

BL 110
recd by email 1-25-23

Superior Cast Stone No. 2015-006
Drainage Calculations

Basin Information For: FL22024

Total Basin Area	=	2.07 ac	10-year, 1-day	P ₁₀ = 5.00 in	Stage
			V = (((5.00-0.2(1.83))^2)/(5.00-0.8(1.83)))^2.07/12 =	0.57 ac-ft	25.88 ft-NGVD
			10-year, 3-day	P ₂₅ = 9.00 in	
			V = (((9.00-0.2(1.83))^2)/(9.00-0.8(1.83)))^2.07/12 =	1.23 ac-ft	26.59 ft-NGVD
			100-year, 3-day	P ₁₀₀ = 10.00 in	
			V = (((10.00-0.2(1.83))^2)/(10.00-0.8(1.83)))^2.07/12 =	1.39 ac-ft	26.72 ft-NGVD
Total Basin Area (water quality)	=	2.07 ac			
Impervious Area					
Roofline/Bldg.	=	0.40 ac			
Wetland	=	ac			
Lakes	=	ac			
Pavement/Sidewalk	=	0.28 ac			
Total Impervious Area	=	0.68 ac			
Pervious Area					
Dry Detention	=	0.19 ac			
Green	=	1.19 ac			
Total Pervious Area	=	1.38 ac			
Percent Impervious	=	33.1%			
Adjusted Soil Storage	=	1.83 in			
Calculated SCS Curve Number	=	73			
Time of Concentration	=	10.00 min			

Control Structure Design

Max. Allowable Discharge	=	0.05 cfs	
Control Elevation	=	23.33 ft-NGVD	
Req. Weir Crest Elevation	=	26.59 ft-NGVD	
Pro. Weir Crest Elevation	=	26.50 ft-NGVD	
Provided Water Quality	=	0.19 ac-ft	
Bleed Down Volume	=	0.10 ac-ft	1/2 detention volume
Allowable Bleeder Discharge	=	0.05 cfs	
	=	0.29 degrees	

Circular Orifice Design:

$$Q = 0.6 * A * (2 * g * H)^{0.5}$$

Solving the above equation for Diameter yields

$$D = 2 * (Q / (0.6 * \pi * (2 * g * H)^{0.5}))^{0.5} * 12 \text{ in/Ft}$$

Assuming 3-inch bleeder initially

$$D = 2 * [0.05 / (0.6 * 3.14 * (2 * 32.2 * (26.50 - (23.33 + 0.125)))^{0.5})]^{0.5} * 12 \text{ in/Ft}$$

D = 1.04 in for one bleeder

Water Quality Calculation

1/2" Pretreatment x Total Area	=	0.09 ac-ft
1" x Total Area	=	0.17 ac-ft
Runoff from 2.5"x % net Impervious - SFWMD criteria	=	0.07 ac-ft
Required Water Quality Volume	=	0.17 ac-ft
Dry Detention Multiplier	=	1.13
Adjusted Required Water Quality Volume	=	0.19 ac-ft
0.5 Water quality stage (0.0968782786673554 ac-ft)	=	24.61 ft-NAVD
Water Quality Stage	=	25.10 ft-NAVD
Min. Req Road Crown Elev. (10 yr-24 hr storm)	=	25.88 ft-NGVD
Min. Req Perimeter Berm Elev. (25 yr-72 hr storm)	=	26.59 ft-NGVD
Min. Req F.F.E. (100 yr-72 hr zero discharge)	=	26.72 ft-NGVD

Stage Storage Calculations for Basin FL22024

Land use Category	Storage Type	Area (ac.)	From Elev.	To Elev.	Cumulative Stage-Storage (ac-ft)										
					23.33	23.50	24.00	24.50	25.00	25.50	26.00	26.50	27.00	27.50	28.00
Dry retention	Vertical	0.00	23.33	23.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dry retention bank	Linear	0.19	23.33	25.00	0.00	0.00	0.03	0.08	0.16	0.26	0.35	0.45	0.55	0.64	0.74

Building	Vertical	0.40	28.40		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pavement	Linear	0.28	27.00	28.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.14
Green	Linear	1.19	25.00	27.00	0.00	0.00	0.00	0.00	0.00	0.07	0.30	0.67	1.19	1.78	2.38

	Total:	2.07		Totals:	0.00	0.002	0.03	0.08	0.16	0.33	0.65	1.12	1.74	2.46	3.26

BL 121
recd by email 1-25-23

Superior Cast Stone No. 2015-006
Drainage Calculations

Basin Information For: FL22024

Total Basin Area	=	2.17	ac
Total Basin Area (water quality)	=	2.17	ac
Impervious Area			
Roofline/Bldg.	=	0.40	ac
Wetland	=		ac
Lakes	=		ac
Pavement/Sidewalk	=	0.28	ac
Total Impervious Area	=	0.68	ac
Pervious Area			
Dry Detention	=	0.22	ac
Green	=	1.27	ac
Total Pervious Area	=	1.48	ac
Percent Impervious	=	31.6%	
Adjusted Soil Storage	=	1.93	in
Calculated SCS Curve Number	=	73	
Time of Concentration	=	10.00	min

10-year, 1-day	P ₁₀ =	5.00	in	
V = (((5.00-0.2(1.93))^2)/(5.00-0.8(1.93)))^2.17/12	=	0.59	ac-ft	26.62 ft-NGVD
10-year, 3-day	P ₂₅ =	9.00	in	
V = (((9.00-0.2(1.93))^2)/(9.00-0.8(1.93)))^2.17/12	=	1.27	ac-ft	27.15 ft-NGVD
100-year, 3-day	P ₁₀₀ =	10.00	in	
V = (((10.00-0.2(1.93))^2)/(10.00-0.8(1.93)))^2.17/12	=	1.45	ac-ft	27.27 ft-NGVD

Control Structure Design

Max. Allowable Discharge	=	0.05	cfs
Control Elevation	=	24.33	ft-NGVD
Req. Weir Crest Elevation	=	27.15	ft-NGVD

Pro. Weir Crest Elevation	=	27.00	ft-NGVD
Provided Water Quality	=	0.20	ac-ft
Bleed Down Volume	=	0.10	ac-ft 1/2 detention volume
Allowable Bleeder Discharge	=	0.05	cfs
	=	0.43	degrees

Circular Orifice Design:

$$Q = 0.6 * A * (2 * g * H)^{0.5}$$

Solving the above equation for Diameter yields

$$D = 2 * (Q / (0.6 * \pi * (2 * g * H)^{0.5}))^{0.5} * 12 \text{ in/Ft}$$

Assuming 3-inch bleeder initially

$$D = 2 * [0.05 / (0.6 * 3.14 * (2 * 32.2 * (27.00 - (24.33 + 0.125)))^{0.5})]^{0.5} * 12 \text{ in/Ft}$$

D = 1.12 in for one bleeder

Water Quality Calculation

1/2" Pretreatment x Total Area	=	0.09	ac-ft
1" x Total Area	=	0.18	ac-ft
Runoff from 2.5" x % net Impervious - SFWMD criteria	=	0.07	ac-ft
Required Water Quality Volume	=	0.18	ac-ft
Dry Detention Multiplier	=	1.13	1.5*0.75
Adjusted Required Water Quality Volume	=	0.20	ac-ft
0.5 Water quality stage (0.101693554149449 ac-ft)	=	25.57	ft-NAVD
Water Quality Stage	=	26.04	ft-NAVD
Min. Req Road Crown Elev. (10 yr-24 hr storm)	=	26.62	ft-NGVD
Min. Req Perimeter Berm Elev. (25 yr-72 hr storm)	=	27.15	ft-NGVD
Min. Req F.F.E. (100 yr-72 hr zero discharge)	=	27.27	ft-NGVD

Stage Storage Calculations for Basin FL22024

Land use Category	Storage Type	Area (ac.)	From Elev.	To Elev.	Cumulative Stage-Storage (ac-ft)										
					24.33	24.50	25.00	25.50	26.00	26.50	27.00	27.50	28.00	28.50	29.00
Dry retention	Vertical	0.00	24.33	24.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dry retention bank	Linear	0.22	24.33	26.00	0.00	0.00	0.03	0.09	0.18	0.29	0.40	0.51	0.62	0.73	0.84

Building	Vertical	0.40	28.40		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24
Pavement	Linear	0.28	27.00	28.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.14	0.28	0.43
Green	Linear	1.27	26.00	27.00	0.00	0.00	0.00	0.00	0.00	0.16	0.63	1.27	1.90	2.53	3.17

	Total:	2.17		Totals:	0.00	0.002	0.03	0.09	0.18	0.45	1.03	1.81	2.66	3.59	4.67
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FL22024 POST

SFWMD 72-hr 100y-72h Rainfall=10.00"

Prepared by HP

Printed 25/01/2023

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Summary for Pond 13P: BLOCK 110

Inflow Area = 2.060 ac, 33.01% Impervious, Inflow Depth = 6.62" for 100y-72h event
 Inflow = 8.12 cfs @ 59.96 hrs, Volume= 1.136 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
 Peak Elev= 26.51' @ 73.01 hrs Surf.Area= 0.000 ac Storage= 1.136 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	23.33'	3.260 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
23.33	0.000
23.50	0.002
24.00	0.030
24.50	0.080
25.00	0.160
25.50	0.330
26.00	0.650
26.50	1.120
27.00	1.740
27.50	2.460
28.00	3.260

FL22024 POST

SFWMD 72-hr 100y-72h Rainfall=10.00"

Prepared by HP

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Summary for Pond 14P: BLOCK 121

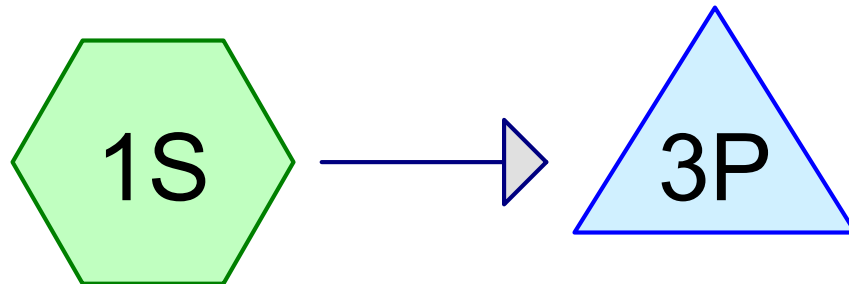
Inflow Area = 2.160 ac, 31.48% Impervious, Inflow Depth = 6.62" for 100y-72h event
 Inflow = 8.51 cfs @ 59.96 hrs, Volume= 1.191 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
 Peak Elev= 27.10' @ 73.01 hrs Surf.Area= 0.000 ac Storage= 1.191 af

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

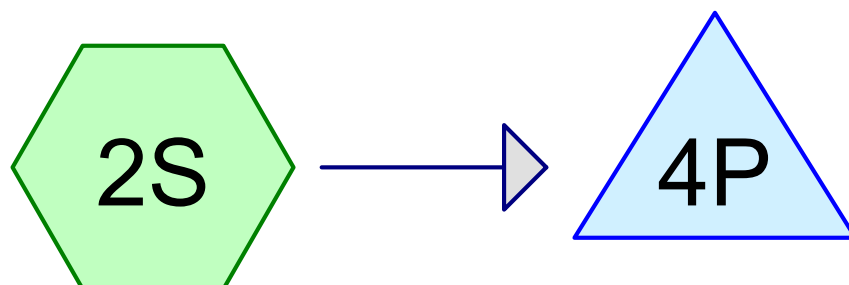
Volume	Invert	Avail.Storage	Storage Description
#1	24.33'	4.670 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
24.33	0.000
24.50	0.002
25.00	0.030
25.50	0.090
26.00	0.180
26.50	0.450
27.00	1.030
27.50	1.810
28.00	2.660
28.50	3.590
29.00	4.670



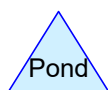
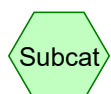
BLOCK 110

BLOCK 110



BLOCK 121

BLOCK 121



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Page 2

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3P	23.33	23.30	32.0	0.0009	0.025	18.0	0.0	0.0
2	4P	24.33	24.30	29.0	0.0010	0.025	18.0	0.0	0.0

FL22024 POST*Type II FL 24-hr 10y-24h Rainfall=5.00"*

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Time span=0.00-900.00 hrs, dt=0.01 hrs, 90001 points

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: BLOCK 110Runoff Area=2.060 ac 33.01% Impervious Runoff Depth=2.28"
Tc=10.0 min CN=73 Runoff=2.52 cfs 0.391 af**Subcatchment 2S: BLOCK 121**Runoff Area=2.160 ac 31.48% Impervious Runoff Depth=2.28"
Tc=10.0 min CN=73 Runoff=2.64 cfs 0.410 af**Pond 3P: BLOCK 110**Peak Elev=25.14' Storage=0.206 af Inflow=2.52 cfs 0.391 af
Outflow=0.29 cfs 0.389 af**Pond 4P: BLOCK 121**Peak Elev=26.08' Storage=0.221 af Inflow=2.64 cfs 0.410 af
Outflow=0.28 cfs 0.408 af**Total Runoff Area = 4.220 ac Runoff Volume = 0.802 af Average Runoff Depth = 2.28"**
67.77% Pervious = 2.860 ac 32.23% Impervious = 1.360 ac

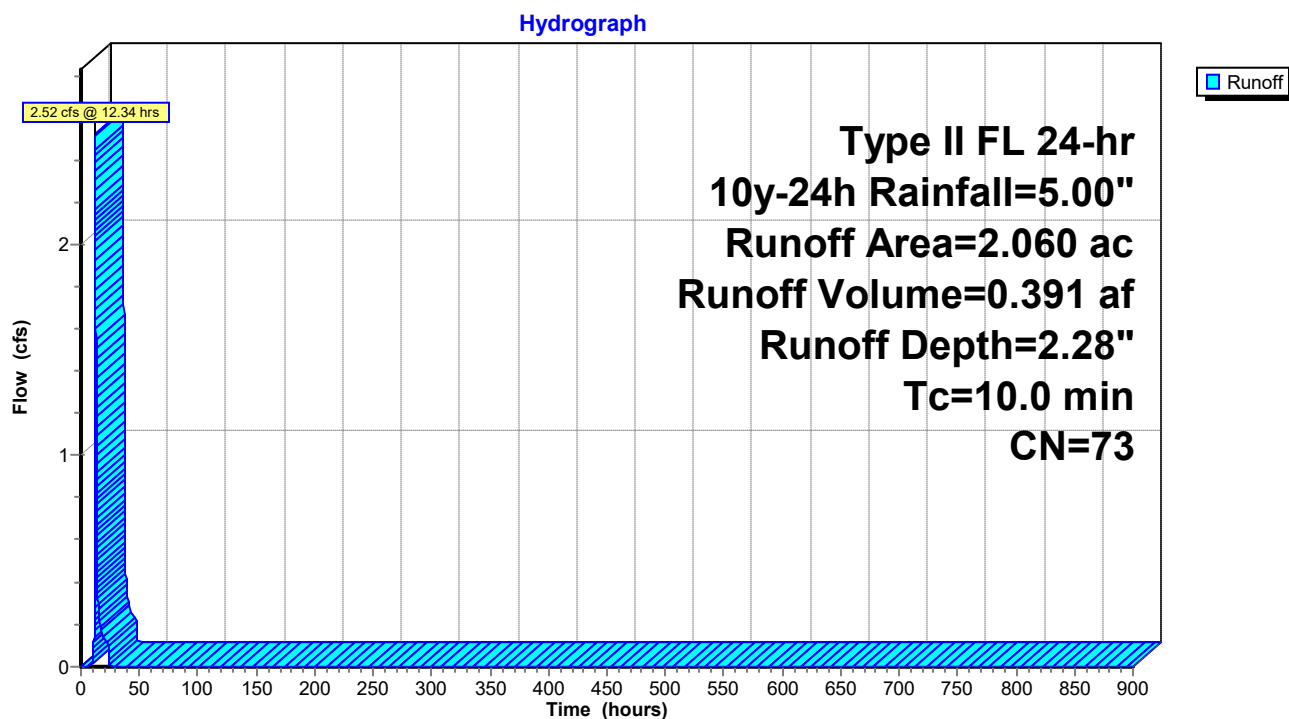
Summary for Subcatchment 1S: BLOCK 110

Runoff = 2.52 cfs @ 12.34 hrs, Volume= 0.391 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
Type II FL 24-hr 10y-24h Rainfall=5.00"

Area (ac)	CN	Description
0.680	98	Paved parking, HSG A
1.380	61	>75% Grass cover, Good, HSG B
2.060	73	Weighted Average
1.380	61	66.99% Pervious Area
0.680	98	33.01% Impervious Area

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

Subcatchment 1S: BLOCK 110

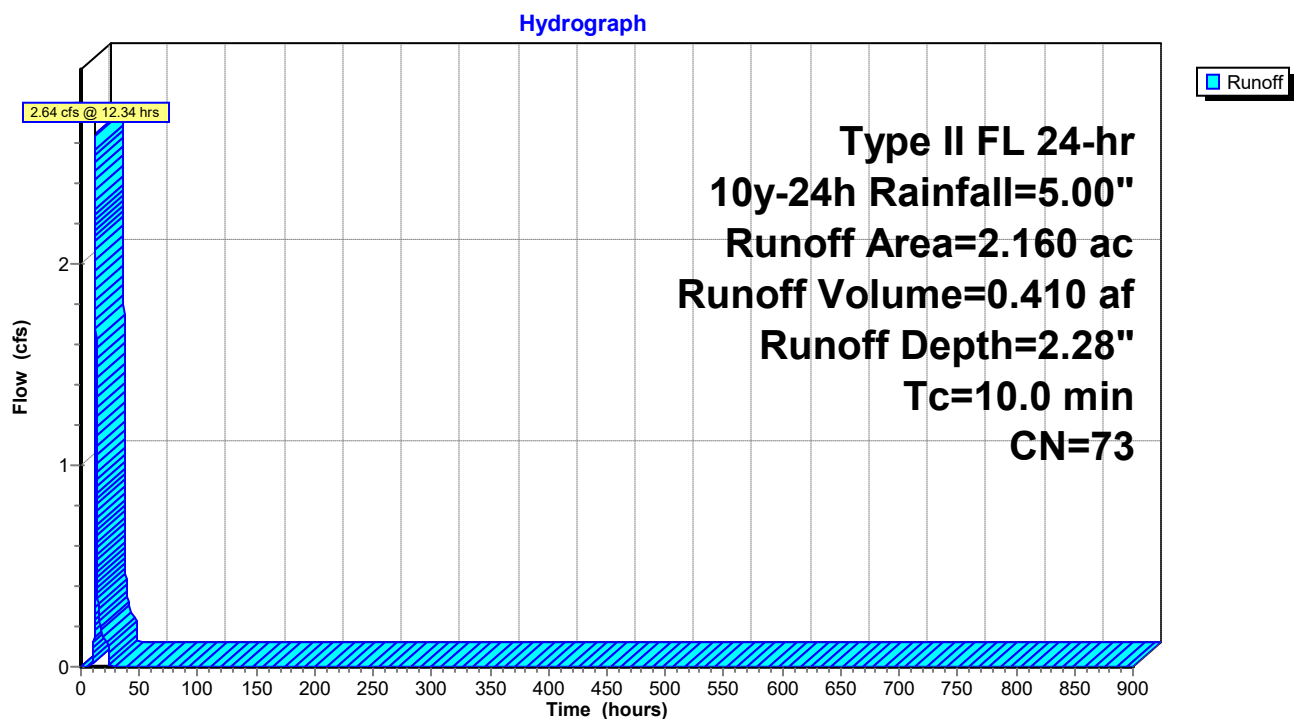
Summary for Subcatchment 2S: BLOCK 121

Runoff = 2.64 cfs @ 12.34 hrs, Volume= 0.410 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
Type II FL 24-hr 10y-24h Rainfall=5.00"

Area (ac)	CN	Description
0.680	98	Paved parking, HSG A
1.480	61	>75% Grass cover, Good, HSG B
2.160	73	Weighted Average
1.480	61	68.52% Pervious Area
0.680	98	31.48% Impervious Area

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

Subcatchment 2S: BLOCK 121

Summary for Pond 3P: BLOCK 110

Inflow Area = 2.060 ac, 33.01% Impervious, Inflow Depth = 2.28" for 10y-24h event
 Inflow = 2.52 cfs @ 12.34 hrs, Volume= 0.391 af
 Outflow = 0.29 cfs @ 14.74 hrs, Volume= 0.389 af, Atten= 88%, Lag= 144.0 min
 Primary = 0.29 cfs @ 14.74 hrs, Volume= 0.389 af

Routing by Stor-Ind method, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
 Peak Elev= 25.14' @ 14.74 hrs Surf.Area= 0.000 ac Storage= 0.206 af

Plug-Flow detention time= 377.6 min calculated for 0.389 af (99% of inflow)
 Center-of-Mass det. time= 374.7 min (1,243.3 - 868.6)

Volume	Invert	Avail.Storage	Storage Description
#1	23.33'	3.260 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
23.33	0.000
23.50	0.002
24.00	0.030
24.50	0.080
25.00	0.160
25.50	0.330
26.00	0.650
26.50	1.120
27.00	1.740
27.50	2.460
28.00	3.260

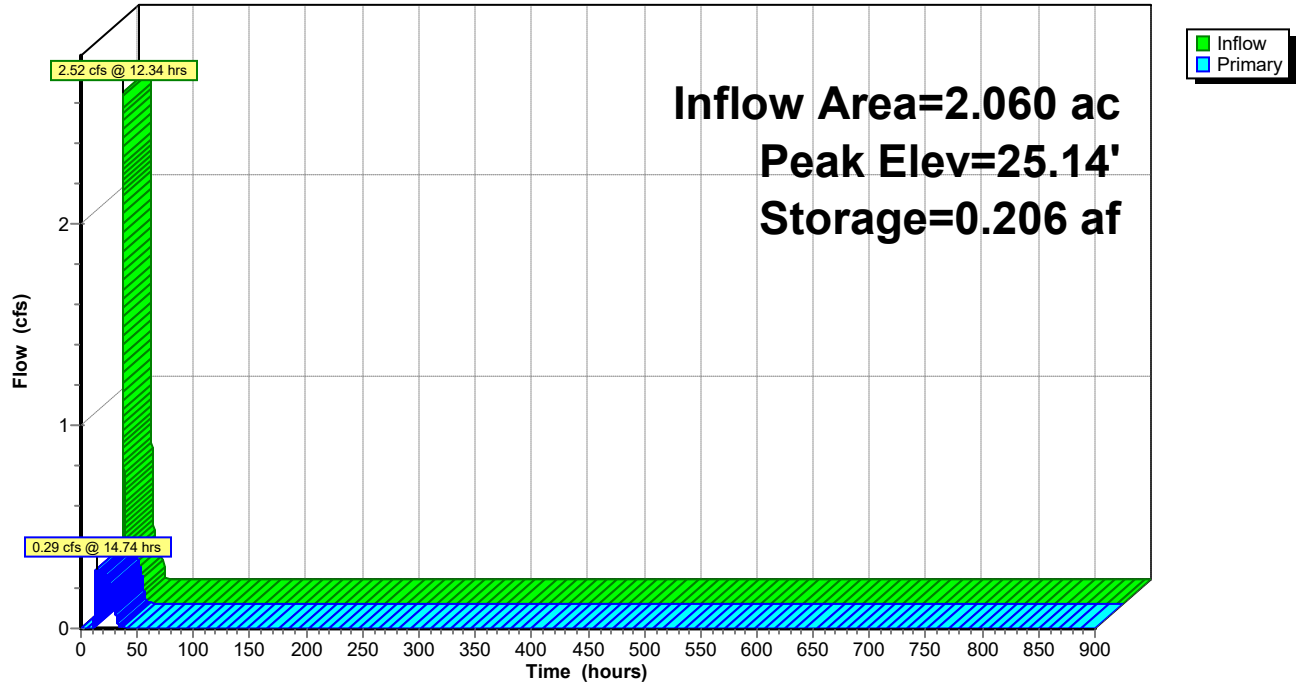
Device	Routing	Invert	Outlet Devices
#1	Primary	23.33'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 23.33' / 23.30' S= 0.0009 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf
#2	Device 1	23.50'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	26.50'	24.0" x 36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.29 cfs @ 14.74 hrs HW=25.14' (Free Discharge)

1=Culvert (Passes 0.29 cfs of 5.22 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.29 cfs @ 5.92 fps)
 3=Orifice/Grate (Controls 0.00 cfs)

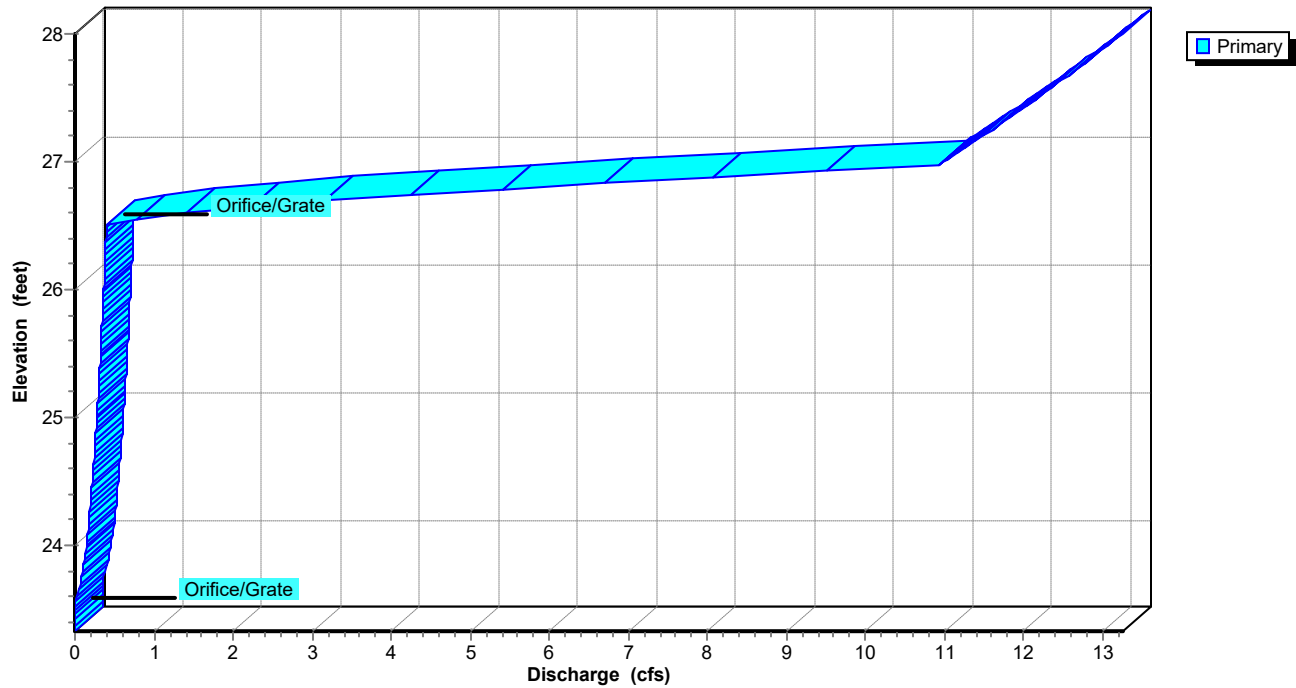
Pond 3P: BLOCK 110

Hydrograph

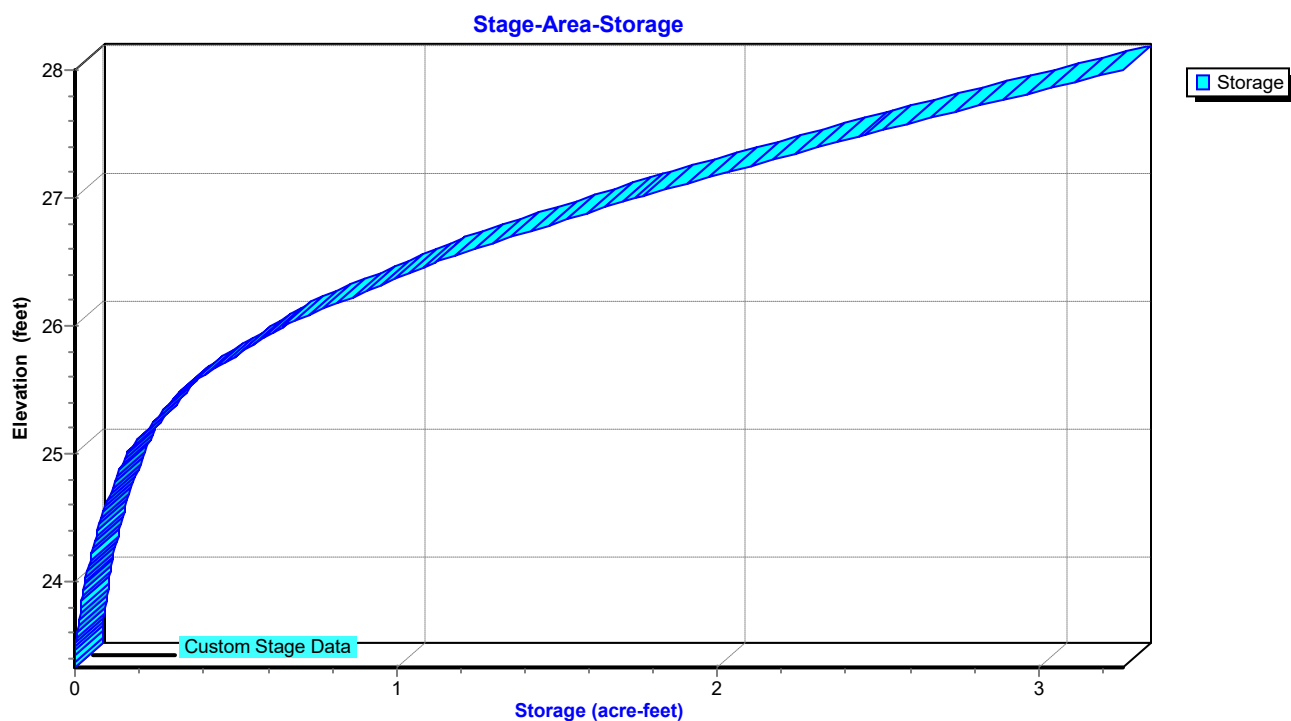


Pond 3P: BLOCK 110

Stage-Discharge



Pond 3P: BLOCK 110



Summary for Pond 4P: BLOCK 121

Inflow Area = 2.160 ac, 31.48% Impervious, Inflow Depth = 2.28" for 10y-24h event
 Inflow = 2.64 cfs @ 12.34 hrs, Volume= 0.410 af
 Outflow = 0.28 cfs @ 14.96 hrs, Volume= 0.408 af, Atten= 89%, Lag= 157.3 min
 Primary = 0.28 cfs @ 14.96 hrs, Volume= 0.408 af

Routing by Stor-Ind method, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
 Peak Elev= 26.08' @ 14.96 hrs Surf.Area= 0.000 ac Storage= 0.221 af

Plug-Flow detention time= 410.0 min calculated for 0.408 af (100% of inflow)
 Center-of-Mass det. time= 407.1 min (1,275.6 - 868.6)

Volume	Invert	Avail.Storage	Storage Description
#1	24.33'	4.670 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
24.33	0.000
24.50	0.002
25.00	0.030
25.50	0.090
26.00	0.180
26.50	0.450
27.00	1.030
27.50	1.810
28.00	2.660
28.50	3.590
29.00	4.670

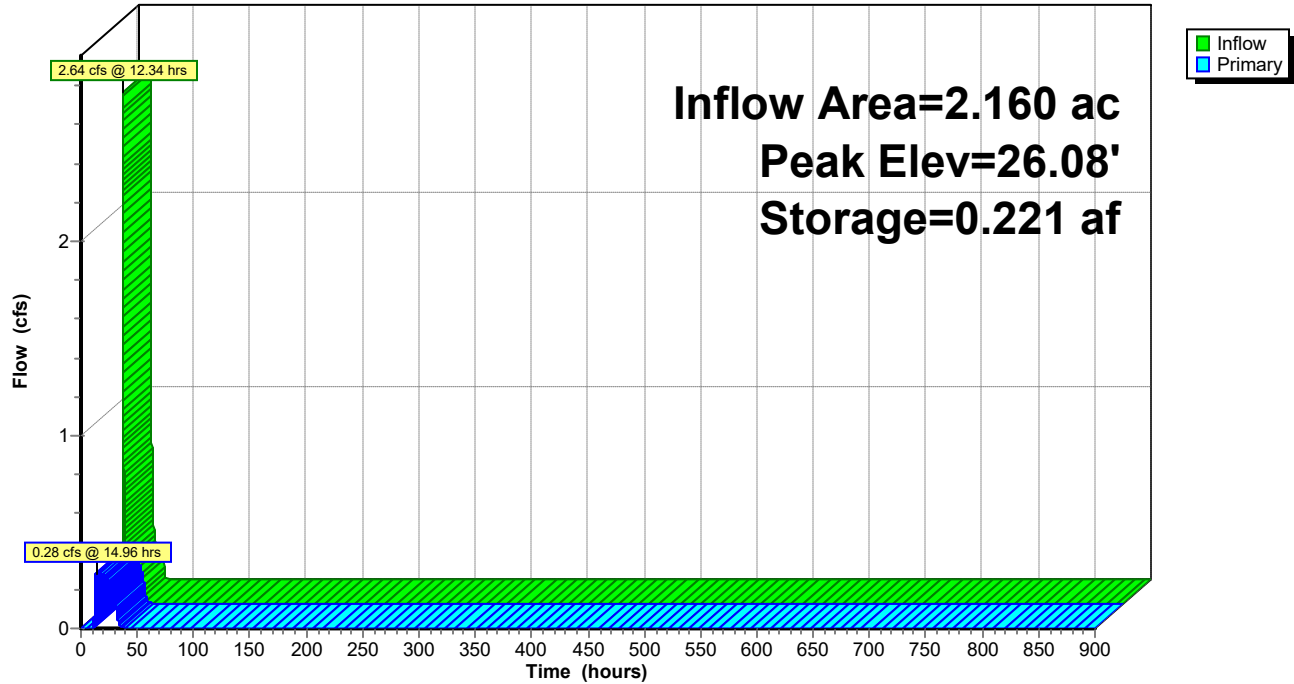
Device	Routing	Invert	Outlet Devices
#1	Primary	24.33'	18.0" Round Culvert L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 24.33' / 24.30' S= 0.0010 ' S= 0.0010 ' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf
#2	Device 1	24.50'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	27.00'	24.0" x 36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 14.96 hrs HW=26.08' (Free Discharge)

1=Culvert (Passes 0.28 cfs of 5.15 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.28 cfs @ 5.80 fps)
 3=Orifice/Grate (Controls 0.00 cfs)

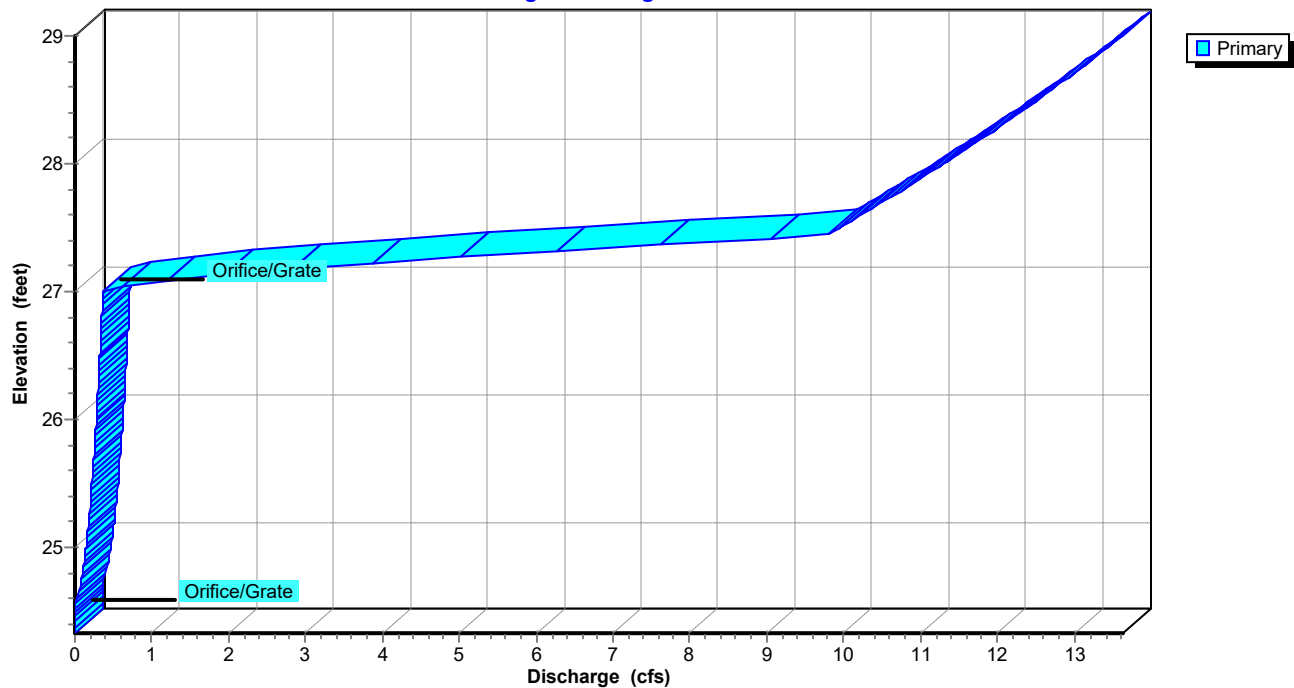
Pond 4P: BLOCK 121

Hydrograph



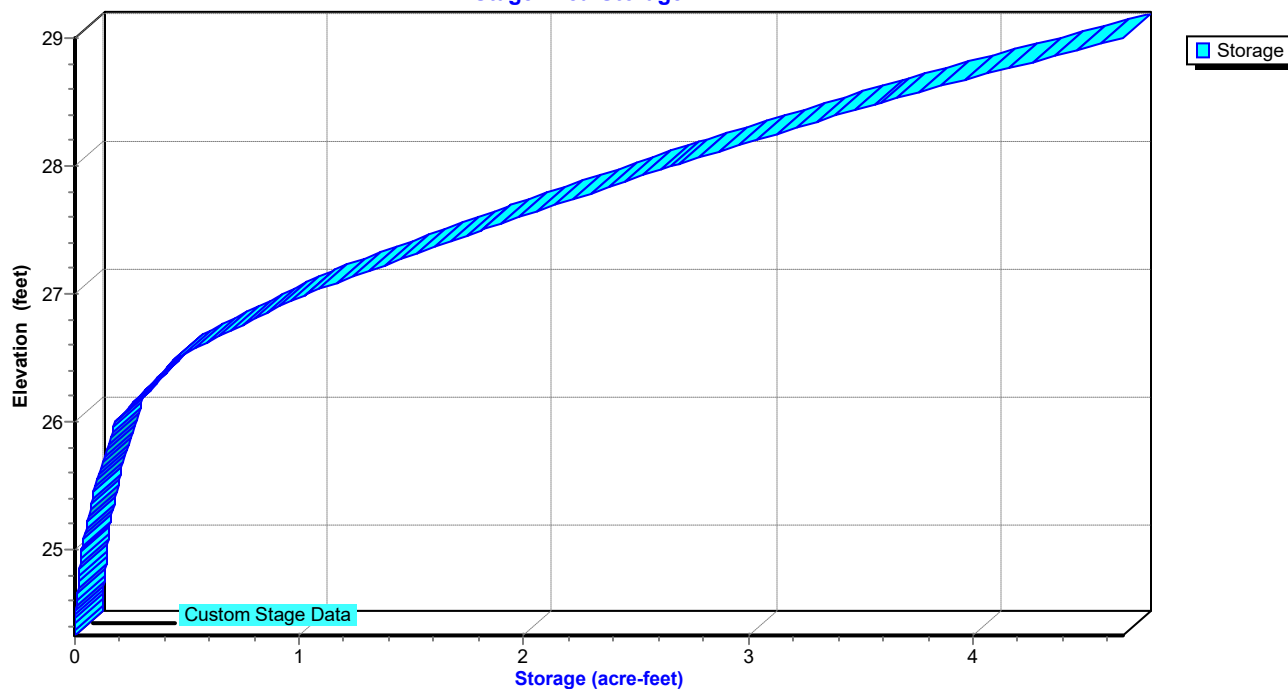
Pond 4P: BLOCK 121

Stage-Discharge



Pond 4P: BLOCK 121

Stage-Area-Storage



FL22024 POST

SFWMD 72-hr 25y-72h Rainfall=9.00"

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Time span=0.00-900.00 hrs, dt=0.01 hrs, 90001 points

Runoff by SCS TR-20 method, UH=SFWMD-256, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: BLOCK 110Runoff Area=2.060 ac 33.01% Impervious Runoff Depth=5.71"
Tc=10.0 min CN=73 Runoff=7.09 cfs 0.980 af**Subcatchment 2S: BLOCK 121**Runoff Area=2.160 ac 31.48% Impervious Runoff Depth=5.71"
Tc=10.0 min CN=73 Runoff=7.43 cfs 1.027 af**Pond 3P: BLOCK 110**Peak Elev=25.82' Storage=0.533 af Inflow=7.09 cfs 0.980 af
Outflow=0.35 cfs 0.978 af**Pond 4P: BLOCK 121**Peak Elev=26.61' Storage=0.574 af Inflow=7.43 cfs 1.027 af
Outflow=0.33 cfs 1.025 af**Total Runoff Area = 4.220 ac Runoff Volume = 2.007 af Average Runoff Depth = 5.71"**
67.77% Pervious = 2.860 ac 32.23% Impervious = 1.360 ac

Summary for Subcatchment 1S: BLOCK 110

Runoff = 7.09 cfs @ 59.97 hrs, Volume= 0.980 af, Depth= 5.71"

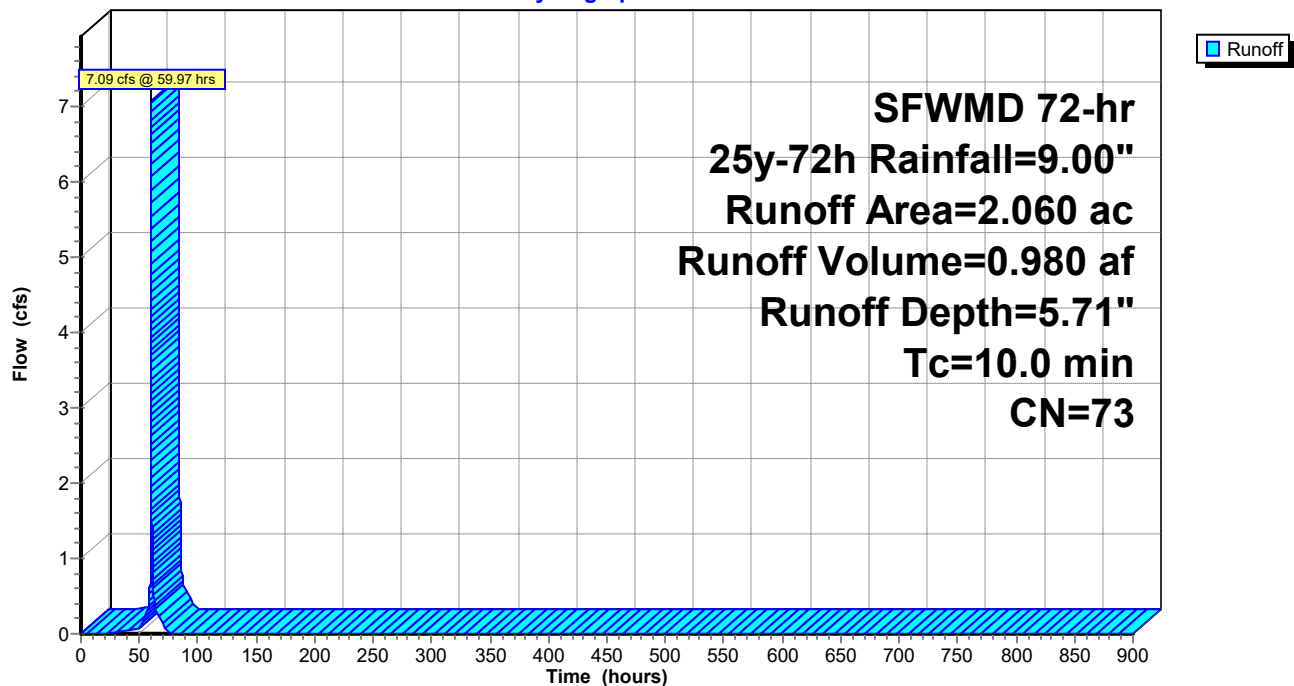
Runoff by SCS TR-20 method, UH=SFWMD-256, Weighted-CN, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
SFWMD 72-hr 25y-72h Rainfall=9.00"

Area (ac)	CN	Description
0.680	98	Paved parking, HSG A
1.380	61	>75% Grass cover, Good, HSG B
2.060	73	Weighted Average
1.380	61	66.99% Pervious Area
0.680	98	33.01% Impervious Area

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

Subcatchment 1S: BLOCK 110

Hydrograph



Summary for Subcatchment 2S: BLOCK 121

Runoff = 7.43 cfs @ 59.97 hrs, Volume= 1.027 af, Depth= 5.71"

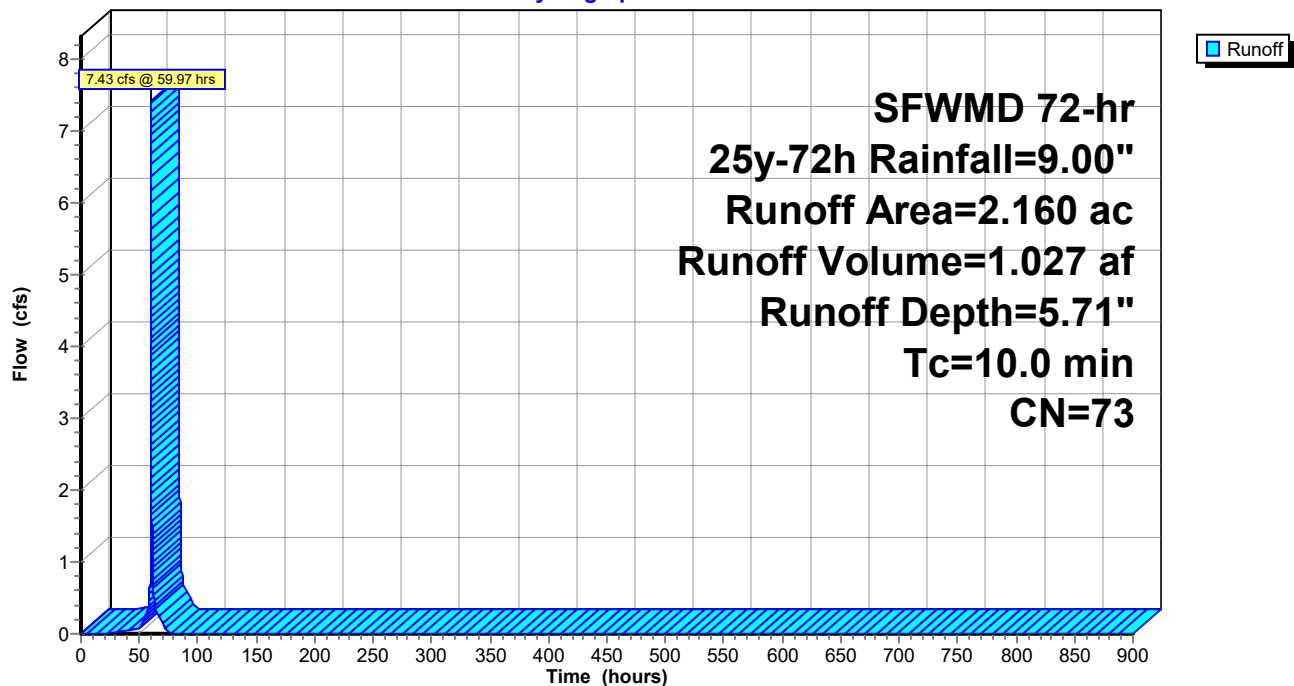
Runoff by SCS TR-20 method, UH=SFWMD-256, Weighted-CN, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
SFWMD 72-hr 25y-72h Rainfall=9.00"

Area (ac)	CN	Description
0.680	98	Paved parking, HSG A
1.480	61	>75% Grass cover, Good, HSG B
2.160	73	Weighted Average
1.480	61	68.52% Pervious Area
0.680	98	31.48% Impervious Area

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

Subcatchment 2S: BLOCK 121

Hydrograph



Summary for Pond 3P: BLOCK 110

Inflow Area = 2.060 ac, 33.01% Impervious, Inflow Depth = 5.71" for 25y-72h event
 Inflow = 7.09 cfs @ 59.97 hrs, Volume= 0.980 af
 Outflow = 0.35 cfs @ 63.66 hrs, Volume= 0.978 af, Atten= 95%, Lag= 221.5 min
 Primary = 0.35 cfs @ 63.66 hrs, Volume= 0.978 af

Routing by Stor-Ind method, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
 Peak Elev= 25.82' @ 63.66 hrs Surf.Area= 0.000 ac Storage= 0.533 af

Plug-Flow detention time= 639.1 min calculated for 0.978 af (100% of inflow)
 Center-of-Mass det. time= 637.3 min (4,153.0 - 3,515.7)

Volume	Invert	Avail.Storage	Storage Description
#1	23.33'	3.260 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
23.33	0.000
23.50	0.002
24.00	0.030
24.50	0.080
25.00	0.160
25.50	0.330
26.00	0.650
26.50	1.120
27.00	1.740
27.50	2.460
28.00	3.260

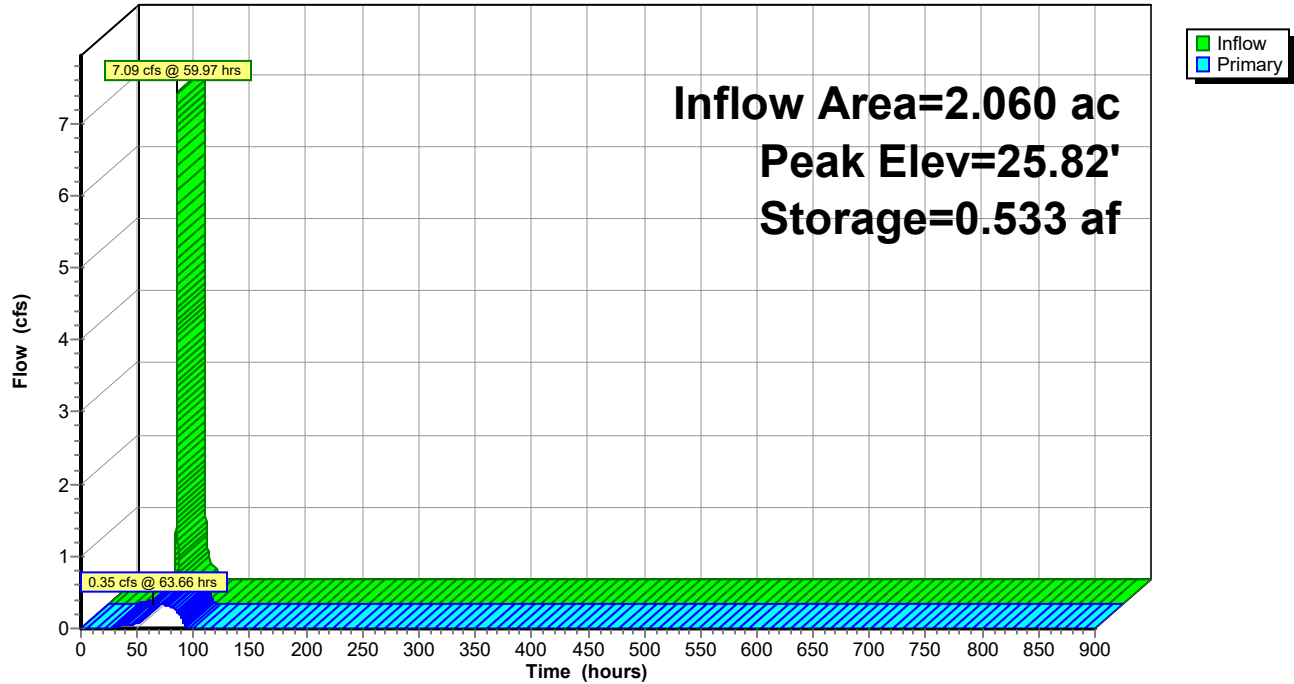
Device	Routing	Invert	Outlet Devices
#1	Primary	23.33'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 23.33' / 23.30' S= 0.0009 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf
#2	Device 1	23.50'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	26.50'	24.0" x 36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.35 cfs @ 63.66 hrs HW=25.82' (Free Discharge)

1=Culvert (Passes 0.35 cfs of 7.47 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.35 cfs @ 7.13 fps)
 3=Orifice/Grate (Controls 0.00 cfs)

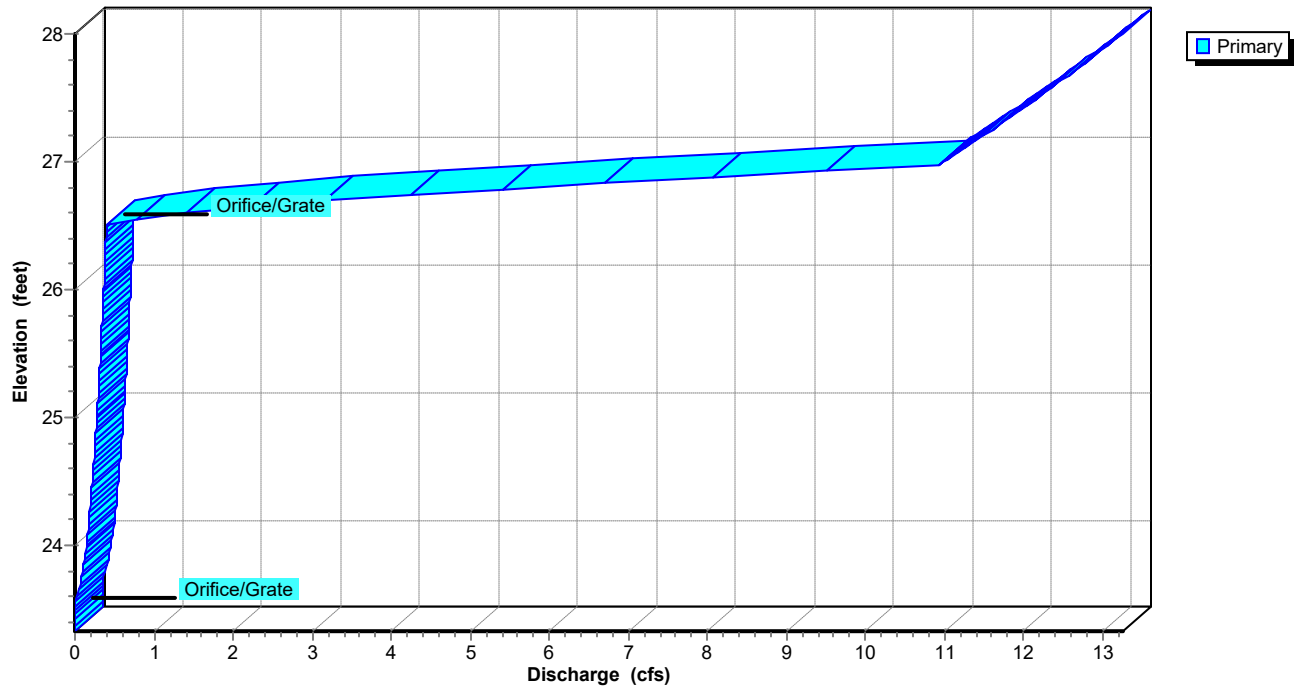
Pond 3P: BLOCK 110

Hydrograph

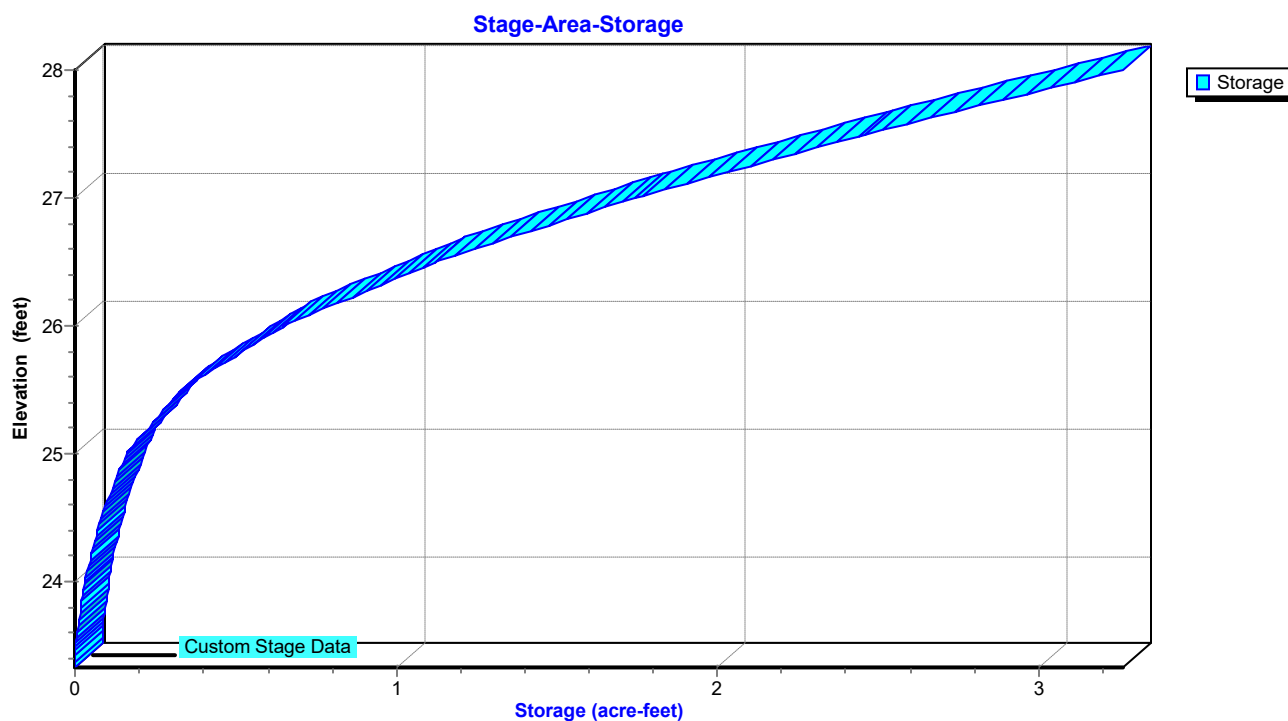


Pond 3P: BLOCK 110

Stage-Discharge



Pond 3P: BLOCK 110



Summary for Pond 4P: BLOCK 121

Inflow Area = 2.160 ac, 31.48% Impervious, Inflow Depth = 5.71" for 25y-72h event
 Inflow = 7.43 cfs @ 59.97 hrs, Volume= 1.027 af
 Outflow = 0.33 cfs @ 64.05 hrs, Volume= 1.025 af, Atten= 96%, Lag= 245.0 min
 Primary = 0.33 cfs @ 64.05 hrs, Volume= 1.025 af

Routing by Stor-Ind method, Time Span= 0.00-900.00 hrs, dt= 0.01 hrs
 Peak Elev= 26.61' @ 64.05 hrs Surf.Area= 0.000 ac Storage= 0.574 af

Plug-Flow detention time= 710.6 min calculated for 1.025 af (100% of inflow)
 Center-of-Mass det. time= 708.9 min (4,224.6 - 3,515.7)

Volume	Invert	Avail.Storage	Storage Description
#1	24.33'	4.670 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
24.33	0.000
24.50	0.002
25.00	0.030
25.50	0.090
26.00	0.180
26.50	0.450
27.00	1.030
27.50	1.810
28.00	2.660
28.50	3.590
29.00	4.670

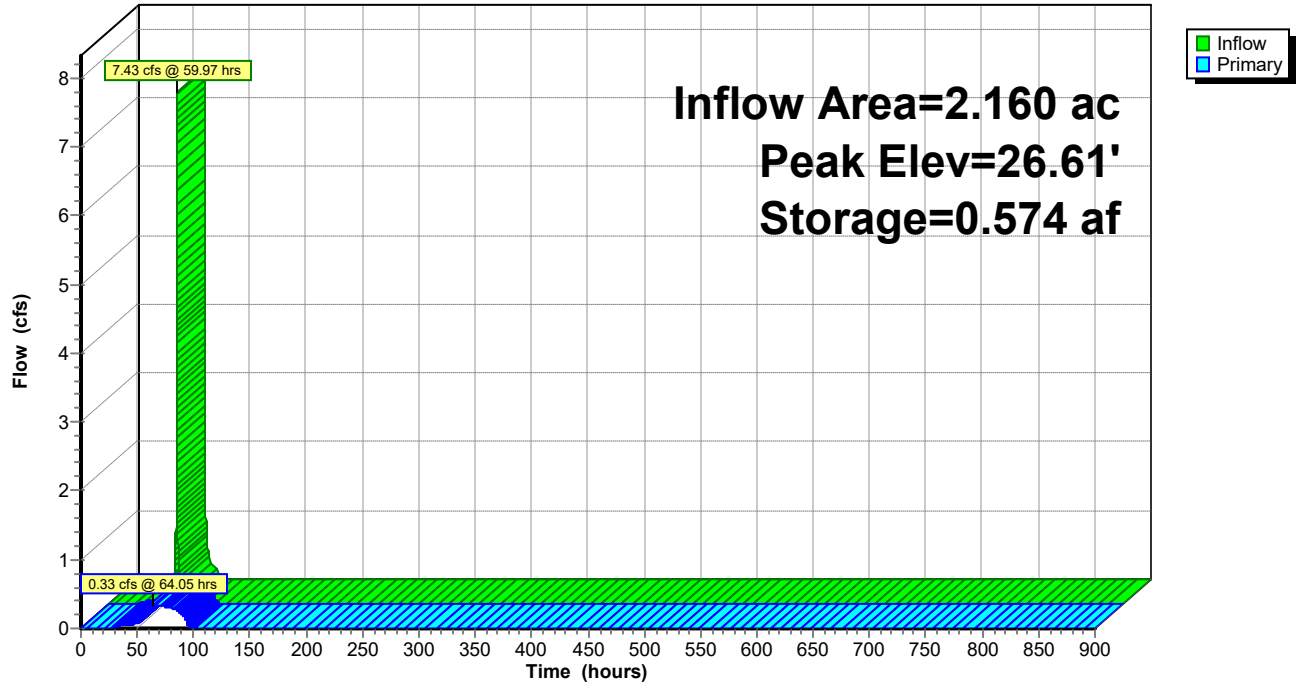
Device	Routing	Invert	Outlet Devices
#1	Primary	24.33'	18.0" Round Culvert L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 24.33' / 24.30' S= 0.0010 ' S= 0.0010 ' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf
#2	Device 1	24.50'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	27.00'	24.0" x 36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.33 cfs @ 64.05 hrs HW=26.61' (Free Discharge)

1=Culvert (Passes 0.33 cfs of 6.85 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.33 cfs @ 6.78 fps)
 3=Orifice/Grate (Controls 0.00 cfs)

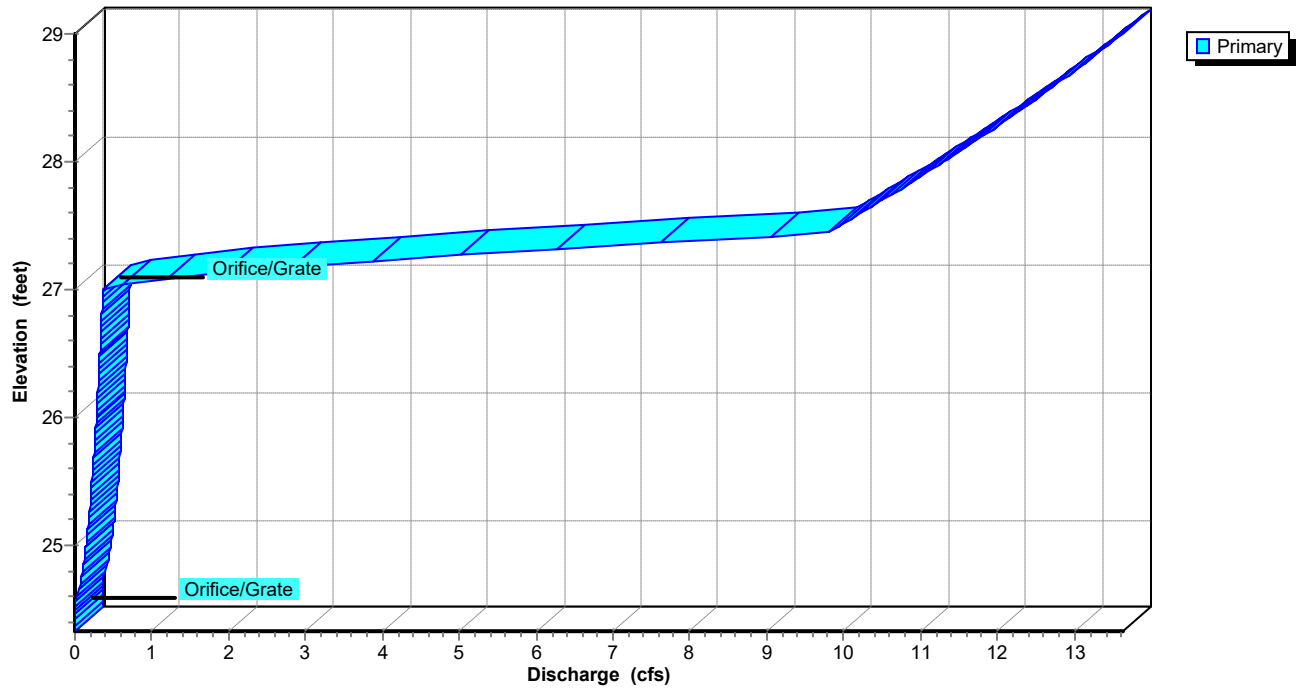
Pond 4P: BLOCK 121

Hydrograph



Pond 4P: BLOCK 121

Stage-Discharge



Pond 4P: BLOCK 121

