1) Drainage Area #3

WinTR55 NOAA A 2 YEAR Rainfall=3.34" Printed 4/30/2020

Page 1

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

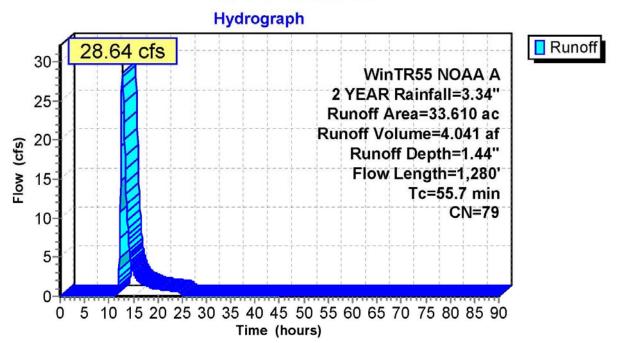
Summary for Subcatchment PA #3: PA #3

Runoff = 28.64 cfs @ 12.80 hrs, Volume= 4.041 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 2 YEAR Rainfall=3.34"

	Area	(ac) C	N I	Descripti	ion							
*	13.	350	36 l	Jrban in	rban industrial, 65% imp, HSG C							
	5.	100	98 F	Paved pa	arking	, HSG C						
*	5.	280	64 :	>75% G	75% Grass cover, Good, HSG C							
	2.	030	98 F	Paved ro	oads w	/curbs & se	ewers, HSG C					
*	0.	670	31 3	>75% G	rass co	over, Good,	, HSG C					
*	4.	240	61 :	>75% G	rass co	over, Good,	, HSG C					
*	2.	940	61 :	>75% G	rass co	over, Good,	, HSG C					
	33.	610	79 I	Neighte	d Aver	age						
	17.	802		52.97%	Pervio	us Area						
	15.	808	4	47.03%	Imper\	ious Area						
					-							
	Tc	Length	Slo	pe Ve	locity	Capacity	Description					
	(min)	(feet)	(fi	t/ft) (ff	t/sec)	(cfs)						
	44.9	240	0.00)63	0.09		Sheet Flow, Segment #1					
							Grass: Dense n= 0.240 P2= 3.30"					
	10.8	1,040	0.01	00	1.61		Shallow Concentrated Flow, Segment #2					
							Unpaved Kv= 16.1 fps					
	55.7	1 280	Tota	al .								

Subcatchment PA #3: PA #3



WinTR55 NOAA A 10 YEAR Rainfall=5.01" Printed 4/30/2020

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 2

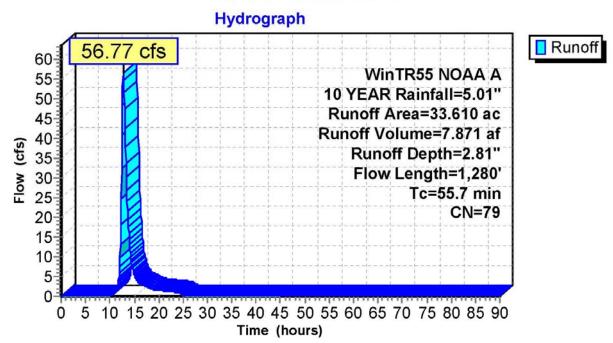
Summary for Subcatchment PA #3: PA #3

Runoff = 56.77 cfs @ 12.77 hrs, Volume= 7.871 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 10 YEAR Rainfall=5.01"

	Area	(ac) C	N De	scription								
*			36 Urb	rban industrial, 65% imp, HSG C								
	5.	100		aved parking, HSG C								
*	5.	280	34 >75	>75% Grass cover, Good, HSG C								
		F.(-10)				ewers, HSG C						
*					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											
	17.	802	52.	97% Pervio	us Area							
	15.	808	47.	03% Imper	vious Area							
	Тс	Length	Slope	Velocity	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			<u> </u>						

Subcatchment PA #3: PA #3



WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Prepared by Hewlett-Packard Company HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 3

Printed 4/30/2020

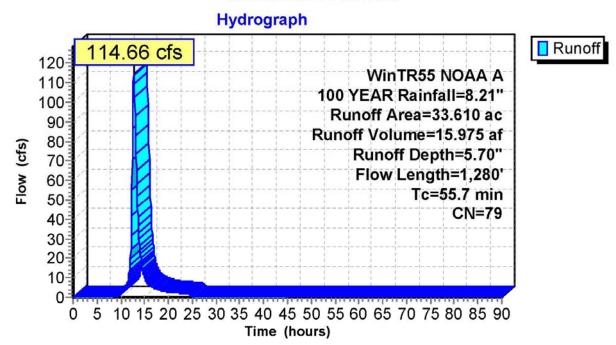
Summary for Subcatchment PA #3: PA #3

15.975 af, Depth= 5.70" Runoff 114.66 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 WinTR55 NOAA A 100 YEAR Rainfall=8.21"

	Area	(ac) C	N Des	cription								
*	13.	350 8	36 Urb	rban industrial, 65% imp, HSG C								
	5.	100 9	8 Pav	aved parking, HSG C								
*	5.	280 6	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 c	over, Good,	, HSG C						
*	4.	240 6	31 >75	% Grass c	over, Good,	, HSG C						
*	2.	940 (31 >75	% Grass c	over, Good,	, HSG C						
	33.	610										
	17.	802	52.9	7% Pervio	us Area							
	15.	808	47.0	3% Imper	vious Area							
	Тс	Length	Slope	Velocity	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



2) Routing for Basin #3

WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Prepared by Hewlett-Packard Company

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Printed 4/30/2020 Page 1

Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 1.44" for 2 YEAR event Inflow Area =

Inflow 28.64 cfs @ 12.80 hrs, Volume= 4.041 af

Outflow 3.321 af, Atten= 95%, Lag= 275.4 min =

1.45 cfs @ 17.39 hrs, Volume= 1.45 cfs @ 17.39 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= 3.321 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= 72.83' @ 17.39 hrs Surf.Area= 2.207 ac Storage= 3.095 af

Plug-Flow detention time= 1,700.7 min calculated for 3.318 af (82% of inflow)

Center-of-Mass det. time= 1,636.0 min (2,500.6 - 864.6)

Volume	Invert	Avail.Stora	ge Ste	orage Description	
#1	69.50'	13.505	af Cu	ustom Stage Data	(Prismatic)Listed below (Recalc)
Elevation	on Surf.Are	ea In	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	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 2.40	00	2.355	5.830	
75.0	00 2.50	00	2.450	8.280	
76.0	00 2.62	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" \	W x 17.0" H Vert.	Orifice/Grate C= 0.600
#3	Primary	69.40'	36.0"	Round Culvert 1:	= 86.0' RCP, square edge headwall, Ke= 0.500
		22110			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

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=1.45 cfs @ 17.39 hrs HW=72.83' (Free Discharge)

3=Culvert (Passes 1.45 cfs of 47.31 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.42 cfs @ 8.62 fps)

-2=Orifice/Grate (Orifice Controls 1.02 cfs @ 1.85 fps)

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

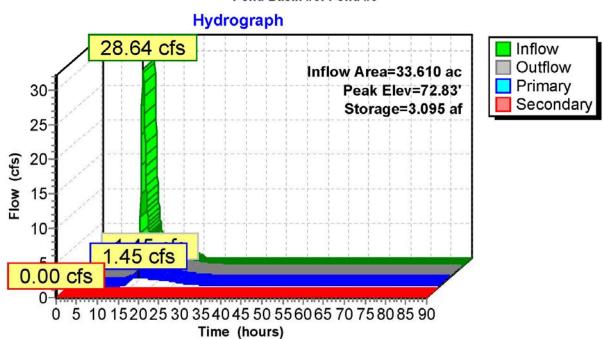
-4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

WinTR55 NOAA A 2 YEAR Rainfall=3.34" Printed 4/30/2020

Page 2

Pond Basin #3: Pond #3



WinTR55 NOAA A 10 YEAR Rainfall=5.01"

Prepared by Hewlett-Packard Company

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Printed 4/30/2020

Page 3

Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 2.81" for 10 YEAR event Inflow Area =

Inflow = 56.77 cfs @ 12.77 hrs, Volume= 7.871 af

Outflow = 7.038 af, Atten= 86%, Lag= 104.2 min

7.79 cfs @ 14.51 hrs, Volume= 7.79 cfs @ 14.51 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Primary = 7.038 af 0.000 af Secondary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 73.73' @ 14.51 hrs Surf.Area= 2.376 ac Storage= 5.188 af

Plug-Flow detention time= 965.7 min calculated for 7.038 af (89% of inflow)

Center-of-Mass det. time= 918.3 min (1,768.8 - 850.5)

Volume	Invert	Avail.Storag	ge Sto	rage Description				
#1	69.50'	13.505	af Cu	stom Stage Data	(Prismatic)Listed below (Recalc)			
Elevation	on Surf.Area	a Inc	.Store	Cum.Store				
(fee	et) (acres	(acr	e-feet)	(acre-feet)				
69.5	50 0.00	0	0.000	0.000				
70.0	0.16	0	0.040	0.040				
71.0	0.50	0	0.330	0.370				
72.0	00 1.70	0	1.100	1.470				
73.0	00 2.31	0	2.005	3.475				
74.0	00 2.40	0	2.355	5.830				
75.0	00 2.50	0	2.450	8.280				
76.0	00 2.62	0	2.560	10.840				
77.0	00 2.71	0	2.665	13.505				
Device	Routing	Invert	Outlet L	Devices				
#1	Device 3	69.50	3.0" Ve	rt. Orifice/Grate	C= 0.600			
#2	Device 3				Orifice/Grate C= 0.600			
#3	Primary	69.40'	36.0" F	Round Culvert L	= 86.0' RCP, square edge headwall, Ke= 0.500			
			Inlet / C	Outlet Invert= 69.40' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf				
#4	Secondary		120.0' long x 10.0' breadth Broad-Crested Rectangular Weir					
			Head (f	eet) 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=7.79 cfs @ 14.51 hrs HW=73.73' (Free Discharge)

3=Culvert (Passes 7.79 cfs of 57.27 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.48 cfs @ 9.76 fps)

-2=Orifice/Grate (Orifice Controls 7.31 cfs @ 3.56 fps)

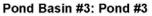
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)

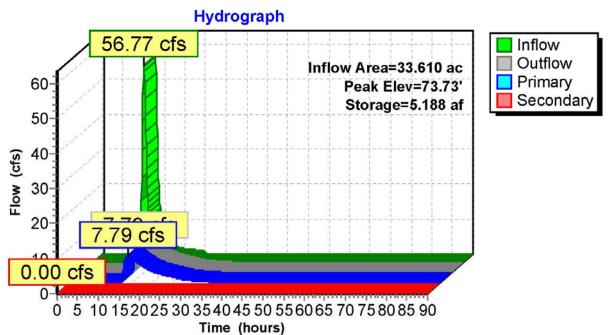
-4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

WinTR55 NOAA A 10 YEAR Rainfall=5.01" Printed 4/30/2020

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 4





WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Prepared by Hewlett-Packard Company

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Printed 4/30/2020 Page 5

Summary for Pond Basin #3: Pond #3

33.610 ac, 47.03% Impervious, Inflow Depth = 5.70" for 100 YEAR event Inflow Area =

114.66 cfs @ 12.75 hrs, Volume= Inflow 15.975 af

Outflow = 15.057 af, Atten= 84%, Lag= 88.9 min 15.057 af

18.54 cfs @ 14.24 hrs, Volume= 18.54 cfs @ 14.24 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Primary Secondary = 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 75.72' @ 14.24 hrs Surf.Area= 2.586 ac Storage= 10.111 af

Plug-Flow detention time= 599.8 min calculated for 15.044 af (94% of inflow)

Center-of-Mass det. time= 572.9 min (1,408.9 - 835.9)

Volume	Invert	Avail.Stora	ge St	orage Description			
#1	69.50'	13.505	af Cu	ustom 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" \	W 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= 0.500				
			Inlet / 0	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' 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=18.54 cfs @ 14.24 hrs HW=75.72' (Free Discharge)

3=Culvert (Passes 18.54 cfs of 74.72 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.58 cfs @ 11.89 fps)

-2=Orifice/Grate (Orifice Controls 17.96 cfs @ 7.61 fps)

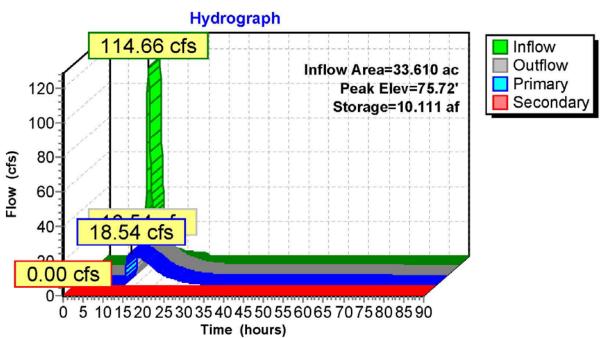
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge) -4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

WinTR55 NOAA A 100 YEAR Rainfall=8.21" Printed 4/30/2020

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 6

Pond Basin #3: Pond #3



6. 150 Pierce Street, LLC - June 2020

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

1) Drainage Area #1

WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Prepared by Hewlett-Packard Company

Printed 4/30/2020 Page 1

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

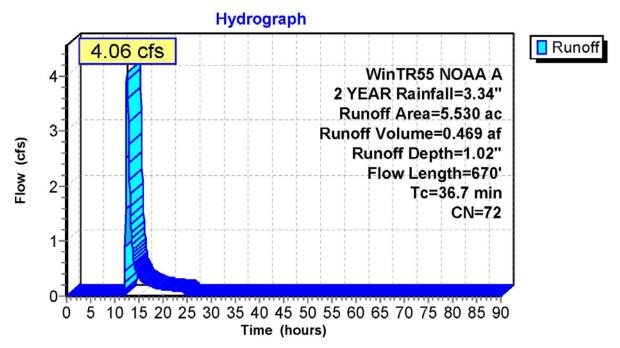
Summary for Subcatchment PA #1: PA #1

Runoff = 4.06 cfs @ 12.57 hrs, Volume= 0.469 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 2 YEAR Rainfall=3.34"

	Area	(ac) C	N Des	cription				
	3.	600	72 1/3	SG B				
*	0.	710	90 Paved roads w/open ditches, 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					

Subcatchment PA #1: PA #1



WinTR55 NOAA A 10 YEAR Rainfall=5.01" Printed 4/30/2020

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 2

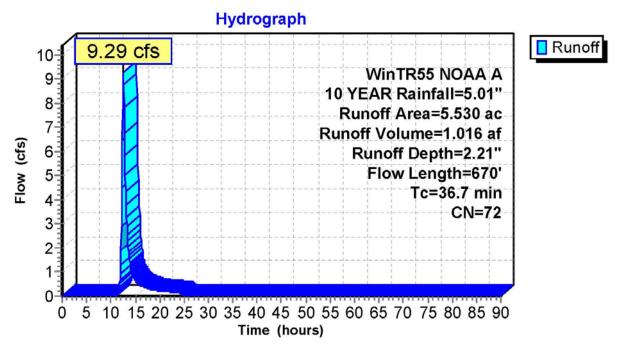
Summary for Subcatchment PA #1: PA #1

Runoff = 9.29 cfs @ 12.54 hrs, Volume= 1.016 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 10 YEAR Rainfall=5.01"

	Area	(ac) C	N Des	cription					
	3.	3.600 72 1/3 acre lots, 30% imp, HSG B							
*	* 0.710 90 Paved roads w/open ditches, 50% imp, HSG C								
*	* 1.220 60 Brush, Good, HSG C								
	5.530 72 Weighted Average								
	4.	095	74.0	5% Pervio	us Area				
	1.	435	25.9	5% Imperv	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						

Subcatchment PA #1: PA #1



WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Prepared by Hewlett-Packard Company

Printed 4/30/2020 Page 3

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

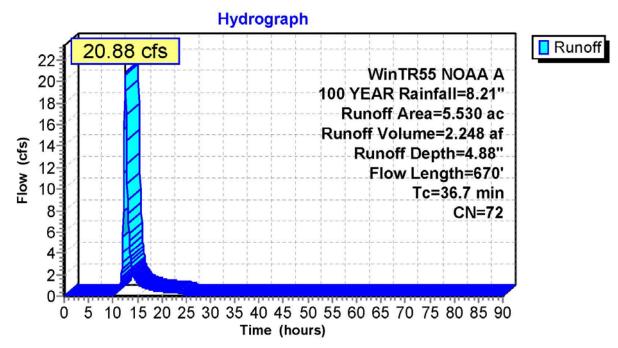
Summary for Subcatchment PA #1: PA #1

Runoff = 20.88 cfs @ 12.52 hrs, Volume= 2.248 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 100 YEAR Rainfall=8.21"

	Area	(ac) (N De	scription			
	SG B						
*	0.710 90 Paved roads w/open ditches, 50% imp, HSG C						
*	1.	1.220 60 Brush, 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				

Subcatchment PA #1: PA #1



2) Drainage Area #2

WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Prepared by Hewlett-Packard Company

Printed 6/22/2020 Page 1

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

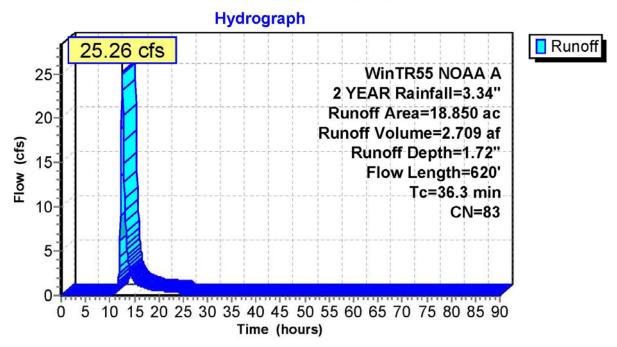
Summary for Subcatchment PA #2: PA #2

Runoff = 25.26 cfs @ 12.51 hrs, Volume= 2.709 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 2 YEAR Rainfall=3.34"

	Area	(ac) (ON D	escription						
*	13.	380	86 U	Jrban industrial, 65% imp, HSG C						
	2.	000	98 Pa	aved parking	, HSG C					
*	3.	060	64 >7	75% Grass co	over, Good,	, HSG C				
*	0.	410	61 Bi	rush, Good, I	HSG C					
	18,850 83 Weighted Average									
	8.	153	43	3.25% Pervio	us Area					
	10.	697	56	3.75% Imper	ious Area					
	Tc (min)	Length (feet)	Slop (ft/f		Capacity (cfs)	Description				
	33.8	300	0.020	0.15		Sheet Flow, Segment #1				
	2.5	320	0.011	2 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



WinTR55 NOAA A 10 YEAR Rainfall=5.01"
Printed 6/22/2020

Prepared by Hewlett-Packard Company

Printed 6/22/2020 Page 2

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

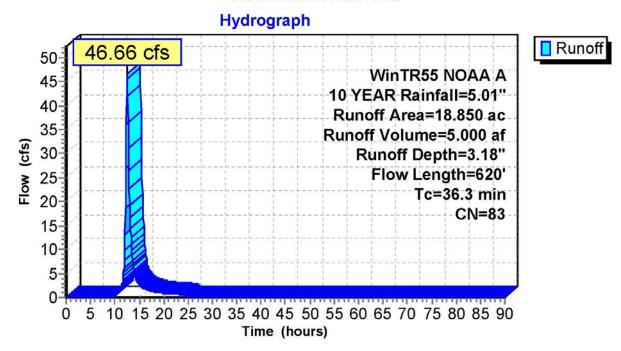
Summary for Subcatchment PA #2: PA #2

Runoff = 46.66 cfs @ 12.50 hrs, Volume= 5.000 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 10 YEAR Rainfall=5.01"

	Area	(ac) (CN	Desc	ription							
*	13.	380	86	Urbai	Jrban industrial, 65% imp, HSG C							
	2.	000	98	Pave	Paved parking, HSG C							
*	3.	060	64	>75%	Grass co	ver, Good,	HSG C					
*	0.	410	61	Brush	n, Good, F	ISG C						
	18.850 83 Weighted Average											
	8.	153		43.25	% Pervio	us Area						
	10.	697		56.75	% Imperv	ious Area						
	_					_						
	Тс	Length			Velocity	Capacity	Description					
_	(min)	(feet)	(1	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



WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Printed 6/22/2020

Page 3

Summary for Subcatchment PA #2: PA #2

Runoff = 89.01 cfs @ 12.49 hrs, Volume= 9.705 af, Depth= 6.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 100 YEAR Rainfall=8.21"

	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	
*	3.	060	64	>75%	6 Grass co	ver, Good,	I, HSG C
*	0.	410	61	Brusl	h, Good, F	ISG C	
	18.850 83 Weighted Average						
	8.	153		43.25	5% Pervio	us Area	
	10.697 56.75% Impervious Area					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"
	2.5	320	0.	0112	2.15		Shallow Concentrated Flow, Segment #2
_							Paved Kv= 20.3 fps
	36.3	620	To	tal			

Subcatchment PA #2: PA #2

Hydrograph Runoff 89.01 cfs 90-WinTR55 NOAA A 100 YEAR Rainfall=8.21" 80-Runoff Area=18.850 ac 70-Runoff Volume=9.705 af (cfs) 60 Runoff Depth=6.18" 50-Flow Length=620' Tc=36.3 min 40-CN=83 30 20 10 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 Time (hours)

3) Drainage Area for Biobasin #2 (Pharmscript East)

WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Printed 6/22/2020 Page 1

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

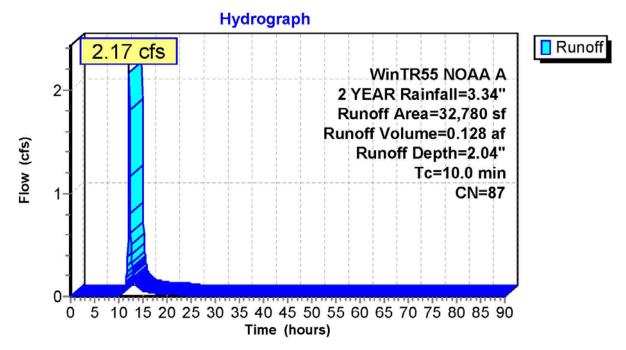
Summary for Subcatchment Pharma E: Pharma East

2.17 cfs @ 12.17 hrs, Volume= 0.128 af, Depth= 2.04" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Area (sf)	CN	Description								
15,090	74	>75% Gras	75% Grass cover, Good, HSG C							
17,690	98	Paved park	Paved parking, HSG C							
32,780	87	Weighted A	verage							
15,090		46.03% Per	rvious Area							
17,690		53.97% Imp	pervious Ar	ea						
Tc Length	Slop		Capacity	Description						
(min) (feet)	(ft/f	t) (ft/sec)	(cfs)							
10.0				Direct Entry,						

Subcatchment Pharma E: Pharma East



WinTR55 NOAA A 10 YEAR Rainfall=5.01" Printed 6/22/2020

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 2

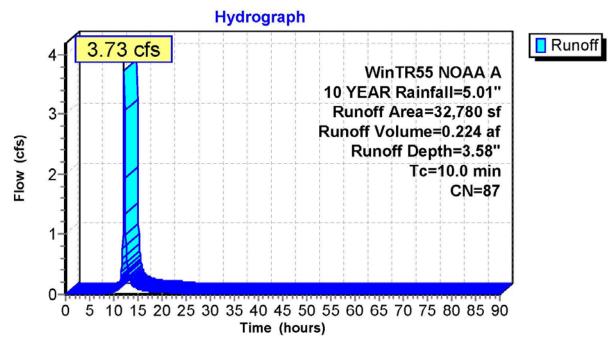
Summary for Subcatchment Pharma E: Pharma East

Runoff = 3.73 cfs @ 12.17 hrs, Volume= 0.224 af, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 10 YEAR Rainfall=5.01"

Area (sf)	CN	Description									
15,090	74	>75% Gras	75% Grass cover, Good, HSG C								
17,690	98	Paved park	Paved parking, HSG C								
32,780	87	Weighted A	verage								
15,090		46.03% Pe	rvious Area								
17,690		53.97% Imp	pervious Ar	ea							
Tc Length (min) (feet)	Slop (ft/		Capacity (cfs)	Description							
10.0				Direct Entry,							

Subcatchment Pharma E: Pharma East



WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Prepared by Hewlett-Packard Company

Printed 6/22/2020 Page 3

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

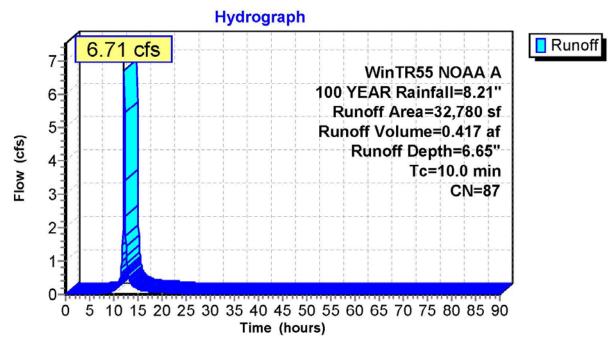
Summary for Subcatchment Pharma E: Pharma East

6.71 cfs @ 12.17 hrs, Volume= 0.417 af, Depth= 6.65" Runoff

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Area (sf)	CN	Description									
15,090	74	>75% Gras	75% Grass cover, Good, HSG C								
17,690	98	Paved park	Paved parking, HSG C								
32,780	87	Weighted A	verage								
15,090		46.03% Pe	rvious Area								
17,690		53.97% lm	pervious Ar	ea							
Tc Length	Slop	e Velocity	Capacity	Description							
(min) (feet)	(ft/1	ft) (ft/sec)	(cfs)								
10.0				Direct Entry,							

Subcatchment Pharma E: Pharma East



4) Routing for Bio Basin East

STIRES ASSOCIATES, P.A.

18051-current1-150 Pierce

NJ DEP 2-hr 1-YR WATER QUALITY Rainfall=1.25"

Prepared by Hewlett-Packard Company

Printed 6/22/2020 Page 1

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Summary for Pond BIO-2: Biobasin -East

0.753 ac, 53.97% Impervious, Inflow Depth = 0.37" for 1-YR WATER QUALITY event Inflow Area = Inflow = 0.69 cfs @ 1.19 hrs, Volume= 0.023 af 0.08 cfs @ 1.93 hrs, Volume= 0.08 cfs @ 1.93 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= Outflow = 0.023 af, Atten= 88%, Lag= 44.1 min Discarded = 0.023 af 0.000 af Primary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 82.63' @ 1.93 hrs Surf.Area= 2,194 sf Storage= 710 cf

Plug-Flow detention time= 89.8 min calculated for 0.023 af (100% of inflow)

Center-of-Mass det. time= 90.1 min (172.3 - 82.2)

Volume	Invert	Avail.Storage Storage Desc		Description				
#1	82.25'	1,63	33 cf Custon	m Stage Data (Prismatic)Listed below (Recalc)				
Elevation (fee 82.2 83.0	et) 25	f.Area (sq-ft) 1,500 2,855	Inc.Store (cubic-feet) 0 1,633	Cum.Store (cubic-feet) 0 1,633				
Device #1 #2	Routing Discarded Primary	Invert 82.25' 82.75'	Outlet Device 1.620 in/hr E 50.0' long x Head (feet) (4.50 5.00 5.	filtration over Surface area .0' breadth Broad-Crested Red 20 0.40 0.60 0.80 1.00 1.20 0 2.46 2.55 2.70 2.69 2.68 2	ctangular Weir 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 .68 2.67 2.64 2.64 2.64 2.65 2.64 2.65			

Discarded OutFlow Max=0.08 cfs @ 1.93 hrs HW=82.63' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=82.25' TW=68.90' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

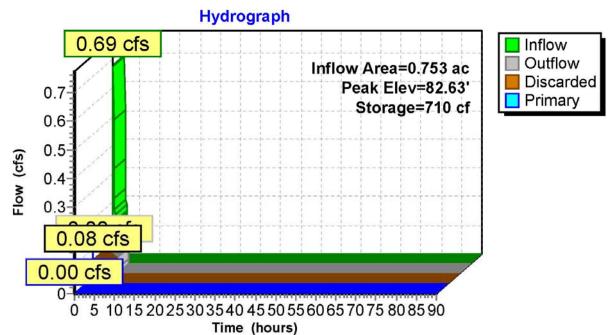
NJ DEP 2-hr 1-YR WATER QUALITY Rainfall=1.25"

Printed 6/22/2020

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 2





STIRES ASSOCIATES, P.A.

18051-current1-150 Pierce

WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Prepared by Hewlett-Packard Company

Printed 6/22/2020 Page 3

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Summary for Pond BIO-2: Biobasin -East

Inflow Area = 0.753 ac, 53.97% Impervious, Inflow Depth = 2.04" for 2 YEAR event
Inflow = 2.17 cfs @ 12.17 hrs, Volume= 0.128 af
Outflow = 2.09 cfs @ 12.22 hrs, Volume= 0.128 af, Atten= 4%, Lag= 2.5 min
Discarded = 0.09 cfs @ 12.21 hrs, Volume= 0.072 af
Primary = 1.99 cfs @ 12.22 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 82.81' @ 12.21 hrs Surf.Area= 2,519 sf Storage= 1,134 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 63.6 min (866.3 - 802.8)

Volume	Invert	Avail.Sto	rage Storage	e Description
#1	82.25'	1,6	33 cf Custon	m Stage Data (Prismatic)Listed below (Recalc)
Elevatio (fee 82.2 83.0	et) 25	urf.Area (sq-ft) 1,500 2,855	Inc.Store (cubic-feet) 0 1,633	Cum.Store (cubic-feet) 0 1,633
Device	Routing	Invert	Outlet Device	es
#1	Discarded	82.25'	1.620 in/hr E	Exfiltration over Surface area
#2	Primary	82.75		x 9.0' breadth Broad-Crested Rectangular Weir
			, ,	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00
			4.50 5.00 5.	5.50 sh) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65
			2.65 2.66 2.	,

Discarded OutFlow Max=0.09 cfs @ 12.21 hrs HW=82.81' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.09 cfs)

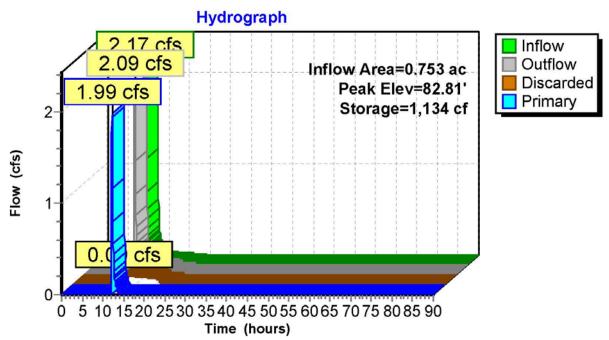
Primary OutFlow Max=1.89 cfs @ 12.22 hrs HW=82.81' TW=70.56' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Weir Controls 1.89 cfs @ 0.61 fps)

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

WinTR55 NOAA A 2 YEAR Rainfall=3.34" Printed 6/22/2020

Page 4





STIRES ASSOCIATES, P.A.

18051-current1-150 Pierce

WinTR55 NOAA A 10 YEAR Rainfall=5.01"

Prepared by Hewlett-Packard Company

Printed 6/22/2020

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 5

Summary for Pond BIO-2: Biobasin -East

 Inflow Area = Inflow Area = Inflow Depth = 3.58" for 10 YEAR event = 0.224 af

 Outflow = Inflow Depth = Inf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 82.84' @ 12.19 hrs Surf.Area= 2,574 sf Storage= 1,211 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 49.8 min (841.0 - 791.2)

Volume	Invert	Avail.Sto	rage Storag	ge Description	
#1	82.25'	1,60	33 cf Custo	om Stage Data (Prismatic)Listed below (Recalc)	
Elevation (fee	700	ırf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
82.2 83.0	90,	1,500 2,855	0 1,633	0 1,633	
Device	Routing	Invert	Outlet Device	ces	
#1 #2	Discarded Primary	82.25' 82.75'	50.0' long Head (feet) 4.50 5.00 5	lish) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65)

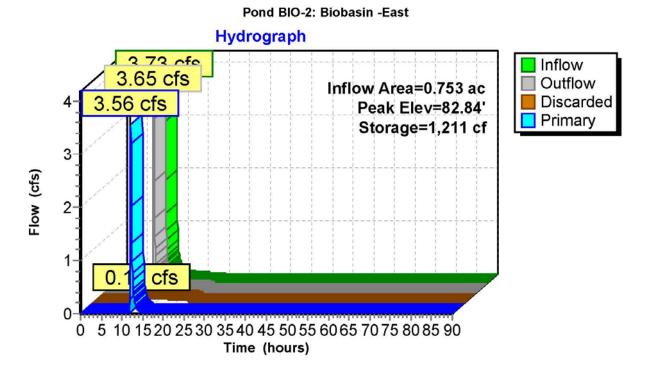
Discarded OutFlow Max=0.10 cfs @ 12.19 hrs HW=82.84' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=3.38 cfs @ 12.19 hrs HW=82.84' TW=71.50' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Weir Controls 3.38 cfs @ 0.74 fps)

WinTR55 NOAA A 10 YEAR Rainfall=5.01" Printed 6/22/2020

Page 6

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC



STIRES ASSOCIATES, P.A.

18051-current1-150 Pierce

WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Prepared by Hewlett-Packard Company

Printed 6/22/2020

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 7

Summary for Pond BIO-2: Biobasin -East

Inflow Area = 0.753 ac, 53.97% Impervious, Inflow Depth = 6.65" for 100 YEAR event
Inflow = 6.71 cfs @ 12.17 hrs, Volume= 0.417 af
Outflow = 6.54 cfs @ 12.18 hrs, Volume= 0.417 af, Atten= 3%, Lag= 0.8 min
Discarded = Primary = 6.44 cfs @ 12.18 hrs, Volume= 0.295 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 82.89' @ 12.18 hrs Surf.Area= 2,656 sf Storage= 1,330 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 39.7 min (818.4 - 778.7)

Volume	Invert	Avail.Sto	rage Storage	Description				
#1	82.25'	1,63	33 cf Custom	cf Custom Stage Data (Prismatic)Listed below (Recalc)				
Elevation (feet)	Su	rf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)				
82.25		1,500	0	0				
83.00		2,855	1,633	1,633				
#1 Di	outing iscarded rimary	Invert 82.25' 82.75'	50.0' long x 9 Head (feet) 0 4.50 5.00 5.5	sfiltration over 9.0' breadth Br 0.20 0.40 0.60 50 1) 2.46 2.55 2.	Surface area road-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 .70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65			

Discarded OutFlow Max=0.10 cfs @ 12.18 hrs HW=82.89' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.10 cfs)

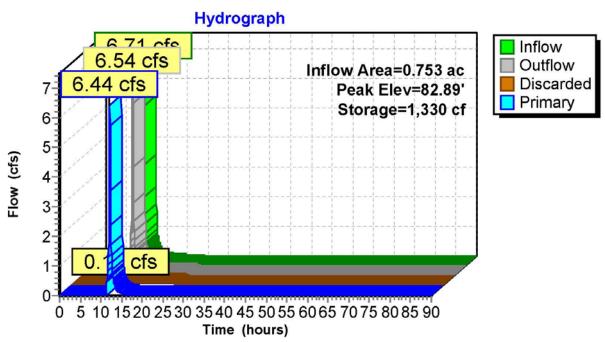
Primary OutFlow Max=6.18 cfs @ 12.18 hrs HW=82.89' TW=73.47' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Weir Controls 6.18 cfs @ 0.91 fps)

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

WinTR55 NOAA A 100 YEAR Rainfall=8.21" Printed 6/22/2020

Page 8

Pond BIO-2: Biobasin -East



C	T	I D	\mathbf{F}	C	Δ	C	C	\cap	C	ΙΔ	٦ ١	rE	' C	D .	Δ
L)		1 1	- 12		$\overline{}$.,		_	١ ١		, v	 г.,	_

5) Drainage Area for Bio Basin #3 (Pharmscript North)

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Printed 6/22/2020 Page 1

WinTR55 NOAA A 2 YEAR Rainfall=3.34"

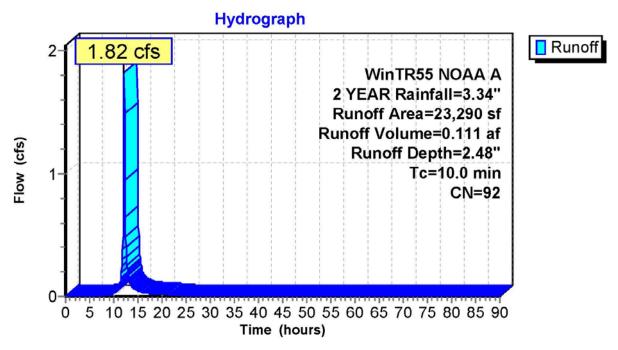
Summary for Subcatchment Pharma N: Pharma North

Runoff = 1.82 cfs @ 12.17 hrs, Volume= 0.111 af, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Area (sf)	CN	Description								
5,755	74	>75% Gras	P75% Grass cover, Good, HSG C							
17,535	98	Paved park	Paved parking, HSG C							
23,290	92	Weighted A	verage							
5,755		24.71% Per	rvious Area							
17,535		75.29% Imp	pervious Ar	ea						
Tc Length (min) (feet		The second secon	Capacity (cfs)	Description						
10.0				Direct Entry,						

Subcatchment Pharma N: Pharma North



WinTR55 NOAA A 10 YEAR Rainfall=5.01" Printed 6/22/2020

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Printed 6/22/2020 Page 2

Summary for Subcatchment Pharma N: Pharma North

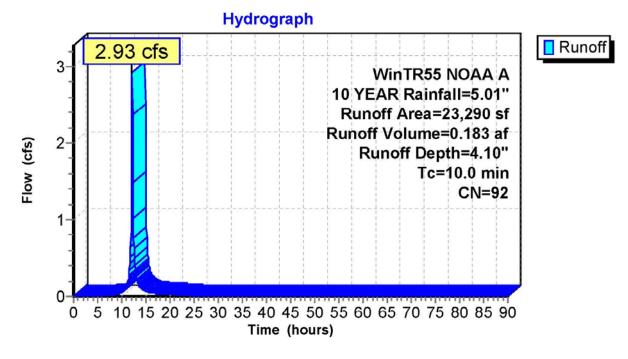
Runoff = 2.93 cfs @ 12.17 hrs, Volume=

0.183 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 10 YEAR Rainfall=5.01"

	Area (sf)) CN Description					
	5,755	74	>75% Gras				
17,535 98 Paved parking, HSG C							
	23,290 92 Weighted Average						
	5,755 24.71% Pervious Area						
	17,535 75.29% Impervious Area						
		01			D		
	Tc Length			Capacity	Description		
	(min) (feet)	(ft/1	ft) (ft/sec)	(cfs)			
	10.0				Direct Entry		

Subcatchment Pharma N: Pharma North



WinTR55 NOAA A 100 YEAR Rainfall=8.21" Printed 6/22/2020

Prepared by Hewlett-Packard Company

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 3

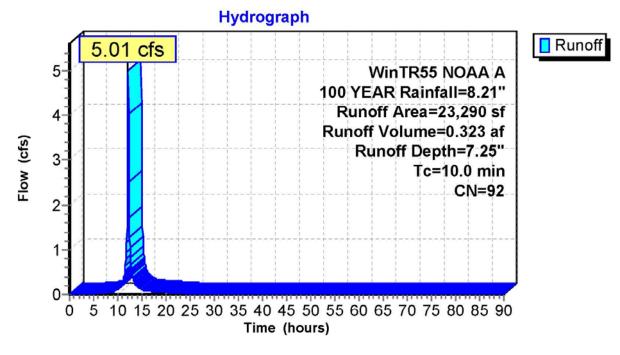
Summary for Subcatchment Pharma N: Pharma North

Runoff = 5.01 cfs @ 12.17 hrs, Volume= 0.323 af, Depth= 7.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs WinTR55 NOAA A 100 YEAR Rainfall=8.21"

_	Area (sf)	CN	Description						
	5,755	74	>75% Gras	s cover, Go	od, HSG C				
	17,535	98	Paved park	ing, HSG C					
23,290 92 Weighted Average									
5,755 24.71% Pervious Area									
	17,535		75.29% lm	pervious Ar	ea				
	T- 1	01		0	Description				
	Tc Length			Capacity	Description				
_	(min) (feet)	(ft/	ft) (ft/sec)	(cfs)					
	10.0				Direct Entry.				

Subcatchment Pharma N: Pharma North



6) Routing for Bio Basin North

18051-current1-150 Pierce

NJ DEP 2-hr 1-YR WATER QUALITY Rainfall=1.25"

Prepared by Hewlett-Packard Company

Printed 6/22/2020

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 1

Summary for Pond BIO-3: Biobasin -North

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 82.62' @ 1.41 hrs Surf.Area= 3,674 sf Storage= 417 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 15.8 min (95.1 - 79.3)

Volume	Invert	Avail.Sto	rage Storage D	Description		
#1	82.50'	1,9	56 cf Custom	Stage Data (Pi	rismatic)Listed below (Recalc)	
Elevation (fee		urf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		
82.5 83.0	1. No.	3,465 4,358	0 1,956	0 1,956		
Device	Routing	Invert	Outlet Devices			
#1	Discarded	82.50'	3.100 in/hr Ext	filtration over	Surface area	
#2	Primary	82.75	100.0' long x 2.0' breadth Broad-Crested Rectangular Weir			
			, ,		0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32	

Discarded OutFlow Max=0.26 cfs @ 1.41 hrs HW=82.62' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=82.50' TW=68.90' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

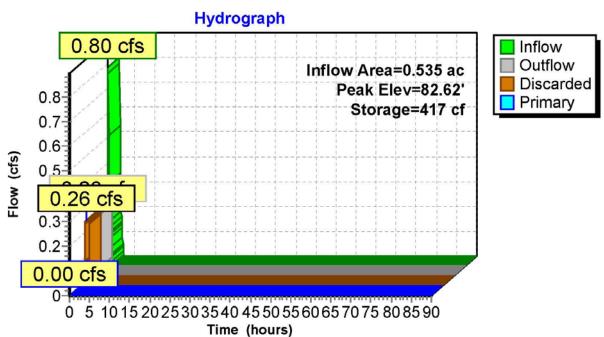
NJ DEP 2-hr 1-YR WATER QUALITY Rainfall=1.25"

Printed 6/22/2020

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 2





18051-current1-150 Pierce

WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Prepared by Hewlett-Packard Company

Printed 6/22/2020

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 3

Summary for Pond BIO-3: Biobasin -North

 Inflow Area =
 0.535 ac, 75.29% Impervious, Inflow Depth = 2.48" for 2 YEAR event

 Inflow =
 1.82 cfs @ 12.17 hrs, Volume=
 0.111 af

 Outflow =
 1.47 cfs @ 12.27 hrs, Volume=
 0.111 af, Atten= 20%, Lag= 5.7 min

 Discarded =
 0.28 cfs @ 12.27 hrs, Volume=
 0.092 af

 Primary =
 1.18 cfs @ 12.27 hrs, Volume=
 0.019 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 82.78' @ 12.27 hrs Surf.Area= 3,970 sf Storage= 1,052 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 19.6 min (807.2 - 787.6)

Volume	Invert	Avail.Sto	rage Storage D	escription		
#1	82.50'	1,95	56 cf Custom S	tage Data (Pi	rismatic)Listed below (Recalc)	
Elevation (fee 82.5 83.0	et) 50	urf.Area (sq-ft) 3,465 4,358	Inc.Store (cubic-feet) 0 1,956	Cum.Store (cubic-feet) 0 1,956		
Device	Routing	Invert	Outlet Devices			
#1	Discarded	82.50'	3.100 in/hr Exfi	Itration over	Surface area	
#2	Primary	mary 82.75' 100.		100.0' long x 2.0' breadth Broad-Crested Rectangular Weir		
			, ,		0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50	
			Coer. (Enalish)	2.34 2.61 2.	61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32	

Discarded OutFlow Max=0.28 cfs @ 12.27 hrs HW=82.77' (Free Discharge) 12-Exfiltration (Exfiltration Controls 0.28 cfs)

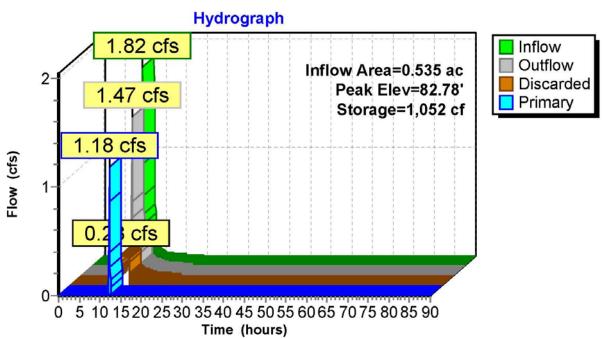
Primary OutFlow Max=1.03 cfs @ 12.27 hrs HW=82.78' TW=70.74' (Dynamic Tailwater)
—2=Broad-Crested Rectangular Weir (Weir Controls 1.03 cfs @ 0.41 fps)

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

WinTR55 NOAA A 2 YEAR Rainfall=3.34" Printed 6/22/2020

Page 4

Pond BIO-3: Biobasin -North



18051-current1-150 Pierce

WinTR55 NOAA A 10 YEAR Rainfall=5.01"

Prepared by Hewlett-Packard Company

Printed 6/22/2020

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 5

Summary for Pond BIO-3: Biobasin -North

 Inflow Area =
 0.535 ac, 75.29% Impervious, Inflow Depth = 4.10" for 10 YEAR event

 Inflow =
 2.93 cfs @ 12.17 hrs, Volume=
 0.183 af

 Outflow =
 3.38 cfs @ 12.18 hrs, Volume=
 0.183 af, Atten= 0%, Lag= 0.6 min

 Discarded =
 0.29 cfs @ 12.18 hrs, Volume=
 0.123 af

 Primary =
 3.09 cfs @ 12.18 hrs, Volume=
 0.060 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 82.80' @ 12.18 hrs Surf.Area= 4,007 sf Storage= 1,135 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 16.1 min (793.7 - 777.6)

Volume	Invert	Avail.Sto	rage Storage De	escription		
#1	82.50'	1,95	56 cf Custom S	tage Data (Pi	rismatic)Listed below (Recalc)	
Elevatio (fee 82.5 83.0	et) 50	urf.Area (sq-ft) 3,465 4,358	Inc.Store (cubic-feet) 0 1,956	Cum.Store (cubic-feet) 0 1,956		
Device	Routing	Invert	Outlet Devices			
#1	Discarded	82.50'	3.100 in/hr Exfi	Itration over	Surface area	
#2	Primary	mary 82.75' 100		100.0' long x 2.0' breadth Broad-Crested Rectangular Weir		
			, ,		0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50	
			Coef. (English)	2.54 2.61 2.	61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32	

Discarded OutFlow Max=0.29 cfs @ 12.18 hrs HW=82.80' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)

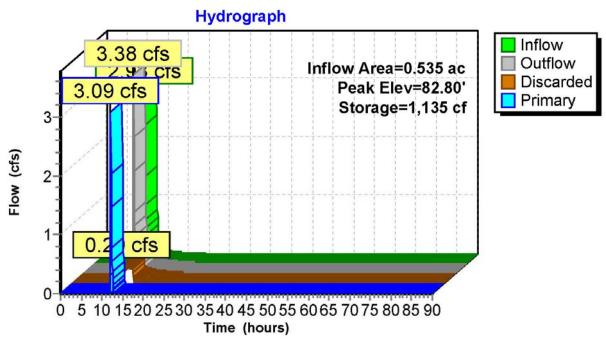
Primary OutFlow Max=2.75 cfs @ 12.18 hrs HW=82.80' TW=71.46' (Dynamic Tailwater)
—2=Broad-Crested Rectangular Weir (Weir Controls 2.75 cfs @ 0.56 fps)

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

WinTR55 NOAA A 10 YEAR Rainfall=5.01" Printed 6/22/2020

Page 6





18051-current1-150 Pierce

WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Prepared by Hewlett-Packard Company

Printed 6/22/2020

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Page 7

Summary for Pond BIO-3: Biobasin -North

 Inflow Area =
 0.535 ac, 75.29% Impervious, Inflow Depth = 7.25" for 100 YEAR event

 Inflow =
 5.01 cfs @ 12.17 hrs, Volume=
 0.323 af

 Outflow =
 4.88 cfs @ 12.18 hrs, Volume=
 0.323 af, Atten= 2%, Lag= 0.8 min

 Discarded =
 0.29 cfs @ 12.18 hrs, Volume=
 0.173 af

 Primary =
 4.60 cfs @ 12.18 hrs, Volume=
 0.150 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs Peak Elev= 82.82' @ 12.18 hrs Surf.Area= 4,035 sf Storage= 1,196 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 13.2 min (779.8 - 766.6)

Volume	Invert	Avail.Sto	rage Storage D	escription		
#1	82.50'	1,95	56 cf Custom S	tage Data (Pi	rismatic)Listed below (Recalc)	
Elevation (fee 82.5 83.0	et) 50	urf.Area (sq-ft) 3,465 4,358	Inc.Store (cubic-feet) 0 1,956	Cum.Store (cubic-feet) 0 1,956		
Device	Routing	Invert	Outlet Devices			
#1	Discarded	82.50'	3.100 in/hr Exfi	Itration over	Surface area	
#2	Primary	mary 82.75' 100.		100.0' long x 2.0' breadth Broad-Crested Rectangular Weir		
			, ,		0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50	
			Coer. (Enalish)	2.34 2.61 2.	61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32	

Discarded OutFlow Max=0.29 cfs @ 12.18 hrs HW=82.82' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)

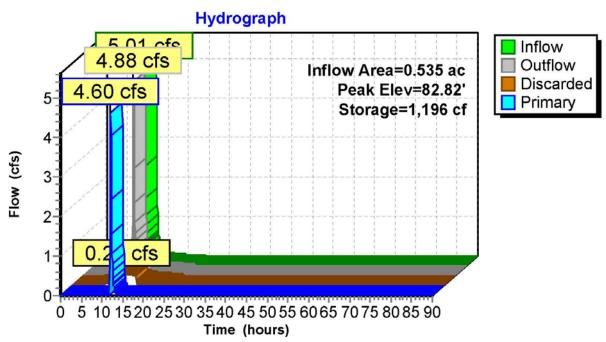
Primary OutFlow Max=4.40 cfs @ 12.18 hrs HW=82.82' TW=73.46' (Dynamic Tailwater)
—2=Broad-Crested Rectangular Weir (Weir Controls 4.40 cfs @ 0.66 fps)

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

WinTR55 NOAA A 100 YEAR Rainfall=8.21" Printed 6/22/2020

Page 8

Pond BIO-3: Biobasin -North



7) Routing for Basin #1

WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Prepared by Hewlett-Packard Company

HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

Printed 6/22/2020 Page 1

Summary for Pond Basin #1: Pond #1

25.667 ac, 50.42% Impervious, Inflow Depth = 1.52" for 2 YEAR event Inflow Area = 29.96 cfs @ 12.51 hrs, Volume= 3.253 af Inflow = 0.68 cfs @ 19.66 hrs, Volume= 0.68 cfs @ 19.66 hrs, Volume= 0.00 cfs @ 0.00 hrs, Volume= 2.397 af, Atten= 98%, Lag= 428.8 min Outflow = 2.397 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= 74.25' @ 19.66 hrs Surf.Area= 45,344 sf Storage= 117,941 cf

Plug-Flow detention time= 2,002.1 min calculated for 2.395 af (74% of inflow)

Center-of-Mass det. time= 1,927.4 min (2,766.2 - 838.8)

Volume	Invert	Avail.Sto	rage St	age Description		
#1	68.90'			tom Stage Data (Prismatic)Listed below (Recal	c)	
					-7	
Elevation	on S	Surf.Area		e Cum.Store		
(fee	et)	(sq-ft)) (cubic-feet)		
68.9	90	0		0		
70.0	00	9,148	5,0	1 5,031		
71.0		21,344	15,2			
72.0		25,700	23,5	of 1		
73.0		30,492	28,0			
74.0		40,075	35,2			
75.0		60,984		0 157,708		
76.0		70,132		3 223,266		
77.0	Le Tres	79,715	74,9	3 1370, 5, 10, 10, 11		
78.0	00	89,298	84,5	7 382,696		
Device	Routing	Invert	Outlet D	vices		
#1	Device 6	68.90'	2.5" Ve	Orifice/Grate C= 0.600		
#2	Device 6	74.00'		24.0" H Vert. Orifice/Grate C= 0.600		
#3	Device 6	76.00'	60.0" W	12.0" H Vert. Orifice/Grate C= 0.600		
#4	Device 6	76.00'	54.0" W	12.0" H Vert. Orifice/Grate C= 0.600		
#5	Device 6	76.00'	54.0" W	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 / O	let Invert= 68.80' / 66.53' S= 0.0264 '/' Cc= 0.9	900 n= 0.011, Flow Area= 7.07 sf	
#7	Secondary	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. (E	glish) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.6	64	

Primary OutFlow Max=0.68 cfs @ 19.66 hrs HW=74.25' (Free Discharge)

6=Culvert (Passes 0.68 cfs of 67.66 cfs potential flow)

-1=Orifice/Grate (Orifice Controls 0.38 cfs @ 11.03 fps) -2=Orifice/Grate (Orifice Controls 0.30 cfs @ 1.61 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)

18051-current1-150 Pierce
Prepared by Hewlett-Packard Com

Prepared by Hewlett-Packard Company
HydroCAD® 10.00-13 s/n 08236 © 2014 HydroCAD Software Solutions LLC

WinTR55 NOAA A 2 YEAR Rainfall=3.34" Printed 6/22/2020

Page 2

