i. Post Development Peak Flow Conditions (Basin #1)

# DONALD H. STIRES ASSOCIATES

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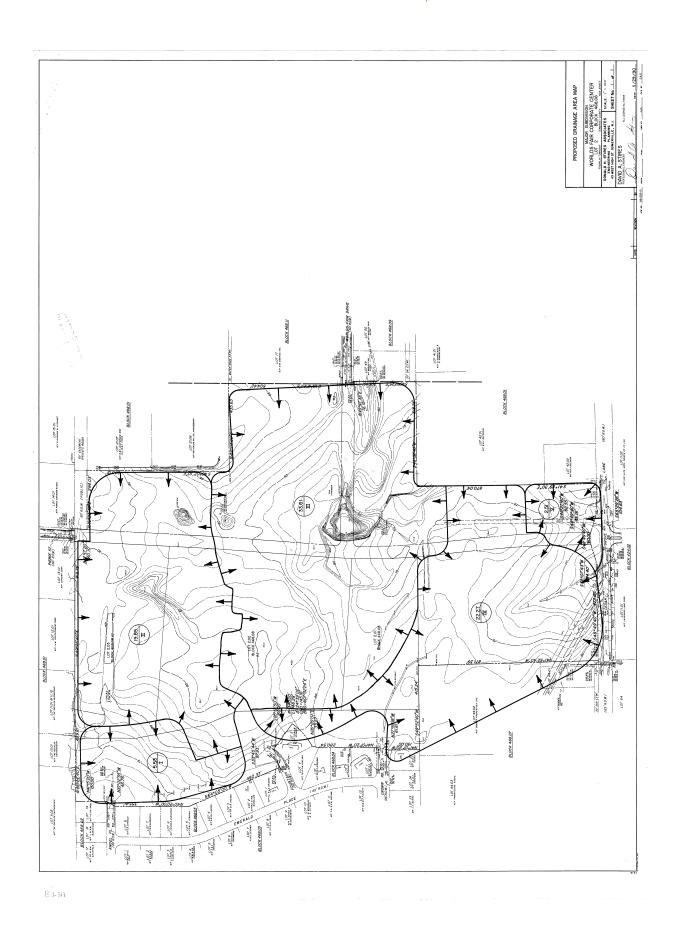
ENGINEER'S REPORT FOR MAJOR SUBDIVISION LOT 2 BLOCK 468.08

FRANKLIN TOWNSHIP, SOMERSET COUNTY

NEW JERSEY

NOVEMBER 1990

David A. Stires, PE N.J. License 34814



1) Drainage Area #1

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Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020

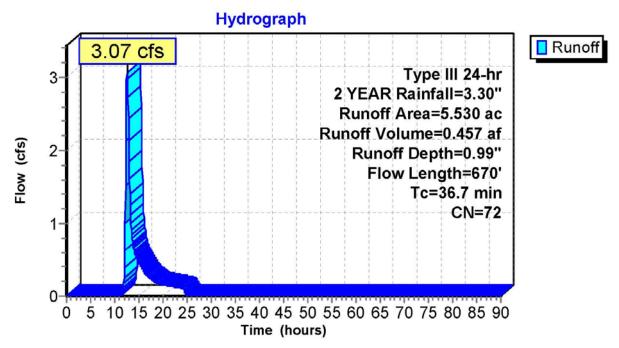
Page 1

#### Summary for Subcatchment PA #1: PA #1

Runoff = 3.07 cfs @ 12.56 hrs, Volume= 0.457 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) (	N De	scription								
	3.	600	72 1/3	acre lots, 3	0% imp, H	SG B						
*	0.	710	90 Pav	red roads w	/open ditch	nes, 50% imp, HSG C						
*	1.	220	60 Bru	ush, Good, HSG C								
	5.530 72 Weighted Average											
	4.	095	74.	05% Pervio	us Area							
	1.	435	25.	95% Imper	vious Area							
	Тс	Length	Slope	Velocity	Capacity	Description						
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)							
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1						
						Grass: Dense n= 0.240 P2= 3.30"						
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2						
_						Unpaved Kv= 16.1 fps						
	36.7	670	Total									



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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020

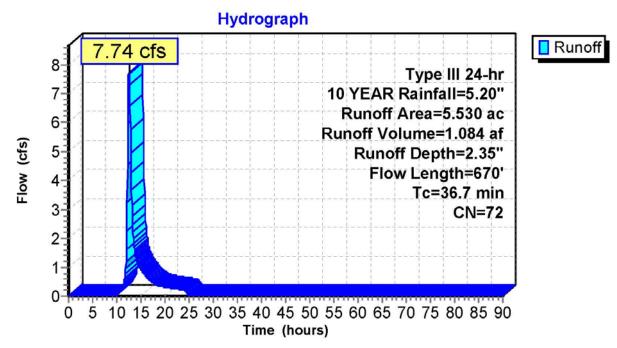
Page 2

#### Summary for Subcatchment PA #1: PA #1

Runoff = 7.74 cfs @ 12.53 hrs, Volume= 1.084 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) C	N Des	cription								
	3.	600	72 1/3	acre lots, 30% imp, HSG B								
*	0.	710	90 Pav	ed roads w	/open ditch	nes, 50% imp, HSG C						
*	1.	220	60 Bru	ush, Good, HSG C								
	5.	5.530 72 Weighted Average										
	4.	095	74.0	5% Pervio	us Area							
	1.	435	25.9	95% Imper	vious Area							
	Тс	Length	Slope			Description						
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)							
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1						
						Grass: Dense n= 0.240 P2= 3.30"						
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2						
_						Unpaved Kv= 16.1 fps						
	36.7	670	Total									



Type III 24-hr 100 YEAR Rainfall=7.50"

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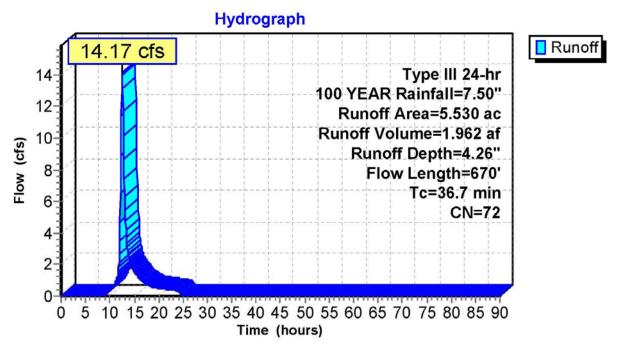
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# Summary for Subcatchment PA #1: PA #1

14.17 cfs @ 12.51 hrs, Volume= 1.962 af, Depth= 4.26" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac) C	N Des	cription								
	3.	600	72 1/3	acre lots, 30% imp, HSG B								
*	0.	710	90 Pav	ved roads w/open ditches, 50% imp, HSG C								
*	1.	220	60 Brus	ush, Good, HSG C								
	5.	5.530 72 Weighted Average										
	4.	095	74.0	5% Pervio	us Area							
	1.	435	25.9	5% Imper	ious Area							
	Tc	Length	Slope	Velocity	Capacity	Description						
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)							
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1						
						Grass: Dense n= 0.240 P2= 3.30"						
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2						
						Unpaved Kv= 16.1 fps						
	36.7	670	Total									



2) Drainage Area #2

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Type III 24-hr 2 YEAR Rainfall=3.30"

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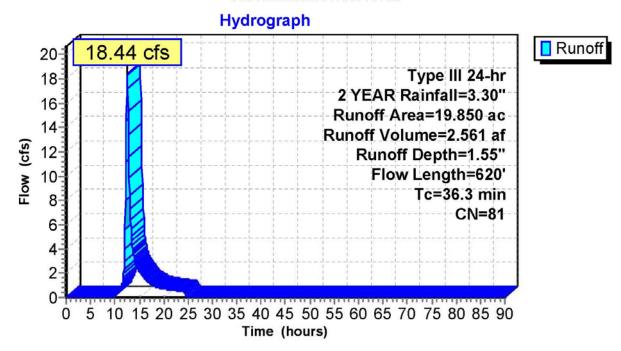
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Summary for Subcatchment PA #2: PA #2

Runoff = 18.44 cfs @ 12.52 hrs, Volume= 2.561 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac)	CN	Desc	ription							
*	13.	380	86	Urba	rban industrial, 65% imp, HSG C							
	1.	130	98	Pave	aved parking, HSG C							
*	4.	930	64	>75%	6 Grass co	ver, Good,	HSG C					
*	0.	410	61	Brus	ısh, Good, HSG C							
	19.850 81 Weighted Average											
	10.	023		50.49	9% Pervio	us Area						
	9.	827		49.5	1% Imperv	rious Area						
	Tc	Length		Slope	Velocity	Capacity	Description					
_	(min)	(feet		(ft/ft)	(ft/sec)	(cfs)						
	33.8	300	0.	0200	0.15		Sheet Flow, Segment #1					
							Grass: Dense n= 0.240 P2= 3.30"					
	2.5	320	0.	0112	2.15		Shallow Concentrated Flow, Segment #2					
							Paved Kv= 20.3 fps					
	36.3	620	To	otal			<u> </u>					



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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020

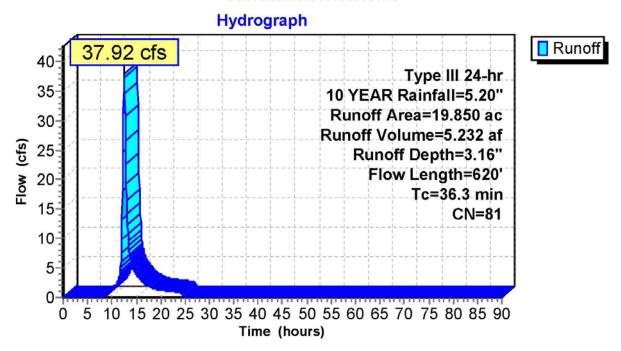
Page 2

# Summary for Subcatchment PA #2: PA #2

Runoff = 37.92 cfs @ 12.50 hrs, Volume= 5.232 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) C	N Des	cription							
*	13.	380	36 Urb	rban industrial, 65% imp, HSG C							
	1.	130		aved parking, HSG C							
*	4.	930	34 > 75	% Grass c	over, Good	, HSG C					
*	0.	410	31 Bru	ısh, Good, HSG C							
	19.850 81 Weighted Average										
	10.023 50.49% Pervious Area										
	9.	827	49.5	51% Imper	vious Area						
	Тс	Longth	Clana	Velocity	Canacity	Description					
	(min)	Length (feet)	Slope (ft/ft)		Capacity (cfs)	Description					
-			\		(CIS)	All I Plant A					
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1					
						Grass: Dense n= 0.240 P2= 3.30"					
	2.5	320	0.0112	2.15		Shallow Concentrated Flow, Segment #2					
_						Paved Kv= 20.3 fps					
	36.3	620	Total								



Type III 24-hr 100 YEAR Rainfall=7.50"

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# Summary for Subcatchment PA #2: PA #2

62.55 cfs @ 12.49 hrs, Volume= 8.721 af, Depth= 5.27" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac) (	CN	Desc	ription							
*	13.	380	86	Urba	rban industrial, 65% imp, HSG C							
	1.	130	98	Pave	aved parking, HSG C							
*	4.	930	64	>75%	6 Grass co	ver, Good,	HSG C					
*	0.	410	61	Brush	ush, Good, HSG C							
	19.	19.850 81 Weighted Average										
	10.	023		50.49	9% Pervio	us Area						
	9.	827		49.51	1% Imperv	ious Area						
	Tc	Length		ope	Velocity	Capacity	Description					
_	(min)	(feet)	(	ft/ft)	(ft/sec)	(cfs)						
	33.8	300	0.0	200	0.15		Sheet Flow, Segment #1					
							Grass: Dense n= 0.240 P2= 3.30"					
	2.5	320	0.0	112	2.15		Shallow Concentrated Flow, Segment #2					
_							Paved Kv= 20.3 fps					
	36.3	620	Tot	al								

# Subcatchment PA #2: PA #2

# Hydrograph 70 Runoff 62.55 cfs Type III 24-hr 60 100 YEAR Rainfall=7.50" Runoff Area=19.850 ac 50 Runoff Volume=8.721 af (cfs) 40 Runoff Depth=5.27" Flow Length=620' Flow 30 Tc=36.3 min CN=81 20 10 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 Time (hours)

3) Routing for Basin #1

Type III 24-hr 2 YEAR Rainfall=3.30"

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## Summary for Pond Basin #1: Pond #1

25.380 ac, 44.37% Impervious, Inflow Depth = 1.43" for 2 YEAR event Inflow Area = 21.46 cfs @ 12.52 hrs, Volume= Inflow 3.018 af = 0.37 cfs @ 24.43 hrs, Volume= 0.37 cfs @ 24.43 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= 2.088 af, Atten= 98%, Lag= 714.3 min Outflow = 2.088 af Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 73.99' @ 24.43 hrs Surf.Area= 36,436 sf Storage= 115,097 cf

Plug-Flow detention time= 2,162.2 min calculated for 2.088 af (69% of inflow)

Center-of-Mass det. time= 2,060.4 min (2,930.9 - 870.5)

Volume	Invert	t Avail.Sto	rage Storag	ge Description
#1	68.90	308,04	42 cf Custo	om Stage Data (Prismatic)Listed below (Recalc)
Elevation	100	urf.Area	Inc.Store	Cum.Store
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)
68.9	90	0	0	0
70.0	00	16,701	9,186	9,186
71.0	00	21,975	19,338	28,524
72.0	00	26,427	24,201	52,725
73.0	00	31,116	28,772	81,496
74.0	00	36,464	33,790	115,286
75.0	00	42,160	39,312	154,598
76.0	00	47,915	45,038	199,636
77.0		54,076	50,996	250,631
77.5		57,500	27,894	278,525
78.0	00	60,567	29,517	308,042
B 9	-			
Device	Routing	Invert	Outlet Device	
#1	Device 6	68.90'		Orifice/Grate C= 0.600
#2	Device 6	74.00'		I.0" H Vert. Orifice/Grate C= 0.600
#3	Device 6	76.00'		2.0" H Vert. Orifice/Grate C= 0.600
#4	Device 6	76.00'		2.0" H Vert. Orifice/Grate C= 0.600
#5	Device 6	76.00'		2.0" H Vert. Orifice/Grate C= 0.600
#6	Primary	68.80'		nd Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500
				t Invert= 68.80' / 66.53' S= 0.0264 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#7	Secondary	77.50	-	x 10.0' breadth Broad-Crested Rectangular Weir
				0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (Engli	ish) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.37 cfs @ 24.43 hrs HW=73.99' (Free Discharge)

6=Culvert (Passes 0.37 cfs of 65.42 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.37 cfs @ 10.76 fps)

-2=Orifice/Grate (Controls 0.00 cfs)

-3=Orifice/Grate (Controls 0.00 cfs)

-4=Orifice/Grate (Controls 0.00 cfs)

-5=Orifice/Grate (Controls 0.00 cfs)

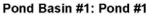
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge)

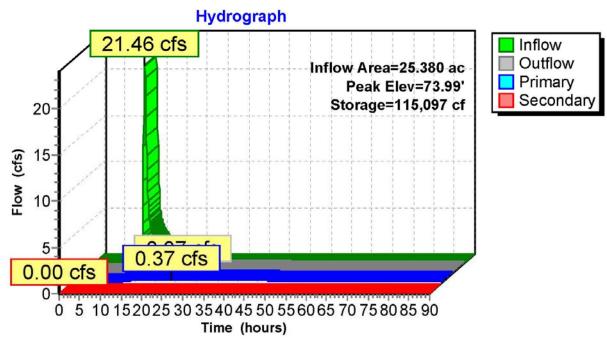
-7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020

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Type III 24-hr 10 YEAR Rainfall=5.20"

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# Summary for Pond Basin #1: Pond #1

25.380 ac, 44.37% Impervious, Inflow Depth = 2.99" for 10 YEAR event Inflow Area = 45.65 cfs @ 12.51 hrs, Volume= Inflow = 6.316 af 4.67 cfs @ 15.16 hrs, Volume= 4.67 cfs @ 15.16 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= = Outflow 5.175 af, Atten= 90%, Lag= 159.0 min 5.175 af Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 75.46' @ 15.16 hrs Surf.Area= 44,814 sf Storage= 174,650 cf

Plug-Flow detention time= 1,105.1 min calculated for 5.175 af (82% of inflow)

Center-of-Mass det. time= 1,032.0 min (1,881.6 - 849.5)

Volume	Invert	t Avail.Sto	rage Storag	e Description
#1	68.90	308,04	42 cf Custo	m Stage Data (Prismatic)Listed below (Recalc)
Elevation	on S	urf.Area	Inc.Store	Cum.Store
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)
68.9	90	0	0	0
70.0	00	16,701	9,186	9,186
71.0	00	21,975	19,338	28,524
72.0	00	26,427	24,201	52,725
73.0	00	31,116	28,772	81,496
74.0	00	36,464	33,790	115,286
75.0	00	42,160	39,312	154,598
76.0	00	47,915	45,038	199,636
77.0		54,076	50,996	250,631
77.5		57,500	27,894	278,525
78.0	00	60,567	29,517	308,042
Device	Routing	Invert	Outlet Device	es
#1	Device 6	68.90'	2.5" Vert. O	prifice/Grate C= 0.600
#2	Device 6	74.00'	9.0" W x 24	.0" H Vert. Orifice/Grate C= 0.600
#3	Device 6	76.00'	60.0" W x 1	2.0" H Vert. Orifice/Grate C= 0.600
#4	Device 6	76.00'	54.0" W x 1	2.0" H Vert. Orifice/Grate C= 0.600
#5	Device 6	76.00'		2.0" H Vert. Orifice/Grate C= 0.600
#6	Primary	68.80'	36.0" Rour	nd Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500
			Inlet / Outlet	Invert= 68.80' / 66.53' S= 0.0264 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#7	Secondary	77.50		x 10.0' breadth Broad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			O . C /E . I'	1) 0 40 0 50 0 70 0 00 0 00 0 00 0 07 0 04

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.67 cfs @ 15.16 hrs HW=75.46' (Free Discharge)

6=Culvert (Passes 4.67 cfs of 77.32 cfs potential flow)
1=Orifice/Grate (Orifice Controls 0.42 cfs @ 12.24 fps)

-2=Orifice/Grate (Orifice Controls 4.25 cfs @ 3.88 fps)

-3=Orifice/Grate (Controls 0.00 cfs)

-4=Orifice/Grate (Controls 0.00 cfs)

-5=Orifice/Grate (Controls 0.00 cfs)

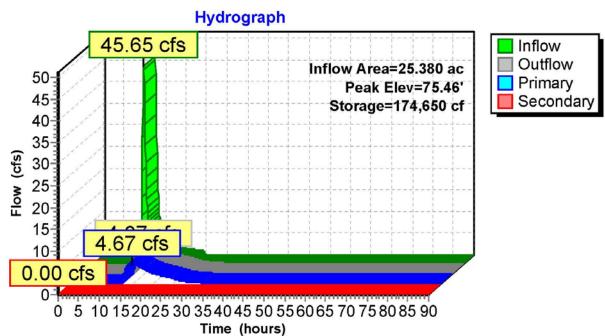
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge)

-7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020 Page 5

Pond Basin #1: Pond #1



Type III 24-hr 100 YEAR Rainfall=7.50"

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# Summary for Pond Basin #1: Pond #1

25.380 ac, 44.37% Impervious, Inflow Depth = 5.05" for 100 YEAR event Inflow Area = 76.69 cfs @ 12.50 hrs, Volume= Inflow = 10.683 af 31.30 cfs @ 13.07 hrs, Volume= 31.30 cfs @ 13.07 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= = Outflow 9.511 af, Atten= 59%, Lag= 34.4 min = 9.511 af Primary 0.00 cfs @ 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 76.62' @ 13.07 hrs Surf.Area= 51,721 sf Storage= 230,411 cf

Plug-Flow detention time= 667.1 min calculated for 9.502 af (89% of inflow)

Center-of-Mass det. time= 618.2 min (1,453.1 - 834.8)

Volume	Inve	rt Avail.Sto	rage Stor	age Description						
#1	68.90	0' 308,0	42 cf Cus	tom Stage Data (Prismatic)Listed below (Recalc)						
Elevation	nn s	Surf.Area	Inc.Store	e Cum.Store						
(fee		(sq-ft)	(cubic-feet)							
68.9		0	()							
70.0		16,701	9,186							
71.0		21,975								
72.0		26,427	19,338 24,201							
73.0		31,116	28,772							
74.0		36,464	33,790							
75.0		42,160	39,312							
76.0		47,915	45,038							
77.0		54,076	50,996							
77.5		57,500	27,894							
78.0	00	60,567	29,517	308,042						
Device	Routing	Invert	Outlet Dev	rices						
#1	Device 6	68.90'	2.5" Vert.	Orifice/Grate C= 0.600						
#2	Device 6	74.00'	9.0" W x 2	9.0" W x 24.0" H Vert. Orifice/Grate C= 0.600						
#3	Device 6	76.00'	60.0" W x	12.0" H Vert. Orifice/Grate C= 0.600						
#4	Device 6	76.00'		12.0" H Vert. Orifice/Grate C= 0.600						
#5	Device 6	76.00'	54.0" W x	12.0" H Vert. Orifice/Grate C= 0.600						
#6	Primary	68.80'	36.0" Ro	und Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500						
			Inlet / Out	let Invert= 68.80' / 66.53' S= 0.0264 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf						
#7	Secondar	y 77.50'		x 10.0' breadth Broad-Crested Rectangular Weir						
				t) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60						
			Coef. (En	glish) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64						
D.:	O 451		0 40 07 1	- LIM/- 70 Od L. /Fara Disabassa)						
rimary	Outriow	iviax=31.09 cts	@ 13.07 nr	s HW=76.61' (Free Discharge)						

6=Culvert (Passes 31.09 cfs of 85.52 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.45 cfs @ 13.28 fps)

-2=Orifice/Grate (Orifice Controls 9.02 cfs @ 6.01 fps) -3=Orifice/Grate (Orifice Controls 7.72 cfs @ 2.52 fps) -4=Orifice/Grate (Orifice Controls 6.95 cfs @ 2.52 fps)

-5=Orifice/Grate (Orifice Controls 6.95 cfs @ 2.52 fps)

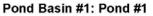
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge)

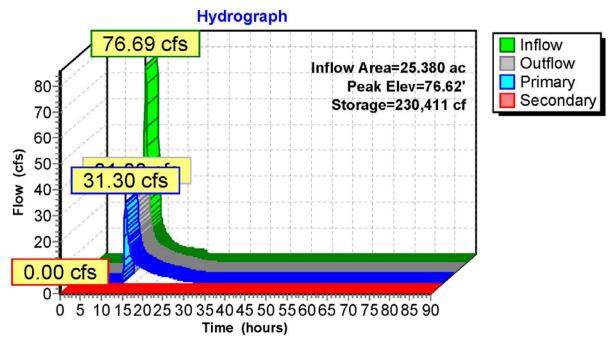
-7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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ii. Post Development Peak Flow Conditions (Basin #3)

1) Drainage Area #3

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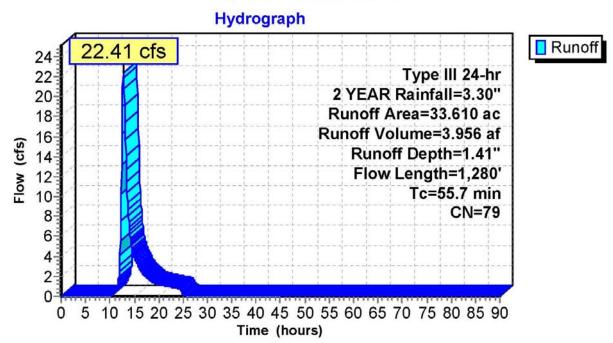
Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020 Page 1

#### Summary for Subcatchment PA #3: PA #3

Runoff = 22.41 cfs @ 12.79 hrs, Volume= 3.956 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) C	N Des	cription						
*	13.	350 8	36 Urb	ban industrial, 65% imp, HSG C						
	5.	100	8 Pav	aved parking, HSG C						
*	5.	280	34 >75	75% Grass cover, Good, HSG C						
	2.	030	8 Pav	ed roads w	/curbs & se	ewers, HSG C				
*	0.	670	31 >75	% Grass co	over, Good	, HSG C				
*	4.	240 (	31 >75	% Grass co	over, Good	, HSG C				
*	2.	940 (	31 >75	% Grass c	over, Good	, HSG C				
	33.610 79 Weighted Average 17.802 52.97% Pervious Area									
	15.	808	47.0	3% Imper	vious Area					
	Тс	Length	Slope		Capacity	Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	44.9	240	0.0063	0.09		Sheet Flow, Segment #1				
						Grass: Dense n= 0.240 P2= 3.30"				
	10.8	1,040	0.0100	1.61		Shallow Concentrated Flow, Segment #2				
_						Unpaved Kv= 16.1 fps				
	55.7	1 280	Total							



Type III 24-hr 10 YEAR Rainfall=5.20"

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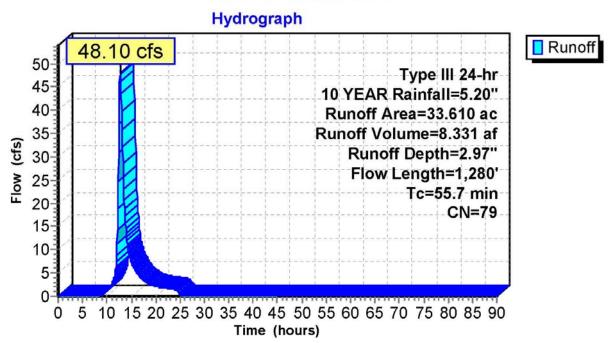
Page 2

# Summary for Subcatchment PA #3: PA #3

8.331 af, Depth= 2.97" Runoff 48.10 cfs @ 12.76 hrs, Volume=

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) C	N Des	cription						
*	13.	350 8	36 Urb	pan industrial, 65% imp, HSG C						
	5.	100	8 Pav	aved parking, HSG C						
*	5.	280	34 >75	75% Grass cover, Good, HSG C						
	2.	030	8 Pav	ed roads w	/curbs & se	ewers, HSG C				
*	0.	670 6	31 >75	% Grass c	over, Good,	, HSG C				
*	4.	240 (			over, Good,					
*	2.	940	31 >75	% Grass c	over, Good,	, HSG C				
	33.610 79 Weighted Average									
		802	52.9	7% Pervio						
	15.	808	47.0	3% Imper	vious Area					
	_									
	Тс	Length	Slope		Capacity	Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	44.9	240	0.0063	0.09		Sheet Flow, Segment #1				
						Grass: Dense n= 0.240 P2= 3.30"				
	10.8	1,040	0.0100	1.61		Shallow Concentrated Flow, Segment #2				
_						Unpaved Kv= 16.1 fps				
	55.7	1.280	Total							



Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020

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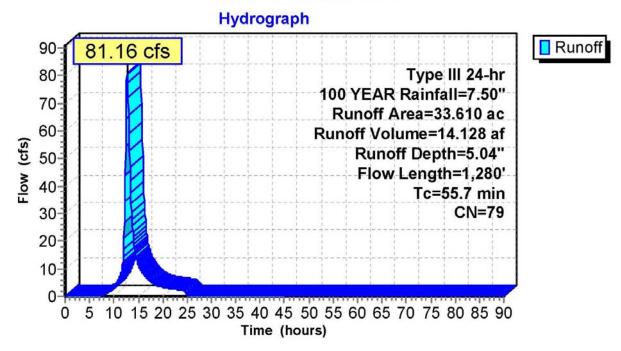
Page 3

## Summary for Subcatchment PA #3: PA #3

Runoff = 81.16 cfs @ 12.75 hrs, Volume= 14.128 af, Depth= 5.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac) C	N Des	cription						
*	13.	350 8	36 Urb	Urban industrial, 65% imp, HSG C						
	5.	100	8 Pav	Paved parking, HSG C						
*	5.	280	34 >75	>75% Grass cover, Good, HSG C						
	2.	2.030 98 Paved roads w/curbs & sewers, HSG C								
*	0.	670			over, Good					
*	4.	240 (	31 >75	% Grass c	over, Good	, HSG C				
*	2.	940 (	31 >75	% Grass c	over, Good	, HSG C				
	33.610 79 Weighted Average									
	15.808 47.03% Impervious Area									
	_									
	Тс	Length	Slope		Capacity	Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	44.9	240	0.0063	0.09		Sheet Flow, Segment #1				
						Grass: Dense n= 0.240 P2= 3.30"				
	10.8	1,040	0.0100	1.61		Shallow Concentrated Flow, Segment #2				
_						Unpaved Kv= 16.1 fps				
	55.7	1.280	Total							



2) Routing for Basin #3

Type III 24-hr 2 YEAR Rainfall=3.30"

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## Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 1.41" for 2 YEAR event Inflow Area =

Inflow = 22.41 cfs @ 12.79 hrs, Volume= 3.956 af

Outflow = 3.249 af, Atten= 94%, Lag= 363.4 min 3.249 af

1.37 cfs @ 18.84 hrs, Volume= 1.37 cfs @ 18.84 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 72.78' @ 18.84 hrs Surf.Area= 2.176 ac Storage= 2.981 af

Invert Avail.Storage Storage Description

Plug-Flow detention time= 1,719.4 min calculated for 3.246 af (82% of inflow)

Center-of-Mass det. time= 1,647.2 min (2,537.7 - 890.4)

#1	69.50'	13.505 a	f Cus	stom Stage Data (Prismatic)Listed below (Recalc)			
Elevation	on Surf.Area	Inc	Store	Cum.Store			
(fee			-feet)	(acre-feet)			
69.5			0.000	0.000			
70.0			0.040	0.040			
71.0			0.330	0.370			
72.0	00 1.700		1.100	1.470			
73.0	00 2.310	3	2.005	3.475			
74.0	00 2.400		2.355	5.830			
75.0	00 2.500		2.450	8.280			
76.0			2.560	10.840			
77.0	00 2.710		2.665	13.505			
Device	Routing	Invert (	Outlet De	Devices			
#1	Device 6	69.50' 3	.0" Ver	rt. Orifice/Grate C= 0.600			
#2	Device 6	72.50' 2	4.0" W	x 18.0" H Vert. Orifice/Grate C= 0.600			
#3	#3 Device 6		0.0" W	x 18.0" H Vert. Orifice/Grate C= 0.600			
#4	#4 Device 6		0.0" W	x 18.0" H Vert. Orifice/Grate C= 0.600			
#5	Device 6			x 18.0" H Vert. Orifice/Grate C= 0.600			
#6	Primary		36.0" Round Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500				
				utlet Invert= 69.40' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf			
#7	Secondary		120.0' long x 10.0' breadth Broad-Crested Rectangular Weir				
				eet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60			
		(	oet. (Ei	English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64			
Primary	Primary OutFlow Max=1.37 cfs @ 18.84 hrs HW=72.78' (Free Discharge)						

-6=Culvert (Passes 1.37 cfs of 46.66 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.42 cfs @ 8.55 fps)

-2=Orifice/Grate (Orifice Controls 0.95 cfs @ 1.70 fps)

-3=Orifice/Grate (Controls 0.00 cfs)

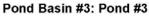
4=Orifice/Grate (Controls 0.00 cfs)

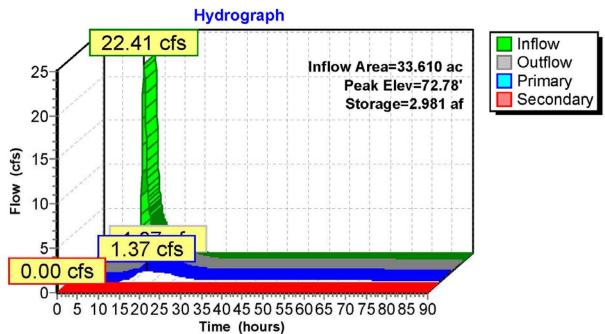
-5=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge) 7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 2 YEAR Rainfall=3.30"
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Type III 24-hr 10 YEAR Rainfall=5.20"

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## Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 2.97" for 10 YEAR event Inflow Area = Inflow 48.10 cfs @ 12.76 hrs, Volume= 8.331 af 7.91 cfs @ 14.79 hrs, Volume= 7.91 cfs @ 14.79 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Outflow = 7.525 af, Atten= 84%, Lag= 121.8 min 7.525 af Primary =

Secondary = 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 73.60' @ 14.79 hrs Surf.Area= 2.364 ac Storage= 4.884 af

Plug-Flow detention time= 901.3 min calculated for 7.518 af (90% of inflow)

Center-of-Mass det. time= 856.7 min (1,725.5 - 868.8)

Volume	Invert	Avail.Stora	age Stor	orage Description
#1	69.50'	13.505	af Cus	stom Stage Data (Prismatic)Listed below (Recalc)
Elevation	on Surf.Ar	ea In	c.Store	Cum.Store
(fee	et) (acre	es) (ac	re-feet)	(acre-feet)
69.5	50 0.0	00	0.000	0.000
70.0	00 0.1	60	0.040	0.040
71.0	00 0.5	00	0.330	0.370
72.0	00 1.7	00	1.100	1.470
73.0	00 2.3	10	2.005	3.475
74.0	00 2.4	00	2.355	5.830
75.0	00 2.5	00	2.450	8.280
76.0	00 2.6	20	2.560	10.840
77.0	00 2.7	10	2.665	13.505
Device	Routing	Invert	Outlet D	Devices
#1	Device 6	69.50'	3.0" Ver	ert. Orifice/Grate C= 0.600
#2	Device 6	72.50'	24.0" W	V x 18.0" H Vert. Orifice/Grate C= 0.600
#3	Device 6	74.00'	60.0" W	V x 18.0" H Vert. Orifice/Grate C= 0.600
#4	Device 6	74.00'	60.0" W	V x 18.0" H Vert. Orifice/Grate C= 0.600
#5	Device 6	74.00'	60.0" W	V x 18.0" H Vert. Orifice/Grate C= 0.600
#6	Primary	69.40'	36.0" R	Round Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500
	-		Inlet / Ou	Outlet Invert= 69.40' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf

76.00' 120.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.91 cfs @ 14.79 hrs HW=73.60' (Free Discharge)

-6=Culvert (Passes 7.91 cfs of 55.95 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.47 cfs @ 9.60 fps)

−2=Orifice/Grate (Orifice Controls 7.44 cfs @ 3.37 fps) −3=Orifice/Grate (Controls 0.00 cfs)

Secondary

4=Orifice/Grate (Controls 0.00 cfs)

-5=Orifice/Grate (Controls 0.00 cfs)

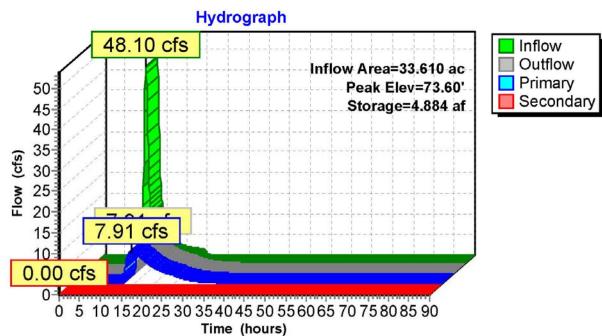
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)

-7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020 Page 5

Pond Basin #3: Pond #3



Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020

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## Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 5.04" for 100 YEAR event Inflow Area = Inflow = 81.16 cfs @ 12.75 hrs, Volume= 14.128 af 31.24 cfs @ 13.58 hrs, Volume= 31.24 cfs @ 13.58 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Outflow = 13.282 af, Atten= 62%, Lag= 50.3 min Primary = 13.282 af Secondary = 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 74.46' @ 13.58 hrs Surf.Area= 2.446 ac Storage= 6.948 af

Plug-Flow detention time= 581.6 min calculated for 13.282 af (94% of inflow)

Center-of-Mass det. time= 549.2 min (1,403.0 - 853.8)

Volume	Invert	Avail.Stora	ge Stor	rage Description
#1	69.50'	13.505	af Cus	stom Stage Data (Prismatic)Listed below (Recalc)
<b>-</b> 1*	O	in for		001
Elevation			c.Store	Cum.Store
(fee	et) (acre	s) (ac	re-feet)	(acre-feet)
69.5	50 0.00	00	0.000	0.000
70.0	00 0.16	60	0.040	0.040
71.0	0.50	00	0.330	0.370
72.0	00 1.70	00	1.100	1.470
73.0	00 2.31	0	2.005	3.475
74.0	00 2.40	00	2.355	5.830
75.0	00 2.50	00	2.450	8.280
76.0	00 2.62	0	2.560	10.840
77.0			2.665	13.505
	2		2.000	10.000
Device	Routing	Invert	Outlet D	Devices
#1	Device 6	69.50'	3.0" Ver	rt. Orifice/Grate C= 0.600
#2	Device 6	72.50'	24.0" W	x 18.0" H Vert. Orifice/Grate C= 0.600
#3	Device 6	74.00'	60.0" W	/ x 18.0" H Vert. Orifice/Grate C= 0.600
#4	Device 6	74.00'	60.0" W	/ x 18.0" H Vert. Orifice/Grate C= 0.600
#5	Device 6	74.00'		/ x 18.0" H Vert. Orifice/Grate C= 0.600
#6	Primary	69.40'		Round Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500
,,,	· ···········	00.10		outlet Inverte 69.40' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#7	Secondary	76.00'		ong x 10.0' breadth Broad-Crested Rectangular Weir
#1	Coolidary	70.00		eet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			i lead (le	0.20 0.40 0.00 0.00 1.00 1.20 1.40 1.00

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=31.20 cfs @ 13.58 hrs HW=74.46' (Free Discharge)

-6=Culvert (Passes 31.20 cfs of 64.22 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.52 cfs @ 10.59 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)

<sup>-2=</sup>Orifice/Grate (Orifice Controls 15.62 cfs @ 5.21 fps) -3=Orifice/Grate (Orifice Controls 5.02 cfs @ 2.18 fps)

<sup>-4=</sup>Orifice/Grate (Orifice Controls 5.02 cfs @ 2.18 fps)

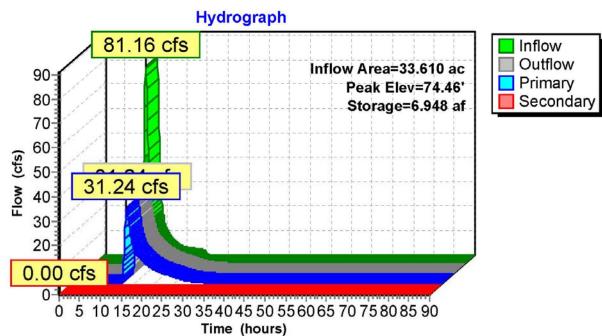
<sup>-5=</sup>Orifice/Grate (Orifice Controls 5.02 cfs @ 2.18 fps)

<sup>-7=</sup>Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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# Pond Basin #3: Pond #3



# STIRES ASSOCIATES, P.A.

4. 150 Pierce Street, LLC (Thomas Edison School Site Plan) July 2016



i.Post Development Peak Flow Conditions (Basin #1)

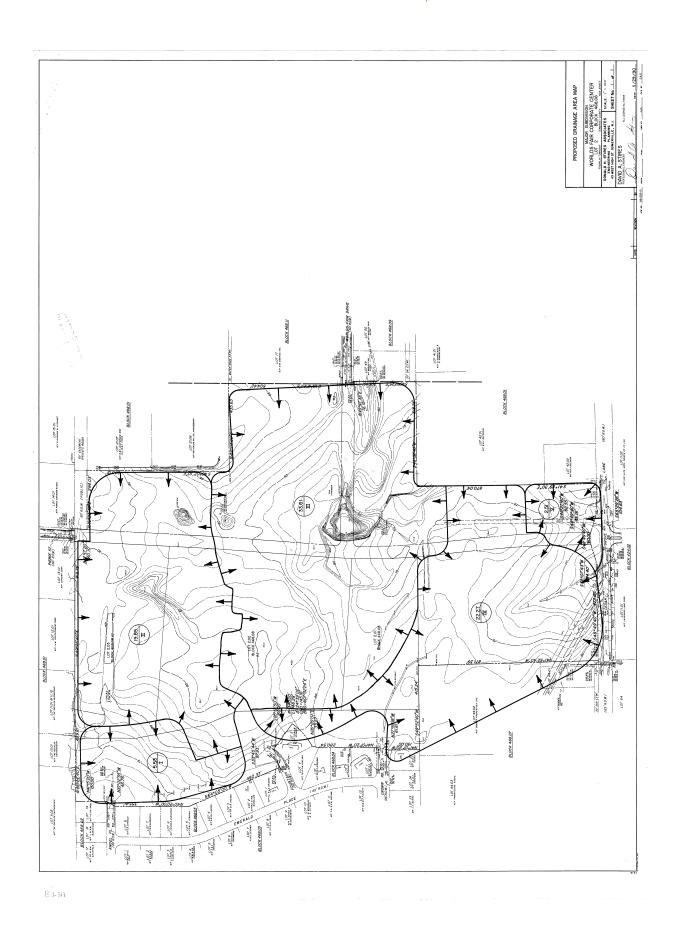
# STIRES ASSOCIATES, P.A.

STIRES ASSOCIATES, P.A.

STORMWATER MANAGEMENT REPORT
CENTRAL JERSEY COLLEGE PREP CHARTER SCHOOL
SITE PLAN
LOT 1.02, BLOCK 511
FRANKLIN TOWNSHIP
SOMERSET COUNTY, NEW JERSEY
July, 2016

Craig W. Stires N.J. License #39078

A MEMBER OF THE "STIRES GROUP" OF COMPANIES



1) Drainage Area #1

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Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020

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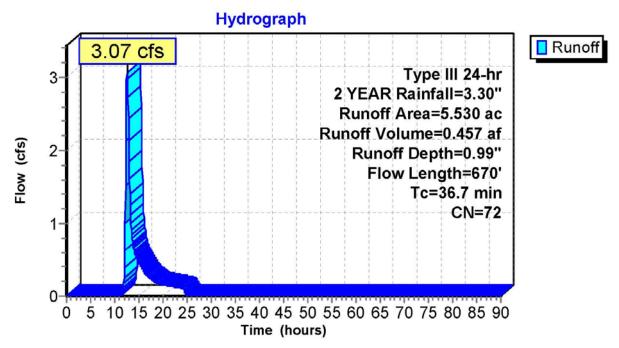
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# Summary for Subcatchment PA #1: PA #1

3.07 cfs @ 12.56 hrs, Volume= 0.457 af, Depth= 0.99" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) (	N De	Description						
	3.600 72 1/3 acre lots, 30% imp, HSG B									
*	0.	710	90 Pav	Paved roads w/open ditches, 50% imp, HSG C						
*	1.	220	60 Bru	Brush, Good, HSG C						
	5.530 72 Weighted Average									
	4.095 74.05% Pervious Area									
	1.	435	25.	95% Imper	vious Area					
	Тс	Length	Slope	Velocity	Capacity	Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1				
						Grass: Dense n= 0.240 P2= 3.30"				
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2				
_						Unpaved Kv= 16.1 fps				
	36.7	670	Total							



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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020

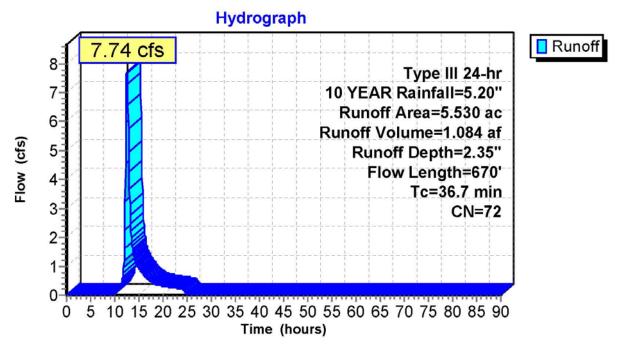
#### Page 2

#### Summary for Subcatchment PA #1: PA #1

Runoff = 7.74 cfs @ 12.53 hrs, Volume= 1.084 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) (	N De	scription						
	3.	600	72 1/3	1/3 acre lots, 30% imp, HSG B						
*	0.	710	90 Pav	red roads w	/open ditch	nes, 50% imp, HSG C				
*	1.	220	60 Bru	sh, Good, I	HSG C					
	5.	530	72 We	ighted Ave	age					
	4.	095	74.	05% Pervio	us Area					
	1.	435	25.	95% Imper	vious Area					
	Тс	Length	Slope	Velocity	Capacity	Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1				
						Grass: Dense n= 0.240 P2= 3.30"				
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2				
_						Unpaved Kv= 16.1 fps				
	36.7	670	Total							



Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020

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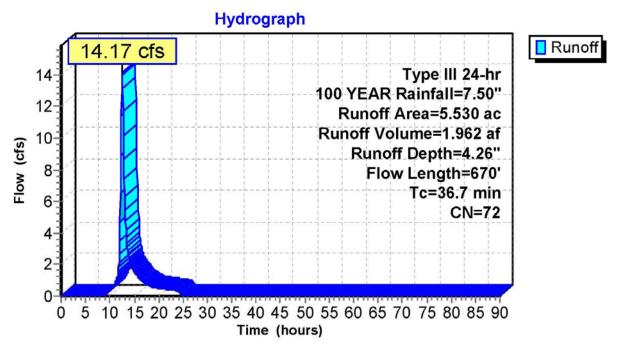
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#### Summary for Subcatchment PA #1: PA #1

Runoff = 14.17 cfs @ 12.51 hrs, Volume= 1.962 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac) C	N Des	cription					
	3.	600	72 1/3	acre lots, 3	0% imp, H	SG B			
*	0.	710	90 Pav	ved roads w/open ditches, 50% imp, HSG C					
*	1.	220	60 Brus	sh, Good, I	HSG C				
	5.	530	72 Wei	ghted Ave	age				
	4.	095	74.0	5% Pervio	us Area				
	1.	435	25.9	5% Imper	ious Area				
	•								
	Tc	Length	Slope	Velocity	Capacity	Description			
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1			
						Grass: Dense n= 0.240 P2= 3.30"			
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2			
						Unpaved Kv= 16.1 fps			
	36.7	670	Total						



2) Drainage Area #2

Type III 24-hr 2 YEAR Rainfall=3.30"

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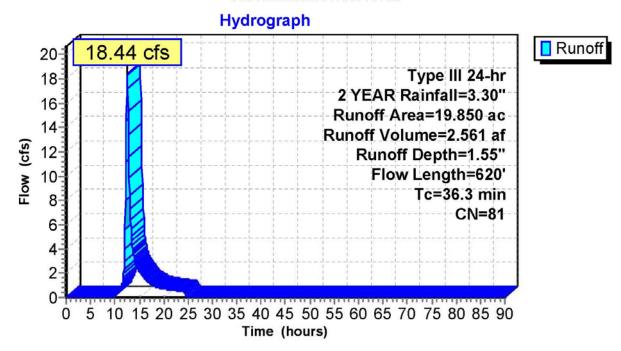
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#### Summary for Subcatchment PA #2: PA #2

18.44 cfs @ 12.52 hrs, Volume= 2.561 af, Depth= 1.55" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) (	CN	Desc	ription					
*	13.	380	86	Urba	rban industrial, 65% imp, HSG C					
	1.	130	98	Pave	aved parking, HSG C					
*	4.	930	64	>75%	75% Grass cover, Good, HSG C					
*	0.	410	61	Brush	h, Good, F	ISG C				
	19.	19.850 81 Weighted Average								
	10.	023		50.49	9% Pervio	us Area				
	9.	827		49.51	1% Imperv	ious Area				
	Tc	Length		ope	Velocity	Capacity	Description			
_	(min)	(feet)	(	ft/ft)	(ft/sec)	(cfs)				
	33.8	300	0.0	200	0.15		Sheet Flow, Segment #1			
							Grass: Dense n= 0.240 P2= 3.30"			
	2.5	320	0.0	112	2.15		Shallow Concentrated Flow, Segment #2			
_							Paved Kv= 20.3 fps			
	36.3	620	Tot	al						



Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020

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#### Summary for Subcatchment PA #2: PA #2

37.92 cfs @ 12.50 hrs, Volume= 5.232 af, Depth= 3.16" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) C	N Des	scription						
*	13.	380	36 Urb	rban industrial, 65% imp, HSG C						
	1.	130	98 Pav	aved parking, HSG C						
*	4.	930	64 >75	75% Grass cover, Good, HSG C						
*	0.	410	31 Bru	sh, Good, I	HSG C					
	19.850 81 Weighted Average									
	10.023 50.49% Pervious Area									
	9.	827	49.	51% Imper						
	Tc (min)	Length (feet)	Slope (ft/ft)		Capacity (cfs)	Description				
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1				
	2.5	320	0.0112	2.15		Grass: Dense n= 0.240 P2= 3.30" Shallow Concentrated Flow, Segment #2 Paved Kv= 20.3 fps				
	36.3	620	Total							

#### Subcatchment PA #2: PA #2

## Hydrograph Runoff 37.92 cfs 40-Type III 24-hr 35 10 YEAR Rainfall=5.20" Runoff Area=19.850 ac 30 Runoff Volume=5.232 af Flow (cfs) 25 Runoff Depth=3.16" Flow Length=620' 20 Tc=36.3 min 15 CN=81 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 Time (hours)

Type III 24-hr 100 YEAR Rainfall=7.50"

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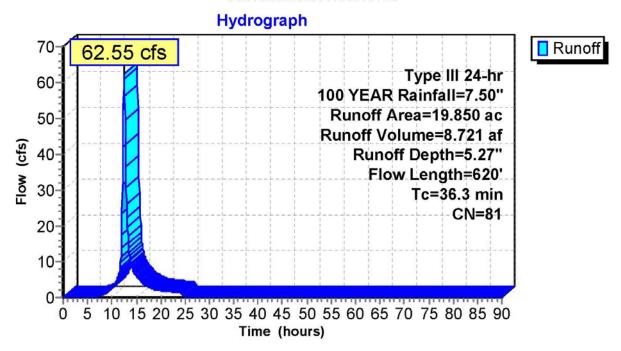
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## Summary for Subcatchment PA #2: PA #2

62.55 cfs @ 12.49 hrs, Volume= 8.721 af, Depth= 5.27" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac)	CN	Desc	ription						
*	13.	380	86	Urba	rban industrial, 65% imp, HSG C						
	1.	130	98	Pave	aved parking, HSG C						
*	4.	930	64	>75%	75% Grass cover, Good, HSG C						
*	0.	410	61	Brus	h, Good, F	ISG C					
	19.850 81 Weighted Average										
	10.	023		50.49	9% Pervio	us Area					
	9.827 49.51% Impervious Area										
	Tc	Length		Slope	Velocity	Capacity	Description				
_	(min)	(feet		(ft/ft)	(ft/sec)	(cfs)					
	33.8	300	0.	0200	0.15		Sheet Flow, Segment #1				
							Grass: Dense n= 0.240 P2= 3.30"				
	2.5	320	0.	0112	2.15		Shallow Concentrated Flow, Segment #2				
							Paved Kv= 20.3 fps				
	36.3	620	To	otal			<u> </u>				



3) Routing for Basin #1

Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020

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#### Summary for Pond Basin #1: Pond #1

25.380 ac, 44.37% Impervious, Inflow Depth = 1.43" for 2 YEAR event Inflow Area = Inflow 21.46 cfs @ 12.52 hrs, Volume= 3.018 af = 0.50 cfs @ 24.28 hrs, Volume= 0.50 cfs @ 24.28 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= 2.194 af, Atten= 98%, Lag= 705.4 min Outflow = 2.194 af Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 74.14' @ 24.28 hrs Surf.Area= 43,048 sf Storage= 113,088 cf

Plug-Flow detention time= 2,118.5 min calculated for 2.192 af (73% of inflow)

Center-of-Mass det. time= 2,025.0 min (2,895.5 - 870.5)

Volume	Invert	. Avail.Sto	rage Sto	orage Description
#1	68.90			stom Stage Data (Prismatic)Listed below (Recalc)
	_			
Elevation	1000	Surf.Area		re Cum.Store
(fee		(sq-ft)	(cubic-fe	
68.9		0		0 0
70.0		9,148		31 5,031
71.0		21,344	15,2	
72.0		25,700	23,5	
73.0		30,492	28,0	
74.0		40,075 60,984		34 107,179
75.0				30 157,708
76.0		70,132	65,5	
77.0		79,715		24 298,190
78.0	00	89,298	84,5	07 382,696
Device	Routing	Invert	Outlet D	evices
#1	Device 6	68.90'		t. Orifice/Grate C= 0.600
#2	Device 6	74.00'		24.0" H Vert. Orifice/Grate C= 0.600
#3	Device 6	76.00		x 12.0" H Vert. Orifice/Grate C= 0.600
#4	Device 6	76.00'		x 12.0" H Vert. Orifice/Grate C= 0.600
#5	Device 6	76.00'		x 12.0" H Vert. Orifice/Grate C= 0.600
#6	Primary	68.80'		ound Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500
				utlet Invert= 68.80' / 66.53' S= 0.0264 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#7	Secondary	77.50'		g x 10.0' breadth Broad-Crested Rectangular Weir
		1.11		et) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
				nglish) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.50 cfs @ 24.28 hrs HW=74.14' (Free Discharge)

6=Culvert (Passes 0.50 cfs of 66.71 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.37 cfs @ 10.91 fps) -2=Orifice/Grate (Orifice Controls 0.13 cfs @ 1.21 fps)

-3=Orifice/Grate (Controls 0.00 cfs) -4=Orifice/Grate (Controls 0.00 cfs)

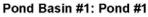
-5=Orifice/Grate (Controls 0.00 cfs)

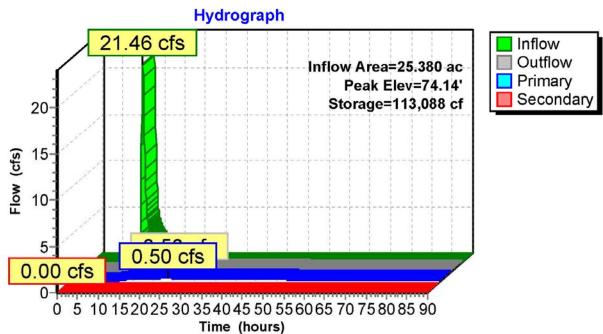
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge) 7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020

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Type III 24-hr 10 YEAR Rainfall=5.20"

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#### Summary for Pond Basin #1: Pond #1

25.380 ac, 44.37% Impervious, Inflow Depth = 2.99" for 10 YEAR event Inflow Area = 45.65 cfs @ 12.51 hrs, Volume= Inflow 6.316 af = 4.11 cfs @ 15.60 hrs, Volume= 4.11 cfs @ 15.60 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Outflow = 5.308 af, Atten= 91%, Lag= 185.8 min 5.308 af Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 75.33' @ 15.60 hrs Surf.Area= 64,023 sf Storage= 178,473 cf

Plug-Flow detention time= 1,119.3 min calculated for 5.308 af (84% of inflow)

Center-of-Mass det. time= 1,051.7 min (1,901.2 - 849.5)

Volume	Invert	Avail.Sto	rage Stora	ge Description
#1	68.90			om Stage Data (Prismatic)Listed below (Recalc)
		,		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Elevation	on S	urf.Area	Inc.Store	Cum.Store
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)
68.9	90	0	0	0
70.0		9,148	5,031	5,031
71.0		21,344	15,246	20,277
72.0		25,700	23,522	43,799
73.0		30,492	28,096	
74.0		40,075	35,284	
75.0		60,984	50,530	
76.0		70,132	65,558	
77.0	T. T.	79,715	74,924	1770 T. S. FURT
78.0	00	89,298	84,507	382,696
Device	Routing	Invert	Outlet Devi	ces
#1	Device 6	68.90'		Orifice/Grate C= 0.600
#2	Device 6	74.00'		4.0" H Vert. Orifice/Grate C= 0.600
#3	Device 6	76.00		12.0" H Vert. Orifice/Grate C= 0.600
#4	Device 6	76.00		12.0" H Vert. Orifice/Grate C= 0.600
#5	Device 6	76.00		12.0" H Vert. Orifice/Grate C= 0.600
#6	Primary	68.80'		nd Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500
""	· initially	00.00		et Invert= 68.80' / 66.53' S= 0.0264 '/' Cc= 0.900 n= 0.011. Flow Area= 7.07 sf
#7	Secondary	77.50'		x 10.0' breadth Broad-Crested Rectangular Weir
				0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			,	lish) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
			, -	

Primary OutFlow Max=4.11 cfs @ 15.60 hrs HW=75.33' (Free Discharge)

6=Culvert (Passes 4.11 cfs of 76.35 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.41 cfs @ 12.11 fps)
-2=Orifice/Grate (Orifice Controls 3.70 cfs @ 3.71 fps)

-3=Orifice/Grate (Controls 0.00 cfs)

-4=Orifice/Grate (Controls 0.00 cfs)

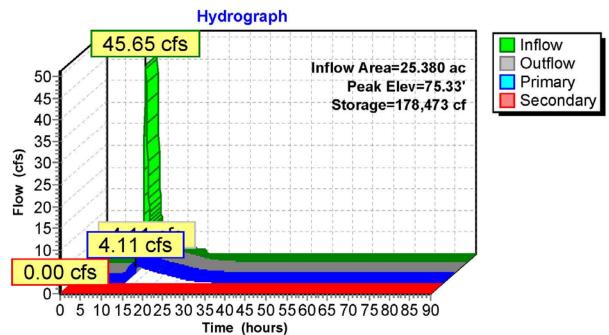
-5=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge) 7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020 Page 5

Pond Basin #1: Pond #1



Type III 24-hr 100 YEAR Rainfall=7.50"

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## Summary for Pond Basin #1: Pond #1

25.380 ac, 44.37% Impervious, Inflow Depth = 5.05" for 100 YEAR event Inflow Area = Inflow 76.69 cfs @ 12.50 hrs, Volume= 10.683 af = 20.36 cfs @ 13.32 hrs, Volume= Outflow = 9.627 af, Atten= 73%, Lag= 49.3 min 20.36 cfs @ 13.32 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= = Primary 9.627 af Secondary = 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 76.40' @ 13.32 hrs Surf.Area= 74,008 sf Storage= 252,414 cf

Plug-Flow detention time= 713.0 min calculated for 9.618 af (90% of inflow)

Center-of-Mass det. time= 667.9 min (1,502.8 - 834.8)

Volume	Invert	Avail.Sto	rage	Storage	Description			
#1	68.90	382,69	96 cf	Custom	Stage Data (Pri	smatic)Listed below	v (Recalc)	
Elevation		urf.Area	Inc.Store		Cum.Store			
(fee		(sq-ft)		-feet)	(cubic-feet)			
68.9		0		0	0			
70.0	00	9,148		5,031	5,031			
71.0	00	21,344	1	5,246	20,277			
72.0		25,700		3,522	43,799			
73.0		30,492		8,096	71,895			
74.0		40,075		5,284	107,179			
75.0		60,984		0,530	157,708			
76.0		70,132		5,558	223,266			
77.0		79,715		4,924	298,190			
78.0	00	89,298		4,507	382,696			
Desire	Destina	Laurench .	0.41-	4 D				
Device	Routing	Invert		t Devices	100 10000 100 100 100			
#1	Device 6	68.90'			fice/Grate C= C	A TATUE AND THE PARTY OF THE PA		
#2	Device 6	74.00'	THE PERSON NAMED IN			/Grate C= 0.600		
#3	Device 6	76.00'				e/Grate C= 0.600		
#4	Device 6	76.00'	54.0" W x 12.0" H Vert. Orifice/Grate C= 0.600					
#5	Device 6	76.00				e/Grate C= 0.600		
#6	Primary	68.80'				)' RCP, square edg		
								= 0.011, Flow Area= 7.07 sf
#7	Secondary	77.50				oad-Crested Recta		
						.80 1.00 1.20 1.40		
			Coef.	. (English	) 2.49 2.56 2.7	0 2.69 2.68 2.69	2.67 2.64	

Primary OutFlow Max=20.30 cfs @ 13.32 hrs HW=76.40' (Free Discharge)

6=Culvert (Passes 20.30 cfs of 84.08 cfs potential flow)

—1=Orifice/Grate (Orifice Controls 0.45 cfs @ 13.10 fps) —2=Orifice/Grate (Orifice Controls 8.35 cfs @ 5.57 fps)

-3=Orifice/Grate (Orifice Controls 4.11 cfs @ 2.04 fps)
-4=Orifice/Grate (Orifice Controls 3.70 cfs @ 2.04 fps)

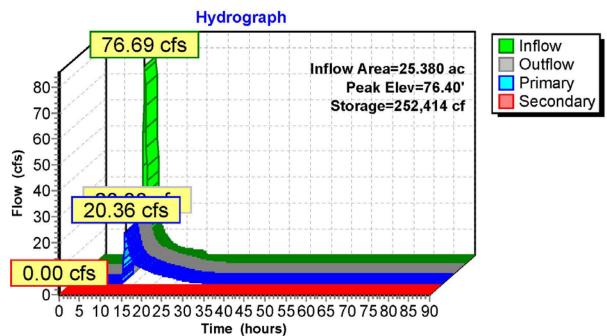
-5=Orifice/Grate (Orifice Controls 3.70 cfs @ 2.04 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge) 7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020 Page 8

Pond Basin #1: Pond #1



S	$\mathbf{T}$	I R	FS	AS	SO	CI	АТБ	2.5	P . A	Δ
N.		1 1	LO	$\Delta$	$\mathbf{o}$	<b>U</b> 1.	ліг	, O	1.1	ъ.

ii. Post Development Peak Flow Conditions (Basin #3)

1) Drainage Area #3

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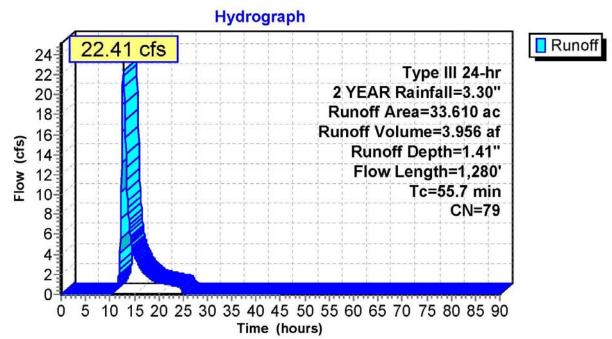
Page 1

## Summary for Subcatchment PA #3: PA #3

22.41 cfs @ 12.79 hrs, Volume= 3.956 af, Depth= 1.41" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) C	N Des	cription					
*	13.	350 8	36 Urb	ban industrial, 65% imp, HSG C					
	5.	100	8 Pav	ed parking	, HSG C				
*	5.	280	34 >75	% Grass c	over, Good,	, HSG C			
	2.	030	8 Pav	ed roads w	/curbs & se	ewers, HSG C			
*	0.	670 6	31 >75	% Grass c	over, Good,	, HSG C			
*	4.	240 (			over, Good,				
*	2.	940 (	31 >75	% Grass c	over, Good,	, HSG C			
	33.610 79 Weighted Average								
		802	52.9	7% Pervio	us Area				
	15.	808	47.0	3% Imper	vious Area				
	_								
	Тс	Length	Slope		Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	44.9	240	0.0063	0.09		Sheet Flow, Segment #1			
						Grass: Dense n= 0.240 P2= 3.30"			
	10.8	1,040	0.0100	1.61		Shallow Concentrated Flow, Segment #2			
_						Unpaved Kv= 16.1 fps			
	55.7	1.280	Total						



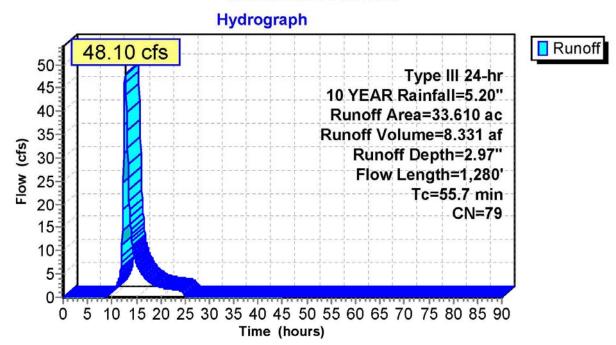
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#### Summary for Subcatchment PA #3: PA #3

8.331 af, Depth= 2.97" Runoff 48.10 cfs @ 12.76 hrs, Volume=

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) C	N Des	cription					
*	13.	350 8	36 Urb	ban industrial, 65% imp, HSG C					
	5.	100	8 Pav	ed parking	, HSG C				
*	5.	280	34 >75	% Grass c	over, Good,	, HSG C			
	2.	030	8 Pav	ed roads w	/curbs & se	ewers, HSG C			
*	0.	670 6	31 >75	% Grass c	over, Good,	, HSG C			
*	4.	240 (			over, Good,				
*	2.	940	31 >75	% Grass c	over, Good,	, HSG C			
	33.610 79 Weighted Average								
		802	52.9	7% Pervio	us Area				
	15.	808	47.0	3% Imper	vious Area				
	_								
	Тс	Length	Slope		Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	44.9	240	0.0063	0.09		Sheet Flow, Segment #1			
						Grass: Dense n= 0.240 P2= 3.30"			
	10.8	1,040	0.0100	1.61		Shallow Concentrated Flow, Segment #2			
_						Unpaved Kv= 16.1 fps			
	55.7	1.280	Total						



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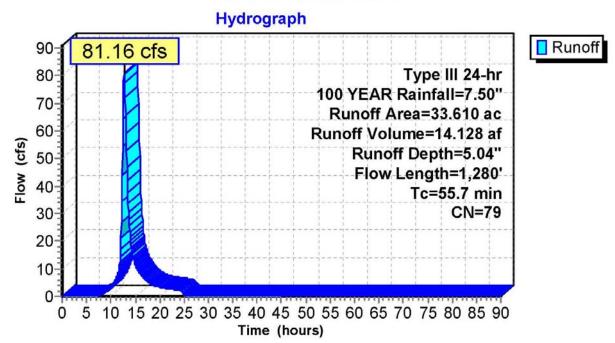
Page 3

#### Summary for Subcatchment PA #3: PA #3

14.128 af, Depth= 5.04" Runoff 81.16 cfs @ 12.75 hrs, Volume=

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac) C	N Des	cription					
*	13.	350 8	36 Urb	an industria	al, 65% imp	, HSG C			
	5.	100	8 Pav	ed parking	, HSG C	* 1000 = 01			
*	5.	280	34 >75	75% Grass cover, Good, HSG C					
	2.	030	8 Pav	ed roads w	/curbs & se	ewers, HSG C			
*	0.	670	31 >75	% Grass co	over, Good	, HSG C			
*	4.	240 (	31 >75	% Grass co	over, Good	, HSG C			
*	2.	940 (	31 >75	% Grass c	over, Good	, HSG C			
	33.610 79 Weighted Average								
	17.	802	52.9						
	15.	808	47.0	3% Imper	vious Area				
	Тс	Length	Slope		Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	44.9	240	0.0063	0.09		Sheet Flow, Segment #1			
						Grass: Dense n= 0.240 P2= 3.30"			
	10.8	1,040	0.0100	1.61		Shallow Concentrated Flow, Segment #2			
_						Unpaved Kv= 16.1 fps			
	55.7	1 280	Total						



2) Routing for Basin #3

Type III 24-hr 2 YEAR Rainfall=3.30"

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#### Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 1.41" for 2 YEAR event Inflow Area =

22.41 cfs @ 12.79 hrs, Volume= Inflow = 3.956 af

Outflow 3.220 af, Atten= 94%, Lag= 393.8 min =

1.28 cfs @ 19.35 hrs, Volume= 1.28 cfs @ 19.35 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= 3.220 af Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 72.79' @ 19.35 hrs Surf.Area= 2.185 ac Storage= 3.013 af

Plug-Flow detention time= 1,744.5 min calculated for 3.217 af (81% of inflow)

Center-of-Mass det. time= 1,670.4 min (2,560.8 - 890.4)

Volume	Invert	Avail.Stora	age Sto	rage Description	
#1	69.50'	13.50	5 af Cu	stom Stage Data	(Prismatic)Listed below (Recalc)
Elas sakia	C	[		O Ct	
Elevation	in the second		nc.Store	Cum.Store	
(fee	et) (acr	es) (ad	cre-feet)	(acre-feet)	
69.5	50 0.0	000	0.000	0.000	
70.0	00 0.1	160	0.040	0.040	
71.0	00 0.5	500	0.330	0.370	
72.0	00 1.7	700	1.100	1.470	
73.0	00 2.3	310	2.005	3.475	
74.0	00 2.4	400	2.355	5.830	
75.0	00 2.5	500	2.450	8.280	
76.0	00 2.6	320	2.560	10.840	
77.0	00 2.7	710	2.665	13.505	
Device	Routing	Invert	Outlet [	Devices	
#1	Device 3	69.50'	3.0" V€	rt. Orifice/Grate	C= 0.600
#2	Device 3	72.50	20.0" V	V x 17.0" H Vert.	Orifice/Grate C= 0.600
#3	Primary	69.40	36.0" I	Round Culvert L	= 86.0' RCP, square edge headwall, Ke= 0.500
					0' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011. Flow Area= 7.07 sf
#4	Secondary	76.00'			dth Broad-Crested Rectangular Weir
	,			•	.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.28 cfs @ 19.35 hrs HW=72.79' (Free Discharge)

3=Culvert (Passes 1.28 cfs of 46.85 cfs potential flow)

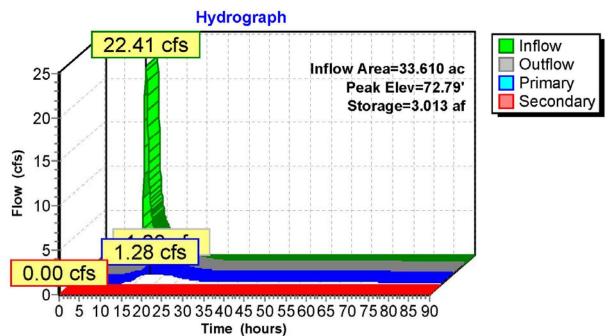
-1=Orifice/Grate (Orifice Controls 0.42 cfs @ 8.57 fps) -2=Orifice/Grate (Orifice Controls 0.85 cfs @ 1.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge) 4=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

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Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020 Page 2

Pond Basin #3: Pond #3



Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020

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#### Summary for Pond Basin #3: Pond #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 73.66' @ 15.05 hrs Surf.Area= 2.369 ac Storage= 5.012 af

Plug-Flow detention time= 935.0 min calculated for 7.471 af (90% of inflow) Center-of-Mass det. time= 885.0 min (1,753.8 - 868.8)

Volume	Invert A	Avail.Storage	Storage Description	n
#1	69.50'	13.505 af	Custom Stage Da	ta (Prismatic)Listed below (Recalc)
Elevation	on Surf.Area	a Inc.S	Store Cum.Store	
(fee	et) (acres)	) (acre-	feet) (acre-feet)	
69.5	0.000	0	.000 0.000	
70.0	0.160	0	.040 0.040	
71.0	0.500		.330 0.370	
72.0			.100 1.470	
73.0			.005 3.475	
74.0			.355 5.830	
75.0		_	.450 8.280	
76.0			.560 10.840	
77.0	00 2.710	) 2	.665 13.505	
Device	Routing	Invert O	utlet Devices	
				2-0600
#1	Device 3		.0" Vert. Orifice/Grat	
#2	Device 3			t. Orifice/Grate C= 0.600
#3	Primary			L= 86.0' RCP, square edge headwall, Ke= 0.500
44	0			0.40' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#4	Secondary			eadth Broad-Crested Rectangular Weir
				0.60 0.80 1.00 1.20 1.40 1.60
		C	oet. (English) 2.49 2	2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.13 cfs @ 15.05 hrs HW=73.66' (Free Discharge)

-3=Culvert (Passes 7.13 cfs of 56.51 cfs potential flow)

1=Orifice/Grate (Orifice Controls 0.47 cfs @ 9.67 fps) 2=Orifice/Grate (Orifice Controls 6.66 cfs @ 3.45 fps)

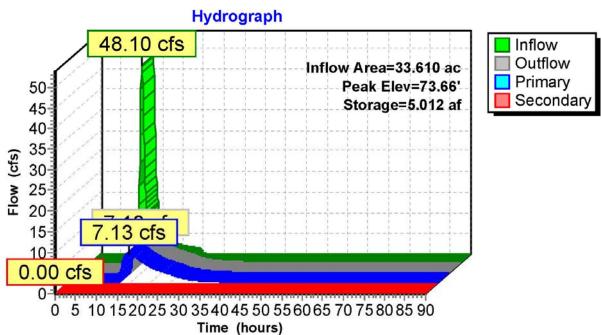
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020 Page 5

# Pond Basin #3: Pond #3



Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020

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#### Summary for Pond Basin #3: Pond #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 74.89' @ 14.41 hrs Surf.Area= 2.489 ac Storage= 7.996 af

Plug-Flow detention time= 644.5 min calculated for 13.212 af (94% of inflow) Center-of-Mass det. time= 609.8 min (1,463.6 - 853.8)

Volume	Invert	Avail.Stora	ge Sto	rage Description	
#1	69.50'	13.505	af Cu	stom Stage Data (	Prismatic)Listed below (Recalc)
Elevation	on Surf.Are	ea In	.Store	Cum.Store	
(fee	et) (acre	s) (ac	e-feet)	(acre-feet)	
69.5	50 0.0	00	0.000	0.000	
70.0	00 0.10	30	0.040	0.040	
71.0	00 0.50	00	0.330	0.370	
72.0	00 1.70	00	1.100	1.470	
73.0	00 2.3	10	2.005	3.475	
74.0	00 2.4	00	2.355	5.830	
75.0	00 2.50	00	2.450	8.280	
76.0	00 2.6	20	2.560	10.840	
77.0	00 2.7	10	2.665	13.505	
Device	Routing	Invert	Outlet D	Devices	
#1	Device 3	69.50'	3.0" Ve	rt. Orifice/Grate	C= 0.600
#2	Device 3	72.50'	20.0" W	x 17.0" H Vert. O	rifice/Grate C= 0.600
#3	Primary	69.40'	36.0" F	Round Culvert L=	86.0' RCP, square edge headwall, Ke= 0.500
			Inlet / O	outlet Invert= 69.40	/ 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#4	Secondary	76.00	120.0' I	ong x 10.0' bread	th Broad-Crested Rectangular Weir
			Head (f	eet) 0.20 0.40 0.6	60 0.80 1.00 1.20 1.40 1.60
			Coef. (E	English) 2.49 2.56	2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=15.16 cfs @ 14.41 hrs HW=74.89' (Free Discharge)

-3=Culvert (Passes 15.16 cfs of 67.95 cfs potential flow)

1=Orifice/Grate (Orifice Controls 0.54 cfs @ 11.04 fps)

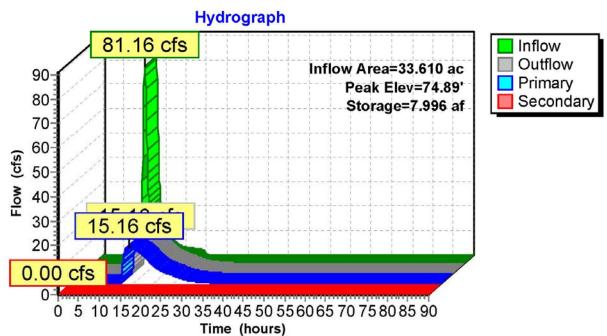
2=Orifice/Grate (Orifice Controls 14.61 cfs @ 6.19 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)
—4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020 Page 8

Pond Basin #3: Pond #3



# STIRES ASSOCIATES, P.A.

5. 150 Pierce Street, LLC (Pharmscript Site Plan) March 2016 i. Post Development Peak Flow Conditions (Basin #1)

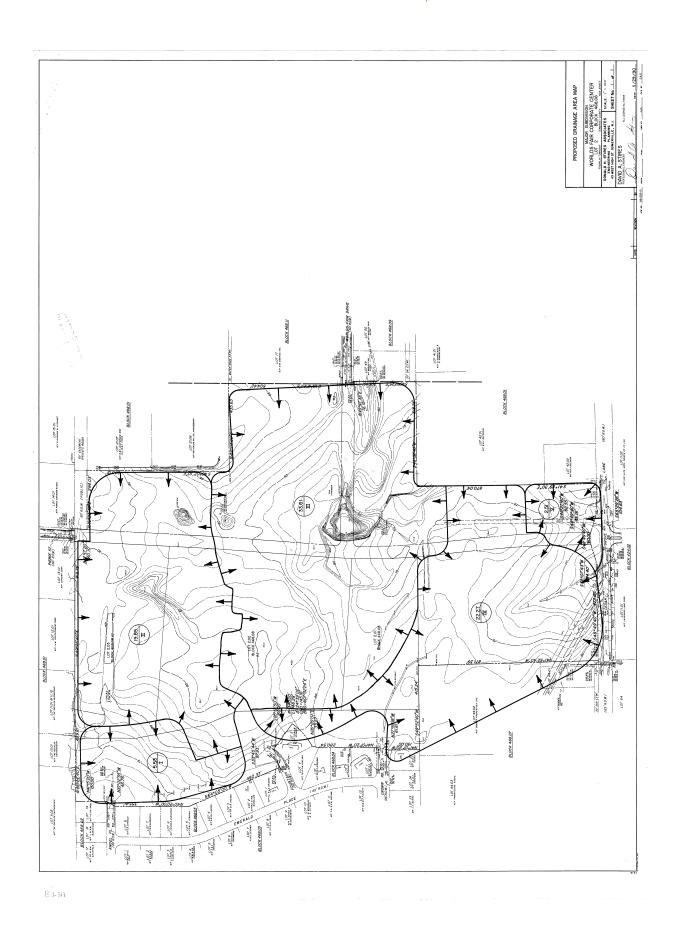
# STIRES ASSOCIATES, P.A.

STIRES ASSOCIATES, P.A.

DRAINAGE REPORT PHARMASCRIPT PARKING ADDITION SITE PLAN LOT 2.02, BLOCK 468.08 FRANKLIN TOWNSHIP SOMERSET COUNTY, NEW JERSEY March, 2016

Craig W. Stires N.J. License #39078

A MEMBER OF THE "STIRES GROUP" OF COMPANIES



1) Drainage Area #1

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Type III 24-hr 2 YEAR Rainfall=3.30"

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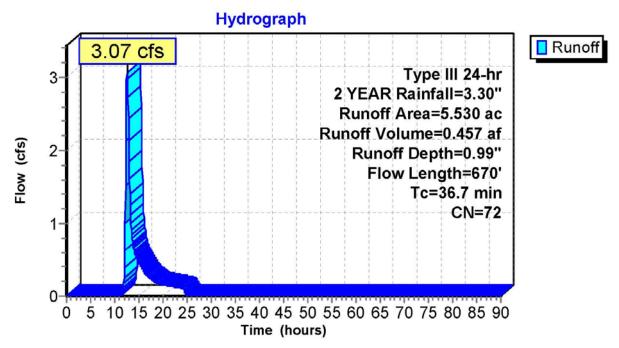
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## Summary for Subcatchment PA #1: PA #1

Runoff = 3.07 cfs @ 12.56 hrs, Volume= 0.457 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) C	N Des	cription						
	3.	600	72 1/3	3 acre lots, 30% imp, HSG B						
*	0.	710	90 Pav	aved roads w/open ditches, 50% imp, HSG C						
*	1.	220	60 Brus	sh, Good, I	HSG C					
	5.	530	72 Wei	ghted Ave	age					
	4.	095	74.0	5% Pervio	us Area					
	1.	435	25.9	5% Imper	ious Area					
	Tc	Length	Slope	Velocity	Capacity	Description				
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1				
						Grass: Dense n= 0.240 P2= 3.30"				
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2				
						Unpaved Kv= 16.1 fps				
	36.7	670	Total							



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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020

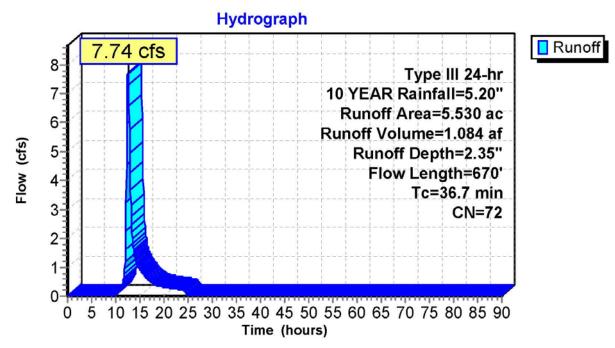
Page 2

#### Summary for Subcatchment PA #1: PA #1

Runoff = 7.74 cfs @ 12.53 hrs, Volume= 1.084 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) C	N Des	cription						
	3.	600	72 1/3	/3 acre lots, 30% imp, HSG B						
*	0.	710	90 Pav	ed roads w	/open ditch	nes, 50% imp, HSG C				
*	1.	220	60 Bru	sh, Good, I	HSG C					
	5.530 72 Weighted Average									
	4.	095	74.0	5% Pervio	us Area					
	1.	435	25.9	95% Imper	vious Area					
	Тс	Length	Slope			Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1				
						Grass: Dense n= 0.240 P2= 3.30"				
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2				
_						Unpaved Kv= 16.1 fps				
	36.7	670	Total							



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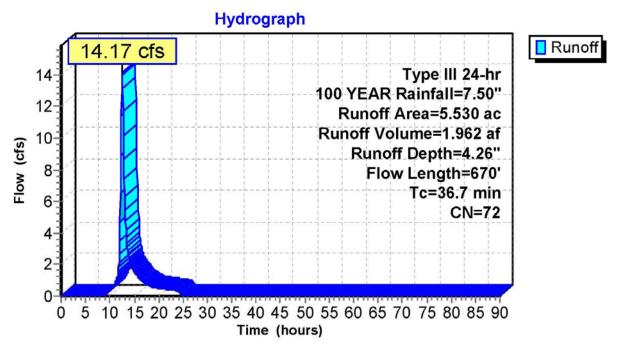
Page 3

## Summary for Subcatchment PA #1: PA #1

14.17 cfs @ 12.51 hrs, Volume= 1.962 af, Depth= 4.26" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac) (	N De	cription						
	3.	600	72 1/3	1/3 acre lots, 30% imp, HSG B						
*	0.	710	90 Pav	Paved roads w/open ditches, 50% imp, HSG C						
*	1.	220	60 Bru	sh, Good, I	HSG C					
	5.	530	72 We	ighted Ave	age					
	4.	095	74.	05% Pervio	us Area					
	1.	435	25.	95% Imper	vious Area					
	Тс	Length	Slope	Velocity	Capacity	Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1				
						Grass: Dense n= 0.240 P2= 3.30"				
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2				
_						Unpaved Kv= 16.1 fps				
	36.7	670	Total							



2) Drainage Area #2

Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020

Page 1

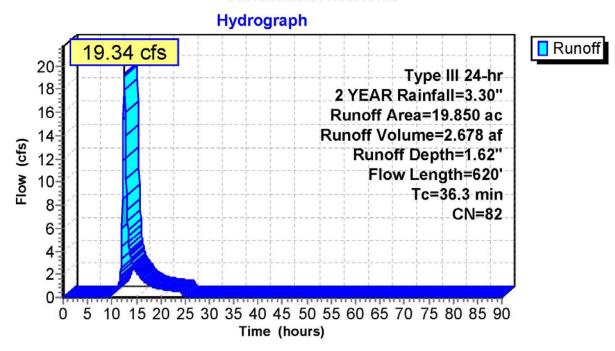
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#### Summary for Subcatchment PA #2: PA #2

19.34 cfs @ 12.52 hrs, Volume= 2.678 af, Depth= 1.62" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) (	ON I	Desci	ription						
*	13.	380	86 I	Urbar	Irban industrial, 65% imp, HSG C						
	2.	000	98	Pave	d parking,	HSG C					
*	4.	060	64	>75%	Grass co	ver, Good,	HSG C				
*	0.	410	61 I	Brush	, Good, F	ISG C					
	19.	850	82 \	Weigl	hted Aver	age					
	9.	153		46.11	% Perviou	us Area					
	10.	697		53.89	% Imperv	ious Area					
	Тс	Length			Velocity	Capacity	Description				
_	(min)	(feet)	(f	t/ft)	(ft/sec)	(cfs)					
	33.8	300	0.02	200	0.15		Sheet Flow, Segment #1				
							Grass: Dense n= 0.240 P2= 3.30"				
	2.5	320	0.01	112	2.15		Shallow Concentrated Flow, Segment #2				
_							Paved Kv= 20.3 fps				
	36.3	620	Tota	al							



Type III 24-hr 10 YEAR Rainfall=5.20" Prepared by Hewlett-Packard Company
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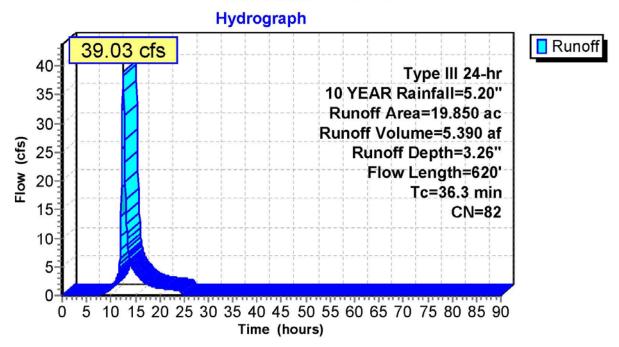
Page 2

#### Summary for Subcatchment PA #2: PA #2

39.03 cfs @ 12.50 hrs, Volume= 5.390 af, Depth= 3.26" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) (	CN	Desc	ription		
*	13.	380	86	Urba	n industria	l, 65% imp	o, HSG C
	2.	000	98	Pave	d parking,	HSG C	
*	4.	060	64	>75%	6 Grass co	ver, Good,	, HSG C
*	0.	410	61	Brus	h, Good, F	ISG C	
	19.	850	82	Weig	hted Aver	age	
	9.	153		46.1	1% Pervio	us Area	
	10.	697		53.89	9% Imperv	ious Area	
	Tc	Length		lope	Velocity	Capacity	Description
_	(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)	
	33.8	300	0.0	0200	0.15		Sheet Flow, Segment #1
							Grass: Dense n= 0.240 P2= 3.30"
	2.5	320	0.0	0112	2.15		Shallow Concentrated Flow, Segment #2
_							Paved Kv= 20.3 fps
	36.3	620	То	tal			



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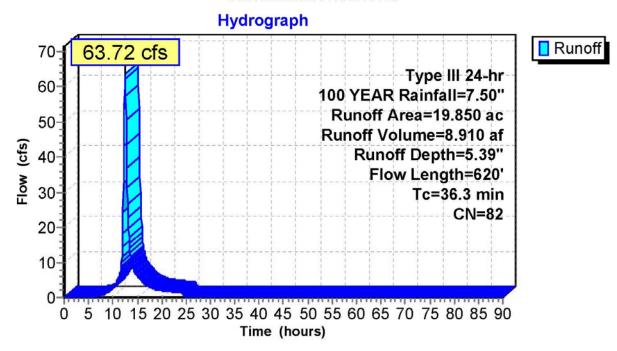
## Summary for Subcatchment PA #2: PA #2

63.72 cfs @ 12.49 hrs, Volume= 8.910 af, Depth= 5.39" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac)	CN	Desc	ription							
*	13.	380	86	Urba	ban industrial, 65% imp, HSG C							
	2.	000	98	Pave	ved parking, HSG C							
*	4.	060	64	>75%	5% Grass cover, Good, HSG C							
*	0.	410	61	Brus	h, Good, F	ISG C						
	19.	19.850 82 Weighted Average										
	9.153 46.11% Pervious Area											
	10.0	697		53.89	9% Imperv	ious Area						
	_											
	Тс	Length		Slope	Velocity	Capacity	Description					
_	(min)	(feet	)	(ft/ft)	(ft/sec)	(cfs)						
	33.8	300	0.	0200	0.15		Sheet Flow, Segment #1					
							Grass: Dense n= 0.240 P2= 3.30"					
	2.5	320	0.	0112	2.15		Shallow Concentrated Flow, Segment #2					
_							Paved Kv= 20.3 fps					
	36.3	620	) To	otal								

#### Subcatchment PA #2: PA #2



3) Routing for Basin #1

Type III 24-hr 2 YEAR Rainfall=3.30"

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## Summary for Pond Basin #1: Pond #1

25.380 ac, 47.80% Impervious, Inflow Depth = 1.48" for 2 YEAR event Inflow Area = Inflow 22.35 cfs @ 12.52 hrs, Volume= 3.135 af = 0.59 cfs @ 24.01 hrs, Volume= 0.59 cfs @ 24.01 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= 2.282 af, Atten= 97%, Lag= 689.6 min Outflow = 2.282 af Primary

0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 74.20' @ 24.01 hrs Surf.Area= 44,303 sf Storage= 115,710 cf

Plug-Flow detention time= 2,072.5 min calculated for 2.282 af (73% of inflow)

Center-of-Mass det. time= 1,977.6 min (2,845.2 - 867.6)

Volume	Inver	. Avail.Sto	rage	Storage	Description	
#1	68.90	382,69	96 cf	Custom	Stage Data (Pi	rismatic)Listed below (Recalc)
Elevation		urf.Area	Inc.Store		Cum.Store	
(fee	et)	(sq-ft)		:-feet)	(cubic-feet)	
68.9	T. T.	0		0	0	
70.0		9,148		5,031	5,031	
71.0		21,344		5,246	20,277	
72.0		25,700		3,522	43,799	
73.0		30,492		8,096	71,895	
74.0		40,075		5,284	107,179	
75.0		60,984		0,530	157,708	
76.0		70,132		5,558	223,266	
77.0		79,715		4,924	298,190	
78.0	00	89,298	8	4,507	382,696	
-	<b>D</b> .:		~			
Device	Routing	Invert		t Device		
#1	Device 6	68.90'			fice/Grate C=	AND THE STATE OF T
#2	Device 6	74.00'	The second			e/Grate C= 0.600
#3	Device 6	76.00				ce/Grate C= 0.600
#4	Device 6	76.00				ce/Grate C= 0.600
#5	Device 6	76.00'				ce/Grate C= 0.600
#6	Primary	68.80'				.0' RCP, square edge headwall, Ke= 0.500
						6.53' S= 0.0264'/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#7	Secondary	77.50		-		road-Crested Rectangular Weir
				,		0.80 1.00 1.20 1.40 1.60
			Coef	. (English	1) 2.49 2.56 2.	70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.59 cfs @ 24.01 hrs HW=74.20' (Free Discharge)

6=Culvert (Passes 0.59 cfs of 67.23 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.37 cfs @ 10.98 fps) -2=Orifice/Grate (Orifice Controls 0.22 cfs @ 1.44 fps)

-3=Orifice/Grate (Controls 0.00 cfs)

-4=Orifice/Grate (Controls 0.00 cfs)

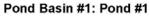
-5=Orifice/Grate (Controls 0.00 cfs)

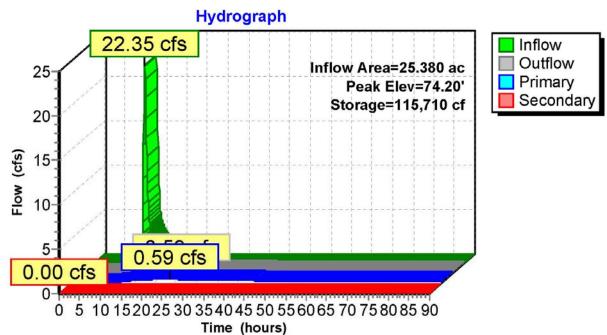
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge) 7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020

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Type III 24-hr 10 YEAR Rainfall=5.20"

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## Summary for Pond Basin #1: Pond #1

25.380 ac, 47.80% Impervious, Inflow Depth = 3.06" for 10 YEAR event Inflow Area = 46.75 cfs @ 12.50 hrs, Volume= Inflow 6.475 af = 4.34 cfs @ 15.46 hrs, Volume= 4.34 cfs @ 15.46 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Outflow = 5.465 af, Atten= 91%, Lag= 177.4 min 5.465 af Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 75.38' @ 15.46 hrs Surf.Area= 64,506 sf Storage= 181,863 cf

Plug-Flow detention time= 1,096.4 min calculated for 5.465 af (84% of inflow)

Center-of-Mass det. time= 1,029.9 min (1,877.0 - 847.2)

Volume	Invert	Avail.Sto	rage Sto	orage Description
#1	68.90'			stom Stage Data (Prismatic)Listed below (Recalc)
Elevation	on S	Surf.Area		re Cum.Store
(fee	et)	(sq-ft)	(cubic-fe	et) (cubic-feet)
68.9	90	0		0 0
70.0	00	9,148	5,0	31 5,031
71.0		21,344	15,2	
72.0		25,700	23,5	
73.0		30,492	28,0	
74.0		40,075	35,2	
75.0		60,984	50,5	
76.0		70,132	65,5	
77.0		79,715	74,9	7.3
78.0	00	89,298	84,5	07 382,696
	<b>D</b>		0 11 1 1	
Device	Routing	Invert	Outlet D	
#1	Device 6	68.90'		t. Orifice/Grate C= 0.600
#2	Device 6	74.00'		24.0" H Vert. Orifice/Grate C= 0.600
#3	Device 6	76.00'		x 12.0" H Vert. Orifice/Grate C= 0.600
#4	Device 6	76.00'		x 12.0" H Vert. Orifice/Grate C= 0.600
#5	Device 6	76.00'		x 12.0" H Vert. Orifice/Grate C= 0.600
#6	Primary	68.80'		ound Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500
				atlet Invert= 68.80' / 66.53' S= 0.0264 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#7	Secondary	77.50'		g x 10.0' breadth Broad-Crested Rectangular Weir
				et) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (E	nglish) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.34 cfs @ 15.46 hrs HW=75.38' (Free Discharge)

6=Culvert (Passes 4.34 cfs of 76.75 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.41 cfs @ 12.16 fps) -2=Orifice/Grate (Orifice Controls 3.92 cfs @ 3.78 fps)

-3=Orifice/Grate (Controls 0.00 cfs)

-4=Orifice/Grate (Controls 0.00 cfs)

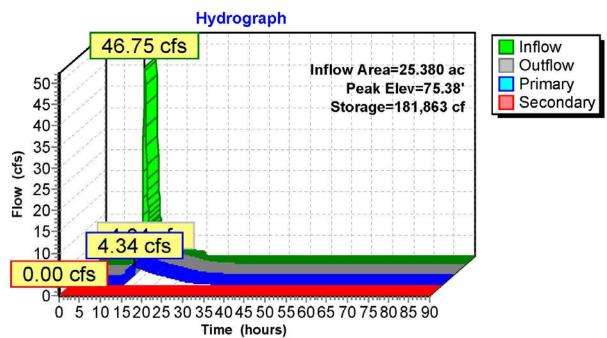
-5=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge) 7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10 YEAR Rainfall=5.20"
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Pond Basin #1: Pond #1



Type III 24-hr 100 YEAR Rainfall=7.50"

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## Summary for Pond Basin #1: Pond #1

25.380 ac, 47.80% Impervious, Inflow Depth = 5.14" for 100 YEAR event Inflow Area = Inflow 77.86 cfs @ 12.50 hrs, Volume= 10.873 af = 21.98 cfs @ 13.28 hrs, Volume= 21.98 cfs @ 13.28 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Outflow = 9.816 af, Atten= 72%, Lag= 46.9 min = Primary 9.816 af Secondary = 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 76.44' @ 13.28 hrs Surf.Area= 74,336 sf Storage= 254,957 cf

Plug-Flow detention time= 701.7 min calculated for 9.807 af (90% of inflow)

Center-of-Mass det. time= 657.2 min (1,490.0 - 832.8)

Volume	Invert	Avail.Sto	rage	Storage	Description			
#1	68.90	382,69	96 cf	Custom	Stage Data (Pr	rismatic)Listed below (Recalc)		
Elevation	on S	urf.Area	Inc	Store	Cum.Store			
(fee		(sq-ft)	(cubic		(cubic-feet)			
68.9		0	(odbio	0	0			
70.0		9,148		5,031	5.031			
71.0		21,344		5,246	20,277			
72.0		25,700		3,522	43,799			
73.0		30,492		8,096	71,895			
74.0		40,075		5,284	107,179			
75.0		60,984		0,530	157,708			
76.0		70,132		5,558	223,266			
77.0		79,715		4,924	298,190			
78.0		89,298		4,507	382,696			
Device	Routing	Invert	Outle	t Devices	5			
#1	Device 6	68.90'	2.5" Vert. Orifice/Grate C= 0.600					
#2	Device 6	74.00'	9.0"	W x 24.0'	' H Vert. Orifice	e/Grate C= 0.600		
#3	Device 6	76.00'	60.0" W x 12.0" H Vert. Orifice/Grate C= 0.600					
#4	Device 6	76.00'	54.0"	W x 12.0	0" H Vert. Orific	ce/Grate C= 0.600		
#5	Device 6	76.00'	54.0" W x 12.0" H Vert. Orifice/Grate C= 0.600					
#6	Primary	68.80'	36.0" Round Culvert L= 86.0' RCP, square edge headwall, Ke= 0.500					
			Inlet	Outlet Ir	overt= 68.80' / 6	6.53' S= 0.0264 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf		
#7	Secondary	77.50'				road-Crested Rectangular Weir		
				,		0.80 1.00 1.20 1.40 1.60		
			Coef.	. (English	2.49 2.56 2.	70 2.69 2.68 2.69 2.67 2.64		
Primary	y OutFlow N	/lax=21.97 cfs	@ 13.2	28 hrs H	W=76.44' (Fre	e Discharge)		

6=Culvert (Passes 21.97 cfs of 84.33 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.45 cfs @ 13.13 fps) -2=Orifice/Grate (Orifice Controls 8.47 cfs @ 5.65 fps)

-3=Orifice/Grate (Orifice Controls 4.66 cfs @ 2.13 fps) -4=Orifice/Grate (Orifice Controls 4.19 cfs @ 2.13 fps)

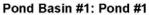
-5=Orifice/Grate (Orifice Controls 4.19 cfs @ 2.13 fps)

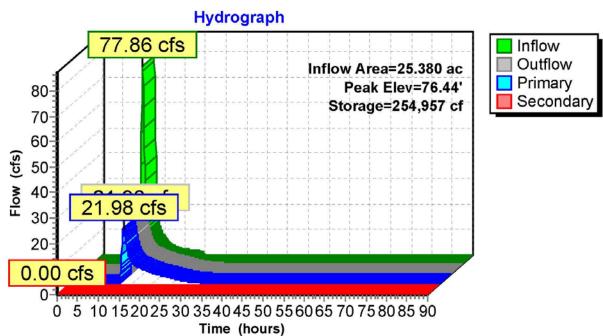
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge) 7=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020

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ii. Post Development Peak Flow Conditions (Basin #3)

1) Drainage Area #3

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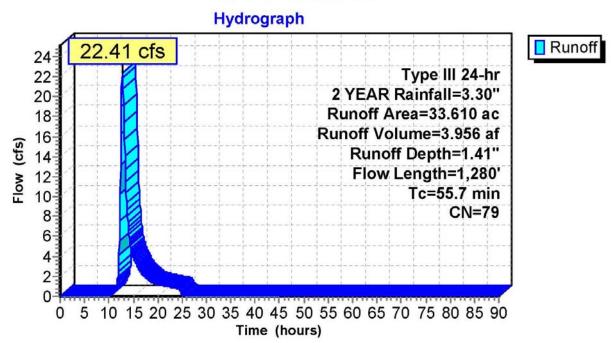
## Summary for Subcatchment PA #3: PA #3

22.41 cfs @ 12.79 hrs, Volume= 3.956 af, Depth= 1.41" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) C	N Des	cription								
*	13.	350 8	36 Urb	ban industrial, 65% imp, HSG C								
	5.	100	8 Pav	ed parking, HSG C								
*	5.	280	34 >75	% Grass c	over, Good,	, HSG C						
	2.	030	8 Pav	ed roads w	/curbs & se	ewers, HSG C						
*	0.	670 6	31 >75	% Grass c	over, Good,	, HSG C						
*	4.	240 (			over, Good,							
*	2.	940	31 >75	% Grass c	over, Good,	, HSG C						
	33.	610	79 Wei	ghted Avei	rage							
		.802 52.97% Pervious Area										
	15.	808	47.0	3% Imper	vious Area							
	_											
	Тс	Length	Slope		Capacity	Description						
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)							
	44.9	240	0.0063	0.09		Sheet Flow, Segment #1						
						Grass: Dense n= 0.240 P2= 3.30"						
	10.8	1,040	0.0100	1.61		Shallow Concentrated Flow, Segment #2						
_						Unpaved Kv= 16.1 fps						
	55.7	1.280	Total									

#### Subcatchment PA #3: PA #3



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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020 Page 2

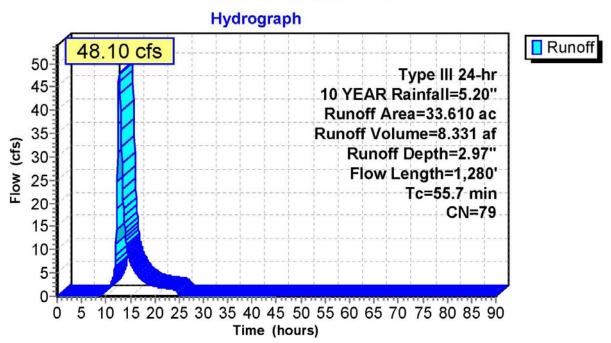
## Summary for Subcatchment PA #3: PA #3

Runoff = 48.10 cfs @ 12.76 hrs, Volume= 8.331 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) C	N Des	cription								
*	13.	350 8	36 Urb	rban industrial, 65% imp, HSG C								
	5.	100	8 Pav	aved parking, HSG C								
*	5.	280	34 >75	75% Grass cover, Good, HSG C								
	2.	030	8 Pav	ed roads w	/curbs & se	ewers, HSG C						
*	0.	670	31 >75	% Grass co	over, Good	, HSG C						
*	4.	240 (	31 >75	% Grass co	over, Good	, HSG C						
*	2.	940 (	31 >75	% Grass c	over, Good	, HSG C						
	33.610 79 Weighted Average											
	17.802 52.97% Pervious Area											
	15.	808	47.0	3% Imper	vious Area							
	Тс	Length	Slope		Capacity	Description						
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)							
	44.9	240	0.0063	0.09		Sheet Flow, Segment #1						
						Grass: Dense n= 0.240 P2= 3.30"						
	10.8	1,040	0.0100	1.61		Shallow Concentrated Flow, Segment #2						
_						Unpaved Kv= 16.1 fps						
	55.7	1 280	Total									

# Subcatchment PA #3: PA #3



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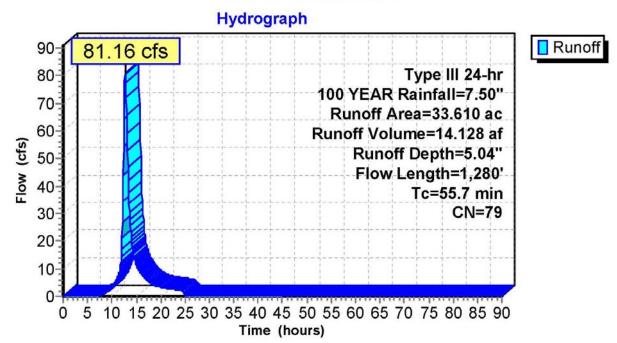
## Summary for Subcatchment PA #3: PA #3

14.128 af, Depth= 5.04" Runoff 81.16 cfs @ 12.75 hrs, Volume=

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac) C	N De	scription								
*	13.	350	36 Ur	ban industrial, 65% imp, HSG C								
	5.	100	98 Pa	aved parking, HSG C								
*	5.	280	34 >7	75% Grass cover, Good, HSG C								
	2.	030				ewers, HSG C						
*	0.	670	31 >7	5% Grass c	over, Good	, HSG C						
*	4.	240		5% Grass c								
*	2.	940 (	31 >7	5% Grass c	over, Good	, HSG C						
	33.610 79 Weighted Average											
	17.	802	52	.97% Pervio	us Area							
	15.	808	47	.03% Imper	vious Area							
	Тс	Length	Slop	e Velocity	Capacity	Description						
_	(min)	(feet)	(ft/f	) (ft/sec)	(cfs)							
	44.9	240	0.006	0.09		Sheet Flow, Segment #1						
						Grass: Dense n= 0.240 P2= 3.30"						
	10.8	1,040	0.010	1.61		Shallow Concentrated Flow, Segment #2						
_						Unpaved Kv= 16.1 fps						
	55.7	1.280	Total									

# Subcatchment PA #3: PA #3



2) Routing for Basin #3

Type III 24-hr 2 YEAR Rainfall=3.30"

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# Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 1.41" for 2 YEAR event Inflow Area =

22.41 cfs @ 12.79 hrs, Volume= Inflow = 3.956 af

Outflow 3.220 af, Atten= 94%, Lag= 393.8 min =

1.28 cfs @ 19.35 hrs, Volume= 1.28 cfs @ 19.35 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= 3.220 af Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 72.79' @ 19.35 hrs Surf.Area= 2.185 ac Storage= 3.013 af

Plug-Flow detention time= 1,744.5 min calculated for 3.217 af (81% of inflow)

Center-of-Mass det. time= 1,670.4 min (2,560.8 - 890.4)

Volume	Invert	Avail.Stora	ge Sto	orage Description	
#1	69.50'	13.505	af Cu	stom Stage Data	(Prismatic)Listed below (Recalc)
Elevation	on Surf.Ai	rea In	c.Store	Cum.Store	
(fee	et) (acre	es) (ad	re-feet)	(acre-feet)	
69.5	50 0.0	000	0.000	0.000	
70.0	00 0.1	60	0.040	0.040	
71.0	0.5	500	0.330	0.370	
72.0	00 1.7	700	1.100	1.470	
73.0	00 2.3	310	2.005	3.475	
74.0	00 2.4	100	2.355	5.830	
75.0	00 2.5	500	2.450	8.280	
76.0	00 2.6	20	2.560	10.840	
77.0	00 2.7	'10	2.665	13.505	
Device	Routing	Invert	Outlet	Devices	
#1	Device 3	69.50'	3.0" Ve	ert. Orifice/Grate	C= 0.600
#2	Device 3	72.50	20.0" N	N x 17.0" H Vert. C	Orifice/Grate C= 0.600
#3 Primary 69.40' 36.0" Round Culvert L= 86.0' RCP, square edge headwall		86.0' RCP, square edge headwall, Ke= 0.500			
			Inlet / C	Outlet Invert= 69.40	0' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#4 Secondary 76.00' 120.0' long x 10.0' breadth Broad-Crested Rectangular We		th Broad-Crested Rectangular Weir			
			Head (	feet) 0.20 0.40 0.	60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.28 cfs @ 19.35 hrs HW=72.79' (Free Discharge)

3=Culvert (Passes 1.28 cfs of 46.85 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.42 cfs @ 8.57 fps)

-2=Orifice/Grate (Orifice Controls 0.85 cfs @ 1.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)

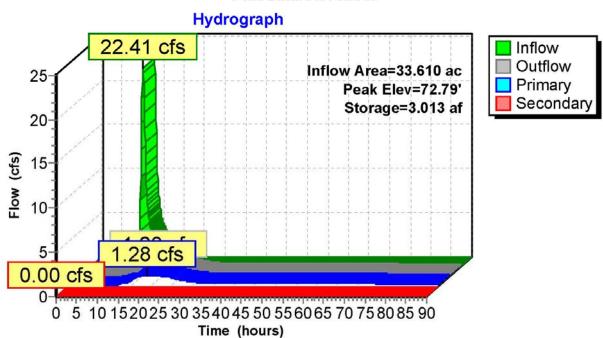
-4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 2 YEAR Rainfall=3.30" Printed 4/30/2020

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## Pond Basin #3: Pond #3



Type III 24-hr 10 YEAR Rainfall=5.20"

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## Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 2.97" for 10 YEAR event Inflow Area =

Inflow = 48.10 cfs @ 12.76 hrs, Volume= 8.331 af

7.471 af, Atten= 85%, Lag= 137.3 min Outflow = 7.471 af

7.13 cfs @ 15.05 hrs, Volume= 7.13 cfs @ 15.05 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Primary 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 73.66' @ 15.05 hrs Surf.Area= 2.369 ac Storage= 5.012 af

Plug-Flow detention time= 935.0 min calculated for 7.471 af (90% of inflow)

Center-of-Mass det. time= 885.0 min (1,753.8 - 868.8)

Volume	Invert	Avail.Stora	ge Sto	orage Description	
#1	69.50'	13.505	af Cu	stom Stage Data	(Prismatic)Listed below (Recalc)
Elevation	on Surf.Ar	ea In	c.Store	Cum.Store	
(fee	et) (acre	es) (ac	re-feet)	(acre-feet)	
69.5	50 0.0	00	0.000	0.000	
70.0	00 0.1	60	0.040	0.040	
71.0	00 0.5	00	0.330	0.370	
72.0	00 1.7	00	1.100	1.470	
73.0	00 2.3	10	2.005	3.475	
74.0	00 2.4	00	2.355	5.830	
75.0	00 2.5	00	2.450	8.280	
76.0	00 2.6	20	2.560	10.840	
77.0	00 2.7	10	2.665	13.505	
Device	Routing	Invert	Outlet I	Devices	
#1	Device 3	69.50'	3.0" Ve	ert. Orifice/Grate	C= 0.600
#2 Device 3		72.50	20.0" V	V x 17.0" H Vert.	Orifice/Grate C= 0.600
#3	Primary	69.40	36.0"	Round Culvert L	= 86.0' RCP, square edge headwall, Ke= 0.500
			Inlet / C	Outlet Invert= 69.4	0' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#4	Secondary	76.00'	120.0	long x 10.0' brea	dth Broad-Crested Rectangular Weir

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.13 cfs @ 15.05 hrs HW=73.66' (Free Discharge)

3=Culvert (Passes 7.13 cfs of 56.51 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.47 cfs @ 9.67 fps)

-2=Orifice/Grate (Orifice Controls 6.66 cfs @ 3.45 fps)

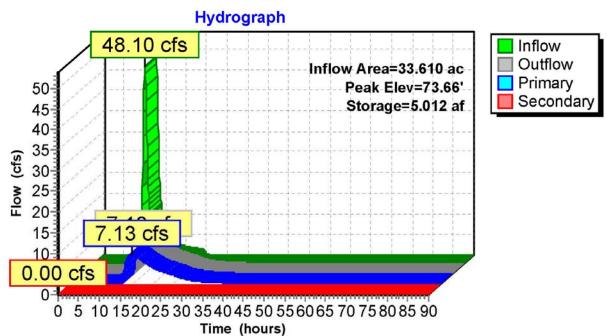
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)

-4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020 Page 5

Pond Basin #3: Pond #3



Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020

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## Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 5.04" for 100 YEAR event Inflow Area =

81.16 cfs @ 12.75 hrs, Volume= Inflow = 14.128 af

Outflow = 13.212 af, Atten= 81%, Lag= 99.6 min 13.212 af Primary

15.16 cfs @ 14.41 hrs, Volume= 15.16 cfs @ 14.41 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 74.89' @ 14.41 hrs Surf.Area= 2.489 ac Storage= 7.996 af

Plug-Flow detention time= 644.5 min calculated for 13.212 af (94% of inflow)

Center-of-Mass det. time= 609.8 min (1,463.6 - 853.8)

Volume	Invert	Avail.Stora	age Sto	orage Description	
#1	69.50'	13.505	af Cu	stom Stage Data	(Prismatic)Listed below (Recalc)
Elevation	on Surf.Ar	ea In	c.Store	Cum.Store	
(fee	et) (acre	es) (ac	re-feet)	(acre-feet)	
69.5	50 0.0	00	0.000	0.000	
70.0	00 0.1	60	0.040	0.040	
71.0	00 0.5	00	0.330	0.370	
72.0	00 1.7	00	1.100	1.470	
73.0	00 2.3	10	2.005	3.475	
74.0	00 2.4	00	2.355	5.830	
75.0	00 2.5	00	2.450	8.280	
76.0	00 2.6	20	2.560	10.840	
77.0	00 2.7	10	2.665	13.505	
Device	Routing	Invert	Outlet [	Devices	
#1	Device 3	69.50'	3.0" V€	ert. Orifice/Grate	C= 0.600
#2	Device 3	72.50'	20.0" V	V x 17.0" H Vert. 0	Orifice/Grate C= 0.600
#3 Primary 69.40' 36.0" Round Culvert L= 86.0' RCP, square edge headwall, Ke=			= 86.0' RCP, square edge headwall, Ke= 0.500		
			Inlet / C	Outlet Invert= 69.40	0' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#4	Secondary	76.00'	120.0'	long x 10.0' bread	dth Broad-Crested Rectangular Weir
			Head (1	feet) 0.20 0.40 0	.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=15.16 cfs @ 14.41 hrs HW=74.89' (Free Discharge)

3=Culvert (Passes 15.16 cfs of 67.95 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.54 cfs @ 11.04 fps)

-2=Orifice/Grate (Orifice Controls 14.61 cfs @ 6.19 fps)

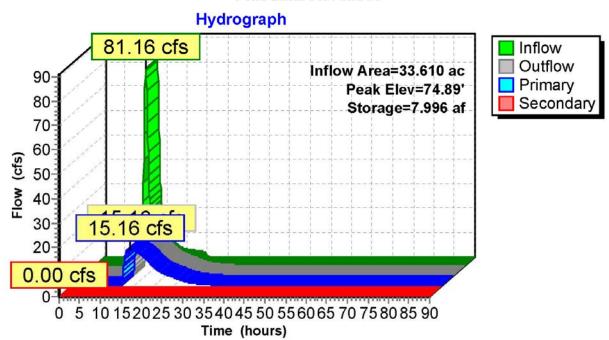
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge) -4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020

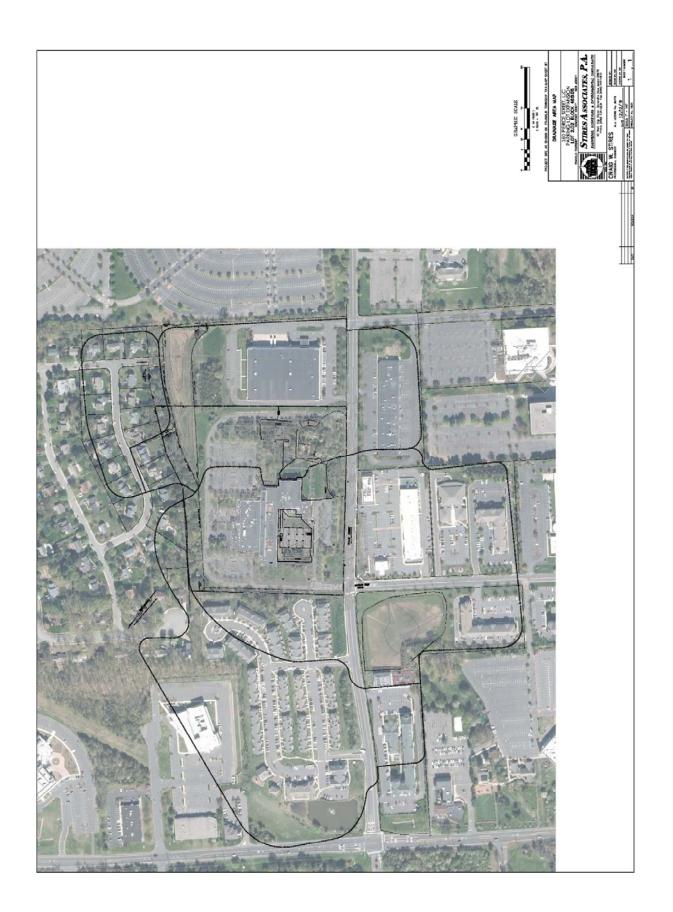
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## Pond Basin #3: Pond #3



6. 150 Pierce Street, LLC - June, 2020

i. Post Development Peak Flow Conditions (Basin #1)



1) Drainage Area #1

## 18051-original-150 Pierce

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Type III 24-hr 2 YEAR Rainfall=3.30"

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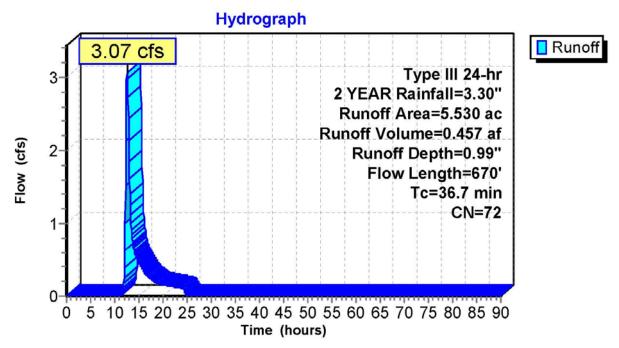
## Summary for Subcatchment PA #1: PA #1

Runoff = 3.07 cfs @ 12.56 hrs, Volume= 0.457 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 2 YEAR Rainfall=3.30"

	Area	(ac) C	N Des	cription								
	3.	600	72 1/3	acre lots, 3	0% imp, H	SG B						
*	0.	710	90 Pav	ed roads w	/open ditch	nes, 50% imp, HSG C						
*	1.	220	60 Bru	ush, Good, HSG C								
	5.	5.530 72 Weighted Average										
	4.095 74.05% Pervious Area											
	1.	435	25.9	95% Imper	vious Area							
	Тс	Length	Slope			Description						
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)							
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1						
						Grass: Dense n= 0.240 P2= 3.30"						
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2						
_						Unpaved Kv= 16.1 fps						
	36.7	670	Total									

## Subcatchment PA #1: PA #1



## 18051-original-150 Pierce

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Type III 24-hr 10 YEAR Rainfall=5.20" Printed 4/30/2020

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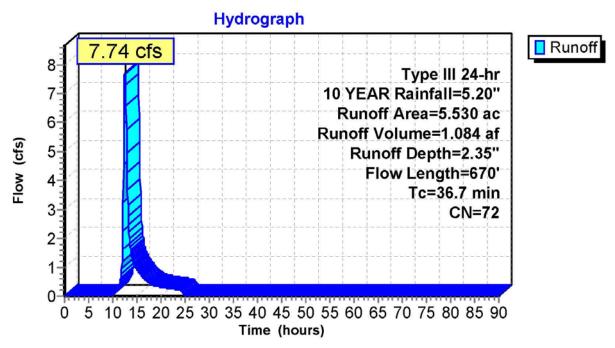
#### Summary for Subcatchment PA #1: PA #1

Runoff = 7.74 cfs @ 12.53 hrs, Volume= 1.084 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 10 YEAR Rainfall=5.20"

	Area	(ac) (	N De	Description							
	3.	600	SG B								
*	0.	710	90 Pav	Paved roads w/open ditches, 50% imp, HSG C							
*	1.220 60 Brush, Good, HSG C										
	5.	530	72 We	ighted Ave	age						
	4.095 74.05% Pervious Area										
	1.	435	25.	95% Imper	vious Area						
	Тс	Length	Slope	Velocity	Capacity	Description					
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)						
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1					
						Grass: Dense n= 0.240 P2= 3.30"					
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2					
_						Unpaved Kv= 16.1 fps					
	36.7	670	Total								

## Subcatchment PA #1: PA #1



## 18051-original-150 Pierce

Prepared by Hewlett-Packard Company
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Type III 24-hr 100 YEAR Rainfall=7.50" Printed 4/30/2020

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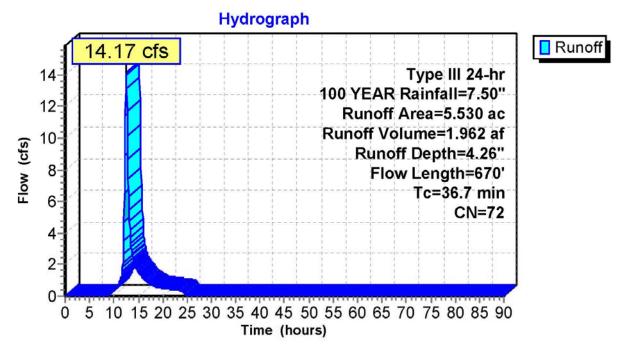
## Summary for Subcatchment PA #1: PA #1

Runoff = 14.17 cfs @ 12.51 hrs, Volume= 1.962 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Type III 24-hr 100 YEAR Rainfall=7.50"

	Area	(ac) (	N De	Description							
	3.	600	SG B								
*	0.	710	90 Pav	Paved roads w/open ditches, 50% imp, HSG C							
*	1.220 60 Brush, Good, HSG C										
	5.	530	72 We	ighted Ave	age						
	4.095 74.05% Pervious Area										
	1.	435	25.	95% Imper	vious Area						
	Тс	Length	Slope	Velocity	Capacity	Description					
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)						
	33.8	300	0.0200	0.15		Sheet Flow, Segment #1					
						Grass: Dense n= 0.240 P2= 3.30"					
	2.9	370	0.0170	2.10		Shallow Concentrated Flow, Segment #2					
_						Unpaved Kv= 16.1 fps					
	36.7	670	Total								

## Subcatchment PA #1: PA #1



2) Drainage Area #2