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Area Listing (selected nodes)

Are	a CN	Description
(acres	3)	(subcatchment-numbers)
0.89	4 40	>75% Grass cover, Good, HSG A (25S, 30S)
7.94	1 61	>75% Grass cover, Good, HSG B (22S, 25S, 29S, 32S, 33S, 37S, 41S, 42S)
3.05	7 74	>75% Grass cover, Good, HSG C (20S, 22S)
22.91	9 98	Paved parking & roofs (11S, 20S, 22S, 25S, 29S, 30S, 32S, 33S, 37S, 41S, 42S)
34.81	1 86	TOTAL AREA

Summary for Subcatchment 11S: SEEPAGE BED #5A (BMP #7)

Runoff = 28.13 cfs @ 11.96 hrs, Volume= 1.585 af, Depth= 3.13" Routed to Pond 9P : seepage pit with chambers #5A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"



Runoff = 36.14 cfs @ 11.96 hrs, Volume= 2.037 af, Depth= 3.13" Routed to Pond 14P : seepage pit with chambers #5F

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

Area	(ac)	CN	Desc	cription						
7.	808	98	Pave	Paved parking & roofs						
0.	009	74	>75%	75% Grass cover, Good, HSG C						
7.	7.817 98 Weighted Average									
0.	009		0.12	% Perviou	s Ārea					
7.	808		99.88	8% Imperv	vious Area					
Та	المعمد	-la (Clana	Valacity	Consolt	Description				
	Leng	in R	Slope	velocity	Capacity	Description				
(min)	(tee	t)	(11/11)	(IT/sec)	(CIS)					
6.0						Direct Entry,				

Subcatchment 20S: SEEPAGE BED #5F (BMP 6)



Runoff	=	9.76 cfs @	11.98 hrs, V	/olume=	0.470 af,	Depth=	1.14"
Route	d to Por	nd 8P : BIO-RE	TENTION BA	ASIN #5A	(POI 001)	-	

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

Area (ac)	CN	Desc	ription		
1.1	186	61	>75%	Grass co	over, Good,	, HSG B
3.0)48	74	>75%	Grass co	over, Good,	, HSG C
0.6	695	98	Pave	d parking	& roofs	
4.9	929	74	Weig	hted Aver	age	
4.2	4.234 85.90% Pervious Area					
0.6	695		14.10)% Imperv	vious Area	
Тс	Leng	th S	Slope	Velocity	Capacity	Description
(min)	(fee	et)	<u>(ft/ft)</u>	(ft/sec)	(cfs)	
6.0						Direct Entry, 6 minute min

Subcatchment 22S: SUB BASIN-5A (BMP 8)



Summary for Subcatchment 25S: BIO-RETENTION BASIN #6A (BMP 5)

Runoff = 4.08 cfs @ 11.98 hrs, Volume= Routed to Pond 24P : bio-retention basin #6a 0.196 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

	Area (ac)) CN	Desc	ription		
	1.119	98	Pave	d parking	& roofs	
*	0.665	6 40	>75%	6 Grass co	over, Good,	, HSG A
	0.169	61	>75%	6 Grass co	over, Good,	, HSG B
	1.953	5 75	Weig	hted Aver	age	
	0.834	ŀ	42.70	0% Pervio	us Area	
	1.119)	57.30	0% Imperv	vious Area	
	- .		~ .		A	
	IC Le	ngth S	Slope	Velocity	Capacity	Description
	(min) (feet)	(ft/ft)	(ft/sec)	(cfs)	
	6.0					Direct Entry,

Subcatchment 25S: BIO-RETENTION BASIN #6A (BMP 5)



Summary for Subcatchment 29S: SWL #1

Runoff = 3.25 cfs @ 12.07 hrs, Volume= 0.212 af, Depth= 1.14" Routed to Reach 26R : SWL-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

Area (ac)	CN	Desc	Description							
0.765	98	Pave	ed parking	& roofs						
1.461	61	>75%	6 Grass co	over, Good,	, HSG B					
2.226 74 Weighted Average										
1.461		65.6	3% Pervio	us Area						
0.765		34.3	7% Imperv	ious Area						
Tc Len	gth	Slope	Velocity	Capacity	Description					
(min) (fe	et)	(ft/ft)	(ft/sec)	(cfs)						
10.2 1	50 0	0.0400	0.24		Sheet Flow,					
					Grass: Short n= 0.150 P2= 3.23"					
4.1 7	′32 (0.0400	3.00		Shallow Concentrated Flow,					
					Grassed Waterway Kv= 15.0 fps					
14.3 8	382 7	Fotal								

Subcatchment 29S: SWL #1



Runoff = 3.38 cfs @ 11.97 hrs, Volume= 0.165 af, Depth= 1.89" Routed to Reach 27R : SWL-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

	Area	(ac)	CN	Desc	ription		
	0.	814	98	Pave	d parking	& roofs	
*	0.	229	40	>75%	6 Grass co	over, Good,	HSG A
	1.	043	85	Weig	hted Aver	age	
	0.	229		21.96	6% Pervio	us Area	
	0.814 78.04% Impervious Area					rious Area	
	_					-	
	Tc	Lengt	h S	Slope	Velocity	Capacity	Description
	<u>(min)</u>	(feet	t)	<u>(ft/ft)</u>	(ft/sec)	(cfs)	
	6.0						Direct Entry,
							-

Subcatchment 30S: SWL #2



Summary for Subcatchment 32S: SWL #3

Runoff = 4.19 cfs @ 12.07 hrs, Volume= 0.272 af, Depth= 0.98" Routed to Reach 28R : SWL-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

Area (ac)	CN	Desc	Description							
0.930	98	Pave	ed parking	& roofs						
2.420	61	>75%	6 Grass co	over, Good,	, HSG B					
3.350	71	Weig	ghted Aver	age						
2.420		72.2	4% Pervio	us Area						
0.930		27.7	6% Imperv	ious Area						
Tc Leng	jth ያ	Slope	Velocity	Capacity	Description					
(min) (fee	et)	(ft/ft)	(ft/sec)	(cfs)						
10.2 1	50 0.	.0400	0.24		Sheet Flow,					
					Grass: Short n= 0.150 P2= 3.23"					
3.2 5	75 0.	.0400	3.00		Shallow Concentrated Flow,					
					Grassed Waterway Kv= 15.0 fps					
13.4 7	25 T	otal								

Subcatchment 32S: SWL #3



Summary for Subcatchment 33S: BIO-RETENTION BASIN #1A (BMP#1)

Runoff = 9.90 cfs @ 11.97 hrs, Volume= Routed to Pond 29P : bio-retention basin #1A 0.483 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

 Area (a	ac)	CN	Desc	ription		
1.9	78	98	Pave	d parking	& roofs	
 1.0	78	61	>75%	6 Grass co	over, Good,	HSG B
3.0	56	85	Weig	hted Aver	age	
1.0	78		35.27	7% Pervio		
1.9	78		64.73	3% Imperv	ious Area	
_		_				–
IC	Length	ຸ ຣ	slope	Velocity	Capacity	Description
 (min)	(feet)	<u>(ft/ft)</u>	(ft/sec)	(cfs)	
6.0						Direct Entry,

Subcatchment 33S: BIO-RETENTION BASIN #1A (BMP#1)



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Summary for Subcatchment 37S: BIO-RETENTION BASIN #2A (BMP #2)

Runoff = 4.98 cfs @ 11.97 hrs, Volume= Routed to Pond 38P : bio-retention basin #2A 0.243 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

 Area (ac)	CN	Desc	ription		
1.0	800	98	Pave	d parking	& roofs	
 0.5	529	61	>75%	6 Grass co	over, Good,	HSG B
1.5	537	85	Weig	hted Aver	age	
0.5	529		34.42	2% Pervio	us Area	
1.0	800		65.58	3% Imperv	vious Area	
-		_			A	
IC	Length	ຸ ຣ	slope	Velocity	Capacity	Description
 (min)	(feet)	<u>(ft/ft)</u>	(ft/sec)	(cfs)	
6.0						Direct Entry,

Subcatchment 37S: BIO-RETENTION BASIN #2A (BMP #2)



Summary for Subcatchment 41S: BIO-RETENTION BASIN #2C (BMP #3)

Runoff = 5.68 cfs @ 11.97 hrs, Volume= Routed to Pond 40P : bio-retention basin #2C 0.276 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

Area	(ac)	CN	Desc	ription		
1.	120	98	Pave	d parking	& roofs	
0.	704	61	>75%	6 Grass co	over, Good,	, HSG B
1.	824	84	Weig	hted Aver	age	
0.	704		38.60)% Pervio	us Area	
1.	120		61.40)% Imperv	vious Area	
Та	ا م م م ا	ь с		Volocity	Consolt	Description
IC (mim)	Lengi	n c	Siope		Capacity	Description
<u>(min)</u>	(iee	ι)	(11/11)	(It/sec)	(CIS)	
6.0						Direct Entry,

Subcatchment 41S: BIO-RETENTION BASIN #2C (BMP #3)



Runoff = 2.97 cfs @ 11.97 hrs, Volume= Routed to Pond 39P : bio-retention basin #2B 0.144 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=3.36"

 Area (a	c) (CN	Desc	ription		
0.59	98	98	Pave	d parking	& roofs	
 0.39	94	61	>75%	6 Grass co	over, Good,	, HSG B
0.99	92	83	Weig	hted Aver	age	
0.39	94		39.72	2% Pervio	us Area	
0.59	98		60.28	3% Imperv	vious Area	
Tc L	ength	S	lope	Velocity	Capacity	Description
 <u>(min)</u>	(feet)	([ft/ft]	(ft/sec)	(cfs)	
6.0						Direct Entry,
						-

Subcatchment 42S: BIO-RETENTION BASIN #2B (BMP #4)



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Summary for Reach 26R: SWL-1

 Inflow Area =
 9.635 ac, 56.76% Impervious, Inflow Depth >
 1.68" for 2-Year event

 Inflow =
 5.18 cfs @
 12.09 hrs, Volume=
 1.346 af

 Outflow =
 5.18 cfs @
 12.09 hrs, Volume=
 1.346 af, Atten= 0%, Lag= 0.0 min

 Routed to Reach 28R : SWL-3
 SWL-3
 1.346 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 26R: SWL-1

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Summary for Reach 27R: SWL-2

Inflow Area = 2.996 ac, 64.52% Impervious, Inflow Depth = 1.44" for 2-Year event

 3.71 cfs @
 11.98 hrs, Volume=
 0.360 af

 3.71 cfs @
 11.98 hrs, Volume=
 0.360 af, Atten= 0%, Lag= 0.0 min

 Inflow = Outflow = Routed to Reach 28R : SWL-3

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 27R: SWL-2

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Summary for Reach 28R: SWL-3

 Inflow Area =
 15.981 ac, 52.14% Impervious, Inflow Depth >
 1.49" for 2-Year event

 Inflow =
 11.69 cfs @
 12.04 hrs, Volume=
 1.979 af

 Outflow =
 11.69 cfs @
 12.04 hrs, Volume=
 1.979 af, Atten= 0%, Lag= 0.0 min

 Routed to Pond 8P : BIO-RETENTION BASIN #5A
 (POI 001)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 28R: SWL-3

Summary for Pond 8P: BIO-RETENTION BASIN #5A (POI 001)

Inflow Area	a =	34.811 ac, 6	5.84% Impe	ervious,	Inflow	Depth >	0.8	4" foi	⁻ 2-Ye	ar event	
Inflow	=	20.54 cfs @	12.00 hrs,	Volume	=	2.449	af				
Outflow	=	1.47 cfs @	17.13 hrs,	Volume	=	2.449	af, J	Atten=	93%,	Lag= 307	7.8 min
Discarded	=	1.47 cfs @	17.13 hrs,	Volume	=	2.449	af			•	
Primary	=	0.00 cfs @	0.00 hrs,	Volume	=	0.000	af				
Routed	to Link	37L : Dischar	ge 001								

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,868.49' @ 17.13 hrs Surf.Area= 81,393 sf Storage= 39,504 cf

Plug-Flow detention time= 300.3 min calculated for 2.449 af (100% of inflow) Center-of-Mass det. time= 299.8 min (1,329.5 - 1,029.7)

Volume	Inver	t Avail.Stor	rage Storage	e Description	
#1	1,868.00	560,09	97 cf Custom	n Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Elevation Surf.Area (feet) (sq-ft)		Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,868.00 1,869.00 1,870.00 1,872.00 1,874.00		79,525 83,329 88,249 98,164 108,304	0 81,427 85,789 186,413 206,468	0 81,427 167,216 353,629 560,097	
Device F	Routing	Invert	Outlet Device	es	
#1 F	Primary	1,865.00'	42.0" Round L= 30.0' Box Inlet / Outlet I n= 0.013 Cor	d Culvert x, headwall w/3 square edges, Ke= 0.500 Invert= 1,865.00' / 1,864.50' S= 0.0167 '/' Cc= 0.900 vrugated PE_smooth interior_Flow Area= 9.62 sf	
#2 [Device 1	1,869.10'	20.0" W x 12. Limited to we	 H Vert. Orifice/Grate X 4.00 C= 0.600	
#3 E	Device 1	1,870.50'	72.0" x 24.0"	'Horiz. Orifice/Grate C= 0.600	
#4 C	Discarded	1,868.00'	0.780 in/hr Ex	Exfiltration over Surface area	

Discarded OutFlow Max=1.47 cfs @ 17.13 hrs HW=1,868.49' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 1.47 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,868.00' (Free Discharge)

-1=Culvert (Passes 0.00 cfs of 45.69 cfs potential flow)

-2=Orifice/Grate (Controls 0.00 cfs)

3=Orifice/Grate (Controls 0.00 cfs)



Pond 8P: BIO-RETENTION BASIN #5A (POI 001)

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Inflow Area = 6.084 ac,100.00% Impervious, Inflow Depth = 3.13" for 2-Year event 28.13 cfs @ 11.96 hrs, Volume= Inflow = 1.585 af Outflow = 1.28 cfs @ 11.10 hrs, Volume= 1.585 af, Atten= 95%, Lag= 0.0 min Discarded = 1.28 cfs @ 11.10 hrs, Volume= 1.585 af Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,877.13' @ 13.07 hrs Surf.Area= 42,456 sf Storage= 30,702 cf

Plug-Flow detention time= 188.2 min calculated for 1.584 af (100% of inflow) Center-of-Mass det. time= 188.0 min (939.5 - 751.5)

Volume	Invert	t Avail.Sto	rage St	torage D	escription	
#1	1,876.00	' 40,5	38 cf C	ustom S	tage Data (Pr	smatic) Listed below (Recalc)
			16	69,824 ct	f Overall - 68,4	78 cf Embedded = 101,346 cf x 40.0% Voids
#2	1,876.50	68,4	78 cf C	ultec R-3	360HD x 1862	Inside #1
			E	ffective S	Size= 54.9"W >	(36.0"H => 9.99 sf x 3.67'L = 36.6 cf
			0	verall Siz	ze= 60.0"W x 3	36.0"H x 4.17'L with 0.50' Overlap
			18	362 Char	mbers in 19 Ro	DWS
			C	ap Stora	ge= 6.5 cf x 2	x 19 rows = 245.5 cf
		109,0	16 cf To	otal Avai	lable Storage	
Elevatio	n S	urf.Area	Inc.St	ore	Cum.Store	
(fee	t)	(sq-ft)	(cubic-fe	eet)	(cubic-feet)	
1,876.0	0	42,456		0	0	
1,880.0	0	42,456	169,8	324	169,824	
Device	Routing	Invert	Outlet I	Devices		
#1	Primary	1,876.00'	24.0" I	Round C	ulvert	
	5		L= 120	.0' CPP	, mitered to co	nform to fill, Ke= 0.700
			Inlet / C	Outlet Inv	ert= 1,876.00'	/ 1,868.00' S= 0.0667 '/' Cc= 0.900
			n= 0.01	3 Corru	gated PE, smo	both interior, Flow Area= 3.14 sf
#2	Device 1	1,877.80'	12.0" V	V x 6.0"	H Vert. Orifice	/Grate C= 0.600
			Limited	to weir f	flow at low hea	ds
#3	Discarded	1,876.00'	1.300 i	n/hr Exfi	Itration over S	Surface area
Discarde	ed OutFlow filtration (E	/ Max=1.28 c Exfiltration Co	fs @ 11.1 ntrols 1.2	0 hrs H 8 cfs)	W=1,876.04'	(Free Discharge)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,876.00' TW=1,869.56' (Fixed TW Elev= 1,869.56') 1=Culvert (Controls 0.00 cfs) 2=Orifice/Grate (Controls 0.00 cfs)



Summary for Pond 14P: seepage pit with chambers #5F

Inflow Area	a =	7.817 ac,	99.88% Imperviou	s, Inflow De	epth = 🔅	3.13" fo	r 2-Ye	ar event
Inflow	=	36.14 cfs @	11.96 hrs, Volur	ne=	2.037 a	f		
Outflow	=	2.24 cfs @	11.40 hrs, Volur	ne=	2.037 a	f, Atten=	94%,	Lag= 0.0 min
Discarded	=	2.24 cfs @	11.40 hrs, Volur	ne=	2.037 a	f		-
Primary	=	0.00 cfs @	0.00 hrs, Volur	ne=	0.000 a	f		
Routed	to Ponc	1 8P : BIO-R	ETENTION BASIN	l#5A (PC	OI 001)			

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,869.53' @ 12.65 hrs Surf.Area= 56,925 sf Storage= 35,756 cf

Plug-Flow detention time= 114.0 min calculated for 2.037 af (100% of inflow) Center-of-Mass det. time= 113.9 min (865.4 - 751.5)

Volume	Invert	Avail.Sto	rage	Storage D	escription	
#1	1,868.50'	56,16	50 cf	Custom S	tage Data (Pi	ismatic) Listed below (Recalc)
	4 000 001	07.07		227,700 ct	f Overall - 87,	300 cf Embedded = 140,400 cf x 40.0% Voids
#2	#2 1,869.00' 87,300 cf		JU CT	Cultec R-	360HD x 23/0	o Inside #1
					512e = 54.9 VV	X 30.0 Π -> 9.99 SI X 3.07 L - 30.0 Cl 36 0"H x / 17"L with 0 50' Overlap
				2376 Chai	mbers in 18 R	ows
				Cap Stora	ge= 6.5 cf x 2	x 18 rows = 232.6 cf
		143,46	60 cf	Total Avai	lable Storage	
Elevatio	on Su	urf.Area	Inc.	Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic	-feet)	(cubic-feet)	
1,868.5	50	56,925		0	0	
1,872.5	50	56,925	22	7,700	227,700	
Device	Routing	Invert	Outle	t Devices		
#1	Primary	1,869.50'	24.0'	' Round C	ulvert	
			L= 60).0' CPP,	mitered to co	nform to fill, Ke= 0.700
			Inlet	/ Outlet Inv	ert= 1,869.50	'/ 1,868.00' S= 0.0250 '/' Cc= 0.900
#2	Dovice 1	1 970 00'	n= 0.		gated PE, sm	ooth interior, Flow Area = 3.14 st
#2	Device I	1,070.00	I imit	ed to weir f	flow at low he	ads
#3	Discarded	1,868.50'	1.700) in/hr Exfi	Itration over	Surface area
Discard	ed OutFlow	Max=2.24 cf	s @ 1 [.]	1.40 hrs H	W=1,868.54'	(Free Discharge)

3=Exfiltration (Exfiltration Controls 2.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,868.50' TW=1,869.56' (Fixed TW Elev= 1,869.56') 1=Culvert (Controls 0.00 cfs) 2=Orifice/Grate (Controls 0.00 cfs)



Pond 14P: seepage pit with chambers #5F

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Inflow Are Inflow Outflow Primary Routed	ea = = = = d to Reac	1.953 ac, 57.3 4.08 cfs @ 11 0.53 cfs @ 12 0.53 cfs @ 12 h 27R : SWL-2	30% Impervious, .98 hrs, Volume 2.35 hrs, Volume 2.35 hrs, Volume	Inflow Der = (= (= (pth = 1.2 0.196 af 0.196 af, 0.196 af	0" for 2-Year event Atten= 87%, Lag= 22.1 min
Routing by Peak Elev	y Stor-Ind /= 1,922.5	l method, Time 57' @ 12.35 hrs	Span= 0.00-72.0 Surf.Area= 6,1)0 hrs, dt= (96 sf Stor	0.05 hrs ⁻ age= 3,34	l3 cf
Plug-Flow Center-of-	/ detentior -Mass def	n time= 161.9 m t. time= 163.0 m t. Avail Stor	hin calculated for hin (1,015.6 - 85 age _ Storage D	0.196 af (1 2.5)	100% of in	flow)
#1	1 022 00	1 Avail.0101	age Storage D	tage Data	(Driemati	c) Listed below (Pecalc)
#1	1,922.00	51,55		lage Dala	(FIISIIIau	C) Listed below (Recald)
Elevation	1 5	Surf.Area	Inc.Store	Cum.Sto	ore	
(feet))	(sq-ft)	(cubic-feet)	(cubic-fee	et)	
1,922.00)	5,567	0		0	
1,924.00)	7,781	13,348	13,34	48	
1,926.00)	10,223	18,004	31,38	52	
Device I	Routing	Invert	Outlet Devices			
#1	Primary Device 1	1,922.00' 1.922.00'	24.0" Round C L= 50.0' CPP, Inlet / Outlet Inv n= 0.013 Corru 6.0" Vert. Orific	ulvert mitered to /ert= 1,922 ugated PE, ce/Grate	conform to .00' / 1,920 smooth in C= 0.600	o fill, Ke= 0.700 0.25' S= 0.0350 '/' Cc= 0.900 terior, Flow Area= 3.14 sf Limited to weir flow at low heads
#3 I	Device 1	1,924.50'	45.0" x 24.0" He Limited to weir f	oriz. Orific flow at low	e/Grate heads	C= 0.600
Primary C	DutFlow	Max=0.53 cfs @	0 12.35 hrs HW:	=1,922.57'	(Free Di	scharge)

-1=Culvert (Passes 0.53 cfs of 1.66 cfs potential flow) -2=Orifice/Grate (Orifice Controls 0.53 cfs @ 2.72 fps) -3=Orifice/Grate (Controls 0.00 cfs)



Pond 24P: bio-retention basin #6a

Summary for Pond 29P: bio-retention basin #1A

Inflow Are	ea =	3.056 ac, 64.7	'3% Impervious,	Inflow Depth	= 1.89"	for 2-Year event
Innow	=		.97 nrs, volume	<i>;</i> = 0.4	83 al	
Outflow	=	0.70 cfs @ 12	.65 hrs, Volume)= 0.4	78 af, Atte	en= 93%, Lag= 40.7 min
Primary	=	0.70 cfs @ 12	2.65 hrs, Volume)= 0.4	78 af	
Route	d to Pond	38P : bio-retent	tion basin #2A			
	o, , ,	0 L T	o o o 7 0 o			
Routing b	by Stor-Ind		Span= 0.00-72.0	10 nrs, dt = 0.0	5 nrs	
Peak Ele	v= 1,938.8	0'@12.65 hrs	Surf.Area= 14,	784 sf Stora	ge= 10,970	U cf
Plug-Flow	v detentior	time- 201 / m	in calculated for	0 477 of (00%	6 of inflow)
Center_of	-Mass dat	time= 294.4 m	111 calculated 101	0.477 al (337 20 8))
Center-O		. ume= 230.0 m	iiii (1,110.9 - 02	0.0)		
Volume	Inver	t Avail.Stor	age Storage D	escription		
#1	1,938.00	' 72,33	4 cf Custom S	stage Data (Pr	rismatic) ∟	isted below (Recalc)
Elevatior	n S	Surf.Area	Inc.Store	Cum.Store		
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)		
1,938.00)	12,620	0	0		
1.940.00)	18.027	30.647	30.647		
1,942.00)	23,660	41,687	72,334		
,		,	,	,		
Device	Routing	Invert	Outlet Devices			
#1	Primary	1,936.00'	24.0" Round C	ulvert		
	2		L= 85.0' CPP,	mitered to co	nform to fil	ll, Ke= 0.700
			Inlet / Outlet Inv	/ert= 1 936 00	/ / 1 934 00	0' S = 0.0235 '/' Cc = 0.900
			n=0.013 Corru	idated PE sm	ooth interi	or Flow Area= 3.14 sf
#2	Device 1	1 038 00'	6 0" Vort Orific	co/Grato C-		mited to weir flow at low heads
#2 #2	Device 1	1,930.00				
#3	Device I	1,940.50		flave at lave ha		0.000
			Limited to well 1	now at low nea	aus	

Primary OutFlow Max=0.70 cfs @ 12.65 hrs HW=1,938.80' TW=1,936.57' (Fixed TW Elev= 1,936.57') **1=Culvert** (Passes 0.70 cfs of 17.91 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.70 cfs @ 3.57 fps)

-3=Orifice/Grate (Controls 0.00 cfs)



Pond 29P: bio-retention basin #1A

Summary for Pond 38P: bio-retention basin #2A

Inflow Area Inflow Outflow Primary Routed	a = = = to Pond	4.593 ac, 65.0 5.48 cfs @ 11 0.88 cfs @ 13 0.88 cfs @ 13 40P : bio-reten	01% Impervious, 1.97 hrs, Volume 3.59 hrs, Volume 3.59 hrs, Volume tion basin #2C	Inflow Dept = 0. = 0. = 0.	h > 1.88" 720 af 720 af, Att 720 af	for 2-Year event en= 84%, Lag= 96.8 min
Routing by Peak Elev	v Stor-Ind = 1,936.0	method, Time 5' @ 13.59 hrs	Span= 0.00-72.0 Surf.Area= 4,3	0 hrs, dt= 0. 60 sf Stora	05 hrs ge= 8,330 d	cf
Plug-Flow Center-of-l	detention Mass det	time= 226.8 n . time= 224.1 n	nin calculated for nin(1,237.3 - 1,0	0.719 af (10)13.2)	0% of inflo	w)
	1 022 00		age Storage D	escription)	isted below (Decels)
<i>#</i> I	1,933.00	19,00	of Clustom S	tage Data (F	rismatic) L	listed below (Recald)
Elevation	S	urf.Area	Inc.Store	Cum.Store)	
(feet)		(sq-ft)	(cubic-feet)	(cubic-feet))	
1,933.00		1,159	0	C)	
1,934.00		2,148	1,654	1,654	ŀ	
1,936.00		4,297	6,445	8,099)	
1,938.00		6,672	10,969	19,068	3	
Device F	Routing	Invert	Outlet Devices			
#1 F	Primary Device 1	1,933.00' 1,933.00'	24.0" Round C L= 115.0' CPP Inlet / Outlet Inv n= 0.013 Corru 3.0" Vert. Orific	ulvert , mitered to o ert= 1,933.0 gated PE, sr ce/Grate C	conform to 0' / 1,931.7 nooth interi = 0.600 Li	fill, Ke= 0.700 '0' S= 0.0113 '/' Cc= 0.900 ior, Flow Area= 3.14 sf imited to weir flow at low heads

Primary OutFlow Max=0.87 cfs @ 13.59 hrs HW=1,936.05' (Free Discharge) **1=Culvert** (Passes 0.87 cfs of 19.13 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.40 cfs @ 8.24 fps)

-3=Orifice/Grate (Weir Controls 0.46 cfs @ 0.76 fps)



Pond 38P: bio-retention basin #2A

Summary for Pond 39P: bio-retention basin #2B

Inflow Ar	ea =	0.992 ac, 60.2	28% Impervious	s, Inflow Dep	oth = 1.74"	for 2-Yea	ar event
Inflow	=	2.97 cfs @ 12	1.97 hrs, Volum	ne= ().144 af		
Outflow	=	0.27 cfs @ 12	2.51 hrs, Volum	ne= ().142 af, Atte	en= 91%,	Lag= 32.2 min
Primary	=	0.27 cfs @ 12	2.51 hrs, Volum	ne= ().142 af		
Route	ed to Reac	h 26R : SWL-1					
Routing b	by Stor-Inc	I method, Time	Span= 0.00-72.	.00 hrs, dt= ().05 hrs		
Peak Ele	v= 1,916.3	33' @ 12.51 hrs	Surf.Area= 9,	613 sf Stor	age= 3,115 c	of	
Plug-Flov	w detention	n time= 333.0 n	nin calculated fo	or 0.142 af (9	9% of inflow	')	
Center-o	f-Mass de	t. time= 326.2 n	nin (1,153.7 - 8	27.5)			
Volume	Inve	rt Avail.Stor	age Storage I	Description			
#1	1,916.00	D' 44,18	80 cf Custom	Stage Data	(Prismatic)	-isted belov	<i>w</i> (Recalc)
Elevatio	n S	Surf.Area	Inc.Store	Cum.Sto	re		
(feet	t)	(sq-ft)	(cubic-feet)	(cubic-fee	et)		
1,916.0	0	9,337	0		0		
1,918.0	0	11,016	20,353	20,35	53		
1,920.0	0	12,811	23,827	44,18	30		
Device	Routing	Invert	Outlet Devices	6			
#1	Primary	1,916.00'	24.0" Round	Culvert			
	•		L= 50.0' CPP	, mitered to	conform to fi	II, Ke= 0.7	00
			Inlet / Outlet In	vert= 1,916.	.00' / 1,914.0	0' S= 0.04	400 '/' Cc= 0.900
			n= 0.013 Corr	ugated PE,	smooth interi	ior, Flow A	rea= 3.14 sf
#2	Device 1	1,916.00'	6.0" Vert. Orif	ice/Grate	C= 0.600 Li	mited to we	eir flow at low heads
#3	Device 1	1,917.50'	45.0" x 24.0" l	Horiz. Orific	e/Grate C=	: 0.600	
			Limited to weir	flow at low	heads		
Primary	OutFlow	Max=0.27 cfs @	🕑 12.51 hrs HW	V=1,916.33'	(Free Disch	narge)	

-1=Culvert (Passes 0.27 cfs of 0.58 cfs potential flow)
 -2=Orifice/Grate (Orifice Controls 0.27 cfs @ 1.95 fps)
 -3=Orifice/Grate (Controls 0.00 cfs)



Pond 39P: bio-retention basin #2B

Summary for Pond 40P: bio-retention basin #2C

Inflow Are Inflow Outflow Primary Routed	ea = = = = d to Reacl	6.417 ac, 63.9 5.98 cfs @ 11 1.76 cfs @ 12 1.76 cfs @ 12 n 26R : SWL-1	99% Impervious, .97 hrs, Volume 2.13 hrs, Volume 2.13 hrs, Volume	Inflow De = = = =	pth > 1.8 0.996 af 0.992 af, 0.992 af	36" Atter	for 2-א 1= 71%	′ear e [.] , Lag	vent j= 9.4 mi	in
Routing by Peak Elev	y Stor-Ind /= 1,931.5	method, Time 59' @ 12.13 hrs	Span= 0.00-72.0 Surf.Area= 9,9)0 hrs, dt= 0 039 sf Stor	0.05 hrs ⁻ age= 5,40	02 cf				
Plug-Flow Center-of-	detentior Mass det	time= 99.4 mir time= 87.9 mir t Avail Stor	n calculated for 0 n(1,210.6 - 1,12).992 af (10 22.7))0% of inf	flow)				
<u>#1</u>	1 931 00	$\frac{1}{36.68}$	Age Clorage D		/Prismati	ic) is	ted he	low (F	ecalc)	
π I	1,001.00	, 00,00		hage Data	(1 11311141			000 (1	(coalo)	
Elevation	1 5	Surf.Area	Inc.Store	Cum.Sto	re					
(feet)		(sq-ft)	(cubic-feet)	(cubic-fee	et)					
1,931.00		8,511	0		0					
1,932.00		10,950	9,731	9,73	31					
1,934.00		15,999	26,949	36,68	30					
Device I	Routing	Invert	Outlet Devices							
#1 I	Primary	1,931.00'	24.0" Round C L= 35.0' CPP, Inlet / Outlet Inv	ulvert mitered to vert= 1,931	conform t .00' / 1,93	to fill, 30.00'	Ke= 0 S= 0).700 .0286	'/' Cc=	0.900
			n= 0.013 Corru	gated PE,	smooth in	nterio	r, Flow	Area	= 3.14 s	f
#2 I	Device 1	1,931.00'	12.0" W x 4.0"	H Vert. Ori	fice/Grate	e X 3	. 00 C	= 0.60)0	
	- · ·	4 000 001	Limited to weir f	flow at low	heads	~ ~				
#3 1	Device 1	1,932.00	45.0" x 24.0" H Limited to weir f	flow at low	e/Grate heads	C= (0.600			
Primary C	DutFlow	Max=1.76 cfs @) 12.13 hrs HW	=1,931.58'	(Free Di	ischa	rge)			

-1=Culvert (Inlet Controls 1.76 cfs @ 2.30 fps) -2=Orifice/Grate (Passes 1.76 cfs of 3.09 cfs potential flow)

-3=Orifice/Grate (Controls 0.00 cfs)



Pond 40P: bio-retention basin #2C

Summary for Subcatchment 11S: SEEPAGE BED #5A (BMP #7)

Runoff = 44.49 cfs @ 11.96 hrs, Volume= 2.557 af, Depth= 5.04" Routed to Pond 9P : seepage pit with chambers #5A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"



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Summary for Subcatchment 20S: SEEPAGE BED #5F (BMP 6)

3.285 af, Depth= 5.04" Runoff 57.16 cfs @ 11.96 hrs, Volume= = Routed to Pond 14P : seepage pit with chambers #5F

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

Area	(ac)	CN	Desc	ription		
7.	808	98	Pave	d parking	& roofs	
0.	009	74	>75%	6 Grass co	over, Good,	I, HSG C
7.	817	98	Weig	hted Aver	age	
0.	009		0.12	% Perviou	s Area	
7.	808		99.88	3% Imperv	vious Area	
Tc	Leng	th S	Slope	Velocity	Capacity	Description
(min)	(fee	t)	(ft/ft)	(ft/sec)	(cfs)	
6.0						Direct Entry,

Subcatchment 20S: SEEPAGE BED #5F (BMP 6)



Summary for Subcatchment 22S: SUB BASIN-5A (BMP 8)

21.99 cfs @ 11.97 hrs, Volume= 1.064 af, Depth= 2.59" Runoff = Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

Area (ac)	CN	Desc	ription		
1.1	186	61	>75%	6 Grass co	over, Good,	, HSG B
3.0	048	74	>75%	6 Grass co	over, Good,	, HSG C
0.0	695	98	Pave	d parking	& roofs	
4.9	929	74	Weig	hted Aver	age	
4.2	234		85.90	0% Pervio	us Area	
0.6	695		14.1(0% Imperv	vious Area	
_						
Tc	Lengt	h S	lope	Velocity	Capacity	Description
(min)	(fee	t) ((ft/ft)	(ft/sec)	(cfs)	
6.0						Direct Entry, 6 minute min
6.0						Direct Entry, 6 minute min

Subcatchment 22S: SUB BASIN-5A (BMP 8)



Summary for Subcatchment 25S: BIO-RETENTION BASIN #6A (BMP 5)

Runoff = 9.00 cfs @ 11.97 hrs, Volume= Routed to Pond 24P : bio-retention basin #6a 0.436 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

	Area (ac)	CN	Desc	ription		
	1.119	98	Pave	d parking	& roofs	
*	0.665	40	>75%	Grass co	over, Good,	I, HSG A
	0.169	61	>75%	6 Grass co	over, Good,	, HSG B
1.953 75 Weighted Average						
	0.834		42.70% Pervious Area			
	1.119 57.30% Impervious Area				ious Area	
	Tc Ler (min) (fe	ngth S eet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0					Direct Entry,

Subcatchment 25S: BIO-RETENTION BASIN #6A (BMP 5)


Summary for Subcatchment 29S: SWL #1

0.480 af, Depth= 2.59"

Runoff = 7.58 cfs @ 12.07 hrs, Volume= Routed to Reach 26R : SWL-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

Area	a (ac)	CN	Desc	cription						
().765	98	Pave	ed parking	& roofs					
1	1.461	61	>75%	6 Grass co	over, Good,	HSG B				
2	2.226	74	Weig	eighted Average						
1	1.461		65.6	35.63% Pervious Area						
().765		34.3							
Tc (min)	Lengt (fee	h : t)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
10.2	15	0 0	.0400	0.24		Sheet Flow,				
4.1	73	2 0	.0400	3.00		Grass: Short n= 0.150 P2= 3.23" Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps				
14.3	88	2 T	otal							

Subcatchment 29S: SWL #1



Runoff = 6.30 cfs @ 11.97 hrs, Volume= Routed to Reach 27R : SWL-2

0.315 af, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

	Area ((ac)	CN	Desc	ription		
	0.	814	98	Pave	d parking	& roofs	
*	0.2	229	40	>75%	6 Grass co	over, Good,	I, HSG A
	1.	043	85	Weig	hted Aver	age	
	0.2	229		21.96	5% Pervio	us Area	
	0.814 78.04% Impervious Area					vious Area	
	-			~		A	
	IC	Lengt	h S	Slope	Velocity	Capacity	Description
	(min)	(tee	t)	(ft/ft)	(ft/sec)	(cts)	
	6.0						Direct Entry,

Subcatchment 30S: SWL #2



Runoff = 10.54 cfs @ 12.06 hrs, Volume= Routed to Reach 28R : SWL-3

0.651 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

Area (ac)	C	N Des	cription		
0.930	98	8 Pave	ed parking	& roofs	
2.420	6	1 >75°	% Grass co	over, Good,	, HSG B
3.350	7	1 Wei	ghted Aver	age	
2.420		72.2	4% Pervio	us Area	
0.930		27.7	6% Imper	∕ious Area	
Tc Ler	igth	Slope	Velocity	Capacity	Description
<u>(min)</u> (fe	eet)	(ft/ft)	(ft/sec)	(cfs)	
10.2	150	0.0400	0.24		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.23"
3.2	575	0.0400	3.00		Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
13.4	725	Total			

Subcatchment 32S: SWL #3



Summary for Subcatchment 33S: BIO-RETENTION BASIN #1A (BMP#1)

Runoff = 18.46 cfs @ 11.97 hrs, Volume= Routed to Pond 29P : bio-retention basin #1A

0.924 af, Depth= 3.63"

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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

 Area (ac)	CN	Desc	ription		
1.9	978	98	Pave	d parking	& roofs	
 1.0)78	61	>75%	6 Grass co	over, Good,	, HSG B
3.0)56	85	Weig	hted Aver	age	
1.0)78		35.27	7% Pervio	us Area	
1.9	978		64.73	3% Imperv	vious Area	
_					_	
Тс	Lengtl	n S	Slope	Velocity	Capacity	Description
 (min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0						Direct Entry,

Subcatchment 33S: BIO-RETENTION BASIN #1A (BMP#1)



Summary for Subcatchment 37S: BIO-RETENTION BASIN #2A (BMP #2)

9.28 cfs @ 11.97 hrs, Volume= Runoff = Routed to Pond 38P : bio-retention basin #2A

0.465 af, Depth= 3.63"

Post BMPs 1-8

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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

Area	(ac)	CN	Desc	ription		
1.	800	98	Pave	d parking	& roofs	
0.	529	61	>75%	6 Grass co	over, Good,	, HSG B
1.	537	85	Weig	hted Aver	age	
0.	529		34.42	2% Pervio	us Area	
1.	800		65.58	3% Imperv	vious Area	
То	Long	.h C	Slope	Volocity	Conosity	Description
IC (min)	Lengi	.11 C 4)			Capacity	Description
(min)	(iee	()	(Π / Π)	(It/sec)	(CIS)	
6.0						Direct Entry,

Subcatchment 37S: BIO-RETENTION BASIN #2A (BMP #2)



Summary for Subcatchment 41S: BIO-RETENTION BASIN #2C (BMP #3)

Runoff = 10.77 cfs @ 11.97 hrs, Volume= Routed to Pond 40P : bio-retention basin #2C 0.536 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

Area	(ac)	CN	Desc	ription		
1.	120	98	Pave	d parking	& roofs	
0.	704	61	>75%	6 Grass co	over, Good,	, HSG B
1.	824	84	Weig	hted Aver	age	
0.	704		38.60)% Pervio	us Area	
1.	120		61.40)% Imperv	vious Area	
Та	ا م م م ا	ь с		Volocity	Consolt	Description
IC (mim)	Lengi	n c	Siope		Capacity	Description
<u>(min)</u>	(iee	ι)	(11/11)	(It/sec)	(CIS)	
6.0						Direct Entry,

Subcatchment 41S: BIO-RETENTION BASIN #2C (BMP #3)



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Summary for Subcatchment 42S: BIO-RETENTION BASIN #2B (BMP #4)

Runoff = 5.72 cfs @ 11.97 hrs, Volume= Routed to Pond 39P : bio-retention basin #2B 0.283 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=5.28"

 Area (ac)	CN	Desc	ription		
0.5	598	98	Pave	d parking	& roofs	
 0.3	394	61	>75%	6 Grass co	over, Good,	HSG B
0.9	992	83	Weig	hted Aver	age	
0.3	394		39.72	2% Pervio	us Area	
0.5	598		60.28	3% Imperv	ious Area	
_						
Тс	Lengt	n S	Slope	Velocity	Capacity	Description
 <u>(min)</u>	(feet	:)	<u>(ft/ft)</u>	(ft/sec)	(cfs)	
6.0						Direct Entry,

Subcatchment 42S: BIO-RETENTION BASIN #2B (BMP #4)



NPDES_Stormwater-REV1.1 Type II 24-hr 10-Year Rainfall=5.28" Prepared by Keystone Consulting Engineers HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Summary for Reach 26R: SWL-1

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9.635 ac, 56.76% Impervious, Inflow Depth > 3.33" for 10-Year event Inflow Area =

 13.53 cfs @
 12.10 hrs, Volume=
 2.676 af

 13.53 cfs @
 12.10 hrs, Volume=
 2.676 af, Atten= 0%, Lag= 0.0 min

 Inflow = Outflow = Routed to Reach 28R : SWL-3

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 26R: SWL-1

Inflow Area = 2.996 ac, 64.52% Impervious, Inflow Depth = 3.01" for 10-Year event Inflow = 7.06 cfs @ 11.97 hrs, Volume= 0.751 af Outflow = 7.06 cfs @ 11.97 hrs, Volume= 0.751 af, Atten= 0%, Lag= 0.0 min Routed to Reach 28R : SWL-3

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs





Summary for Reach 28R: SWL-3

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Inflow Area	a =	15.981 ac, 5	2.14% Impervio	ous, Inflow	Depth >	3.06"	for 10-'	Year event
Inflow	=	27.88 cfs @	12.05 hrs, Vol	lume=	4.078	af		
Outflow	=	27.88 cfs @	12.05 hrs, Vol	lume=	4.078	af, Atte	n= 0%,	Lag= 0.0 min
Routed	to Pon	d 8P : BIO-RE	TENTION BAS	IN #5A	(POI 001)			

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 28R: SWL-3

Summary for Pond 8P: BIO-RETENTION BASIN #5A (POI 001)

Inflow Area	a =	34.811 ac, 6	5.84% Impe	ervious,	Inflow	Depth >	1.7	'9" for	· 10-Y	'ear ever	nt
Inflow	=	47.87 cfs @	12.00 hrs,	Volume	=	5.190	af				
Outflow	=	3.55 cfs @	15.73 hrs,	Volume	=	5.190	af,	Atten=	93%,	Lag= 22	24.2 min
Discarded	=	1.53 cfs @	15.73 hrs,	Volume	=	4.212	af			•	
Primary	=	2.02 cfs @	15.73 hrs,	Volume	=	0.978	af				
Routed	to Link	37L : Dischar	ae 001								

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,869.31' @ 15.73 hrs Surf.Area= 84,837 sf Storage= 107,196 cf

Plug-Flow detention time= 590.8 min calculated for 5.190 af (100% of inflow) Center-of-Mass det. time= 590.6 min (1,555.0 - 964.4)

Volume	Inver	t Avail.Sto	rage Sto	orage Description
#1	1,868.00	560,09	97 cf Cu	ustom Stage Data (Prismatic) Listed below (Recalc)
Elevatior (feet	n S	Surf.Area (sq-ft)	Inc.Sto (cubic-fee	ore Cum.Store (cubic-feet)
1,868.00	C	79,525		0 0
1,869.00	C	83,329	81,42	.27 81,427
1,870.00	C	88,249	85,78	89 167,216
1,872.00	C	98,164	186,4 ⁻	.13 353,629
1,874.00	C	108,304	206,46	.68 560,097
Device	Routing	Invert	Outlet D	Devices
#1	Primary	1,865.00'	42.0" R	lound Culvert
			L= 30.0' Inlet / Ou n= 0.013	Box, headwall w/3 square edges, Ke= 0.500 utlet Invert= 1,865.00' / 1,864.50' S= 0.0167 '/' Cc= 0.900 Corrugated PE, smooth interior, Flow Area= 9.62 sf
#2	Device 1	1,869.10'	20.0" W Limited t	1 x 12.0" H Vert. Orifice/Grate X 4.00 C= 0.600 to weir flow at low heads
#3	Device 1	1,870.50'	72.0" x 2	24.0" Horiz. Orifice/Grate C= 0.600 to weir flow at low heads
#4	Discarded	1,868.00'	0.780 in	hr Exfiltration over Surface area

Discarded OutFlow Max=1.53 cfs @ 15.73 hrs HW=1,869.31' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 1.53 cfs)

Primary OutFlow Max=2.01 cfs @ 15.73 hrs HW=1,869.31' (Free Discharge)

-1=Culvert (Passes 2.01 cfs of 72.94 cfs potential flow)

2=Orifice/Grate (Orifice Controls 2.01 cfs @ 1.46 fps)

3=Orifice/Grate (Controls 0.00 cfs)



NPDES_Stormwater-REV1.1TypePrepared by Keystone Consulting EngineersHydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Summary for Pond 9P: seepage pit with chambers #5A

Inflow Area = 6.084 ac,100.00% Impervious, Inflow Depth = 5.04" for 10-Year event 44.49 cfs @ 11.96 hrs, Volume= Inflow = 2.557 af Outflow = 1.34 cfs @ 13.86 hrs, Volume= 2.557 af, Atten= 97%, Lag= 114.2 min Discarded = 1.28 cfs @ 10.30 hrs, Volume= 2.546 af Primary = 0.07 cfs @ 13.86 hrs, Volume= 0.011 af Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,877.87' @ 13.86 hrs Surf.Area= 42,456 sf Storage= 55,971 cf

Plug-Flow detention time= 366.1 min calculated for 2.555 af (100% of inflow) Center-of-Mass det. time= 366.2 min (1,109.2 - 743.0)

Volume	Invert	Avail.Sto	rage Stora	rage Description				
#1	1,876.00	40,53	88 cf Cus 169,	tom Stage Data (Prismatic) Listed below (Recalc) ,824 cf Overall - 68,478 cf Embedded = 101,346 cf x 40.0% Voids				
#2	1,876.50	68,47	78 cf Cult	Cultec R-360HD x 1862 Inside #1				
		-	Effe	ctive Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf				
			Over	erall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap				
			1862	2 Chambers in 19 Rows				
			Cap) Storage= 6.5 cf x 2 x 19 rows = 245.5 cf				
		109,01	6 cf Tota	al Available Storage				
		,		5				
Elevatio	on S	urf.Area	Inc.Store	e Cum.Store				
(fee	t)	(sq-ft)	(cubic-feet	t) (cubic-feet)				
1,876.0	0	42,456	(0 0				
1,880.0	0	42,456	169,824	4 169,824				
Device	Routing	Invert	Outlet Dev	evices				
#1	Primary	1,876.00'	24.0" Ro L= 120.0' Inlet / Out n= 0.013	CPP, mitered to conform to fill, Ke= 0.700 tlet Invert= 1,876.00' / 1,868.00' S= 0.0667 '/' Cc= 0.900 Corrugated PE smooth interior Flow Area= 3 14 sf				
#2	Device 1	1,877.80'	12.0" W x Limited to	c 6.0" H Vert. Orifice/Grate C= 0.600 weir flow at low heads				
#3	Discarded	1,876.00'	1.300 in/h	hr Exfiltration over Surface area				
Discarde	ed OutFlow filtration(E	Max=1.28 cf Exfiltration Cor	s @ 10.30 l htrols 1.28 c	hrs HW=1,876.04' (Free Discharge) cfs)				

Primary OutFlow Max=0.07 cfs @ 13.86 hrs HW=1,877.87' TW=1,869.56' (Fixed TW Elev= 1,869.56') **1=Culvert** (Passes 0.07 cfs of 12.58 cfs potential flow) **2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 0.88 fps)



Pond 9P: seepage pit with chambers #5A

Summary for Pond 14P: seepage pit with chambers #5F

Inflow Area	a =	7.817 ac, 9	99.88% Impervious	, Inflow Depth =	5.04"	for 10-Y	'ear event
Inflow	=	57.16 cfs @	11.96 hrs, Volum	ie= 3.285	af		
Outflow	=	2.47 cfs @	13.15 hrs, Volum	ie= 3.285	af, Attei	n= 96%,	Lag= 71.6 min
Discarded	=	2.24 cfs @	10.80 hrs, Volum	ie= 3.247	′ af		-
Primary	=	0.23 cfs @	13.15 hrs, Volum	ie= 0.038	af		
Routed	to Pond	18P : BIO-RE	ETENTION BASIN	#5A (POI 001)		

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,870.17' @ 13.15 hrs Surf.Area= 56,925 sf Storage= 64,623 cf

Plug-Flow detention time= 223.9 min calculated for 3.283 af (100% of inflow) Center-of-Mass det. time= 223.9 min (966.9 - 743.0)

Volume Invert		Avail.Stor	rage	Storage D	escription	
#1	1,868.50'	56,16	60 cf	Custom S	tage Data (Pi	ismatic) Listed below (Recalc)
				227,700 cf	Overall - 87,	300 cf Embedded = 140,400 cf x 40.0% Voids
#2	1,869.00	87,30	JU CT	Cultec R-3	360HD x 23/0	o Inside #1
					5120-54.9 VV	X 30.0 Π -> 9.99 SI X 3.07 L - 30.0 CI 36 0"H x / 17"L with 0.50' Overlap
				2376 Char	mbers in 18 R	ows
				Cap Stora	ge= 6.5 cf x 2	x 18 rows = 232.6 cf
		143,46	60 cf	Total Avail	lable Storage	
Elevatio	on Si	urf.Area	Inc.	Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic	-feet)	(cubic-feet)	
1,868.5	50	56,925		0	0	
1,872.5	50	56,925	22	7,700	227,700	
Device	Routing	Invert	Outle	t Devices		
#1	Primary	1,869.50'	24.0"	Round C	ulvert	
			L= 60).0' CPP,	mitered to co	nform to fill, Ke= 0.700
			Inlet	Outlet Inv	ert= 1,869.50	'/1,868.00' S= 0.0250 '/' Cc= 0.900
#2	Daviaa 1	1 970 00'	n= 0.		gated PE, sm	ooth Interior, Flow Area = 3.14 st
#2	Device I	1,070.00	IZ.U	ed to weir f	low at low be	e/Grate C= 0.000
#3	Discarded	1,868.50'	1.700) in/hr Exfi	Itration over	Surface area
Discard	ed OutFlow	Max=2.24 cf	s @ 10).80 hrs H	W=1,868.54'	(Free Discharge)

3=Exfiltration (Exfiltration Controls 2.24 cfs)

Primary OutFlow Max=0.23 cfs @ 13.15 hrs HW=1,870.17' TW=1,869.56' (Fixed TW Elev= 1,869.56') 1=Culvert (Passes 0.23 cfs of 2.17 cfs potential flow) 2=Orifice/Grate (Orifice Controls 0.23 cfs @ 1.33 fps)



Pond 14P: seepage pit with chambers #5F

Summary for Pond 24P: bio-retention basin #6a

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Inflow Ar Inflow Outflow Primary Route	ea = = = = ed to Reac	1.953 ac, 57.3 9.00 cfs @ 11 0.99 cfs @ 12 0.99 cfs @ 12 h 27R : SWL-2	80% Impervious, I.97 hrs, Volume 2.40 hrs, Volume 2.40 hrs, Volume	Inflow Dep e= (e= (e= (oth = 2.68).436 af).436 af, <i>A</i>).436 af	3" for 10- Atten= 89%	Year event ,Lag= 25.8 min
Routing I Peak Ele	oy Stor-Ind v= 1,923.3	d method, Time 35' @ 12.40 hrs	Span= 0.00-72.0 Surf.Area= 7,0	00 hrs, dt= 0)60 sf Stor).05 hrs age= 8,51	4 cf	
Plug-Flov Center-o	w detentio f-Mass de	n time= 141.4 m t. time= 142.7 m	nin calculated for nin (971.8 - 829.	⁻ 0.435 af (1 .1)	00% of inf	flow)	
Volume	Inve	rt Avail.Stor	age Storage D	escription			
#1	1,922.00	0' 31,35	2 cf Custom S	Stage Data	(Prismatio	;) Listed bel	ow (Recalc)
Elevatio (feet	n s t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Stor (cubic-fee	re et)		
1,922.0	0	5,567	0		0		
1,924.0	0	7,781	13,348	13,34	18		
1,926.0	0	10,223	18,004	31,35	52		
Device	Routing	Invert	Outlet Devices				
#1	Primary	1,922.00'	24.0" Round C L= 50.0' CPP, Inlet / Outlet Inv n= 0.013 Corru	Sulvert mitered to vert= 1,922. ugated PE, s	conform to .00' / 1,920 smooth int	o fill, Ke= 0).25' S= 0. erior, Flow	.700 0350 '/' Cc= 0.900 Area= 3.14 sf
#2	Device 1	1,922.00'	6.0" Vert. Orifi	ce/Grate (C= 0.600	Limited to	weir flow at low heads
#3 Device 1 1,924.50' 45.0'' x 24.0'' Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads							
Primary	OutFlow	May=0.00 cfs @	0.1240 hrs HW	=1 023 35	(Free Dis	charge)	

rimary OutFlow Max=0.99 cfs @ 12.40 hrs HW=1,923.35' (Free Discharge) -1=Culvert (Passes 0.99 cfs of 7.86 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.99 cfs @ 5.05 fps) -3=Orifice/Grate (Controls 0.00 cfs)



Pond 24P: bio-retention basin #6a

Summary for Pond 29P: bio-retention basin #1A

Inflow Area = 3.056	ac, 64.73% Impervio	ous, Inflow Depth = 3.63" for 10-Year event
Inflow = 18.46 cf	s @ 11.97 hrs, Vol	lume= 0.924 af
Outflow = 1.07 cf	s @ 12.85 hrs, Vol	lume= 0.919 af, Atten= 94%, Lag= 53.1 min
Primary = 1.07 cf	s @ 12.85 hrs. Vol	lume= 0.919 af
Routed to Pond 38P · b	io-retention basin #2	24
Routing by Stor-Ind metho	d Time Span= 0 00-	-72 00 hrs_dt= 0 05 hrs
Peak Flev= 1 939 53' @ 1	2 85 hrs Surf Area=	= 16 748 sf Storage= 22 421 cf
		10,110 01 0 01 0 01 0 0 0 0 0 0 0 0 0 0
Plug-Flow detention time=	310 3 min calculated	d for 0.918 af (99% of inflow)
Center-of-Mass det time=	308.4 min (1.110.7)	-8023
Center-or-Mass det. inne-	500.4 min (1, 110.7	- 002.0)
Volume Invert A	vail.Storage Storag	ge Description
#1 1 938 00'	72 334 cf Custo	m Stage Data (Prismatic) Listed below (Recalc)
#1 1,330.00		Sin Stage Data (Frisinalic) Listed below (Needle)
Elevation Surf Are	a Inc Store	Cum Store
(feet) (sq.f	t) (cubic-feet)	(cubic-feet)
1,930.00 12,02	0 0	20 647
1,940.00 10,02	1 30,047	30,047 70,224
1,942.00 23,66	41,087	72,334
Device Routing	Invert Outlet Devi	ices
#1 Primary 1,9	136.00° 24.0 ° Rour	nd Cuivert
	L= 85.0' C	CPP, mitered to conform to fill, Ke= 0.700
	Inlet / Outle	et Invert= 1,936.00' / 1,934.00' S= 0.0235 '/' Cc= 0.900
	n= 0.013 C	Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2 Device 1 1,9	38.00' 6.0" Vert. C	Drifice/Grate C= 0.600 Limited to weir flow at low heads
#3 Device 1 1,9	40.50' 45.0" x 24.0	0" Horiz. Orifice/Grate C= 0.600
	Limited to w	<i>w</i> eir flow at low heads

Primary OutFlow Max=1.07 cfs @ 12.85 hrs HW=1,939.53' TW=1,936.57' (Fixed TW Elev= 1,936.57') **1=Culvert** (Passes 1.07 cfs of 21.22 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 1.07 cfs @ 5.44 fps) -3=Orifice/Grate (Controls 0.00 cfs)



Pond 29P: bio-retention basin #1A

Summary for Pond 38P: bio-retention basin #2A

Inflow Ar Inflow Outflow Primary Route	ea = = 10 = 0 ed to Pond 4	4.593 ac, 65.0 0.12 cfs @ 11 6.26 cfs @ 12 6.26 cfs @ 12 6.26 cfs @ 12 40P : bio-reten	01% Imperviou 1.97 hrs, Volur 2.07 hrs, Volur 2.07 hrs, Volur tion basin #2C	s, Inflow De ne= ne= ne=	pth > 3.61' 1.383 af 1.383 af, A 1.383 af	" for 10-Year .tten= 38%, Laç	event g= 6.0 min			
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,936.29' @ 12.07 hrs Surf.Area= 4,643 sf Storage= 9,402 cf										
Plug-Flov Center-o	w detention f-Mass det.	time= 152.6 m time= 151.1 m	nin calculated fo nin (1,158.2 - 1	or 1.383 af (´ 1,007.1)	100% of infl	ow)				
volume	Invert	Avail.Stor	age Storage	Description						
#1	1,933.00	19,06	8 cf Custom	Stage Data	(Prismatic)	Listed below (H	Recalc)			
Flevatio	n S	urf Area	Inc Store	Cum Sto	re					
(fee	t)	(sa-ft)	(cubic-feet)	(cubic-fee	et)					
1 933 0	0	1 159	0		0					
1,000.0	0	2 148	1 654	1.6	54					
1,936.0	0	4,297	6,445	8.0	99					
1,938.0	0	6,672	10,969	19,0	68					
Device	Routing	Invert	Outlet Device	s						
#1 #2	Primary Device 1	1,933.00' 1,933.00'	24.0" Round Culvert L= 115.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,933.00' / 1,931.70' S= 0.0113 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf 3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads							
#3	$#3 \text{Device 1} 1,936.00 45.0^{\circ} \times 24.0^{\circ} Horiz. Orifice/Grate C = 0.600 Limited to weir flow at low heads$									

Primary OutFlow Max=5.69 cfs @ 12.07 hrs HW=1,936.27' (Free Discharge) **1=Culvert** (Passes 5.69 cfs of 20.11 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.42 cfs @ 8.54 fps)

-3=Orifice/Grate (Weir Controls 5.27 cfs @ 1.70 fps)



Pond 38P: bio-retention basin #2A

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Inflow Area Inflow Outflow Primary Routed	a = = = = I to Reach	0.992 ac, 60.2 5.72 cfs @ 11 0.60 cfs @ 12 0.60 cfs @ 12 1 26R : SWL-1	28% Impervious, .97 hrs, Volume 2.39 hrs, Volume 2.39 hrs, Volume	Inflow De = := :=	pth = 3.4 0.283 af 0.282 af, 0.282 af, 0.282 af	3" for 1 Atten= 90	0-Year e %, Lag	event = 25.5 min
Routing by Peak Elev	/ Stor-Ind = 1,916.6	method, Time 5' @ 12.39 hrs	Span= 0.00-72.0 Surf.Area= 9,88	0 hrs, dt= 85 sf Stor	0.05 hrs rage= 6,2	75 cf		
Plug-Flow	detentior	n time= 249.7 m	nin calculated for	0.282 af (§	99% of inf	low)		
Center-of-	Mass det	. time= 245.8 m	nin (1,054.0 - 808	8.2)				
Volume	Inver	t Avail.Stor	age Storage De	escription				
#1	1,916.00	' 44,18	0 cf Custom St	tage Data	(Prismati	i c) Listed b	elow (R	ecalc)
Elevation (feet)	S	Surf.Area (sg-ft)	Inc.Store (cubic-feet)	Cum.Sto (cubic-fe	ore et)			
1.916.00		9.337	0		0			
1,918.00		11,016	20,353	20,3	53			
1,920.00		12,811	23,827	44,18	80			
Device F	Routing	Invert	Outlet Devices					
#1 F	Primary	1,916.00'	24.0" Round C L= 50.0' CPP, 1 Inlet / Outlet Inv n= 0.013 Corrug	ulvert mitered to ert= 1,916 gated PE,	conform 1 .00' / 1,91 smooth ir	to fill, Ke= 4.00' S= hterior, Flo	0.700 0.0400 w Area:	'/' Cc= 0.900 = 3.14 sf
#2 E	Device 1	1,916.00'	6.0" Vert. Orific	e/Grate	C= 0.600	Limited t	o weir fl	ow at low heads
#3 E	Device 1	1,917.50'	45.0" x 24.0" Ho Limited to weir fl	o riz. Orific low at low	e/Grate heads	C= 0.600		
Primary O	OutFlow	Max=0.60 cfs @	0 12 39 hrs HW=	=1 916 65'	(Free Di	scharge)		

Tarry OutFlow Max=0.60 cfs @ 12.39 hrs HW=1,916.65' (Free Discharge) **1=Culvert** (Passes 0.60 cfs of 2.16 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.60 cfs @ 3.06 fps) -3=Orifice/Grate (Controls 0.00 cfs)



Pond 39P: bio-retention basin #2B

Summary for Pond 40P: bio-retention basin #2C

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Inflow A Inflow Outflow Primary Route	rea = = = = ed to Read	6.417 ac, 63.9 12.67 cfs @ 12 5.91 cfs @ 12 5.91 cfs @ 12 ch 26R : SWL-1	99% Impervious 2.03 hrs, Volun 2.16 hrs, Volun 2.16 hrs, Volun	s, Inflow Depti ne= 1.9 ne= 1.9 ne= 1.9	h > 3.59" 919 af 914 af, Att 914 af	for 10- en= 53%	Year event , Lag= 7.9	t) min
Routing Peak Ele	by Stor-Ine ev= 1,932.	d method, Time 14' @ 12.16 hrs	Span= 0.00-72 Surf.Area= 1	00 hrs, dt= 0. 1,296 sf Stora	05 hrs age= 11,25	54 cf		
Plug-Flo Center-c	w detentio of-Mass de	on time= 71.7 mi et. time= 65.8 mi	n calculated for n (1,125.4 - 1,	[·] 1.913 af (100 059.6)	% of inflow	/)		
Volume	Inve	ert Avail.Stor	rage Storage	Description				
#1	1,931.0	0' 36,68	30 cf Custom	Stage Data (F	'rismatic)	Listed bel	ow (Recald	c)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	;			
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet))			
1,931.0)0	8,511	0	0)			
1,932.0	00	10,950	9,731	9,731	I			
1,934.0	00	15,999	26,949	36,680)			
Device	Routing	Invert	Outlet Device:	s				
#1	Primary	1,931.00'	24.0" Round	Culvert			700	
			L= 35.0' CPF	² , mitered to co	onform to f	III, Ke= 0	.700	0.000
			Inlet / Outlet II	nvert= 1,931.0	0'/1,930.0	$10^{\circ} S = 0.$	0286 / C	c= 0.900
40	Davias 1	1 024 001	n= 0.013 Cor	rugated PE, sr	nooth inter	10r, FIOW	Area= 3.1	4 ST
#2	Device I	1,931.00	12.0 VV X 4.0	r flow of low b	ce/Grate X	3.00 C=	= 0.600	
#3	Dovico 1	1 032 00'		Horiz Orificol	saus I Grato C-	- 0 600		
#3	Device I	1,932.00	Limited to wei	r flow at low he	eads	- 0.000		
Drimor	OutFlow	Mov-5 00 of a	⇒ 10.16 bra ⊔\		(Eroo Diool			
r i i i ai y	OULFIOW	IVIAX-0.00 CIS (ע ו∠.וטוווס ⊓ע	v-1,902.10 (iaiye)		

 1=Culvert (Inlet Controls 5.88 cfs @ 3.20 fps)

 2=Orifice/Grate (Passes < 4.73 cfs potential flow)</td>

 3=Orifice/Grate (Passes < 1.85 cfs potential flow)</td>



Pond 40P: bio-retention basin #2C

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Summary for Subcatchment 11S: SEEPAGE BED #5A (BMP #7)

Runoff 60.80 cfs @ 11.96 hrs, Volume= 3.529 af, Depth= 6.96" = Routed to Pond 9P : seepage pit with chambers #5A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"



Summary for Subcatchment 20S: SEEPAGE BED #5F (BMP 6)

Runoff = 78.12 cfs @ 11.96 hrs, Volume= 4.534 af, Depth= 6.96" Routed to Pond 14P : seepage pit with chambers #5F

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

Area	(ac)	CN	Desc	ription						
7.	808	98	Pave	vaved parking & roofs						
0.	009	74	>75%	75% Grass cover, Good, HSG C						
7.	817	98	Weig	hted Aver	age					
0.	009		0.12	% Perviou	s Ārea					
7.	808		99.88	3% Imperv	vious Area					
т.	1		01	\/_l;	O a m a aite a	Description				
	Leng	in t	Slope	velocity	Capacity	Description				
(min)	(tee	τ)	(11/11)	(IT/Sec)	(CIS)					
6.0						Direct Entry,				

Subcatchment 20S: SEEPAGE BED #5F (BMP 6)



Summary for Subcatchment 22S: SUB BASIN-5A (BMP 8)

Runoff = 35.41 cfs @ 11.97 hrs, Volume= 1.732 af, Depth= 4.22" Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

Area	(ac)	CN	Desc	ription		
1.	186	61	>75%	Grass co	over, Good,	, HSG B
3.	048	74	>75%	Grass co	over, Good,	, HSG C
0.	695	98	Pave	d parking	& roofs	
4.	929	74	Weig	hted Aver	age	
4.	234		85.90	% Pervio	us Area	
0.	695		14.10)% Imperv	ious Area	
Tc	Leng	th S	Slope	Velocity	Capacity	Description
<u>(min)</u>	(fee	et)	<u>(ft/ft)</u>	(ft/sec)	(cfs)	
6.0						Direct Entry, 6 minute min

Subcatchment 22S: SUB BASIN-5A (BMP 8)



Summary for Subcatchment 25S: BIO-RETENTION BASIN #6A (BMP 5)

Runoff = 14.36 cfs @ 11.97 hrs, Volume= Routed to Pond 24P : bio-retention basin #6a 0.704 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

	Area (ac)	CN	Desc	ription		
	1.119	98	Pave	d parking	& roofs	
*	0.665	40	>75%	6 Grass co	over, Good,	, HSG A
	0.169	61	>75%	6 Grass co	over, Good,	, HSG B
	1.953	75	Weig	hted Aver	age	
	0.834		42.70	0% Pervio	us Area	
	1.119		57.30	0% Imperv	vious Area	
					_	
	Tc Ler	ngth S	Slope	Velocity	Capacity	Description
	(min) (fe	eet) ((ft/ft)	(ft/sec)	(cfs)	
	6.0					Direct Entry,

Subcatchment 25S: BIO-RETENTION BASIN #6A (BMP 5)



Summary for Subcatchment 29S: SWL #1

Runoff = 12.31 cfs @ 12.06 hrs, Volume= Routed to Reach 26R : SWL-1

0.782 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

Area (ac) C	N Des	cription							
0.765	59	8 Pave	aved parking & roofs							
1.46	16	1 >75	>75% Grass cover, Good, HSG B							
2.226	67	4 Wei	ghted Aver	age						
1.461 65.63% Pervious Area										
0.765	5	34.3	7% Imperv	/ious Area						
Tc Le	ength	Slope	Velocity	Capacity	Description					
(min) ((feet)	(ft/ft)	(ft/sec)	(cfs)						
10.2	150	0.0400	0.24		Sheet Flow,					
					Grass: Short n= 0.150 P2= 3.23"					
4.1	732	0.0400	3.00		Shallow Concentrated Flow,					
					Grassed Waterway Kv= 15.0 fps					
14.3	882	Total								

Subcatchment 29S: SWL #1



Summary for Subcatchment 30S: SWL #2

Runoff = 9.24 cfs @ 11.96 hrs, Volume= Routed to Reach 27R : SWL-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

	Area ((ac)	CN	Desc	ription						
	0.	814	98	Pave	d parking	& roofs					
*	0.2	229	40	>75%	75% Grass cover, Good, HSG A						
	1.	043	85	Weig	hted Aver	age					
	0.229 21.96% Pervious Area										
	0.	814		78.04	4% Imperv	vious Area					
	Та	Longt	ь (Clana	Valacity	Conosity	Description				
		Lengi	n c	Siope		Capacity	Description				
	(min)	(tee	[)	(π/π)	(IT/sec)	(CIS)					
	6.0						Direct Entry,				

Subcatchment 30S: SWL #2



0.473 af, Depth= 5.44"

1.087 af, Depth= 3.89"

Summary for Subcatchment 32S: SWL #3

Runoff = 17.67 cfs @ 12.05 hrs, Volume= Routed to Reach 28R : SWL-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

	Area	(ac) (CN	Desc	cription				
	0.	930	98	Pave	ed parking	& roofs			
_	2.	420	61	>75%	6 Grass co	over, Good,	HSG B		
	3.	350	71	Weig	ghted Aver	age			
	2.420 72.24% Pervious Area								
	0.	930		27.76	6% Imperv	vious Area			
	Tc (min)	Length (feet)	S	lope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description		
	10.2	150	0.0	0400	0.24		Sheet Flow,		
	3.2	575	6 0.0	0400	3.00		Grass: Short n= 0.150 P2= 3.23" Shallow Concentrated Flow,		
_							Grassed Waterway Kv= 15.0 fps		
	13.4	725	i To	otal					

Subcatchment 32S: SWL #3



Summary for Subcatchment 33S: BIO-RETENTION BASIN #1A (BMP#1)

27.07 cfs @ 11.96 hrs, Volume= Runoff = Routed to Pond 29P : bio-retention basin #1A

1.386 af, Depth= 5.44"

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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

Area	(ac)	CN	Desc	ription					
1.	978	98	Pave	Paved parking & roofs					
1.	078	61	>75%	>75% Grass cover, Good, HSG B					
3.	056	85	Weig	hted Aver	age				
1.	078		35.27	7% Pervio	us Area				
1.	978		64.73	3% Imperv	vious Area				
-			21		o ''				
IC	Leng	in t	Slope	Velocity	Capacity	Description			
<u>(min)</u>	(tee	t)	(ft/ft)	(ft/sec)	(cts)				
6.0						Direct Entry,			

Subcatchment 33S: BIO-RETENTION BASIN #1A (BMP#1)



Runoff = 13.61 cfs @ 11.96 hrs, Volume= Routed to Pond 38P : bio-retention basin #2A 0.697 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

Area	(ac)	CN	Desc	ription		
1.	800	98	Pave	d parking	& roofs	
0.	529	61	>75%	6 Grass co	over, Good,	, HSG B
1.	537	85	Weig	hted Aver	age	
0.	529		34.42	2% Pervio	us Area	
1.	800		65.58	3% Imperv	vious Area	
Та	ا م م م ا			Valasity	Consolt	Description
	Lengi	in t	Siope	velocity	Capacity	Description
<u>(min)</u>	(tee	t)	(π/π)	(ft/sec)	(CIS)	
6.0						Direct Entry,

Subcatchment 37S: BIO-RETENTION BASIN #2A (BMP #2)



Summary for Subcatchment 41S: BIO-RETENTION BASIN #2C (BMP #3)

Runoff = 15.91 cfs @ 11.97 hrs, Volume= Routed to Pond 40P : bio-retention basin #2C

0.810 af, Depth= 5.33"

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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

Area	(ac)	CN	Desc	ription		
1.	120	98	Pave	d parking	& roofs	
0.	704	61	>75%	6 Grass co	over, Good,	, HSG B
1.	824	84	Weig	hted Aver	age	
0.	704		38.60	0% Pervio	us Area	
1.	120		61.40	0% Imperv	vious Area	
т.	1			V/.1	0	Description
IC	Leng	in E	slope	Velocity	Capacity	Description
<u>(min)</u>	(tee	t)	(ft/ft)	(ft/sec)	(CfS)	
6.0						Direct Entry,

Subcatchment 41S: BIO-RETENTION BASIN #2C (BMP #3)


Summary for Subcatchment 42S: BIO-RETENTION BASIN #2B (BMP #4)

Runoff = 8.52 cfs @ 11.97 hrs, Volume= Routed to Pond 39P : bio-retention basin #2B 0.431 af, Depth= 5.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=7.20"

Area	(ac)	CN	Desc	ription					
0.	598	98	Pave	d parking	& roofs				
0.	394	61	>75%	75% Grass cover, Good, HSG B					
0.	992	83	Weig	hted Aver	age				
0.	394		39.72	2% Pervio	us Area				
0.	598		60.28	3% Imperv	vious Area				
т.	1			V/.1	0	Description			
IC	Lengt	n t	Slope	Velocity	Capacity	Description			
(min)	(tee	t)	(ft/ft)	(ft/sec)	(cts)				
6.0						Direct Entry,			

Subcatchment 42S: BIO-RETENTION BASIN #2B (BMP #4)



Summary for Reach 26R: SWL-1

9.635 ac, 56.76% Impervious, Inflow Depth > 5.10" for 50-Year event Inflow Area =

 24.59 cfs @
 12.08 hrs, Volume=
 4.094 af

 24.59 cfs @
 12.08 hrs, Volume=
 4.094 af, Atten= 0%, Lag= 0.0 min

 Inflow = Outflow = Routed to Reach 28R : SWL-3

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 26R: SWL-1

Time (hours)

Summary for Reach 27R: SWL-2

 Inflow Area =
 2.996 ac, 64.52% Impervious, Inflow Depth =
 4.71" for 50-Year event

 Inflow =
 10.28 cfs @
 11.97 hrs, Volume=
 1.177 af

 Outflow =
 10.28 cfs @
 11.97 hrs, Volume=
 1.177 af, Atten= 0%, Lag= 0.0 min

 Routed to Reach 28R : SWL-3
 SWL-3
 1.177 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs





Summary for Reach 28R: SWL-3

Inflow Area	a =	15.981 ac, 5	2.14% Impervious,	Inflow Depth >	4.77" fo	r 50-Year event
Inflow	=	48.53 cfs @	12.04 hrs, Volume	e= 6.358	af	
Outflow	=	48.53 cfs @	12.04 hrs, Volume	e= 6.358	af, Atten=	0%, Lag= 0.0 min
Routed	to Pon	d 8P : BIO-RE	TENTION BASIN #	5A (POI 001)		

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 28R: SWL-3

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Summary for Pond 8P: BIO-RETENTION BASIN #5A (POI 001)

Inflow Area	a =	34.811 ac, 6	5.84% Impe	ervious, Inflov	v Depth =	3.16"	for 50-Y	ear event
Inflow	=	79.99 cfs @	12.00 hrs,	Volume=	9.174	af		
Outflow	=	11.64 cfs @	13.56 hrs,	Volume=	9.174	af, Atte	en= 85%,	Lag= 93.6 min
Discarded	=	1.57 cfs @	13.56 hrs,	Volume=	4.607	af		•
Primary	=	10.07 cfs @	13.56 hrs,	Volume=	4.567	af		
Routed	to Link	37L : Dischar	ae 001					

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,869.70' @ 13.56 hrs Surf.Area= 86,796 sf Storage= 141,373 cf

Plug-Flow detention time= 399.0 min calculated for 9.167 af (100% of inflow) Center-of-Mass det. time= 398.7 min (1,333.3 - 934.7)

Volume	Invert	Avail.Sto	rage Sto	rage Description
#1	1,868.00'	560,09	97 cf Cus	stom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Su	urf.Area (sq-ft)	Inc.Stor (cubic-fee	re Cum.Store t) (cubic-feet)
1,868.00		79,525		0 0
1,869.00		83,329	81,42	81,427
1,870.00		88,249	85,78	9 167,216
1,872.00		98,164	186,41	3 353,629
1,874.00		108,304	206,46	8 560,097
Device F	Routing	Invert	Outlet De	evices
#1 P	rimary	1,865.00'	42.0" Ro	ound Culvert
			L= 30.0' Inlet / Ou n= 0.013	Box, headwall w/3 square edges, Ke= 0.500 tlet Invert= 1,865.00' / 1,864.50' S= 0.0167 '/' Cc= 0.900 Corrugated PE, smooth interior, Flow Area= 9.62 sf
#2 C	evice 1	1,869.10'	20.0" W	x 12.0" H Vert. Orifice/Grate X 4.00 C= 0.600
#3 C	evice 1	1,870.50'	72.0" x 2 Limited to	4.0" Horiz. Orifice/Grate C= 0.600 o weir flow at low heads
#4 C	iscarded	1,868.00'	0.780 in/	hr Exfiltration over Surface area

Discarded OutFlow Max=1.57 cfs @ 13.56 hrs HW=1,869.70' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 1.57 cfs)

Primary OutFlow Max=10.06 cfs @ 13.56 hrs HW=1,869.70' (Free Discharge)

-1=Culvert (Passes 10.06 cfs of 77.84 cfs potential flow)

2=Orifice/Grate (Orifice Controls 10.06 cfs @ 2.50 fps)

-3=Orifice/Grate (Controls 0.00 cfs)



Pond 8P: BIO-RETENTION BASIN #5A (POI 001)

NPDES Stormwater-REV1.1 Prepared by Keystone Consulting Engineers HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Summary for Pond 9P: seepage pit with chambers #5A

Inflow Area = 6.084 ac,100.00% Impervious, Inflow Depth = 6.96" for 50-Year event 60.80 cfs @ 11.96 hrs, Volume= 3.529 af Inflow = Outflow = 2.87 cfs @ 13.01 hrs, Volume= 3.529 af, Atten= 95%, Lag= 63.1 min Discarded = 1.28 cfs @ 9.05 hrs, Volume= 3.000 af Primary = 1.60 cfs @ 13.01 hrs, Volume= 0.530 af Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,878.50' @ 13.01 hrs Surf.Area= 42,456 sf Storage= 75,688 cf

Plug-Flow detention time= 373.0 min calculated for 3.527 af (100% of inflow) Center-of-Mass det. time= 373.2 min (1,111.5 - 738.4)

Volume	Invert	Avail.Sto	rage	Storage [Description				
#1	1,876.00'	40,53	38 cf	Custom 8	Stage Data (F	Prismatic) Listed below (Recalc)			
				169,824 (of Overall - 68	3,478 cf Embedded = 101,346 cf x 40.0% Voids			
#2 1,876.50' 68,478 cf			78 cf	Cultec R	-360HD x 18	52 Inside #1			
				Effective	Size= 54.9"W	/ x 36.0"H => 9.99 st x 3.67'L = 36.6 ct			
				Overall S	IZE= 60.0"W	x 36.0"H x 4.17'L with 0.50' Overlap			
				1862 Una	ampers in 19	ROWS			
		100.0	10.5			2 X 1910WS - 245.5 Cl			
		109,07	16 CT	Iotal Ava	illable Storage	2			
Elevatio	on Su	urf.Area	Inc.	Store	Cum.Store				
(fee	et)	(sq-ft)	(cubic	-feet)	(cubic-feet				
1,876.0	00	42,456		0	(-)			
1,880.0	00	42,456	169	9,824	169,824	ŀ			
Device	Routing	Invert	Outle	t Devices					
#1	Primary	1,876.00'	24.0"	Round	Culvert				
	2		L= 12	20.0' CPI	P, mitered to	conform to fill, Ke= 0.700			
			Inlet /	Outlet In	vert= 1,876.0	0' / 1,868.00' S= 0.0667 '/' Cc= 0.900			
			n= 0.	013 Corr	ugated PE, si	mooth interior, Flow Area= 3.14 sf			
#2	Device 1	1,877.80'	12.0"	W x 6.0"	H Vert. Orifi	ce/Grate C= 0.600			
			Limite	Limited to weir flow at low heads					
#3	Discarded	1,876.00'	1.300	in/hr Ext	filtration ove	r Surface area			
Discard	ed OutFlow	Max=1.28 cf	s @ 9.	05 hrs H	W=1,876.04'	(Free Discharge)			

3=Exfiltration (Exfiltration Controls 1.28 cfs)

Primary OutFlow Max=1.60 cfs @ 13.01 hrs HW=1,878.50' TW=1,869.56' (Fixed TW Elev= 1,869.56') -**1=Culvert** (Passes 1.60 cfs of 16.36 cfs potential flow) **2=Orifice/Grate** (Orifice Controls 1.60 cfs @ 3.19 fps)



Pond 9P: seepage pit with chambers #5A

Summary for Pond 14P: seepage pit with chambers #5F

Inflow Area = 7.817 ac, 99.88% Impervious, Inflow Depth = 6.96" for 50-Year event 78.12 cfs @ 11.96 hrs, Volume= Inflow = 4.534 af Outflow = 3.99 cfs @ 12.91 hrs, Volume= 4.534 af, Atten= 95%, Lag= 57.1 min Discarded = 2.24 cfs @ 10.20 hrs, Volume= 3.979 af Primary = 1.75 cfs @ 12.91 hrs, Volume= 0.555 af Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,870.79' @ 12.91 hrs Surf.Area= 56,925 sf Storage= 90,722 cf

Plug-Flow detention time= 255.8 min calculated for 4.531 af (100% of inflow) Center-of-Mass det. time= 255.8 min (994.1 - 738.4)

Volume	Invert	Avail.Sto	rage	Storage D	escription				
#1	1,868.50'	56,16	50 cf	Custom S	tage Data (P	rismatic) Listed below (Recalc)			
	4 000 001	07.07		227,700 ct	Overall - 87,	300 cf Embedded = 140,400 cf x 40.0% Voids			
#2	1,869.00'	87,30	JU ct	Cultec R-3	360HD x 237	6 Inside #1			
					$51Ze = 54.9^{\circ}VV$	X 30.0 H => 9.99 ST X 3.07 L = 30.0 CT 36.0 H x 4.17 L with 0.50 Overlap			
				2376 Char	20-00.0 W X	ows			
				Cap Stora	ge= 6.5 cf x 2	x 18 rows = 232.6 cf			
		143,46	60 cf	Total Avai	lable Storage				
Elevatio	on Si	urf.Area	Inc.	Store	Cum.Store				
(fee	et)	(sq-ft)	(cubic	-feet)	(cubic-feet)				
1,868.5	50	56,925		0	0				
1,872.5	50	56,925	22	7,700	227,700				
Device	Routing	Invert	Outle	t Devices					
#1	Primary	1,869.50'	24.0'	' Round C	ulvert				
			L= 60).0' CPP,	mitered to co	nform to fill, Ke= 0.700			
			Inlet	/ Outlet Inv	ert= 1,869.50	'/1,868.00' S= 0.0250 '/' Cc= 0.900			
40	Davias 1	4 070 001	n= 0.	013 Corru	gated PE, sm	ooth interior, Flow Area= 3.14 st			
#2	Device 1	1,870.00	12.0 [°]	• VV X 6.0 **	H vert. Orific	e/Grate C= 0.600			
#3	Discarded	1,868.50'	1.700	.role to well flow at low heads					
Discard	ed OutFlow	Max=2.24 cf	s @ 1().20 hrs H	W=1,868.54'	(Free Discharge)			

3=Exfiltration (Exfiltration Controls 2.24 cfs)

Primary OutFlow Max=1.75 cfs @ 12.91 hrs HW=1,870.79' TW=1,869.56' (Fixed TW Elev= 1,869.56') -1=Culvert (Passes 1.75 cfs of 7.29 cfs potential flow) -2=Orifice/Grate (Orifice Controls 1.75 cfs @ 3.50 fps)



Pond 14P: seepage pit with chambers #5F

Summary for Pond 24P: bio-retention basin #6a

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Inflow Are Inflow Outflow Primary Route	ea = = 14 = 7 d to Reach	1.953 ac, 57.3 4.36 cfs @ 11 1.31 cfs @ 12 1.31 cfs @ 12 27R : SWL-2	30% Impervious .97 hrs, Volun 2.48 hrs, Volun 2.48 hrs, Volun	s, Inflow Depth = ne= 0.704 ne= 0.704 ne= 0.704	4.33" Faf Faf, Atte Faf	for 50-Ƴ n= 91%,	′ear event Lag= 30.7 min	
Routing b Peak Elev	oy Stor-Ind v= 1,924.16	method, Time 6' @ 12.48 hrs	Span= 0.00-72 Surf.Area= 7	.00 hrs, dt= 0.05 ,981 sf Storage=	hrs • 14,640 d	cf		
Plug-Flov Center-of	v detention f-Mass det.	time= 155.1 m time= 154.8 m	iin calculated fo iin (970.2 - 81	or 0.704 af (100% 5.4)	of inflow	')		
Volume	Invert	Avail.Stor	age Storage	Description				
#1	1,922.00'	31,35	2 cf Custom	Stage Data (Pris	matic) Li	sted belo	w (Recalc)	
	,	- ,		J. J	,			
Elevatior	n S	urf.Area	Inc.Store	Cum.Store				
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)				
1.922.00)	5.567	0	0				
1.924.00	0	7.781	13.348	13.348				
1,926.00	0	10,223	18,004	31,352				
Device	Douting	las cont	Outlet Devices	_				
Device	Rouling	Invent	Outlet Devices	5 • • •				
#1	Primary	1,922.00'	24.0" Round	Culvert				
			L= 50.0' CPF	² , mitered to conf	orm to fill	, Ke= 0.	700	
			Inlet / Outlet I	1/1,922.00 /	1,920.25	S = 0.0)350 '/' Cc= 0.900	ł
			n= 0.013 Cor	rugated PE, smoo	oth interio	or, ⊢low /	Area= 3.14 st	
#2	Device 1	1,922.00'	6.0" Vert. Ori	fice/Grate C= 0	.600 Lin	nited to w	eir flow at low hea	ds
#3	Device 1	1,924.50	45.0" x 24.0" Limited to wei	r flow at low head	ate C=0 Is	0.600		
Primary (1=Cul -2=(-3=(OutFlow M vert (Pass Orifice/Gra Orifice/Gra	Max=1.31 cfs @ es 1.31 cfs of te (Orifice Cor te (Controls 0	0 12.48 hrs HV 14.40 cfs poter htrols 1.31 cfs (0.00 cfs)	V=1,924.16' (Fre ntial flow) @ 6.66 fps)	ee Discha	arge)		



Pond 24P: bio-retention basin #6a

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Inflow Area Inflow Outflow Primary Routed	a = 3.0 = 27.0 = 1.3 = 1.3 to Pond 38F	56 ac, 64.7 7 cfs @ 11 3 cfs @ 13 3 cfs @ 13 ? : bio-retent	73% Impervious, .96 hrs, Volume 8.04 hrs, Volume 8.04 hrs, Volume tion basin #2A	Inflow Dep = 1 = 1 = 1	oth = 5.4 I.386 af I.381 af, I.381 af	4" for Atten= 9	50-Year 5%, La	event g= 64.4 min	
Routing by Peak Elev=	Stor-Ind me = 1,940.22' @	thod, Time ② 13.04 hrs	Span= 0.00-72.0 Surf.Area= 18,0	0 hrs, dt= 0 650 sf Sto).05 hrs orage= 34	,704 cf			
Plug-Flow	detention tim	ne= 354.8 m	in calculated for	1.381 af (1	00% of in	flow)			
Center-of-N	Mass det. tim	ne= 352.1 m	nin (1,143.0 - 790	0.9)					
Volume	Invert	Avail.Stor	age Storage De	escription					
#1	1,938.00'	72,33	4 cf Custom S	tage Data ((Prismati	c) Listed	below (I	Recalc)	
Elevation (feet)	Surf. (s	Area sq-ft)	Inc.Store (cubic-feet)	Cum.Stor (cubic-fee	re :t)				
1,938.00	12	2,620	0		0				
1,940.00	18	3,027	30,647	30,64	7				
1,942.00	23	3,660	41,687	72,33	34				
Device R	outing	Invert	Outlet Devices						
#1 P	rimary	1,936.00'	24.0" Round Culvert L= 85.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,936.00' / 1,934.00' S= 0.0235 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf						
#2 D	evice 1	1,938.00'	6.0" Vert. Orific	e/Grate (C= 0.600	Limited	to weir	flow at low heads	
#3 D	evice 1	1,940.50'	45.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads						
Brimon (-1 22 of a	0 12 01 bro UW-	-1 040 22	T\A/-1 02	6 57' (Tived TV	N Elov- 1 026 57')	

Primary OutFlow Max=1.33 cfs @ 13.04 hrs HW=1,940.22' TW=1,936.57' (Fixed TW Elev= 1,936.57') -1=Culvert (Passes 1.33 cfs of 23.95 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 1.33 cfs @ 6.76 fps) -3=Orifice/Grate (Controls 0.00 cfs)



Pond 29P: bio-retention basin #1A

Summary for Pond 38P: bio-retention basin #2A

Inflow Are Inflow Outflow Primary Route	ea = = 1 = 1 = 1 d to Pond	4.593 ac, 65.0 4.68 cfs @ 11 3.71 cfs @ 12 3.71 cfs @ 12 40P : bio-retent	01% Impervious, I.97 hrs, Volume 2.00 hrs, Volume 2.00 hrs, Volume tion basin #2C	Inflow Dep 3= 2 3= 2 3= 2 3= 2	th > 5.43" .078 af .077 af, Att .077 af	for 50-Yea en= 7%, La	ar event g= 2.2 min
Routing b Peak Elev	y Stor-Ind v= 1,936.5	method, Time i0' @ 12.00 hrs	Span= 0.00-72.0 Surf.Area= 4,8)0 hrs, dt= 0 90 sf Stora	.05 hrs ige= 10,393	3 cf	
Plug-Flow Center-of	v detentior -Mass det	n time= 120.4 m . time= 119.3 m	hin calculated for hin (1,144.2 - 1,0	[.] 2.077 af (10 024.8))0% of inflo	w)	
volume			age Storage D	escription	<u></u>		(D
#1	1,933.00	19,06	e cr Custom S	stage Data (Prismatic)		(Recalc)
Elevatior	n s	Surf.Area	Inc.Store	Cum.Stor	е		
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet	t)		
1,933.00)	1,159	0		ō		
1,934.00)	2,148	1,654	1,654	4		
1,936.00)	4,297	6,445	8,09	9		
1,938.00)	6,672	10,969	19,06	8		
Device	Routing	Invert	Outlet Devices				
#1 #2 #3	Primary Device 1 Device 1	1,933.00' 1,933.00' 1,936.00'	24.0" Round Culvert L= 115.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,933.00' / 1,931.70' S= 0.0113 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf 3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads 45.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads				

Primary OutFlow Max=13.59 cfs @ 12.00 hrs HW=1,936.50' (Free Discharge) **1=Culvert** (Passes 13.59 cfs of 21.09 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.43 cfs @ 8.84 fps)

-3=Orifice/Grate (Weir Controls 13.16 cfs @ 2.30 fps)



Pond 38P: bio-retention basin #2A

Summary for Pond 39P: bio-retention basin #2B

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Inflow Are Inflow Outflow Primary Route	ea = = = = d to React	0.992 ac, 60.2 8.52 cfs @ 11 0.82 cfs @ 12 0.82 cfs @ 12 n 26R : SWL-1	28% Impervious, .97 hrs, Volume 2.43 hrs, Volume 2.43 hrs, Volume	Inflow Depth = 0.4 = 0.4 = 0.4	1 = 5.22" 431 af 429 af, Atte 429 af	for 50-Ye en= 90%,	ear event Lag= 27.6 min		
Routing b Peak Ele ^v	oy Stor-Ind v= 1,917.0	method, Time 00' @ 12.43 hrs	Span= 0.00-72.0 Surf.Area= 10,	0 hrs, dt= 0.0 177 sf Stora)5 hrs age= 9,760	cf			
Plug-Flov	v detentior	n time= 229.5 m	nin calculated for	0.429 af (10	0% of inflov	w)			
Center-of	-Mass det	. time= 226.8 m	nin (1,023.0 - 790	6.3)					
Volume	Inver	t Avail.Stor	age Storage De	escription					
#1	1,916.00)' 44,18	0 cf Custom S	tage Data (P	rismatic) L	isted below	v (Recalc)		
Elevatior (feet	า S)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	1				
1,916.00)	9,337	0	0					
1,918.00)	11,016	20,353	20,353					
1,920.00)	12,811	23,827	44,180					
Device	Routing	Invert	Outlet Devices						
#1	Primary 1,916.00' 24.0" Round Culvert L= 50.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,916.00' / 1,914.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE smooth interior Elow Area= 3.14 sf								
#2	Device 1	1,916.00'	6.0" Vert. Orific	e/Grate C=	= 0.600 Lir	mited to we	eir flow at low heads		
#3	Device 1	1,917.50'	45.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads						
Primary	OutFlow	Max=0 82 cfs @	0) 12 43 hrs HW=	=1 917 00' (Free Disch	arge)			

Timary OutFlow Max=0.82 cfs @ 12.43 hrs HW=1,917.00' (Free Discharge) -1=Culvert (Passes 0.82 cfs of 4.72 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.82 cfs @ 4.17 fps) -3=Orifice/Grate (Controls 0.00 cfs)



Pond 39P: bio-retention basin #2B

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Summary for Pond 40P: bio-retention basin #2C

Inflow Ar Inflow Outflow Primary Route	rea = = = = ed to Read	6.417 ac, 63.9 29.08 cfs @ 11 11.90 cfs @ 12 11.90 cfs @ 12 ch 26R : SWL-1	99% Impervious, .98 hrs, Volume 2.12 hrs, Volume 2.12 hrs, Volume	Inflow Deptl ⇒= 2. ⇒= 2. ⇒= 2.	h = 5.40" 887 af 882 af, Atte 882 af	for 50-Y en= 59%,	′ear event Lag= 8.0 min
Routing Peak Ele	by Stor-In ev= 1,932.	d method, Time 79' @ 12.12 hrs	Span= 0.00-72.0 Surf.Area= 12,)0 hrs, dt= 0.0 ,937 sf Stora	05 hrs age= 19,13	2 cf	
Plug-Flor Center-o	w detentic of-Mass de	on time= 60.3 min et. time= 56.2 min ert Avail Stor	n calculated for 2 n(1,102.0 - 1,04	2.880 af (100 45.8)	% of inflow))	
<u>#1</u>	1 931 0	0' 36.68	0 cf Custom S	tage Data (F	Prismatic)	isted belo	w (Recalc)
<i></i> 1	1,001.0			lugo Dulu (i			
Elevatio	n	Surf.Area	Inc.Store	Cum.Store	;		
(fee	t)	(sq-ft)	(cubic-feet)	(cubic-feet)	<u>)</u>		
1,931.0	0	8,511	0	C)		
1,932.0	0	10,950	9,731	9,731	1		
1,934.0	0	15,999	26,949	36,680)		
Device	Routing	Invert	Outlet Devices				
#1	Primary	1,931.00'	24.0" Round C	ulvert			
			L= 35.0' CPP,	mitered to co	onform to fil	ll, Ke= 0.7	700
			Inlet / Outlet Inv	/ert= 1,931.0	0' / 1,930.0	0' S= 0.0	286 '/' Cc= 0.900
	D · · · ·	4 004 001	n= 0.013 Corru	igated PE, sr	nooth interi	or, Flow A	Area= 3.14 sf
#2	Device 1	1,931.00'	12.0" W x 4.0"	H Vert. Orific	ce/Grate X	3.00 C=	0.600
#2	Davias 1	1 022 001		now at low ne	eads	0 600	
#3	Device I	1,932.00	Limited to weir f	flow at low he	eads	0.000	
Primary	OutFlow	Max=11.81 cfs	@ 12.12 hrs HV	V=1,932.78'	(Free Disc	harge)	

1=Culvert (Inlet Controls 11.81 cfs @ 4.00 fps)
2=Orifice/Grate (Passes < 6.11 cfs potential flow)</p>

-3=Orifice/Grate (Passes < 25.75 cfs potential flow)



Pond 40P: bio-retention basin #2C

Summary for Subcatchment 11S: SEEPAGE BED #5A (BMP #7)

Runoff = 70.99 cfs @ 11.96 hrs, Volume= 4.137 af, Depth= 8.16" Routed to Pond 9P : seepage pit with chambers #5A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"



Summary for Subcatchment 20S: SEEPAGE BED #5F (BMP 6)

Runoff = 91.21 cfs @ 11.96 hrs, Volume= 5.316 af, Depth= 8.16" Routed to Pond 14P : seepage pit with chambers #5F

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

Area	(ac)	CN	Desc	ription						
7.	808	98	Pave	aved parking & roofs						
0.	009	74	>75%	75% Grass cover, Good, HSG C						
7.	817	98	Weig	hted Aver	age					
0.	009		0.120	% Perviou	s Ārea					
7.	808		99.88	3% Imperv	vious Area					
Та	Longt	ь (Clana	Valacity	Consoitu	Description				
IC (maim)	Lengi	ព ខ	Siope		Capacity	Description				
<u>(mn)</u>	(lee	()	(\mathbf{n})	(it/sec)	(CIS)					
6.0						Direct Entry,				

Subcatchment 20S: SEEPAGE BED #5F (BMP 6)



Summary for Subcatchment 22S: SUB BASIN-5A (BMP 8)

Runoff = 44.01 cfs @ 11.97 hrs, Volume= 2.171 af, Depth= 5.28" Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

Subcatchment 22S: SUB BASIN-5A (BMP 8)



Runoff = 17.77 cfs @ 11.97 hrs, Volume= Routed to Pond 24P : bio-retention basin #6a 0.880 af, Depth= 5.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

	Area (ac)	CN	Desc	ription		
	1.119	98	Pave	d parking	& roofs	
*	0.665	40	>75%	6 Grass co	over, Good,	, HSG A
	0.169	61	>75%	6 Grass co	over, Good,	, HSG B
	1.953	75	Weig	hted Aver	age	
	0.834		42.70)% Pervio	us Area	
	1.119		57.30)% Imperv	vious Area	
	- .				A	
	IC Len	gth S	slope	Velocity	Capacity	Description
	(min) (fe	eet)	(ft/ft)	(ft/sec)	(cfs)	
	6.0					Direct Entry,

Subcatchment 25S: BIO-RETENTION BASIN #6A (BMP 5)



Summary for Subcatchment 29S: SWL #1

Runoff = 15.36 cfs @ 12.06 hrs, Volume= Routed to Reach 26R : SWL-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

Area (ac) C	N De	scription		
0.	765	98 Pa	ved parking	& roofs	
1.4	461	61 >7	5% Grass c	over, Good	, HSG B
2.2	226	74 W	eighted Ave	rage	
1.4	461	65	.63% Pervic	ous Area	
0.	765	34	.37% Imper	vious Area	
Tc	Length	Slop	e Velocity	Capacity	Description
(min)	(feet)	(ft/f	:) (ft/sec)	(cfs)	
10.2	150	0.040	0.24		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.23"
4.1	732	0.040	0 3.00		Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
14.3	882	Total			

Subcatchment 29S: SWL #1



0.980 af, Depth= 5.28"

Summary for Subcatchment 30S: SWL #2

Runoff = 11.07 cfs @ 11.96 hrs, Volume= Routed to Reach 27R : SWL-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

	Area	(ac)	CN	Desc	ription		
	0.	814	98	Pave	d parking	& roofs	
*	0.	229	40	>75%	6 Grass co	over, Good,	, HSG A
	1.043 85 Weighted Average						
	0.229 21.96% Pervious Area						
0.814 78.04% Impervious Area					4% Imperv	vious Area	
	Та	Longt	6	Clana	Volgaity	Consoitu	Description
	IC (min)	Lengt				Capacity	Description
	(min)	(lee	9	(11/11)	(it/sec)	(CIS)	
	6.0						Direct Entry,

Subcatchment 30S: SWL #2



0.574 af, Depth= 6.60"

Runoff = 22.31 cfs @ 12.05 hrs, Volume= 1.376 af, Depth= 4.93" Routed to Reach 28R : SWL-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

 Area	(ac) (CN	Desc	cription				
0.	930	98 Paved parking & roofs						
 2.	420	61	>75%	6 Grass co	over, Good,	HSG B		
 3.350 71 Weighted Average								
2.	420		72.24	4% Pervio	us Area			
0.	930		27.76	6% Imperv	vious Area			
Tc (min)	Length (feet)	S	lope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description		
10.2	150	0.0	0400	0.24		Sheet Flow,		
 3.2	575	6 0.0	0400	3.00		Grass: Short n= 0.150 P2= 3.23" Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps		
13.4	725	i To	otal					

Subcatchment 32S: SWL #3



Runoff = 32.42 cfs @ 11.96 hrs, Volume= Routed to Pond 29P : bio-retention basin #1A 1.681 af, Depth= 6.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

 Area (a	ac)	CN	Desc	ription		
1.9	978	98	Pave	d parking	& roofs	
 1.0)78	61	>75%	6 Grass co	over, Good,	HSG B
3.0)56	85	Weig	hted Aver	age	
1.0)78		35.27	7% Pervio	us Area	
1.9	978		64.73	3% Imperv	ious Area	
_						
Tc	Length	າ 5	Slope	Velocity	Capacity	Description
 <u>(min)</u>	(feet)	<u>(ft/ft)</u>	(ft/sec)	(cfs)	
6.0						Direct Entry,

Subcatchment 33S: BIO-RETENTION BASIN #1A (BMP#1)



Runoff = 16.31 cfs @ 11.96 hrs, Volume= Routed to Pond 38P : bio-retention basin #2A 0.845 af, Depth= 6.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

 Area (a	ac)	CN	Desc	ription		
1.0	800	98	Pave	d parking	& roofs	
 0.5	529	61	>75%	6 Grass co	over, Good,	, HSG B
1.5	537	85	Weig	hted Aver	age	
0.5	529		34.42	2% Pervio	us Area	
1.0	800		65.58	3% Imperv	vious Area	
_					_	
Tc	Lengtl	n S	Slope	Velocity	Capacity	Description
 (min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0						Direct Entry,
						-

Subcatchment 37S: BIO-RETENTION BASIN #2A (BMP #2)



Runoff = 19.11 cfs @ 11.96 hrs, Volume= Routed to Pond 40P : bio-retention basin #2C

0.985 af, Depth= 6.48"

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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

Area	(ac)	CN	Desc	ription		
1.	120	98	Pave	d parking	& roofs	
0.	704	61	>75%	6 Grass co	over, Good,	I, HSG B
1.	824	84	Weig	hted Aver	age	
0.	704		38.60	0% Pervio	us Area	
1.	120		61.40	0% Imperv	vious Area	
Та	Long	.h C	Clana	Volgaity	Consoitu	Description
IC (mim)	Lengi	יד רו	Siope		Capacity	Description
<u>(min)</u>	(iee	()	(11/11)	(It/sec)	(CIS)	
6.0						Direct Entry,

Subcatchment 41S: BIO-RETENTION BASIN #2C (BMP #3)



Runoff = 10.26 cfs @ 11.96 hrs, Volume= Routed to Pond 39P : bio-retention basin #2B 0.526 af, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=8.40"

Description
Paved parking & roofs
>75% Grass cover, Good, HSG B
Weighted Average
39.72% Pervious Area
60.28% Impervious Area
ope Velocity Capacity Description
ft/ft) (ft/sec) (cfs)
Direct Entry,

Subcatchment 42S: BIO-RETENTION BASIN #2B (BMP #4)



Summary for Reach 26R: SWL-1

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9.635 ac, 56.76% Impervious, Inflow Depth > 6.23" for 100-Year event Inflow Area = 30.39 cfs @ 12.07 hrs, Volume= 30.39 cfs @ 12.07 hrs, Volume= Inflow = 5.003 af Outflow = 5.003 af, Atten= 0%, Lag= 0.0 min Routed to Reach 28R : SWL-3

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 26R: SWL-1

Summary for Reach 27R: SWL-2

Inflow Area =2.996 ac, 64.52% Impervious, Inflow Depth =5.82" for 100-Year eventInflow =12.24 cfs @11.97 hrs, Volume=1.453 afOutflow =12.24 cfs @11.97 hrs, Volume=1.453 af, Atten= 0%, Lag= 0.0 minRouted to Reach 28R : SWL-3SWL-31.453 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs





Summary for Reach 28R: SWL-3

Inflow Area	a =	15.981 ac, 5	2.14% Impervious	, Inflow Depth =	5.88" fc	or 100-Year event
Inflow	=	60.36 cfs @	12.04 hrs, Volum	e= 7.832	af	
Outflow	=	60.36 cfs @	12.04 hrs, Volum	e= 7.832	af, Atten=	= 0%, Lag= 0.0 min
Routed	to Pon	d 8P : BIO-RE	TENTION BASIN	#5A (POI 001)		

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Reach 28R: SWL-3

Summary for Pond 8P: BIO-RETENTION BASIN #5A (POI 001)

Inflow Area = 34.811 ac, 65.84% Impervious, Inflow Depth = 4.11" for 100-Year event 101.83 cfs @ 12.00 hrs, Volume= Inflow = 11.922 af Outflow = 18.29 cfs @ 13.01 hrs, Volume= 11.922 af, Atten= 82%, Lag= 60.4 min Discarded = 1.59 cfs @ 13.01 hrs, Volume= 4.818 af Primary = 16.70 cfs @ 13.01 hrs, Volume= 7.104 af Routed to Link 37L : Discharge 001

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,869.95' @ 13.01 hrs Surf.Area= 87,990 sf Storage= 162,572 cf

Plug-Flow detention time= 332.3 min calculated for 11.913 af (100% of inflow) Center-of-Mass det. time= 332.0 min (1,259.5 - 927.5)

Volume	Invert	Avail.Sto	rage Stora	age Description
#1	1,868.00'	560,09	97 cf Cust	tom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	S	urf.Area (sg-ft)	Inc.Store	e Cum.Store
1 868 00		79 525	0	$) \qquad 0$
1.869.00		83.329	81.427	81.427
1,870.00		88,249	85,789) 167,216
1,872.00		98,164	186,413	3 353,629
1,874.00		108,304	206,468	3 560,097
Device I	Routing	Invert	Outlet Dev	vices
#1 I	Primary	1,865.00'	42.0" Rou	und Culvert
			L= 30.0' E Inlet / Outl n= 0.013	Box, headwall w/3 square edges, Ke= 0.500 let Invert= 1,865.00' / 1,864.50' S= 0.0167 '/' Cc= 0.900 Corrugated PE, smooth interior, Flow Area= 9.62 sf
#2 I	Device 1	1,869.10'	20.0" W x Limited to	12.0" H Vert. Orifice/Grate X 4.00 C= 0.600 weir flow at low heads
#3 I	Device 1	1,870.50'	72.0" x 24 Limited to	.0" Horiz. Orifice/Grate C= 0.600 weir flow at low heads
#4 I	Discarded	1,868.00'	0.780 in/h	r Exfiltration over Surface area

Discarded OutFlow Max=1.59 cfs @ 13.01 hrs HW=1,869.95' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 1.59 cfs)

Primary OutFlow Max=16.69 cfs @ 13.01 hrs HW=1,869.95' (Free Discharge)

-1=Culvert (Passes 16.69 cfs of 82.83 cfs potential flow)

2=Orifice/Grate (Orifice Controls 16.69 cfs @ 2.95 fps)

3=Orifice/Grate (Controls 0.00 cfs)



Pond 8P: BIO-RETENTION BASIN #5A (POI 001)
Summary for Pond 9P: seepage pit with chambers #5A

Inflow Area = 6.084 ac,100.00% Impervious, Inflow Depth = 8.16" for 100-Year event 70.99 cfs @ 11.96 hrs, Volume= Inflow = 4.137 af Outflow = 3.61 cfs @ 12.92 hrs, Volume= 4.137 af, Atten= 95%, Lag= 57.3 min Discarded = 1.28 cfs @ 8.60 hrs, Volume= 3.190 af 0.947 af Primary = 2.33 cfs @ 12.92 hrs, Volume= Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,879.00' @ 12.92 hrs Surf.Area= 42,456 sf Storage= 89,570 cf

Plug-Flow detention time= 367.1 min calculated for 4.137 af (100% of inflow) Center-of-Mass det. time= 367.0 min (1,103.4 - 736.4)

Volume	Invert	Avail.Sto	rage St	torage Description
#1	1,876.00'	40,53	38 cf C u	ustom Stage Data (Prismatic) Listed below (Recalc)
			16	69,824 cf Overall - 68,478 cf Embedded = 101,346 cf x 40.0% Voids
#2	1,876.50'	68,47	78 cf Ci	ultec R-360HD x 1862 Inside #1
			Ef	ffective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf
			0	$Verall Size = 60.0^{\circ}W \times 36.0^{\circ}H \times 4.17^{\circ}L$ with 0.50° Overlap
			18	862 Chambers in 19 Rows
			Ca	ap Storage= 6.5 cf x 2 x 19 rows = 245.5 cf
		109,01	16 cf To	otal Available Storage
Elevatio	on Su	urf.Area	Inc.St	tore Cum.Store
(fee	et)	(sq-ft)	(cubic-fe	eet) (cubic-feet)
1,876.0	00	42,456		0 0
1,880.0	00	42,456	169,8	824 169,824
Device	Routing	Invert	Outlet E	Devices
#1	Primary	1,876.00'	24.0" F	Round Culvert
	,	,	L= 120.	0.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / C	Dutlet Invert= 1,876.00' / 1,868.00' S= 0.0667 '/' Cc= 0.900
			n= 0.01	13 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,877.80'	12.0" W	N x 6.0" H Vert. Orifice/Grate C= 0.600
			Limited	I to weir flow at low heads
#3	Discarded	1,876.00'	1.300 ir	n/hr Exfiltration over Surface area
Discard	ed OutFlow	Max=1.28 cf	s @ 8.60) hrs HW=1,876.04' (Free Discharge)

—3=Exfiltration (Exfiltration Controls 1.28 cfs)

Primary OutFlow Max=2.33 cfs @ 12.92 hrs HW=1,879.00' TW=1,869.56' (Fixed TW Elev= 1,869.56') -1=Culvert (Passes 2.33 cfs of 18.85 cfs potential flow) **2=Orifice/Grate** (Orifice Controls 2.33 cfs @ 4.67 fps)



Pond 9P: seepage pit with chambers #5A

Summary for Pond 14P: seepage pit with chambers #5F

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Inflow Area = 7.817 ac, 99.88% Impervious, Inflow Depth = 8.16" for 100-Year event 91.21 cfs @ 11.96 hrs, Volume= Inflow = 5.316 af Outflow = 4.63 cfs @ 12.92 hrs, Volume= 5.316 af, Atten= 95%, Lag= 57.5 min Discarded = 2.24 cfs @ 9.85 hrs, Volume= 4.343 af Primary = 2.39 cfs @ 12.92 hrs, Volume= 0.972 af Routed to Pond 8P : BIO-RETENTION BASIN #5A (POI 001)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,871.24' @ 12.92 hrs Surf.Area= 56,925 sf Storage= 108,429 cf

Plug-Flow detention time= 268.8 min calculated for 5.316 af (100% of inflow) Center-of-Mass det. time= 268.8 min (1,005.1 - 736.4)

Volume	Invert	Avail.Stor	rage Stor	rage Description					
#1	1,868.50'	56,16	60 cf Cus	Custom Stage Data (Prismatic) Listed below (Recalc)					
		227	',700 cf Overall - 87,300 cf Embedded = 140,400 cf x 40.0% Voids						
#2	1,869.00'	87,30	0 cf Cul	tec R-360HD x 2376 Inside #1					
			Effe	ective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf					
			Ove	erall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap					
			237	6 Chambers in 18 Rows					
			Сар	o Storage= 6.5 ct x 2 x 18 rows = 232.6 ct					
		143,46	60 cf Tota	al Available Storage					
Elevatio	on Si	urf.Area	Inc.Stor	re Cum.Store					
(fee	et)	(sq-ft)	(cubic-fee	et) (cubic-feet)					
1,868.5	50	56,925		0 0					
1,872.5	50	56,925	227,70	00 227,700					
Device	Routing	Invert	Outlet De	evices					
#1	Primary	1,869.50'	24.0" Ro	ound Culvert					
	-		L= 60.0'	CPP, mitered to conform to fill, Ke= 0.700					
			Inlet / Ou	Itlet Invert= 1,869.50' / 1,868.00' S= 0.0250 '/' Cc= 0.900					
			n= 0.013	Corrugated PE, smooth interior, Flow Area= 3.14 sf					
#2	Device 1	1,870.00'	12.0" W x	x 6.0" H Vert. Orifice/Grate C= 0.600					
			Limited to	o weir flow at low heads					
#3	Discarded	1,868.50'	1.700 in/	hr Exfiltration over Surface area					
Discard	ed OutFlow	Max=2.24 cf	s @ 9.85 h	nrs HW=1,868.54' (Free Discharge)					

—3=Exfiltration (Exfiltration Controls 2.24 cfs)

Primary OutFlow Max=2.39 cfs @ 12.92 hrs HW=1,871.24' TW=1,869.56' (Fixed TW Elev= 1,869.56') -1=Culvert (Passes 2.39 cfs of 11.50 cfs potential flow) **2=Orifice/Grate** (Orifice Controls 2.39 cfs @ 4.78 fps)



Pond 14P: seepage pit with chambers #5F

Summary for Pond 24P: bio-retention basin #6a

Inflow Are Inflow Outflow Primary Routed	a = = 1 = = to React	1.953 ac, 57.3 7.77 cfs @ 11 2.25 cfs @ 12 2.25 cfs @ 12 1 27R : SWL-2	0% Impervious, .97 hrs, Volume .28 hrs, Volume .28 hrs, Volume	Inflow Dep e= (e= (e= (oth = 5 0.880 at 0.879 at 0.879 at	5.40" f f, Atte f	for en= 8	100- 37%,	-Yea Lag	r eve g= 18	ənt 3.7 mir	n
Routing by Peak Elev	/ Stor-Ind = 1,924.5	method, Time 8' @ 12.28 hrs	Span= 0.00-72.0 Surf.Area= 8,4)0 hrs, dt= (l84 sf Stor	0.05 hrs ∙age= 1≀	s 8,034	cf					
Plug-Flow	detentior	n time= 157.3 m	in calculated for	r 0.879 af (1	100% of	ⁱ inflov	v)					
Center-of-	Mass det	. time= 158.6 m	iin (967.7 - 809.	.1)								
Volume	Inver	t Avail.Stor	age Storage D	Description								
#1	1,922.00	' 31,35	2 cf Custom S	Stage Data	(Prisma	atic) L	isted	belo	ow (F	Reca	lc)	
Flevation		Surf Area	Inc Store	Cum Sto	re							
(feet)		(sq-ft)	(cubic-feet)	(cubic-fee	et)							
1.922.00		5.567	0		0							
1,924.00		7,781	13,348	13,34	48							
1,926.00		10,223	18,004	31,35	52							
Device F	Routing	Invert	Outlet Devices									
#1 F	Primary	1,922.00'	24.0" Round C	Sulvert								
			L= 50.0' CPP,	mitered to	conform	n to fil	l, Ke	e= 0.	700			
			Inlet / Outlet Inv	vert= 1,922.	.00' / 1,9	920.25	5' S	= 0.0)350	'/' (Cc= 0	.900
<i></i>		4 000 001	n= 0.013 Corru	ugated PE,	smooth	interio	or, ⊦	low	Area	i= 3.1	14 st	1
#2 L #2 F		1,922.00		ce/Grate	C = 0.60				veir t	IOW a	at Iow	neads
#3 L		1,924.30	Limited to weir	flow at low	heads	; ()=	0.00	U				
Drimon, C	Primary OutElow May=2.22 of (2.22) bro (1) W=1.024.59' (Erec Discharge)											

Primary OutFlow Max=2.23 cfs @ 12.28 hrs HW=1,924.58' (Free Discharge) -**1=Culvert** (Passes 2.23 cfs of 16.75 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 1.44 cfs @ 7.34 fps) -3=Orifice/Grate (Weir Controls 0.78 cfs @ 0.90 fps)



Pond 24P: bio-retention basin #6a

Summary for Pond 29P: bio-retention basin #1A

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Inflow Area	a =	3.056 ac, 64.7	'3% Impervious,	Inflow Depth	ו= 6.60"	for 100-Year event					
Inflow	= 32	2.42 cfs @ 11	.96 hrs, Volume	;= ¹ .6	381 af						
Outflow	= 2	2.19 cfs @12	.61 hrs, Volume	1 hrs, Volume= 1.675 af, Atten= 93%, Lag= 38.6 min							
Primary = $2.19 \text{ cfs} @ 12.61 \text{ hrs}$. Volume= 1.675 af											
Routed	Routed to Pond 38P : bio-retention basin #2A										
Routing by	Stor-Ind I	method, Time	Span= 0.00-72.0	0 hrs, dt= 0.0)5 hrs						
Peak Elev	= 1,940.57	" @ 12.61 hrs	Surf.Area= 19,0	639 sf Stora	age= 41,42	5 cf					
	,	0	,		0 ,						
Plug-Flow	detention	time= 365.8 m	in calculated for	1.675 af (10	0% of inflov	N)					
Center-of-I	Mass det.	time= 363.4 m	in (1,149.0 - 78	5.6)		,					
				,							
Volume	Invert	Avail.Stor	age Storage De	escription							
#1	1,938.00'	72,334	4 cf Custom S	tage Data (P	rismatic) L	isted below (Recalc)					
	_										
Elevation	Sı	urf.Area	Inc.Store	Cum.Store							
(feet)		(sq-ft)	(cubic-feet)	(cubic-feet)							
1,938.00		12,620	0	0							
1,940.00		18,027	30,647	30,647							
1,942.00		23,660	41,687	72,334							
Davias D	outing	Invert	Outlet Devices								
			Outlet Devices								
#1 P	rimary	1,936.00'	24.0" Round C	ulvert							
			L= 85.0' CPP,	mitered to co	onform to fil	l, Ke= 0.700					
			Inlet / Outlet Inv	ert = 1,936.00)' / 1,934.00	0' S= 0.0235 '/' Cc= 0.900					
			n= 0.013 Corru	gated PE, sn	nooth interi	or, Flow Area= 3.14 sf					
#2 D	evice 1	1,938.00'	6.0" Vert. Orific	:e/Grate C=	= 0.600 Lir	mited to weir flow at low heads					
#3 D	evice 1	1,940.50'	45.0" x 24.0" He	oriz. Orifice/	Grate C=	0.600					
			Limited to weir f	low at low he	ads						

Primary OutFlow Max=2.17 cfs @ 12.61 hrs HW=1,940.57' TW=1,936.57' (Fixed TW Elev= 1,936.57') -1=Culvert (Passes 2.17 cfs of 25.23 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 1.44 cfs @ 7.34 fps)

-3=Orifice/Grate (Weir Controls 0.73 cfs @ 0.88 fps)



Pond 29P: bio-retention basin #1A

Summary for Pond 38P: bio-retention basin #2A

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Inflow Area Inflow Outflow Primary Routed	a = 4. = 17.4 = 16.0 = 16.0 to Pond 40	593 ac, 65.0 49 cfs @ 11 60 cfs @ 12 60 cfs @ 12 P : bio-retent	01% Impervious, .97 hrs, Volume 2.00 hrs, Volume 2.00 hrs, Volume tion basin #2C	Inflow Dep = 2 = 2 = 2	th > 6.58" 520 af 519 af, Atte 519 af	for 100-โ en= 5%, L	∕ear event ag= 1.8 min	
Routing by Peak Elev	v Stor-Ind m = 1,936.57'	ethod, Time @ 12.00 hrs	Span= 0.00-72.0 Surf.Area= 4,97	0 hrs, dt= 0 73 sf Stora	.05 hrs age= 10,737	′ cf		
Plug-Flow Center-of-l	detention ti Mass det. ti	me= 107.8 m me= 106.9 m	nin calculated for nin (1,134.0 - 1,0	2.517 af (10 27.1)	00% of inflo	w)		
<u>volume</u> #1		Avail.3(0)	age Storage De	togo Doto (Driomotio)	isted bolov		
<i>#</i> I	1,955.00	19,00		lage Dala (Prismatic)		v (Recalc)	
Elevation	Sur	f.Area	Inc.Store	Cum.Stor	e			
(feet)		(sq-ft)	(cubic-feet)	(cubic-fee	t)			
1,933.00		1,159	0		0			
1,934.00		2,148	1,654	1,65	4			
1,936.00		4,297	6,445	8,09	9			
1,938.00		6,672	10,969	19,06	8			
Device F	Routing	Invert	Outlet Devices					
#1 F #2 [#3 [Primary Device 1 Device 1	1,933.00' 1,933.00' 1,936.00'	24.0" Round Culvert L= 115.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,933.00' / 1,931.70' S= 0.0113 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf 3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads 45.0" x 24.0" Horiz. Orifice/Grate C= 0.600					
				iow at iow r	leaus			

Primary OutFlow Max=16.42 cfs @ 12.00 hrs HW=1,936.57' (Free Discharge) **1=Culvert** (Passes 16.42 cfs of 21.38 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.44 cfs @ 8.93 fps)

-3=Orifice/Grate (Weir Controls 15.98 cfs @ 2.46 fps)



Pond 38P: bio-retention basin #2A

Summary for Pond 39P: bio-retention basin #2B

Inflow Area	a =	0.992 ac, 60.2	8% Impervious,	Inflow Deptl	h = 6.36"	for 100-Ye	ear event				
Inflow	= 10	0.26 CTS @ 11	.96 nrs, volume	¹⁰ nrs, volume= 0.526 at							
Outflow	= (0.93 cfs @ 12.45 hrs, Volume= 0.524 af, Atten= 91%, Lag= 29.2 min									
Primary = 0.93 cfs @ 12.45 hrs, Volume= 0.524 af											
Routed	to Reach	26R : SWL-1									
Routing by	Stor-Ind	method Time	Span= 0 00-72 0	0 hrs dt = 0	05 hrs						
Peak Eleve	= 1 017 22	2' @ 12.45 hrs	Surf Area = 10	350 sf Stor	200= 11 08	7 cf					
	- 1,517.22	2 @ 12.40113			age= 11,50						
Plug-Flow	detention	time= 226.6 m	in calculated for	0.524 af (10	0% of inflov	A ()					
Center_of_I	Mass det	time= 224.3 m	1000000000000000000000000000000000000	07)		•)					
Center-or-	Mass uet.	ume= 224.0 m	iiii (1,015.0 - 73	0.7)							
Volume	Invert	Avail.Stor	age Storage D	escription							
#1	1 916 00'	11 18	Ocf Custom S	tago Data (E	Prismatic)	isted below	(Recalc)				
π	1,310.00			laye Dala (F	nsmatic) L		(Incoald)				
Flevation	S	urf Area	Inc Store	Cum Store	1						
(feet)	0.	(sa_ft)	(cubic_feet)	(cubic_feet)							
					-						
1,916.00		9,337	0	0							
1,918.00		11,016	20,353	20,353							
1,920.00		12,811	23,827	44,180							
Device R	Routing	Invert	Outlet Devices								
#1 P	rimary	1,916.00'	24.0" Round C	ulvert							
	,	,	I = 50.0' CPP	mitered to co	onform to fil	ll Ke= 0.70	0				
			Inlet / Outlet Inv	ort= 1 016 0	0' / 1 014 0	0' S = 0.040	00'/' Cc= 0.900				
			n=0.012 Corru	acted DE or	nooth intori	or Elow Ar	307 00 = 0.000				
//O D		4 040 001				UI, FIUW AI					
#2 D	pevice 1	1,916.00	6.0" Vert. Orific	:e/Grate C=	= 0.600 LI	mited to wei	r flow at low neads				
#3 D	Device 1	1,917.50'	45.0" x 24.0" H	oriz. Orifice/	Grate C=	0.600					
			Limited to weir f	low at low he	eads						
Primary O		1av=0 03 cfc @) 12 15 brs H\//	=1 017 22'	Free Disch	arde)					

rimary OutFlow Max=0.93 cfs @ 12.45 hrs HW=1,917.22' (Free Discharge) -**1=Culvert** (Passes 0.93 cfs of 6.63 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.93 cfs @ 4.74 fps) -3=Orifice/Grate (Controls 0.00 cfs)

1 0-

Hydrograph Inflow
Primary 10.26 11 Inflow Area=0.992 ac 10-Peak Elev=1,917.22' 9 Storage=11,987 cf 8-7 Flow (cfs) 6 5 4 3-2-0.9

Pond 39P: bio-retention basin #2B

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0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 Time (hours)

Summary for Pond 40P: bio-retention basin #2C

Inflow Are Inflow Outflow Primary Routed	ea = = = = d to Read	6.417 ac, 63.9 35.33 cfs @ 11 14.40 cfs @ 12 14.40 cfs @ 12 ch 26R : SWL-1	99% Impervious, I.98 hrs, Volume 2.11 hrs, Volume 2.11 hrs, Volume	Inflow Dep ə= 3 ə= 3 ə= 3	th = 6.55" 5.504 af 5.499 af, Att 5.499 af	for 100 ten= 59%)-Year event , Lag= 8.1 min	
Routing b Peak Elev	y Stor-In /= 1,933.	d method, Time 16' @ 12.11 hrs	Span= 0.00-72.0 Surf.Area= 13,)0 hrs, dt= 0 ,888 sf Sto	0.05 hrs rage= 24,18	32 cf		
Plug-Flow Center-of	/ detentic -Mass de	on time= 56.5 mi et. time= 52.5 mi	n calculated for 3 n (1,089.3 - 1,03	3.499 af (10 36.8)	0% of inflow	/)		
Volume	Inve	ert Avail.Stor	age Storage D	escription				
#1	1,931.0	0' 36,68	0 cf Custom S	Stage Data (Prismatic) l	Listed bel	low (Recalc)	
Elevation	'n	Surf Area	Inc Store	Cum Stor	·0			
(feet))	(sa-ft)	(cubic_feet)	(cubic_fee	t)			
1 031 00	/	<u> </u>	0	00010-100	0			
1,931.00)	10.050	0 731	0.73	0 :1			
1 03/ 00)	15,950	26 9/19	36,68	1 30			
1,004.00	,	10,000	20,040	00,00	0			
Device	Routing	Invert	Outlet Devices					
#1	Primary	1,931.00'	24.0" Round C	Culvert				
			L= 35.0' CPP,	mitered to a	conform to fi	ill, Ke= 0).700	
			Inlet / Outlet Inv	vert= 1,931.0	00' / 1,930.0)0' S= 0.	.0286 '/' Cc= 0.900	
			n= 0.013 Corru	ugated PE, s	smooth inter	ior, Flow	/ Area= 3.14 sf	
#2	Device 1	1,931.00'	12.0" W x 4.0"	H Vert. Orif	ice/Grate X	3.00 C	= 0.600	
			Limited to weir	flow at low h	neads			
#3	Device 1	1,932.00'	45.0" x 24.0" H	loriz. Orifice	e/Grate C=	= 0.600		
			Limited to weir	flow at low h	neads			
Primary (OutFlow	Max=14.34 cfs	@ 12.11 hrs HV	N=1,933.15'	(Free Disc	charge)		

1=Culvert (Inlet Controls 14.34 cfs @ 4.56 fps) **2=Orifice/Grate** (Passes < 6.79 cfs potential flow) **3=Orifice/Grate** (Passes < 38.79 cfs potential flow)



Pond 40P: bio-retention basin #2C