

019-A-001-001

1-1 India St, Portland, ME

The Longfellow at Ocean Gateway

Riverwalk, LLC

Pre-Development

Prepared by Woodard & Curran

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Pre-Development

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

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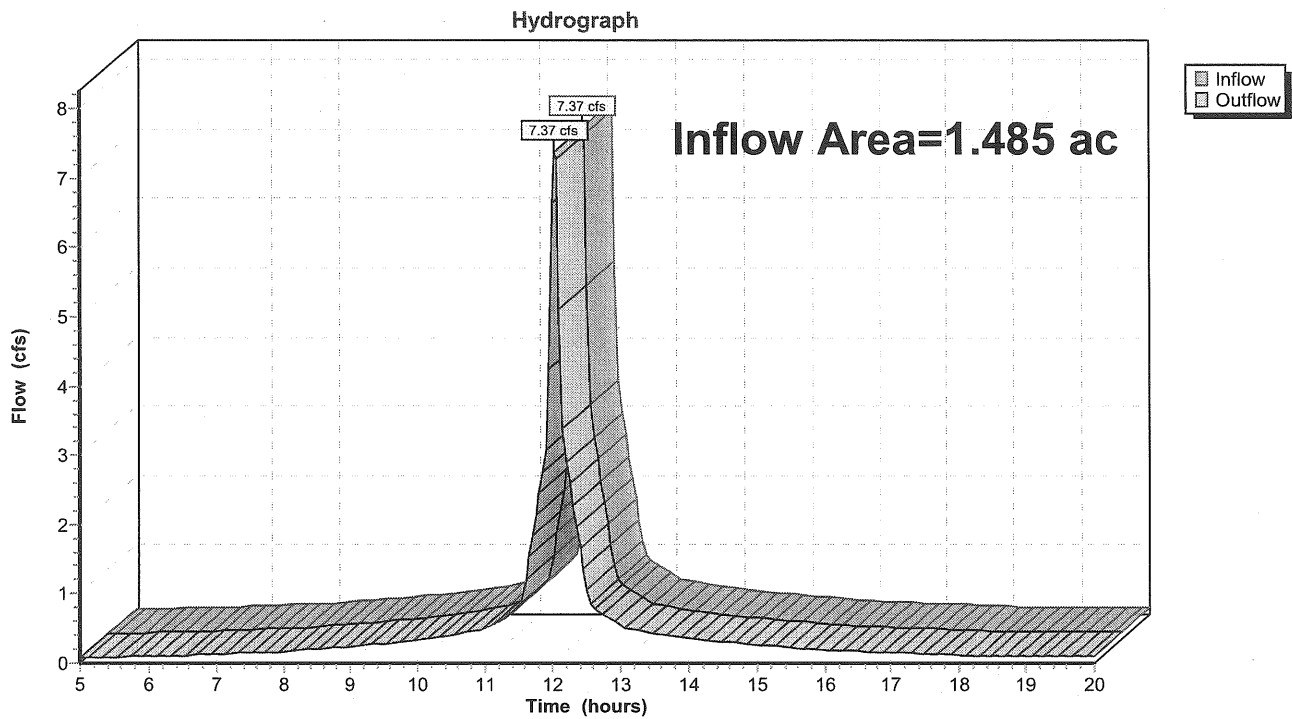
10/30/2006

Reach S1: (new node)

Inflow Area = 1.485 ac, Inflow Depth > 4.15" for 10-Year Storm event
Inflow = 7.37 cfs @ 12.04 hrs, Volume= 0.513 af
Outflow = 7.37 cfs @ 12.04 hrs, Volume= 0.513 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach S1: (new node)



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

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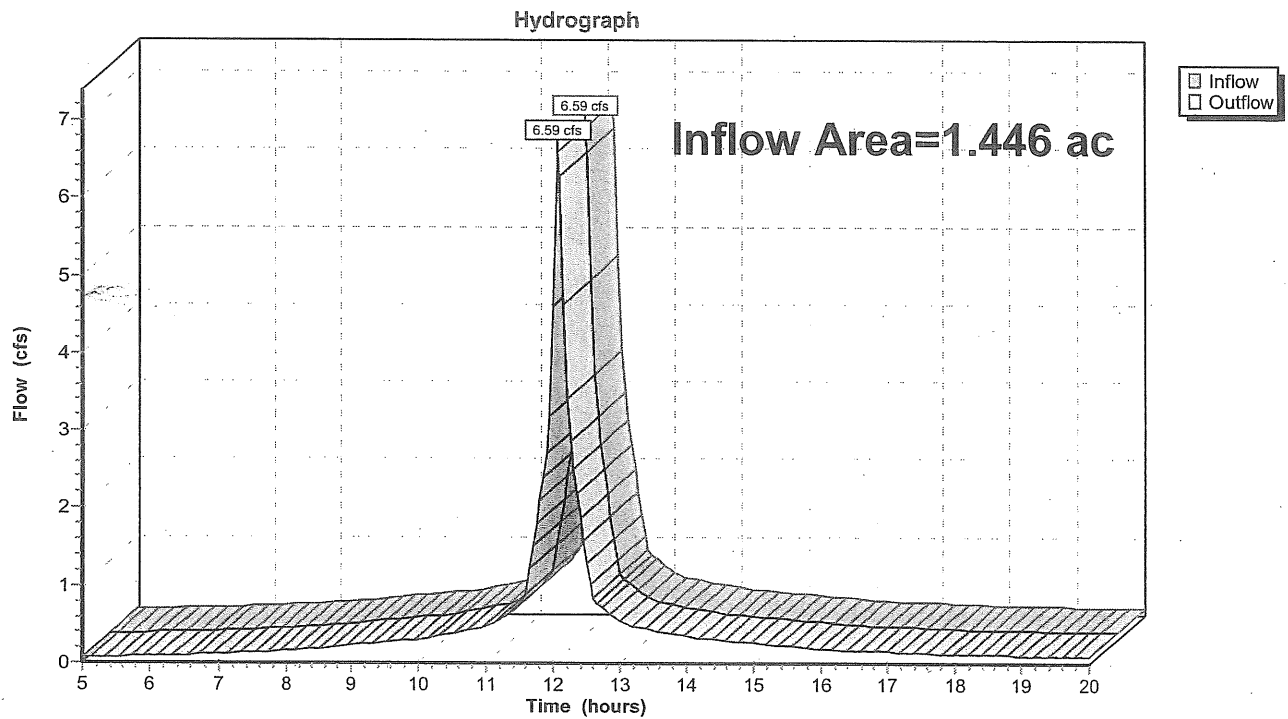
10/30/2006

Reach FR: Fore River

Inflow Area = 1.446 ac, Inflow Depth > 4.10" for 10-Year Storm event
Inflow = 6.59 cfs @ 12.07 hrs, Volume= 0.494 af
Outflow = 6.59 cfs @ 12.07 hrs, Volume= 0.494 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach FR: Fore River



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

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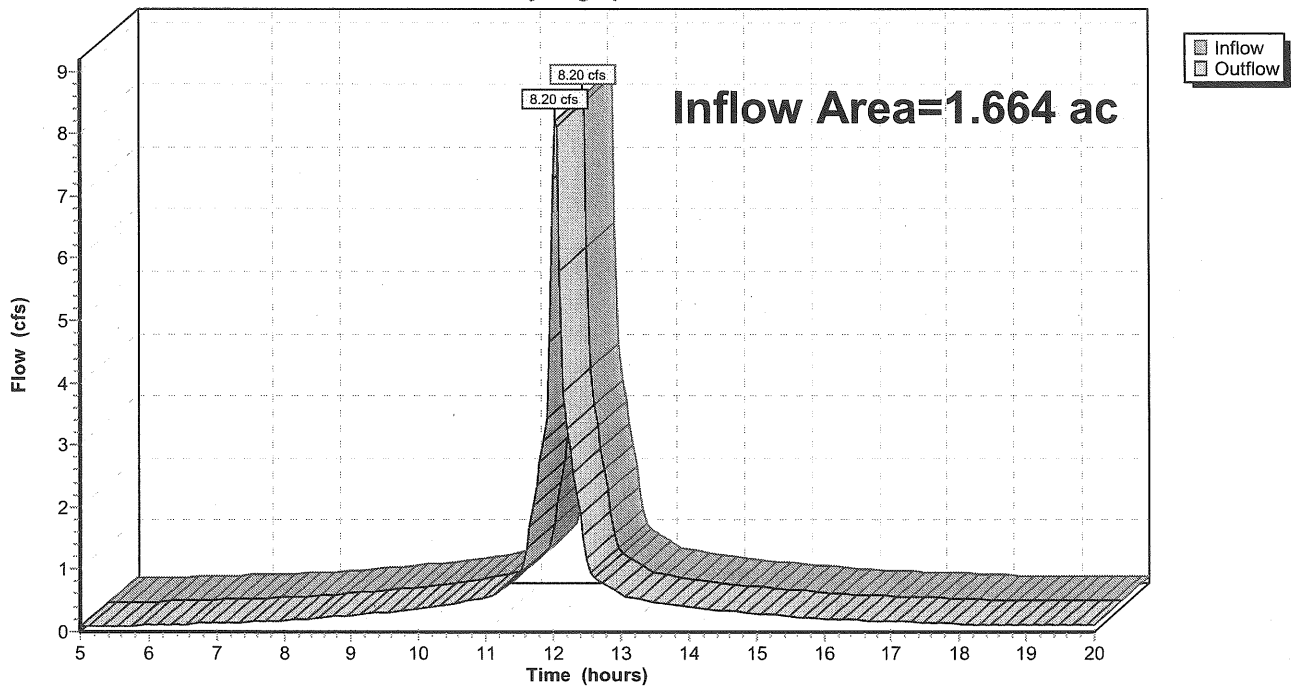
Reach CS: Combined Sewer

Inflow Area = 1.664 ac, Inflow Depth > 4.12" for 10-Year Storm event
Inflow = 8.20 cfs @ 12.04 hrs, Volume= 0.571 af
Outflow = 8.20 cfs @ 12.04 hrs, Volume= 0.571 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach CS: Combined Sewer

Hydrograph



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

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Subcatchment 5X: Ocean Gateway Gravel Lot

Runoff = 4.60 cfs @ 12.08 hrs, Volume= 0.351 af, Depth> 4.15"

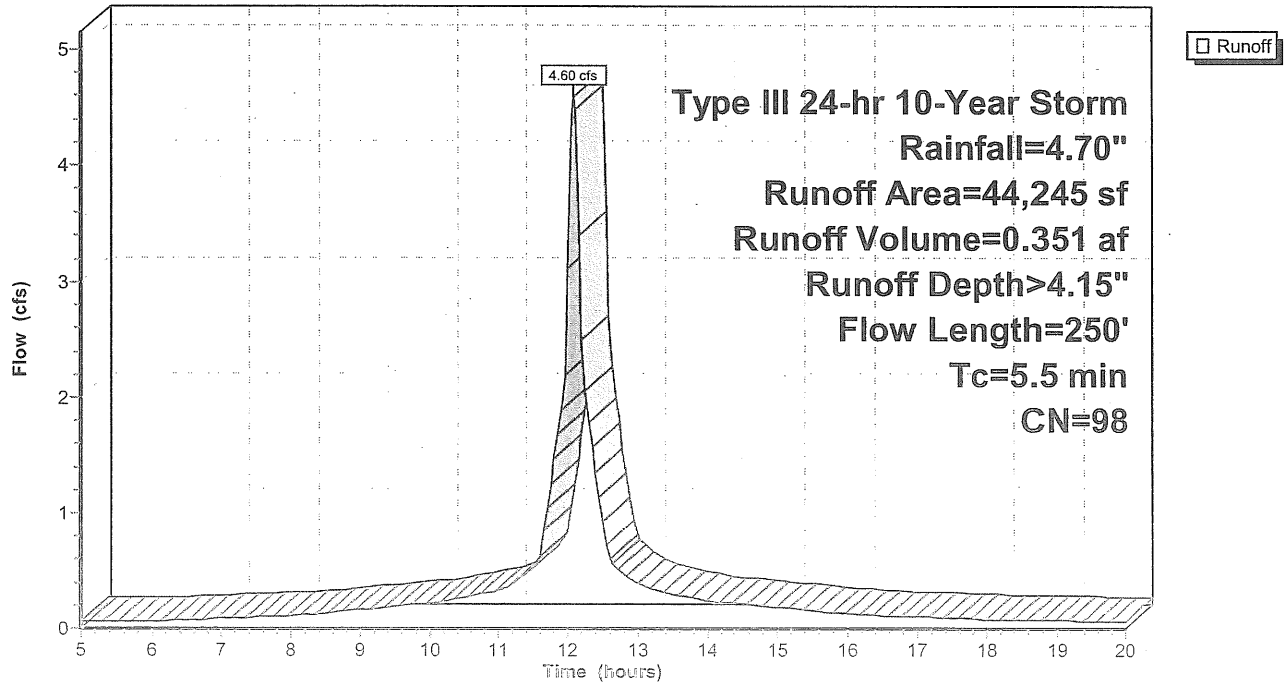
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.70"

Area (sf)	CN	Description
675	98	Buildings
1,415	98	Paved
41,460	98	Gravel Parking
695	68	<50% Grass cover, Poor, HSG A
44,245	98	Weighted Average
695		Pervious Area
43,550		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	15	0.0100	0.09		Sheet Flow, BC Grass: Short n= 0.150 P2= 3.00"
1.4	85	0.0100	0.98		Sheet Flow, CD Smooth surfaces n= 0.011 P2= 3.00"
1.2	150	0.0171	2.11		Shallow Concentrated Flow, DE Unpaved Kv= 16.1 fps
5.5	250	Total			

Subcatchment 5X: Ocean Gateway Gravel Lot

Hydrograph



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

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Subcatchment 4X: Turner Barker Gravel Lot

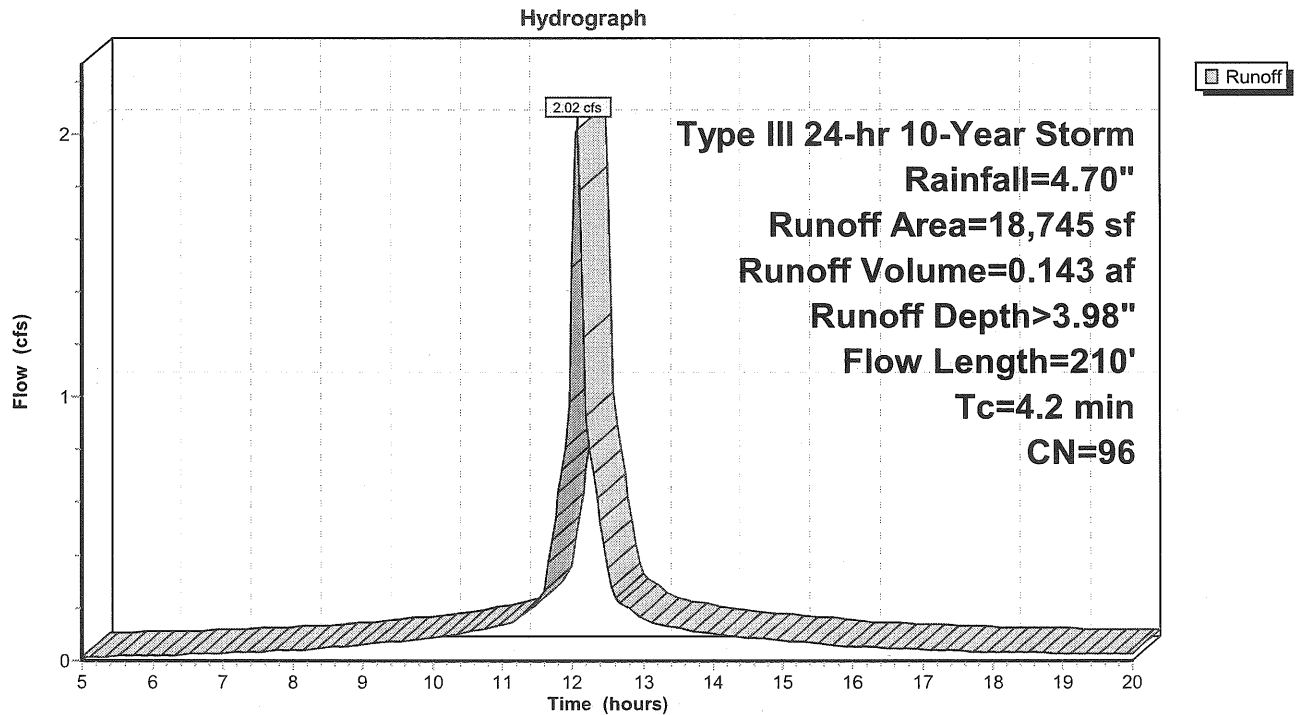
Runoff = 2.02 cfs @ 12.06 hrs, Volume= 0.143 af, Depth> 3.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.70"

Area (sf)	CN	Description
1,030	98	Buildings
285	98	Paved
16,130	98	Gravel Parking
1,300	68	<50% Grass cover, Poor, HSG A
18,745	96	Weighted Average
1,300		Pervious Area
17,445		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	15	0.0200	0.11		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
1.1	85	0.0200	1.29		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.9	110	0.0150	1.97		Shallow Concentrated Flow, CD Unpaved Kv= 16.1 fps
4.2	210	Total			

Subcatchment 4X: Turner Barker Gravel Lot



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

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Subcatchment 3X: Turner Barker

Runoff = 0.85 cfs @ 12.05 hrs, Volume= 0.058 af, Depth> 3.89"

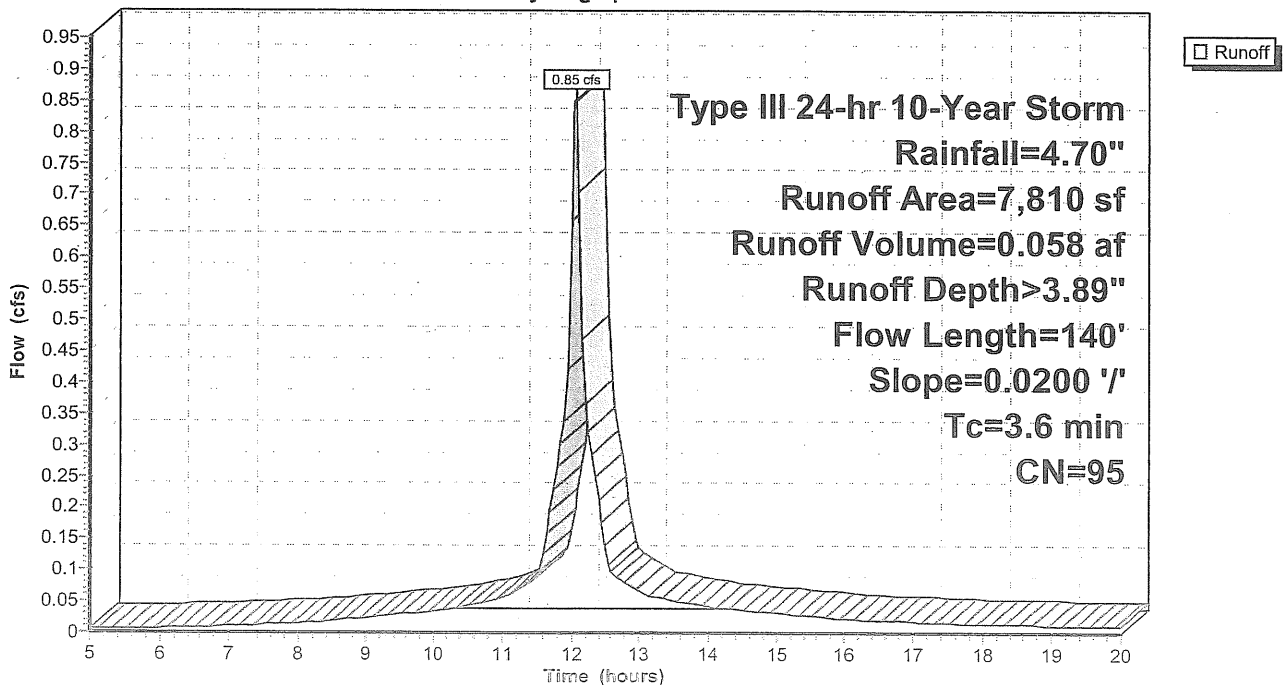
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.70"

Area (sf)	CN	Description
4,000	98	Building
2,980	98	Gravel Parking
830	68	<50% Grass cover, Poor, HSG A
7,810	95	Weighted Average
830		Pervious Area
6,980		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	15	0.0200	0.11		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
1.1	85	0.0200	1.29		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.3	40	0.0200	2.28		Shallow-Concentrated Flow, CD Unpaved Kv= 16.1 fps
3.6	140	Total			

Subcatchment 3X: Turner Barker

Hydrograph



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

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Subcatchment 2X: Breakaway

Runoff = 0.81 cfs @ 12.01 hrs, Volume= 0.054 af, Depth> 4.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Storm Rainfall=4.70"

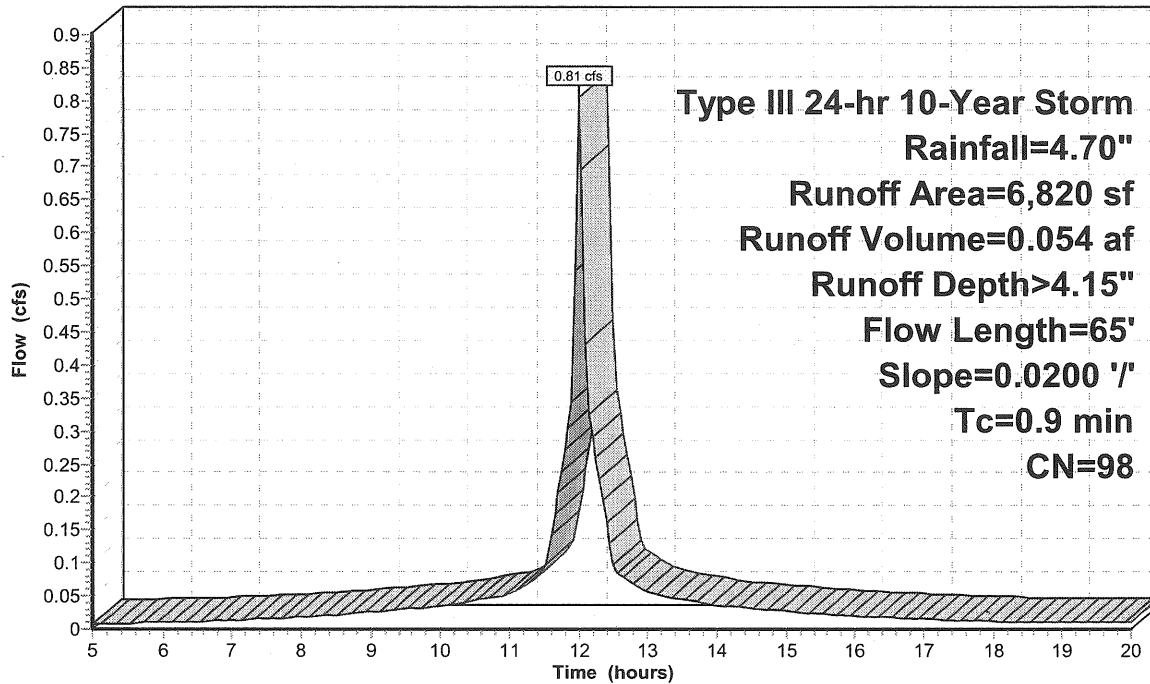
Area (sf)	CN	Description
5,870	98	Building
950	98	Gravel Parking
6,820	98	Weighted Average
6,820		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	65	0.0200	1.22		Sheet Flow, AB

Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2X: Breakaway

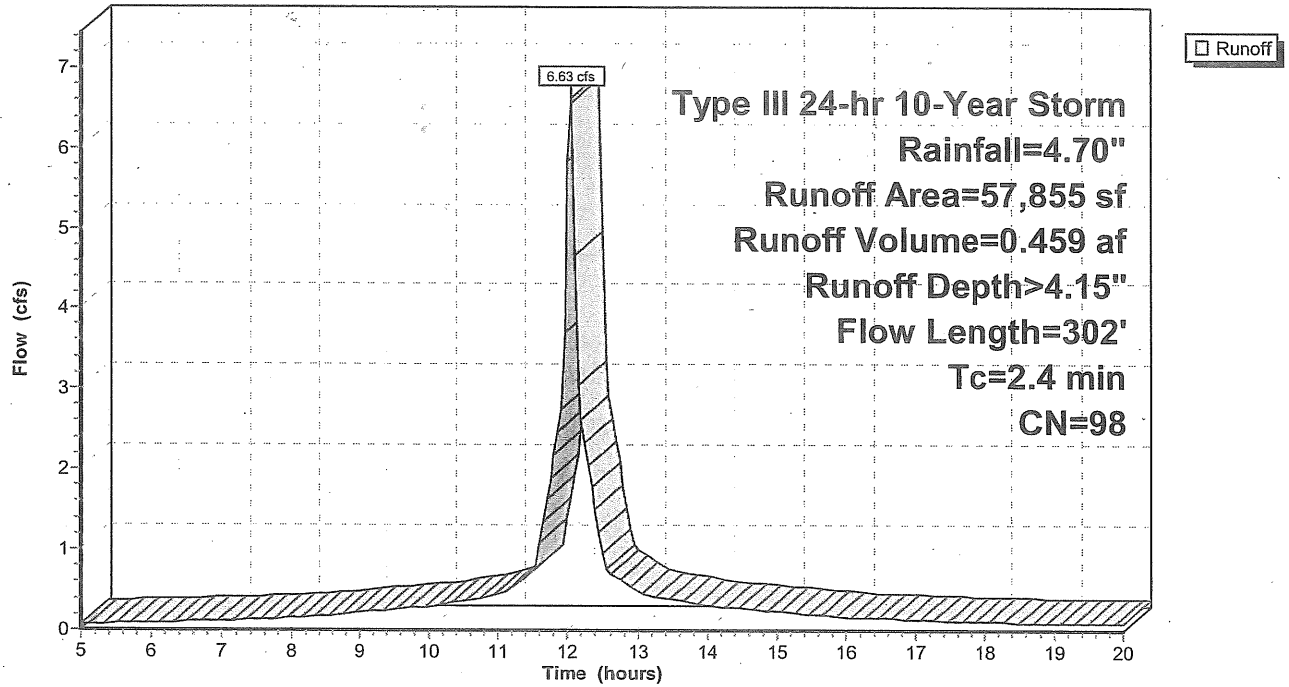
Hydrograph



Runoff

Subcatchment 1X: Shipyard Gravel Lot

Hydrograph



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

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Subcatchment 1X: Shipyard Gravel Lot

Runoff = 6.63 cfs @ 12.04 hrs, Volume= 0.459 af, Depth> 4.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.70"

Area (sf)	CN	Description
2,635	98	Building
29,940	98	Gravel Parking
25,280	98	Paved
57,855	98	Weighted Average
57,855		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0333	1.47		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
0.3	40	0.1000	2.11		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.2	40	0.0500	3.60		Shallow Concentrated Flow, CD Unpaved Kv= 16.1 fps
0.9	90	0.0111	1.70		Shallow Concentrated Flow, DE Unpaved Kv= 16.1 fps
0.2	40	0.0625	4.03		Shallow Concentrated Flow, EF Unpaved Kv= 16.1 fps
0.1	32	0.0100	5.90	4.63	Circular Channel (pipe), FG Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010
2.4	302	Total			

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

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1X: Shipyard Gravel Lot

Runoff Area=57,855 sf Runoff Depth>4.15"
Flow Length=302' Tc=2.4 min CN=98 Runoff=6.63 cfs 0.459 af

Subcatchment 2X: Breakaway

Runoff Area=6,820 sf Runoff Depth>4.15"
Flow Length=65' Slope=0.0200 '/ Tc=0.9 min CN=98 Runoff=0.81 cfs 0.054 af

Subcatchment 3X: Turner Barker

Runoff Area=7,810 sf Runoff Depth>3.89"
Flow Length=140' Slope=0.0200 '/ Tc=3.6 min CN=95 Runoff=0.85 cfs 0.058 af

Subcatchment 4X: Turner Barker Gravel Lot

Runoff Area=18,745 sf Runoff Depth>3.98"
Flow Length=210' Tc=4.2 min CN=96 Runoff=2.02 cfs 0.143 af

Subcatchment 5X: Ocean Gateway Gravel Lot

Runoff Area=44,245 sf Runoff Depth>4.15"
Flow Length=250' Tc=5.5 min CN=98 Runoff=4.60 cfs 0.351 af

Reach CS: Combined Sewer

Inflow=8.20 cfs 0.571 af
Outflow=8.20 cfs 0.571 af

Reach FR: Fore River

Inflow=6.59 cfs 0.494 af
Outflow=6.59 cfs 0.494 af

Reach S1: (new node)

Inflow=7.37 cfs 0.513 af
Outflow=7.37 cfs 0.513 af

Reach S2: (new node)

Inflow=0.85 cfs 0.058 af
Outflow=0.85 cfs 0.058 af

Reach TOT: (new node)

Inflow=14.53 cfs 1.065 af
Outflow=14.53 cfs 1.065 af

Pond D2: Commercial Street Storm System

Peak Elev=9.68' Inflow=2.02 cfs 0.143 af
15.0" x 192.0' Culvert Outflow=2.02 cfs 0.143 af

Pond D3: Commercial

Peak Elev=9.27' Inflow=2.02 cfs 0.143 af
15.0" x 192.0' Culvert Outflow=2.02 cfs 0.143 af

Pond D7: Hancock

Peak Elev=9.21' Inflow=4.60 cfs 0.351 af
30.0" x 36.0' Culvert Outflow=4.60 cfs 0.351 af

Pond D8: Hancock Street Storm System

Peak Elev=10.70' Inflow=4.60 cfs 0.351 af
24.0" x 196.0' Culvert Outflow=4.60 cfs 0.351 af

Total Runoff Area = 3.110 ac Runoff Volume = 1.065 af Average Runoff Depth = 4.11"
2.09% Pervious Area = 0.065 ac 97.91% Impervious Area = 3.045 ac

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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Pond D8: Hancock Street Storm System

Inflow Area = 1.016 ac, Inflow Depth > 2.59" for 2-Year Storm event
Inflow = 2.91 cfs @ 12.08 hrs, Volume= 0.219 af
Outflow = 2.91 cfs @ 12.08 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min
Primary = 2.91 cfs @ 12.08 hrs, Volume= 0.219 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 10.50' @ 12.08 hrs

Flood Elev= 15.38'

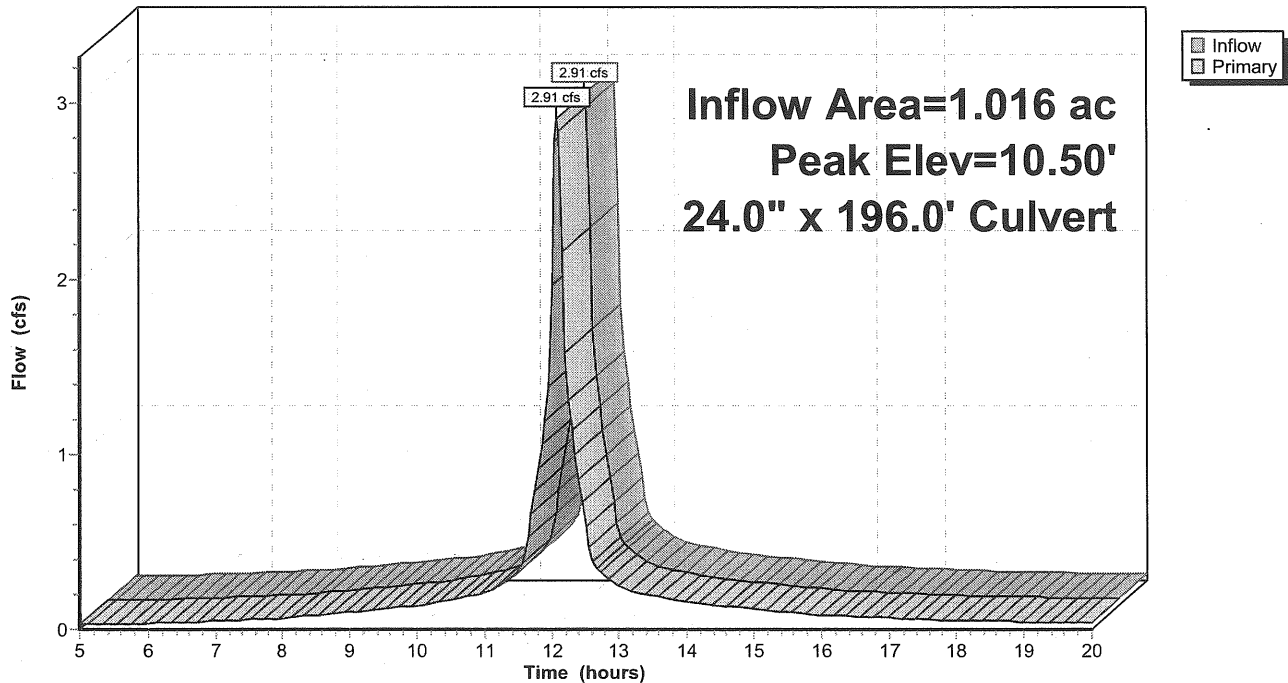
Device	Routing	Invert	Outlet Devices
#1	Primary	9.78'	24.0" x 196.0' long Culvert Ke= 0.500 Outlet Invert= 8.18' S= 0.0082 ' Cc= 0.900 n= 0.011

Primary OutFlow Max=2.82 cfs @ 12.08 hrs HW=10.48' TW=8.96' (Dynamic Tailwater)

↳ **1=Culvert** (Inlet Controls 2.82 cfs @ 2.86 fps)

Pond D8: Hancock Street Storm System

Hydrograph



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Pond D7: Hancock

Inflow Area = 1.016 ac, Inflow Depth > 2.59" for 2-Year Storm event
Inflow = 2.91 cfs @ 12.08 hrs, Volume= 0.219 af
Outflow = 2.91 cfs @ 12.08 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min
Primary = 2.91 cfs @ 12.08 hrs, Volume= 0.219 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 8.98' @ 12.08 hrs

Flood Elev= 13.91'

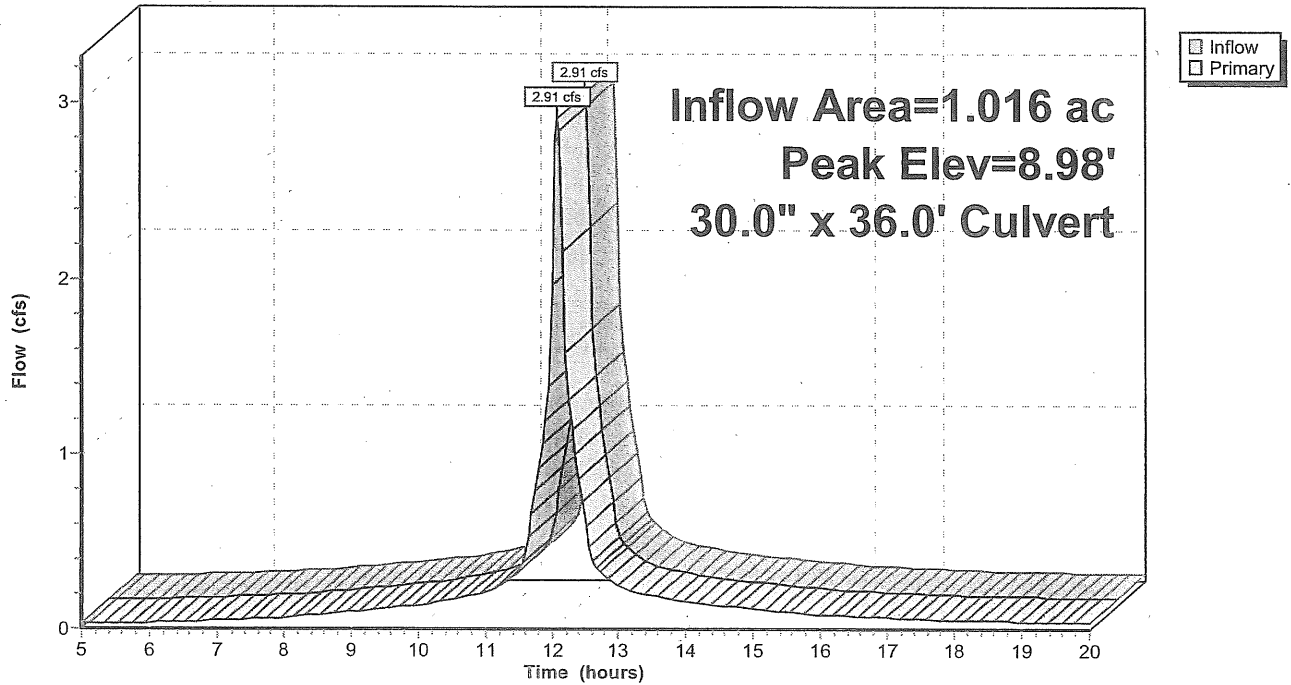
Device	Routing	Invert	Outlet Devices
#1	Primary	8.08'	30.0" x 36.0' long Culvert Ke= 0.500 Outlet Invert= 8.07' S= 0.0003 '/ Cc= 0.900 n= 0.012

Primary OutFlow Max=2.82 cfs @ 12.08 hrs HW=8.96' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 2.82 cfs @ 2.70 fps)

Pond D7: Hancock

Hydrograph



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Pond D3: Commercial

Inflow Area = 0.430 ac, Inflow Depth > 2.41" for 2-Year Storm event
Inflow = 1.25 cfs @ 12.06 hrs, Volume= 0.086 af
Outflow = 1.25 cfs @ 12.06 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
Primary = 1.25 cfs @ 12.06 hrs, Volume= 0.086 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 9.05' @ 12.06 hrs

Flood Elev= 13.91'

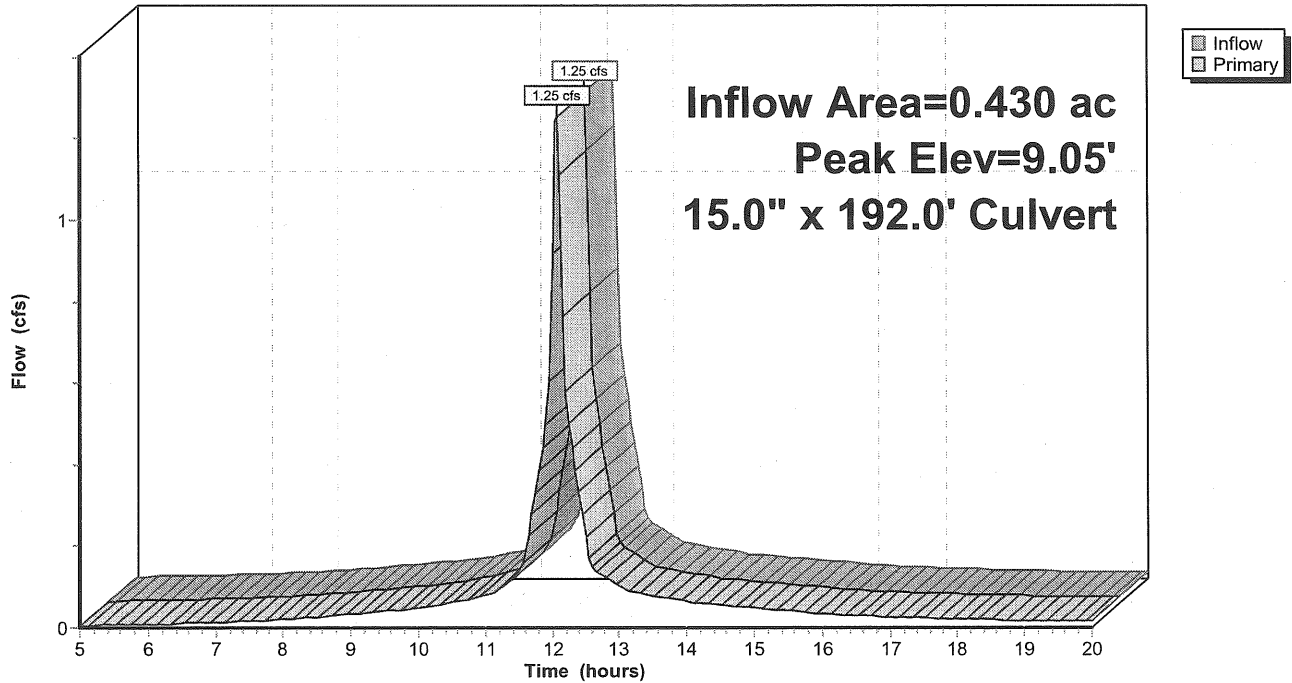
Device	Routing	Invert	Outlet Devices
#1	Primary	8.35'	15.0" x 192.0' long Culvert Ke= 0.500 Outlet Invert= 8.06' S= 0.0015 '/' Cc= 0.900 n= 0.010

Primary OutFlow Max=1.22 cfs @ 12.06 hrs HW=9.04' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 1.22 cfs @ 2.53 fps)

Pond D3: Commercial

Hydrograph



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Pond D2: Commercial Street Storm System

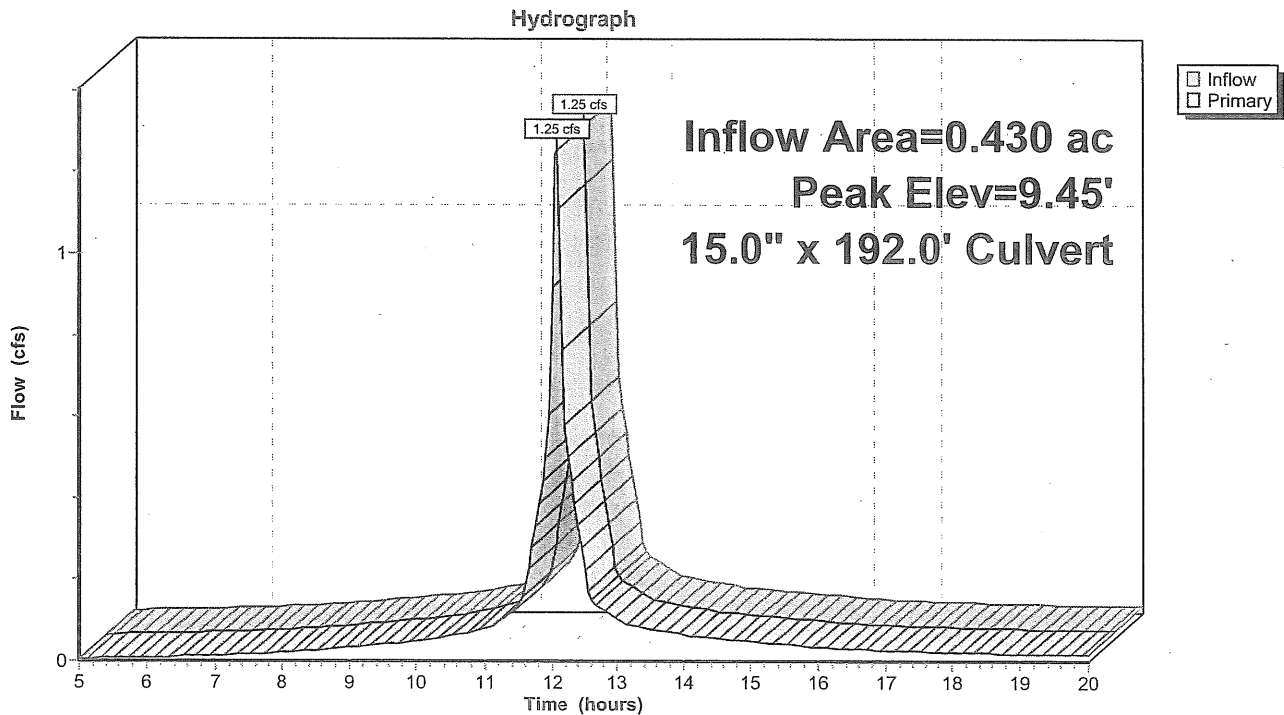
Inflow Area = 0.430 ac, Inflow Depth > 2.41" for 2-Year Storm event
Inflow = 1.25 cfs @ 12.06 hrs, Volume= 0.086 af
Outflow = 1.25 cfs @ 12.06 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
Primary = 1.25 cfs @ 12.06 hrs, Volume= 0.086 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 9.45' @ 12.07 hrs
Flood Elev= 14.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	8.74'	15.0" x 192.0' long Culvert Ke= 0.500 Outlet Invert= 8.45' S= 0.0015 '/' Cc= 0.900 n= 0.010

Primary OutFlow Max=1.15 cfs @ 12.06 hrs HW=9.44' TW=9.04' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.15 cfs @ 2.35 fps)

Pond D2: Commercial Street Storm System



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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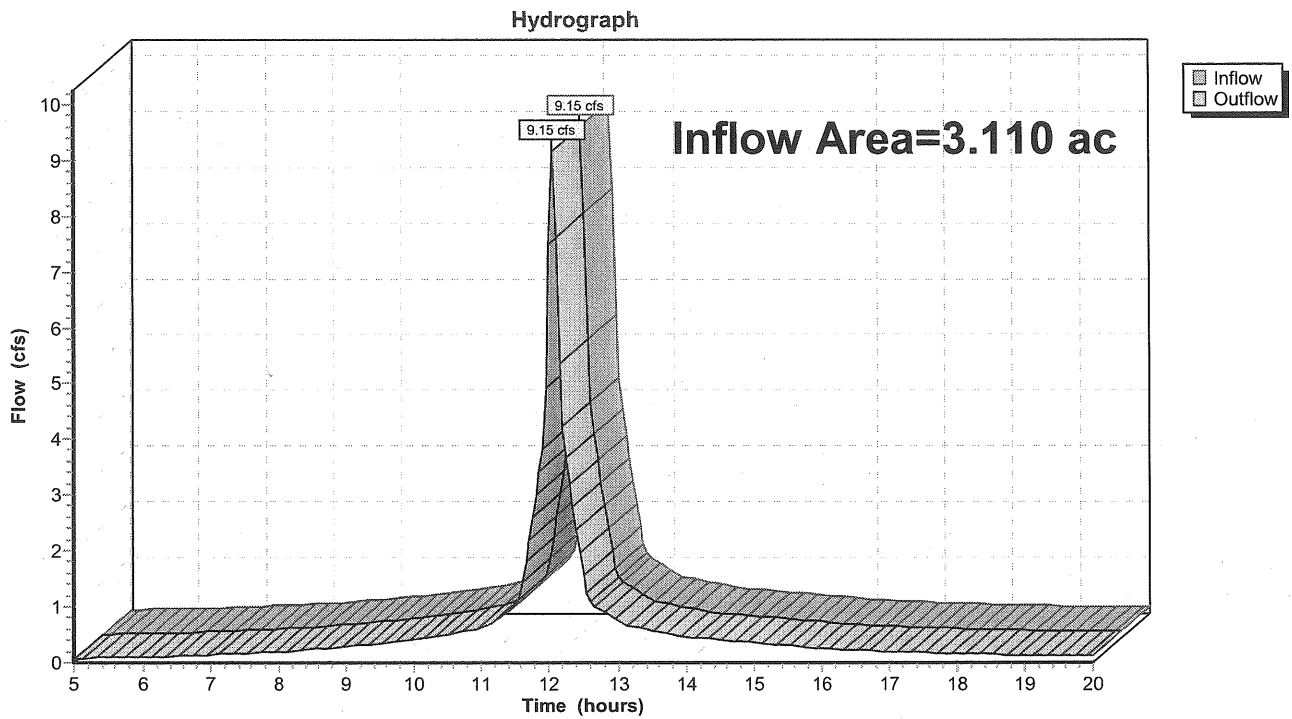
10/30/2006

Reach TOT: (new node)

Inflow Area = 3.110 ac, Inflow Depth > 2.55" for 2-Year Storm event
Inflow = 9.15 cfs @ 12.05 hrs, Volume= 0.661 af
Outflow = 9.15 cfs @ 12.05 hrs, Volume= 0.661 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach TOT: (new node)



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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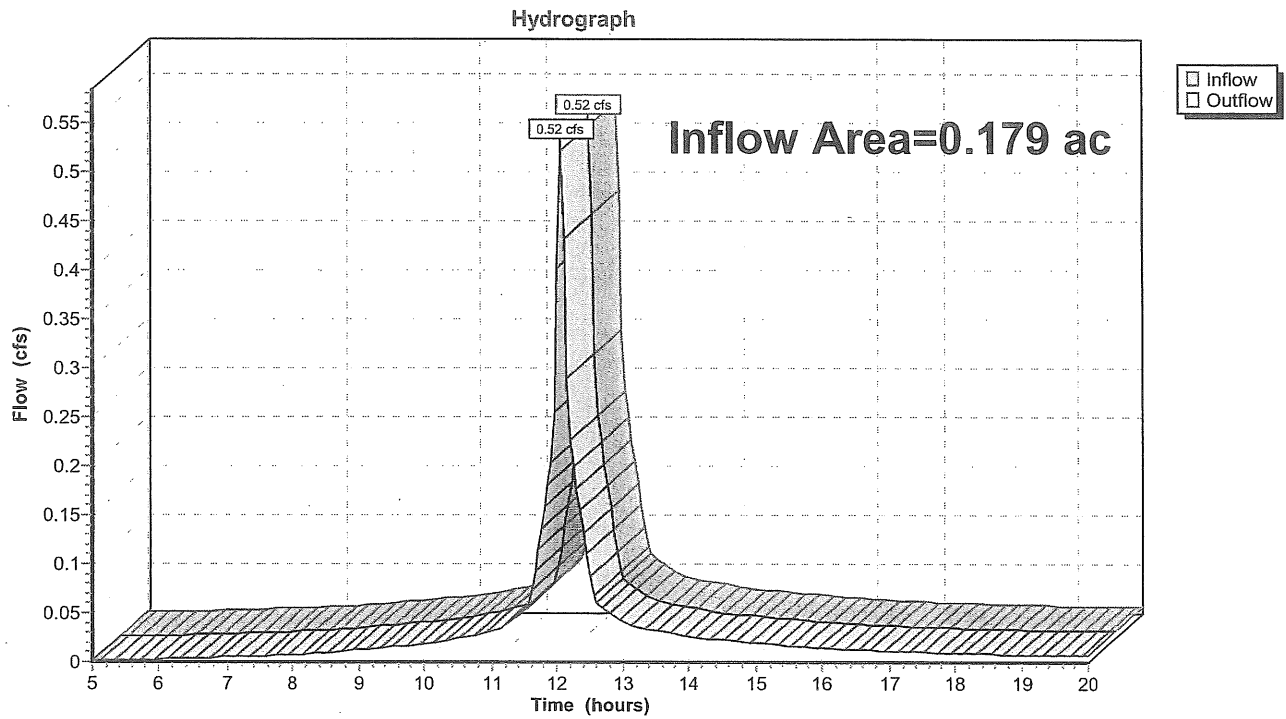
10/30/2006

Reach S2: (new node)

Inflow Area = 0.179 ac, Inflow Depth > 2.32" for 2-Year Storm event
Inflow = 0.52 cfs @ 12.05 hrs, Volume= 0.035 af
Outflow = 0.52 cfs @ 12.05 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach S2: (new node)



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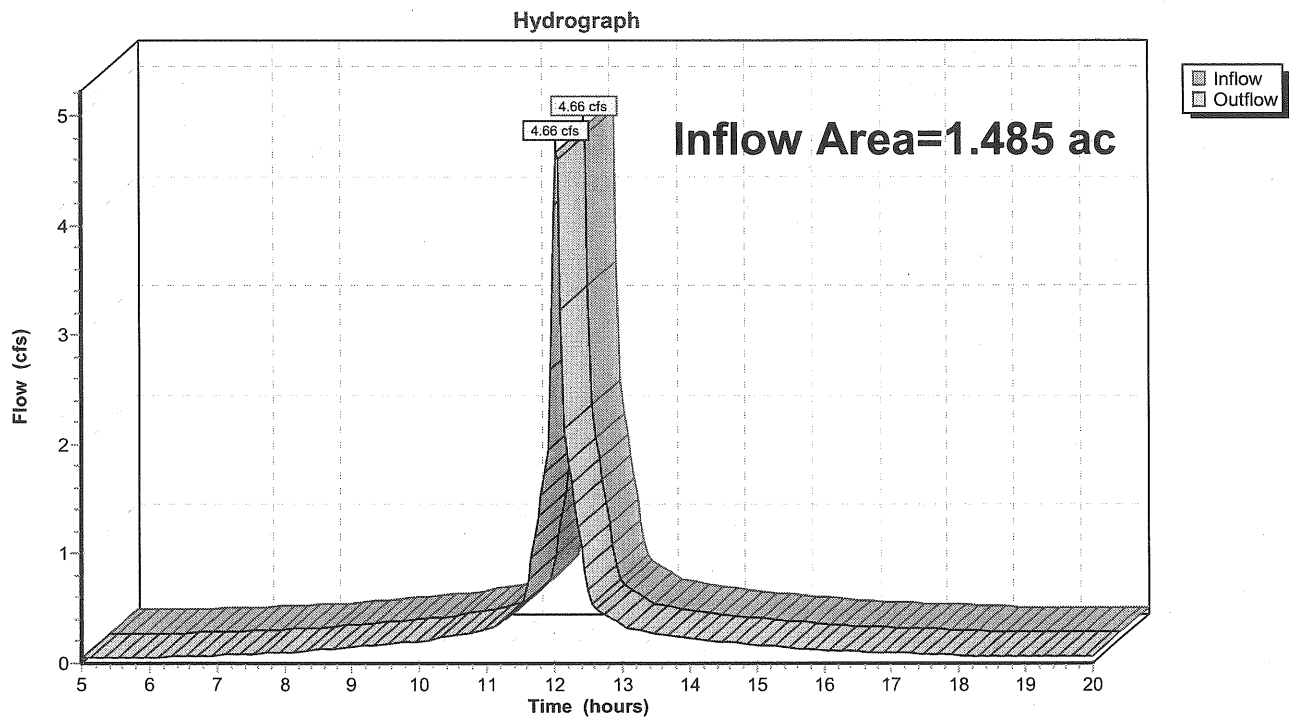
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Reach S1: (new node)

Inflow Area = 1.485 ac, Inflow Depth > 2.59" for 2-Year Storm event
Inflow = 4.66 cfs @ 12.04 hrs, Volume= 0.321 af
Outflow = 4.66 cfs @ 12.04 hrs, Volume= 0.321 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach S1: (new node)



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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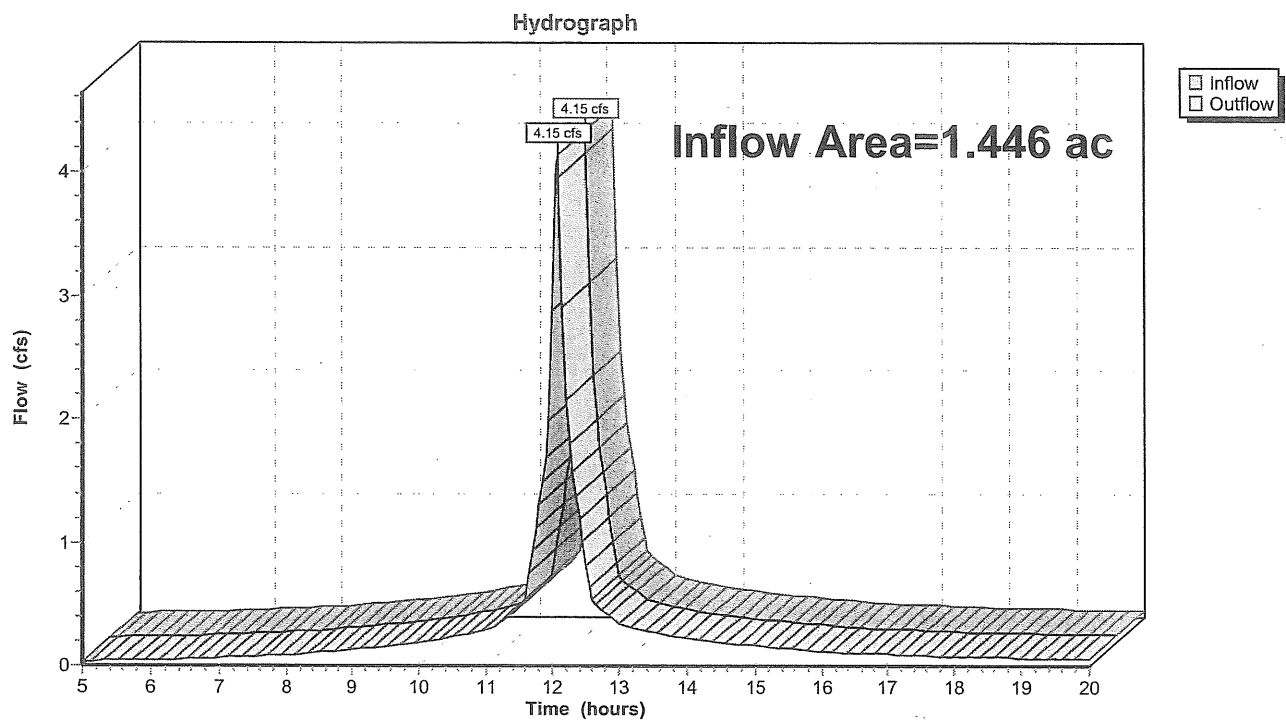
10/30/2006

Reach FR: Fore River

Inflow Area = 1.446 ac, Inflow Depth > 2.54" for 2-Year Storm event
Inflow = 4.15 cfs @ 12.07 hrs, Volume= 0.306 af
Outflow = 4.15 cfs @ 12.07 hrs, Volume= 0.306 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach FR: Fore River



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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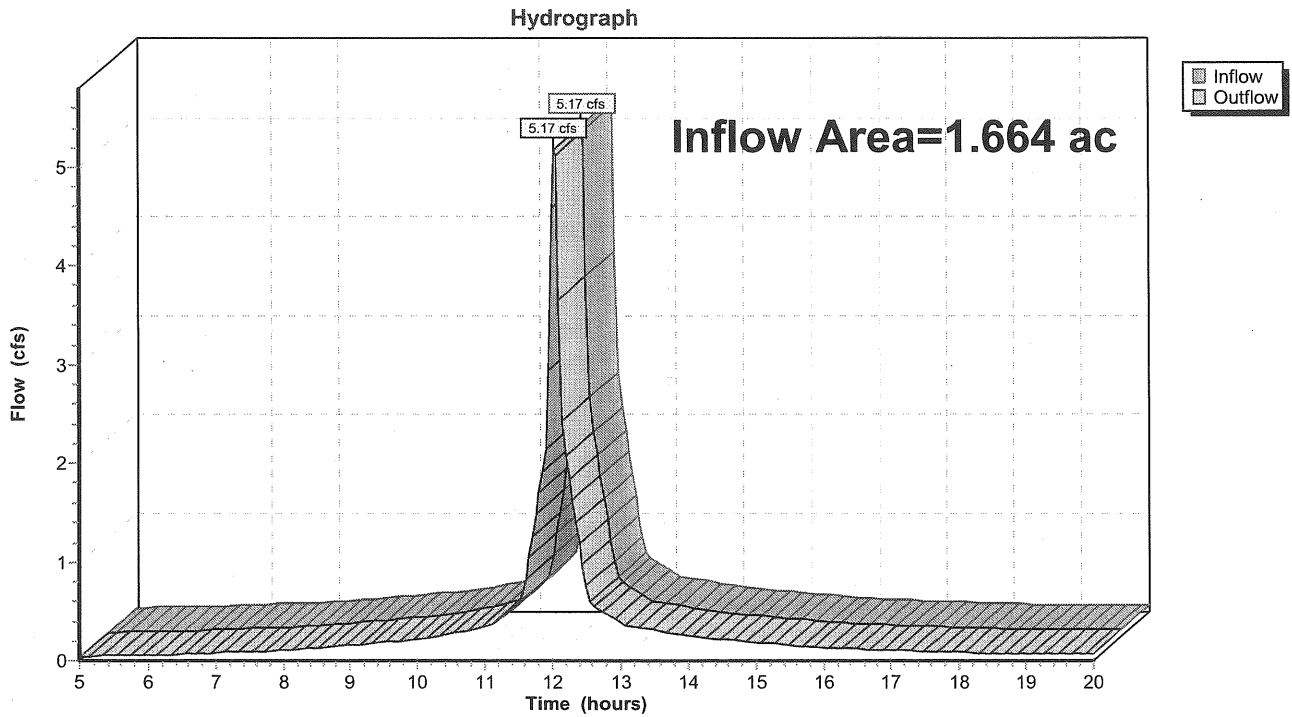
10/30/2006

Reach CS: Combined Sewer

Inflow Area = 1.664 ac, Inflow Depth > 2.56" for 2-Year Storm event
Inflow = 5.17 cfs @ 12.04 hrs, Volume= 0.355 af
Outflow = 5.17 cfs @ 12.04 hrs, Volume= 0.355 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach CS: Combined Sewer



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Subcatchment 5X: Ocean Gateway Gravel Lot

Runoff = 2.91 cfs @ 12.08 hrs, Volume= 0.219 af, Depth> 2.59"

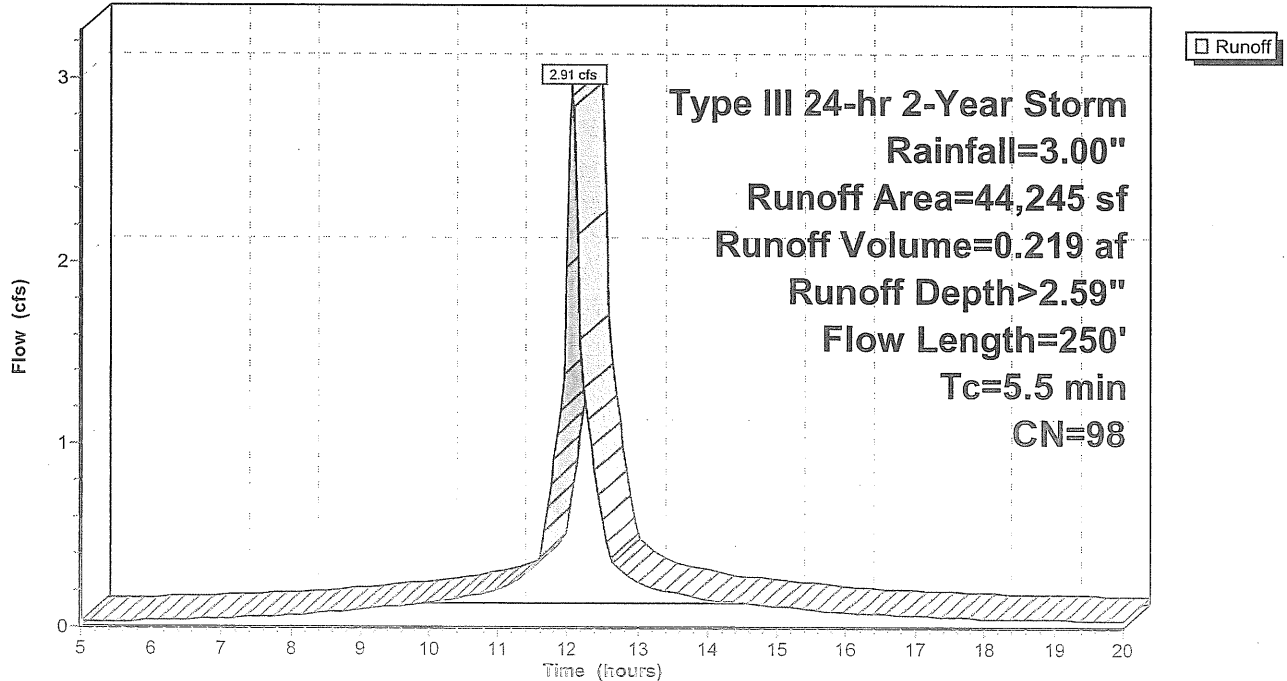
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
675	98	Buildings
1,415	98	Paved
41,460	98	Gravel Parking
695	68	<50% Grass cover, Poor, HSG A
44,245	98	Weighted Average
695		Pervious Area
43,550		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	15	0.0100	0.09		Sheet Flow, BC Grass: Short n= 0.150 P2= 3.00"
1.4	85	0.0100	0.98		Sheet Flow, CD Smooth surfaces n= 0.011 P2= 3.00"
1.2	150	0.0171	2.11		Shallow Concentrated Flow, DE Unpaved Kv= 16.1 fps
5.5	250	Total			

Subcatchment 5X: Ocean Gateway Gravel Lot

Hydrograph



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Subcatchment 4X: Turner Barker Gravel Lot

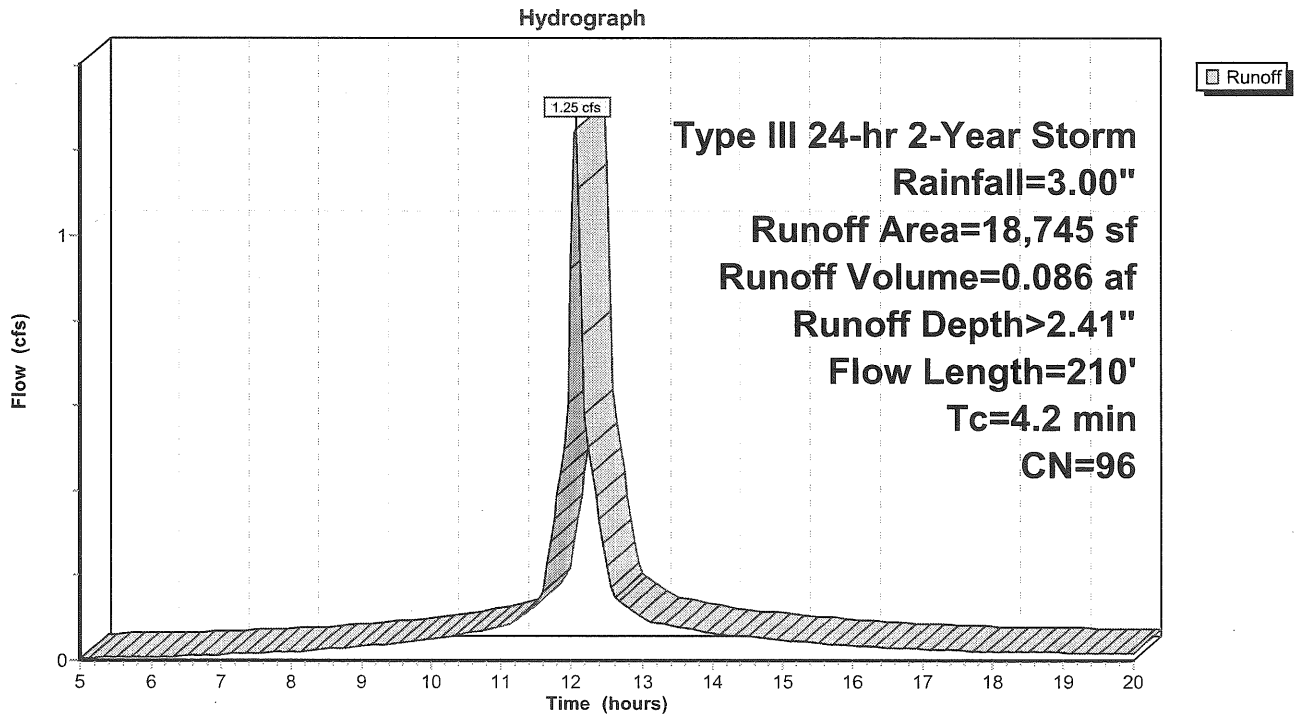
Runoff = 1.25 cfs @ 12.06 hrs, Volume= 0.086 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
1,030	98	Buildings
285	98	Paved
16,130	98	Gravel Parking
1,300	68	<50% Grass cover, Poor, HSG A
18,745	96	Weighted Average
1,300		Pervious Area
17,445		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	15	0.0200	0.11		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
1.1	85	0.0200	1.29		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.9	110	0.0150	1.97		Shallow Concentrated Flow, CD Unpaved Kv= 16.1 fps
4.2	210	Total			

Subcatchment 4X: Turner Barker Gravel Lot



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Subcatchment 3X: Turner Barker

Runoff = 0.52 cfs @ 12.05 hrs, Volume= 0.035 af, Depth> 2.32"

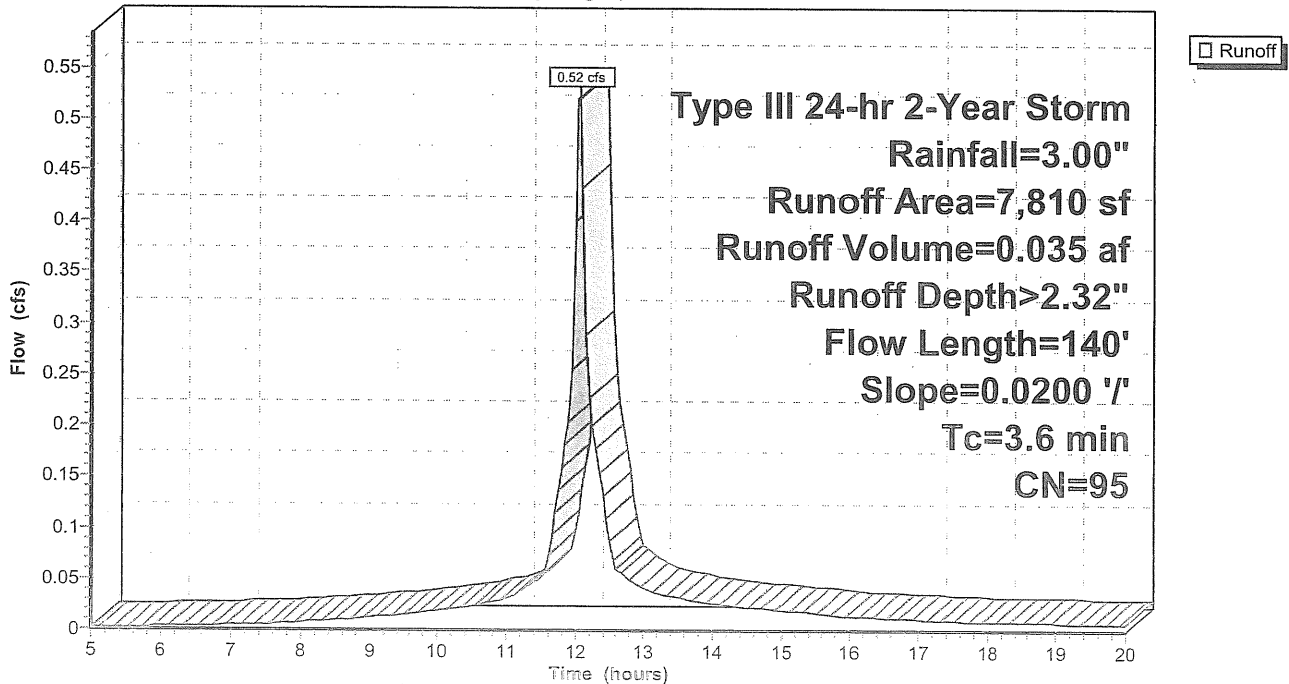
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
4,000	98	Building
2,980	98	Gravel Parking
830	68	<50% Grass cover, Poor, HSG A
7,810	95	Weighted Average
830		Pervious Area
6,980		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	15	0.0200	0.11		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
1.1	85	0.0200	1.29		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.3	40	0.0200	2.28		Shallow Concentrated Flow, CD Unpaved Kv= 16.1 fps
3.6	140	Total			

Subcatchment 3X: Turner Barker

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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Subcatchment 2X: Breakaway

Runoff = 0.51 cfs @ 12.01 hrs, Volume= 0.034 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

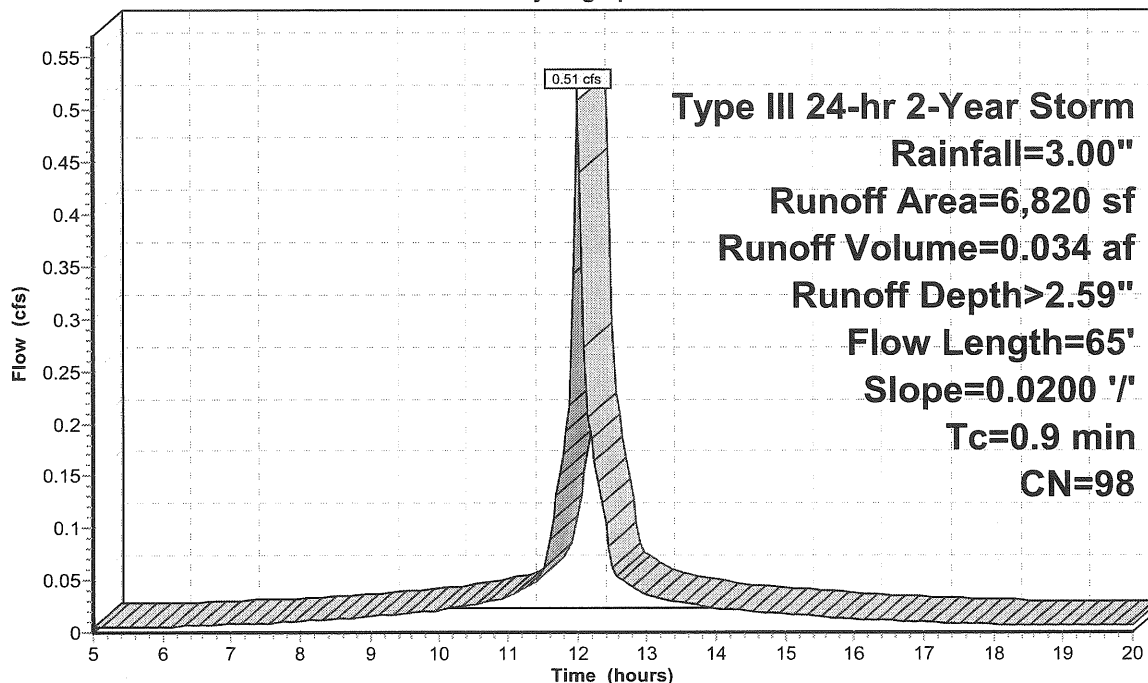
Area (sf)	CN	Description
5,870	98	Building
950	98	Gravel Parking
6,820	98	Weighted Average
6,820		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	65	0.0200	1.22		Sheet Flow, AB

Smooth surfaces n= 0.011 P2= 3.00"

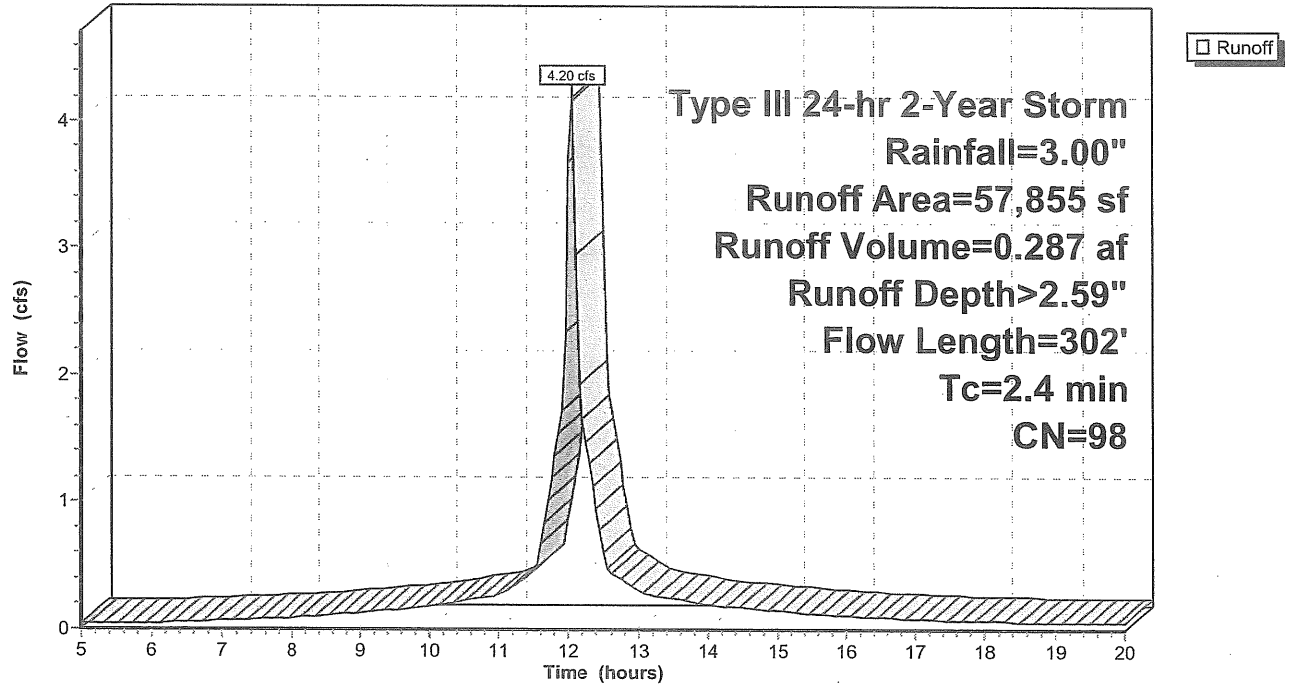
Subcatchment 2X: Breakaway

Hydrograph



Subcatchment 1X: Shipyard Gravel Lot

Hydrograph



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Subcatchment 1X: Shipyard Gravel Lot

Runoff = 4.20 cfs @ 12.04 hrs, Volume= 0.287 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
2,635	98	Building
29,940	98	Gravel Parking
25,280	98	Paved
57,855	98	Weighted Average
57,855		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0333	1.47		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
0.3	40	0.1000	2.11		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.2	40	0.0500	3.60		Shallow Concentrated Flow, CD Unpaved Kv= 16.1 fps
0.9	90	0.0111	1.70		Shallow Concentrated Flow, DE Unpaved Kv= 16.1 fps
0.2	40	0.0625	4.03		Shallow Concentrated Flow, EF Unpaved Kv= 16.1 fps
0.1	32	0.0100	5.90	4.63	Circular Channel (pipe), FG Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010
2.4	302	Total			

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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1X: Shipyard Gravel Lot

Runoff Area=57,855 sf Runoff Depth>2.59"
Flow Length=302' Tc=2.4 min CN=98 Runoff=4.20 cfs 0.287 af

Subcatchment 2X: Breakaway

Runoff Area=6,820 sf Runoff Depth>2.59"
Flow Length=65' Slope=0.0200 '/' Tc=0.9 min CN=98 Runoff=0.51 cfs 0.034 af

Subcatchment 3X: Turner Barker

Runoff Area=7,810 sf Runoff Depth>2.32"
Flow Length=140' Slope=0.0200 '/' Tc=3.6 min CN=95 Runoff=0.52 cfs 0.035 af

Subcatchment 4X: Turner Barker Gravel Lot

Runoff Area=18,745 sf Runoff Depth>2.41"
Flow Length=210' Tc=4.2 min CN=96 Runoff=1.25 cfs 0.086 af

Subcatchment 5X: Ocean Gateway Gravel Lot

Runoff Area=44,245 sf Runoff Depth>2.59"
Flow Length=250' Tc=5.5 min CN=98 Runoff=2.91 cfs 0.219 af

Reach CS: Combined Sewer

Inflow=5.17 cfs 0.355 af
Outflow=5.17 cfs 0.355 af

Reach FR: Fore River

Inflow=4.15 cfs 0.306 af
Outflow=4.15 cfs 0.306 af

Reach S1: (new node)

Inflow=4.66 cfs 0.321 af
Outflow=4.66 cfs 0.321 af

Reach S2: (new node)

Inflow=0.52 cfs 0.035 af
Outflow=0.52 cfs 0.035 af

Reach TOT: (new node)

Inflow=9.15 cfs 0.661 af
Outflow=9.15 cfs 0.661 af

Pond D2: Commercial Street Storm System

Peak Elev=9.45' Inflow=1.25 cfs 0.086 af
15.0" x 192.0' Culvert Outflow=1.25 cfs 0.086 af

Pond D3: Commercial

Peak Elev=9.05' Inflow=1.25 cfs 0.086 af
15.0" x 192.0' Culvert Outflow=1.25 cfs 0.086 af

Pond D7: Hancock

Peak Elev=8.98' Inflow=2.91 cfs 0.219 af
30.0" x 36.0' Culvert Outflow=2.91 cfs 0.219 af

Pond D8: Hancock Street Storm System

Peak Elev=10.50' Inflow=2.91 cfs 0.219 af
24.0" x 196.0' Culvert Outflow=2.91 cfs 0.219 af

Total Runoff Area = 3.110 ac Runoff Volume = 0.661 af Average Runoff Depth = 2.55"
2.09% Pervious Area = 0.065 ac 97.91% Impervious Area = 3.045 ac

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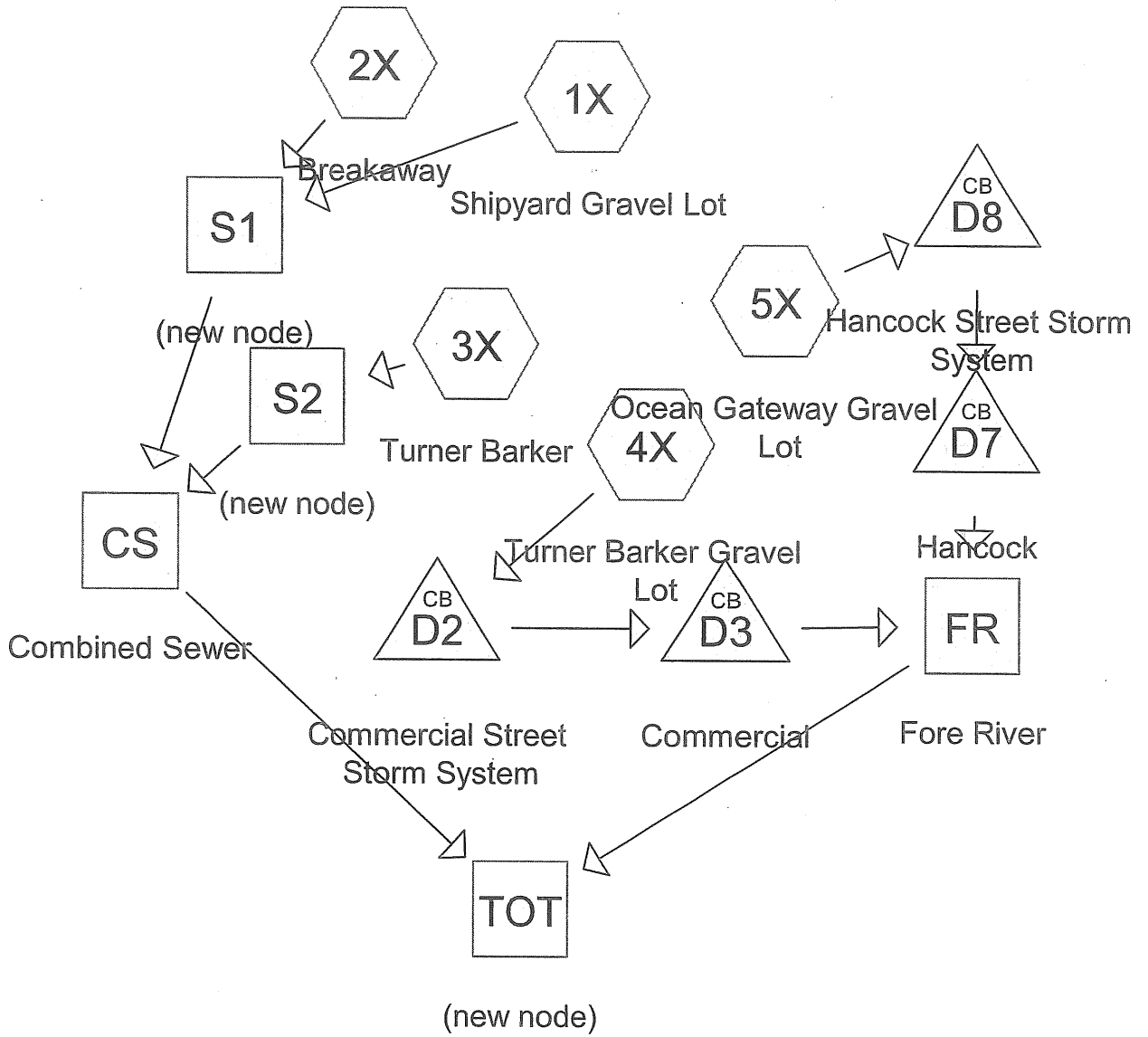
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Area Listing (all nodes)

<u>Area (acres)</u>	<u>CN</u>	<u>Description (subcats)</u>
0.065	68	<50% Grass cover, Poor, HSG A (3X,4X,5X)
0.287	98	Building (1X,2X,3X)
0.039	98	Buildings (4X,5X)
2.100	98	Gravel Parking (1X,2X,3X,4X,5X)
0.619	98	Paved (1X,4X,5X)
<hr/>		
3.110		



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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond UH2: Hancock Link DMH2

Inflow Area = 1.086 ac, Inflow Depth > 3.73" for 25-Year Storm event
Inflow = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af
Outflow = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af, Atten= 0%, Lag= 0.0 min
Primary = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 17.04' @ 12.20 hrs

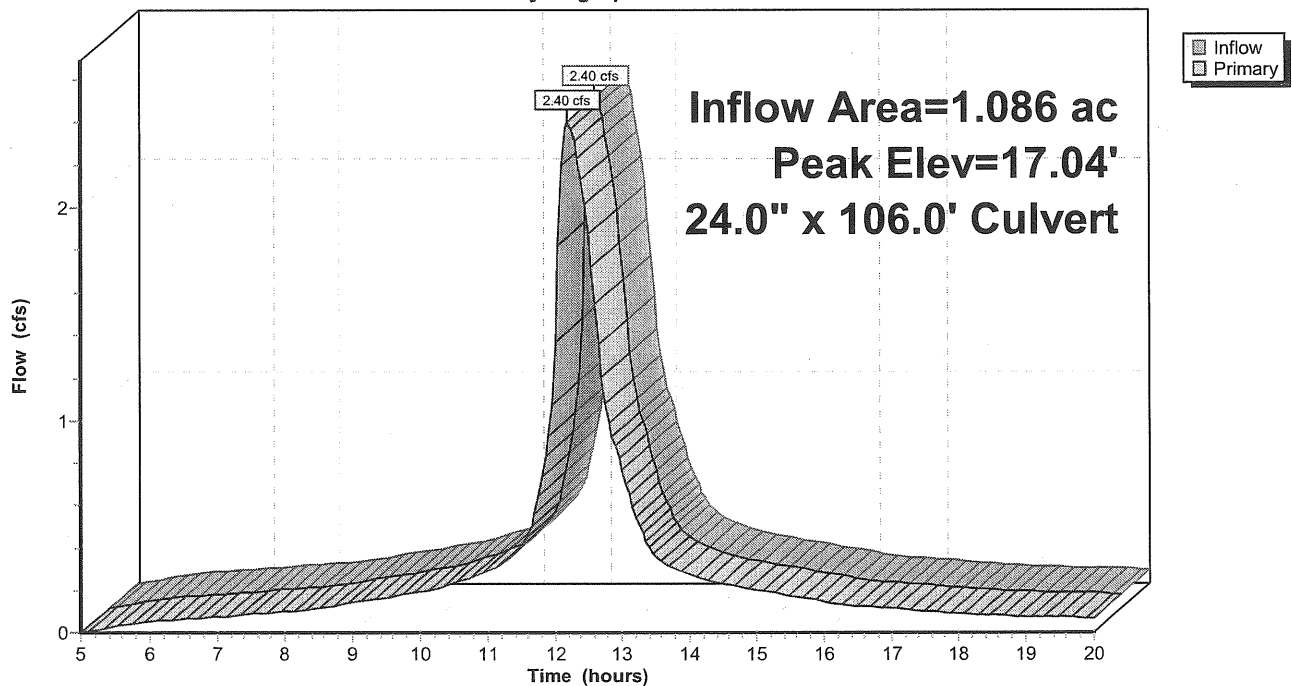
Flood Elev= 22.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	16.39'	24.0" x 106.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 11.73' S= 0.0440 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=2.40 cfs @ 12.20 hrs HW=17.04' TW=12.28' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 2.40 cfs @ 2.74 fps)

Pond UH2: Hancock Link DMH2

Hydrograph



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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond UH1: Hancock Link DMH1

Inflow Area = 1.086 ac, Inflow Depth > 3.73" for 25-Year Storm event
 Inflow = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af
 Outflow = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af

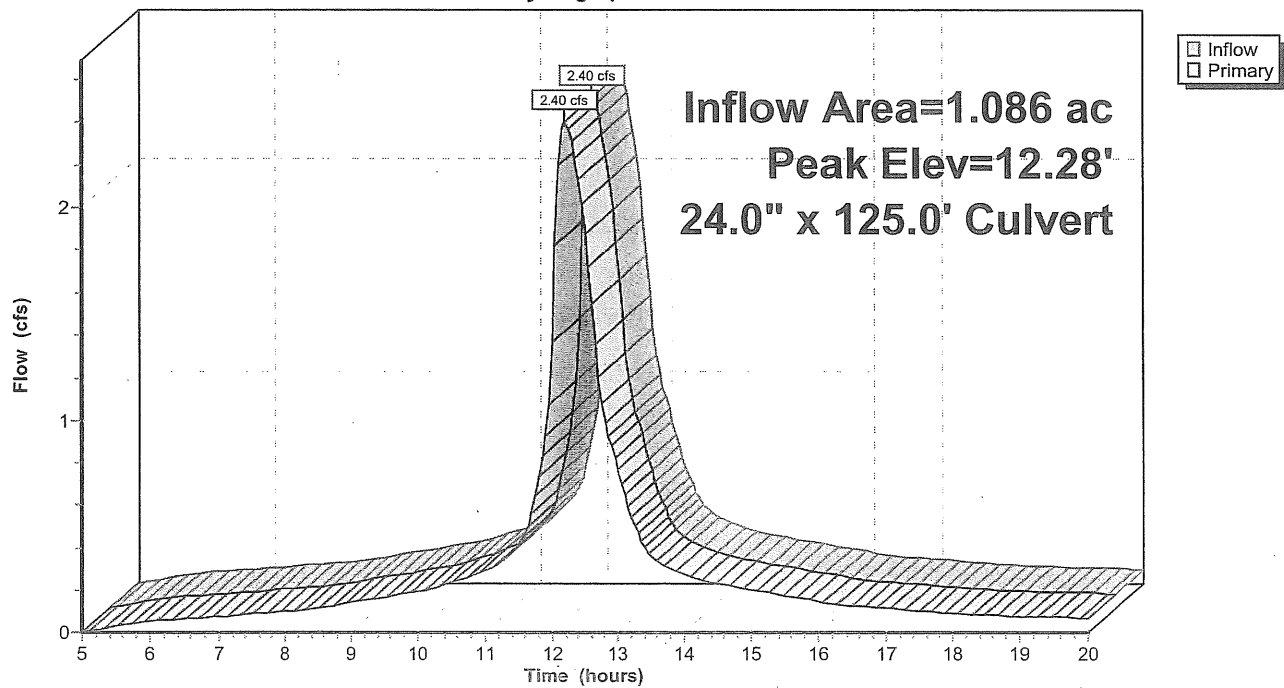
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 12.28' @ 12.20 hrs
 Flood Elev= 16.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	11.63'	24.0" x 125.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 9.88' S= 0.0140 '/ Cc= 0.900 n= 0.012

Primary OutFlow Max=2.40 cfs @ 12.20 hrs HW=12.28' TW=10.43' (Dynamic Tailwater)
 ←1=Culvert (Inlet Controls 2.40 cfs @ 2.74 fps)

Pond UH1: Hancock Link DMH1

Hydrograph



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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond D8: Hancock Street Storm System

Inflow Area = 1.086 ac, Inflow Depth > 3.73" for 25-Year Storm event
Inflow = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af
Outflow = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af, Atten= 0%, Lag= 0.0 min
Primary = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 10.43' @ 12.20 hrs

Flood Elev= 15.38'

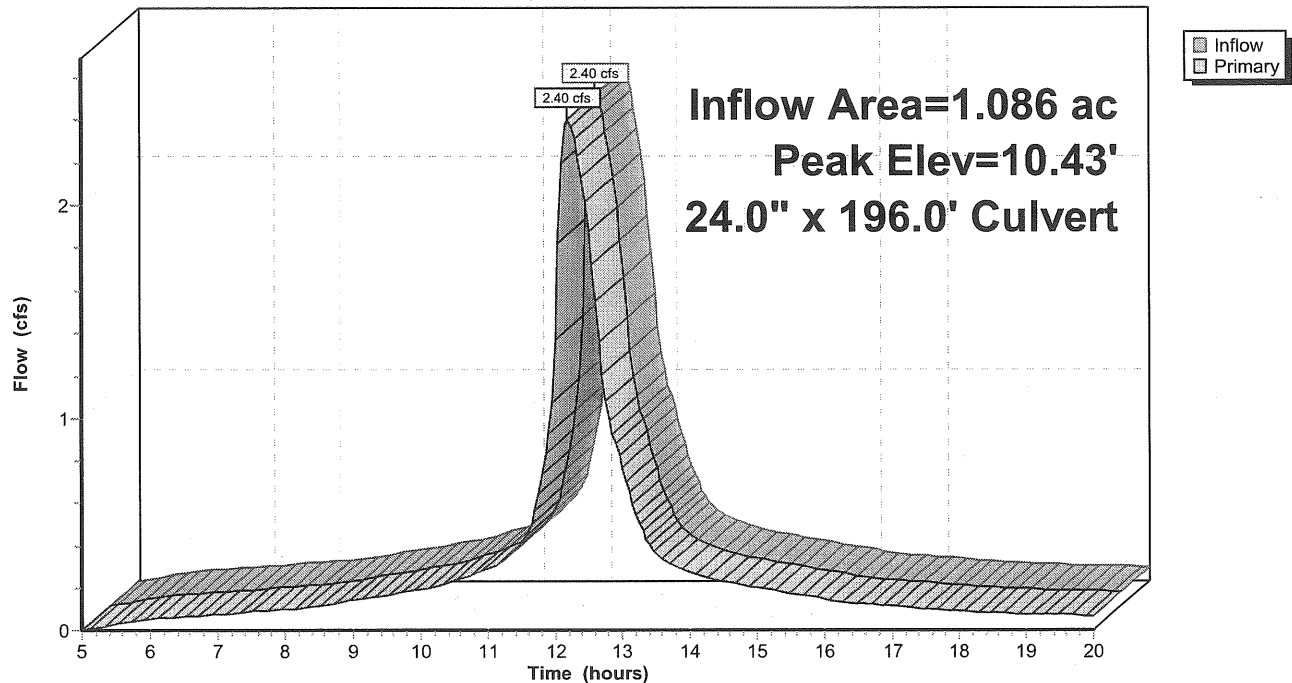
Device	Routing	Invert	Outlet Devices
#1	Primary	9.78'	24.0" x 196.0' long Culvert Ke= 0.500 Outlet Invert= 8.18' S= 0.0082 '/' Cc= 0.900 n= 0.011

Primary OutFlow Max=2.40 cfs @ 12.20 hrs HW=10.43' TW=8.90' (Dynamic Tailwater)

1=Culvert (Inlet Controls 2.40 cfs @ 2.74 fps)

Pond D8: Hancock Street Storm System

Hydrograph



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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond D7: Hancock

Inflow Area = 1.086 ac, Inflow Depth > 3.73" for 25-Year Storm event
Inflow = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af
Outflow = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af, Atten= 0%, Lag= 0.0 min
Primary = 2.40 cfs @ 12.20 hrs, Volume= 0.338 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 8.90' @ 12.20 hrs

Flood Elev= 13.91'

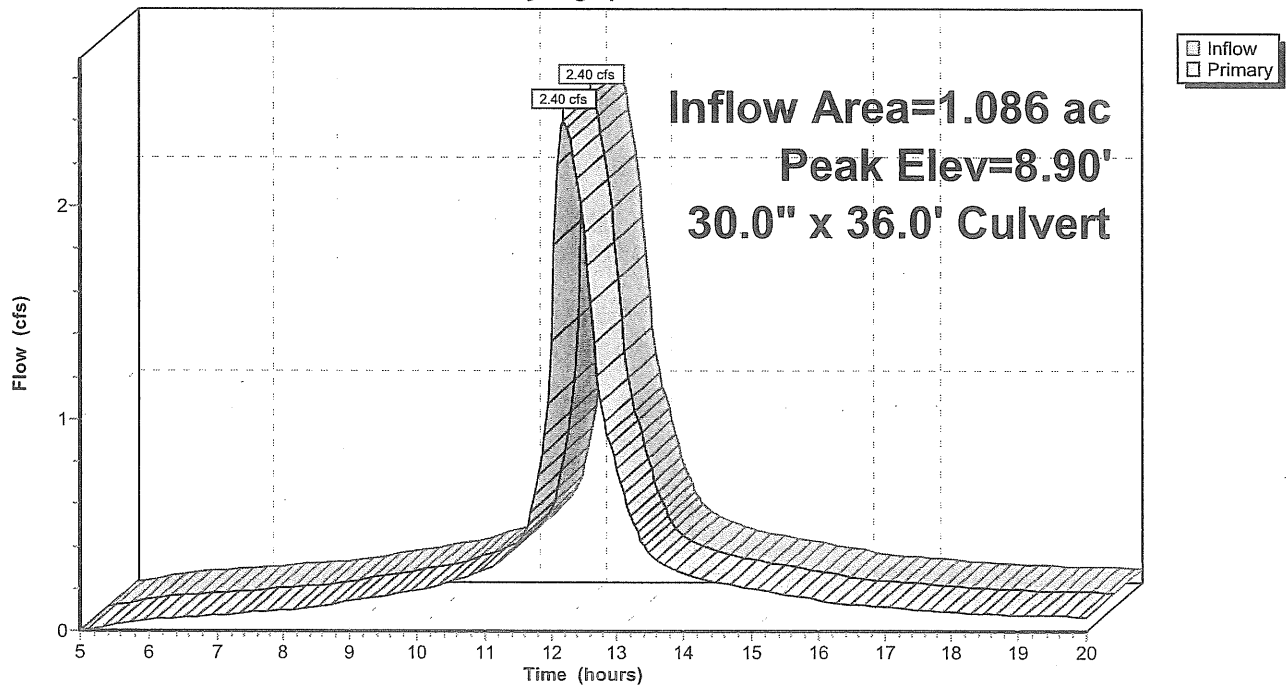
Device	Routing	Invert	Outlet Devices
#1	Primary	8.08'	30.0" x 36.0' long Culvert Ke= 0.500 Outlet Invert= 8.07' S= 0.0003 '/ Cc= 0.900 n= 0.012

Primary OutFlow Max=2.40 cfs @ 12.20 hrs HW=8.90' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 2.40 cfs @ 2.57 fps)

Pond D7: Hancock

Hydrograph



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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond D3: Commercial

Inflow Area = 1.625 ac, Inflow Depth > 4.57" for 25-Year Storm event
Inflow = 6.09 cfs @ 12.11 hrs, Volume= 0.618 af
Outflow = 6.09 cfs @ 12.11 hrs, Volume= 0.618 af, Atten= 0%, Lag= 0.0 min
Primary = 6.09 cfs @ 12.11 hrs, Volume= 0.618 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 10.89' @ 12.11 hrs

Flood Elev= 13.91'

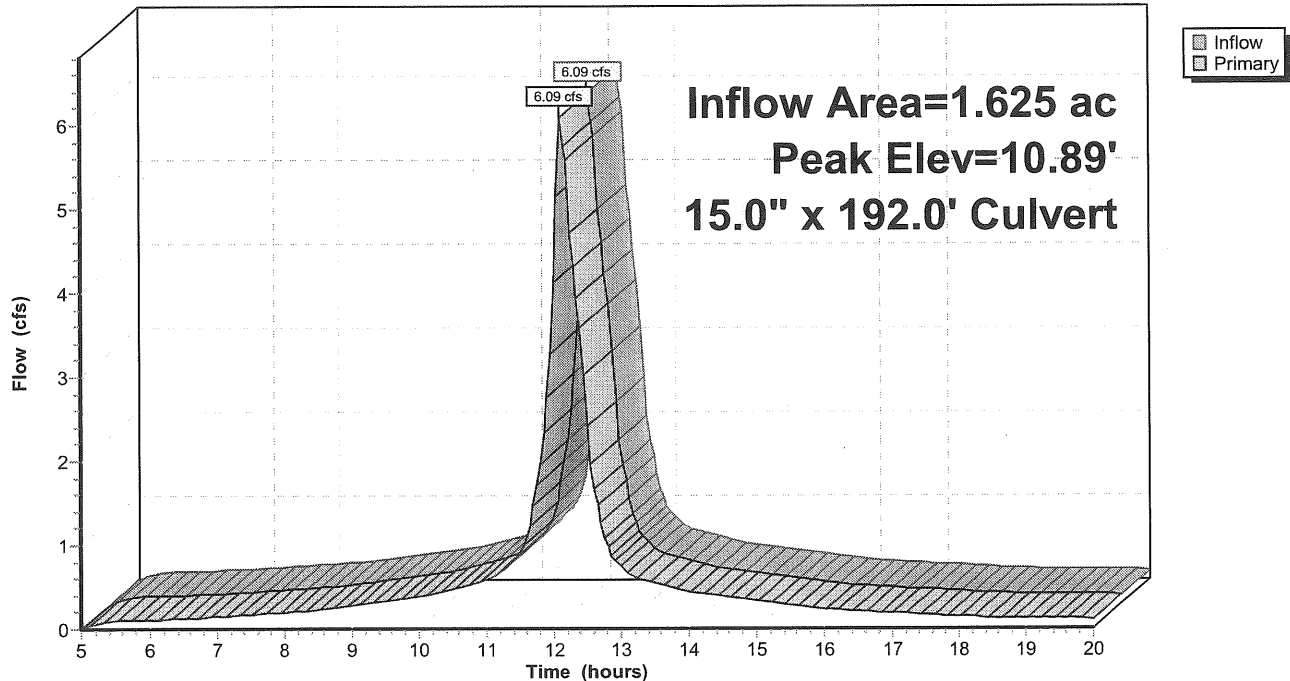
Device	Routing	Invert	Outlet Devices
#1	Primary	8.35'	15.0" x 192.0' long Culvert Ke= 0.500 Outlet Invert= 8.06' S= 0.0015 '/' Cc= 0.900 n= 0.010

Primary OutFlow Max=5.97 cfs @ 12.11 hrs HW=10.84' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 5.97 cfs @ 4.87 fps)

Pond D3: Commercial

Hydrograph



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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond D2: Commercial Street Storm System

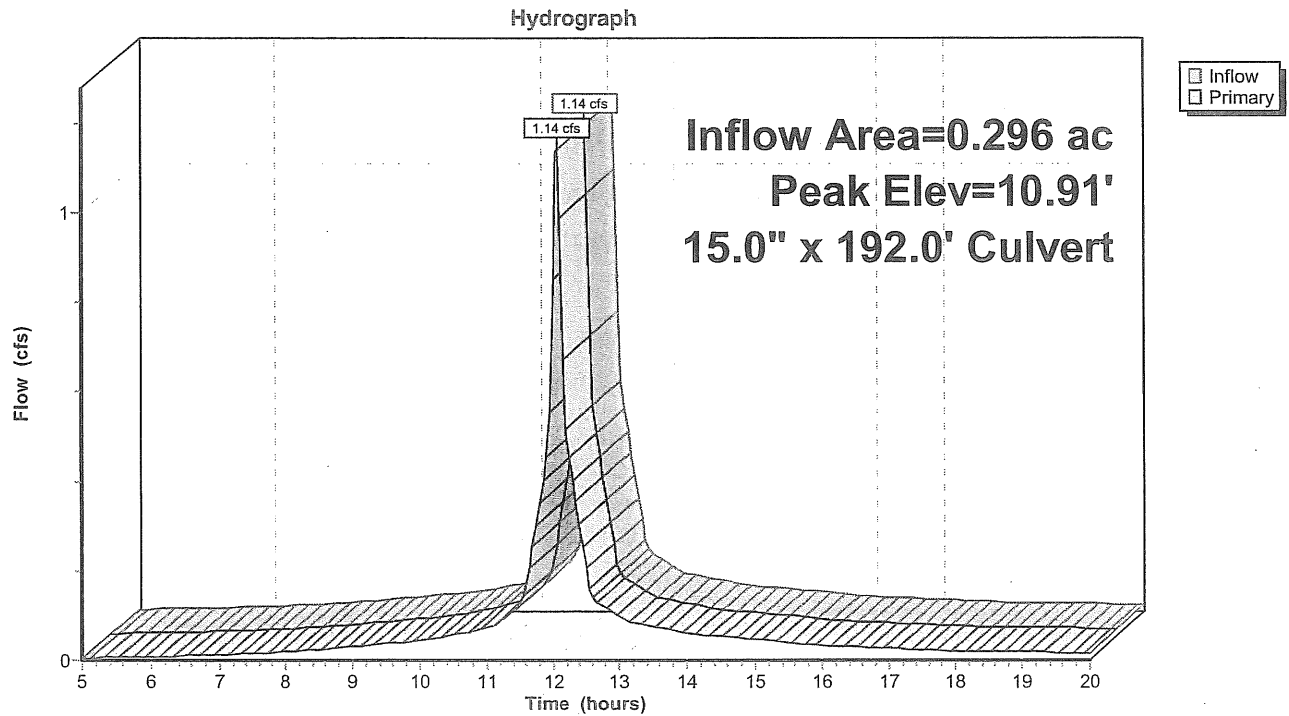
Inflow Area = 0.296 ac, Inflow Depth > 3.24" for 25-Year Storm event
Inflow = 1.14 cfs @ 12.06 hrs, Volume= 0.080 af
Outflow = 1.14 cfs @ 12.06 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min
Primary = 1.14 cfs @ 12.06 hrs, Volume= 0.080 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 10.91' @ 12.16 hrs
Flood Elev= 14.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	8.74'	15.0" x 192.0' long Culvert Ke= 0.500 Outlet Invert= 8.45' S= 0.0015 '/ Cc= 0.900 n= 0.010

Primary OutFlow Max=0.00 cfs @ 12.06 hrs HW=10.06' TW=10.51' (Dynamic Tailwater)
↑1=Culvert (Controls 0.00 cfs)

Pond D2: Commercial Street Storm System



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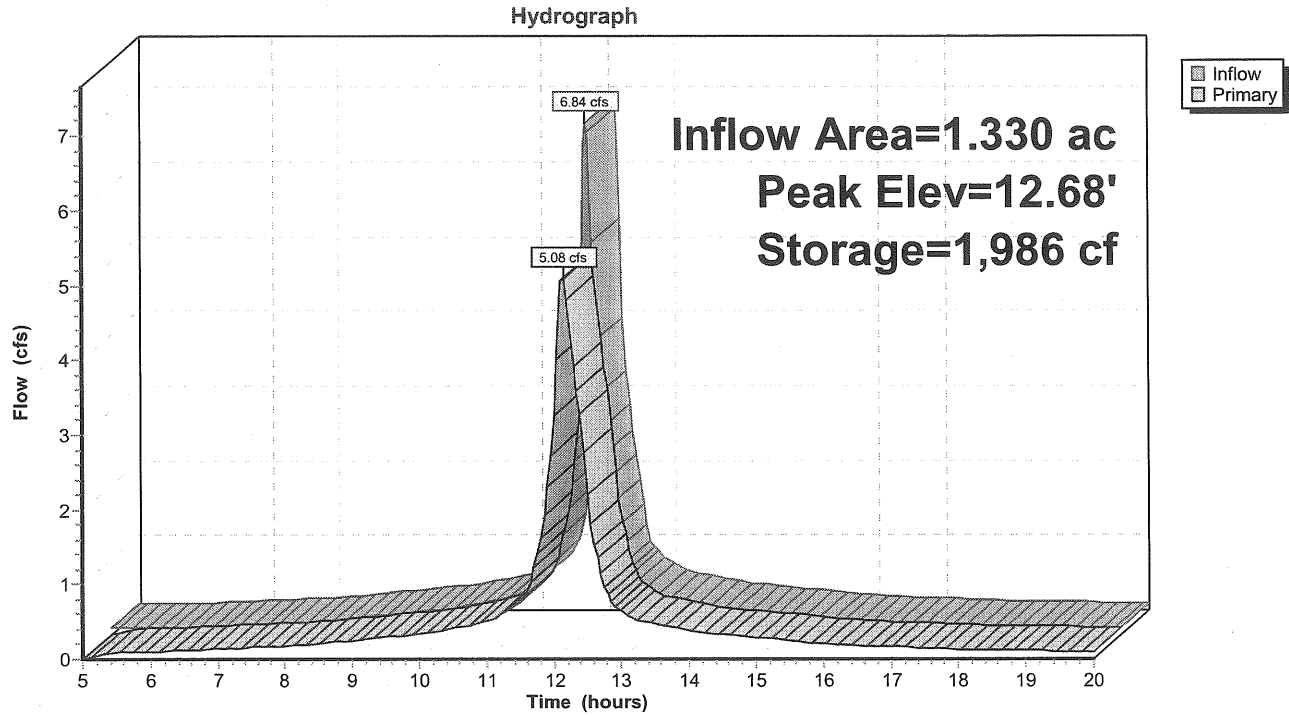
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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond 5C: Subsurface Detention for Plaza



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 Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond 5C: Subsurface Detention for Plaza

Inflow Area = 1.330 ac, Inflow Depth > 4.87" for 25-Year Storm event
 Inflow = 6.84 cfs @ 12.08 hrs, Volume= 0.540 af
 Outflow = 5.08 cfs @ 12.16 hrs, Volume= 0.539 af, Atten= 26%, Lag= 4.6 min
 Primary = 5.08 cfs @ 12.16 hrs, Volume= 0.539 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 12.68' @ 12.16 hrs Surf.Area= 988 sf Storage= 1,986 cf

Plug-Flow detention time= 6.7 min calculated for 0.537 af (99% of inflow)
 Center-of-Mass det. time= 5.1 min (739.4 - 734.3)

Volume	Invert	Avail.Storage	Storage Description
#1	9.50'	1,085 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 3,952 cf Overall - 1,240 cf Embedded = 2,712 cf x 40.0% Voids
#2	10.50'	1,240 cf	
		2,325 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.50	988	0	0
13.50	988	3,952	3,952

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	12.0" x 50.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 9.00' S= 0.0100 '/' Cc= 0.900 n= 0.011
#2	Device 1	9.50'	8.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	10.50'	8.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	12.00'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=5.27 cfs @ 12.16 hrs HW=12.66' TW=10.72' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 5.27 cfs @ 6.71 fps)
- 2=Orifice/Grate (Passes < 2.34 cfs potential flow)
- 3=Orifice/Grate (Passes < 2.27 cfs potential flow)
- 4=Orifice/Grate (Passes < 1.52 cfs potential flow)

Post-Development-ST

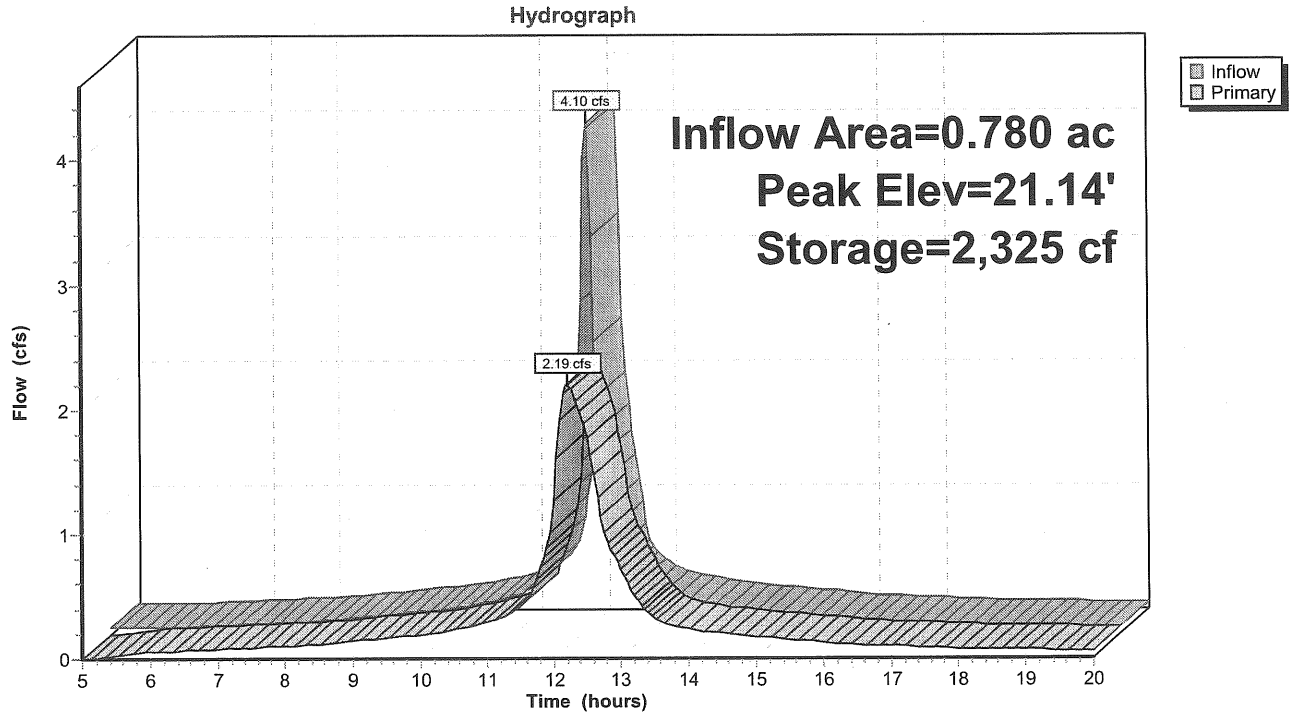
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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond 1B: Subsurface Detention for Parking Garage



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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond 1B: Subsurface Detention for Parking Garage

Inflow Area = 0.780 ac, Inflow Depth > 4.87" for 25-Year Storm event
 Inflow = 4.10 cfs @ 12.09 hrs, Volume= 0.317 af
 Outflow = 2.19 cfs @ 12.22 hrs, Volume= 0.315 af, Atten= 47%, Lag= 8.1 min
 Primary = 2.19 cfs @ 12.22 hrs, Volume= 0.315 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 21.14' @ 12.22 hrs Surf.Area= 1,770 sf Storage= 2,325 cf

Plug-Flow detention time= 17.4 min calculated for 0.314 af (99% of inflow)
 Center-of-Mass det. time= 13.8 min (748.4 - 734.6)

Volume	Invert	Avail.Storage	Storage Description
#1	19.00'	1,950 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,080 cf Overall - 2,205 cf Embedded = 4,875 cf x 40.0% Voids
#2	20.00'	2,205 cf	44.6"W x 30.0"H x 7.12'L StormTech SC-740 x 48 Inside #1
		4,155 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.00	1,770	0	0
23.00	1,770	7,080	7,080

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	12.0" x 150.0' long Culvert CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 18.00' S= 0.0067 '/ Cc= 0.900 n= 0.011
#2	Device 1	20.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	19.00'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	21.50'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=2.18 cfs @ 12.22 hrs HW=21.13' TW=17.03' (Dynamic Tailwater)

- 1=Culvert (Passes 2.18 cfs of 4.17 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.89 cfs @ 4.52 fps)
- 3=Orifice/Grate (Orifice Controls 1.30 cfs @ 6.61 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

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Type III 24-hr 25-Year Storm Rainfall=5.50"

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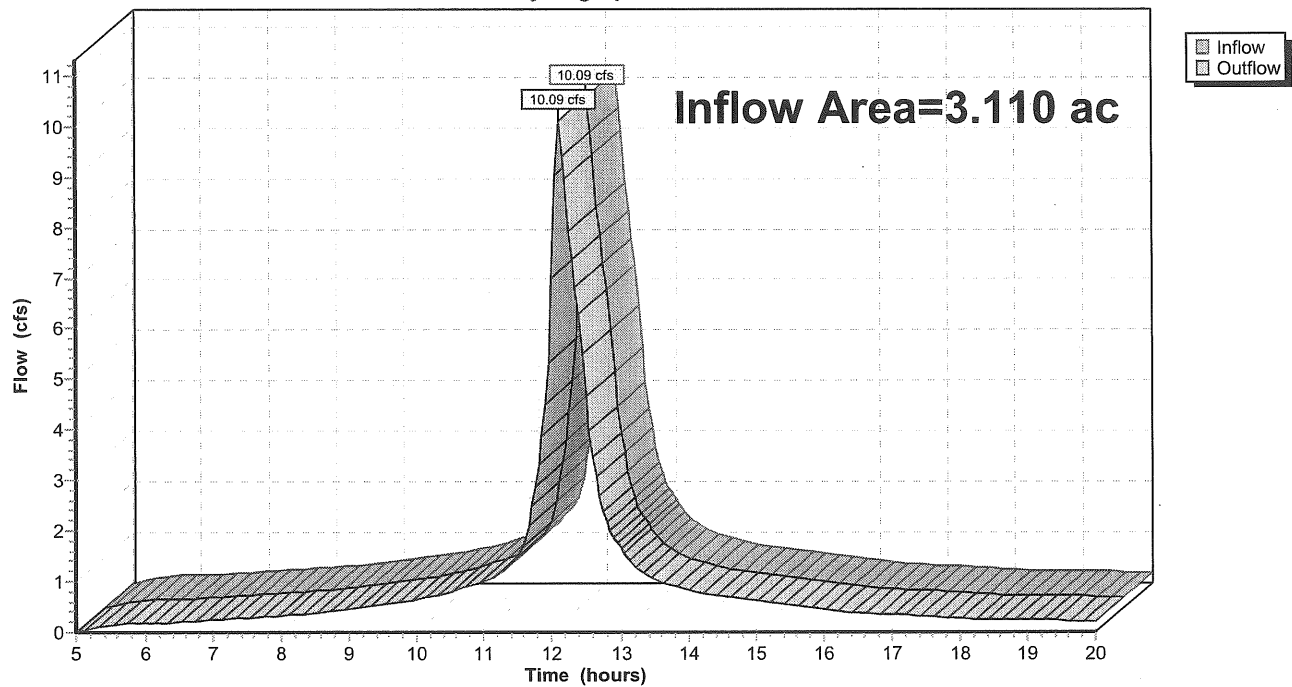
Reach TOT: (new node)

Inflow Area = 3.110 ac, Inflow Depth > 4.23" for 25-Year Storm event
Inflow = 10.09 cfs @ 12.11 hrs, Volume= 1.097 af
Outflow = 10.09 cfs @ 12.11 hrs, Volume= 1.097 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach TOT: (new node)

Hydrograph



Post-Development-ST

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Post-Development w/ StormTech
Type III 24-hr 25-Year Storm Rainfall=5.50"

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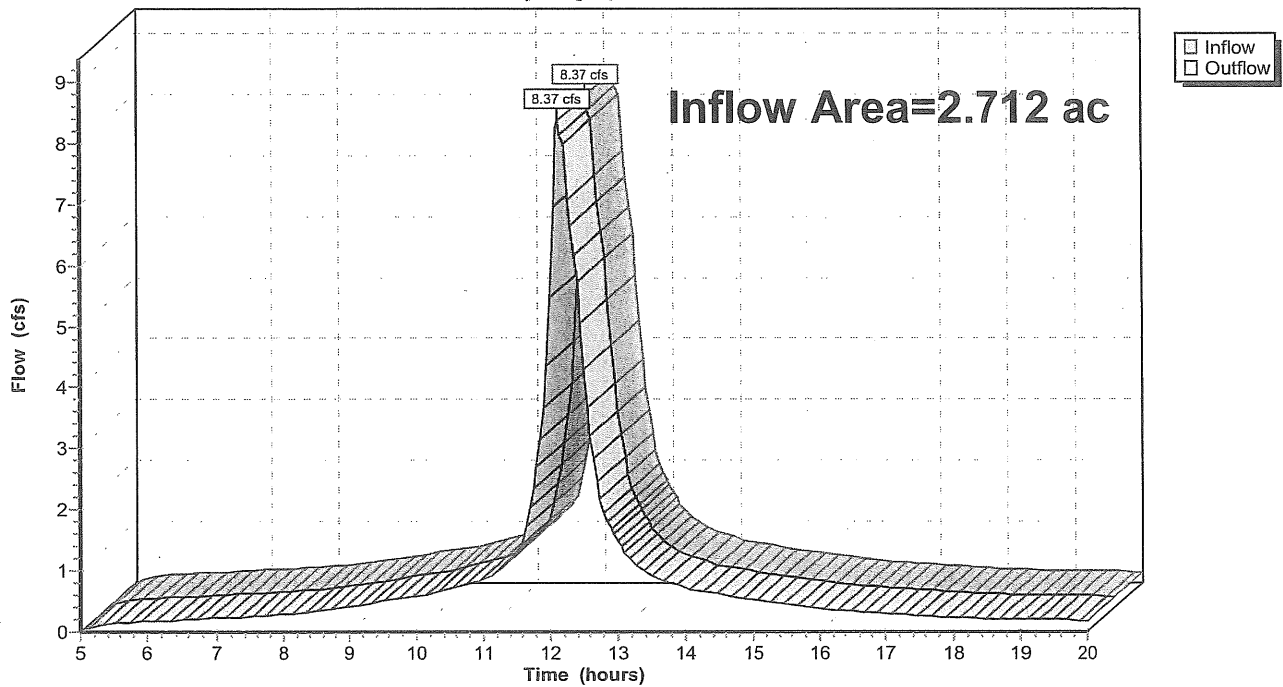
Reach FR: Fore River

Inflow Area = 2.712 ac, Inflow Depth > 4.23" for 25-Year Storm event
Inflow = 8.37 cfs @ 12.12 hrs, Volume= 0.957 af
Outflow = 8.37 cfs @ 12.12 hrs, Volume= 0.957 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach FR: Fore River

Hydrograph



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Type III 24-hr 25-Year Storm Rainfall=5.50"

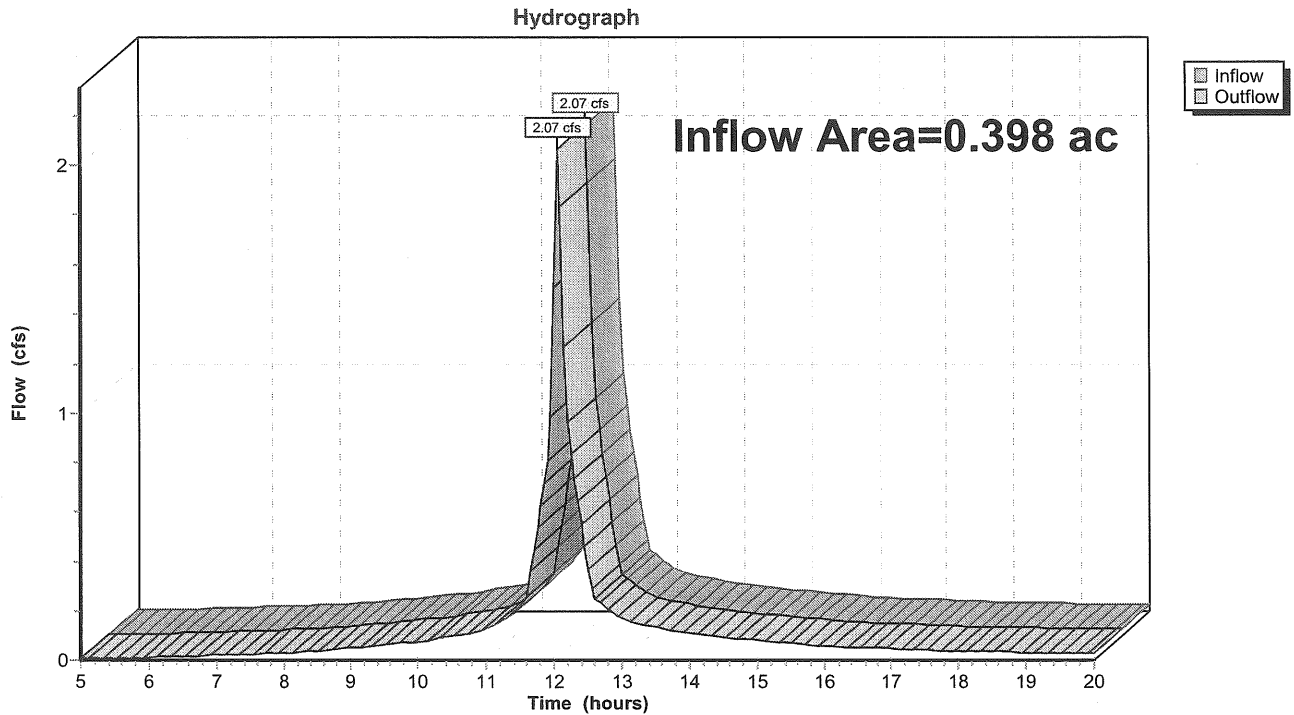
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Reach CS: Combined Sewer

Inflow Area = 0.398 ac, Inflow Depth > 4.22" for 25-Year Storm event
Inflow = 2.07 cfs @ 12.06 hrs, Volume= 0.140 af
Outflow = 2.07 cfs @ 12.06 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach CS: Combined Sewer



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 Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 5CP: Plaza

Runoff = 0.68 cfs @ 12.02 hrs, Volume= 0.047 af, Depth> 4.87"

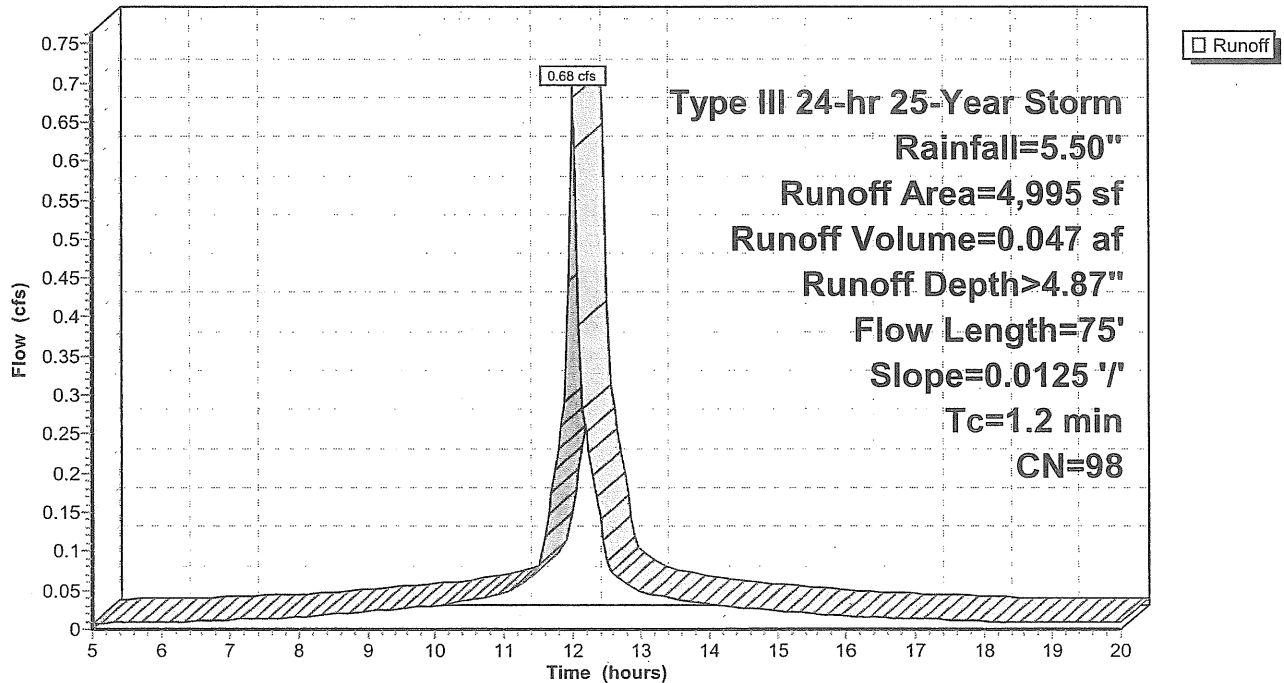
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (sf)	CN	Description
4,995	98	Paved parking & roofs
4,995		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	75	0.0125	1.04		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 5CP: Plaza

Hydrograph



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Post-Development w/ StormTech
 Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 5BP: East Half of Complex

Runoff = 4.65 cfs @ 12.09 hrs, Volume= 0.359 af, Depth> 4.87"

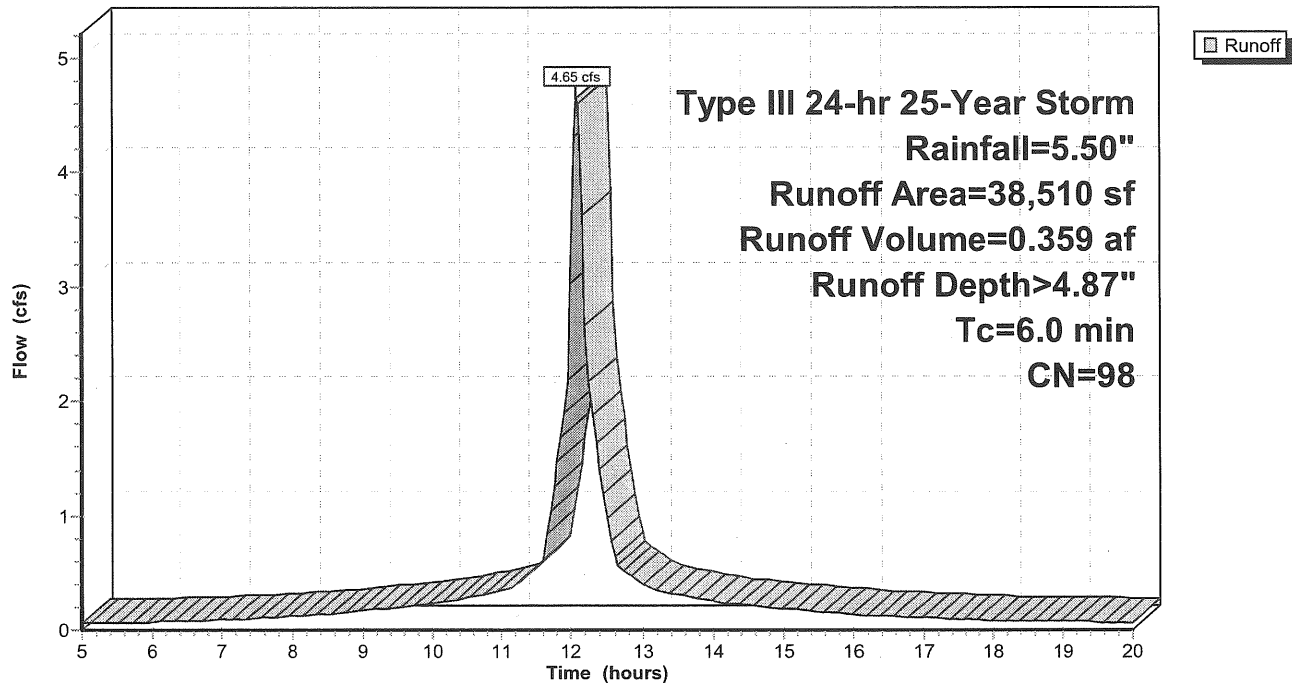
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (sf)	CN	Description
32,915	98	Paved parking & roofs
5,595	98	Plaza
38,510	98	Weighted Average
38,510		Impervious Area

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

Subcatchment 5BP: East Half of Complex

Hydrograph



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 Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 5AP: West Half of Complex

Runoff = 1.74 cfs @ 12.09 hrs, Volume= 0.134 af, Depth> 4.87"

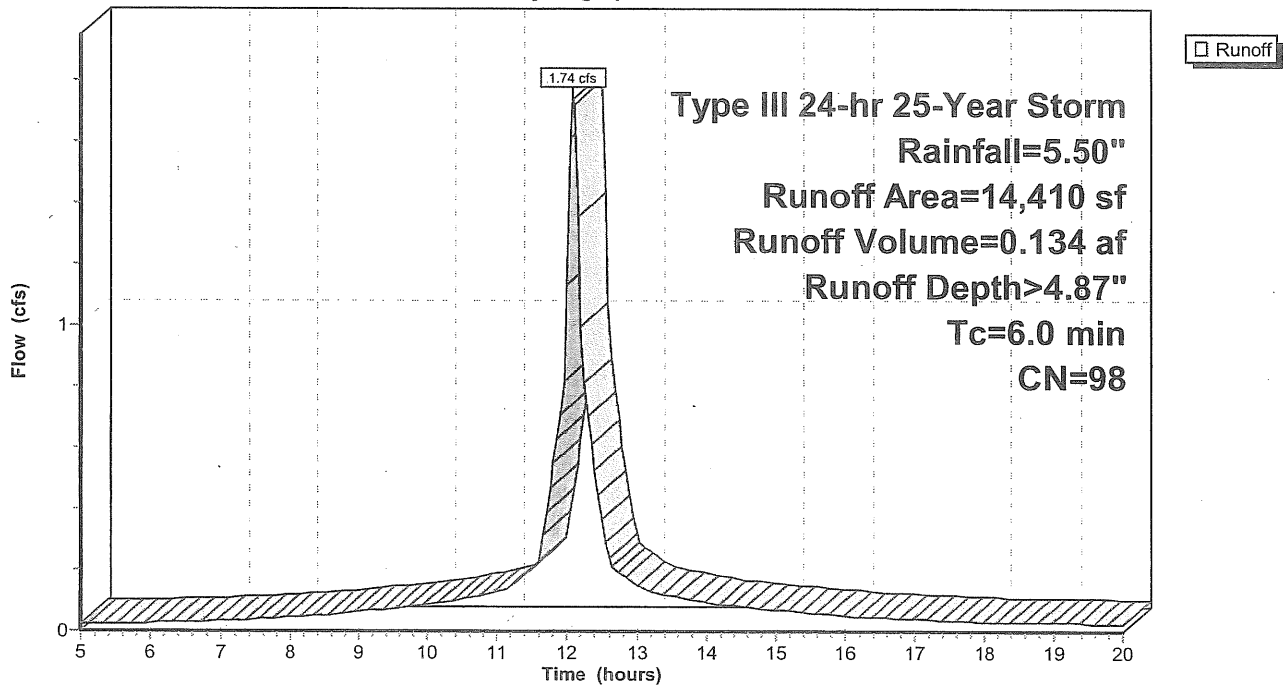
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (sf)	CN	Description
13,840	98	Buildings
570	98	Paved
14,410	98	Weighted Average
14,410		Impervious Area

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

Subcatchment 5AP: West Half of Complex

Hydrograph



Post-Development-ST

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Post-Development w/ StormTech
 Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 4P: Back of PS

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.002 af, Depth> 0.25"

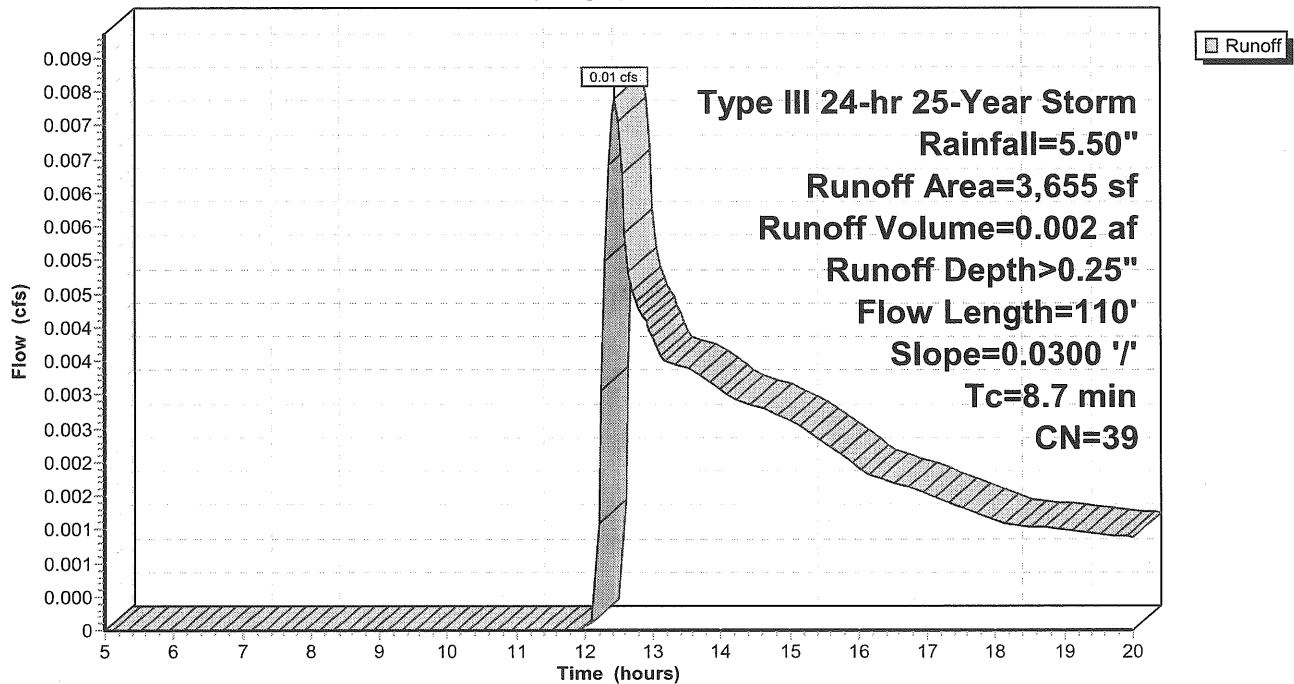
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (sf)	CN	Description
3,655	39	>75% Grass cover, Good, HSG A
3,655		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0300	0.19		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
0.1	10	0.0300	1.21		Shallow Concentrated Flow, BC Short Grass Pasture Kv= 7.0 fps
8.7	110	Total			

Subcatchment 4P: Back of PS

Hydrograph



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 Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 3P: Turner Barker

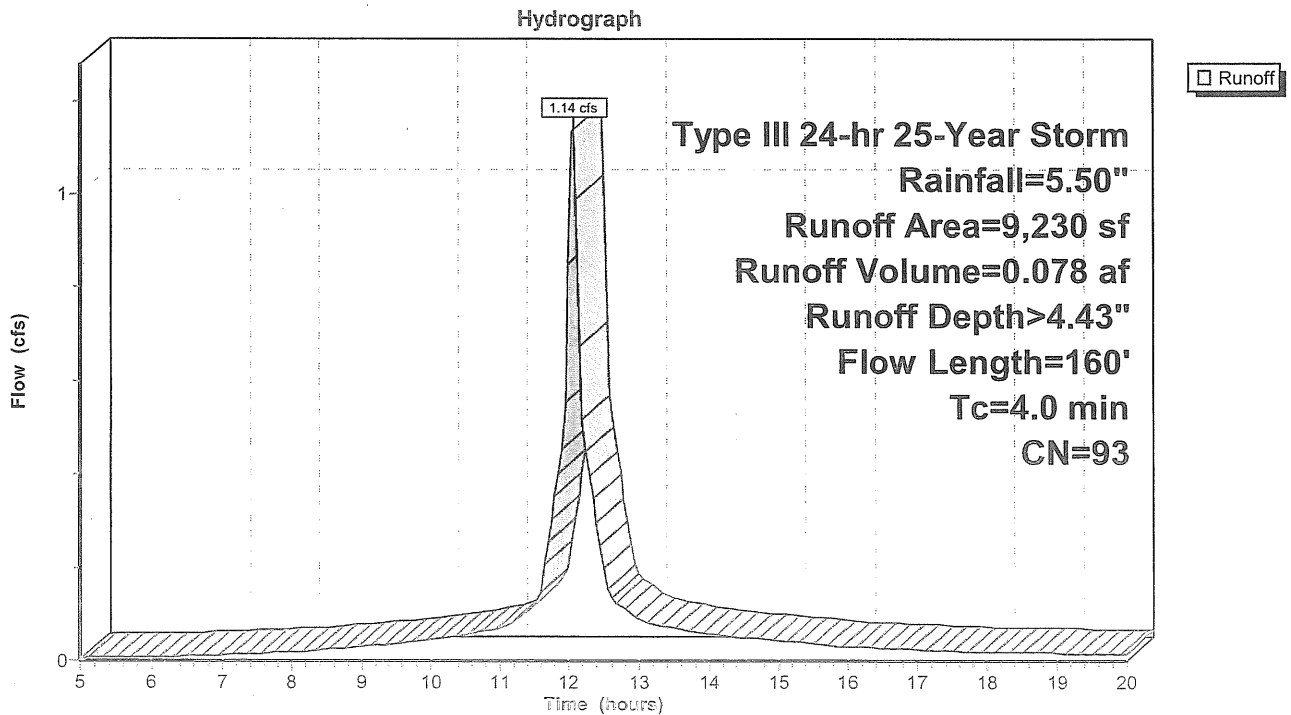
Runoff = 1.14 cfs @ 12.06 hrs, Volume= 0.078 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (sf)	CN	Description
4,000	98	Building
4,380	98	Paved parking & roofs
850	39	>75% Grass cover, Good, HSG A
9,230	93	Weighted Average
850		Pervious Area
8,380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	10	0.0050	0.06		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
0.8	30	0.0050	0.60		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.4	120	0.0100	5.36	4.21	Circular Channel (pipe), CDE Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
4.0	160	Total			

Subcatchment 3P: Turner Barker



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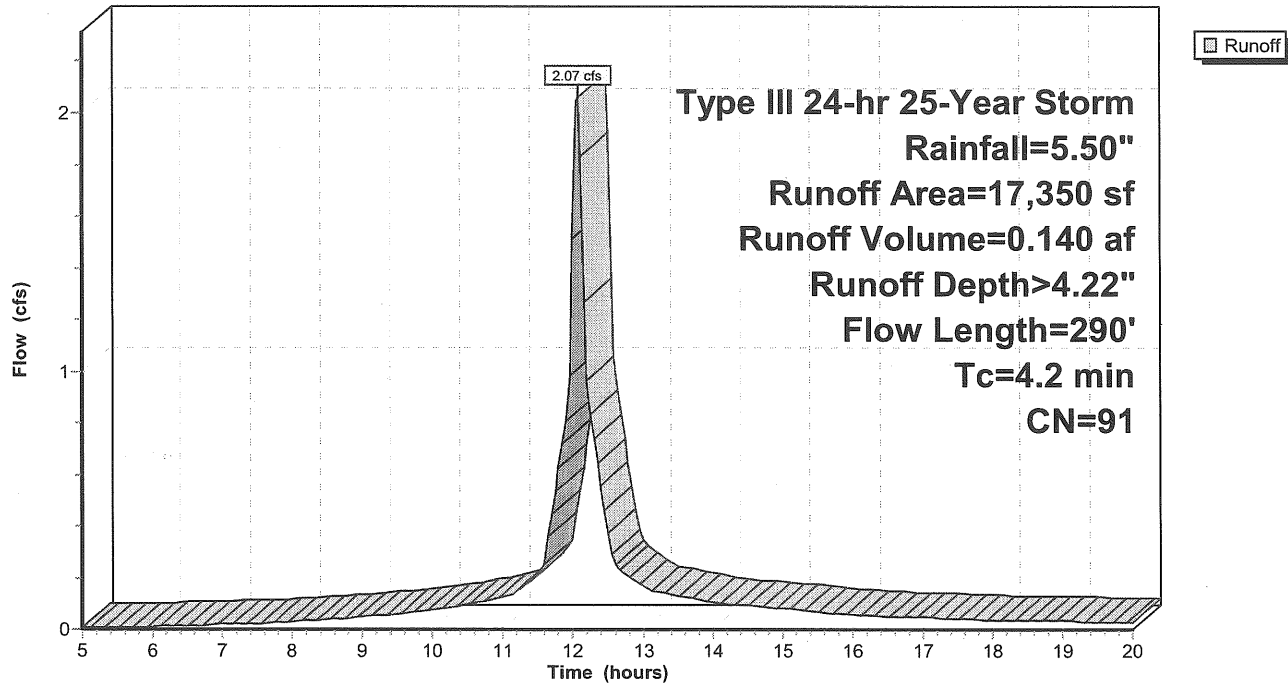
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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 2P: Office Building

Hydrograph



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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 2P: Office Building

Runoff = 2.07 cfs @ 12.06 hrs, Volume= 0.140 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (sf)	CN	Description
5,810	98	Building
1,110	98	Paved roads w/curbs & sewers
2,130	39	>75% Grass cover, Good, HSG A
8,300	98	Gravel Parking
17,350	91	Weighted Average
2,130		Pervious Area
15,220		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	90	0.0250	1.43		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
2.1	90	0.0100	0.70		Shallow Concentrated Flow, BC Short Grass Pasture Kv= 7.0 fps
0.1	25	0.2000	3.13		Shallow Concentrated Flow, CD Short Grass Pasture Kv= 7.0 fps
0.9	85	0.0060	1.57		Shallow Concentrated Flow, DE Paved Kv= 20.3 fps
4.2	290	Total			

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Post-Development w/ StormTech
 Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 1BP: Parking Garage

Runoff = 4.10 cfs @ 12.09 hrs, Volume= 0.317 af, Depth> 4.87"

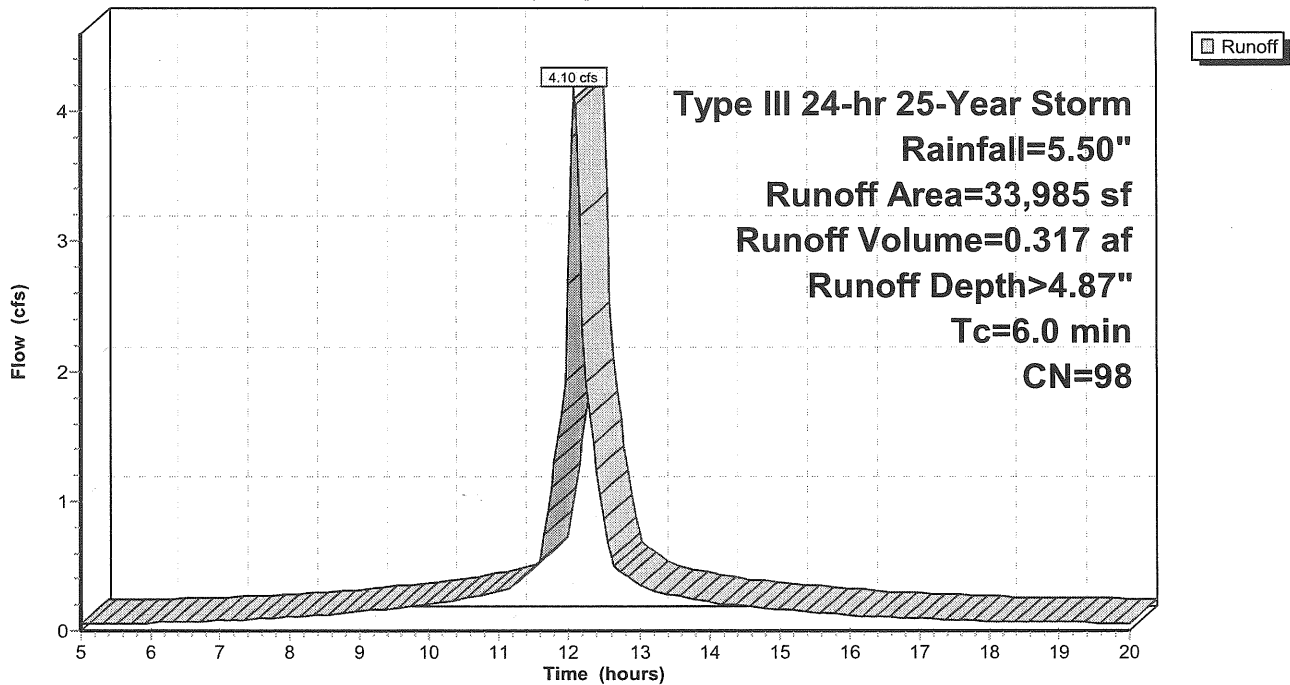
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (sf)	CN	Description
30,730	98	Building
3,255	98	Paved
33,985	98	Weighted Average
33,985		Impervious Area

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

Subcatchment 1BP: Parking Garage

Hydrograph



Post-Development-ST

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Post-Development w/ StormTech
 Type III 24-hr 25-Year Storm Rainfall=5.50"

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Subcatchment 1AP: Open Space

Runoff = 0.29 cfs @ 12.11 hrs, Volume= 0.024 af, Depth> 0.92"

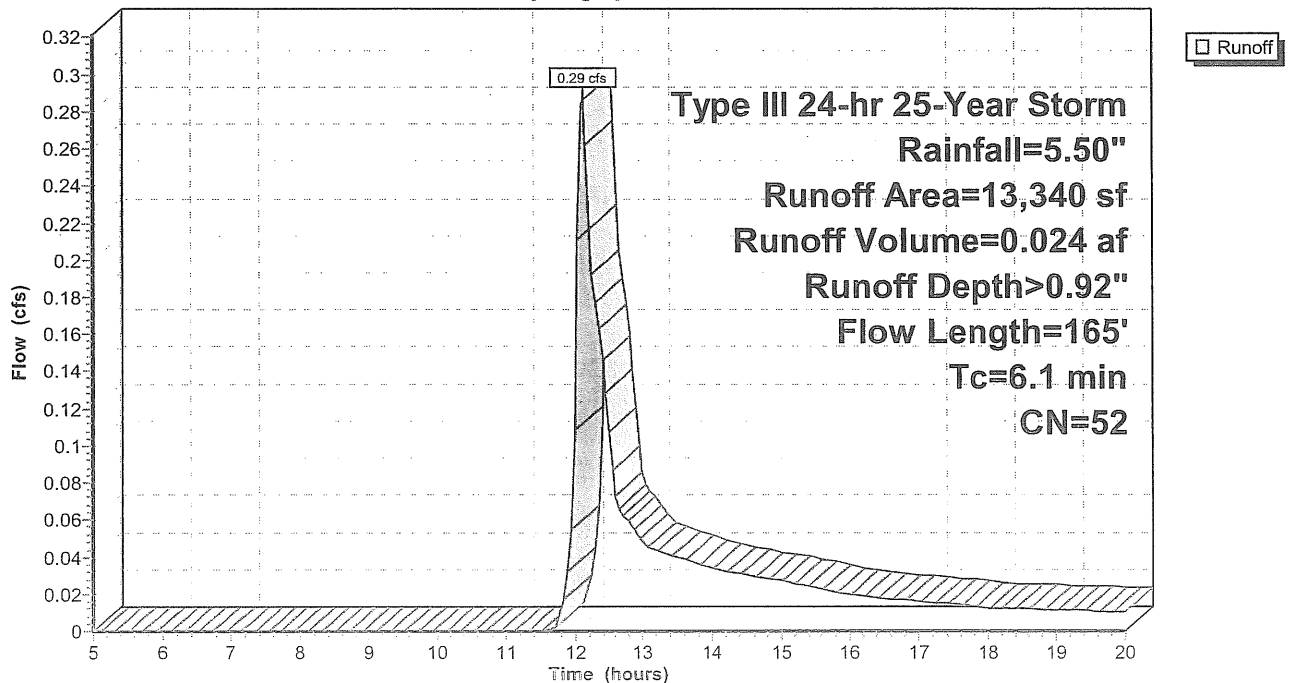
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (sf)	CN	Description
10,440	39	>75% Grass cover, Good, HSG A
2,900	98	Paved parking & roofs
13,340	52	Weighted Average
10,440		Pervious Area
2,900		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	45	0.0200	1.14		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
4.8	55	0.0400	0.19		Sheet Flow, BC Grass: Short n= 0.150 P2= 3.00"
0.6	65	0.0600	1.71		Shallow Concentrated Flow, CD Short Grass Pasture Kv= 7.0 fps
6.1	165	Total			

Subcatchment 1AP: Open Space

Hydrograph



Post-Development-ST

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Post-Development w/ StormTech
Type III 24-hr 25-Year Storm Rainfall=5.50"

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Pond D7: Hancock

Peak Elev=8.90' Inflow=2.40 cfs 0.338 af
30.0" x 36.0' Culvert Outflow=2.40 cfs 0.338 af

Pond D8: Hancock Street Storm System

Peak Elev=10.43' Inflow=2.40 cfs 0.338 af
24.0" x 196.0' Culvert Outflow=2.40 cfs 0.338 af

Pond UH1: Hancock Link DMH1

Peak Elev=12.28' Inflow=2.40 cfs 0.338 af
24.0" x 125.0' Culvert Outflow=2.40 cfs 0.338 af

Pond UH2: Hancock Link DMH2

Peak Elev=17.04' Inflow=2.40 cfs 0.338 af
24.0" x 106.0' Culvert Outflow=2.40 cfs 0.338 af

Total Runoff Area = 3.110 ac Runoff Volume = 1.101 af Average Runoff Depth = 4.25"
12.60% Pervious Area = 0.392 ac 87.40% Impervious Area = 2.718 ac

Post-Development-ST

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Type III 24-hr 25-Year Storm Rainfall=5.50"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1AP: Open Space

Runoff Area=13,340 sf Runoff Depth>0.92"
Flow Length=165' Tc=6.1 min CN=52 Runoff=0.29 cfs 0.024 af

Subcatchment 1BP: Parking Garage

Runoff Area=33,985 sf Runoff Depth>4.87"
Tc=6.0 min CN=98 Runoff=4.10 cfs 0.317 af

Subcatchment 2P: Office Building

Runoff Area=17,350 sf Runoff Depth>4.22"
Flow Length=290' Tc=4.2 min CN=91 Runoff=2.07 cfs 0.140 af

Subcatchment 3P: Turner Barker

Runoff Area=9,230 sf Runoff Depth>4.43"
Flow Length=160' Tc=4.0 min CN=93 Runoff=1.14 cfs 0.078 af

Subcatchment 4P: Back of PS

Runoff Area=3,655 sf Runoff Depth>0.25"
Flow Length=110' Slope=0.0300 '/' Tc=8.7 min CN=39 Runoff=0.01 cfs 0.002 af

Subcatchment 5AP: West Half of Complex

Runoff Area=14,410 sf Runoff Depth>4.87"
Tc=6.0 min CN=98 Runoff=1.74 cfs 0.134 af

Subcatchment 5BP: East Half of Complex

Runoff Area=38,510 sf Runoff Depth>4.87"
Tc=6.0 min CN=98 Runoff=4.65 cfs 0.359 af

Subcatchment 5CP: Plaza

Runoff Area=4,995 sf Runoff Depth>4.87"
Flow Length=75' Slope=0.0125 '/' Tc=1.2 min CN=98 Runoff=0.68 cfs 0.047 af

Reach CS: Combined Sewer

Inflow=2.07 cfs 0.140 af
Outflow=2.07 cfs 0.140 af

Reach FR: Fore River

Inflow=8.37 cfs 0.957 af
Outflow=8.37 cfs 0.957 af

Reach TOT: (new node)

Inflow=10.09 cfs 1.097 af
Outflow=10.09 cfs 1.097 af

Pond 1B: Subsurface Detention for Parking G Peak Elev=21.14' Storage=2,325 cf Inflow=4.10 cfs 0.317 af
Outflow=2.19 cfs 0.315 af

Pond 5C: Subsurface Detention for Plaza Peak Elev=12.68' Storage=1,986 cf Inflow=6.84 cfs 0.540 af
Outflow=5.08 cfs 0.539 af

Pond D2: Commercial Street Storm System Peak Elev=10.91' Inflow=1.14 cfs 0.080 af
15.0" x 192.0' Culvert Outflow=1.14 cfs 0.080 af

Pond D3: Commercial Peak Elev=10.89' Inflow=6.09 cfs 0.618 af
15.0" x 192.0' Culvert Outflow=6.09 cfs 0.618 af

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Post-Development w/ StormTech
Type III 24-hr 10-Year Storm Rainfall=4.70"

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Pond UH2: Hancock Link DMH2

Inflow Area = 1.086 ac, Inflow Depth > 3.12" for 10-Year Storm event
Inflow = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af
Outflow = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min
Primary = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af

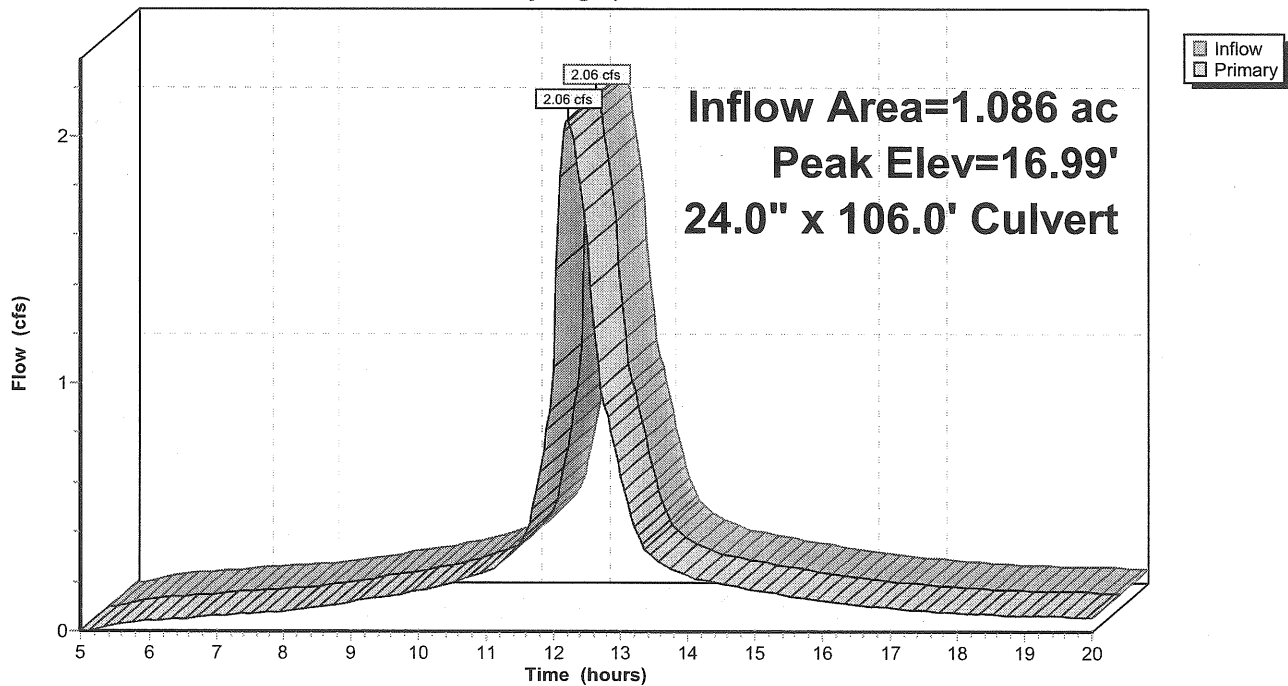
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 16.99' @ 12.21 hrs
Flood Elev= 22.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	16.39'	24.0" x 106.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 11.73' S= 0.0440 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=2.06 cfs @ 12.21 hrs HW=16.98' TW=12.22' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 2.06 cfs @ 2.63 fps)

Pond UH2: Hancock Link DMH2

Hydrograph



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

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Pond UH1: Hancock Link DMH1

Inflow Area = 1.086 ac, Inflow Depth > 3.12" for 10-Year Storm event
Inflow = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af
Outflow = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min
Primary = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 12.23' @ 12.21 hrs

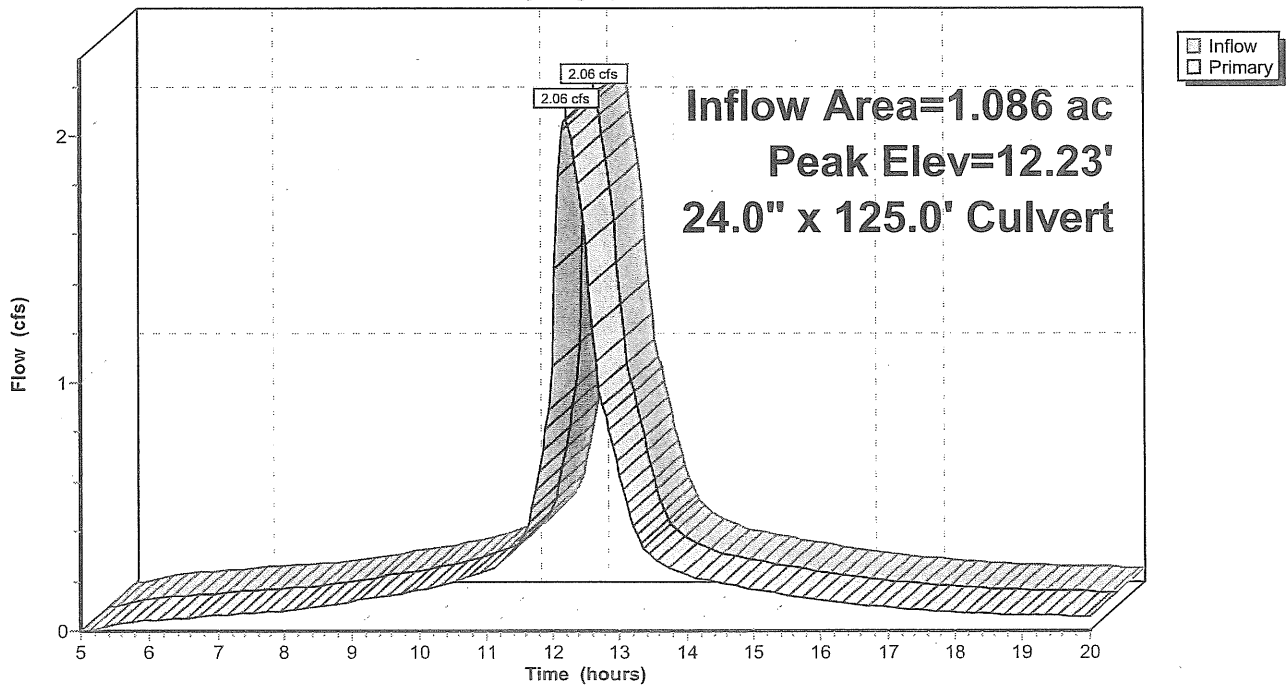
Flood Elev= 16.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	11.63'	24.0" x 125.0' long Culvert RCP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 9.88' S= 0.0140 '/ Cc= 0.900 n= 0.012

Primary OutFlow Max=2.06 cfs @ 12.21 hrs HW=12.22' TW=10.37' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 2.06 cfs @ 2.63 fps)

Pond UH1: Hancock Link DMH1

Hydrograph



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Post-Development w/ StormTech
Type III 24-hr 10-Year Storm Rainfall=4.70"

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Pond D8: Hancock Street Storm System

Inflow Area = 1.086 ac, Inflow Depth > 3.12" for 10-Year Storm event
Inflow = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af
Outflow = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min
Primary = 2.06 cfs @ 12.21 hrs, Volume= 0.282 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 10.38' @ 12.21 hrs

Flood Elev= 15.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	9.78'	24.0" x 196.0' long Culvert Ke= 0.500 Outlet Invert= 8.18' S= 0.0082 '/ Cc= 0.900 n= 0.011

Primary OutFlow Max=2.06 cfs @ 12.21 hrs HW=10.37' TW=8.84' (Dynamic Tailwater)
↳ **1=Culvert** (Inlet Controls 2.06 cfs @ 2.63 fps)

Pond D8: Hancock Street Storm System

Hydrograph

