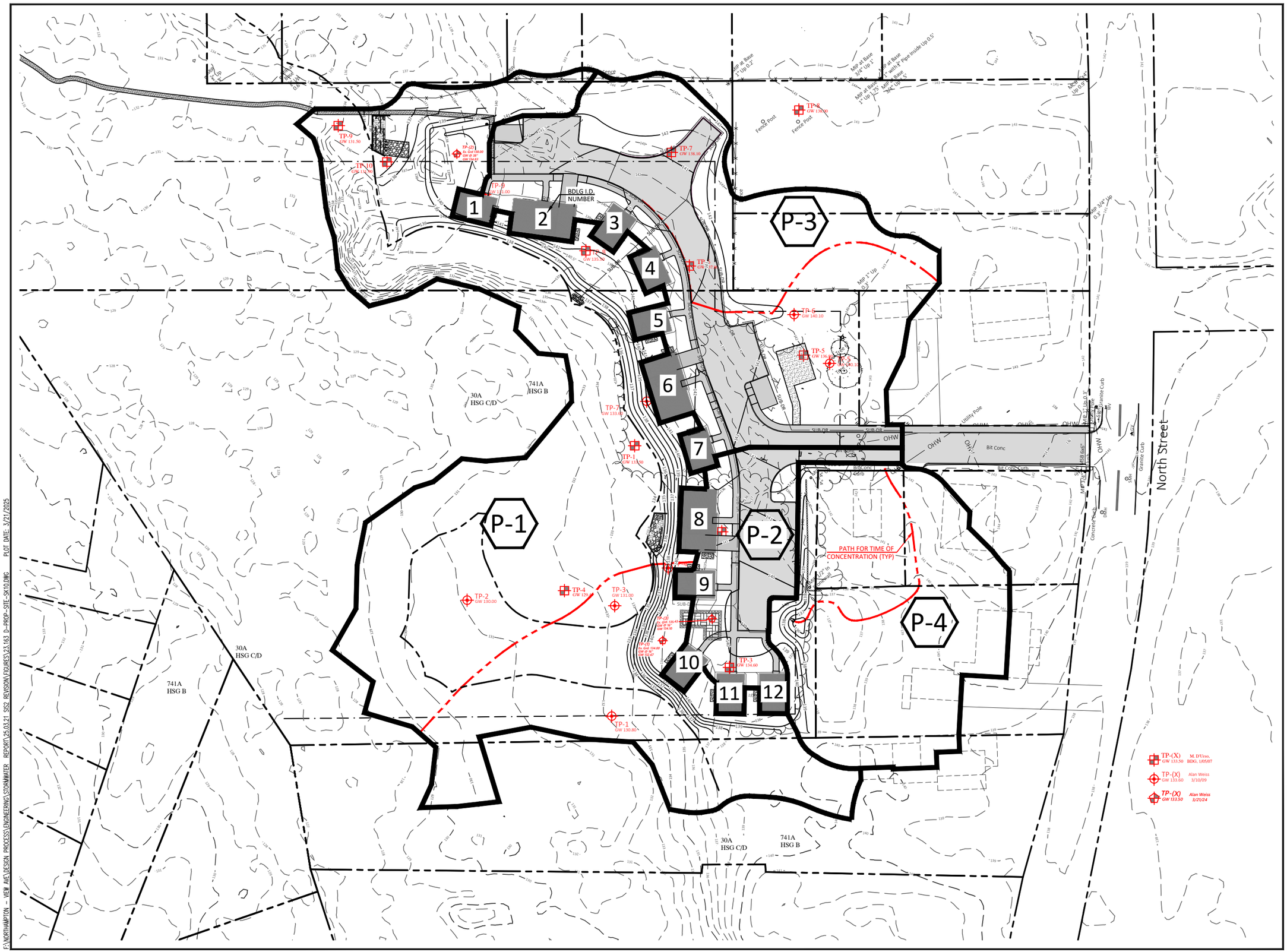
POST-DEVELOPMENT DRAINAGE AREAS TO WOODMONT RD CULVERT

Revisions

Date:	Sheet Number
March 21, 2025	SK-009
Scale: 1"=300'	
Drawn By: CC	

F:\NORTHAMPTON – VIEW AVE\DESIGN PROCESS\ENGINEERING\STORMWATER REPORT\25.03.21 SK52 REVISION FIGURES\23.163 D–PROP–LARGESCALE–SK9.DWG PLOT DATE: 3/21/2025



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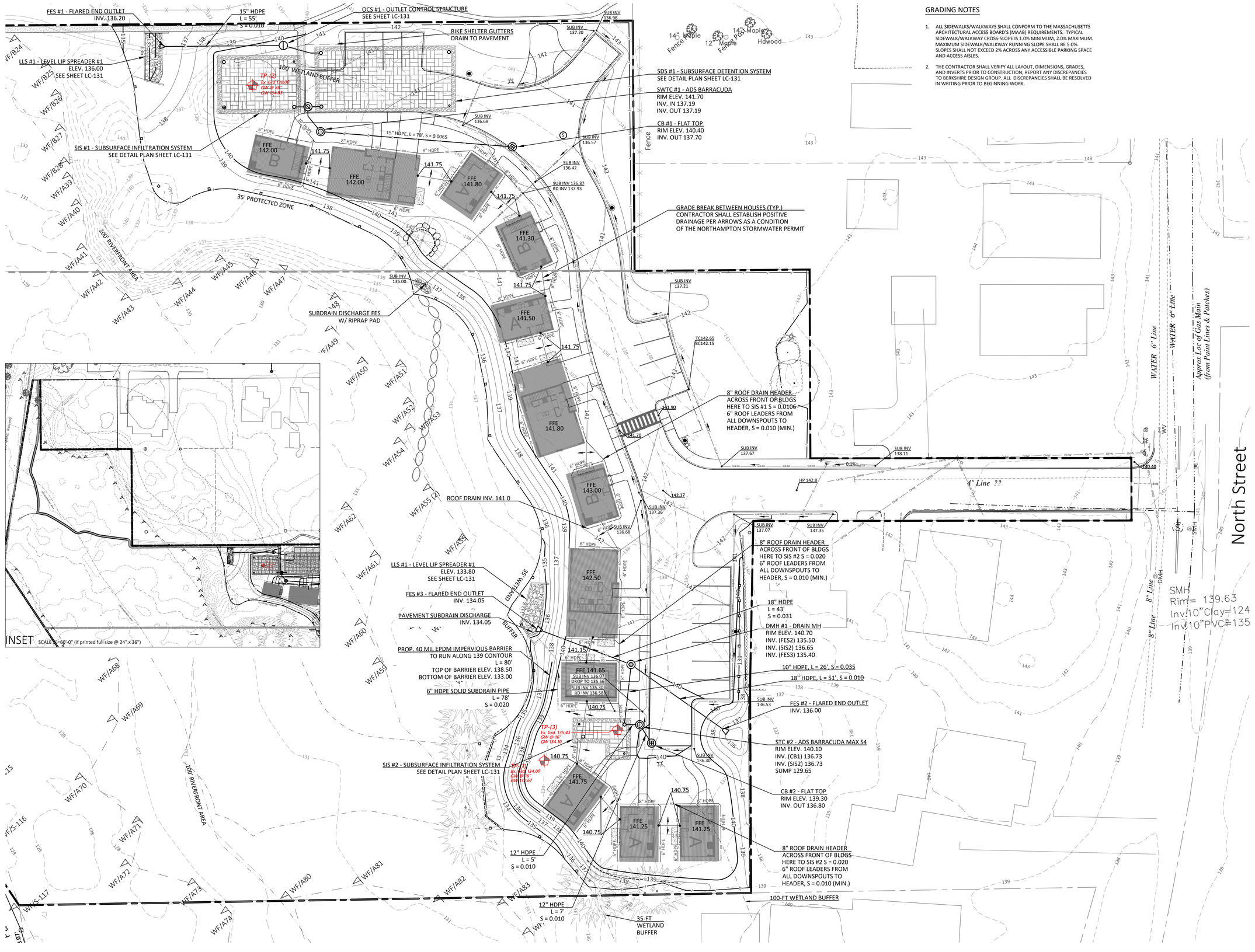
POST-DEVELOPMENT
PROJECT SITE
DRAINAGE AREAS

Revisions

Date:	March 21, 2025
Scale:	1"=60'
Drawn By:	CC
Sheet Number	SK-010

F:\NORTHAMPTON – VIEW AVE\DESIGN PROCESS\ENGINEERING\STORMWATER REPORT\25.03.21 SIS2 REVISION\FIGURES\23.163 D-PROP-SITE-SK10.DWG PLOT DATE: 3/21/2025



GRADING NOTES

1. ALL SIDEWALKS/WALKWAYS SHALL CONFORM TO THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD'S (MAAB) REQUIREMENTS. TYPICAL SIDEWALK/WALKWAY CROSS-SLOPE IS 1.0% MINIMUM, 2.0% MAXIMUM. MAXIMUM SIDEWALK/WALKWAY RUNNING SLOPE SHALL BE 5.0%. SLOPES SHALL NOT EXCEED 2% ACROSS ANY ACCESSIBLE PARKING SPACE AND ACCESS AISLES.
2. THE CONTRACTOR SHALL VERIFY ALL LAYOUT, DIMENSIONS, GRADES, AND INVERTS PRIOR TO CONSTRUCTION; REPORT ANY DISCREPANCIES TO BERKSHIRE DESIGN GROUP. ALL DISCREPANCIES SHALL BE RESOLVED IN WRITING PRIOR TO BEGINNING WORK.

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Sovereign Builders, Inc.

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Northampton, MA

PERMIT SET
NOT FOR CONSTRUCTION

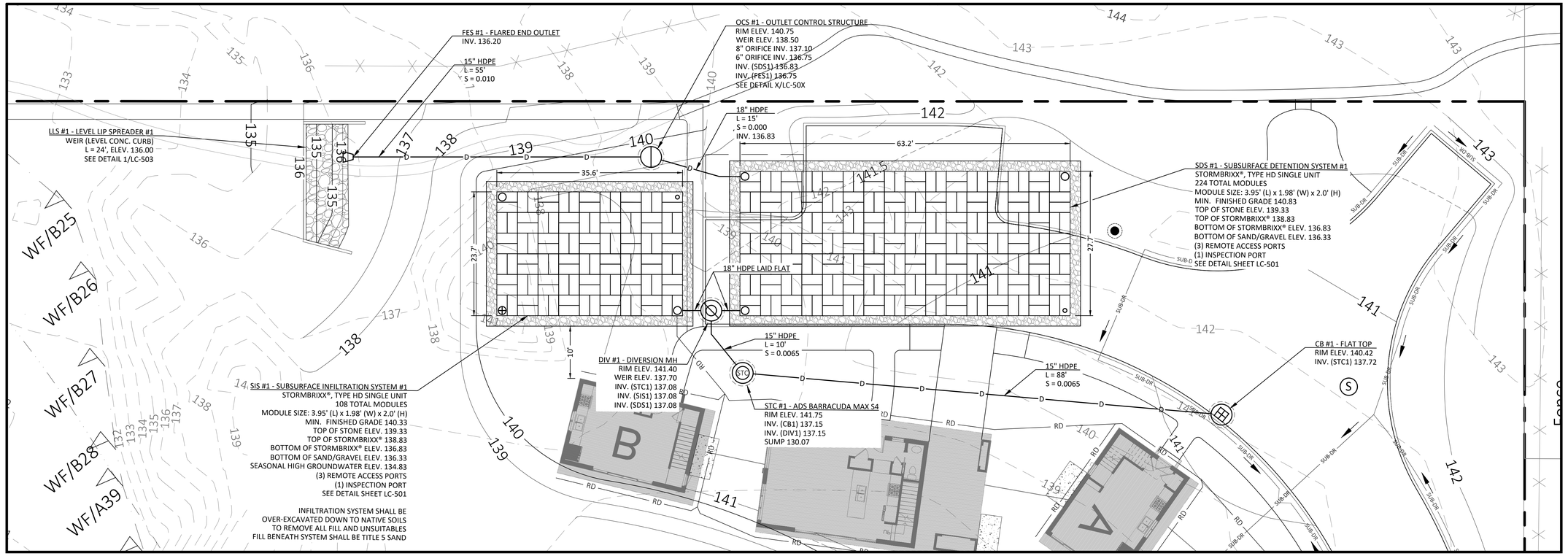
GRADING & DRAINAGE PLAN

SCALE 1"=20'-0" (if printed full size @ 24" x 36")
0 10' 20' 40' 60'

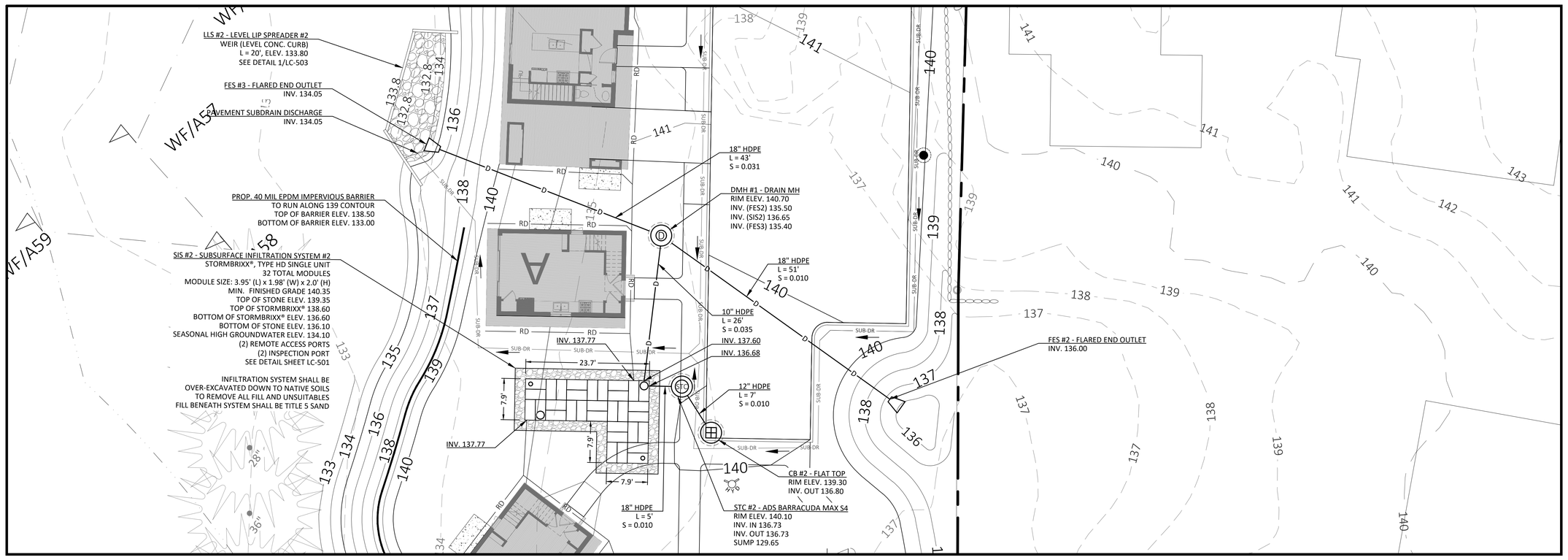
Revisions	
May 13, 2024	July 25, 2024
June 10, 2024	September 6, 2024
June 14, 2024	September 20, 2024
June 25, 2024	
July 03, 2024	
July 17, 2024	
July 24, 2024	

Date: April 25, 2024	Sheet Number
Scale: 1"=20'	LC-130
Drawn By: DS/GH/JS	
Checked By: JDS	

F:\NORTHAMPTON - VIEW AVE\DESIGN PROCESS\DRAWINGS\LC-130 GRADING & DRAINAGE.DWG PLOT DATE: 3/11/2025



STORMWATER MANAGEMENT SYSTEM (NORTH)



STORMWATER MANAGEMENT SYSTEM (SOUTH)

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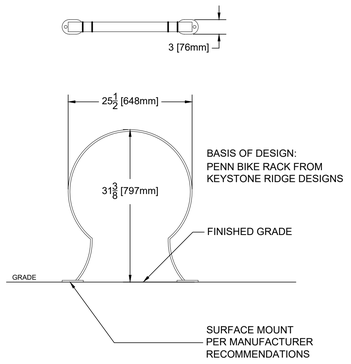
DRAINAGE DETAIL PLAN

SCALE 1"=20'-0" (if printed full size @ 24" x 36")
0 10' 20' 40' 60'

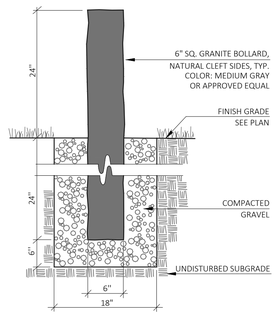
Revisions	
May 13, 2024	July 25, 2024
June 10, 2024	September 6, 2024
June 14, 2024	September 20, 2024
June 25, 2024	
July 03, 2024	
July 17, 2024	
July 24, 2024	

Date: April 25, 2024	Sheet Number LC-131
Scale: 1"=20'	
Drawn By: DS/GH/JS	
Checked By: JDS	

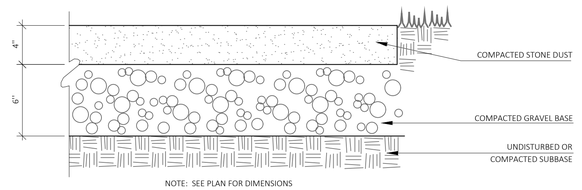
F:\NORTHAMPTON - VIEW AVE\DESIGN PROCESS\DRAWINGS\LC-130 GRADING & DRAINAGE.DWG PLOT DATE: 3/21/2025



01 BICYCLE RACK
SCALE: NOT TO SCALE

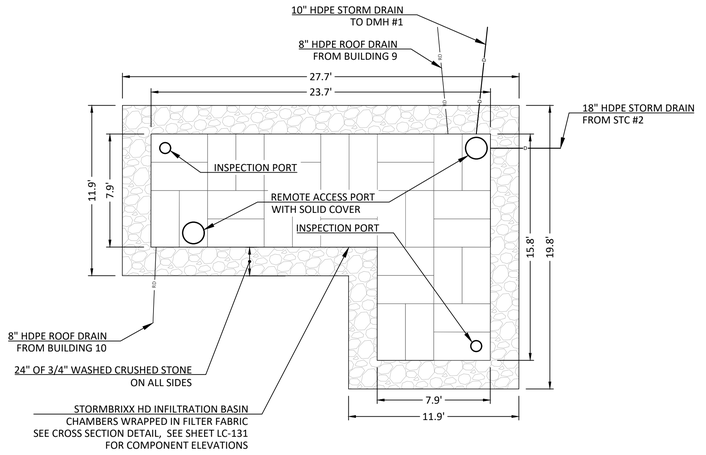


02 WETLAND MARKER
SCALE: NOT TO SCALE

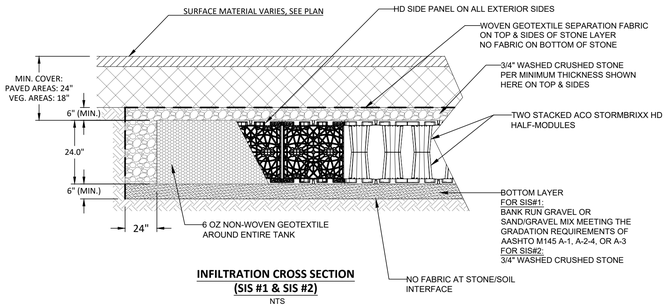


NOTE: SEE PLAN FOR DIMENSIONS

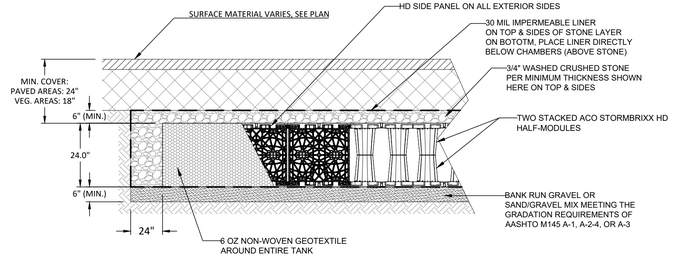
03 COMPACTED GRAVEL PATH
SCALE: NOT TO SCALE



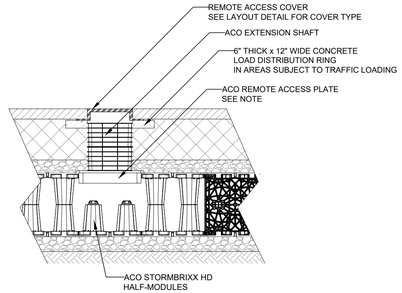
SUBSURFACE INFILTRATION SYSTEM #2
NTS



INFILTRATION CROSS SECTION
(SIS #1 & SIS #2)
NTS



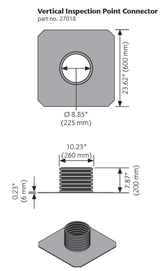
DETENTION CROSS SECTION
(SDS #1)
NTS



ACCESS POINT CROSS SECTION
NTS

NOTE

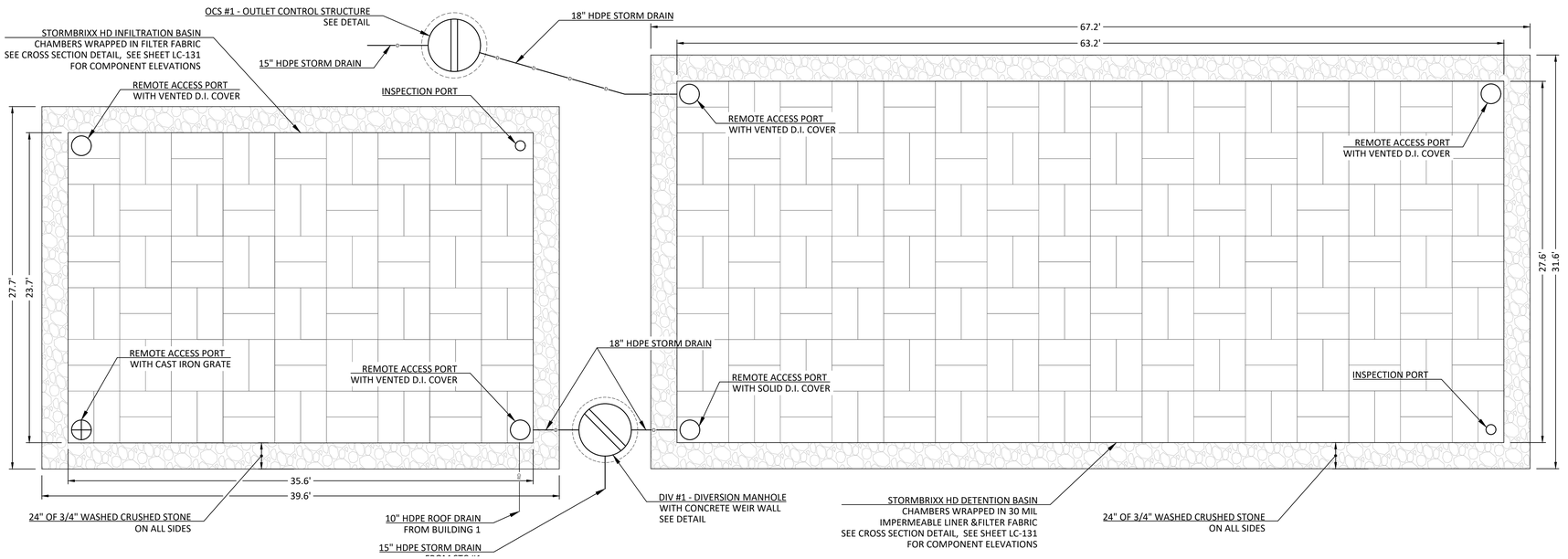
THE REMOTE ACCESS PLATE IS APPROXIMATELY THE SIZE OF HALF OF A HALF-MODULE. THE HALF-MODULE AT THE TOP OF THE TANK MUST BE CUT IN HALF TO ACCOMMODATE THE REMOTE ACCESS PLATE.



NOTE

INSTALL 9" CAST IRON FRAME AND COVER FLUSH WITH GRADE OVER INSPECTION PORT.

INSPECTION PORT
NTS



SIS #1 - SUBSURFACE INFILTRATION SYSTEM #1
NTS

SDS #1 SUBSURFACE DETENTION SYSTEM #1
NTS

04 STORMBRIXX - SUBSURFACE STORMWATER INFILTRATION SYSTEMS
SCALE: NOT TO SCALE

NOTES:
1. ALL DELETERIOUS MATERIAL FOUND BELOW THE PROPOSED SUBSURFACE INFILTRATION SYSTEMS, SUCH AS BRICKS, CONCRETE, BUILDING MATERIALS, ETC. SHALL BE REMOVED. ONCE THESE MATERIALS ARE REMOVED, THE REMAINING SPACE SHALL BE FILLED WITH TITLE 5 SAND.

2. IF NO DELETERIOUS MATERIAL IS ENCOUNTERED, ANY FILL REQUIRED BELOW THE PROPOSED SUBSURFACE INFILTRATION SYSTEMS ABOVE EXISTING GRADE TO THE BOTTOM OF THE STONE SHALL BE TITLE 5 SAND.

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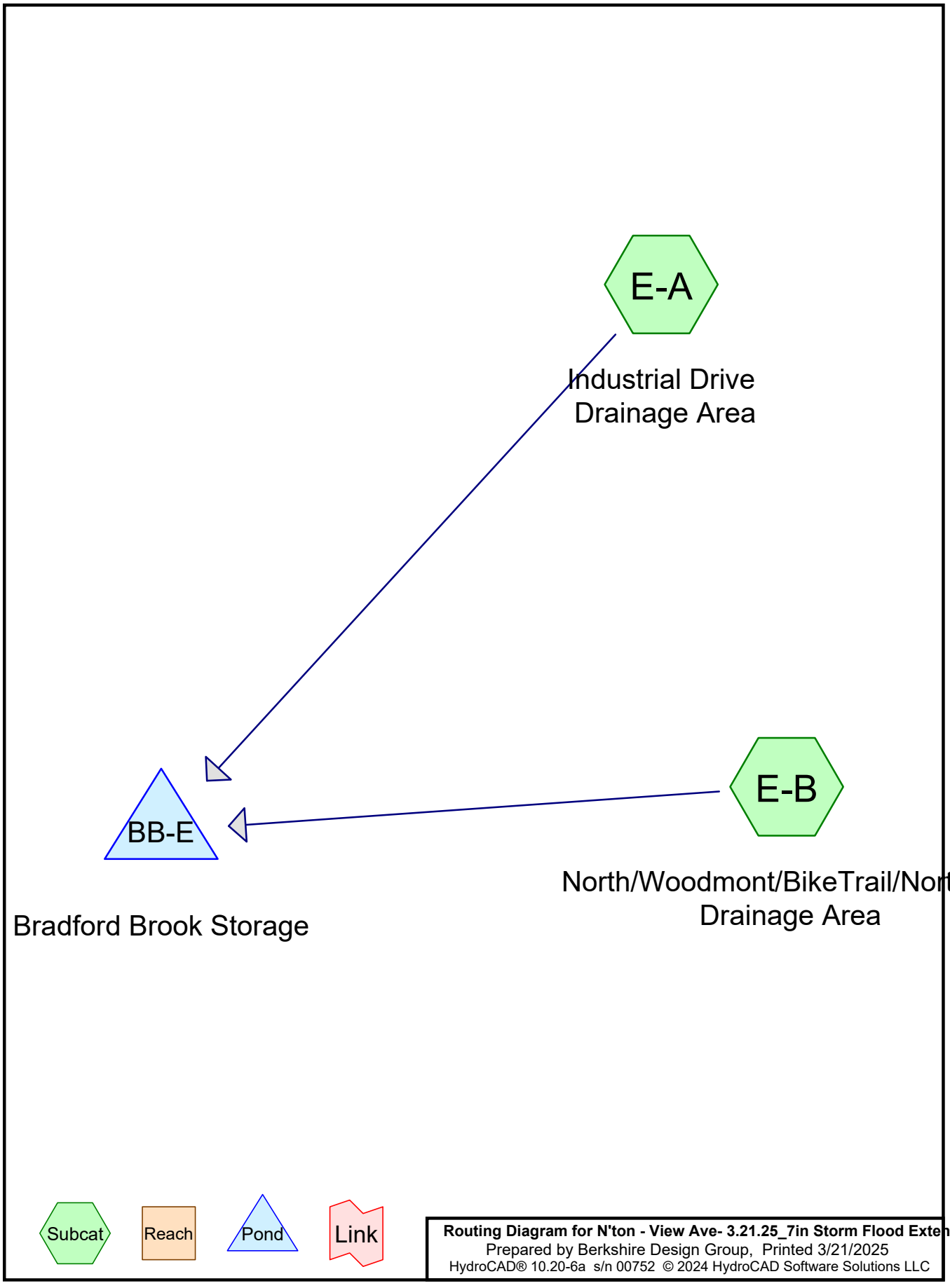
SITE DETAILS

Revisions
June 14, 2024
July 03, 2024
July 17, 2024
September 20, 2024
January 9, 2025

Date: April 25, 2024	Sheet Number LC-501
Scale: as noted	
Drawn By: WDS/GPH	
Checked By: JDS	

F:\NORTHAMPTON - VIEW AVE\DESIGN PROCESS\DRAWINGS\LC-500 - LC-503 SITE DETAILS.DWG PLOT DATE: 3/21/2025



Routing Diagram for N'ton - View Ave- 3.21.25_7in Storm Flood Extent
Prepared by Berkshire Design Group, Printed 3/21/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-Year Flood	Type III 24-hr		Default	24.00	1	7.00	2

Time span=0.00-32.00 hrs, dt=0.01 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-A: Industrial Drive Runoff Area=1,978,000 sf 44.26% Impervious Runoff Depth=4.92"
Flow Length=1,650' Tc=18.5 min CN=82 Runoff=180.06 cfs 18.603 af

Subcatchment E-B: Runoff Area=816,000 sf 20.34% Impervious Runoff Depth=4.04"
Flow Length=600' Tc=13.1 min CN=74 Runoff=70.76 cfs 6.310 af

Pond BB-E: Bradford Brook Storage Peak Elev=130.04' Storage=217,306 cf Inflow=245.67 cfs 24.913 af
42.0" x 42.0", R=21.0" Arch Culvert n=0.022 L=42.0' S=0.0255 '/' Outflow=96.32 cfs 24.913 af

Total Runoff Area = 64.141 ac Runoff Volume = 24.913 af Average Runoff Depth = 4.66"
62.73% Pervious = 40.234 ac 37.27% Impervious = 23.907 ac

Summary for Subcatchment E-A: Industrial Drive Drainage Area

[47] Hint: Peak is 372% of capacity of segment #3

Runoff = 180.06 cfs @ 12.25 hrs, Volume= 18.603 af, Depth= 4.92"
Routed to Pond BB-E : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Flood Rainfall=7.00"

	Area (sf)	CN	Description
	736,000	88	Urban industrial, 72% imp, HSG B
	72,000	98	Paved roads w/curbs & sewers, HSG B
*	278,000	82	Railroad, HSG B
	155,000	75	1/4 acre lots, 38% imp, HSG B
	55,000	70	1/2 acre lots, 25% imp, HSG B
	199,000	58	Woods/grass comb., Good, HSG B
	160,000	91	Urban industrial, 72% imp, HSG C
	22,000	98	Paved roads w/curbs & sewers, HSG C
	9,000	83	1/4 acre lots, 38% imp, HSG C
	199,000	72	Woods/grass comb., Good, HSG C
	60,000	93	Urban industrial, 72% imp, HSG D
	17,000	98	Paved roads w/curbs & sewers, HSG D
	16,000	79	Woods/grass comb., Good, HSG D
	1,978,000	82	Weighted Average
	1,102,610		55.74% Pervious Area
	875,390		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
5.1	650	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.1	900	0.0050	3.63	48.39	**Parabolic Channel,** W=20.00' D=1.00' Area=13.3 sf Perim=20.1' n= 0.022 Earth, clean & straight
18.5	1,650	Total			

Summary for Subcatchment E-B: North/Woodmont/BikeTrail/Northern Drainage Area

Runoff = 70.76 cfs @ 12.18 hrs, Volume= 6.310 af, Depth= 4.04"
Routed to Pond BB-E : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Flood Rainfall=7.00"

Area (sf)	CN	Description
29,000	98	Paved roads w/curbs & sewers, HSG B
2,000	98	Roofs, HSG B
300,000	75	1/4 acre lots, 38% imp, HSG B
84,000	70	1/2 acre lots, 25% imp, HSG B
120,000	58	Woods/grass comb., Good, HSG B
281,000	79	Woods/grass comb., Good, HSG D
816,000	74	Weighted Average
650,000		79.66% Pervious Area
166,000		20.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	75	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.1	525	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.1	600	Total			

Summary for Pond BB-E: Bradford Brook Storage

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 64.141 ac, 37.27% Impervious, Inflow Depth = 4.66" for 100-Year Flood event
Inflow = 245.67 cfs @ 12.23 hrs, Volume= 24.913 af
Outflow = 96.32 cfs @ 12.62 hrs, Volume= 24.913 af, Atten= 61%, Lag= 23.9 min
Primary = 96.32 cfs @ 12.62 hrs, Volume= 24.913 af
Routed to nonexistent node CPEtot

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 130.04' @ 12.62 hrs Surf.Area= 171,698 sf Storage= 217,306 cf

Plug-Flow detention time= 13.2 min calculated for 24.905 af (100% of inflow)
Center-of-Mass det. time= 13.2 min (831.4 - 818.1)

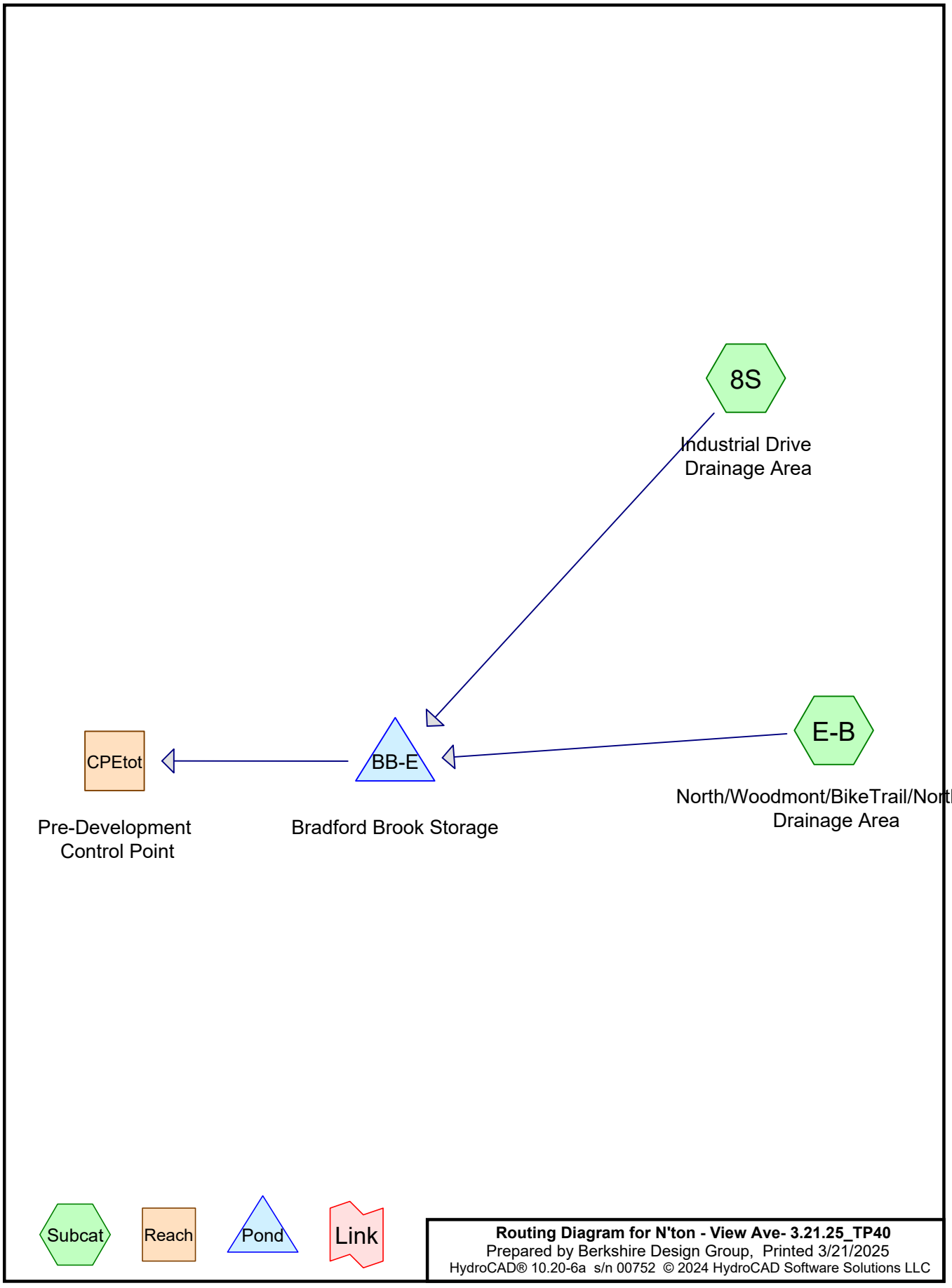
Volume	Invert	Avail.Storage	Storage Description
#1	128.00'	1,340,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
128.00	38,300	2,000.0	0	0	38,300
129.00	110,500	3,200.0	71,285	71,285	534,870
130.00	169,500	3,000.0	138,952	210,237	633,595
131.00	226,500	3,700.0	197,313	407,550	1,006,828
132.00	285,200	3,600.0	255,287	662,837	1,065,034
133.00	338,000	3,400.0	311,227	974,063	1,176,498
134.00	395,500	3,300.0	366,374	1,340,437	1,229,920

Device	Routing	Invert	Outlet Devices
#1	Primary	124.86'	**42.0" W x 42.0" H, R=21.0" Arch Culvert** L= 42.0' Box, headwall w/3 square edges, Ke= 0.500

Inlet / Outlet Invert= 124.86' / 123.79' S= 0.0255 '/' Cc= 0.900
n= 0.022 Earth, clean & straight, Flow Area= 10.94 sf

Primary OutFlow Max=96.32 cfs @ 12.62 hrs HW=130.04' TW=126.00' (Fixed TW Elev= 126.00')
↑—**1=Culvert** (Inlet Controls 96.32 cfs @ 8.81 fps)


8S
Industrial Drive
Drainage Area
E-B
North/Woodmont/BikeTrail/Northern
Drainage Area
CPEtot
Pre-Development
Control Point
BB-E
Bradford Brook Storage
Subcat
Reach
Pond
Link
Routing Diagram for N'ton - View Ave- 3.21.25_TP40
Prepared by Berkshire Design Group, Printed 3/21/2025
HydroCAD® 10.20-6a s/n 00752 © 2024 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.00	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.50	2
3	100-Year	Type III 24-hr		Default	24.00	1	6.40	2

Time span=0.00-32.00 hrs, dt=0.01 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment8S: Industrial Drive Runoff Area=1,978,000 sf 44.26% Impervious Runoff Depth=1.38"
Flow Length=1,650' Tc=18.5 min CN=82 Runoff=50.62 cfs 5.218 af

SubcatchmentE-B: Runoff Area=816,000 sf 20.34% Impervious Runoff Depth=0.91"
Flow Length=600' Tc=13.1 min CN=74 Runoff=14.69 cfs 1.418 af

Reach CPEtot: Pre-DevelopmentControl Point Inflow=60.01 cfs 6.636 af
Outflow=60.01 cfs 6.636 af

Pond BB-E: Bradford Brook Storage Peak Elev=128.10' Storage=3,898 cf Inflow=64.25 cfs 6.636 af
42.0" x 42.0", R=21.0" Arch Culvert n=0.022 L=42.0' S=0.0255 '/' Outflow=60.01 cfs 6.636 af

Total Runoff Area = 64.141 ac Runoff Volume = 6.636 af Average Runoff Depth = 1.24"
62.73% Pervious = 40.234 ac 37.27% Impervious = 23.907 ac

Summary for Subcatchment 8S: Industrial Drive Drainage Area

[47] Hint: Peak is 105% of capacity of segment #3

Runoff = 50.62 cfs @ 12.27 hrs, Volume= 5.218 af, Depth= 1.38"
Routed to Pond BB-E : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
	736,000	88	Urban industrial, 72% imp, HSG B
	72,000	98	Paved roads w/curbs & sewers, HSG B
*	278,000	82	Railroad, HSG B
	155,000	75	1/4 acre lots, 38% imp, HSG B
	55,000	70	1/2 acre lots, 25% imp, HSG B
	199,000	58	Woods/grass comb., Good, HSG B
	160,000	91	Urban industrial, 72% imp, HSG C
	22,000	98	Paved roads w/curbs & sewers, HSG C
	9,000	83	1/4 acre lots, 38% imp, HSG C
	199,000	72	Woods/grass comb., Good, HSG C
	60,000	93	Urban industrial, 72% imp, HSG D
	17,000	98	Paved roads w/curbs & sewers, HSG D
	16,000	79	Woods/grass comb., Good, HSG D
	1,978,000	82	Weighted Average
	1,102,610		55.74% Pervious Area
	875,390		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
5.1	650	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.1	900	0.0050	3.63	48.39	**Parabolic Channel,** W=20.00' D=1.00' Area=13.3 sf Perim=20.1' n= 0.022 Earth, clean & straight
18.5	1,650	Total			

Summary for Subcatchment E-B: North/Woodmont/BikeTrail/Northern Drainage Area

Runoff = 14.69 cfs @ 12.19 hrs, Volume= 1.418 af, Depth= 0.91"
Routed to Pond BB-E : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
29,000	98	Paved roads w/curbs & sewers, HSG B
2,000	98	Roofs, HSG B
300,000	75	1/4 acre lots, 38% imp, HSG B
84,000	70	1/2 acre lots, 25% imp, HSG B
120,000	58	Woods/grass comb., Good, HSG B
281,000	79	Woods/grass comb., Good, HSG D
816,000	74	Weighted Average
650,000		79.66% Pervious Area
166,000		20.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	75	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.1	525	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.1	600	Total			

Summary for Reach CPEtot: Pre-Development Control Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 64.141 ac, 37.27% Impervious, Inflow Depth = 1.24" for 2-Year event
Inflow = 60.01 cfs @ 12.32 hrs, Volume= 6.636 af
Outflow = 60.01 cfs @ 12.32 hrs, Volume= 6.636 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Pond BB-E: Bradford Brook Storage

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 64.141 ac, 37.27% Impervious, Inflow Depth = 1.24" for 2-Year event
Inflow = 64.25 cfs @ 12.24 hrs, Volume= 6.636 af
Outflow = 60.01 cfs @ 12.32 hrs, Volume= 6.636 af, Atten= 7%, Lag= 4.6 min
Primary = 60.01 cfs @ 12.32 hrs, Volume= 6.636 af
Routed to Reach CPEtot : Pre-Development Control Point

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 128.10' @ 12.32 hrs Surf.Area= 43,569 sf Storage= 3,898 cf

Plug-Flow detention time= 0.7 min calculated for 6.634 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (856.4 - 855.7)

Volume	Invert	Avail.Storage	Storage Description
#1	128.00'	1,340,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
128.00	38,300	2,000.0	0	0	38,300
129.00	110,500	3,200.0	71,285	71,285	534,870
130.00	169,500	3,000.0	138,952	210,237	633,595
131.00	226,500	3,700.0	197,313	407,550	1,006,828
132.00	285,200	3,600.0	255,287	662,837	1,065,034
133.00	338,000	3,400.0	311,227	974,063	1,176,498
134.00	395,500	3,300.0	366,374	1,340,437	1,229,920

Device	Routing	Invert	Outlet Devices
#1	Primary	124.86'	**42.0" W x 42.0" H, R=21.0" Arch Culvert** L= 42.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 124.86' / 123.79' S= 0.0255 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 10.94 sf

Primary OutFlow Max=60.02 cfs @ 12.32 hrs HW=128.10' TW=126.00' (Fixed TW Elev= 126.00')
↑—**1=Culvert** (Inlet Controls 60.02 cfs @ 5.66 fps)

Time span=0.00-32.00 hrs, dt=0.01 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment8S: Industrial Drive Runoff Area=1,978,000 sf 44.26% Impervious Runoff Depth=2.64"
Flow Length=1,650' Tc=18.5 min CN=82 Runoff=97.66 cfs 9.975 af

SubcatchmentE-B: Runoff Area=816,000 sf 20.34% Impervious Runoff Depth=1.97"
Flow Length=600' Tc=13.1 min CN=74 Runoff=34.03 cfs 3.079 af

Reach CPEtot: Pre-DevelopmentControl Point Inflow=77.32 cfs 13.054 af
Outflow=77.32 cfs 13.054 af

Pond BB-E: Bradford Brook Storage Peak Elev=128.88' Storage=58,503 cf Inflow=129.31 cfs 13.054 af
42.0" x 42.0", R=21.0" Arch Culvert n=0.022 L=42.0' S=0.0255 '/' Outflow=77.32 cfs 13.054 af

Total Runoff Area = 64.141 ac Runoff Volume = 13.054 af Average Runoff Depth = 2.44"
62.73% Pervious = 40.234 ac 37.27% Impervious = 23.907 ac

Summary for Subcatchment 8S: Industrial Drive Drainage Area

[47] Hint: Peak is 202% of capacity of segment #3

Runoff = 97.66 cfs @ 12.25 hrs, Volume= 9.975 af, Depth= 2.64"
Routed to Pond BB-E : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
	736,000	88	Urban industrial, 72% imp, HSG B
	72,000	98	Paved roads w/curbs & sewers, HSG B
*	278,000	82	Railroad, HSG B
	155,000	75	1/4 acre lots, 38% imp, HSG B
	55,000	70	1/2 acre lots, 25% imp, HSG B
	199,000	58	Woods/grass comb., Good, HSG B
	160,000	91	Urban industrial, 72% imp, HSG C
	22,000	98	Paved roads w/curbs & sewers, HSG C
	9,000	83	1/4 acre lots, 38% imp, HSG C
	199,000	72	Woods/grass comb., Good, HSG C
	60,000	93	Urban industrial, 72% imp, HSG D
	17,000	98	Paved roads w/curbs & sewers, HSG D
	16,000	79	Woods/grass comb., Good, HSG D
	1,978,000	82	Weighted Average
	1,102,610		55.74% Pervious Area
	875,390		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
5.1	650	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.1	900	0.0050	3.63	48.39	**Parabolic Channel,** W=20.00' D=1.00' Area=13.3 sf Perim=20.1' n= 0.022 Earth, clean & straight
18.5	1,650	Total			

Summary for Subcatchment E-B: North/Woodmont/BikeTrail/Northern Drainage Area

Runoff = 34.03 cfs @ 12.18 hrs, Volume= 3.079 af, Depth= 1.97"
Routed to Pond BB-E : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
29,000	98	Paved roads w/curbs & sewers, HSG B
2,000	98	Roofs, HSG B
300,000	75	1/4 acre lots, 38% imp, HSG B
84,000	70	1/2 acre lots, 25% imp, HSG B
120,000	58	Woods/grass comb., Good, HSG B
281,000	79	Woods/grass comb., Good, HSG D
816,000	74	Weighted Average
650,000		79.66% Pervious Area
166,000		20.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	75	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.1	525	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.1	600	Total			

Summary for Reach CPEtot: Pre-Development Control Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 64.141 ac, 37.27% Impervious, Inflow Depth = 2.44" for 10-Year event
Inflow = 77.32 cfs @ 12.50 hrs, Volume= 13.054 af
Outflow = 77.32 cfs @ 12.50 hrs, Volume= 13.054 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Pond BB-E: Bradford Brook Storage

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 64.141 ac, 37.27% Impervious, Inflow Depth = 2.44" for 10-Year event
Inflow = 129.31 cfs @ 12.23 hrs, Volume= 13.054 af
Outflow = 77.32 cfs @ 12.50 hrs, Volume= 13.054 af, Atten= 40%, Lag= 16.1 min
Primary = 77.32 cfs @ 12.50 hrs, Volume= 13.054 af
Routed to Reach CPEtot : Pre-Development Control Point

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 128.88' @ 12.50 hrs Surf.Area= 99,719 sf Storage= 58,503 cf

Plug-Flow detention time= 4.0 min calculated for 13.050 af (100% of inflow)
Center-of-Mass det. time= 4.0 min (840.3 - 836.3)

Volume	Invert	Avail.Storage	Storage Description
#1	128.00'	1,340,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
128.00	38,300	2,000.0	0	0	38,300
129.00	110,500	3,200.0	71,285	71,285	534,870
130.00	169,500	3,000.0	138,952	210,237	633,595
131.00	226,500	3,700.0	197,313	407,550	1,006,828
132.00	285,200	3,600.0	255,287	662,837	1,065,034
133.00	338,000	3,400.0	311,227	974,063	1,176,498
134.00	395,500	3,300.0	366,374	1,340,437	1,229,920

Device	Routing	Invert	Outlet Devices
#1	Primary	124.86'	**42.0" W x 42.0" H, R=21.0" Arch Culvert** L= 42.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 124.86' / 123.79' S= 0.0255 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 10.94 sf

Primary OutFlow Max=77.32 cfs @ 12.50 hrs HW=128.88' TW=126.00' (Fixed TW Elev= 126.00')
↑—**1=Culvert** (Inlet Controls 77.32 cfs @ 7.07 fps)

Time span=0.00-32.00 hrs, dt=0.01 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment8S: Industrial Drive Runoff Area=1,978,000 sf 44.26% Impervious Runoff Depth=4.36"
Flow Length=1,650' Tc=18.5 min CN=82 Runoff=160.14 cfs 16.486 af

SubcatchmentE-B: Runoff Area=816,000 sf 20.34% Impervious Runoff Depth=3.52"
Flow Length=600' Tc=13.1 min CN=74 Runoff=61.68 cfs 5.501 af

Reach CPEtot: Pre-DevelopmentControl Point Inflow=92.41 cfs 21.987 af
Outflow=92.41 cfs 21.987 af

Pond BB-E: Bradford Brook Storage Peak Elev=129.78' Storage=174,416 cf Inflow=217.36 cfs 21.987 af
42.0" x 42.0", R=21.0" Arch Culvert n=0.022 L=42.0' S=0.0255 '/' Outflow=92.41 cfs 21.987 af

Total Runoff Area = 64.141 ac Runoff Volume = 21.987 af Average Runoff Depth = 4.11"
62.73% Pervious = 40.234 ac 37.27% Impervious = 23.907 ac

Summary for Subcatchment 8S: Industrial Drive Drainage Area

[47] Hint: Peak is 331% of capacity of segment #3

Runoff = 160.14 cfs @ 12.25 hrs, Volume= 16.486 af, Depth= 4.36"
Routed to Pond BB-E : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.40"

	Area (sf)	CN	Description
	736,000	88	Urban industrial, 72% imp, HSG B
	72,000	98	Paved roads w/curbs & sewers, HSG B
*	278,000	82	Railroad, HSG B
	155,000	75	1/4 acre lots, 38% imp, HSG B
	55,000	70	1/2 acre lots, 25% imp, HSG B
	199,000	58	Woods/grass comb., Good, HSG B
	160,000	91	Urban industrial, 72% imp, HSG C
	22,000	98	Paved roads w/curbs & sewers, HSG C
	9,000	83	1/4 acre lots, 38% imp, HSG C
	199,000	72	Woods/grass comb., Good, HSG C
	60,000	93	Urban industrial, 72% imp, HSG D
	17,000	98	Paved roads w/curbs & sewers, HSG D
	16,000	79	Woods/grass comb., Good, HSG D
	1,978,000	82	Weighted Average
	1,102,610		55.74% Pervious Area
	875,390		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
5.1	650	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.1	900	0.0050	3.63	48.39	**Parabolic Channel,** W=20.00' D=1.00' Area=13.3 sf Perim=20.1' n= 0.022 Earth, clean & straight
18.5	1,650	Total			

Summary for Subcatchment E-B: North/Woodmont/BikeTrail/Northern Drainage Area

Runoff = 61.68 cfs @ 12.18 hrs, Volume= 5.501 af, Depth= 3.52"
Routed to Pond BB-E : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.40"

Area (sf)	CN	Description
29,000	98	Paved roads w/curbs & sewers, HSG B
2,000	98	Roofs, HSG B
300,000	75	1/4 acre lots, 38% imp, HSG B
84,000	70	1/2 acre lots, 25% imp, HSG B
120,000	58	Woods/grass comb., Good, HSG B
281,000	79	Woods/grass comb., Good, HSG D
816,000	74	Weighted Average
650,000		79.66% Pervious Area
166,000		20.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	75	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.1	525	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.1	600	Total			

Summary for Reach CPEtot: Pre-Development Control Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 64.141 ac, 37.27% Impervious, Inflow Depth = 4.11" for 100-Year event
Inflow = 92.41 cfs @ 12.60 hrs, Volume= 21.987 af
Outflow = 92.41 cfs @ 12.60 hrs, Volume= 21.987 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Pond BB-E: Bradford Brook Storage

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 64.141 ac, 37.27% Impervious, Inflow Depth = 4.11" for 100-Year event
Inflow = 217.36 cfs @ 12.23 hrs, Volume= 21.987 af
Outflow = 92.41 cfs @ 12.60 hrs, Volume= 21.987 af, Atten= 57%, Lag= 22.5 min
Primary = 92.41 cfs @ 12.60 hrs, Volume= 21.987 af
Routed to Reach CPEtot : Pre-Development Control Point

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 129.78' @ 12.60 hrs Surf.Area= 155,406 sf Storage= 174,416 cf

Plug-Flow detention time= 10.8 min calculated for 21.987 af (100% of inflow)
Center-of-Mass det. time= 10.8 min (832.4 - 821.6)

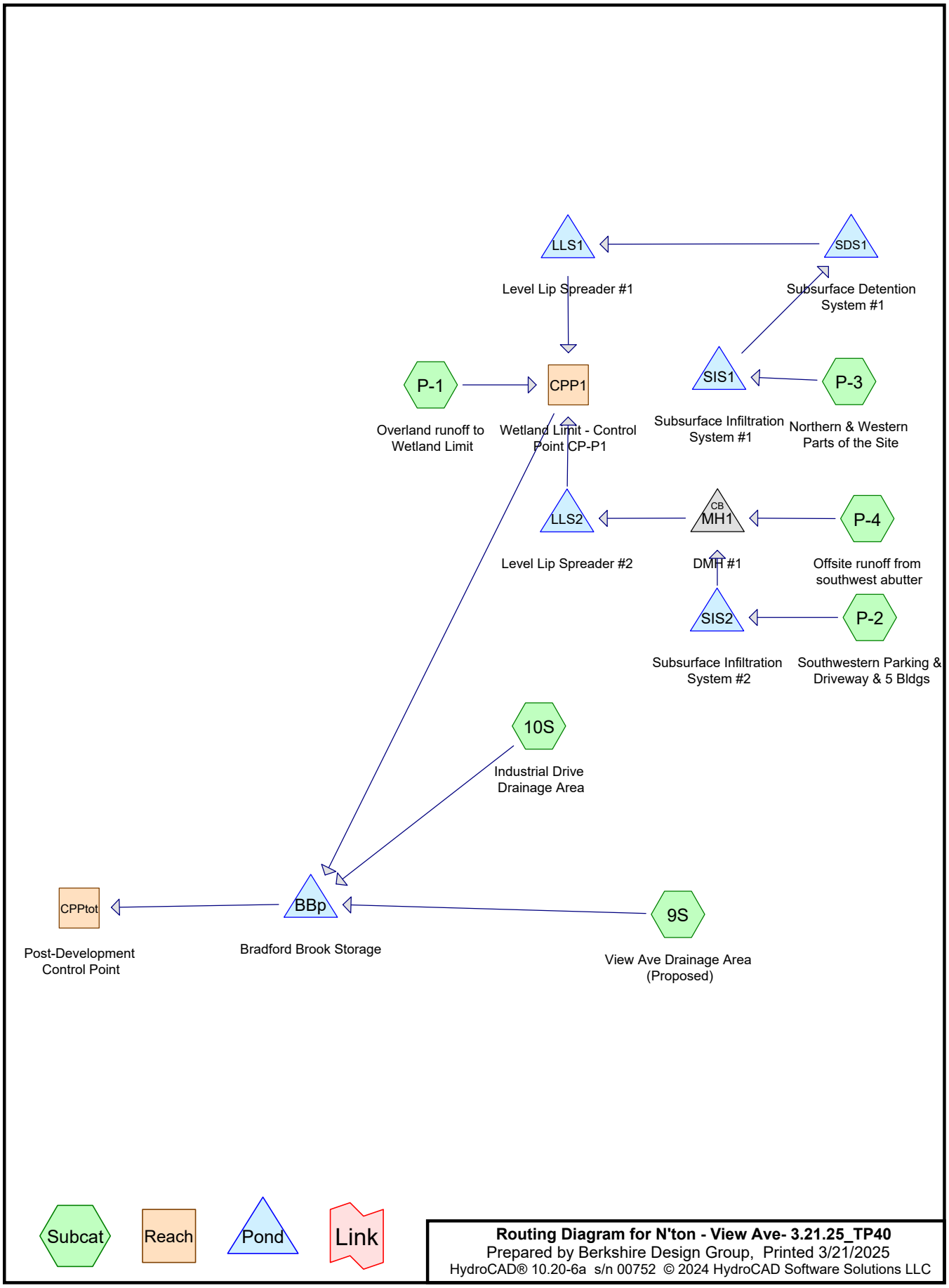
Volume	Invert	Avail.Storage	Storage Description
#1	128.00'	1,340,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
128.00	38,300	2,000.0	0	0	38,300
129.00	110,500	3,200.0	71,285	71,285	534,870
130.00	169,500	3,000.0	138,952	210,237	633,595
131.00	226,500	3,700.0	197,313	407,550	1,006,828
132.00	285,200	3,600.0	255,287	662,837	1,065,034
133.00	338,000	3,400.0	311,227	974,063	1,176,498
134.00	395,500	3,300.0	366,374	1,340,437	1,229,920

Device	Routing	Invert	Outlet Devices
#1	Primary	124.86'	**42.0" W x 42.0" H, R=21.0" Arch Culvert** L= 42.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 124.86' / 123.79' S= 0.0255 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 10.94 sf

Primary OutFlow Max=92.41 cfs @ 12.60 hrs HW=129.78' TW=126.00' (Fixed TW Elev= 126.00')
↑—**1=Culvert** (Inlet Controls 92.41 cfs @ 8.45 fps)

Drainage Analysis - Post-Development (2-Year Storm) to Woodmont Road Culvert



Routing Diagram for N'ton - View Ave- 3.21.25_TP40
Prepared by Berkshire Design Group, Printed 3/21/2025
HydroCAD® 10.20-6a s/n 00752 © 2024 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.00	2

Time span=0.00-32.00 hrs, dt=0.01 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment9S: View Ave Drainage Runoff Area=660,664 sf 22.54% Impervious Runoff Depth=1.02"
Flow Length=600' Tc=13.1 min CN=76 Runoff=13.63 cfs 1.283 af

Subcatchment10S: Industrial Drive Runoff Area=1,978,000 sf 44.26% Impervious Runoff Depth=1.38"
Flow Length=1,650' Tc=18.5 min CN=82 Runoff=50.62 cfs 5.218 af

SubcatchmentP-1: Overland runoff to Runoff Area=75,703 sf 0.00% Impervious Runoff Depth=0.71"
Flow Length=223' Tc=30.8 min CN=70 Runoff=0.71 cfs 0.103 af

SubcatchmentP-2: Southwestern Parking Runoff Area=12,163 sf 73.38% Impervious Runoff Depth=1.82"
Tc=5.0 min CN=88 Runoff=0.62 cfs 0.042 af

SubcatchmentP-3: Northern & Western Runoff Area=42,223 sf 43.23% Impervious Runoff Depth=1.02"
Flow Length=287' Tc=22.1 min CN=76 Runoff=0.71 cfs 0.082 af

SubcatchmentP-4: Offsite runoff from Runoff Area=25,247 sf 16.66% Impervious Runoff Depth=0.58"
Flow Length=195' Tc=10.2 min CN=67 Runoff=0.27 cfs 0.028 af

Reach CPP1: Wetland Limit - Control Point CP-P1 Inflow=1.06 cfs 0.211 af
Outflow=1.06 cfs 0.211 af

Reach CPPtot: Post-DevelopmentControl Point Inflow=59.99 cfs 6.712 af
Outflow=59.99 cfs 6.712 af

Pond BBp: Bradford Brook Storage Peak Elev=128.09' Storage=3,855 cf Inflow=64.11 cfs 6.712 af
42.0" x 42.0", R=21.0" Arch Culvert n=0.022 L=42.0' S=0.0255 '/' Outflow=59.99 cfs 6.712 af

Pond LLS1: Level Lip Spreader#1 Peak Elev=136.02' Storage=106 cf Inflow=0.18 cfs 0.054 af
Outflow=0.18 cfs 0.051 af

Pond LLS2: Level Lip Spreader#2 Peak Elev=133.86' Storage=107 cf Inflow=0.78 cfs 0.058 af
Outflow=0.78 cfs 0.056 af

Pond MH1: DMH #1 Peak Elev=135.79' Inflow=0.78 cfs 0.058 af
18.0" Round Culvert n=0.012 L=43.0' S=0.0314 '/' Outflow=0.78 cfs 0.058 af

Pond SDS1: Subsurface Detention System#1 Peak Elev=137.10' Storage=491 cf Inflow=0.52 cfs 0.054 af
Outflow=0.18 cfs 0.054 af

Pond SIS1: Subsurface Infiltration System#1 Peak Elev=137.95' Storage=1,009 cf Inflow=0.71 cfs 0.082 af
Discarded=0.01 cfs 0.012 af Primary=0.52 cfs 0.054 af Outflow=0.53 cfs 0.065 af

Pond SIS2: Subsurface Infiltration System#2 Peak Elev=137.99' Storage=511 cf Inflow=0.62 cfs 0.042 af
Discarded=0.00 cfs 0.005 af Primary=0.53 cfs 0.030 af Outflow=0.53 cfs 0.035 af

Total Runoff Area = 64.141 ac Runoff Volume = 6.757 af Average Runoff Depth = 1.26"
62.21% Pervious = 39.906 ac 37.79% Impervious = 24.236 ac

Summary for Subcatchment 9S: View Ave Drainage Area (Proposed)

Runoff = 13.63 cfs @ 12.19 hrs, Volume= 1.283 af, Depth= 1.02"
Routed to Pond BBp : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
28,000	98	Paved roads w/curbs & sewers, HSG B
263,000	75	1/4 acre lots, 38% imp, HSG B
84,000	70	1/2 acre lots, 25% imp, HSG B
48,664	58	Woods/grass comb., Good, HSG B
237,000	79	Woods/grass comb., Good, HSG D
660,664	76	Weighted Average
511,724		77.46% Pervious Area
148,940		22.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	75	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.1	525	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.1	600	Total			

Summary for Subcatchment 10S: Industrial Drive Drainage Area

[47] Hint: Peak is 105% of capacity of segment #3

Runoff = 50.62 cfs @ 12.27 hrs, Volume= 5.218 af, Depth= 1.38"
Routed to Pond BBp : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
	736,000	88	Urban industrial, 72% imp, HSG B
	72,000	98	Paved roads w/curbs & sewers, HSG B
*	278,000	82	Railroad, HSG B
	155,000	75	1/4 acre lots, 38% imp, HSG B
	55,000	70	1/2 acre lots, 25% imp, HSG B
	199,000	58	Woods/grass comb., Good, HSG B
	160,000	91	Urban industrial, 72% imp, HSG C
	22,000	98	Paved roads w/curbs & sewers, HSG C
	9,000	83	1/4 acre lots, 38% imp, HSG C
	199,000	72	Woods/grass comb., Good, HSG C
	60,000	93	Urban industrial, 72% imp, HSG D
	17,000	98	Paved roads w/curbs & sewers, HSG D
	16,000	79	Woods/grass comb., Good, HSG D
	1,978,000	82	Weighted Average
	1,102,610		55.74% Pervious Area
	875,390		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
5.1	650	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.1	900	0.0050	3.63	48.39	**Parabolic Channel,** W=20.00' D=1.00' Area=13.3 sf Perim=20.1' n= 0.022 Earth, clean & straight
18.5	1,650	Total			

Summary for Subcatchment P-1: Overland runoff to Wetland Limit

Runoff = 0.71 cfs @ 12.49 hrs, Volume= 0.103 af, Depth= 0.71"
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
	37,021	77	Woods, Good, HSG D
	12,125	55	Woods, Good, HSG B
	17,581	61	>75% Grass cover, Good, HSG B
	7,936	80	>75% Grass cover, Good, HSG D
*	321	85	Riprap, HSG B
*	308	91	Riprap, HSG D
	271	85	Gravel roads, HSG B
	140	91	Gravel roads, HSG D
	75,703	70	Weighted Average
	75,703		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	28	0.3333	0.39		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
23.8	72	0.0347	0.05		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
5.8	123	0.0203	0.36		**Shallow Concentrated Flow, Woods** Forest w/Heavy Litter Kv= 2.5 fps
30.8	223	Total			

Summary for Subcatchment P-2: Southwestern Parking & Driveway & 5 Bldgs

Runoff = 0.62 cfs @ 12.07 hrs, Volume= 0.042 af, Depth= 1.82"
Routed to Pond SIS2 : Subsurface Infiltration System #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
5,915	98	Paved parking, HSG D
3,010	98	Roofs, HSG B
3,238	61	>75% Grass cover, Good, HSG B
12,163	88	Weighted Average
3,238		26.62% Pervious Area
8,925		73.38% Impervious Area

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

Summary for Subcatchment P-3: Northern & Western Parts of the Site

Runoff = 0.71 cfs @ 12.33 hrs, Volume= 0.082 af, Depth= 1.02"
Routed to Pond SIS1 : Subsurface Infiltration System #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
13,496	98	Unconnected pavement, HSG B
4,756	98	Roofs, HSG B
16,612	61	>75% Grass cover, Good, HSG B
7,310	55	Woods, Good, HSG B
49	85	Gravel roads, HSG B
42,223	76	Weighted Average
23,971		56.77% Pervious Area
18,252		43.23% Impervious Area
13,496		73.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	52	0.0200	0.14		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
14.1	40	0.0100	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	64	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.2	41	0.0200	2.87		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.3	90	0.0100	5.90	88.54	**Trap/Vee/Rect Channel Flow, Gutter Flow** Bot.W=20.00' D=0.50' Z= 0.1 & 40.0 '/' Top.W=40.05' n= 0.013 Asphalt, smooth
22.1	287	Total			

Summary for Subcatchment P-4: Offsite runoff from southwest abutter

Runoff = 0.27 cfs @ 12.17 hrs, Volume= 0.028 af, Depth= 0.58"
Routed to Pond MH1 : DMH #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,206	98	Roofs, HSG B
856	55	Woods, Good, HSG B
20,185	61	>75% Grass cover, Good, HSG B
25,247	67	Weighted Average
21,041		83.34% Pervious Area
4,206		16.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0300	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
0.3	30	0.0667	1.81		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.3	65	0.0150	0.86		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
10.2	195	Total			

Summary for Reach CPP1: Wetland Limit - Control Point CP-P1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.566 ac, 20.20% Impervious, Inflow Depth = 0.71" for 2-Year event
Inflow = 1.06 cfs @ 12.41 hrs, Volume= 0.211 af
Outflow = 1.06 cfs @ 12.41 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.0 min
Routed to Pond BBp : Bradford Brook Storage

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Reach CPPtot: Post-Development Control Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 64.141 ac, 37.79% Impervious, Inflow Depth = 1.26" for 2-Year event
Inflow = 59.99 cfs @ 12.32 hrs, Volume= 6.712 af
Outflow = 59.99 cfs @ 12.32 hrs, Volume= 6.712 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Pond BBp: Bradford Brook Storage

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 64.141 ac, 37.79% Impervious, Inflow Depth = 1.26" for 2-Year event
Inflow = 64.11 cfs @ 12.24 hrs, Volume= 6.712 af
Outflow = 59.99 cfs @ 12.32 hrs, Volume= 6.712 af, Atten= 6%, Lag= 4.5 min
Primary = 59.99 cfs @ 12.32 hrs, Volume= 6.712 af
Routed to Reach CPPtot : Post-Development Control Point

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 128.09' @ 12.32 hrs Surf.Area= 43,512 sf Storage= 3,855 cf

Plug-Flow detention time= 0.7 min calculated for 6.712 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (856.5 - 855.8)

Volume	Invert	Avail.Storage	Storage Description
#1	128.00'	1,340,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
128.00	38,300	2,000.0	0	0	38,300
129.00	110,500	3,200.0	71,285	71,285	534,870
130.00	169,500	3,000.0	138,952	210,237	633,595
131.00	226,500	3,700.0	197,313	407,550	1,006,828
132.00	285,200	3,600.0	255,287	662,837	1,065,034
133.00	338,000	3,400.0	311,227	974,063	1,176,498
134.00	395,500	3,300.0	366,374	1,340,437	1,229,920

Device	Routing	Invert	Outlet Devices
#1	Primary	124.86'	**42.0" W x 42.0" H, R=21.0" Arch Culvert** L= 42.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 124.86' / 123.79' S= 0.0255 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 10.94 sf

Primary OutFlow Max=59.99 cfs @ 12.32 hrs HW=128.09' TW=126.00' (Fixed TW Elev= 126.00')
↑—**1=Culvert** (Inlet Controls 59.99 cfs @ 5.66 fps)

Summary for Pond LLS1: Level Lip Spreader #1

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 0.67" for 2-Year event
Inflow = 0.18 cfs @ 13.07 hrs, Volume= 0.054 af
Outflow = 0.18 cfs @ 13.08 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.2 min
Primary = 0.18 cfs @ 13.08 hrs, Volume= 0.051 af
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 136.02' @ 13.08 hrs Surf.Area= 155 sf Storage= 106 cf

Plug-Flow detention time= 30.5 min calculated for 0.051 af (96% of inflow)
Center-of-Mass det. time= 9.0 min (956.7 - 947.7)

Volume	Invert	Avail.Storage	Storage Description
#1	135.00'	196 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.00	60	49.0	0	0	60
136.00	152	57.0	102	102	146
136.50	224	64.0	93	196	220

Device	Routing	Invert	Outlet Devices
#1	Primary	136.00'	**24.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.18 cfs @ 13.08 hrs HW=136.02' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.38 fps)

Summary for Pond LLS2: Level Lip Spreader #2

Inflow Area = 0.859 ac, 35.10% Impervious, Inflow Depth = 0.81" for 2-Year event
Inflow = 0.78 cfs @ 12.13 hrs, Volume= 0.058 af
Outflow = 0.78 cfs @ 12.13 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.1 min
Primary = 0.78 cfs @ 12.13 hrs, Volume= 0.056 af
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 133.86' @ 12.13 hrs Surf.Area= 151 sf Storage= 107 cf

Plug-Flow detention time= 27.3 min calculated for 0.056 af (96% of inflow)
Center-of-Mass det. time= 6.5 min (879.1 - 872.6)

Volume	Invert	Avail.Storage	Storage Description
#1	132.80'	180 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
132.80	56	48.0	0	0	56
133.80	148	56.0	98	98	140
134.30	178	60.0	81	180	187

Device	Routing	Invert	Outlet Devices
#1	Primary	133.80'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.77 cfs @ 12.13 hrs HW=133.86' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.77 cfs @ 0.65 fps)

Summary for Pond MH1: DMH #1

[57] Hint: Peaked at 135.79' (Flood elevation advised)

Inflow Area = 0.859 ac, 35.10% Impervious, Inflow Depth = 0.81" for 2-Year event
Inflow = 0.78 cfs @ 12.13 hrs, Volume= 0.058 af
Outflow = 0.78 cfs @ 12.13 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
Primary = 0.78 cfs @ 12.13 hrs, Volume= 0.058 af
Routed to Pond LLS2 : Level Lip Spreader #2

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 135.79' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.40'	**18.0" Round Culvert** L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.40' / 134.05' S= 0.0314 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.78 cfs @ 12.13 hrs HW=135.79' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.78 cfs @ 2.13 fps)

Summary for Pond SDS1: Subsurface Detention System #1

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 0.67" for 2-Year event
Inflow = 0.52 cfs @ 12.55 hrs, Volume= 0.054 af
Outflow = 0.18 cfs @ 13.07 hrs, Volume= 0.054 af, Atten= 66%, Lag= 31.6 min
Primary = 0.18 cfs @ 13.07 hrs, Volume= 0.054 af
Routed to Pond LLS1 : Level Lip Spreader #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Peak Elev= 137.10' @ 13.07 hrs Surf.Area= 2,146 sf Storage= 491 cf

Plug-Flow detention time= 40.9 min calculated for 0.054 af (100% of inflow)
Center-of-Mass det. time= 40.9 min (947.7 - 906.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.83'	731 cf	**31.67'W x 67.25'L x 2.51'H Field A** 5,342 cf Overall - 3,515 cf Embedded = 1,828 cf x 40.0% Voids
#2A	136.83'	3,339 cf	**ACO StormBrixx HD 1** x 224 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 224 Chambers in 14 Rows
#3	136.83'	25 cf	**18.0" Round 18" HDPE Outlet Pipe Storage** L= 14.0'
		4,095 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	136.75'	**15.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.75' / 136.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	136.75'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.10'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	138.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.18 cfs @ 13.07 hrs HW=137.10' (Free Discharge)
└**1=Culvert** (Passes 0.18 cfs of 0.56 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.18 cfs @ 2.05 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SIS1: Subsurface Infiltration System #1

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 1.02" for 2-Year event
Inflow = 0.71 cfs @ 12.33 hrs, Volume= 0.082 af
Outflow = 0.53 cfs @ 12.55 hrs, Volume= 0.065 af, Atten= 25%, Lag= 13.0 min
Discarded = 0.01 cfs @ 11.65 hrs, Volume= 0.012 af
Primary = 0.52 cfs @ 12.55 hrs, Volume= 0.054 af
Routed to Pond SDS1 : Subsurface Detention System #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 137.95' @ 12.55 hrs Surf.Area= 1,097 sf Storage= 1,009 cf

Plug-Flow detention time= 184.6 min calculated for 0.065 af (80% of inflow)
Center-of-Mass det. time= 102.8 min (977.2 - 874.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.83'	423 cf	**27.72'W x 39.58'L x 2.51'H Field A** 2,752 cf Overall - 1,695 cf Embedded = 1,057 cf x 40.0% Voids
#2A	136.83'	1,610 cf	**ACO StormBrixx HD 1** x 108 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 108 Chambers in 12 Rows
#3	138.83'	316 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		2,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.83	4	16.0	0	0	4
140.49	4	16.0	7	7	31
140.50	505	83.0	2	8	558
141.00	731	98.0	307	316	779

Device	Routing	Invert	Outlet Devices
#1	Discarded	136.83'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	137.83'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.01 cfs @ 11.65 hrs HW=136.87' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.52 cfs @ 12.55 hrs HW=137.95' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.52 cfs @ 1.12 fps)

Summary for Pond SIS2: Subsurface Infiltration System #2

Inflow Area = 0.279 ac, 73.38% Impervious, Inflow Depth = 1.82" for 2-Year event
Inflow = 0.62 cfs @ 12.07 hrs, Volume= 0.042 af
Outflow = 0.53 cfs @ 12.12 hrs, Volume= 0.035 af, Atten= 14%, Lag= 2.7 min
Discarded = 0.00 cfs @ 8.72 hrs, Volume= 0.005 af
Primary = 0.53 cfs @ 12.12 hrs, Volume= 0.030 af
Routed to Pond MH1 : DMH #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 137.99' @ 12.12 hrs Surf.Area= 424 sf Storage= 511 cf

Plug-Flow detention time= 156.7 min calculated for 0.035 af (82% of inflow)
Center-of-Mass det. time= 85.8 min (902.6 - 816.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.10'	352 cf	**35.63'W x 11.91'L x 3.26'H Field A** 1,382 cf Overall - 502 cf Embedded = 880 cf x 40.0% Voids
#2A	136.60'	477 cf	**ACO StormBrixx HD 1** x 32 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 32 Chambers in 16 Rows

829 cf Total Available Storage

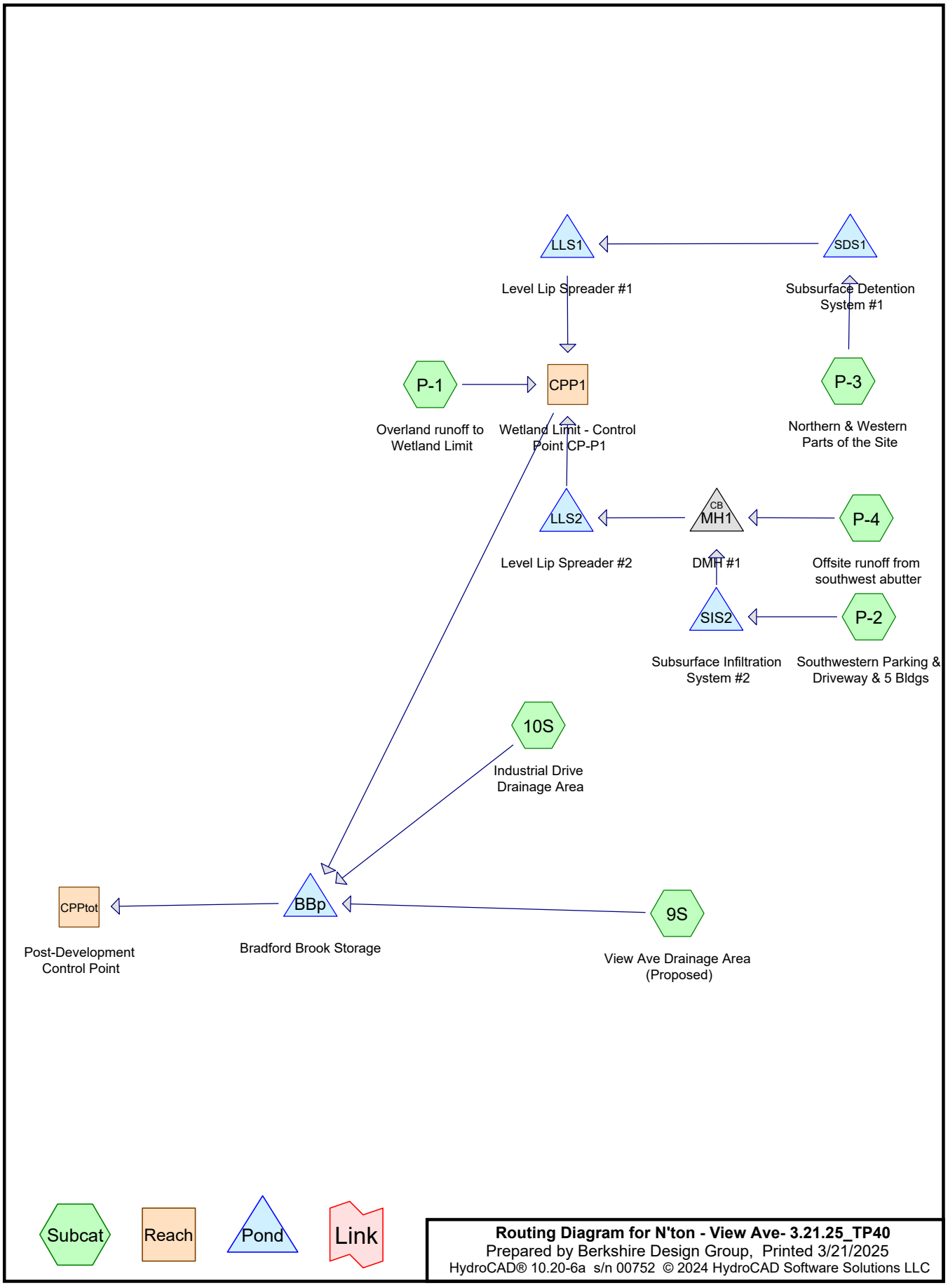
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	137.60'	**10.0" Round Culvert** L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.60' / 136.65' S= 0.0352 '/' Cc= 0.900 n= 0.012, Flow Area= 0.55 sf
#2	Discarded	136.10'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 8.72 hrs HW=136.13' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.53 cfs @ 12.12 hrs HW=137.99' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.53 cfs @ 2.12 fps)

Drainage Analysis - Post-Development (10-Year, 100-Year Storm) to Woodmont Road Culvert



Routing Diagram for N'ton - View Ave- 3.21.25_TP40
Prepared by Berkshire Design Group, Printed 3/21/2025
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-Year	Type III 24-hr		Default	24.00	1	4.50	2
2	100-Year	Type III 24-hr		Default	24.00	1	6.40	2

Time span=0.00-32.00 hrs, dt=0.01 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment9S: View Ave Drainage Runoff Area=660,664 sf 22.54% Impervious Runoff Depth=2.13"
Flow Length=600' Tc=13.1 min CN=76 Runoff=29.96 cfs 2.692 af

Subcatchment10S: Industrial Drive Runoff Area=1,978,000 sf 44.26% Impervious Runoff Depth=2.64"
Flow Length=1,650' Tc=18.5 min CN=82 Runoff=97.66 cfs 9.975 af

SubcatchmentP-1: Overland runoff to Runoff Area=75,703 sf 0.00% Impervious Runoff Depth=1.67"
Flow Length=223' Tc=30.8 min CN=70 Runoff=1.84 cfs 0.242 af

SubcatchmentP-2: Southwestern Parking Runoff Area=12,163 sf 73.38% Impervious Runoff Depth=3.20"
Tc=5.0 min CN=88 Runoff=1.07 cfs 0.074 af

SubcatchmentP-3: Northern & Western Runoff Area=42,223 sf 43.23% Impervious Runoff Depth=2.13"
Flow Length=287' Tc=22.1 min CN=76 Runoff=1.55 cfs 0.172 af

SubcatchmentP-4: Offsite runoff from Runoff Area=25,247 sf 16.66% Impervious Runoff Depth=1.46"
Flow Length=195' Tc=10.2 min CN=67 Runoff=0.81 cfs 0.071 af

Reach CPP1: Wetland Limit - Control Point CP-P1 Inflow=3.63 cfs 0.542 af
Outflow=3.63 cfs 0.542 af

Reach CPPtot: Post-DevelopmentControl Point Inflow=77.32 cfs 13.209 af
Outflow=77.32 cfs 13.209 af

Pond BBp: Bradford Brook Storage Peak Elev=128.88' Storage=58,518 cf Inflow=128.26 cfs 13.209 af
42.0" x 42.0", R=21.0" Arch Culvert n=0.022 L=42.0' S=0.0255 '/' Outflow=77.32 cfs 13.209 af

Pond LLS1: Level Lip Spreader#1 Peak Elev=136.07' Storage=113 cf Inflow=1.13 cfs 0.172 af
Outflow=1.13 cfs 0.170 af

Pond LLS2: Level Lip Spreader#2 Peak Elev=133.90' Storage=114 cf Inflow=1.75 cfs 0.132 af
Outflow=1.75 cfs 0.130 af

Pond MH1: DMH #1 Peak Elev=136.00' Inflow=1.75 cfs 0.132 af
18.0" Round Culvert n=0.012 L=43.0' S=0.0314 '/' Outflow=1.75 cfs 0.132 af

Pond SDS1: Subsurface Detention System Peak Elev=137.65' Storage=1,493 cf Inflow=1.55 cfs 0.172 af
Outflow=1.13 cfs 0.172 af

Pond SIS2: Subsurface Infiltration System#2 Peak Elev=138.16' Storage=565 cf Inflow=1.07 cfs 0.074 af
Discarded=0.00 cfs 0.006 af Primary=1.00 cfs 0.061 af Outflow=1.00 cfs 0.067 af

Total Runoff Area = 64.141 ac Runoff Volume = 13.226 af Average Runoff Depth = 2.47"
62.21% Pervious = 39.906 ac 37.79% Impervious = 24.236 ac

Summary for Subcatchment 9S: View Ave Drainage Area (Proposed)

Runoff = 29.96 cfs @ 12.18 hrs, Volume= 2.692 af, Depth= 2.13"
Routed to Pond BBp : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
28,000	98	Paved roads w/curbs & sewers, HSG B
263,000	75	1/4 acre lots, 38% imp, HSG B
84,000	70	1/2 acre lots, 25% imp, HSG B
48,664	58	Woods/grass comb., Good, HSG B
237,000	79	Woods/grass comb., Good, HSG D
660,664	76	Weighted Average
511,724		77.46% Pervious Area
148,940		22.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	75	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.1	525	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.1	600	Total			

Summary for Subcatchment 10S: Industrial Drive Drainage Area

[47] Hint: Peak is 202% of capacity of segment #3

Runoff = 97.66 cfs @ 12.25 hrs, Volume= 9.975 af, Depth= 2.64"
Routed to Pond BBp : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
	736,000	88	Urban industrial, 72% imp, HSG B
	72,000	98	Paved roads w/curbs & sewers, HSG B
*	278,000	82	Railroad, HSG B
	155,000	75	1/4 acre lots, 38% imp, HSG B
	55,000	70	1/2 acre lots, 25% imp, HSG B
	199,000	58	Woods/grass comb., Good, HSG B
	160,000	91	Urban industrial, 72% imp, HSG C
	22,000	98	Paved roads w/curbs & sewers, HSG C
	9,000	83	1/4 acre lots, 38% imp, HSG C
	199,000	72	Woods/grass comb., Good, HSG C
	60,000	93	Urban industrial, 72% imp, HSG D
	17,000	98	Paved roads w/curbs & sewers, HSG D
	16,000	79	Woods/grass comb., Good, HSG D
	1,978,000	82	Weighted Average
	1,102,610		55.74% Pervious Area
	875,390		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
5.1	650	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.1	900	0.0050	3.63	48.39	**Parabolic Channel,** W=20.00' D=1.00' Area=13.3 sf Perim=20.1' n= 0.022 Earth, clean & straight
18.5	1,650	Total			

Summary for Subcatchment P-1: Overland runoff to Wetland Limit

Runoff = 1.84 cfs @ 12.46 hrs, Volume= 0.242 af, Depth= 1.67"
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
	37,021	77	Woods, Good, HSG D
	12,125	55	Woods, Good, HSG B
	17,581	61	>75% Grass cover, Good, HSG B
	7,936	80	>75% Grass cover, Good, HSG D
*	321	85	Riprap, HSG B
*	308	91	Riprap, HSG D
	271	85	Gravel roads, HSG B
	140	91	Gravel roads, HSG D
	75,703	70	Weighted Average
	75,703		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	28	0.3333	0.39		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
23.8	72	0.0347	0.05		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
5.8	123	0.0203	0.36		**Shallow Concentrated Flow, Woods** Forest w/Heavy Litter Kv= 2.5 fps
30.8	223	Total			

Summary for Subcatchment P-2: Southwestern Parking & Driveway & 5 Bldgs

Runoff = 1.07 cfs @ 12.07 hrs, Volume= 0.074 af, Depth= 3.20"
Routed to Pond SIS2 : Subsurface Infiltration System #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
5,915	98	Paved parking, HSG D
3,010	98	Roofs, HSG B
3,238	61	>75% Grass cover, Good, HSG B
12,163	88	Weighted Average
3,238		26.62% Pervious Area
8,925		73.38% Impervious Area

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

Summary for Subcatchment P-3: Northern & Western Parts of the Site

Runoff = 1.55 cfs @ 12.31 hrs, Volume= 0.172 af, Depth= 2.13"
Routed to Pond SDS1 : Subsurface Detention System #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
13,496	98	Unconnected pavement, HSG B
4,756	98	Roofs, HSG B
16,612	61	>75% Grass cover, Good, HSG B
7,310	55	Woods, Good, HSG B
49	85	Gravel roads, HSG B
42,223	76	Weighted Average
23,971		56.77% Pervious Area
18,252		43.23% Impervious Area
13,496		73.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	52	0.0200	0.14		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
14.1	40	0.0100	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	64	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.2	41	0.0200	2.87		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.3	90	0.0100	5.90	88.54	**Trap/Vee/Rect Channel Flow, Gutter Flow** Bot.W=20.00' D=0.50' Z= 0.1 & 40.0 '/' Top.W=40.05' n= 0.013 Asphalt, smooth
22.1	287	Total			

Summary for Subcatchment P-4: Offsite runoff from southwest abutter

Runoff = 0.81 cfs @ 12.15 hrs, Volume= 0.071 af, Depth= 1.46"
Routed to Pond MH1 : DMH #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
4,206	98	Roofs, HSG B
856	55	Woods, Good, HSG B
20,185	61	>75% Grass cover, Good, HSG B
25,247	67	Weighted Average
21,041		83.34% Pervious Area
4,206		16.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0300	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
0.3	30	0.0667	1.81		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.3	65	0.0150	0.86		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
10.2	195	Total			

Summary for Reach CPP1: Wetland Limit - Control Point CP-P1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.566 ac, 20.20% Impervious, Inflow Depth = 1.82" for 10-Year event
Inflow = 3.63 cfs @ 12.43 hrs, Volume= 0.542 af
Outflow = 3.63 cfs @ 12.43 hrs, Volume= 0.542 af, Atten= 0%, Lag= 0.0 min
Routed to Pond BBp : Bradford Brook Storage

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Reach CPPtot: Post-Development Control Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 64.141 ac, 37.79% Impervious, Inflow Depth = 2.47" for 10-Year event
Inflow = 77.32 cfs @ 12.51 hrs, Volume= 13.209 af
Outflow = 77.32 cfs @ 12.51 hrs, Volume= 13.209 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Pond BBp: Bradford Brook Storage

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 64.141 ac, 37.79% Impervious, Inflow Depth = 2.47" for 10-Year event
Inflow = 128.26 cfs @ 12.23 hrs, Volume= 13.209 af
Outflow = 77.32 cfs @ 12.51 hrs, Volume= 13.209 af, Atten= 40%, Lag= 16.5 min
Primary = 77.32 cfs @ 12.51 hrs, Volume= 13.209 af
Routed to Reach CPPtot : Post-Development Control Point

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 128.88' @ 12.51 hrs Surf.Area= 99,732 sf Storage= 58,518 cf

Plug-Flow detention time= 4.0 min calculated for 13.205 af (100% of inflow)
Center-of-Mass det. time= 4.0 min (840.4 - 836.4)

Volume	Invert	Avail.Storage	Storage Description
#1	128.00'	1,340,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
128.00	38,300	2,000.0	0	0	38,300
129.00	110,500	3,200.0	71,285	71,285	534,870
130.00	169,500	3,000.0	138,952	210,237	633,595
131.00	226,500	3,700.0	197,313	407,550	1,006,828
132.00	285,200	3,600.0	255,287	662,837	1,065,034
133.00	338,000	3,400.0	311,227	974,063	1,176,498
134.00	395,500	3,300.0	366,374	1,340,437	1,229,920

Device	Routing	Invert	Outlet Devices
#1	Primary	124.86'	**42.0" W x 42.0" H, R=21.0" Arch Culvert** L= 42.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 124.86' / 123.79' S= 0.0255 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 10.94 sf

Primary OutFlow Max=77.32 cfs @ 12.51 hrs HW=128.88' TW=126.00' (Fixed TW Elev= 126.00')
↑—**1=Culvert** (Inlet Controls 77.32 cfs @ 7.07 fps)

Summary for Pond LLS1: Level Lip Spreader #1

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 2.13" for 10-Year event
Inflow = 1.13 cfs @ 12.53 hrs, Volume= 0.172 af
Outflow = 1.13 cfs @ 12.53 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.1 min
Primary = 1.13 cfs @ 12.53 hrs, Volume= 0.170 af
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 136.07' @ 12.53 hrs Surf.Area= 161 sf Storage= 113 cf

Plug-Flow detention time= 12.0 min calculated for 0.170 af (99% of inflow)
Center-of-Mass det. time= 3.7 min (891.5 - 887.8)

Volume	Invert	Avail.Storage	Storage Description
#1	135.00'	196 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.00	60	49.0	0	0	60
136.00	152	57.0	102	102	146
136.50	224	64.0	93	196	220

Device	Routing	Invert	Outlet Devices
#1	Primary	136.00'	**24.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.12 cfs @ 12.53 hrs HW=136.07' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 1.12 cfs @ 0.70 fps)

Summary for Pond LLS2: Level Lip Spreader #2

Inflow Area = 0.859 ac, 35.10% Impervious, Inflow Depth = 1.85" for 10-Year event
Inflow = 1.75 cfs @ 12.12 hrs, Volume= 0.132 af
Outflow = 1.75 cfs @ 12.12 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.1 min
Primary = 1.75 cfs @ 12.12 hrs, Volume= 0.130 af
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 133.90' @ 12.12 hrs Surf.Area= 154 sf Storage= 114 cf

Plug-Flow detention time= 12.9 min calculated for 0.130 af (98% of inflow)
Center-of-Mass det. time= 3.0 min (851.2 - 848.1)

Volume	Invert	Avail.Storage	Storage Description
#1	132.80'	180 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
132.80	56	48.0	0	0	56
133.80	148	56.0	98	98	140
134.30	178	60.0	81	180	187

Device	Routing	Invert	Outlet Devices
#1	Primary	133.80'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.74 cfs @ 12.12 hrs HW=133.90' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.74 cfs @ 0.86 fps)

Summary for Pond MH1: DMH #1

[57] Hint: Peaked at 136.00' (Flood elevation advised)

Inflow Area = 0.859 ac, 35.10% Impervious, Inflow Depth = 1.85" for 10-Year event
Inflow = 1.75 cfs @ 12.12 hrs, Volume= 0.132 af
Outflow = 1.75 cfs @ 12.12 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
Primary = 1.75 cfs @ 12.12 hrs, Volume= 0.132 af
Routed to Pond LLS2 : Level Lip Spreader #2

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 136.00' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.40'	**18.0" Round Culvert** L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.40' / 134.05' S= 0.0314 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.75 cfs @ 12.12 hrs HW=136.00' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.75 cfs @ 2.64 fps)

Summary for Pond SDS1: Subsurface Detention System #1

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 2.13" for 10-Year event
Inflow = 1.55 cfs @ 12.31 hrs, Volume= 0.172 af
Outflow = 1.13 cfs @ 12.53 hrs, Volume= 0.172 af, Atten= 28%, Lag= 13.5 min
Primary = 1.13 cfs @ 12.53 hrs, Volume= 0.172 af
Routed to Pond LLS1 : Level Lip Spreader #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Peak Elev= 137.65' @ 12.53 hrs Surf.Area= 2,151 sf Storage= 1,493 cf

Plug-Flow detention time= 35.5 min calculated for 0.172 af (100% of inflow)
Center-of-Mass det. time= 35.5 min (887.8 - 852.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.83'	731 cf	**31.67'W x 67.25'L x 2.51'H Field A** 5,342 cf Overall - 3,515 cf Embedded = 1,828 cf x 40.0% Voids
#2A	136.83'	3,339 cf	**ACO StormBrixx HD 1** x 224 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 224 Chambers in 14 Rows
#3	136.83'	25 cf	**18.0" Round 18" HDPE Outlet Pipe Storage** L= 14.0'
		4,095 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	136.75'	**15.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.75' / 136.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	136.75'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.10'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	138.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.13 cfs @ 12.53 hrs HW=137.64' (Free Discharge)
└**1=Culvert** (Passes 1.13 cfs of 2.98 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.36 cfs @ 4.11 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.77 cfs @ 2.51 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SIS2: Subsurface Infiltration System #2

Inflow Area = 0.279 ac, 73.38% Impervious, Inflow Depth = 3.20" for 10-Year event
Inflow = 1.07 cfs @ 12.07 hrs, Volume= 0.074 af
Outflow = 1.00 cfs @ 12.10 hrs, Volume= 0.067 af, Atten= 6%, Lag= 1.7 min
Discarded = 0.00 cfs @ 7.02 hrs, Volume= 0.006 af
Primary = 1.00 cfs @ 12.10 hrs, Volume= 0.061 af
Routed to Pond MH1 : DMH #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 138.16' @ 12.10 hrs Surf.Area= 424 sf Storage= 565 cf

Plug-Flow detention time= 102.4 min calculated for 0.067 af (90% of inflow)
Center-of-Mass det. time= 54.2 min (855.0 - 800.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.10'	352 cf	**35.63'W x 11.91'L x 3.26'H Field A** 1,382 cf Overall - 502 cf Embedded = 880 cf x 40.0% Voids
#2A	136.60'	477 cf	**ACO StormBrixx HD 1** x 32 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 32 Chambers in 16 Rows
		829 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	137.60'	**10.0" Round Culvert** L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.60' / 136.65' S= 0.0352 '/' Cc= 0.900 n= 0.012, Flow Area= 0.55 sf
#2	Discarded	136.10'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 7.02 hrs HW=136.13' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=1.00 cfs @ 12.10 hrs HW=138.16' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.00 cfs @ 2.55 fps)

Time span=0.00-32.00 hrs, dt=0.01 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment9S: View Ave Drainage Runoff Area=660,664 sf 22.54% Impervious Runoff Depth=3.73"
Flow Length=600' Tc=13.1 min CN=76 Runoff=52.83 cfs 4.711 af

Subcatchment10S: Industrial Drive Runoff Area=1,978,000 sf 44.26% Impervious Runoff Depth=4.36"
Flow Length=1,650' Tc=18.5 min CN=82 Runoff=160.14 cfs 16.486 af

SubcatchmentP-1: Overland runoff to Runoff Area=75,703 sf 0.00% Impervious Runoff Depth=3.13"
Flow Length=223' Tc=30.8 min CN=70 Runoff=3.54 cfs 0.453 af

SubcatchmentP-2: Southwestern Parking Runoff Area=12,163 sf 73.38% Impervious Runoff Depth=5.01"
Tc=5.0 min CN=88 Runoff=1.64 cfs 0.117 af

SubcatchmentP-3: Northern & Western Runoff Area=42,223 sf 43.23% Impervious Runoff Depth=3.73"
Flow Length=287' Tc=22.1 min CN=76 Runoff=2.74 cfs 0.301 af

SubcatchmentP-4: Offsite runoff from Runoff Area=25,247 sf 16.66% Impervious Runoff Depth=2.84"
Flow Length=195' Tc=10.2 min CN=67 Runoff=1.65 cfs 0.137 af

Reach CPP1: Wetland Limit - Control Point CP-P1 Inflow=6.65 cfs 0.989 af
Outflow=6.65 cfs 0.989 af

Reach CPPtot: Post-DevelopmentControl Point Inflow=92.39 cfs 22.187 af
Outflow=92.39 cfs 22.187 af

Pond BBp: Bradford Brook Storage Peak Elev=129.78' Storage=174,214 cf Inflow=214.83 cfs 22.187 af
42.0" x 42.0", R=21.0" Arch Culvert n=0.022 L=42.0' S=0.0255 '/' Outflow=92.39 cfs 22.187 af

Pond LLS1: Level Lip Spreader#1 Peak Elev=136.10' Storage=118 cf Inflow=1.91 cfs 0.301 af
Outflow=1.91 cfs 0.299 af

Pond LLS2: Level Lip Spreader#2 Peak Elev=133.95' Storage=121 cf Inflow=3.09 cfs 0.240 af
Outflow=3.09 cfs 0.238 af

Pond MH1: DMH #1 Peak Elev=136.23' Inflow=3.09 cfs 0.240 af
18.0" Round Culvert n=0.012 L=43.0' S=0.0314 '/' Outflow=3.09 cfs 0.240 af

Pond SDS1: Subsurface Detention System Peak Elev=138.17' Storage=2,449 cf Inflow=2.74 cfs 0.301 af
Outflow=1.91 cfs 0.301 af

Pond SIS2: Subsurface Infiltration System#2 Peak Elev=138.35' Storage=623 cf Inflow=1.64 cfs 0.117 af
Discarded=0.00 cfs 0.006 af Primary=1.53 cfs 0.103 af Outflow=1.53 cfs 0.109 af

Total Runoff Area = 64.141 ac Runoff Volume = 22.205 af Average Runoff Depth = 4.15"
62.21% Pervious = 39.906 ac 37.79% Impervious = 24.236 ac

Summary for Subcatchment 9S: View Ave Drainage Area (Proposed)

Runoff = 52.83 cfs @ 12.18 hrs, Volume= 4.711 af, Depth= 3.73"
Routed to Pond BBp : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.40"

Area (sf)	CN	Description
28,000	98	Paved roads w/curbs & sewers, HSG B
263,000	75	1/4 acre lots, 38% imp, HSG B
84,000	70	1/2 acre lots, 25% imp, HSG B
48,664	58	Woods/grass comb., Good, HSG B
237,000	79	Woods/grass comb., Good, HSG D
660,664	76	Weighted Average
511,724		77.46% Pervious Area
148,940		22.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	75	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.1	525	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.1	600	Total			

Summary for Subcatchment 10S: Industrial Drive Drainage Area

[47] Hint: Peak is 331% of capacity of segment #3

Runoff = 160.14 cfs @ 12.25 hrs, Volume= 16.486 af, Depth= 4.36"
Routed to Pond BBp : Bradford Brook Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.40"

	Area (sf)	CN	Description
	736,000	88	Urban industrial, 72% imp, HSG B
	72,000	98	Paved roads w/curbs & sewers, HSG B
*	278,000	82	Railroad, HSG B
	155,000	75	1/4 acre lots, 38% imp, HSG B
	55,000	70	1/2 acre lots, 25% imp, HSG B
	199,000	58	Woods/grass comb., Good, HSG B
	160,000	91	Urban industrial, 72% imp, HSG C
	22,000	98	Paved roads w/curbs & sewers, HSG C
	9,000	83	1/4 acre lots, 38% imp, HSG C
	199,000	72	Woods/grass comb., Good, HSG C
	60,000	93	Urban industrial, 72% imp, HSG D
	17,000	98	Paved roads w/curbs & sewers, HSG D
	16,000	79	Woods/grass comb., Good, HSG D
	1,978,000	82	Weighted Average
	1,102,610		55.74% Pervious Area
	875,390		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
5.1	650	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.1	900	0.0050	3.63	48.39	**Parabolic Channel,** W=20.00' D=1.00' Area=13.3 sf Perim=20.1' n= 0.022 Earth, clean & straight
18.5	1,650	Total			

Summary for Subcatchment P-1: Overland runoff to Wetland Limit

Runoff = 3.54 cfs @ 12.43 hrs, Volume= 0.453 af, Depth= 3.13"
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.40"

	Area (sf)	CN	Description
	37,021	77	Woods, Good, HSG D
	12,125	55	Woods, Good, HSG B
	17,581	61	>75% Grass cover, Good, HSG B
	7,936	80	>75% Grass cover, Good, HSG D
*	321	85	Riprap, HSG B
*	308	91	Riprap, HSG D
	271	85	Gravel roads, HSG B
	140	91	Gravel roads, HSG D
	75,703	70	Weighted Average
	75,703		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	28	0.3333	0.39		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
23.8	72	0.0347	0.05		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
5.8	123	0.0203	0.36		**Shallow Concentrated Flow, Woods** Forest w/Heavy Litter Kv= 2.5 fps
30.8	223	Total			

Summary for Subcatchment P-2: Southwestern Parking & Driveway & 5 Bldgs

Runoff = 1.64 cfs @ 12.07 hrs, Volume= 0.117 af, Depth= 5.01"
Routed to Pond SIS2 : Subsurface Infiltration System #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.40"

Area (sf)	CN	Description
5,915	98	Paved parking, HSG D
3,010	98	Roofs, HSG B
3,238	61	>75% Grass cover, Good, HSG B
12,163	88	Weighted Average
3,238		26.62% Pervious Area
8,925		73.38% Impervious Area

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

Summary for Subcatchment P-3: Northern & Western Parts of the Site

Runoff = 2.74 cfs @ 12.30 hrs, Volume= 0.301 af, Depth= 3.73"
Routed to Pond SDS1 : Subsurface Detention System #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.40"

Area (sf)	CN	Description
13,496	98	Unconnected pavement, HSG B
4,756	98	Roofs, HSG B
16,612	61	>75% Grass cover, Good, HSG B
7,310	55	Woods, Good, HSG B
49	85	Gravel roads, HSG B
42,223	76	Weighted Average
23,971		56.77% Pervious Area
18,252		43.23% Impervious Area
13,496		73.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	52	0.0200	0.14		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
14.1	40	0.0100	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	64	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.2	41	0.0200	2.87		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.3	90	0.0100	5.90	88.54	**Trap/Vee/Rect Channel Flow, Gutter Flow** Bot.W=20.00' D=0.50' Z= 0.1 & 40.0 '/' Top.W=40.05' n= 0.013 Asphalt, smooth
22.1	287	Total			

Summary for Subcatchment P-4: Offsite runoff from southwest abutter

Runoff = 1.65 cfs @ 12.15 hrs, Volume= 0.137 af, Depth= 2.84"
Routed to Pond MH1 : DMH #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.40"

Area (sf)	CN	Description
4,206	98	Roofs, HSG B
856	55	Woods, Good, HSG B
20,185	61	>75% Grass cover, Good, HSG B
25,247	67	Weighted Average
21,041		83.34% Pervious Area
4,206		16.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0300	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.00"
0.3	30	0.0667	1.81		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.3	65	0.0150	0.86		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
10.2	195	Total			

Summary for Reach CPP1: Wetland Limit - Control Point CP-P1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.566 ac, 20.20% Impervious, Inflow Depth = 3.33" for 100-Year event
Inflow = 6.65 cfs @ 12.40 hrs, Volume= 0.989 af
Outflow = 6.65 cfs @ 12.40 hrs, Volume= 0.989 af, Atten= 0%, Lag= 0.0 min
Routed to Pond BBp : Bradford Brook Storage

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Reach CPPtot: Post-Development Control Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 64.141 ac, 37.79% Impervious, Inflow Depth = 4.15" for 100-Year event
Inflow = 92.39 cfs @ 12.61 hrs, Volume= 22.187 af
Outflow = 92.39 cfs @ 12.61 hrs, Volume= 22.187 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Pond BBp: Bradford Brook Storage

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 64.141 ac, 37.79% Impervious, Inflow Depth = 4.15" for 100-Year event
Inflow = 214.83 cfs @ 12.23 hrs, Volume= 22.187 af
Outflow = 92.39 cfs @ 12.61 hrs, Volume= 22.187 af, Atten= 57%, Lag= 22.9 min
Primary = 92.39 cfs @ 12.61 hrs, Volume= 22.187 af
Routed to Reach CPPtot : Post-Development Control Point

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 129.78' @ 12.61 hrs Surf.Area= 155,324 sf Storage= 174,214 cf

Plug-Flow detention time= 10.8 min calculated for 22.180 af (100% of inflow)
Center-of-Mass det. time= 10.8 min (832.6 - 821.8)

Volume	Invert	Avail.Storage	Storage Description
#1	128.00'	1,340,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
128.00	38,300	2,000.0	0	0	38,300
129.00	110,500	3,200.0	71,285	71,285	534,870
130.00	169,500	3,000.0	138,952	210,237	633,595
131.00	226,500	3,700.0	197,313	407,550	1,006,828
132.00	285,200	3,600.0	255,287	662,837	1,065,034
133.00	338,000	3,400.0	311,227	974,063	1,176,498
134.00	395,500	3,300.0	366,374	1,340,437	1,229,920

Device	Routing	Invert	Outlet Devices
#1	Primary	124.86'	**42.0" W x 42.0" H, R=21.0" Arch Culvert** L= 42.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 124.86' / 123.79' S= 0.0255 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 10.94 sf

Primary OutFlow Max=92.39 cfs @ 12.61 hrs HW=129.78' TW=126.00' (Fixed TW Elev= 126.00')
↑—**1=Culvert** (Inlet Controls 92.39 cfs @ 8.45 fps)

Summary for Pond LLS1: Level Lip Spreader #1

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 3.73" for 100-Year event
Inflow = 1.91 cfs @ 12.53 hrs, Volume= 0.301 af
Outflow = 1.91 cfs @ 12.54 hrs, Volume= 0.299 af, Atten= 0%, Lag= 0.1 min
Primary = 1.91 cfs @ 12.54 hrs, Volume= 0.299 af
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 136.10' @ 12.54 hrs Surf.Area= 165 sf Storage= 118 cf

Plug-Flow detention time= 7.7 min calculated for 0.299 af (99% of inflow)
Center-of-Mass det. time= 2.7 min (871.1 - 868.4)

Volume	Invert	Avail.Storage	Storage Description
#1	135.00'	196 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.00	60	49.0	0	0	60
136.00	152	57.0	102	102	146
136.50	224	64.0	93	196	220

Device	Routing	Invert	Outlet Devices
#1	Primary	136.00'	**24.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.91 cfs @ 12.54 hrs HW=136.10' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 1.91 cfs @ 0.83 fps)

Summary for Pond LLS2: Level Lip Spreader #2

Inflow Area = 0.859 ac, 35.10% Impervious, Inflow Depth = 3.36" for 100-Year event
Inflow = 3.09 cfs @ 12.12 hrs, Volume= 0.240 af
Outflow = 3.09 cfs @ 12.12 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.1 min
Primary = 3.09 cfs @ 12.12 hrs, Volume= 0.238 af
Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 133.95' @ 12.12 hrs Surf.Area= 157 sf Storage= 121 cf

Plug-Flow detention time= 7.9 min calculated for 0.238 af (99% of inflow)
Center-of-Mass det. time= 2.2 min (834.0 - 831.8)

Volume	Invert	Avail.Storage	Storage Description
#1	132.80'	180 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
132.80	56	48.0	0	0	56
133.80	148	56.0	98	98	140
134.30	178	60.0	81	180	187

Device	Routing	Invert	Outlet Devices
#1	Primary	133.80'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=3.09 cfs @ 12.12 hrs HW=133.95' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 3.09 cfs @ 1.04 fps)

Summary for Pond MH1: DMH #1

[57] Hint: Peaked at 136.23' (Flood elevation advised)

Inflow Area = 0.859 ac, 35.10% Impervious, Inflow Depth = 3.36" for 100-Year event
Inflow = 3.09 cfs @ 12.12 hrs, Volume= 0.240 af
Outflow = 3.09 cfs @ 12.12 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.0 min
Primary = 3.09 cfs @ 12.12 hrs, Volume= 0.240 af
Routed to Pond LLS2 : Level Lip Spreader #2

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 136.23' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.40'	**18.0" Round Culvert** L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.40' / 134.05' S= 0.0314 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.09 cfs @ 12.12 hrs HW=136.23' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 3.09 cfs @ 3.10 fps)

Summary for Pond SDS1: Subsurface Detention System #1

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 3.73" for 100-Year event
Inflow = 2.74 cfs @ 12.30 hrs, Volume= 0.301 af
Outflow = 1.91 cfs @ 12.53 hrs, Volume= 0.301 af, Atten= 30%, Lag= 13.9 min
Primary = 1.91 cfs @ 12.53 hrs, Volume= 0.301 af
Routed to Pond LLS1 : Level Lip Spreader #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Peak Elev= 138.17' @ 12.53 hrs Surf.Area= 2,143 sf Storage= 2,449 cf

Plug-Flow detention time= 32.3 min calculated for 0.301 af (100% of inflow)
Center-of-Mass det. time= 32.3 min (868.4 - 836.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.83'	731 cf	**31.67'W x 67.25'L x 2.51'H Field A** 5,342 cf Overall - 3,515 cf Embedded = 1,828 cf x 40.0% Voids
#2A	136.83'	3,339 cf	**ACO StormBrixx HD 1** x 224 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 224 Chambers in 14 Rows
#3	136.83'	25 cf	**18.0" Round 18" HDPE Outlet Pipe Storage** L= 14.0'
		4,095 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	136.75'	**15.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.75' / 136.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	136.75'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.10'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	138.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.91 cfs @ 12.53 hrs HW=138.17' (Free Discharge)
↑**1=Culvert** (Passes 1.91 cfs of 5.26 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.47 cfs @ 5.38 fps)
3=Orifice/Grate (Orifice Controls 1.44 cfs @ 4.12 fps)
4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond SIS2: Subsurface Infiltration System #2

Inflow Area = 0.279 ac, 73.38% Impervious, Inflow Depth = 5.01" for 100-Year event
Inflow = 1.64 cfs @ 12.07 hrs, Volume= 0.117 af
Outflow = 1.53 cfs @ 12.10 hrs, Volume= 0.109 af, Atten= 6%, Lag= 1.7 min
Discarded = 0.00 cfs @ 5.44 hrs, Volume= 0.006 af
Primary = 1.53 cfs @ 12.10 hrs, Volume= 0.103 af
Routed to Pond MH1 : DMH #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
Peak Elev= 138.35' @ 12.10 hrs Surf.Area= 424 sf Storage= 623 cf

Plug-Flow detention time= 75.0 min calculated for 0.109 af (94% of inflow)
Center-of-Mass det. time= 40.8 min (829.1 - 788.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.10'	352 cf	**35.63'W x 11.91'L x 3.26'H Field A** 1,382 cf Overall - 502 cf Embedded = 880 cf x 40.0% Voids
#2A	136.60'	477 cf	**ACO StormBrixx HD 1** x 32 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 32 Chambers in 16 Rows
		829 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	137.60'	**10.0" Round Culvert** L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.60' / 136.65' S= 0.0352 '/' Cc= 0.900 n= 0.012, Flow Area= 0.55 sf
#2	Discarded	136.10'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 5.44 hrs HW=136.13' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=1.53 cfs @ 12.10 hrs HW=138.35' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.53 cfs @ 2.95 fps)

Commonwealth of Massachusetts
City/Town of Northampton
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: #3 (2.25.2025) Additional Hole

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-9"	Ap	10 YR 3.2				FSL					LOAM
9-16"	Bw	2.5 Y4.2				VFS					
16-108"	C	2.5 y 4.2	16"	7.5 R 5.8	10	FS			Gran.	LOOSE	
				2.5 Y 4.1							
			SEEPS	36"		STATIC	42"				

Additional Notes:

View Ave - SIS#2 - Rev 3/21/2025

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

use consistent units (e.g. feet & days **or** inches & hours)

Conversion Table

inch/hour	feet/day
0.67	1.33
2.00	4.00

hours	days
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

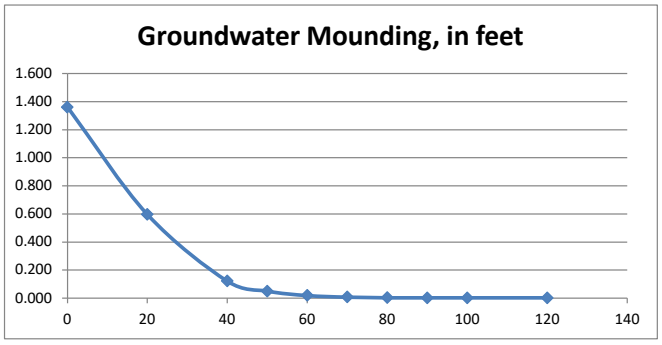
Input Values

0.5400	***R***	**Recharge (infiltration) rate (feet/day)**
0.200	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**
5.40	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***
13.860	**x**	**1/2 length of basin (x direction, in feet)**
9.900	**y**	**1/2 width of basin (y direction, in feet)**
1.700	**t**	**duration of infiltration period (days)**
7.670	**hi(0)**	**initial thickness of saturated zone (feet)**

9.031	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
1.361	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
1.361	0
0.597	20
0.122	40
0.050	50
0.019	60
0.007	70
0.003	80
0.002	90
0.002	100
0.002	120

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.