



**STORMWATER CALCULATIONS-
PHASE II & III**

**November 28, 2018
Revised April 4, 2019
Revised May 26, 2021**



Bay Pointe Club • Wareham • Massachusetts

**Definitive Plan Submission
Bay Pointe Mixed-Use Development Project**

Prepared For:

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501 Wampanoag Trail, Suite 400
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Prepared By:

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Storm Water Management-Phase II & III

The storm water management system selected is best suited to the site and provides the least disturbance of the site while recharging the aquifer. The system is sized to mitigate the effects of increased runoff typically resulting from development of a site. The storm water management system consists of the collection of overland runoff into a closed piping systems and transport to various infiltration basins on site. The drainage system is designed to offset increased storm flows and provide water quality in accordance with the regulations of both state and local authorities. This drainage system is intended to mitigate increased runoff generated from new construction so the downstream wetlands, water bodies, and neighboring homes will not be impacted. The drainage system will completely control post development peak flows and provide for total suspended solids (TSS) removal at the maximum possible rate.

The proposed storm water management system consists of the collection of runoff into area catch basins where it is transported within a closed pipe system to its eventual discharge location. Specifically, this design includes two main piping systems which each discharge storm water runoff to a HydroGuard Water Quality unit, then to its corresponding infiltration basin. Additionally, newly graded lawn areas and existing woodland area drain uncontrolled to the two basins.

The Pre Development watershed area consists of three sub-areas, "3", "4" and "5". Pre Area 3 encompasses 11.88 acres and generates 21.08 cfs of runoff during the 100-year storm event. Pre Area 4 includes 6.19 acres and generates 0.72 cfs of runoff during the 100-year storm event. Pre Area 5 contains 19.76 acres and has a 100-year storm flow of 3.49 cfs.

Under Post Development Conditions, for phase II & III the site has been divided into two sub-watershed areas containing a total of twenty-three and 69/100 (23.69) acres, labeled, "Infiltration Basin 4" and "Infiltration Basin 5", herein referred to as Basin 4 and Basin 5, respectively. The watershed areas consist of partially wooded areas and well-maintained grass fairways, lawns and portions of road/driveways and roof area.

Stormwater Calculations – Phase II
 Bay Pointe Club Mixed-Use Development Project
 Wareham, MA
 November 28, 2018
 Revised 4-4-19, Revised 5-26-21

The following table summarizes the results of the inflow analysis for the two sub-watershed areas under post development conditions:

WATERSHED	2-YEAR STORM	10-YEAR STORM	25-YEAR STORM	100-YEAR STORM
Infiltration Basin 4	0.30 CFS	1.62 CFS	3.04 CFS	5.68 CFS
Infiltration Basin 5	1.22 CFS	7.61 CFS	15.61 CFS	31.44 CFS

The following table summarizes the results of the discarded (infiltrated) flows from the four infiltration systems under post development conditions:

BASIN/POND	2-YEAR STORM	10-YEAR STORM	25-YEAR STORM	100-YEAR STORM
BASIN 4	0.13 CFS	0.29 CFS	0.41 CFS	0.61 CFS
BASIN 5	1.11 CFS	1.73 CFS	2.11 CFS	2.80 CFS

The drainage collection system proposed takes full advantage of the natural slopes and contours of the site and utilize the existing course sandy subsoil parent material. It provides for both peak storm flow mitigation and sediment removal. Also, additional water quality and sediment removal will be achieved through the installation and maintenance of the HydroGuard Water Quality units proposed for the development. By reducing post-development storm water flows, the primary goal of the proposed drainage system is achieved. Any potential impacts from the proposed development on the abutting properties have been mitigated.



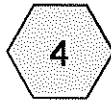
Stormwater Calculations – Phase II
Bay Pointe Club Mixed-Use Development Project
Wareham, MA
November 28, 2018
Revised 4-4-19, Revised 5-26-21

HYDROCAD CALCULATIONS





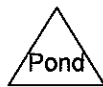
PRE 3



PRE 4



PRE 5



Routing Diagram for Baypointe Phase II & III- PRE 5-26-21
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Baypointe Phase II & III- PRE 5-26-21

Type III 24-hr 2-Year Rainfall=3.40"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 3: PRE 3

Runoff Area=517,601 sf 27.78% Impervious Runoff Depth=0.28"
Flow Length=972' Tc=11.9 min CN=54 Runoff=1.36 cfs 0.279 af

Subcatchment 4: PRE 4

Runoff Area=269,455 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=965' Tc=21.2 min CN=34 Runoff=0.00 cfs 0.000 af

Subcatchment 5: PRE 5

Runoff Area=860,900 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,181' Tc=12.0 min CN=35 Runoff=0.00 cfs 0.000 af

Total Runoff Area = 37.832 ac Runoff Volume = 0.279 af Average Runoff Depth = 0.09"
91.27% Pervious = 34.531 ac 8.73% Impervious = 3.301 ac

Summary for Subcatchment 3: PRE 3

Runoff = 1.36 cfs @ 12.41 hrs, Volume= 0.279 af, Depth= 0.28"

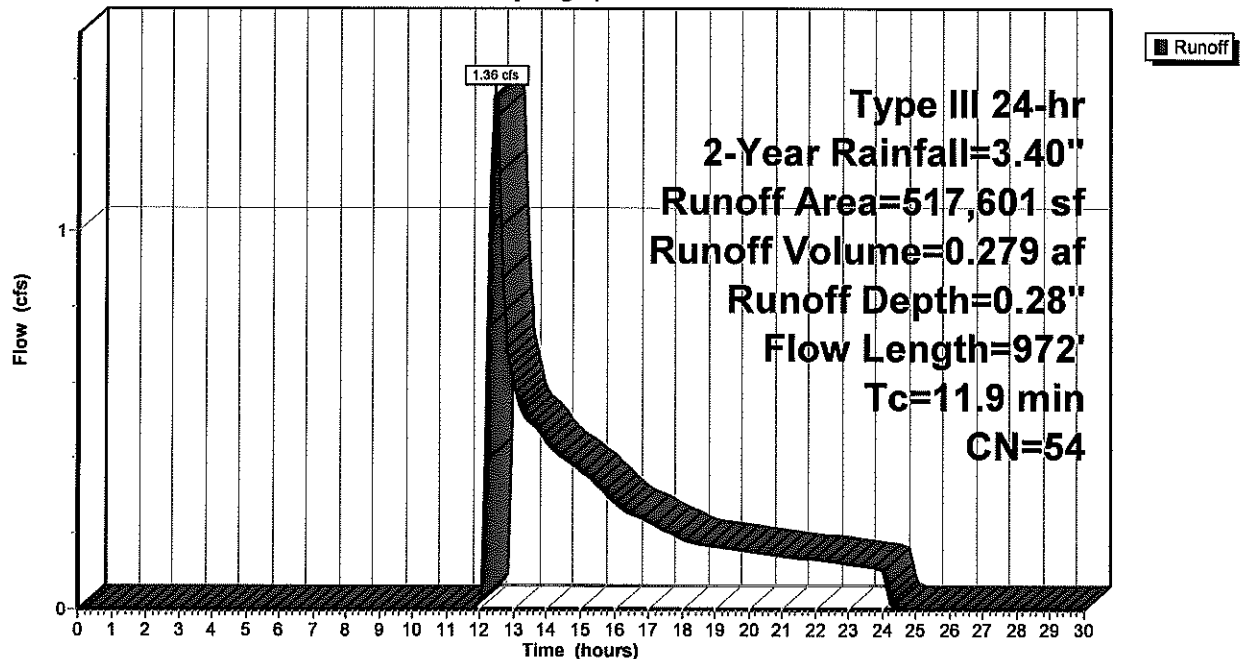
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
73,403	30	Woods, Good, HSG A
300,391	39	>75% Grass cover, Good, HSG A
* 134,417	98	Roads/Driveways/SWalk
* 9,390	98	Existing Roofs
517,601	54	Weighted Average
373,794		72.22% Pervious Area
143,807		27.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0520	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
1.0	97	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	775	0.0200	10.18	31.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
11.9	972	Total			

Subcatchment 3: PRE 3

Hydrograph



Summary for Subcatchment 4: PRE 4

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

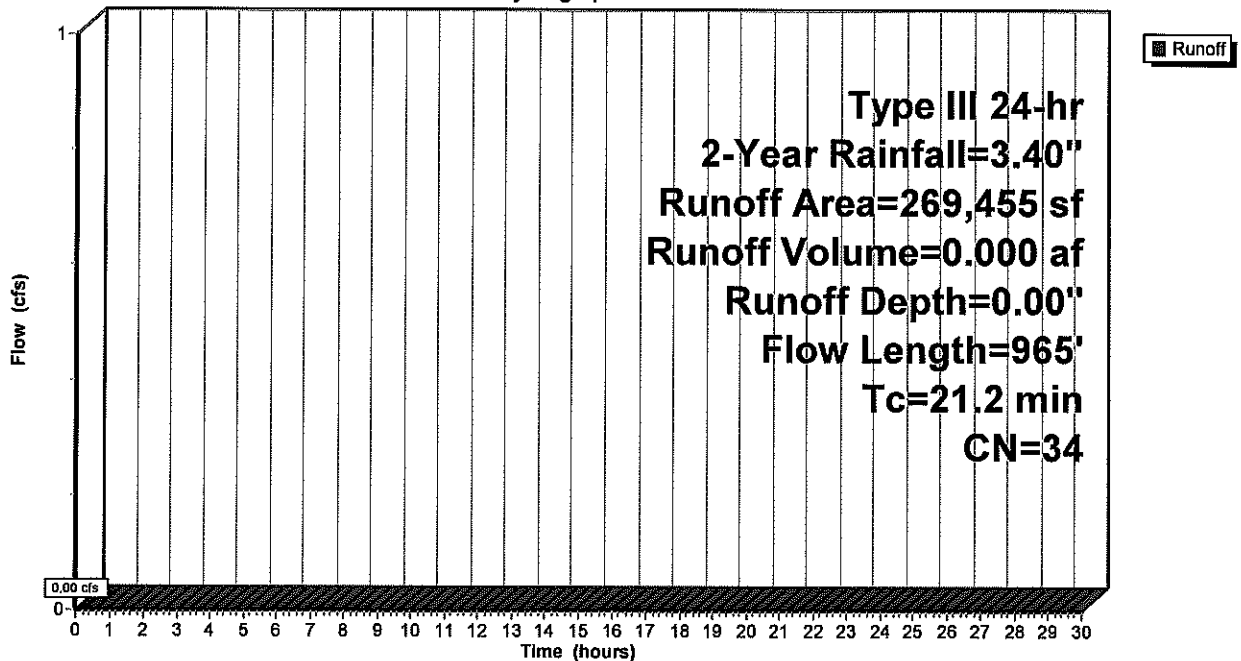
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
170,065	30	Woods, Good, HSG A
91,640	39	>75% Grass cover, Good, HSG A
7,750	76	Gravel roads, HSG A
269,455	34	Weighted Average
269,455		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.1	43	0.0900	4.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.6	61	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.0	761	0.0200	6.42	5.04	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
21.2	965	Total			

Subcatchment 4: PRE 4

Hydrograph



Summary for Subcatchment 5: PRE 5

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

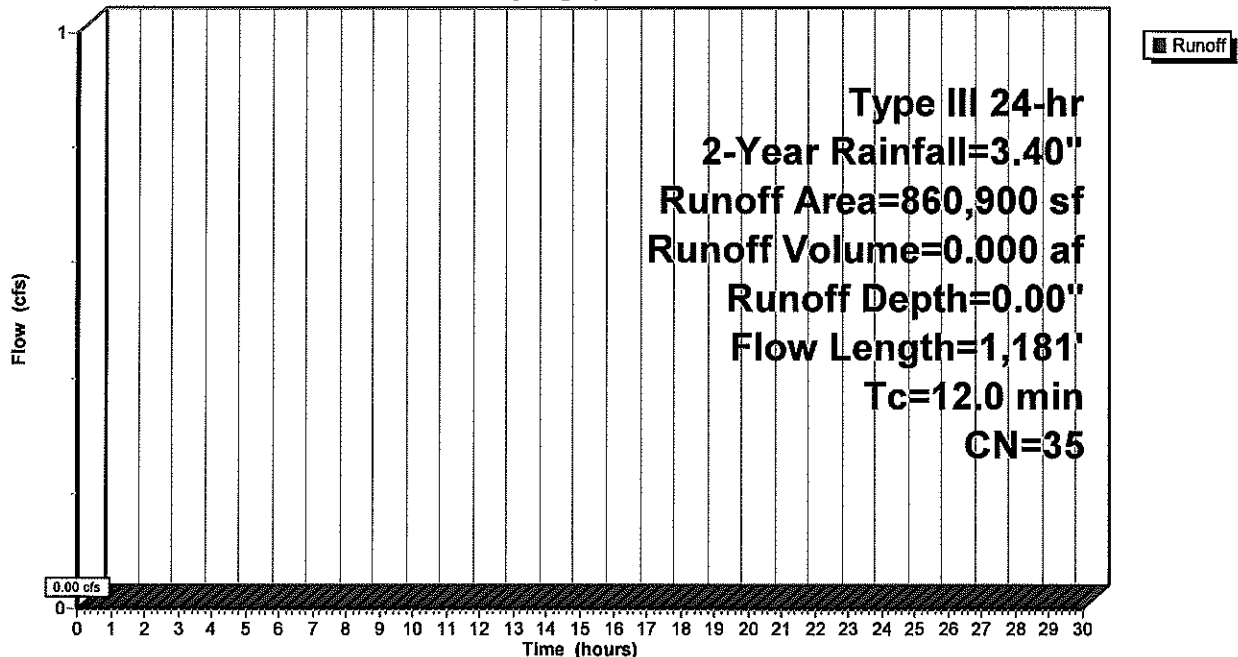
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
523,400	30	Woods, Good, HSG A
311,900	39	>75% Grass cover, Good, HSG A
25,600	76	Gravel roads, HSG A
860,900	35	Weighted Average
860,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.1100	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
3.9	754	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	49	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	278	0.0200	8.41	14.86	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
12.0	1,181	Total			

Subcatchment 5: PRE 5

Hydrograph



Baypointe Phase II & III- PRE 5-26-21

Type III 24-hr 10-Year Rainfall=4.70"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 3: PRE 3

Runoff Area=517,601 sf 27.78% Impervious Runoff Depth=0.78"
Flow Length=972' Tc=11.9 min CN=54 Runoff=6.36 cfs 0.772 af

Subcatchment 4: PRE 4

Runoff Area=269,455 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=965' Tc=21.2 min CN=34 Runoff=0.02 cfs 0.017 af

Subcatchment 5: PRE 5

Runoff Area=860,900 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=1,181' Tc=12.0 min CN=35 Runoff=0.12 cfs 0.082 af

Total Runoff Area = 37.832 ac Runoff Volume = 0.871 af Average Runoff Depth = 0.28"
91.27% Pervious = 34.531 ac 8.73% Impervious = 3.301 ac

Summary for Subcatchment 3: PRE 3

Runoff = 6.36 cfs @ 12.22 hrs, Volume= 0.772 af, Depth= 0.78"

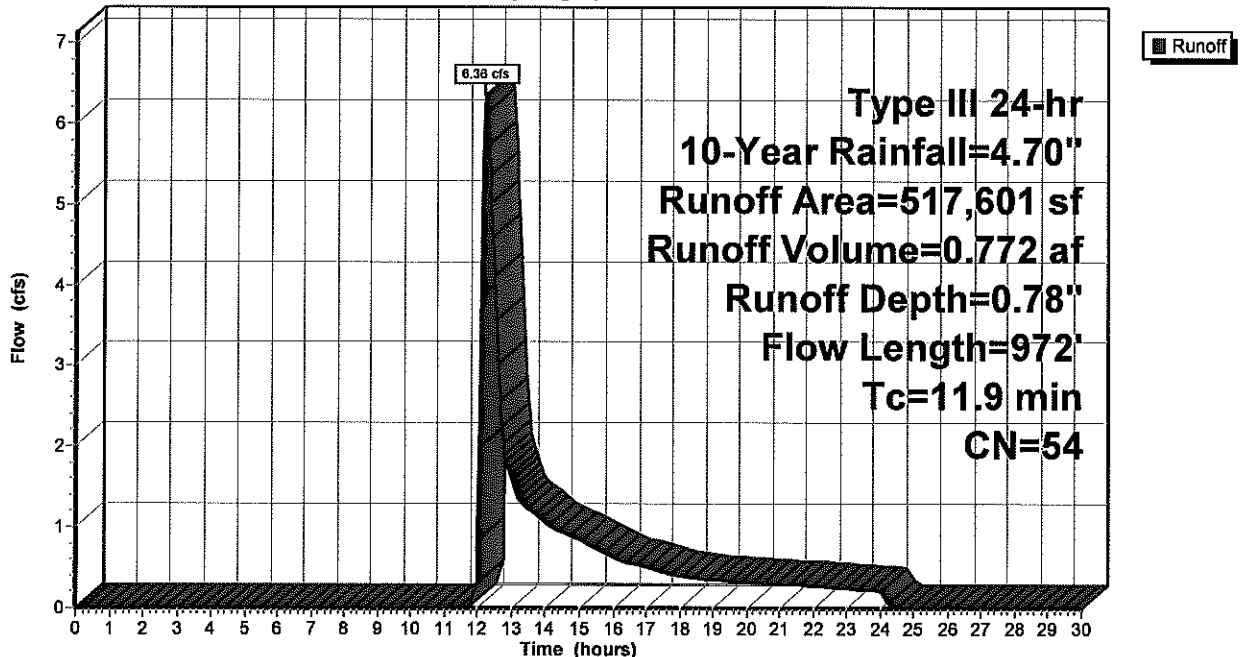
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
73,403	30	Woods, Good, HSG A
300,391	39	>75% Grass cover, Good, HSG A
* 134,417	98	Roads/Driveways/SWalk
* 9,390	98	Existing Roofs
517,601	54	Weighted Average
373,794		72.22% Pervious Area
143,807		27.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0520	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
1.0	97	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	775	0.0200	10.18	31.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
11.9	972	Total			

Subcatchment 3: PRE 3

Hydrograph



Summary for Subcatchment 4: PRE 4

Runoff = 0.02 cfs @ 17.36 hrs, Volume= 0.017 af, Depth= 0.03"

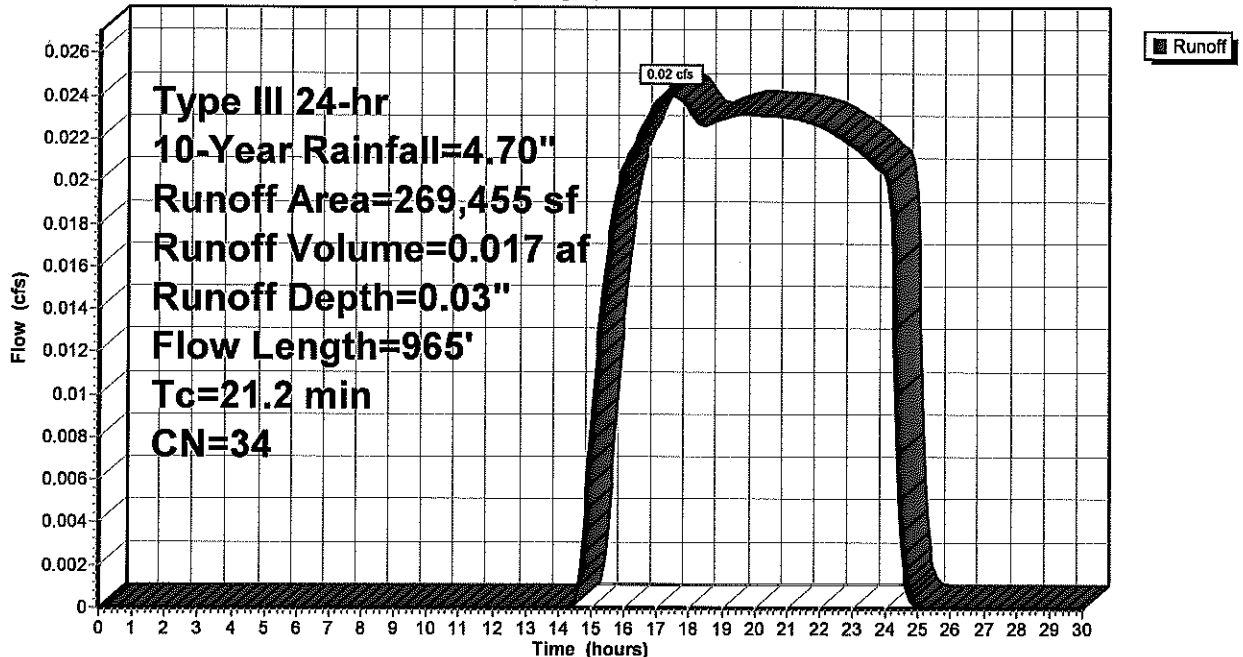
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
170,065	30	Woods, Good, HSG A
91,640	39	>75% Grass cover, Good, HSG A
7,750	76	Gravel roads, HSG A
269,455	34	Weighted Average
269,455		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.1	43	0.0900	4.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.6	61	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.0	761	0.0200	6.42	5.04	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
21.2	965	Total			

Subcatchment 4: PRE 4

Hydrograph



Summary for Subcatchment 5: PRE 5

Runoff = 0.12 cfs @ 15.73 hrs, Volume= 0.082 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

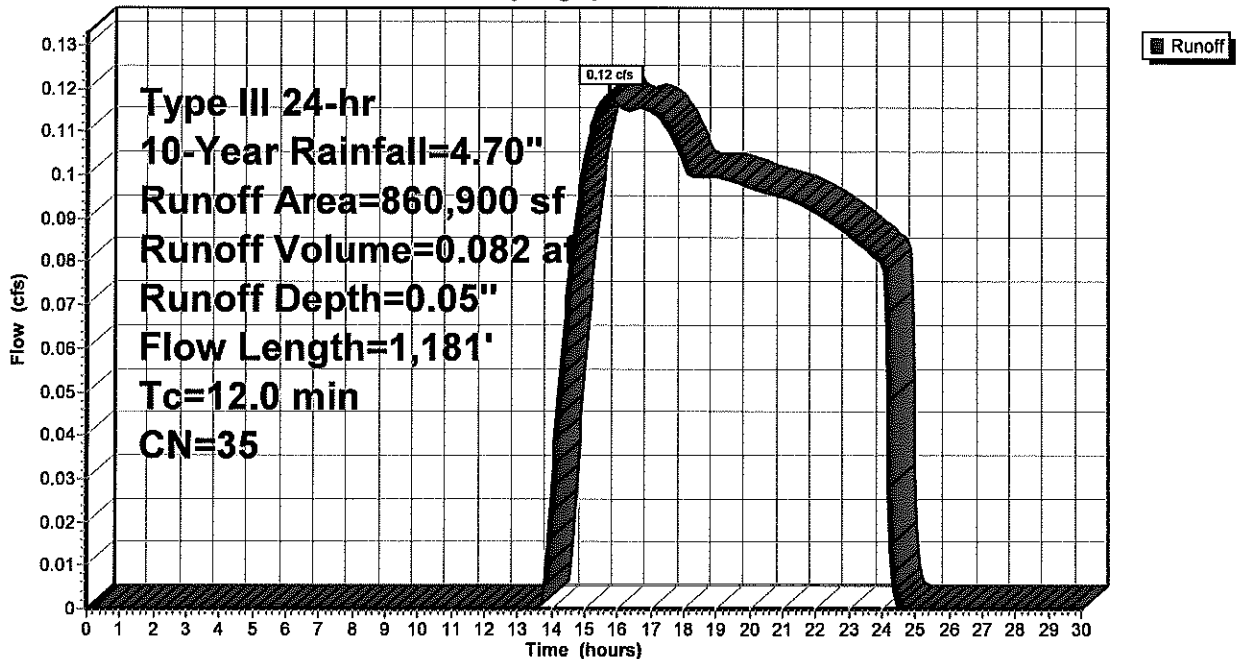
Area (sf)	CN	Description
523,400	30	Woods, Good, HSG A
311,900	39	>75% Grass cover, Good, HSG A
25,600	76	Gravel roads, HSG A
860,900	35	Weighted Average
860,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.1100	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
3.9	754	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	49	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	278	0.0200	8.41	14.86	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013

12.0 1,181 Total

Subcatchment 5: PRE 5

Hydrograph



Baypointe Phase II & III- PRE 5-26-21

Type III 24-hr 25-Year Rainfall=5.60"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 3: PRE 3

Runoff Area=517,601 sf 27.78% Impervious Runoff Depth=1.22"
Flow Length=972' Tc=11.9 min CN=54 Runoff=11.55 cfs 1.211 af

Subcatchment 4: PRE 4

Runoff Area=269,455 sf 0.00% Impervious Runoff Depth=0.14"
Flow Length=965' Tc=21.2 min CN=34 Runoff=0.12 cfs 0.072 af

Subcatchment 5: PRE 5

Runoff Area=860,900 sf 0.00% Impervious Runoff Depth=0.17"
Flow Length=1,181' Tc=12.0 min CN=35 Runoff=0.47 cfs 0.286 af

Total Runoff Area = 37.832 ac Runoff Volume = 1.569 af Average Runoff Depth = 0.50"
91.27% Pervious = 34.531 ac 8.73% Impervious = 3.301 ac

Summary for Subcatchment 3: PRE 3

Runoff = 11.55 cfs @ 12.20 hrs, Volume= 1.211 af, Depth= 1.22"

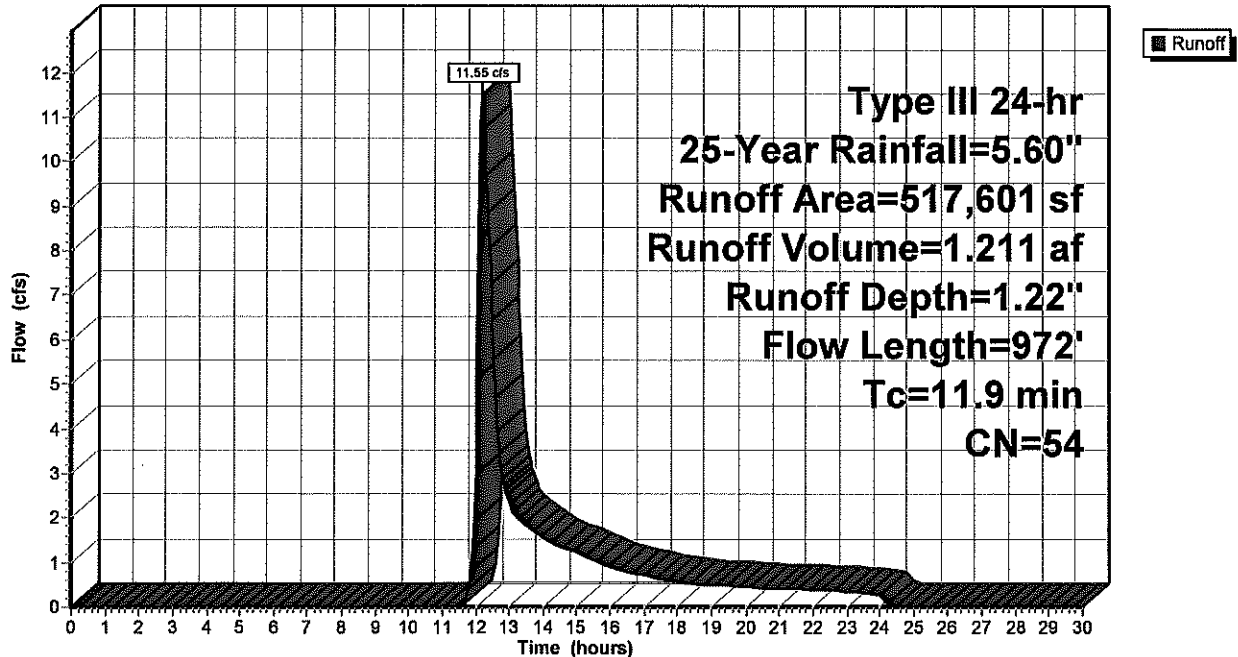
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
73,403	30	Woods, Good, HSG A
300,391	39	>75% Grass cover, Good, HSG A
* 134,417	98	Roads/Driveways/SWalk
* 9,390	98	Existing Roofs
517,601	54	Weighted Average
373,794		72.22% Pervious Area
143,807		27.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0520	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
1.0	97	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	775	0.0200	10.18	31.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
11.9	972	Total			

Subcatchment 3: PRE 3

Hydrograph



Baypointe Phase II & III- PRE 5-26-21

Type III 24-hr 25-Year Rainfall=5.60"

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Summary for Subcatchment 4: PRE 4

Runoff = 0.12 cfs @ 14.92 hrs, Volume= 0.072 af, Depth= 0.14"

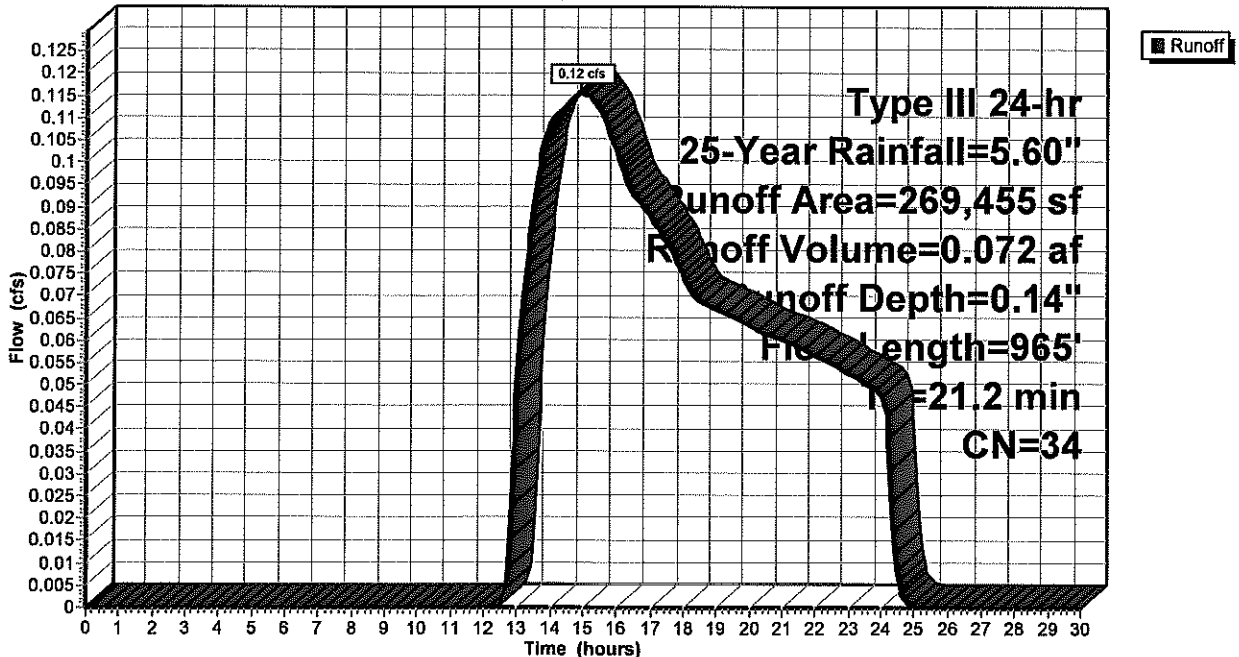
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
170,065	30	Woods, Good, HSG A
91,640	39	>75% Grass cover, Good, HSG A
7,750	76	Gravel roads, HSG A
269,455	34	Weighted Average
269,455		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.1	43	0.0900	4.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.6	61	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.0	761	0.0200	6.42	5.04	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
21.2	965	Total			

Subcatchment 4: PRE 4

Hydrograph



Summary for Subcatchment 5: PRE 5

Runoff = 0.47 cfs @ 13.84 hrs, Volume= 0.286 af, Depth= 0.17"

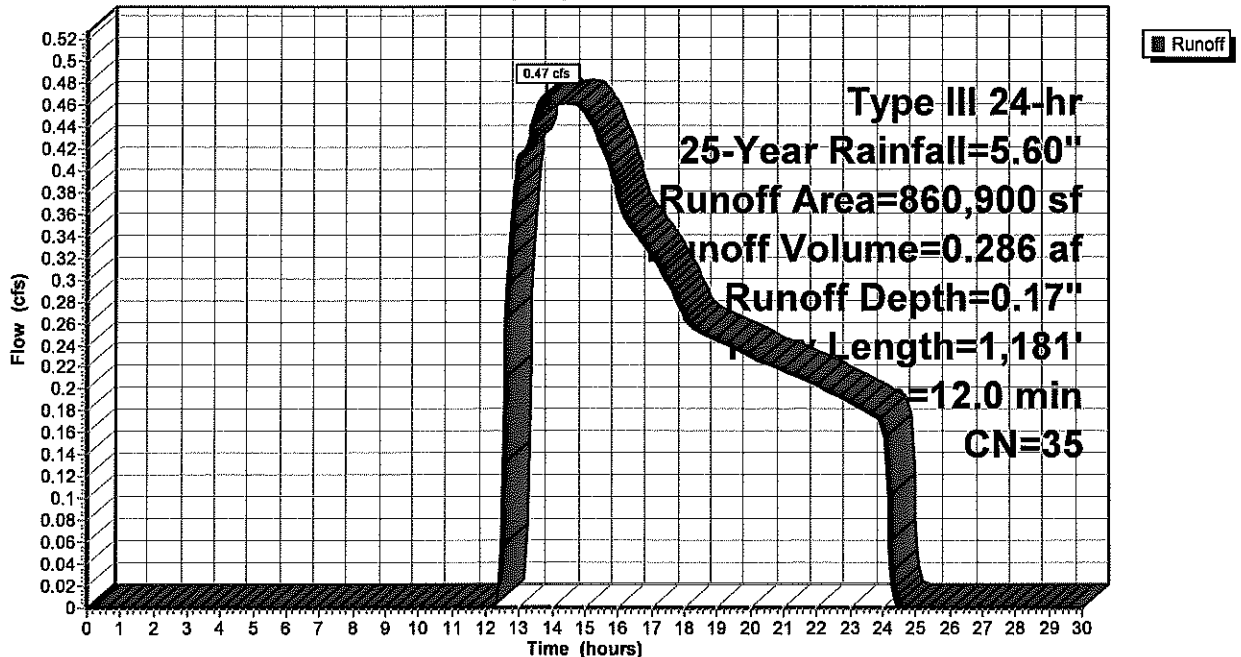
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
523,400	30	Woods, Good, HSG A
311,900	39	>75% Grass cover, Good, HSG A
25,600	76	Gravel roads, HSG A
860,900	35	Weighted Average
860,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.1100	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
3.9	754	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	49	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	278	0.0200	8.41	14.86	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
12.0	1,181	Total			

Subcatchment 5: PRE 5

Hydrograph



Baypointe Phase II & III- PRE 5-26-21

Type III 24-hr 100-Year Rainfall=7.00"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 3: PRE 3

Runoff Area=517,601 sf 27.78% Impervious Runoff Depth=2.03"
Flow Length=972' Tc=11.9 min CN=54 Runoff=21.08 cfs 2.011 af

Subcatchment 4: PRE 4

Runoff Area=269,455 sf 0.00% Impervious Runoff Depth=0.43"
Flow Length=965' Tc=21.2 min CN=34 Runoff=0.72 cfs 0.222 af

Subcatchment 5: PRE 5

Runoff Area=860,900 sf 0.00% Impervious Runoff Depth=0.49"
Flow Length=1,181' Tc=12.0 min CN=35 Runoff=3.49 cfs 0.813 af

Total Runoff Area = 37.832 ac Runoff Volume = 3.046 af Average Runoff Depth = 0.97"
91.27% Pervious = 34.531 ac 8.73% Impervious = 3.301 ac

Summary for Subcatchment 3: PRE 3

Runoff = 21.08 cfs @ 12.18 hrs, Volume= 2.011 af, Depth= 2.03"

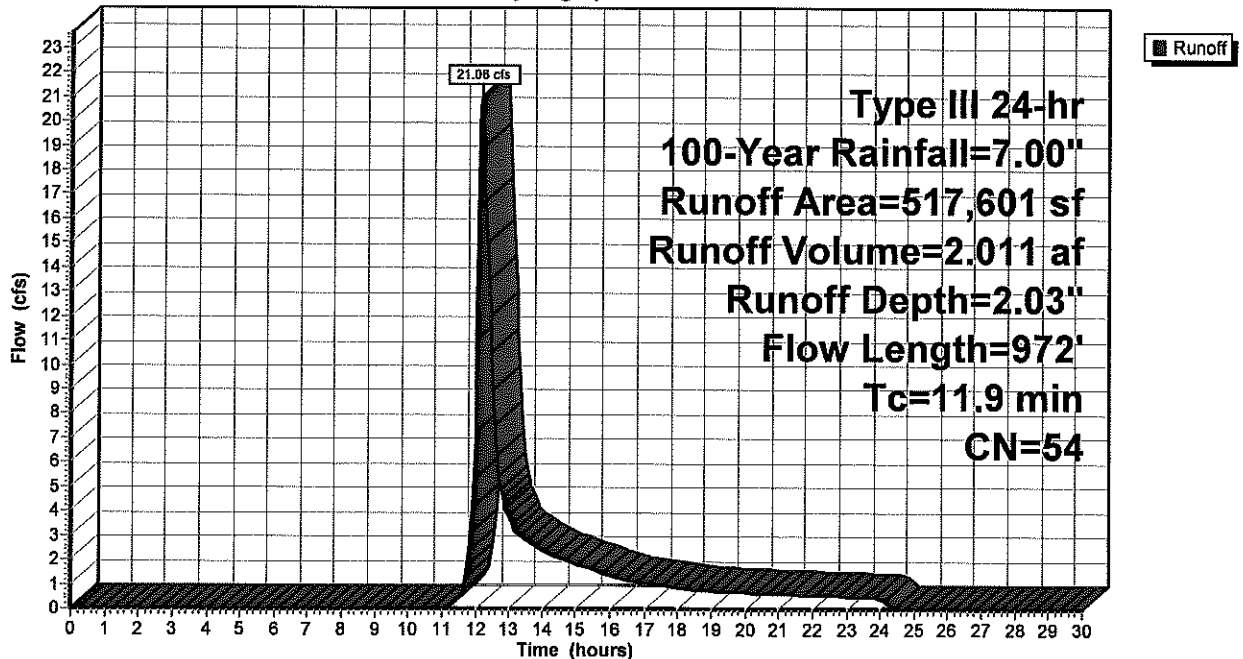
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
73,403	30	Woods, Good, HSG A
300,391	39	>75% Grass cover, Good, HSG A
* 134,417	98	Roads/Driveways/SWalk
* 9,390	98	Existing Roofs
517,601	54	Weighted Average
373,794		72.22% Pervious Area
143,807		27.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0520	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
1.0	97	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	775	0.0200	10.18	31.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
11.9	972	Total			

Subcatchment 3: PRE 3

Hydrograph



Summary for Subcatchment 4: PRE 4

Runoff = 0.72 cfs @ 12.61 hrs, Volume= 0.222 af, Depth= 0.43"

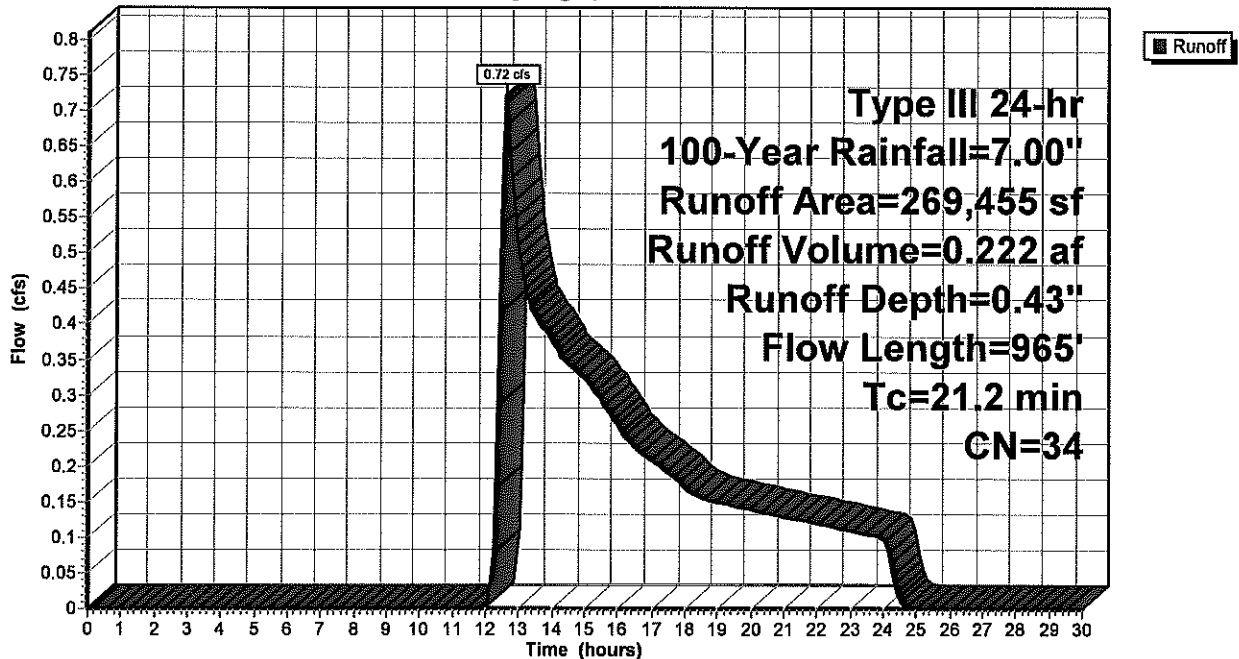
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
170,065	30	Woods, Good, HSG A
91,640	39	>75% Grass cover, Good, HSG A
7,750	76	Gravel roads, HSG A
269,455	34	Weighted Average
269,455		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.1	43	0.0900	4.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.6	61	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.0	761	0.0200	6.42	5.04	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
21.2	965	Total			

Subcatchment 4: PRE 4

Hydrograph



Summary for Subcatchment 5: PRE 5

Runoff = 3.49 cfs @ 12.45 hrs, Volume= 0.813 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.00"

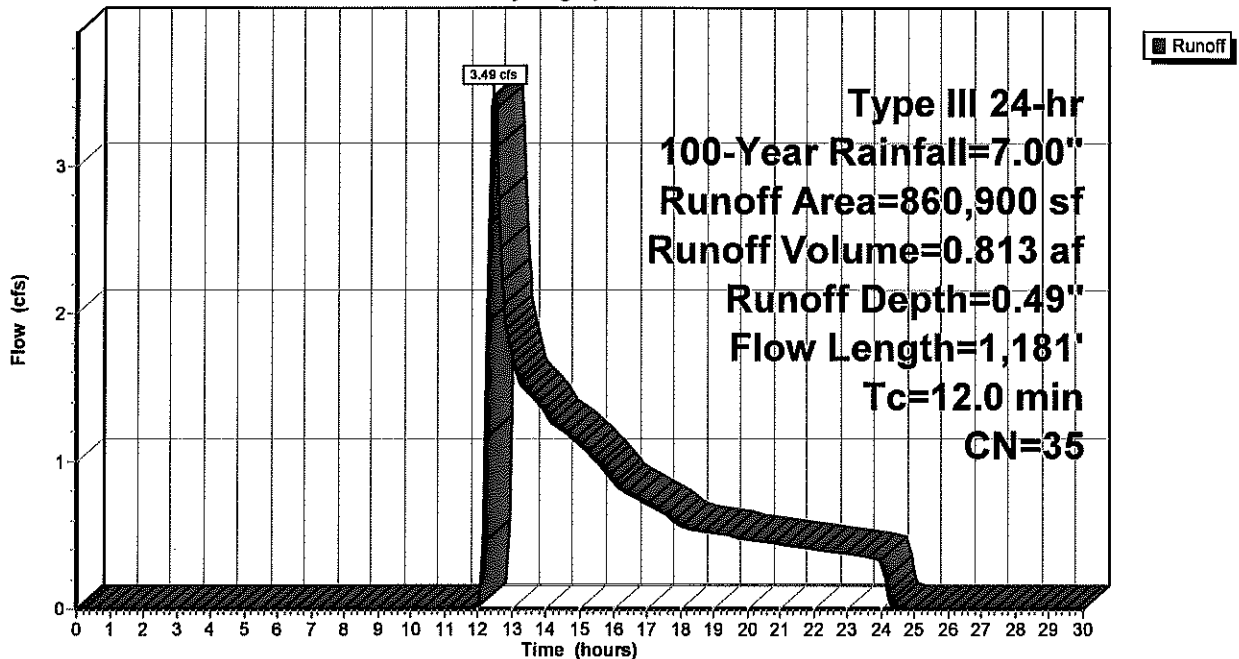
Area (sf)	CN	Description
523,400	30	Woods, Good, HSG A
311,900	39	>75% Grass cover, Good, HSG A
25,600	76	Gravel roads, HSG A
860,900	35	Weighted Average
860,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.1100	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
3.9	754	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	49	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	278	0.0200	8.41	14.86	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013

12.0 1,181 Total

Subcatchment 5: PRE 5

Hydrograph



Baypointe Phase II & III- PRE 5-26-21

Type III 24-hr Common Storm Rainfall=0.40"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 3: PRE 3

Runoff Area=517,601 sf 27.78% Impervious Runoff Depth=0.00"
Flow Length=972' Tc=11.9 min CN=54 Runoff=0.00 cfs 0.000 af

Subcatchment 4: PRE 4

Runoff Area=269,455 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=965' Tc=21.2 min CN=34 Runoff=0.00 cfs 0.000 af

Subcatchment 5: PRE 5

Runoff Area=860,900 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,181' Tc=12.0 min CN=35 Runoff=0.00 cfs 0.000 af

Total Runoff Area = 37.832 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
91.27% Pervious = 34.531 ac 8.73% Impervious = 3.301 ac

Summary for Subcatchment 3: PRE 3

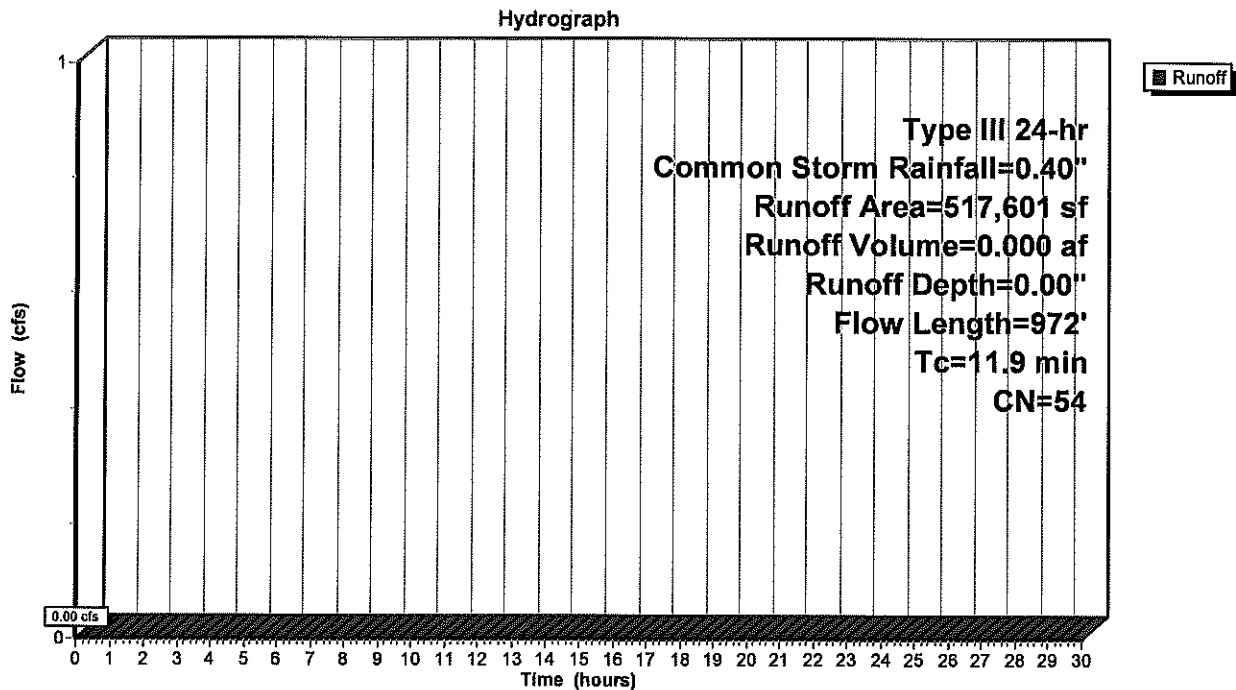
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr Common Storm Rainfall=0.40"

Area (sf)	CN	Description
73,403	30	Woods, Good, HSG A
300,391	39	>75% Grass cover, Good, HSG A
* 134,417	98	Roads/Driveways/SWalk
* 9,390	98	Existing Roofs
517,601	54	Weighted Average
373,794		72.22% Pervious Area
143,807		27.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0520	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
1.0	97	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	775	0.0200	10.18	31.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
11.9	972	Total			

Subcatchment 3: PRE 3



Summary for Subcatchment 4: PRE 4

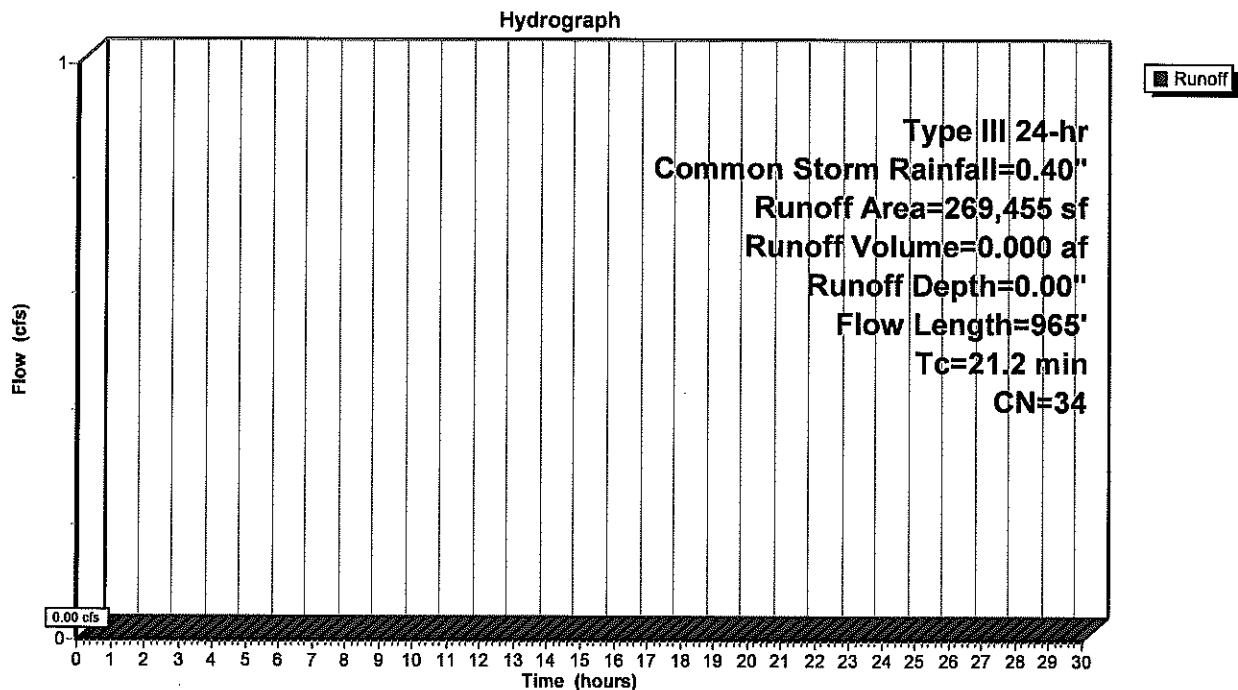
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr Common Storm Rainfall=0.40"

Area (sf)	CN	Description
170,065	30	Woods, Good, HSG A
91,640	39	>75% Grass cover, Good, HSG A
7,750	76	Gravel roads, HSG A
269,455	34	Weighted Average
269,455		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.1	43	0.0900	4.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.6	61	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.0	761	0.0200	6.42	5.04	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
21.2	965	Total			

Subcatchment 4: PRE 4



Summary for Subcatchment 5: PRE 5

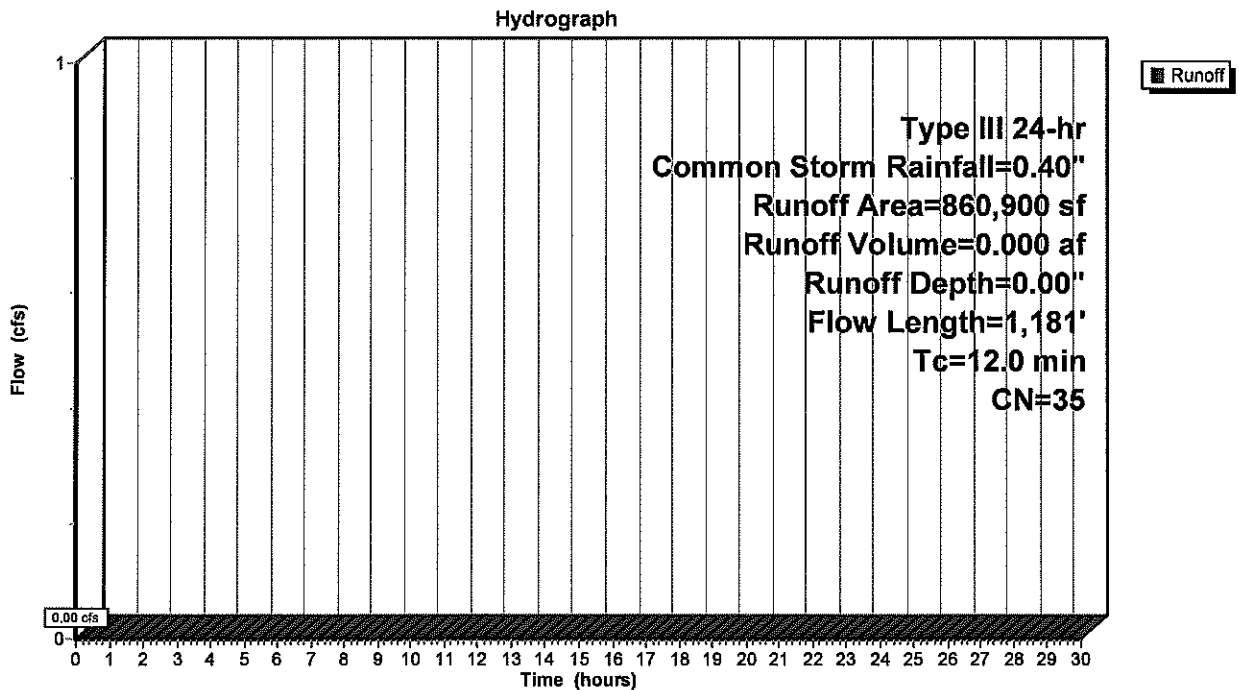
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

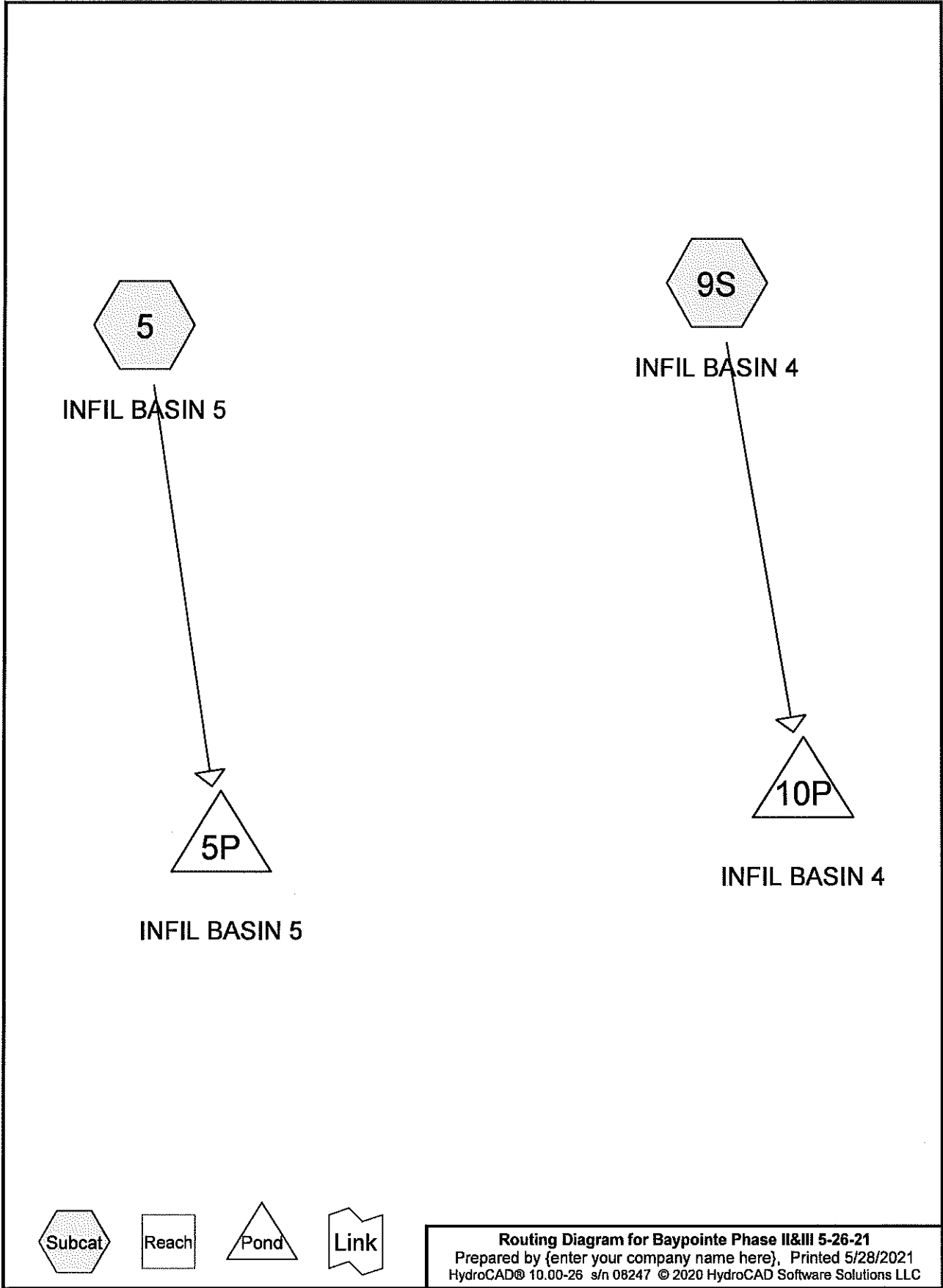
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr Common Storm Rainfall=0.40"

Area (sf)	CN	Description
523,400	30	Woods, Good, HSG A
311,900	39	>75% Grass cover, Good, HSG A
25,600	76	Gravel roads, HSG A
860,900	35	Weighted Average
860,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.1100	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
3.9	754	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	49	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	278	0.0200	8.41	14.86	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
12.0	1,181	Total			

Subcatchment 5: PRE 5





Baypointe Phase II&III 5-26-21

Type III 24-hr 2-Year Rainfall=3.40"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 5: INFIL BASIN 5

Runoff Area=900,643 sf 21.04% Impervious Runoff Depth=0.20"
Flow Length=1,150' Tc=11.0 min CN=51 Runoff=1.22 cfs 0.340 af

Subcatchment 9S: INFIL BASIN 4

Runoff Area=131,584 sf 24.29% Impervious Runoff Depth=0.25"
Flow Length=316' Tc=8.0 min CN=53 Runoff=0.30 cfs 0.063 af

Pond 5P: INFIL BASIN 5

Peak Elev=20.05' Storage=347 cf Inflow=1.22 cfs 0.340 af
Outflow=1.11 cfs 0.340 af

Pond 10P: INFIL BASIN 4

Peak Elev=30.47' Storage=268 cf Inflow=0.30 cfs 0.063 af
Outflow=0.13 cfs 0.063 af

Total Runoff Area = 23.697 ac Runoff Volume = 0.403 af Average Runoff Depth = 0.20"
78.54% Pervious = 18.612 ac 21.46% Impervious = 5.085 ac

Baypointe Phase II&III 5-26-21

Type III 24-hr 2-Year Rainfall=3.40"

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Summary for Subcatchment 5: INFIL BASIN 5

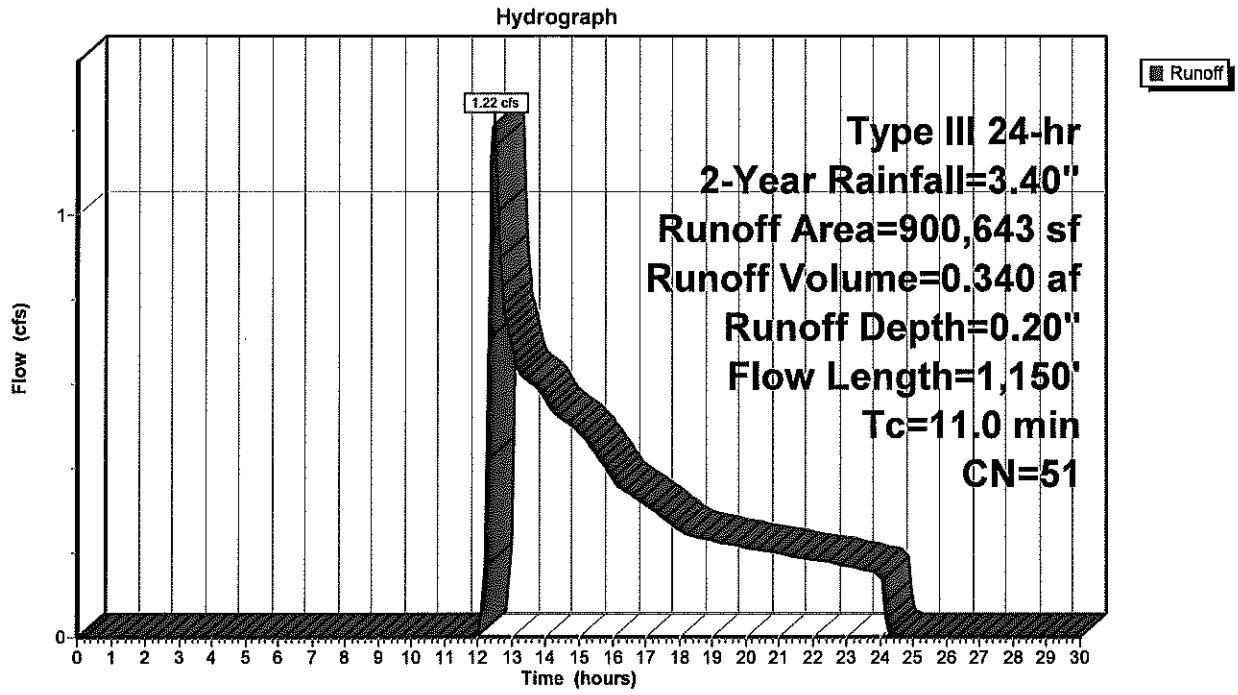
Runoff = 1.22 cfs @ 12.47 hrs, Volume= 0.340 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
72,307	30	Woods, Good, HSG A
* 0	98	Existing Roof
638,799	39	>75% Grass cover, Good, HSG A
* 97,623	98	New Roof
* 91,914	98	New Road/Driveway/Swalk
900,643	51	Weighted Average
711,106		78.96% Pervious Area
189,537		21.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.1760	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
4.2	79	0.1013	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.5	690	0.0406	3.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	70	0.0429	4.20		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	290	0.0240	9.21	16.27	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
11.0	1,150	Total			

Subcatchment 5: INFIL BASIN 5



Baypointe Phase II&III 5-26-21

Type III 24-hr 2-Year Rainfall=3.40"

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Summary for Subcatchment 9S: INFIL BASIN 4

Runoff = 0.30 cfs @ 12.38 hrs, Volume= 0.063 af, Depth= 0.25"

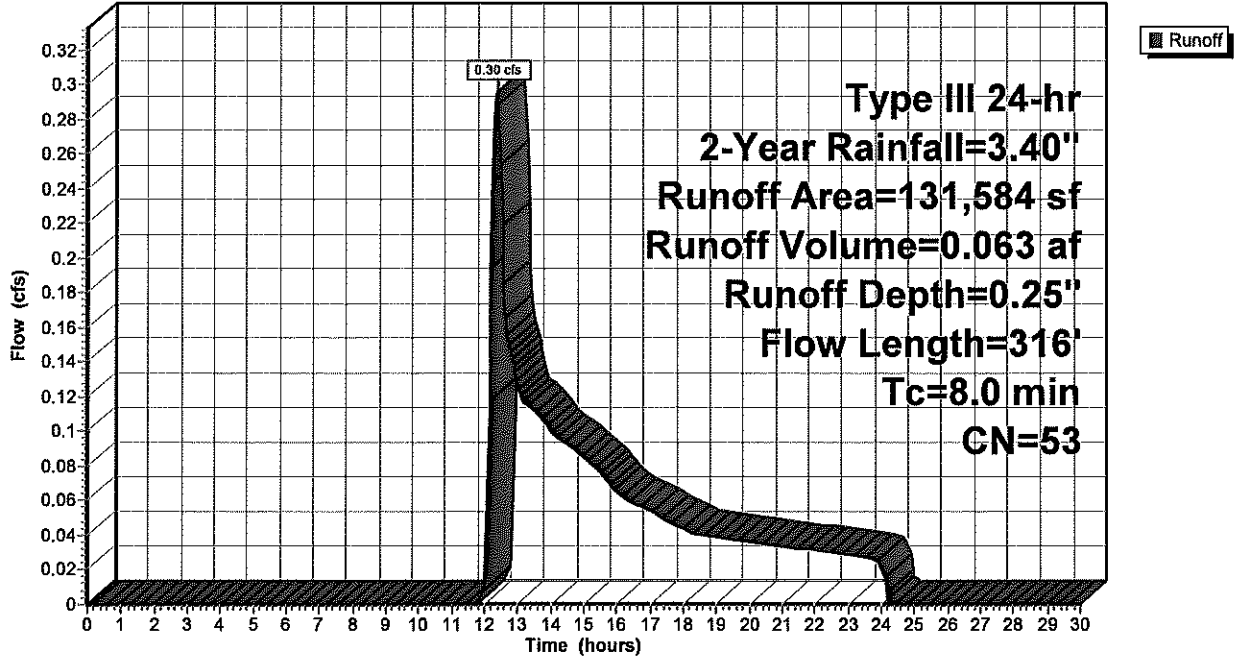
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
10,077	30	Woods, Good, HSG A
* 0	98	Existing Roof
89,550	39	>75% Grass cover, Good, HSG A
* 18,248	98	New Roof
* 13,709	98	New Road/Driveway/Swalk
131,584	53	Weighted Average
99,627		75.71% Pervious Area
31,957		24.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0470	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
0.9	125	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	30	0.0330	3.69		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	61	0.0656	15.22	26.90	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.0	316	Total			

Subcatchment 9S: INFIL BASIN 4

Hydrograph



Baypointe Phase II&III 5-26-21

Type III 24-hr 2-Year Rainfall=3.40"

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Summary for Pond 5P: INFIL BASIN 5

Inflow Area = 20.676 ac, 21.04% Impervious, Inflow Depth = 0.20" for 2-Year event
 Inflow = 1.22 cfs @ 12.47 hrs, Volume= 0.340 af
 Outflow = 1.11 cfs @ 12.56 hrs, Volume= 0.340 af, Atten= 9%, Lag= 5.2 min
 Discarded = 1.11 cfs @ 12.56 hrs, Volume= 0.340 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 20.05' @ 12.56 hrs Surf.Area= 7,473 sf Storage= 347 cf

Plug-Flow detention time= 5.2 min calculated for 0.339 af (100% of inflow)
 Center-of-Mass det. time= 5.2 min (989.0 - 983.8)

Volume	Invert	Avail.Storage	Storage Description
#1	20.00'	67,758 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

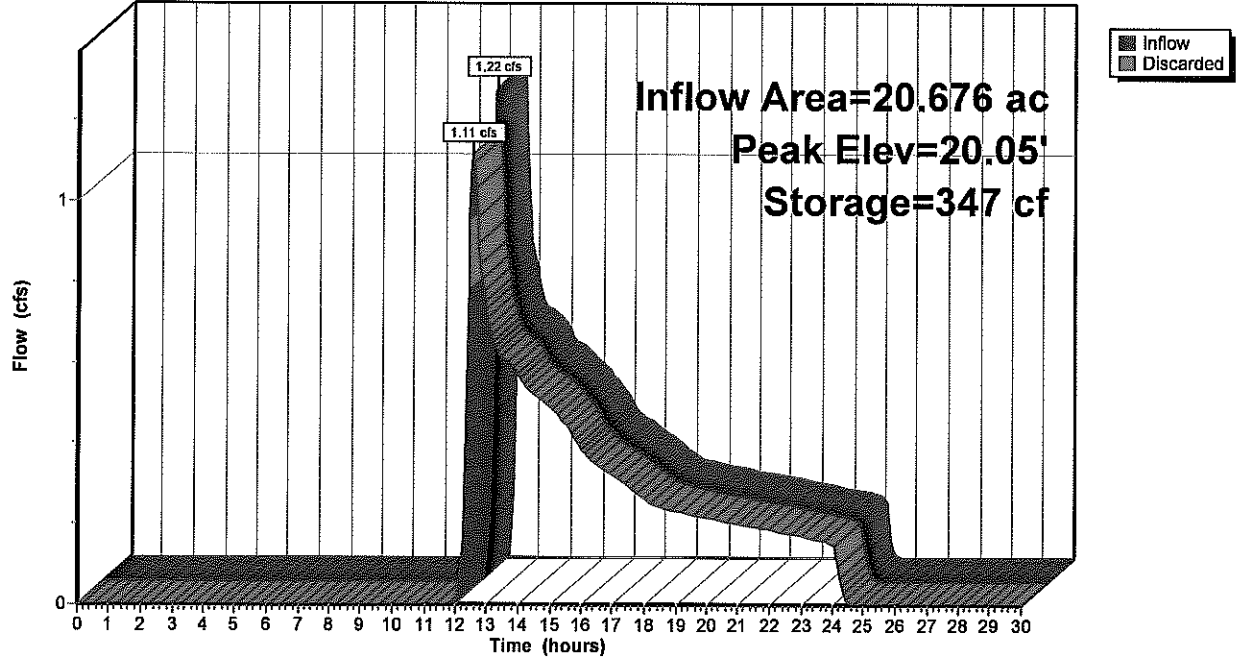
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.00	7,416	0	0
22.00	9,865	17,281	17,281
24.00	12,558	22,423	39,704
26.00	15,496	28,054	67,758

Device	Routing	Invert	Outlet Devices
#1	Discarded	20.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.43 cfs @ 12.56 hrs HW=20.05' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 1.43 cfs)

Pond 5P: INFIL BASIN 5

Hydrograph



Summary for Pond 10P: INFIL BASIN 4

Inflow Area = 3.021 ac, 24.29% Impervious, Inflow Depth = 0.25" for 2-Year event
 Inflow = 0.30 cfs @ 12.38 hrs, Volume= 0.063 af
 Outflow = 0.13 cfs @ 13.01 hrs, Volume= 0.063 af, Atten= 57%, Lag= 37.8 min
 Discarded = 0.13 cfs @ 13.01 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 30.47' @ 13.01 hrs Surf.Area= 674 sf Storage= 268 cf

Plug-Flow detention time= 16.5 min calculated for 0.063 af (100% of inflow)
 Center-of-Mass det. time= 16.5 min (978.0 - 961.5)

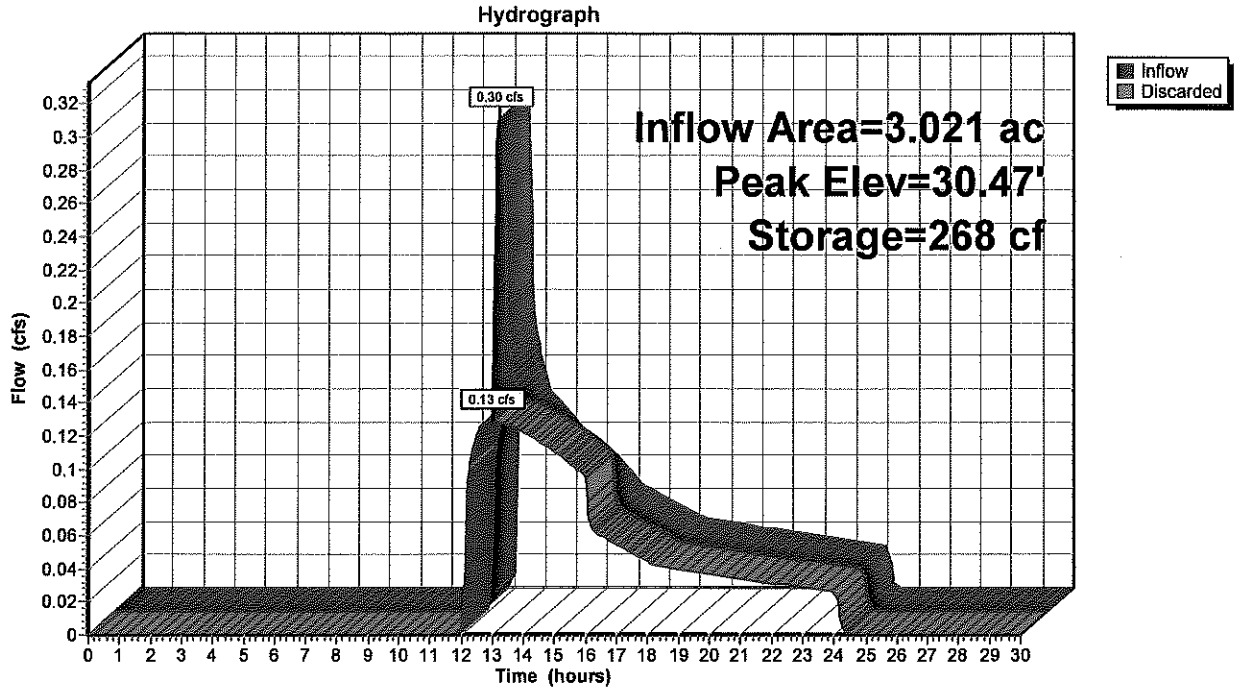
Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	11,976 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	471	0	0
32.00	1,337	1,808	1,808
34.00	2,477	3,814	5,622
36.00	3,877	6,354	11,976

Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.13 cfs @ 13.01 hrs HW=30.47' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.13 cfs)

Pond 10P: INFIL BASIN 4



Baypointe Phase II&III 5-26-21

Type III 24-hr 10-Year Rainfall=4.70"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 5: INFIL BASIN 5 Runoff Area=900,643 sf 21.04% Impervious Runoff Depth=0.62"
Flow Length=1,150' Tc=11.0 min CN=51 Runoff=7.61 cfs 1.074 af

Subcatchment 9S: INFIL BASIN 4 Runoff Area=131,584 sf 24.29% Impervious Runoff Depth=0.73"
Flow Length=316' Tc=8.0 min CN=53 Runoff=1.62 cfs 0.183 af

Pond 5P: INFIL BASIN 5 Peak Elev=21.31' Storage=10,804 cf Inflow=7.61 cfs 1.074 af
Outflow=1.73 cfs 1.074 af

Pond 10P: INFIL BASIN 4 Peak Elev=32.29' Storage=2,217 cf Inflow=1.62 cfs 0.183 af
Outflow=0.29 cfs 0.183 af

Total Runoff Area = 23.697 ac Runoff Volume = 1.257 af Average Runoff Depth = 0.64"
78.54% Pervious = 18.612 ac 21.46% Impervious = 5.085 ac

Baypointe Phase II&III 5-26-21

Type III 24-hr 10-Year Rainfall=4.70"

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Summary for Subcatchment 5: INFIL BASIN 5

Runoff = 7.61 cfs @ 12.22 hrs, Volume= 1.074 af, Depth= 0.62"

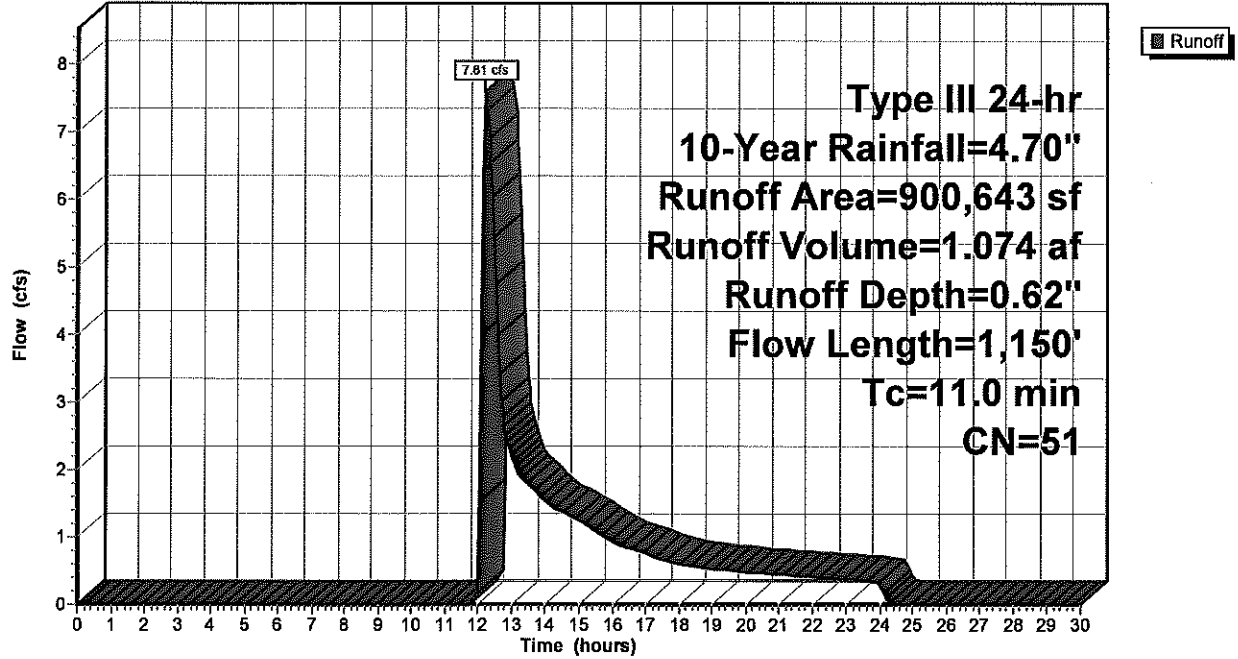
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
72,307	30	Woods, Good, HSG A
* 0	98	Existing Roof
638,799	39	>75% Grass cover, Good, HSG A
* 97,623	98	New Roof
* 91,914	98	New Road/Driveway/Swalk
900,643	51	Weighted Average
711,106		78.96% Pervious Area
189,537		21.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.1760	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
4.2	79	0.1013	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.5	690	0.0406	3.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	70	0.0429	4.20		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	290	0.0240	9.21	16.27	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
11.0	1,150	Total			

Subcatchment 5: INFIL BASIN 5

Hydrograph



Baypointe Phase II&III 5-26-21

Type III 24-hr 10-Year Rainfall=4.70"

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Summary for Subcatchment 9S: INFIL BASIN 4

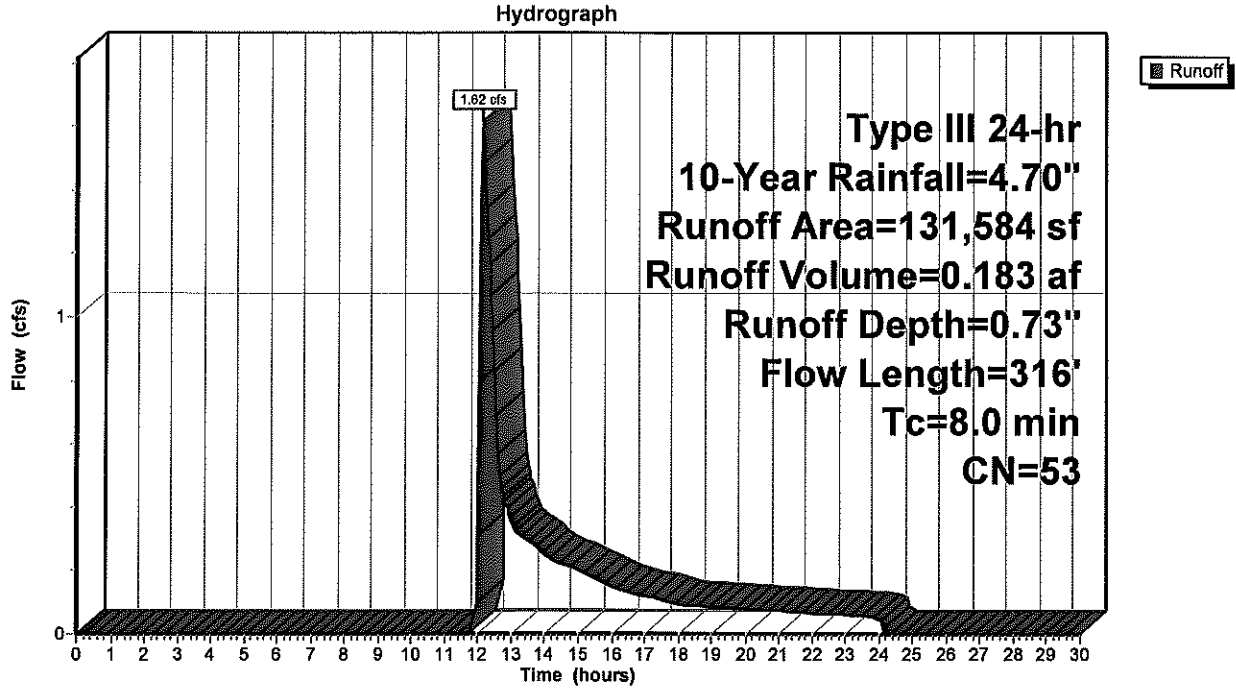
Runoff = 1.62 cfs @ 12.16 hrs, Volume= 0.183 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
10,077	30	Woods, Good, HSG A
* 0	98	Existing Roof
89,550	39	>75% Grass cover, Good, HSG A
* 18,248	98	New Roof
* 13,709	98	New Road/Driveway/Swalk
131,584	53	Weighted Average
99,627		75.71% Pervious Area
31,957		24.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0470	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
0.9	125	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	30	0.0330	3.69		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	61	0.0656	15.22	26.90	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.0	316	Total			

Subcatchment 9S: INFIL BASIN 4



Baypointe Phase II&III 5-26-21

Type III 24-hr 10-Year Rainfall=4.70"

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Summary for Pond 5P: INFIL BASIN 5

Inflow Area = 20.676 ac, 21.04% Impervious, Inflow Depth = 0.62" for 10-Year event
 Inflow = 7.61 cfs @ 12.22 hrs, Volume= 1.074 af
 Outflow = 1.73 cfs @ 13.62 hrs, Volume= 1.074 af, Atten= 77%, Lag= 84.0 min
 Discarded = 1.73 cfs @ 13.62 hrs, Volume= 1.074 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 21.31' @ 13.62 hrs Surf.Area= 9,025 sf Storage= 10,804 cf

Plug-Flow detention time= 59.5 min calculated for 1.072 af (100% of inflow)
 Center-of-Mass det. time= 59.4 min (981.8 - 922.4)

Volume	Invert	Avail.Storage	Storage Description
#1	20.00'	67,758 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.00	7,416	0	0
22.00	9,865	17,281	17,281
24.00	12,558	22,423	39,704
26.00	15,496	28,054	67,758

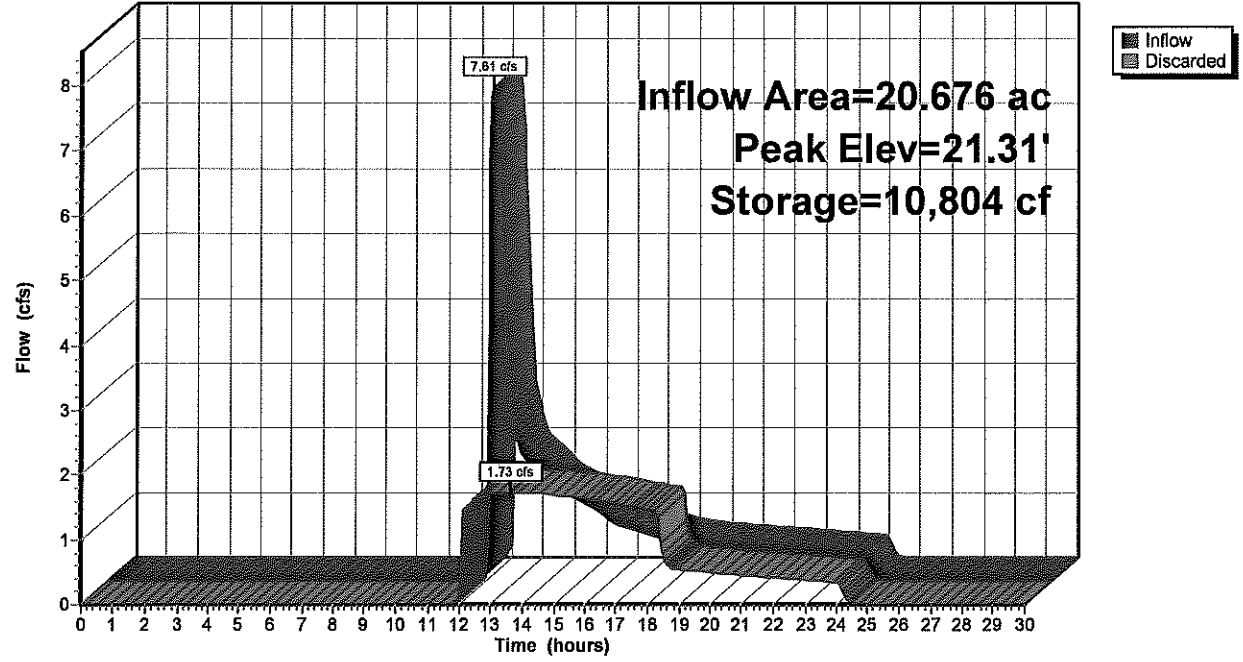
Device	Routing	Invert	Outlet Devices
#1	Discarded	20.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.73 cfs @ 13.62 hrs HW=21.31' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 1.73 cfs)

Pond 5P: INFIL BASIN 5

Hydrograph



Baypointe Phase II&III 5-26-21

Type III 24-hr 10-Year Rainfall=4.70"

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Summary for Pond 10P: INFIL BASIN 4

Inflow Area = 3.021 ac, 24.29% Impervious, Inflow Depth = 0.73" for 10-Year event
 Inflow = 1.62 cfs @ 12.16 hrs, Volume= 0.183 af
 Outflow = 0.29 cfs @ 13.55 hrs, Volume= 0.183 af, Atten= 82%, Lag= 83.7 min
 Discarded = 0.29 cfs @ 13.55 hrs, Volume= 0.183 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 32.29' @ 13.55 hrs Surf.Area= 1,501 sf Storage= 2,217 cf

Plug-Flow detention time= 90.1 min calculated for 0.182 af (100% of inflow)
 Center-of-Mass det. time= 90.0 min (999.6 - 909.6)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	11,976 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

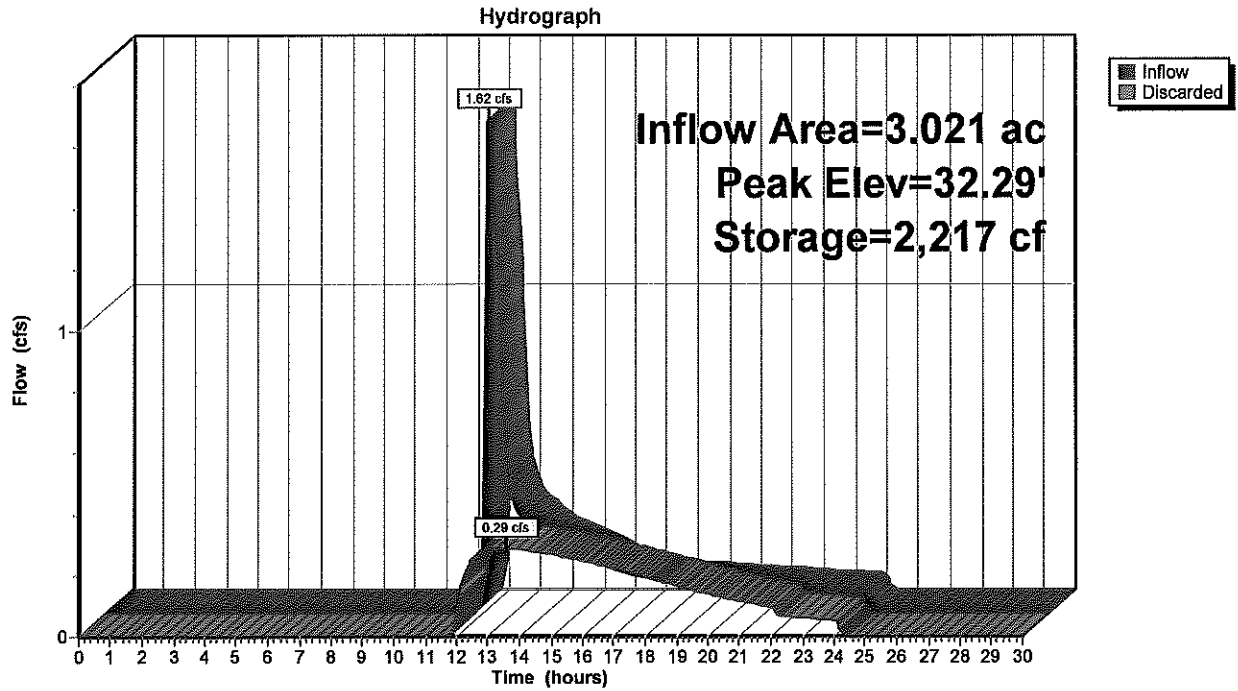
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	471	0	0
32.00	1,337	1,808	1,808
34.00	2,477	3,814	5,622
36.00	3,877	6,354	11,976

Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.29 cfs @ 13.55 hrs HW=32.29' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Pond 10P: INFIL BASIN 4



Baypointe Phase II&III 5-26-21

Type III 24-hr 25-Year Rainfall=5.60"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 5: INFIL BASIN 5

Runoff Area=900,643 sf 21.04% Impervious Runoff Depth=1.02"
Flow Length=1,150' Tc=11.0 min CN=51 Runoff=15.61 cfs 1.755 af

Subcatchment 9S: INFIL BASIN 4

Runoff Area=131,584 sf 24.29% Impervious Runoff Depth=1.15"
Flow Length=316' Tc=8.0 min CN=53 Runoff=3.04 cfs 0.290 af

Pond 5P: INFIL BASIN 5

Peak Elev=22.87' Storage=26,419 cf Inflow=15.61 cfs 1.755 af
Outflow=2.11 cfs 1.755 af

Pond 10P: INFIL BASIN 4

Peak Elev=33.44' Storage=4,320 cf Inflow=3.04 cfs 0.290 af
Outflow=0.41 cfs 0.290 af

Total Runoff Area = 23.697 ac Runoff Volume = 2.045 af Average Runoff Depth = 1.04"
78.54% Pervious = 18.612 ac 21.46% Impervious = 5.085 ac

Baypointe Phase II&III 5-26-21

Type III 24-hr 25-Year Rainfall=5.60"

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Summary for Subcatchment 5: INFIL BASIN 5

Runoff = 15.61 cfs @ 12.19 hrs, Volume= 1.755 af, Depth= 1.02"

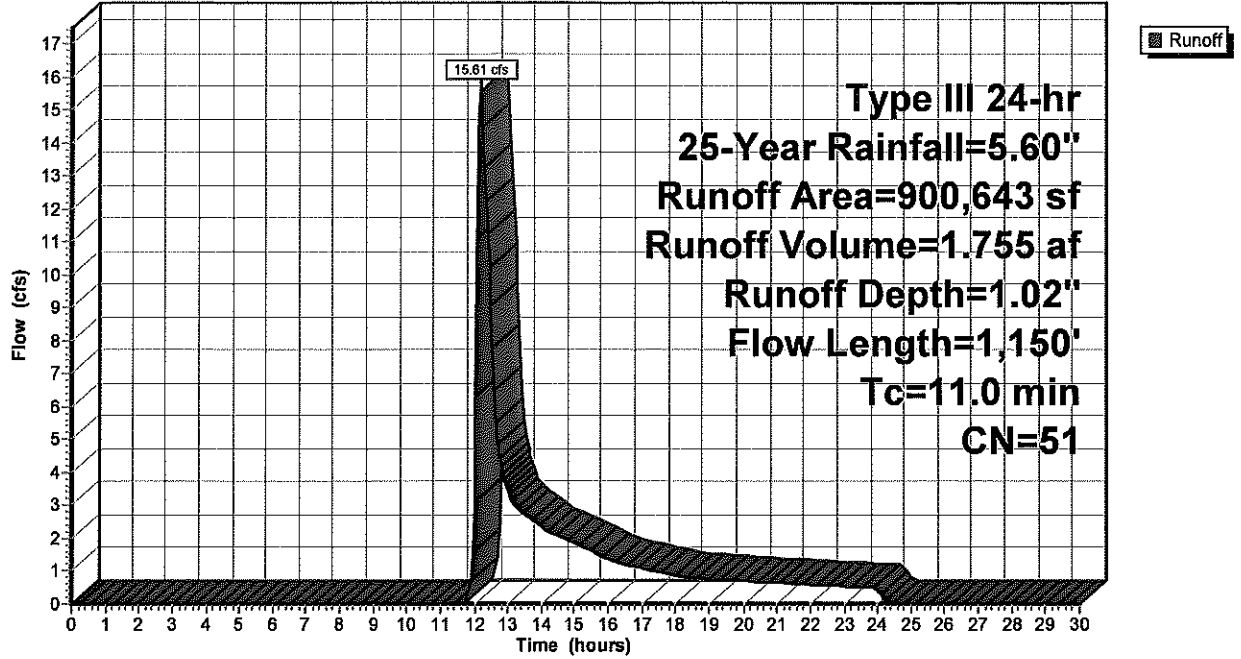
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
72,307	30	Woods, Good, HSG A
* 0	98	Existing Roof
638,799	39	>75% Grass cover, Good, HSG A
* 97,623	98	New Roof
* 91,914	98	New Road/Driveway/Swalk
900,643	51	Weighted Average
711,106		78.96% Pervious Area
189,537		21.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.1760	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
4.2	79	0.1013	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.5	690	0.0406	3.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	70	0.0429	4.20		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	290	0.0240	9.21	16.27	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
11.0	1,150	Total			

Subcatchment 5: INFIL BASIN 5

Hydrograph



Baypointe Phase II&III 5-26-21

Type III 24-hr 25-Year Rainfall=5.60"

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Summary for Subcatchment 9S: INFIL BASIN 4

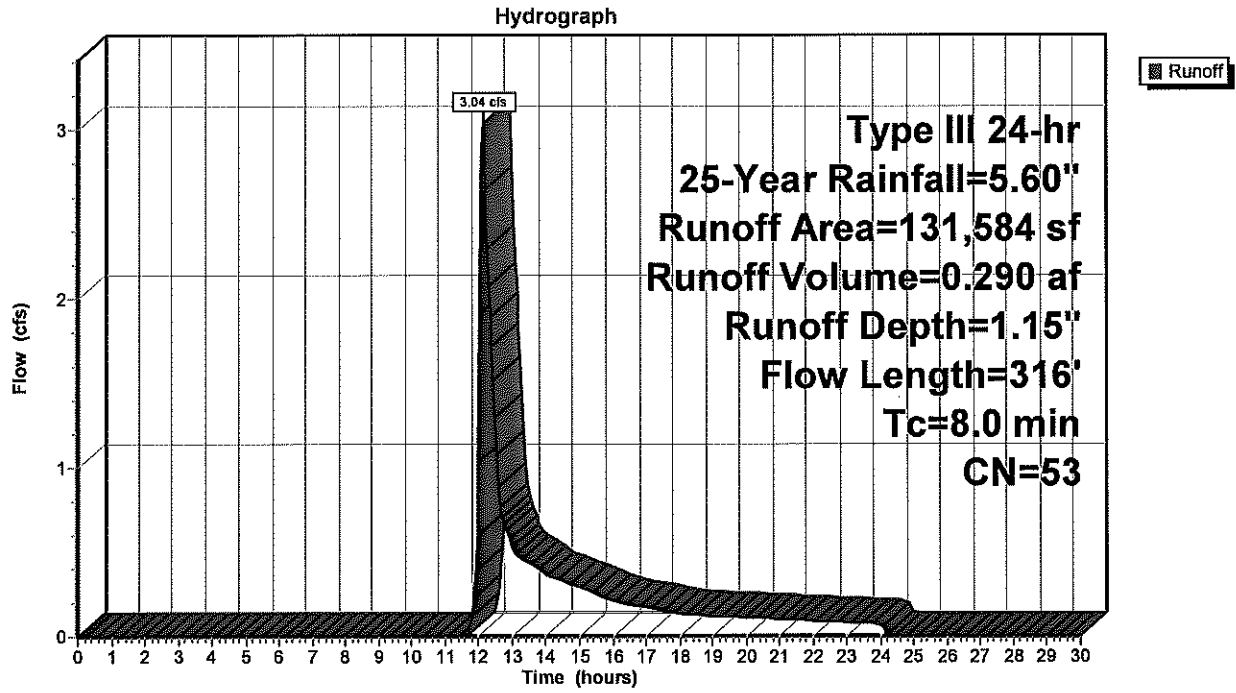
Runoff = 3.04 cfs @ 12.14 hrs, Volume= 0.290 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
10,077	30	Woods, Good, HSG A
* 0	98	Existing Roof
89,550	39	>75% Grass cover, Good, HSG A
* 18,248	98	New Roof
* 13,709	98	New Road/Driveway/Swalk
131,584	53	Weighted Average
99,627		75.71% Pervious Area
31,957		24.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0470	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
0.9	125	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	30	0.0330	3.69		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	61	0.0656	15.22	26.90	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.0	316	Total			

Subcatchment 9S: INFIL BASIN 4



Baypointe Phase II&III 5-26-21

Type III 24-hr 25-Year Rainfall=5.60"

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Summary for Pond 5P: INFIL BASIN 5

Inflow Area = 20.676 ac, 21.04% Impervious, Inflow Depth = 1.02" for 25-Year event
 Inflow = 15.61 cfs @ 12.19 hrs, Volume= 1.755 af
 Outflow = 2.11 cfs @ 14.38 hrs, Volume= 1.755 af, Atten= 86%, Lag= 130.9 min
 Discarded = 2.11 cfs @ 14.38 hrs, Volume= 1.755 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 22.87' @ 14.38 hrs Surf.Area= 11,042 sf Storage= 26,419 cf

Plug-Flow detention time= 141.6 min calculated for 1.752 af (100% of inflow)
 Center-of-Mass det. time= 141.4 min (1,043.3 - 902.0)

Volume	Invert	Avail.Storage	Storage Description
#1	20.00'	67,758 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

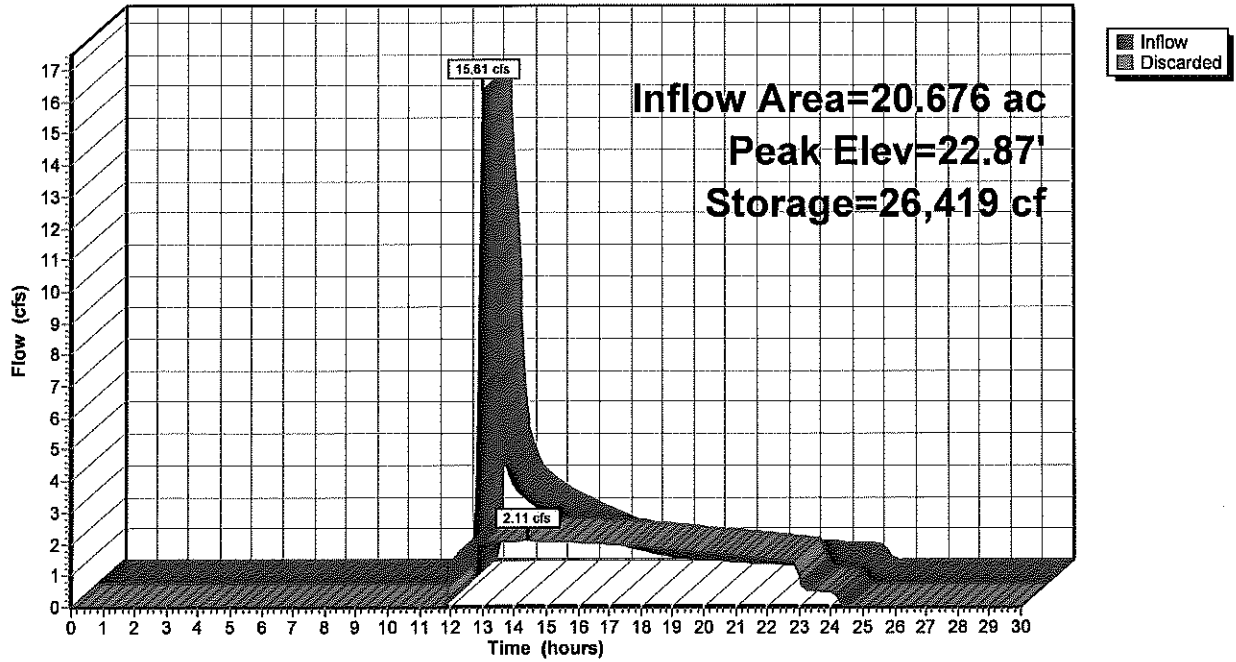
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.00	7,416	0	0
22.00	9,865	17,281	17,281
24.00	12,558	22,423	39,704
26.00	15,496	28,054	67,758

Device	Routing	Invert	Outlet Devices
#1	Discarded	20.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=2.11 cfs @ 14.38 hrs HW=22.87' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.11 cfs)

Pond 5P: INFIL BASIN 5

Hydrograph



Summary for Pond 10P: INFIL BASIN 4

Inflow Area = 3.021 ac, 24.29% Impervious, Inflow Depth = 1.15" for 25-Year event
 Inflow = 3.04 cfs @ 12.14 hrs, Volume= 0.290 af
 Outflow = 0.41 cfs @ 13.68 hrs, Volume= 0.290 af, Atten= 86%, Lag= 92.1 min
 Discarded = 0.41 cfs @ 13.68 hrs, Volume= 0.290 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 33.44' @ 13.68 hrs Surf.Area= 2,157 sf Storage= 4,320 cf

Plug-Flow detention time= 132.2 min calculated for 0.290 af (100% of inflow)
 Center-of-Mass det. time= 132.1 min (1,023.5 - 891.4)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	11,976 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	471	0	0
32.00	1,337	1,808	1,808
34.00	2,477	3,814	5,622
36.00	3,877	6,354	11,976

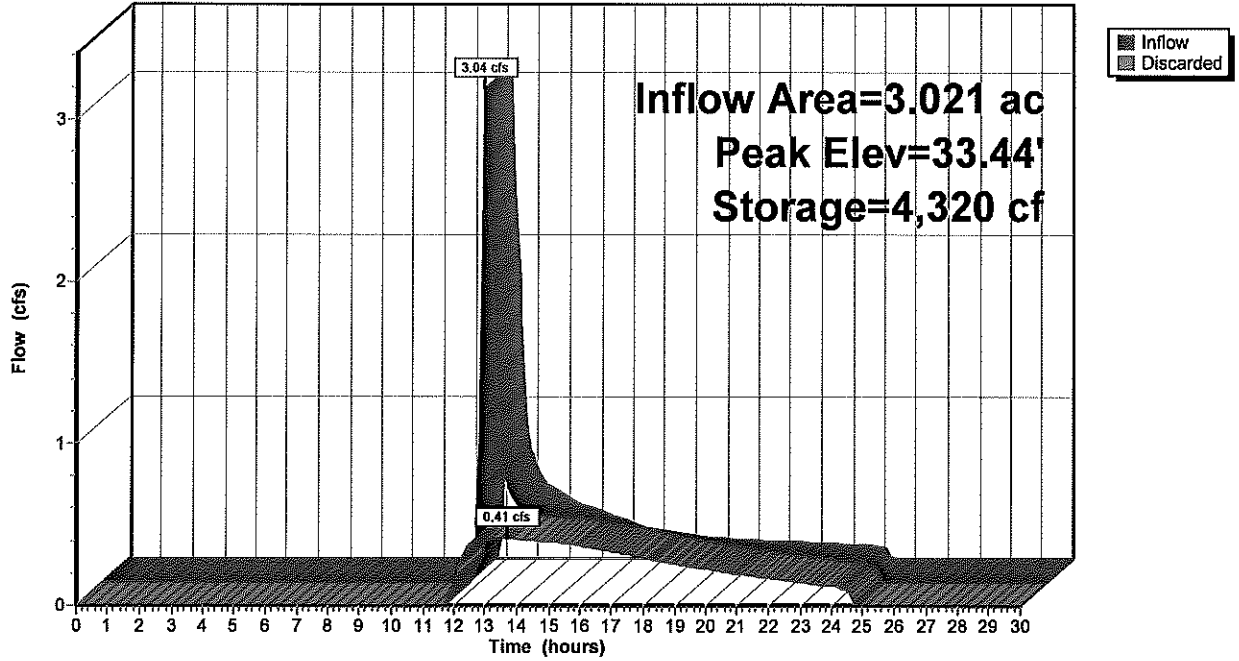
Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.41 cfs @ 13.68 hrs HW=33.44' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.41 cfs)

Pond 10P: INFIL BASIN 4

Hydrograph



Baypointe Phase II&III 5-26-21

Type III 24-hr 100-Year Rainfall=7.00"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 5: INFIL BASIN 5

Runoff Area=900,643 sf 21.04% Impervious Runoff Depth=1.76"
Flow Length=1,150' Tc=11.0 min CN=51 Runoff=31.44 cfs 3.026 af

Subcatchment 9S: INFIL BASIN 4

Runoff Area=131,584 sf 24.29% Impervious Runoff Depth=1.94"
Flow Length=316' Tc=8.0 min CN=53 Runoff=5.68 cfs 0.488 af

Pond 5P: INFIL BASIN 5

Peak Elev=25.42' Storage=59,046 cf Inflow=31.44 cfs 3.026 af
Outflow=2.80 cfs 3.026 af

Pond 10P: INFIL BASIN 4

Peak Elev=35.04' Storage=8,585 cf Inflow=5.68 cfs 0.488 af
Outflow=0.61 cfs 0.488 af

Total Runoff Area = 23.697 ac Runoff Volume = 3.514 af Average Runoff Depth = 1.78"
78.54% Pervious = 18.612 ac 21.46% Impervious = 5.085 ac

Summary for Subcatchment 5: INFIL BASIN 5

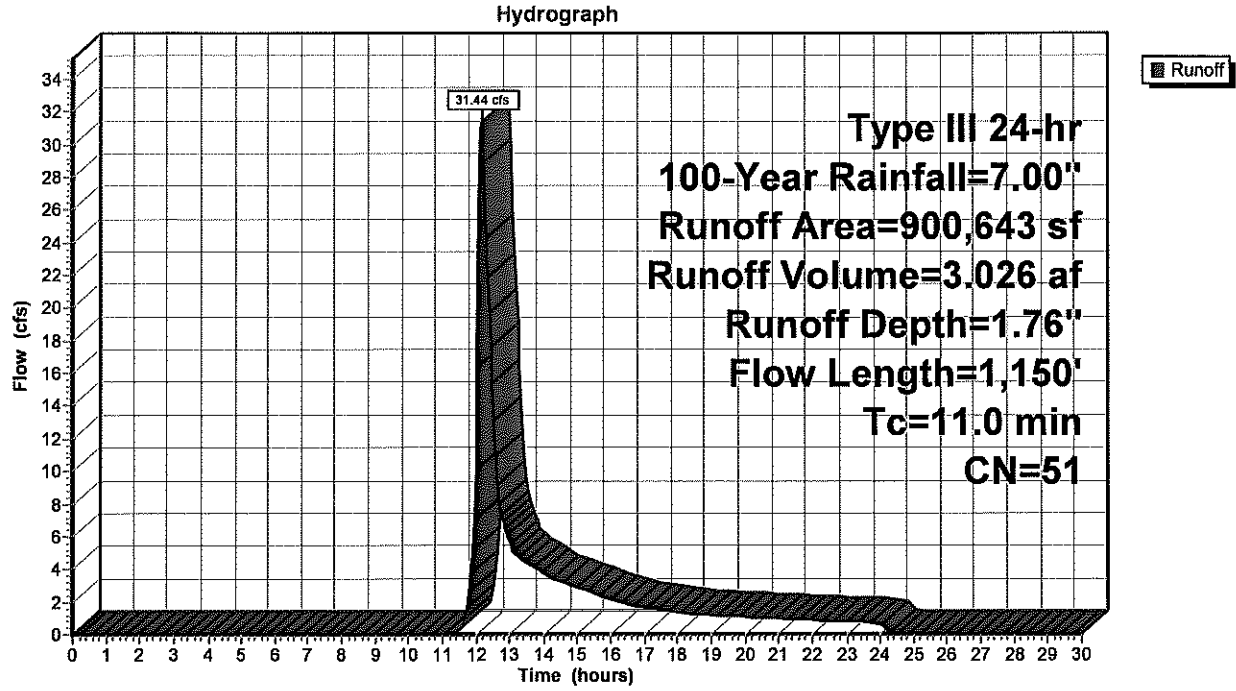
Runoff = 31.44 cfs @ 12.17 hrs, Volume= 3.026 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
72,307	30	Woods, Good, HSG A
* 0	98	Existing Roof
638,799	39	>75% Grass cover, Good, HSG A
* 97,623	98	New Roof
* 91,914	98	New Road/Driveway/Swalk
900,643	51	Weighted Average
711,106		78.96% Pervious Area
189,537		21.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.1760	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
4.2	79	0.1013	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.5	690	0.0406	3.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	70	0.0429	4.20		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	290	0.0240	9.21	16.27	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
11.0	1,150	Total			

Subcatchment 5: INFIL BASIN 5



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Type III 24-hr 100-Year Rainfall=7.00"

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Summary for Subcatchment 9S: INFIL BASIN 4

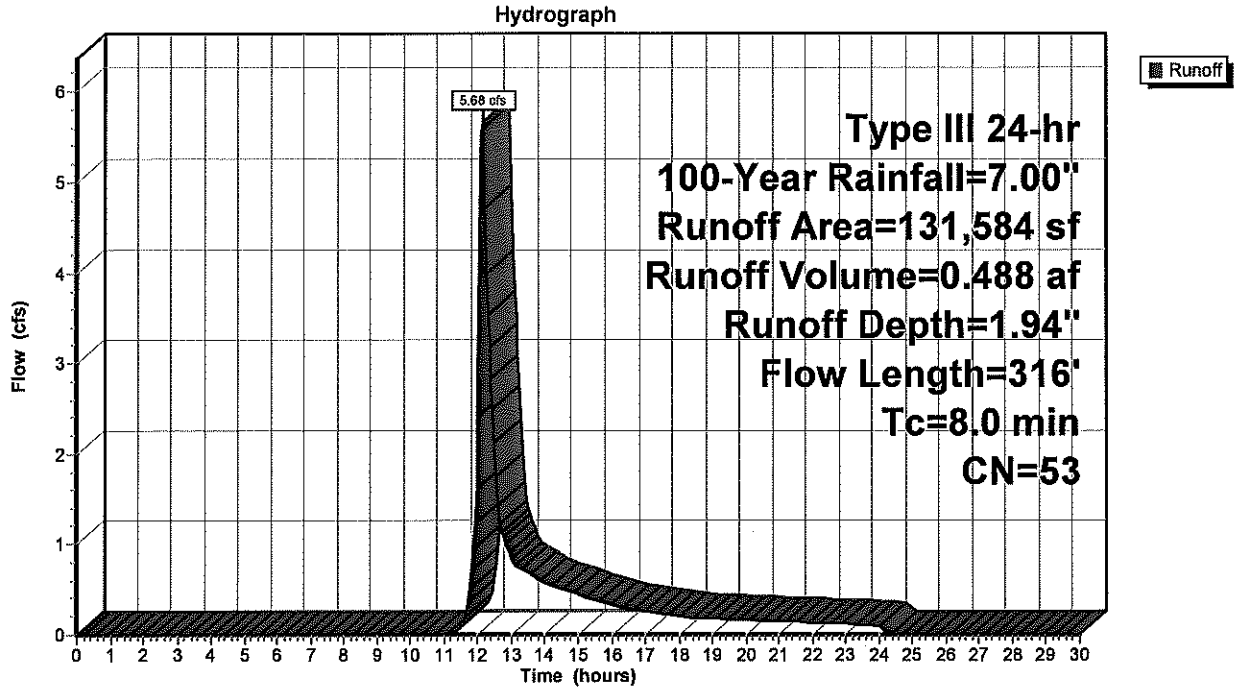
Runoff = 5.68 cfs @ 12.13 hrs, Volume= 0.488 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
10,077	30	Woods, Good, HSG A
* 0	98	Existing Roof
89,550	39	>75% Grass cover, Good, HSG A
* 18,248	98	New Roof
* 13,709	98	New Road/Driveway/Swalk
131,584	53	Weighted Average
99,627		75.71% Pervious Area
31,957		24.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0470	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
0.9	125	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	30	0.0330	3.69		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	61	0.0656	15.22	26.90	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.0	316	Total			

Subcatchment 9S: INFIL BASIN 4



Summary for Pond 5P: INFIL BASIN 5

Inflow Area = 20.676 ac, 21.04% Impervious, Inflow Depth = 1.76" for 100-Year event
 Inflow = 31.44 cfs @ 12.17 hrs, Volume= 3.026 af
 Outflow = 2.80 cfs @ 15.12 hrs, Volume= 3.026 af, Atten= 91%, Lag= 176.8 min
 Discarded = 2.80 cfs @ 15.12 hrs, Volume= 3.026 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 25.42' @ 15.12 hrs Surf.Area= 14,647 sf Storage= 59,046 cf

Plug-Flow detention time= 259.9 min calculated for 3.021 af (100% of inflow)
 Center-of-Mass det. time= 259.8 min (1,142.1 - 882.2)

Volume	Invert	Avail.Storage	Storage Description
#1	20.00'	67,758 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

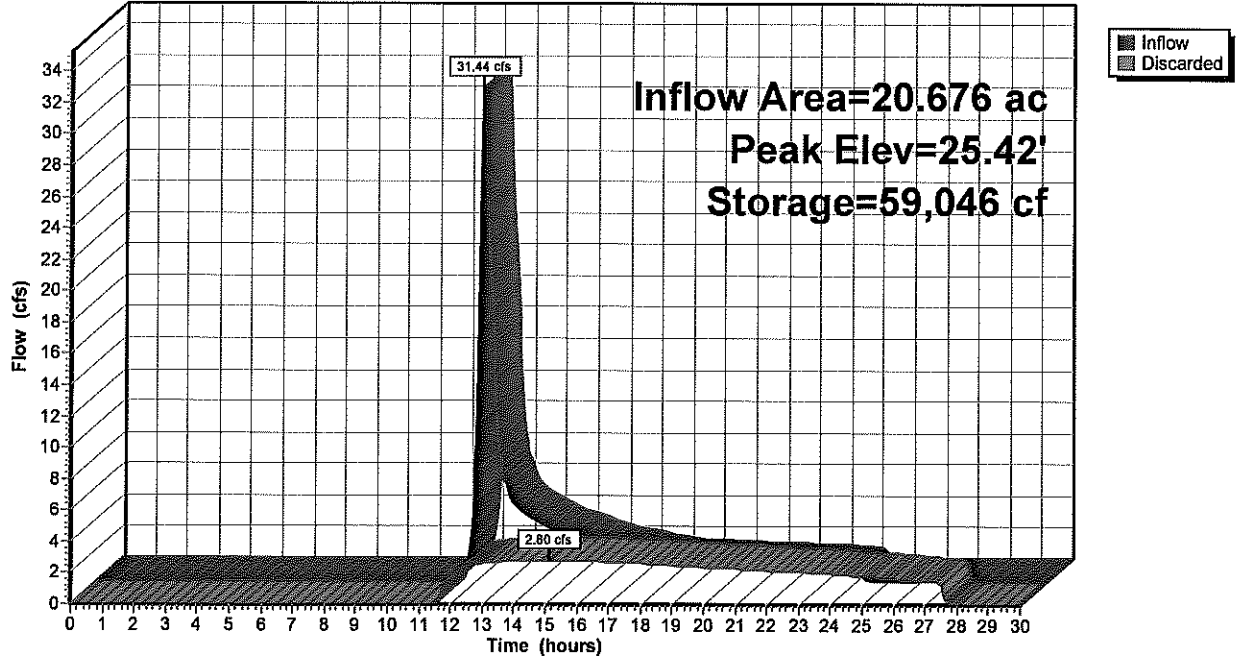
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.00	7,416	0	0
22.00	9,865	17,281	17,281
24.00	12,558	22,423	39,704
26.00	15,496	28,054	67,758

Device	Routing	Invert	Outlet Devices
#1	Discarded	20.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=2.80 cfs @ 15.12 hrs HW=25.42' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.80 cfs)

Pond 5P: INFIL BASIN 5

Hydrograph



Baypointe Phase II&III 5-26-21

Type III 24-hr 100-Year Rainfall=7.00"

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Summary for Pond 10P: INFIL BASIN 4

Inflow Area = 3.021 ac, 24.29% Impervious, Inflow Depth = 1.94" for 100-Year event
 Inflow = 5.68 cfs @ 12.13 hrs, Volume= 0.488 af
 Outflow = 0.61 cfs @ 13.81 hrs, Volume= 0.488 af, Atten= 89%, Lag= 100.7 min
 Discarded = 0.61 cfs @ 13.81 hrs, Volume= 0.488 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 35.04' @ 13.81 hrs Surf.Area= 3,207 sf Storage= 8,585 cf

Plug-Flow detention time= 184.2 min calculated for 0.488 af (100% of inflow)
 Center-of-Mass det. time= 184.1 min (1,057.6 - 873.5)

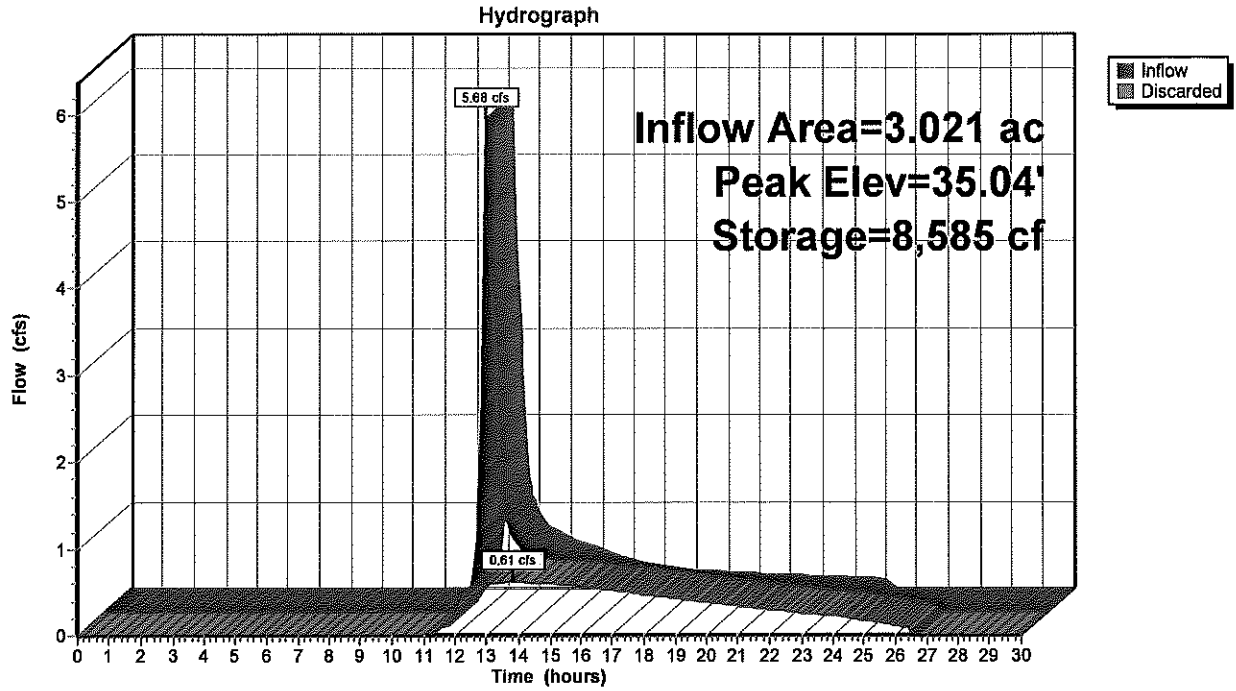
Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	11,976 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	471	0	0
32.00	1,337	1,808	1,808
34.00	2,477	3,814	5,622
36.00	3,877	6,354	11,976

Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.61 cfs @ 13.81 hrs HW=35.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.61 cfs)

Pond 10P: INFIL BASIN 4



Baypointe Phase II&III 5-26-21

Type III 24-hr Common Storm Rainfall=0.40"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 5: INFIL BASIN 5

Runoff Area=900,643 sf 21.04% Impervious Runoff Depth=0.00"
Flow Length=1,150' Tc=11.0 min CN=51 Runoff=0.00 cfs 0.000 af

Subcatchment 9S: INFIL BASIN 4

Runoff Area=131,584 sf 24.29% Impervious Runoff Depth=0.00"
Flow Length=316' Tc=8.0 min CN=53 Runoff=0.00 cfs 0.000 af

Pond 5P: INFIL BASIN 5

Peak Elev=20.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 10P: INFIL BASIN 4

Peak Elev=30.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 23.697 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
78.54% Pervious = 18.612 ac 21.46% Impervious = 5.085 ac

Summary for Subcatchment 5: INFIL BASIN 5

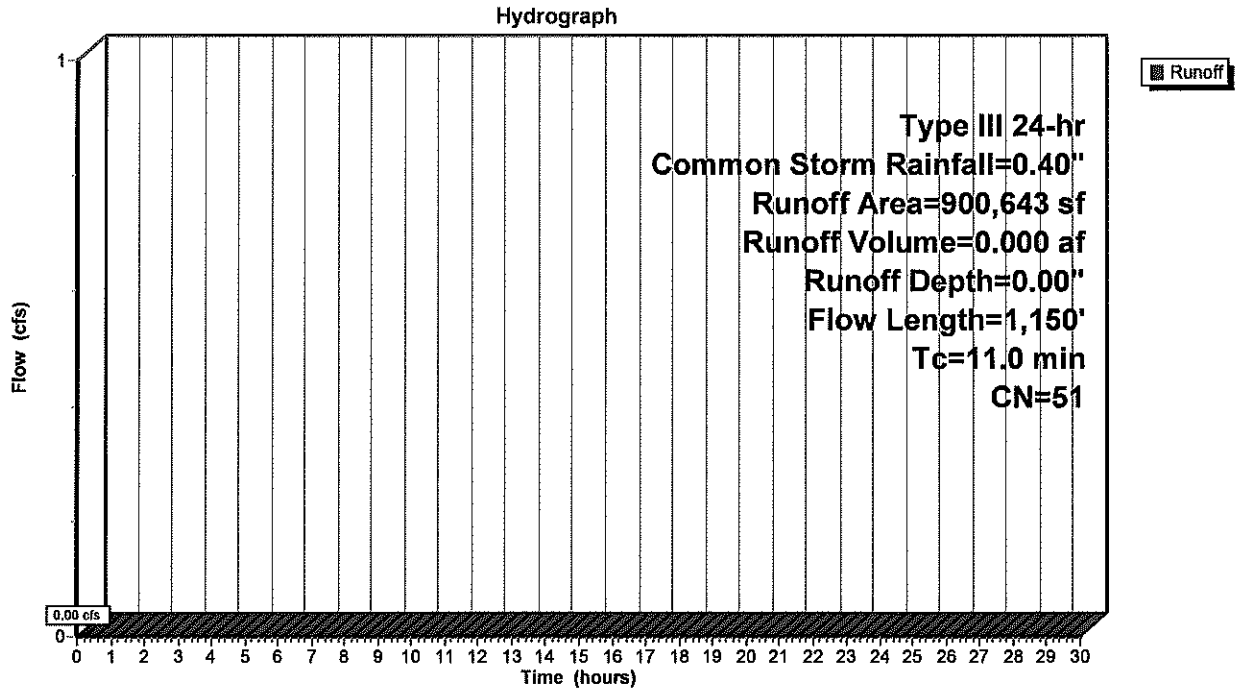
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr Common Storm Rainfall=0.40"

Area (sf)	CN	Description
72,307	30	Woods, Good, HSG A
* 0	98	Existing Roof
638,799	39	>75% Grass cover, Good, HSG A
* 97,623	98	New Roof
* 91,914	98	New Road/Driveway/Swalk
900,643	51	Weighted Average
711,106		78.96% Pervious Area
189,537		21.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.1760	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
4.2	79	0.1013	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.5	690	0.0406	3.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	70	0.0429	4.20		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	290	0.0240	9.21	16.27	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
11.0	1,150	Total			

Subcatchment 5: INFIL BASIN 5



Summary for Subcatchment 9S: INFIL BASIN 4

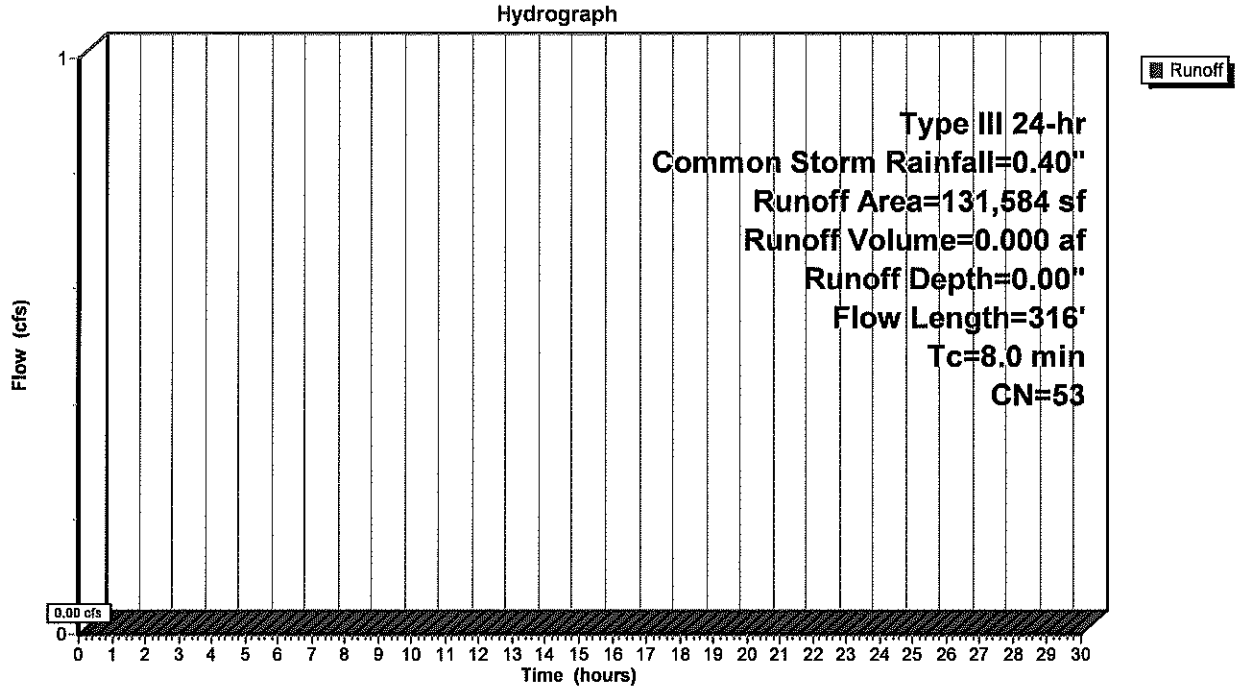
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr Common Storm Rainfall=0.40"

Area (sf)	CN	Description
10,077	30	Woods, Good, HSG A
* 0	98	Existing Roof
89,550	39	>75% Grass cover, Good, HSG A
* 18,248	98	New Roof
* 13,709	98	New Road/Driveway/Swalk
131,584	53	Weighted Average
99,627		75.71% Pervious Area
31,957		24.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0470	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
0.9	125	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	30	0.0330	3.69		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	61	0.0656	15.22	26.90	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.0	316	Total			

Subcatchment 9S: INFIL BASIN 4



Summary for Pond 5P: INFIL BASIN 5

Inflow Area = 20.676 ac, 21.04% Impervious, Inflow Depth = 0.00" for Common Storm event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 20.00' @ 0.00 hrs Surf.Area= 7,416 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	20.00'	67,758 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

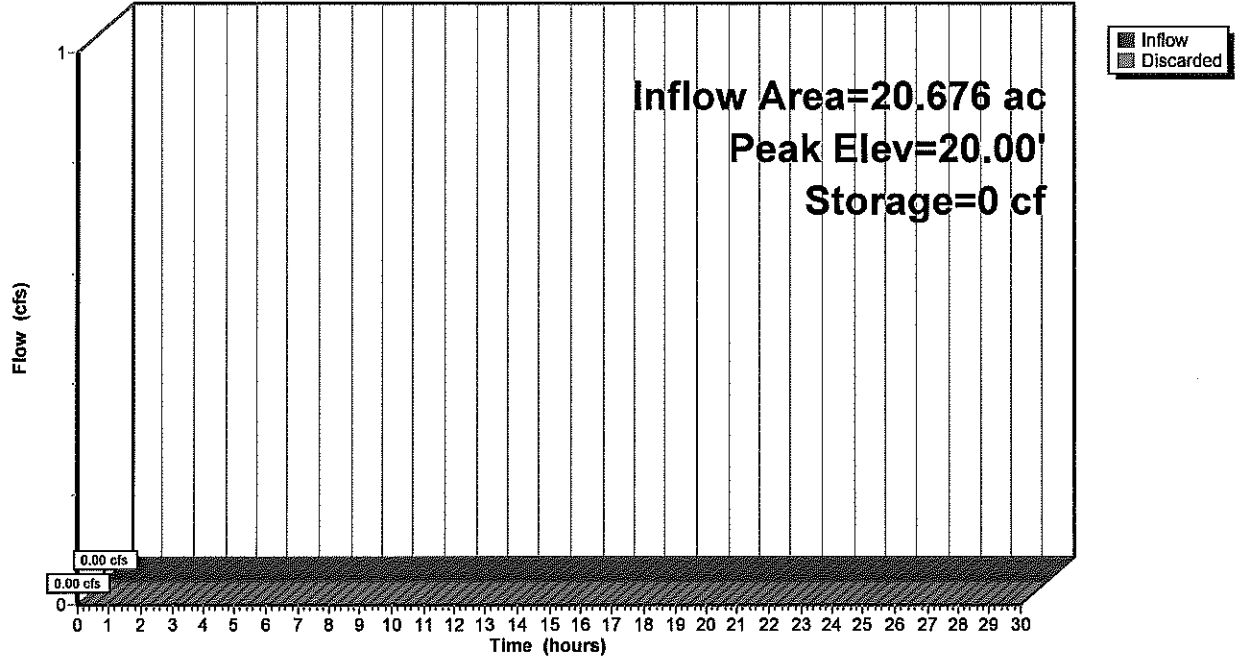
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.00	7,416	0	0
22.00	9,865	17,281	17,281
24.00	12,558	22,423	39,704
26.00	15,496	28,054	67,758

Device	Routing	Invert	Outlet Devices
#1	Discarded	20.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=20.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Pond 5P: INFIL BASIN 5

Hydrograph



Summary for Pond 10P: INFIL BASIN 4

Inflow Area = 3.021 ac, 24.29% Impervious, Inflow Depth = 0.00" for Common Storm event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 30.00' @ 0.00 hrs Surf.Area= 471 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

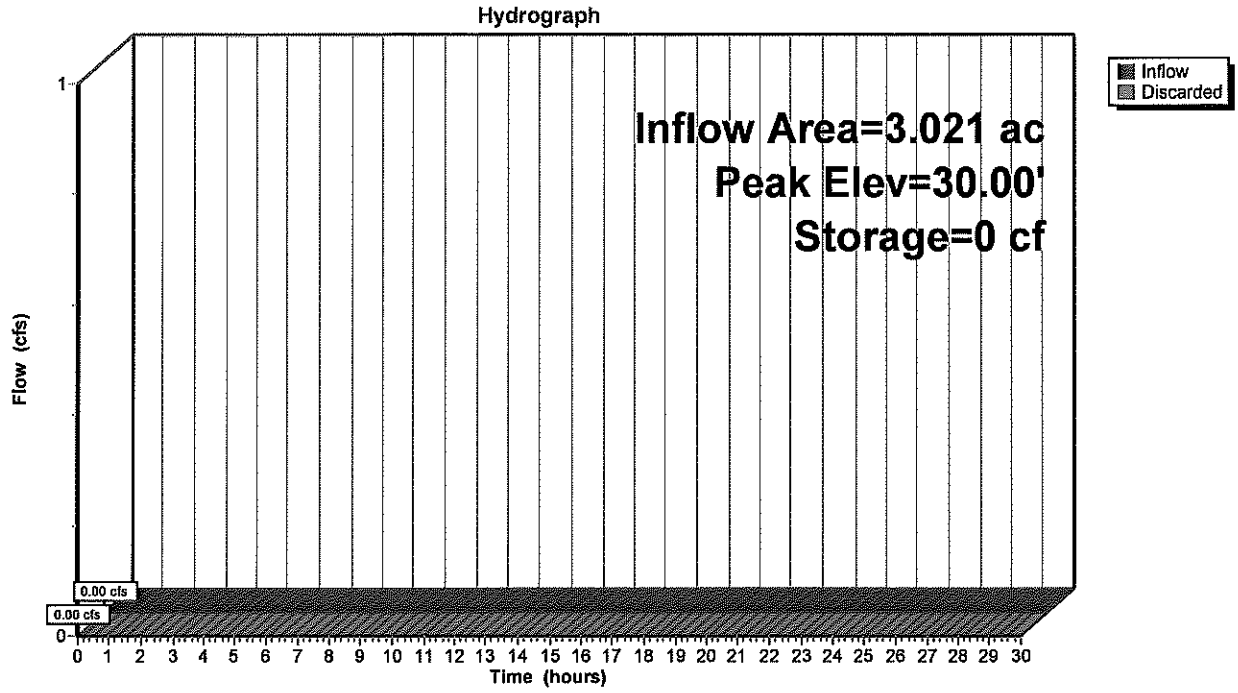
Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	11,976 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	471	0	0
32.00	1,337	1,808	1,808
34.00	2,477	3,814	5,622
36.00	3,877	6,354	11,976

Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=30.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

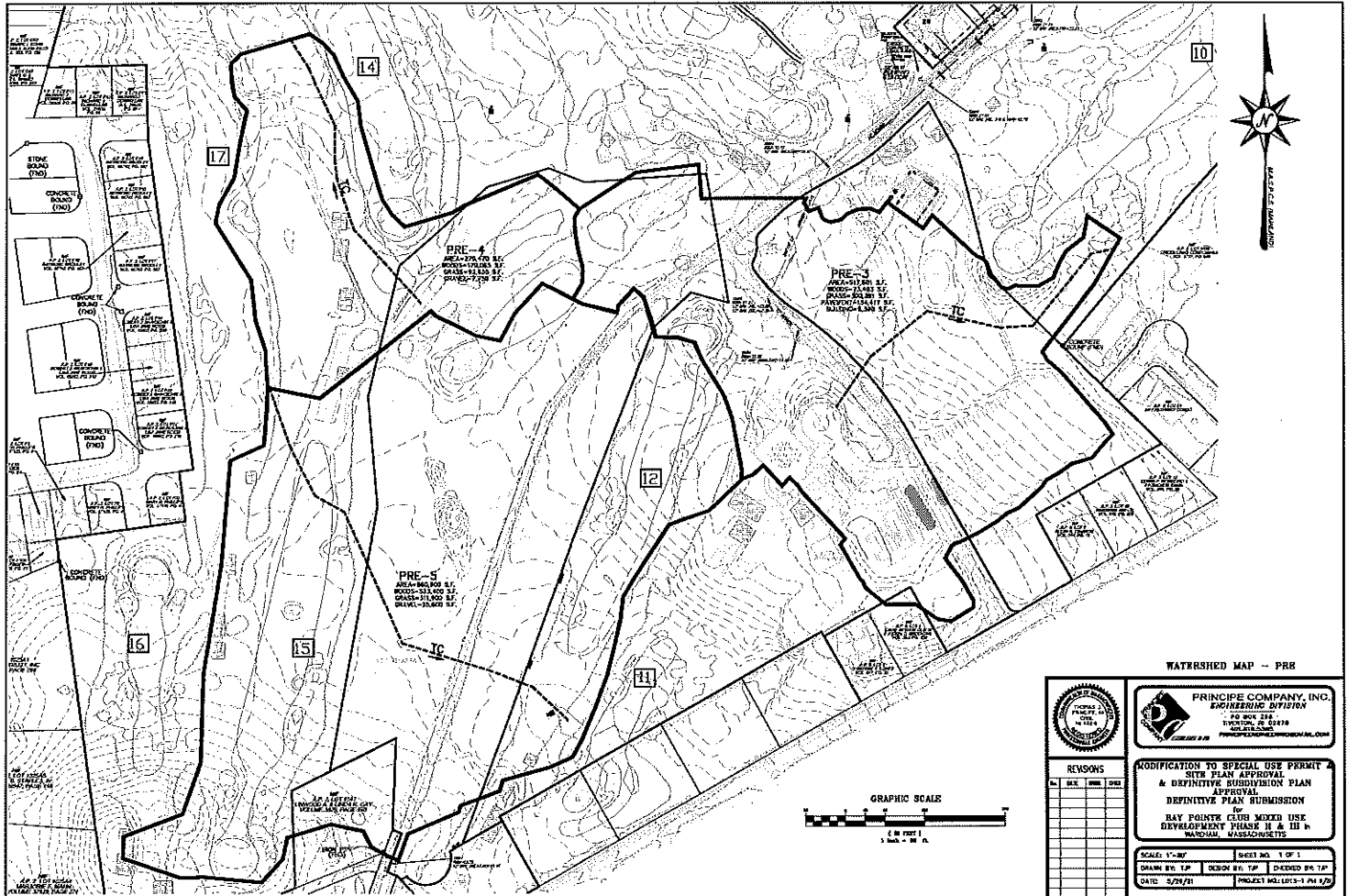
Pond 10P: INFIL BASIN 4



Stormwater Calculations – Phase II
Bay Pointe Club Mixed-Use Development Project
Wareham, MA
November 28, 2018
Revised 4-4-19, Revised 5-26-21

WATERSHED MAPS





WATERSHED MAP -- PRR

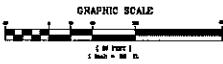
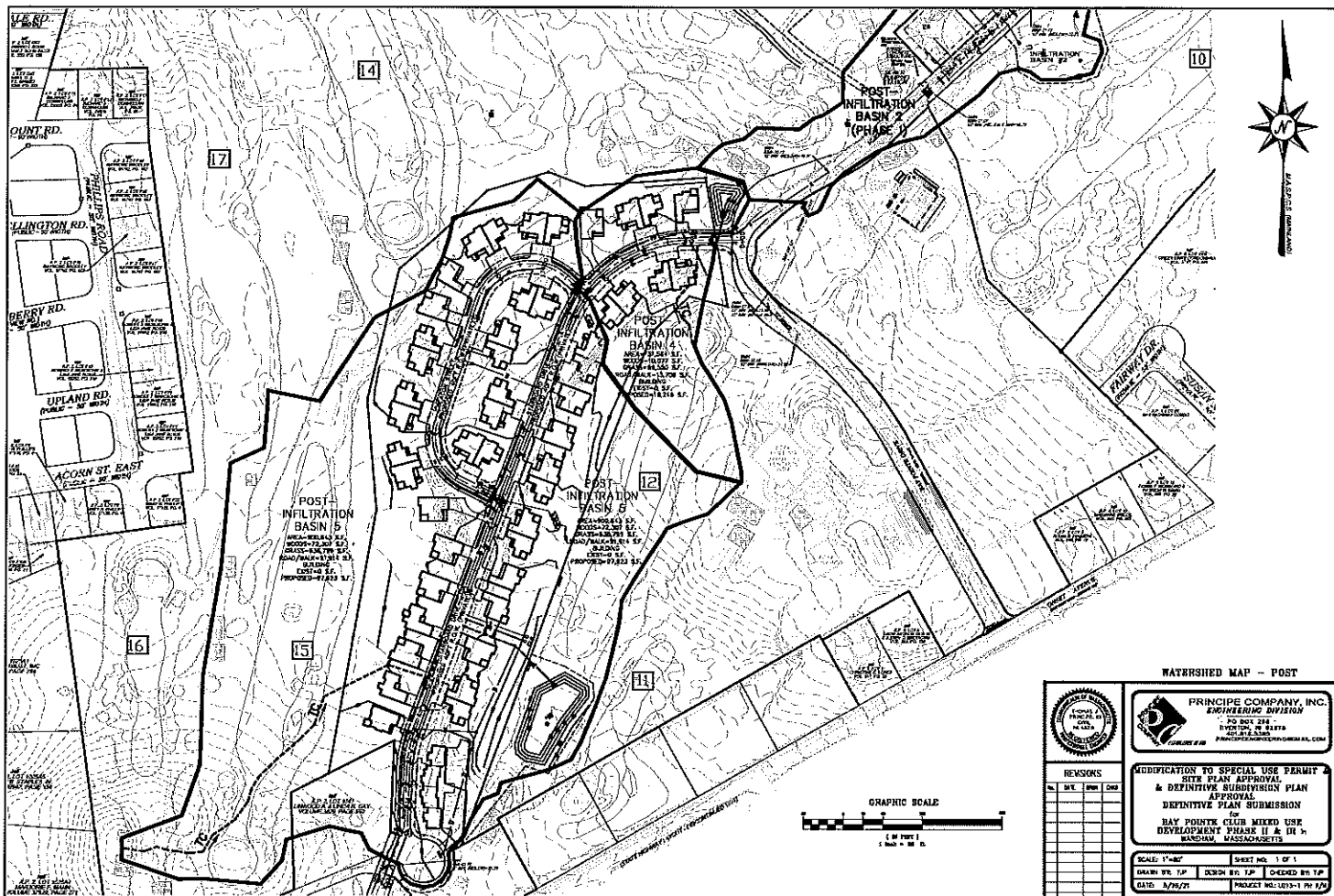


PRINCIPLE COMPANY, INC.
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REVISIONS			
NO.	DATE	DESCRIPTION	BY

MODIFICATION TO SPECIAL USE PERMIT
 & DEFINITIVE SUBDIVISION PLAN
 APPROVAL
 DEFINITIVE PLAN SUBMISSION
 for
 RAY POINTS CLUB MIXED USE
 DEVELOPMENT PHASE II & III
 WARDMAN, MASSACHUSETTS

SCALE: 1"=80'
 SHEET NO. 1 OF 1
 DRAWN BY: TJP DESIGN BY: TJP CHECKED BY: TJP
 DATE: 5/24/21 PROJECT NUMBER: 1-PR-8/20



WATERSHED MAP - POST



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 ENGINEERING DIVISION
 70 BOX 218
 HYSTON, RI 02118
 401.872.2300
 PRINCIPAL@PRINCIPALINC.COM

REVISIONS			
No.	Date	By	Check

**MODIFICATION TO SPECIAL USE PERMIT
 SITE PLAN APPROVAL
 & DEFINITIVE SUBDIVISION PLAN
 APPROVAL
 DEFINITIVE PLAN SUBMISSION
 FOR
 BAY POINTS CLUB MIXED USE
 DEVELOPMENT PHASE II & III
 WANDAN, MASSACHUSETTS**

SCALE: 1"=60' SHEET NO. 1 OF 1
 DRAWN BY: T.P. DESIGN BY: T.P. CHECKED BY: T.P.
 DATE: 8/26/21 PROJECT NO.: URS-1 PV 170