

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

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Area Listing (selected nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
7.659	61	>75% Grass cover, Good, HSG B (23S, 45S, 46S)
2.353	74	>75% Grass cover, Good, HSG C (46S)
0.493	58	Meadow, non-grazed, HSG B (23S)
26.832	98	Paved parking & roofs (18S, 45S, 46S)
0.266	60	Woods, Fair, HSG B (23S)
37.603	88	TOTAL AREA

Summary for Subcatchment 18S: SEEPAGE BED #5E (BMP 14)

0.737 af, Depth= 3.13" Runoff 13.07 cfs @ 11.96 hrs, Volume= = Routed to Pond 12P : seepage pit with chambers #5e

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"



Summary for Subcatchment 23S: UNDETAINED 002

Runoff = 0.76 cfs @ 12.19 hrs, Volume= 0.087 af, Depth= 0.47" Routed to Link 24L : Discharge 002

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						
1.	.447	61 >	>75%	75% Grass cover, Good, HSG B						
0.	266	60 \	Noo	Voods, Fair, HSG B						
0.	.493	58 I	Mea	dow, non-g	grazed, HS	G B				
2.	.206	60 \	Neig	ghted Aver	age					
2.	206		100.	00% Pervi	ous Area					
Тс	Length	Slo	pe	Velocity	Capacity	Description				
(min)	(feet)) (ft	:/ft)	(ft/sec)	(cfs)					
16.0	150	0.01	30	0.16		Sheet Flow,				
						Grass: Short n= 0.150 P2= 3.23"				
4.4	444	0.05	680	1.69		Shallow Concentrated Flow,				
						Short Grass Pasture Kv= 7.0 fps				
20.4	594	Tota	al							

Subcatchment 23S: UNDETAINED 002



Summary for Subcatchment 45S: BASIN #5C (BMP 15)

Runoff = 15.34 cfs @ 11.98 hrs, Volume= 0.745 af, Depth= 1.03" Routed to Pond 44P : DETENTION BASIN #5C

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					
2.	646	98	Pave	d parking	& roofs				
6.	034	61	>75%	•75% Grass cover, Good, HSG B					
8.	680	72	Weig	hted Aver	age				
6.	034		69.52	2% Pervio	us Area				
2.	646		30.48	3% Imperv	vious Area				
т.	1			M. L	0	Description			
	Lengt	in t	Slope	Velocity	Capacity	Description			
<u>(min)</u>	(tee	t)	(ft/ft)	(ft/sec)	(cts)				
6.0						Direct Entry,			

Subcatchment 45S: BASIN #5C (BMP 15)



Summary for Subcatchment 46S: SEEPAGE BED #5C (BMP 13)

Runoff = 105.17 cfs @ 11.96 hrs, Volume= 5.577 af, Depth= 2.80" Routed to Pond 41P : seepage pit with chambers #5C (combined old 5C and 5D)

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	Description		
21.358	98	Paved parking	& roofs	
2.353	74	>75% Grass c	over, Good,	I, HSG C
0.178	61	>75% Grass c	over, Good,	I, HSG B
23.889	95	Weighted Aver	rage	
2.531		10.59% Pervio	us Area	
21.358		89.41% Imperv	vious Area	
			.	
Tc Len	gth S	Slope Velocity	Capacity	Description
<u>(min)</u> (fe	et)	<u>(ft/ft) (ft/sec)</u>	(cfs)	
6.0				Direct Entry,

Subcatchment 46S: SEEPAGE BED #5C (BMP 13)



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Summary for Reach 46R: SWL-5

 Inflow Area =
 26.717 ac, 90.53% Impervious, Inflow Depth =
 0.00"
 for 2-Year event

 Inflow =
 0.00 cfs @
 0.00 hrs, Volume=
 0.000 af

 Outflow =
 0.00 cfs @
 0.00 hrs, Volume=
 0.000 af, Atten= 0%, Lag= 0.0 min

 Routed to Pond 44P : DETENTION BASIN #5C
 5

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



Reach 46R: SWL-5

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Summary for Pond 12P: seepage pit with chambers #5e

Inflow Area	a =	2.828 ac,100	0.00% Impervious,	Inflow Depth =	3.13" for	2-Year event
Inflow	=	13.07 cfs @	11.96 hrs, Volume	= 0.737 a	af	
Outflow	=	0.23 cfs @	9.05 hrs, Volume	= 0.737 a	af, Atten=	98%, Lag= 0.0 min
Discarded	=	0.23 cfs @	9.05 hrs, Volume	= 0.737 a	af	•
Primary	=	0.00 cfs @	0.00 hrs, Volume	= 0.000 a	af	
Routed	to Read	ch 46R : SWL-	5			

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,870.21' @ 15.93 hrs Surf.Area= 24,890 sf Storage= 19,373 cf

Plug-Flow detention time= 748.4 min calculated for 0.737 af (100% of inflow) Center-of-Mass det. time= 748.2 min (1,499.6 - 751.5)

Volume	Invert	Avail.Stor	rage	Storage D	escription	
#1	1,869.00'	24,57	'6 cf	Custom S	tage Data (P	rismatic) Listed below (Recalc)
#2	1 960 50	20.10	01 of	99,560 cf (Overall - 38,1	21 cf Embedded = 61,439 cf x 40.0% Voids
#2	1,009.50	30,12		Effective S	Size= 54 9"\//	x 36 0"H => 9 99 sf x 3 67'I = 36 6 cf
				Overall Siz	ze= 60.0"W x	36.0"H x 4.17'L with 0.50' Overlap
				1035 Char	mbers in 15 F	Rows
				Cap Stora	ge= 6.5 cf x 2	2 x 15 rows = 193.8 cf
		62,69	97 cf	Total Avail	able Storage	
Elevatio	on S	urf.Area	Inc	.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubio	c-feet)	(cubic-feet)	
1,869.0	00	24,890		0	0	
1,873.0	00	24,890	ç	9,560	99,560	
Device	Routing	Invert	Outle	et Devices		
#1	Primary	1,869.00'	24.0	" Round C	ulvert	
			L= 6	0.0' CPP,	mitered to co	onform to fill, Ke= 0.700
			Inlet	/ Outlet Inv	ert= 1,869.00	0' / 1,868.00' S= 0.0167 '/' Cc= 0.900
40	Davis 1	4 074 001	n= 0	.013 Corru	gated PE, sn	nooth interior, Flow Area= 3.14 st
#2	Device	1,871.30	1 2.0	J" W x 6.0" H Vert. Orifice/Grate C= 0.600		
#3	Discarded	1,869.00'	0.40	0 in/hr Exfi	Itration over	Surface area
Discard	ed OutFlow	Max=0.23 cf	s @ 9	.05 hrs HW	/=1,869.04'	(Free Discharge)

3=Exfiltration (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,869.00' (Free Discharge)

2=Orifice/Grate (Controls 0.00 cfs)



Pond 12P: seepage pit with chambers #5e

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Total Tributary Area to 002 Type II 24-hr 2-Year Rainfall=3.36" **NPDES Stormwater-REV1.1** Prepared by Keystone Consulting Engineers HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Summary for Pond 41P: seepage pit with chambers #5C (combined old 5C and 5D)

Inflow Area = 23.889 ac, 89.41% Impervious, Inflow Depth = 2.80" for 2-Year event 105.17 cfs @ 11.96 hrs, Volume= Inflow = 5.577 af Outflow = 3.09 cfs @ 10.75 hrs, Volume= 5.577 af, Atten= 97%, Lag= 0.0 min Discarded = 3.09 cfs @ 10.75 hrs, Volume= 5.577 af Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af Routed to Reach 46R : SWL-5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,871.10' @ 13.98 hrs Surf.Area= 190,835 sf Storage= 129,250 cf

Plug-Flow detention time= 381.2 min calculated for 5.574 af (100% of inflow) Center-of-Mass det. time= 381.2 min (1,157.3 - 776.1)

Volume	Invert	Avail.Storage	e Storage Description
#1	1,870.00'	194,128 c	f Custom Stage Data (Prismatic) Listed below (Recalc)
		004 000	763,340 cf Overall - 278,021 cf Embedded = 485,319 cf x 40.0% Voids
#2	1,870.50	201,800 c	T Cultec R-360HD x 5502 Inside #1 Effective Size $54.000 \text{ m} \text{ s} \approx 0.00 \text{ ef} \times 2.070 \text{ m} = 20.0 \text{ ef}$
			Effective Size= 54.9 W X 30.0 H => 9.99 Si X 3.07 L = 30.0 Cl Overall Size= 60.0"W x 26.0"H x 4.17", with 0.50' Overlap
			5502 Chambers in 14 Powe
			Cap Storage = 6.5 cf x 2 x 14 rows = 180.0 cf
#3	1 870 50'	76 221 c	$f = Culter R_{-360HD} \times 2074 \text{ Inside } \#1$
π0	1,070.00	10,2210	Effective Size= 54 9"W x 36 0"H => 9 99 sf x 3 67"L = 36 6 cf
			Overall Size = 60.0° W x 36.0 [°] H x 4.17 [°] with 0.50 [°] Overlap
			2074 Chambers in 17 Rows
			Cap Storage = 6.5 cf x 2 x 17 rows = 219.6 cf
		472.148 c	f Total Available Storage
		, –	5
Elevatio	on Sur	f.Area I	nc.Store Cum.Store
(fee	et)	(sq-ft) (cu	bic-feet) (cubic-feet)
1,870.0	00 19	90,835	0 0
1,874.0	00 19	90,835	763,340 763,340
Device	Routing	Invert O	utlet Devices
#1	Primary	1,870.00' 24	I.0" Round Culvert
		L=	= 180.0' CPP, mitered to conform to fill, Ke= 0.700
		In	let / Outlet Invert= 1,870.00' / 1,868.20' S= 0.0100 '/' Cc= 0.900
		n=	0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,871.50' 12	2.0" W x 6.0" H Vert. Orifice/Grate C= 0.600
		Lii	mited to weir flow at low heads
#3	Discarded	1,870.00' 0. '	700 in/hr Exfiltration over Surface area
Discard	ed OutFlow	Max=3.09 cfs @) 10 75 hrs HW=1 870 04' (Free Discharge)
3=Ex	filtration (Fx	filtration Control	s 3 09 cfs)
• 14			

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,870.00' (Free Discharge) **1=Culvert** (Controls 0.00 cfs)

2=Orifice/Grate (Controls 0.00 cfs)



Pond 41P: seepage pit with chambers #5C (combined old 5C and 5D)

Total Tributary Area to 002 Type II 24-hr 2-Year Rainfall=3.36" NPDES_Stormwater-REV1.1 Prepared by Keystone Consulting Engineers HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Summary for Pond 44P: DETENTION BASIN #5C

Inflow Are Inflow Outflow Primary Routed	a = 1 = 1 = 1 to Link 2	35.397 ac, 75.8 5.34 cfs @ 11 0.21 cfs @ 24 0.21 cfs @ 24 24L : Discharge	30% Impervious, I.98 hrs, Volume I.00 hrs, Volume I.00 hrs, Volume 002	Inflow Depth = = 0.74 = 0.66 = 0.66	= 0.25" 5 af 8 af, Atte 8 af	for 2-Ye en= 99%,	ear event Lag= 721.1 min
Routing by Peak Elev	y Stor-Inc = 1,866.9	l method, Time 90' @ 24.00 hrs	Span= 0.00-72.00 Surf.Area= 28,6) hrs, dt= 0.05 99 sf Storag	hrs e= 23,848	3 cf	
Plug-Flow Center-of-	detention Mass det	n time= 1,288.8 time= 1,236.5	min calculated fo min (2,098.7 - 80	r 0.668 af (90 [°] 62.2)	% of inflov	w)	
Volume	Inve	rt Avail.Stor	age Storage De	scription			
#1	1,866.00)' 406,63	1 cf Custom St	age Data (Pri	smatic) Li	isted belo	ow (Recalc)
Elevation	S	Surf.Area	Inc.Store	Cum.Store			
		(SQ-II)					
1,866.00		24,581	U 50.262	U 50.262			
1,000.00		33,701 17 171	20,302 80,055	130,302			
1 872 00		66 070	113 244	252 561			
1,874.00		88,000	154,070	406,631			
Device F	Routing	Invert	Outlet Devices	,			
#1 F	Primary	1,866.00'	24.0" Round Cu	ulvert			
	-		L= 20.0' CPP, r	nitered to con	form to fill	l, Ke= 0.	700
			Inlet / Outlet Inve	ert= 1,866.00'	/ 1,865.00)' S= 0.0)500 '/' Cc= 0.900
			n= 0.013 Corrug	jated PE, smo	oth interio	or, Flow	Area= 3.14 sf
#2 [Device 1	1,869.00'	18.0" W x 12.0"	H Vert. Orific	e/Grate	C = 0.600)
#з г	Device 1	1 866 00'	3 0" Vort Orifice	ow at low near	us 1600 Lin	nited to v	veir flow at low beads
#3 L #4 [Device 1	1,871.00'	24.0" x 45.0" Ho Limited to weir flo	ow at low hea	r ate C= ds	0.600	
Primary C	OutFlow	Max=0.21 cfs @	24.00 hrs HW=	1,866.90' (Fr	ee Discha	arge)	

-1=Culvert (Passes 0.21 cfs of 3.87 cfs potential flow)

2=Orifice/Grate (Controls 0.00 cfs)

-3=Orifice/Grate (Orifice Controls 0.21 cfs @ 4.23 fps)

-4=Orifice/Grate (Controls 0.00 cfs)

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Total Tributary Area to 002 *Type II 24-hr 2-Year Rainfall=3.36"* Printed 11/16/2022 LLC Page 13



Pond 44P: DETENTION BASIN #5C

Summary for Link 24L: Discharge 002

Inflow Area	a =	37.603 ac, 7	1.36% Impe	ervious,	Inflow Depth	> 0.24"	for 2-Year event
Inflow	=	0.90 cfs @	12.19 hrs,	Volume=	= 0.7	′55 af	
Primary	=	0.90 cfs @	12.19 hrs,	Volume=	= 0.7	755 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Link 24L: Discharge 002

Summary for Subcatchment 18S: SEEPAGE BED #5E (BMP 14)

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1.188 af, Depth= 5.04" Runoff 20.68 cfs @ 11.96 hrs, Volume= = Routed to Pond 12P : seepage pit with chambers #5e

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"



Runoff	=	3.24 cfs @	12.15 hrs,	Volume=	0.270 af,	Depth=	1.47"
Routed	d to Li	nk 24L : Dischar	ge 002			-	

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 D	escription						
1.4	147	61 >7	75% Grass cover, Good, HSG B						
0.2	266	60 W	Voods, Fair, HSG B						
0.4	493	58 M	eadow, non-	grazed, HS	G B				
2.2	206	60 W	eighted Ave	rage					
2.2	206	1(0.00% Perv	ious Area					
Tc	Length	Slop	e Velocity	Capacity	Description				
(min)	(feet)	(ft/1	t) (ft/sec)	(cfs)					
16.0	150	0.013	0.16		Sheet Flow,				
					Grass: Short n= 0.150 P2= 3.23"				
4.4	444	0.058	0 1.69		Shallow Concentrated Flow,				
					Short Grass Pasture Kv= 7.0 fps				
20.4	594	Total							

Subcatchment 23S: UNDETAINED 002



Summary for Subcatchment 45S: BASIN #5C (BMP 15)

Runoff = 36.17 cfs @ 11.97 hrs, Volume= 1.747 af, Depth= 2.42" Routed to Pond 44P : DETENTION BASIN #5C

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	cription		
2.	646	98	Pave	ed parking	& roofs	
6.	034	61	>75%	6 Grass co	over, Good,	I, HSG B
8.	680	72	Weig	ghted Aver	age	
6.	034		69.52	2% Pervio	us Area	
2.	646		30.48	8% Imperv	vious Area	
-			~		o ''	
IC	Lengt	in S	slope	Velocity	Capacity	Description
<u>(min)</u>	(tee	t)	(ft/ft)	(ft/sec)	(cts)	
6.0						Direct Entry,

Subcatchment 45S: BASIN #5C (BMP 15)



Summary for Subcatchment 46S: SEEPAGE BED #5C (BMP 13)

Runoff = 170.72 cfs @ 11.96 hrs, Volume= 9.351 af, Depth= 4.70" Routed to Pond 41P : seepage pit with chambers #5C (combined old 5C and 5D)

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	Description		
21.358	8 98	Paved parking	& roofs	
2.353	3 74	>75% Grass c	over, Good,	I, HSG C
0.178	8 61	>75% Grass c	over, Good,	I, HSG B
23.889	9 95	Weighted Ave	rage	
2.531		10.59% Pervic	ous Area	
21.358	3	89.41% Imper	vious Area	
Tc Le (min) (ength feet)	Slope Velocity (ft/ft) (ft/sec)	Capacity (cfs)	Description
6.0				Direct Entry,

Subcatchment 46S: SEEPAGE BED #5C (BMP 13)



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Summary for Reach 46R: SWL-5

Inflow Area	ı =	26.717 ac,	90.53% Imper	vious, Inflow	Depth = 0.7	18" for 10-	Year event
Inflow	=	0.69 cfs @	15.08 hrs, \	/olume=	0.400 af		
Outflow	=	0.69 cfs @	15.08 hrs, \	/olume=	0.400 af,	Atten= 0%,	Lag= 0.0 min
Routed	to Pond	44P : DETE	ENTION BASI	N #5C			

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



Reach 46R: SWL-5

Summary for Pond 12P: seepage pit with chambers #5e

Inflow Area	a =	2.828 ac,10	0.00% Impervious,	Inflow Depth =	5.04" for	10-Year event
Inflow	=	20.68 cfs @	11.96 hrs, Volume	e= 1.188 a	af	
Outflow	=	0.23 cfs @	6.40 hrs, Volume	e= 1.188 a	af, Atten=	99%, Lag= 0.0 min
Discarded	=	0.23 cfs @	6.40 hrs, Volume	e= 1.188 a	af	·
Primary	=	0.00 cfs @	0.00 hrs, Volume	e= 0.000 a	af	
Routed	to Rea	ch 46R : SWL	-5			

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,871.05' @ 19.16 hrs Surf.Area= 24,890 sf Storage= 35,446 cf

Plug-Flow detention time= 1,335.7 min calculated for 1.188 af (100% of inflow) Center-of-Mass det. time= 1,336.6 min (2,079.6 - 743.0)

Volume	Invert	Avail.Stor	rage	Storage D	escription	
#1	1,869.00'	24,57	'6 cf	Custom S 99,560 cf	tage Data (F Overall - 38,	Prismatic) Listed below (Recalc) 121 cf Embedded = 61,439 cf x 40.0% Voids
#2	1,869.50'	38,12	21 cf	Cultec R- Effective S Overall Siz 1035 Char Cap Stora	35 Inside #1 ' x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf < 36.0"H x 4.17'L with 0.50' Overlap Rows 2 x 15 rows = 193.8 cf	
		62,69	97 cf	Total Avai	lable Storage	2
Elevatio (fee	n Sı t)	urf.Area (sq-ft)	Inc. (cubic	Store -feet)	Cum.Store (cubic-feet)	
1,869.0 1,873.0	0 0	24,890 24,890	99	0 9,560	0 99,560	
Device	Routing	Invert	Outle	t Devices		
#1	Primary	1,869.00'	24.0'' L= 60 Inlet / n= 0.1	Round C 0.0' CPP, 'Outlet Inv 013 Corru	culvert mitered to co vert= 1,869.0 ligated PE, sr	onform to fill, Ke= 0.700 0' / 1,868.00' S= 0.0167 '/' Cc= 0.900 nooth interior, Flow Area= 3.14 sf
#2	Device 1	1,871.30'	12.0" Limite	W x 6.0" ed to weir f	H Vert. Orific	ce/Grate C= 0.600
#3	Discarded	1,869.00'	0.400	in/hr Exfi	Itration over	Surface area
Discarde	ed OutFlow filtration (E	Max=0.23 cfs Exfiltration Cor	s @ 6. htrols 0	40 hrs HV .23 cfs)	V=1,869.04'	(Free Discharge)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,869.00' (Free Discharge)

2=Orifice/Grate (Controls 0.00 cfs)



Total Tributary Area to 002

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Inflow Area	a =	23.889 ac, 8	9.41% Imp	ervious,	Inflow Depth =	4.70"	for 10-Y	ear event	
Inflow	=	170.72 cfs @	11.96 hrs,	Volume	= 9.351	af			
Outflow	=	3.78 cfs @	15.08 hrs,	Volume	= 9.351	af, Atte	en= 98%,	Lag= 187.2 m	in
Discarded	=	3.09 cfs @	9.25 hrs,	Volume	= 8.950	af		•	
Primary	=	0.69 cfs @	15.08 hrs,	Volume	= 0.400	af			
Routed	to Rea	ach 46R : SWL	-5						

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,871.86' @ 15.08 hrs Surf.Area= 190,835 sf Storage= 238,825 cf

Plug-Flow detention time= 650.5 min calculated for 9.344 af (100% of inflow) Center-of-Mass det. time= 650.8 min (1,414.0 - 763.2)

Volume	Invert	Avail.Storag	ge Storage Description
#1	1,870.00'	194,128 (cf Custom Stage Data (Prismatic) Listed below (Recalc)
40		004 000	763,340 cf Overall - 278,021 cf Embedded = 485,319 cf x 40.0% Voids
#Z	1,870.50	201,800 (CT CUITEC R-360HD X 550Z INSIGE #1
			Effective Size= 54.9 W X 30.0 Π = 2 9.99 Si X 3.07 L = 30.0 Ci Overall Size= 60.0"W x 36.0"H x 4.17", with 0.50' Overlap
			5502 Chambers in 14 Rows
			Cap Storage = $6.5 \text{ cf x } 2 \text{ x } 14 \text{ rows} = 180.9 \text{ cf}$
#3	1 870 50'	76 221 (cf Culter R-360HD x 2074 Inside $#1$
110	1,070.00	10,2210	Effective Size= 54 9"W x 36 0"H => 9 99 sf x 3 67'L = 36 6 cf
			Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap
			2074 Chambers in 17 Rows
			Cap Storage= 6.5 cf x 2 x 17 rows = 219.6 cf
		472,148	cf Total Available Storage
Elevatio	n Sur	f.Area	Inc.Store Cum.Store
(feet	t)	(sq-ft) (cu	ubic-feet) (cubic-feet)
1.870.00	0 19	0.835	0 0
1,874.00	0 19	90,835	763,340 763,340
Device	Routing	Invert O	Dutlet Devices
#1	Primary	1.870.00' 2	4.0" Round Culvert
	j	L	= 180.0' CPP, mitered to conform to fill, Ke= 0.700
		Ir	nlet / Outlet Invert= 1,870.00' / 1,868.20' S= 0.0100 '/' Cc= 0.900
		n	= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,871.50' 1 2	2.0" W x 6.0" H Vert. Orifice/Grate C= 0.600
		Li	imited to weir flow at low heads
#3	Discarded	1,870.00' 0 ,	.700 in/hr Exfiltration over Surface area
Discarde ¹ ──3=Exf	ed OutFlow iltration (Ex	Max=3.09 cfs @ filtration Contro	@ 9.25 hrs HW=1,870.04' (Free Discharge) bls 3.09 cfs)

Primary OutFlow Max=0.69 cfs @ 15.08 hrs HW=1,871.86' (Free Discharge) -**1=Culvert** (Passes 0.69 cfs of 12.46 cfs potential flow)

1-2=Orifice/Grate (Orifice Controls 0.69 cfs @ 1.92 fps)



Pond 41P: seepage pit with chambers #5C (combined old 5C and 5D)

Inflow Are Inflow Outflow Primary Routed	ea = = ; = = d to Link ;	35.397 ac, 75.8 36.17 cfs @ 11 0.37 cfs @ 24 0.37 cfs @ 24 24L : Discharge	30% Impervio I.97 hrs, Volu I.04 hrs, Volu I.04 hrs, Volu 002	us, Inflow Depth ime= 2.14 ime= 1.52 ime= 1.52	= 0.73" 18 af 28 af, Atte 28 af	for 10-Y en= 99%,	∕ear event Lag= 723.7 min	
Routing b Peak Elev	y Stor-Ind /= 1,868.:	d method, Time 56' @ 24.04 hrs	Span= 0.00-7 Surf.Area=	2.00 hrs, dt= 0.05 37,548 sf Storag	5 hrs je= 78,426	6 cf		
Plug-Flow Center-of	[,] detentio -Mass de	n time= 1,628.0 t. time= 1,518.3	min calculate min (2,385.9	ed for 1.528 af (71 9 - 867.5)	% of inflov	w)		
Volume	Inve	ert Avail.Stor	age Storage	e Description				
#1	1,866.0	0' 406,63	1 cf Custor	n Stage Data (Pr	i smatic) Li	isted belo	w (Recalc)	_
Elevation (feet)		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)				
1 866 00	<u> </u>	24 581	0	0				
1,868,00		33 781	58 362	58 362				
1,000.00		47 174	80,955	139,317				
1 872 00		66,070	113 244	252 561				
1,874.00)	88,000	154,070	406,631				
Device	Routing	Invert	Outlet Devic	es				
#1	Primary	1,866.00'	24.0" Roun L= 20.0' CF Inlet / Outlet n= 0.013 Co	d Culvert PP, mitered to cor Invert= 1,866.00' prrugated PE, smo	iform to fill / 1,865.00	l, Ke= 0.3)' S= 0.0 or. Flow /	700)500 '/' Cc= 0.900 Area= 3.14 sf	
#2	Device 1	1,869.00'	18.0" W x 12 Limited to we	2.0" H Vert. Orific	:e/Grate	C= 0.600)	
#3	Device 1	1.866.00'	3.0" Vert. O	rifice/Grate C=	0.600 Lin	nited to w	eir flow at low head	s
#4	Device 1	1,871.00'	24.0" x 45.0 Limited to we	" Horiz. Orifice/G eir flow at low hea	rate C=	0.600		2
Primary (DutFlow	Max=0.37 cfs @	n) 24 ∩4 hre ⊢		ree Disch:	arge)		

Primary OutFlow Max=0.37 cfs @ 24.04 hrs HW=1,868.56' (Free Discharge) **1=Culvert** (Passes 0.37 cfs of 16.68 cfs potential flow)

2=Orifice/Grate (Controls 0.00 cfs)

-3=Orifice/Grate (Orifice Controls 0.37 cfs @ 7.52 fps)

-4=Orifice/Grate (Controls 0.00 cfs)

Total Tributary Area to 002

Total Tributary Area to 002 *Type II 24-hr 10-Year Rainfall=5.28"* Printed 11/16/2022 LLC Page 25



Pond 44P: DETENTION BASIN #5C

NPDES_Stormwater-REV1.1Total Tributary Area to 002Prepared by Keystone Consulting EngineersType II 24-hr10-Year Rainfall=5.28"HydroCAD® 10.20-2bs/n 02767© 2021 HydroCAD Software Solutions LLCPage 26

Summary for Link 24L: Discharge 002

Inflow Area	a =	37.603 ac, 7	1.36% Impe	ervious,	Inflow Depth	> 0.57"	for 10-Year event
Inflow	=	3.50 cfs @	12.15 hrs,	Volume	= 1.79	98 af	
Primary	=	3.50 cfs @	12.15 hrs,	Volume	= 1.79	98 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Link 24L: Discharge 002

Summary for Subcatchment 18S: SEEPAGE BED #5E (BMP 14)

Runoff = 28.26 cfs @ 11.96 hrs, Volume= 1.640 af, Depth= 6.96" Routed to Pond 12P : seepage pit with chambers #5e

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 23S: UNDETAINED 002

Runoff = 6.45 cfs @ 12.14 hrs, Volume= 0.505 af, Depth= 2.75" Routed to Link 24L : Discharge 002

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 De	scription						
1.	447	61 >7	5% Grass c	over, Good	, HSG B				
0.	266	60 Wo	oods, Fair, HSG B						
0.	493	58 Me	adow, non-	grazed, HS	G B				
2.	206	60 We	eighted Ave	rage					
2.	206	100).00% Perv	ous Area					
Тс	Length	Slope	e Velocity	Capacity	Description				
(min)	(feet)	(ft/ft)) (ft/sec)	(cfs)					
16.0	150	0.0130	0.16		Sheet Flow,				
					Grass: Short n= 0.150 P2= 3.23"				
4.4	444	0.0580	1.69		Shallow Concentrated Flow,				
					Short Grass Pasture Kv= 7.0 fps				
20.4	594	Total							

Subcatchment 23S: UNDETAINED 002



Summary for Subcatchment 45S: BASIN #5C (BMP 15)

Runoff = 59.42 cfs @ 11.97 hrs, Volume= 2.893 af, Depth= 4.00" Routed to Pond 44P : DETENTION BASIN #5C

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		
2.	646	98	Pave	d parking	& roofs	
6.	034	61	>75%	6 Grass co	over, Good,	, HSG B
8.	680	72	Weig	hted Aver	age	
6.	034		69.52	2% Pervio	us Area	
2.	646		30.48	3% Imperv	vious Area	
_						
Tc	Lengt	h S	Slope	Velocity	Capacity	Description
(min)	(fee	t)	(ft/ft)	(ft/sec)	(cfs)	
6.0						Direct Entry,

Subcatchment 45S: BASIN #5C (BMP 15)



Summary for Subcatchment 46S: SEEPAGE BED #5C (BMP 13)

Runoff = 235.58 cfs @ 11.96 hrs, Volume= 13.148 af, Depth= 6.60" Routed to Pond 41P : seepage pit with chambers #5C (combined old 5C and 5D)

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	Description
21.358	98	Paved parking & roofs
2.353	74	>75% Grass cover, Good, HSG C
0.178	61	>75% Grass cover, Good, HSG B
23.889	95	Weighted Average
2.531		10.59% Pervious Area
21.358		89.41% Impervious Area
Tc Lengt	h S	lope Velocity Capacity Description
(min) (fee	t) ((ft/ft) (ft/sec) (cfs)
6.0		Direct Entry,

Subcatchment 46S: SEEPAGE BED #5C (BMP 13)



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

Summary for Reach 46R: SWL-5

Inflow Area	a =	26.717 ac,	90.53% Impe	ervious,	Inflow Depth =	1.14'	" for 50-`	Year event
Inflow	=	2.85 cfs @	14.12 hrs,	Volume	= 2.549	af		
Outflow	=	2.85 cfs @	14.12 hrs,	Volume	= 2.549	af, A	tten= 0%,	Lag= 0.0 min
Routed	to Pond	44P : DETE	ENTION BAS	SIN #5C				

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



Reach 46R: SWL-5

Total Tributary Area to 002

Summary for Pond 12P: seepage pit with chambers #5e

Total Tributary Area to 002

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Inflow Area	a =	2.828 ac,10	0.00% Impe	ervious,	Inflow Depth =	6.96	" for 50-Y	'ear event	
Inflow	=	28.26 cfs @	11.96 hrs,	Volume=	= 1.640	af			
Outflow	=	0.83 cfs @	13.93 hrs,	Volume=	= 1.613	af, A	tten= 97%,	Lag= 117.9) min
Discarded	=	0.23 cfs @	4.30 hrs,	Volume=	= 1.328	af		•	
Primary	=	0.60 cfs @	13.93 hrs,	Volume=	= 0.285	af			
Routed	to Rea	ch 46R : SWL	-5						

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,871.63' @ 13.93 hrs Surf.Area= 24,890 sf Storage= 45,483 cf

Plug-Flow detention time= 1,281.5 min calculated for 1.612 af (98% of inflow) Center-of-Mass det. time= 1,271.4 min (2,009.8 - 738.4)

Volume	Invert	Avail.Stor	rage	Storage D	escription		
#1	1,869.00'	24,57	′6 cf	Custom S 99,560 cf (tage Data (F Overall - 38, <i>1</i>	r ismatic) Listed below (Recalc) l21 cf Embedded = 61,439 cf x 40.0% Voids	
#2 1,869.50' 38,121 cf Cultec R-360HD x 1035 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36 Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overla 1035 Chambers in 15 Rows Cap Storage= 6.5 cf x 2 x 15 rows = 193.8 cf							
		62,69	97 cf	Total Avail	able Storage		
Elevatio (fee	n Sı t)	urf.Area (sq-ft)	Inc. (cubic	Store -feet)	Cum.Store (cubic-feet)		
1,869.0	0	24,890		0	0		
1,873.0	0	24,890	9	9,560	99,560		
Device	Routing	Invert	Outle	et Devices			
#1	Primary	1,869.00'	24.0' L= 60 Inlet n= 0.	Round C).0' CPP, / Outlet Inv 013 Corru	ulvert mitered to co ert= 1,869.00 gated PE, sr	onform to fill, Ke= 0.700 D' / 1,868.00' S= 0.0167 '/' Cc= 0.900 nooth interior, Flow Area= 3.14 sf	
#2	Device 1	1,871.30'	12.0'	' W x 6.0" I ed to weir f	H Vert. Orific	ce/Grate C= 0.600	
#3	Discarded	1,869.00'	0.400) in/hr Exfi	Itration over	Surface area	
Discarde 1−3=Ext	ed OutFlow filtration(E	Max=0.23 cf Exfiltration Cor	s @ 4. htrols (30 hrs HW).23 cfs)	/=1,869.04'	(Free Discharge)	

Primary OutFlow Max=0.60 cfs @ 13.93 hrs HW=1,871.63' (Free Discharge) -1=Culvert (Passes 0.60 cfs of 17.02 cfs potential flow) -2=Orifice/Grate (Orifice Controls 0.60 cfs @ 1.83 fps)



Pond 12P: seepage pit with chambers #5e

Total Tributary Area to 002

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Inflow Area	a =	23.889 ac, 8	9.41% Imp	ervious,	Inflow D	epth =	6.6)" for	50-Y	ear eve	nt
Inflow	=	235.58 cfs @	11.96 hrs,	Volume	=	13.148	af				
Outflow	=	5.37 cfs @	14.93 hrs,	Volume	=	13.148	af, /	Atten=	98%,	Lag= 17	78.0 min
Discarded	=	3.09 cfs @	8.20 hrs,	Volume	=	10.885	af			•	
Primary	=	2.28 cfs @	14.93 hrs,	Volume	=	2.264	af				
Routed	to Rea	ach 46R : SWL	-5								

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,872.65' @ 14.93 hrs Surf.Area= 190,835 sf Storage= 344,513 cf

Plug-Flow detention time= 736.0 min calculated for 13.148 af (100% of inflow) Center-of-Mass det. time= 735.9 min (1,491.4 - 755.5)

Volume	Invert	Avail.Storag	e Storage Description
#1	1,870.00'	194,128 (cf Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1 870 50'	201 800	cf Culter R-360HD x 5502 Inside #1
	1,010.00	201,000	Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf
			Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap
			5502 Chambers in 14 Rows
			Cap Storage= 6.5 cf x 2 x 14 rows = 180.9 cf
#3	1,870.50'	76,221 (cf Cultec R-360HD x 2074 Inside #1
			Effective Size= 54.9"W x 36.0"H => 9.99 st x 3.67'L = 36.6 cf
			Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap
			2074 Chambers In 17 Rows
		470 440	Cap Storage = 6.5 ct x 2 x 17 rows = 219.6 ct
		472,1480	ci Total Avallable Storage
Flevatio	on Sur	f Area	Inc Store Cum Store
(fee	et)	(sq-ft) (ci	ubic-feet) (cubic-feet)
1.870.0	$\frac{1}{10}$	90.835	0 0
1,874.0	00 19	90,835	763,340 763,340
Device	Routing	Invert C	Dutlet Devices
#1	Primary	1,870.00' 2	4.0" Round Culvert
		L	= 180.0' CPP, mitered to conform to fill, Ke= 0.700
		Ir	nlet / Outlet Invert= 1,870.00' / 1,868.20' S= 0.0100 '/' Cc= 0.900
		n	= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,871.50' 1	2.0" W x 6.0" H Vert. Orifice/Grate C= 0.600
		L	imited to weir flow at low heads
#3	Discarded	1,870.00' 0	.700 in/hr Exfiltration over Surface area
Discard 1−3=Ex	ed OutFlow filtration (Ex	Max=3.09 cfs @ filtration Contro	② 8.20 hrs HW=1,870.04' (Free Discharge) bls 3.09 cfs)

Primary OutFlow Max=2.28 cfs @ 14.93 hrs HW=1,872.65' (Free Discharge) -**1=Culvert** (Passes 2.28 cfs of 17.14 cfs potential flow)

1-2=Orifice/Grate (Orifice Controls 2.28 cfs @ 4.55 fps)

Pond 41P: seepage pit with chambers #5C (combined old 5C and 5D) Hydrograph Inflow Outflow 235.58 cfs Discarded Inflow Area=23.889 ac Primary 260 Peak Elev=1,872.65 240 Storage=344,513 cf 220 200 180 160 (cfs) 140 Flow 120 100 80 60 5.37 cfs 40 11/1/1 3.09 cfs 20 2.28 cfs 0 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 44P: DETENTION BASIN #5C

Inflow Area	a =	35.397 ac, 7	5.80% Imp	ervious,	Inflow D	Depth =	1.84	" for	50-Y	ear even	t
Inflow	=	59.58 cfs @	11.97 hrs,	Volume	=	5.442	af				
Outflow	=	3.30 cfs @	18.26 hrs,	Volume	=	4.366	af, A	Atten=	94%,	Lag= 377	7.2 min
Primary	=	3.30 cfs @	18.26 hrs,	Volume	=	4.366	af				
Routed	to Link	24L : Dischar	ge 002								

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,869.71' @ 18.26 hrs Surf.Area= 45,199 sf Storage= 125,696 cf

Plug-Flow detention time= 882.2 min calculated for 4.363 af (80% of inflow) Center-of-Mass det. time= 778.4 min (1,735.0 - 956.6)

Volume	Invert	Avail.Sto	rage	Storage	Description	
#1	1,866.00	406,63	31 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevation (feet	n S	urf.Area (sq-ft)	Inc. (cubic	.Store -feet)	Cum.Store (cubic-feet)	
1,866.0	0	24,581		0	0	
1,868.0	0	33,781	5	8,362	58,362	
1,870.0	0	47,174	8	0,955	139,317	
1,872.0	D	66,070	11	3,244	252,561	
1,874.0	D	88,000	15	4,070	406,631	
Device	Routing	Invert	Outle	et Device	s	
#1	Primary	1,866.00'	24.0 L= 20 Inlet n= 0	' Round 0.0' CPF / Outlet I .013 Cor	Culvert P, mitered to cor nvert= 1,866.00 rugated PE, sm	nform to fill, Ke= 0.700 / / 1,865.00' S= 0.0500 '/' Cc= 0.900 ooth interior, Flow Area= 3.14 sf
#2	Device 1	1,869.00'	18.0' Limit	' W x 12. ed to wei	0" H Vert. Orific r flow at low hea	ce/Grate C= 0.600 ads
#3	Device 1	1,866.00'	3.0"	Vert. Ori	fice/Grate C=	0.600 Limited to weir flow at low heads
#4	Device 1	1,871.00'	24.0' Limit	' x 45.0'' ed to wei	Horiz. Orifice/G r flow at low hea	Grate C= 0.600 ads

Primary OutFlow Max=3.30 cfs @ 18.26 hrs HW=1,869.71' (Free Discharge)

-1=Culvert (Passes 3.30 cfs of 21.95 cfs potential flow)

- -2=Orifice/Grate (Orifice Controls 2.85 cfs @ 2.70 fps)
- -3=Orifice/Grate (Orifice Controls 0.45 cfs @ 9.11 fps)

-4=Orifice/Grate (Controls 0.00 cfs)

Total Tributary Area to 002 *Type II 24-hr 50-Year Rainfall=7.20"* Printed 11/16/2022 LLC Page 37



Pond 44P: DETENTION BASIN #5C

NPDES_Stormwater-REV1.1Total Tributary Area to 002Prepared by Keystone Consulting EngineersType II 24-hr50-Year Rainfall=7.20"HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLCPrinted 11/16/2022

Summary for Link 24L: Discharge 002

Inflow Area	a =	37.603 ac, 7	′1.36% Impe	ervious,	Inflow De	epth >	1.55"	for 50-Year event	
Inflow	=	6.79 cfs @	12.14 hrs,	Volume	=	4.871 a	af		
Primary	=	6.79 cfs @	12.14 hrs,	Volume	=	4.871 a	af, Atte	en= 0%, Lag= 0.0 n	nin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Link 24L: Discharge 002

Summary for Subcatchment 18S: SEEPAGE BED #5E (BMP 14)

Runoff = 33.00 cfs @ 11.96 hrs, Volume= 1.923 af, Depth= 8.16" Routed to Pond 12P : seepage pit with chambers #5e

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 23S: UNDETAINED 002

Runoff	=	8.67 cfs @	12.14 hrs,	Volume=	0.668 af,	Depth=	3.64"
Routed	to Li	nk 24L : Dischar	ge 002			-	

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 De	scription		
1.	447	61 >7	5% Grass c	over, Good	, HSG B
0.	266	60 Wo	ods, Fair, F	ISG B	
0.	493	58 Me	adow, non-	grazed, HS	G B
2.	206	60 We	eighted Ave	rage	
2.	206	100).00% Perv	ous Area	
Тс	Length	Slope	e Velocity	Capacity	Description
(min)	(feet)	(ft/ft)) (ft/sec)	(cfs)	
16.0	150	0.0130	0.16		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.23"
4.4	444	0.0580	1.69		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
20.4	594	Total			

Subcatchment 23S: UNDETAINED 002



Summary for Subcatchment 45S: BASIN #5C (BMP 15)

Runoff = 74.43 cfs @ 11.97 hrs, Volume= 3.651 af, Depth= 5.05" Routed to Pond 44P : DETENTION BASIN #5C

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		
2.	646	98	Pave	d parking	& roofs	
6.	034	61	>75%	6 Grass co	over, Good,	I, HSG B
8.	680	72	Weig	hted Aver	age	
6.	034		69.52	2% Pervio	us Area	
2.	646		30.48	3% Imperv	vious Area	
-			21		A	
IC	Lengt	n t	Slope	Velocity	Capacity	Description
<u>(min)</u>	(tee	t)	(ft/ft)	(ft/sec)	(cts)	
6.0						Direct Entry,

Subcatchment 45S: BASIN #5C (BMP 15)



Summary for Subcatchment 46S: SEEPAGE BED #5C (BMP 13)

Runoff = 275.93 cfs @ 11.96 hrs, Volume= 15.527 af, Depth= 7.80" Routed to Pond 41P : seepage pit with chambers #5C (combined old 5C and 5D)

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	Description		
21.358	98	Paved parking	& roofs	
2.353	74	>75% Grass c	over, Good,	, HSG C
0.178	61	>75% Grass c	over, Good,	, HSG B
23.889	95	Weighted Aver	age	
2.531		10.59% Pervio	us Area	
21.358		89.41% Imperv	vious Area	
	uth C	Slope Velocity	Capacity	Description
(min) (fee	jui c st)	(ft/ft) (ft/see)		Description
	51)		(05)	
6.0				Direct Entry,

Subcatchment 46S: SEEPAGE BED #5C (BMP 13)



NPDES_Stormwater-REV1.1Total Tributary Area to 002Prepared by Keystone Consulting EngineersType II 24-hr 100-Year Rainfall=8.40"HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLCPage 43

Summary for Reach 46R: SWL-5

Inflow Area	a =	26.71	7 ac, 🖇	90.53% Imp	ervious,	Inflow Depth =	1.8	3" for 10	0-Year event
Inflow	=	4.26	cfs @	13.36 hrs,	Volume	= 4.075	af		
Outflow	=	4.26	cfs @	13.36 hrs,	Volume	= 4.075	af,	Atten= 0%,	Lag= 0.0 min
Routed	to Pond	44P :	DETE	ENTION BAS	SIN #5C				

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



Reach 46R: SWL-5

Summary for Pond 12P: seepage pit with chambers #5e

Inflow Area	a =	2.828 ac,10	0.00% Impe	ervious,	Inflow Depth =	8.16"	for 10	0-Year ev	ent
Inflow	=	33.00 cfs @	11.96 hrs,	Volume=	= 1.923	af			
Outflow	=	1.66 cfs @	12.93 hrs,	Volume=	= 1.887	af, Att	en= 95%	, Lag= 58	3.4 min
Discarded	=	0.23 cfs @	3.30 hrs,	Volume=	= 1.336	af		•	
Primary	=	1.43 cfs @	12.93 hrs,	Volume=	= 0.551	af			
Routed	to Rea	ch 46R : SWL	-5						

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,871.92' @ 12.93 hrs Surf.Area= 24,890 sf Storage= 50,168 cf

Plug-Flow detention time= 1,117.9 min calculated for 1.886 af (98% of inflow) Center-of-Mass det. time= 1,106.6 min (1,843.0 - 736.4)

Volume	Invert	Avail.Stor	rage	Storage D	escription	
#1	1,869.00'	24,57	′6 cf	Custom S 99,560 cf	t age Data (P Overall - 38,1	r ismatic) Listed below (Recalc) 21 cf Embedded = 61,439 cf x 40.0% Voids
#2	1,869.50'	38,12	21 cf	Cultec R-3	360HD x 103	35 Inside #1
				Effective S	Size= 54.9"W	x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf
				Overall Siz	ze= 60.0"W x	x 36.0"H x 4.17'L with 0.50' Overlap
				1035 Chai	mbers in 15 H	Rows
				Cap Stora	ge= 6.5 cf x 2	2 x 15 rows = 193.8 cf
		62,69	97 cf	Total Avai	lable Storage	
Elevatio	n Sı	urf.Area	Inc	Store	Cum.Store	
(fee	t)	(sq-ft)	(cubi	c-feet)	(cubic-feet)	
1,869.0	0	24,890		0	0	
1,873.0	0	24,890	ç	99,560	99,560	
Device	Routing	Invert	Outl	et Devices		
#1	Primary	1,869.00'	24.0	" Round C	ulvert	
	2		L= 6	0.0' CPP,	mitered to co	onform to fill, Ke= 0.700
			Inlet	/ Outlet Inv	vert= 1,869.00	0' / 1,868.00' S= 0.0167 '/' Cc= 0.900
			n= 0	.013 Corru	gated PE, sn	nooth interior, Flow Area= 3.14 sf
#2	Device 1	1,871.30'	12.0	" W x 6.0"	H Vert. Orific	ce/Grate C= 0.600
			Limi	ted to weir f	flow at low he	eads
#3	Discarded	1,869.00'	0.40	0 in/hr Exfi	Itration over	Surface area
Discarde	ed OutFlow filtration(E	Max=0.23 cf	s @ 3 ntrols	.30 hrs HV 0.23 cfs)	V=1,869.04'	(Free Discharge)

Primary OutFlow Max=1.43 cfs @ 12.93 hrs HW=1,871.92' (Free Discharge) **1=Culvert** (Passes 1.43 cfs of 18.48 cfs potential flow) **2=Orifice/Grate** (Orifice Controls 1.43 cfs @ 2.85 fps)



Pond 12P: seepage pit with chambers #5e

Summary for Pond 41P: seepage pit with chambers #5C (combined old 5C and 5D)

Inflow Area	a =	23.889 ac, 8	9.41% Imp	ervious,	Inflow Depth =	7.80)" for	100-	Year ever	ıt
Inflow	=	275.93 cfs @	11.96 hrs,	Volume	= 15.527	af				
Outflow	=	6.08 cfs @	15.07 hrs,	Volume	= 15.527	af, /	Atten= 9	8%,	Lag= 186	.3 min
Discarded	=	3.09 cfs @	6.95 hrs,	Volume	= 12.003	af			•	
Primary	=	2.98 cfs @	15.07 hrs,	Volume	= 3.525	af				
Routed	to Rea	ach 46R : SWL	-5							

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,873.29' @ 15.07 hrs Surf.Area= 190,835 sf Storage= 416,227 cf

Plug-Flow detention time= 797.4 min calculated for 15.517 af (100% of inflow) Center-of-Mass det. time= 798.0 min (1,550.2 - 752.1)

Volume	Invert	Avail.Storag	ge Stora	ge Description
#1	1,870.00'	194,128	cf Custo	om Stage Data (Prismatic) Listed below (Recalc)
		004.000	763,3	40 cf Overall - 278,021 cf Embedded = 485,319 cf x 40.0% Voids
#2 1,870.50 201,800 cf				c R-360HD x 5502 Inside #1
			Effect	$100 \text{ Size} = 54.9^{\circ}\text{W} \times 36.0^{\circ}\text{H} => 9.99 \text{ st} \times 3.67^{\circ}\text{L} = 36.6 \text{ ct}$
			Overa	all Size= 60.0° V X 36.0°H X 4.17°L with 0.50° Overlap
			5502	Chambers in 14 Rows
що		76.004	Cap S	$3001age= 0.5 CI \times 2 \times 14 TOWS = 180.9 CI$
#3	1,670.50	70,221	CI Cuite	C R-360 HD X 2074 INSIDE #1
			Overe	1/2 Size= 54.9 // X 30.0 Fi => 9.99 Si X 3.07 L = 30.0 Ci
			2074	$\begin{array}{c} \text{III Size-00.0 VV X Solutin X 4.17 L Will 0.50 Overlap} \\ \text{Chambers in 17 Powe} \end{array}$
			Can S	Storage = $6.5 \text{ cf } \times 2 \times 17 \text{ rows} = 210.6 \text{ cf}$
		170 110	of Total	Available Storage
		472,140	CI IUlai	Available Storage
Elevatio	on Sur	f Area	Inc Store	Cum Store
(fee	t)	(sa-ft) (c	ubic-feet)	(cubic-feet)
1 870 0)0 10	<u>(0 9 10)</u> 00 835	0	
1 874 0	0 19	90,835	763 340	763 340
1,07 1.0		,000	100,010	
Device	Routing	Invert C	Dutlet Devi	ces
#1	Primary	1,870.00' 2	4.0" Rou	nd Culvert
	-	L	.= 180.0'	CPP, mitered to conform to fill, Ke= 0.700
		Ir	nlet / Outle	et Invert= 1,870.00' / 1,868.20' S= 0.0100 '/' Cc= 0.900
		n	= 0.013 C	Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,871.50' 1	2.0" W x 6	5.0" H Vert. Orifice/Grate C= 0.600
		L	imited to v	<i>v</i> eir flow at low heads
#3	Discarded	1,870.00' 0	.700 in/hr	Exfiltration over Surface area
	ed OutFlow	Max=3.09 cfs (filtration Contro	@ 6.95 hrs ols 3 09 cf	⊨ HW=1,870.04' (Free Discharge) s)
				<i>.</i> ,

Primary OutFlow Max=2.98 cfs @ 15.07 hrs HW=1,873.29' (Free Discharge)

1-2=Orifice/Grate (Orifice Controls 2.98 cfs @ 5.97 fps)



Pond 41P: seepage pit with chambers #5C (combined old 5C and 5D)

Summary for Pond 44P: DETENTION BASIN #5C

Inflow Area	a =	35.397 ac, 7	5.80% Imp	ervious,	Inflow E	Depth =	2.62	" for	100-	Year ev	/ent
Inflow	=	75.34 cfs @	11.97 hrs,	Volume	=	7.726	af				
Outflow	=	5.11 cfs @	16.03 hrs,	Volume	=	6.566	af, A	tten= §	93%,	Lag= 2	243.3 min
Primary	=	5.11 cfs @	16.03 hrs,	Volume	=	6.566	af			-	
Routed	to Link	24L : Dischar	ge 002								

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 1,869.98' @ 16.03 hrs Surf.Area= 47,011 sf Storage= 138,169 cf

Plug-Flow detention time= 669.2 min calculated for 6.566 af (85% of inflow) Center-of-Mass det. time= 569.8 min (1,568.9 - 999.1)

Volume	Invert	: Avail.Sto	rage	Storage	Description	
#1	1,866.00	406,63	31 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatior (feet	ר S)	urf.Area (sq-ft)	Inc. (cubic	Store -feet)	Cum.Store (cubic-feet)	
1,866.00)	24,581		0	0	
1,868.00)	33,781	58	3,362	58,362	
1,870.00)	47,174	80	0,955	139,317	
1,872.00)	66,070	11:	3,244	252,561	
1,874.00)	88,000	154	4,070	406,631	
Device	Routing	Invert	Outle	t Device:	S	
#1	Primary	1,866.00'	24.0'' L= 20 Inlet / n= 0.0	Round 0.0' CPF Outlet In 013 Cor	Culvert P, mitered to cor nvert= 1,866.00 rugated PE, sm	nform to fill, Ke= 0.700 / 1,865.00' S= 0.0500 '/' Cc= 0.900 ooth interior, Flow Area= 3.14 sf
#2	Device 1	1,869.00'	18.0'' Limite	W x 12. ed to wei	0" H Vert. Orific r flow at low hea	ce/Grate C= 0.600 ads
#3	Device 1	1,866.00'	3.0" \	Vert. Ori	fice/Grate C=	0.600 Limited to weir flow at low heads
#4	Device 1	1,871.00'	24.0'' Limite	x 45.0" ed to wei	Horiz. Orifice/G r flow at low hea	Grate C= 0.600 ads

Primary OutFlow Max=5.10 cfs @ 16.03 hrs HW=1,869.98' (Free Discharge)

-1=Culvert (Passes 5.10 cfs of 23.02 cfs potential flow)

- -2=Orifice/Grate (Orifice Controls 4.64 cfs @ 3.17 fps)
- -3=Orifice/Grate (Orifice Controls 0.46 cfs @ 9.45 fps)

-4=Orifice/Grate (Controls 0.00 cfs)

Total Tributary Area to 002

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Total Tributary Area to 002 Type II 24-hr 100-Year Rainfall=8.40" Printed 11/16/2022 ns LLC Page 49



Pond 44P: DETENTION BASIN #5C

NPDES_Stormwater-REV1.1Total Tributary Area to 002Prepared by Keystone Consulting EngineersType II 24-hr100-Year Rainfall=8.40"HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLCPrinted11/16/2022Prepared by Keystone Consulting EngineersPrinted11/16/2022

Summary for Link 24L: Discharge 002

Inflow Area	a =	37.603 ac, 7	1.36% Impe	ervious,	Inflow Depth	> 2.31"	for 100-Year event
Inflow	=	9.05 cfs @	12.14 hrs,	Volume	= 7.2	34 af	
Primary	=	9.05 cfs @	12.14 hrs,	Volume	= 7.2	34 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Link 24L: Discharge 002