3/2/2017
MLV

Matthews Motors
Drainage Area Calculations
DA 1

15037

Impervious Area		
Land Use	sq. ft.	acres
Buildings	7,120	0.16
Asphalt	45,184	1.04
Sidewalk	380	0.01
		0.00

Summary	sq. ft.	acres
Total Drainage Area =	67,780	1.56
Total Impervious Area =	52,684	1.21
Total Pervious Area =	15,096	0.35
Percent Impervious =	78%	

Soil Type	See Soils Report
SHWT Elevation	32.42
Infiltration Rate	4.6 in/hr

Volume Requirement for Storage of first 1.5" runoff:

Vol. = 3630*Rd*(0.05+0.9*Ia)*A
= 6,351 cu.ft.

Drawdown Rate:
For 1st 1.5" of stormwater

Drawdown Time = Provided Storage Volume / (Infiltration Surface Area * Infiltration Rate)
= 6,393 Provided Storage Volume
= 12,097 Surface Area of Infiltration
= 1.38 Hours of drawdown time

Final SW Calcs
SWP2016023 R2
4/20/2017
RAC

NORTH CAROLINA PROFESSIONAL SEAL 17374 ENGINEER

3.2.17

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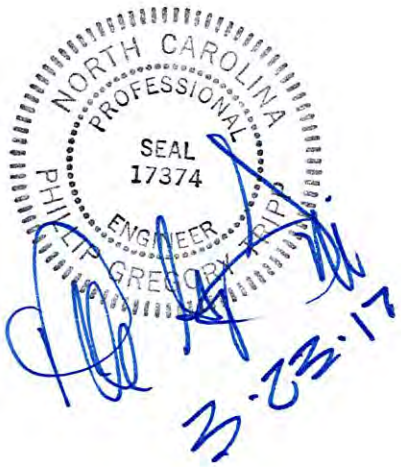
ENGINEERING

03/23/2017
MLV

Matthews Motors
10 Year Storm Pipe and HGL Calculations

15037

LOCATION		AREA		RUNOFF	RAIN	INCREMENTAL FLOW	TOTAL FLOW	PIPE DATA										
FROM	TO	SUB TOTAL (Acre)	TOTAL (Acre)	COEFF. C	INT. I (in/hr)	Q=CIA (C.F.S. REQ'D)	Q=CIA (C.F.S. REQ'D)	TYPE	N	LENGTH (ft)	S %	SIZE (in)	VEL. (fps)	Q AVAIL. (cfs)	Friction Loss (Hf) (ft)	Pond Elev. (ft)	Inlet WS Elev. (ft)	Rim Elev. (ft)
DI No. 1B	DI No. 1A	0.21	0.21	0.80	7.23	1.21	1.21	RCP	0.013	82	0.98%	12	1.5	3.54	0.0609	35.50	35.69	37.40
DI No. 1A	TRENCH No. 1	0.33	0.54	0.80	7.23	1.91	3.12	RCP	0.013	81	0.31%	15	2.5	3.61	0.1304	35.50	35.63	37.40
DI No. 2B	TRENCH No. 2	0.53	0.53	0.80	7.23	3.07	3.07	RCP	0.013	42	0.60%	15	2.5	5.02	0.0651	35.50	35.57	36.50
DI No. 2A	TRENCH No. 2	0.49	0.49	0.80	7.23	2.83	2.83	RCP	0.013	42	0.60%	15	2.3	5.02	0.0557	35.50	35.56	36.50
DI No. 2A	DI No. 2B	0.49	0.49	0.80	7.23	2.83	2.83	RCP	0.013	96	1.35%	15	2.3	7.53	0.1272	33.50	33.63	36.50
DI No. 2B	SDMH No. 1	0.53	1.02	0.80	7.23	3.07	5.90	RCP	0.013	18	1.67%	15	4.8	8.37	0.1034	32.20	32.30	36.50
DI No. 1B	DI No. 1A	0.21	0.21	0.80	7.23	1.21	1.21	RCP	0.013	82	1.10%	12	1.5	3.75	0.0609	35.30	35.36	37.40
DI No. 1A	SDMH No. 3	0.33	0.54	0.80	7.23	1.91	3.12	RCP	0.013	121	0.66%	15	2.5	5.26	0.1947	34.40	34.59	37.40
SDMH No. 3	SDMH No. 2	0.00	0.54	0.80	7.23	0.00	3.12	RCP	0.013	213	0.47%	15	2.5	4.44	0.3428	33.60	33.94	38.00
SDMH No. 2	SDMH No. 1	0.00	0.54	0.80	7.23	0.00	3.12	RCP	0.013	63	1.11%	15	2.5	6.82	0.1014	32.60	32.70	37.30
SDMH No. 1	18" RCP	0.00	1.56	0.80	7.23	0.00	9.02	RCP	0.013	45	2.00%	18	5.1	14.90	0.2429	31.90	32.14	36.65



Matthews Motors
50 Year Storm Pipe and HGL Calculations

LOCATION		AREA		RUNOFF	RAIN	INCREMENTAL FLOW	TOTAL FLOW	PIPE DATA										
FROM	TO	SUB TOTAL (Acre)	TOTAL (Acre)	COEFF. C	INT. I (in/hr)	Q=CIA (C.F.S. REQ'D)	Q=CIA (C.F.S. REQ'D)	TYPE	N	LENGTH (ft)	S %	SIZE (in)	VEL. (fps)	Q AVAIL. (cfs)	Friction Loss (Hf) (ft)	Pond Elev. (ft)	Inlet WS Elev. (ft)	Rim Elev. (ft)
DI No. 1B	DI No. 1A	0.21	0.21	0.80	8.87	1.49	1.49	RCP	0.013	82	0.98%	12	1.9	3.54	0.0917	35.50	35.79	37.40
DI No. 1A	TRENCH No. 1	0.33	0.54	0.80	8.87	2.34	3.83	RCP	0.013	81	0.31%	15	3.1	3.61	0.1962	35.50	35.70	37.40
DI No. 2B	TRENCH No. 2	0.53	0.53	0.80	8.87	3.76	3.76	RCP	0.013	42	0.60%	15	3.1	5.02	0.0980	35.50	35.60	36.50
DI No. 2A	TRENCH No. 2	0.49	0.49	0.80	8.87	3.48	3.48	RCP	0.013	42	0.60%	15	2.8	5.02	0.0838	35.50	35.58	36.50
DI No. 2A	DI No. 2B	0.49	0.49	0.80	8.87	3.48	3.48	RCP	0.013	96	1.35%	15	2.8	7.53	0.1915	33.50	33.69	36.50
DI No. 2B	SDMH No. 1	0.53	1.02	0.80	8.87	3.76	7.24	RCP	0.013	18	1.67%	15	5.9	8.37	0.1556	32.20	32.36	36.50
DI No. 1B	DI No. 1A	0.21	0.21	0.80	8.87	1.49	1.49	RCP	0.013	82	1.10%	12	1.9	3.75	0.0917	35.30	35.39	37.40
DI No. 1A	SDMH No. 3	0.33	0.54	0.80	8.87	2.34	3.83	RCP	0.013	121	0.66%	15	3.1	5.26	0.2931	34.40	34.69	37.40
SDMH No. 3	SDMH No. 2	0.00	0.54	0.80	8.87	0.00	3.83	RCP	0.013	213	0.47%	15	3.1	4.44	0.5160	33.60	34.12	38.00
SDMH No. 2	SDMH No. 1	0.00	0.54	0.80	8.87	0.00	3.83	RCP	0.013	63	1.11%	15	3.1	6.82	0.1526	32.60	32.75	37.30
SDMH No. 1	18" RCP	0.00	1.56	0.80	8.87	0.00	11.07	RCP	0.013	45	2.00%	18	6.3	14.90	0.3656	31.90	32.27	36.65

Matthews Motors
Time of Concentration Calculations

$T_C = [((L/H)^3)^{0.385)}/128]$

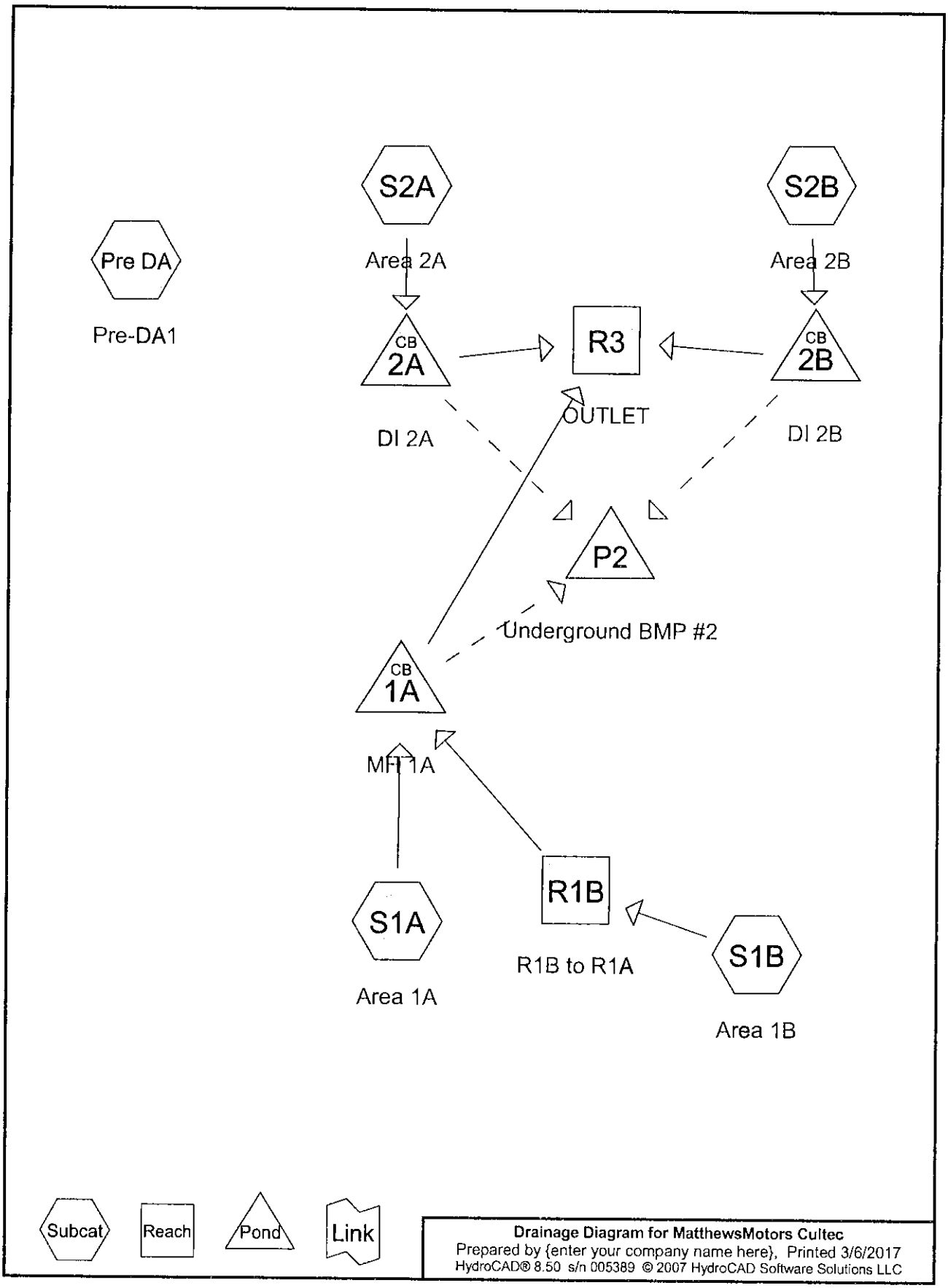
$T_C = [((524/4.3)^3)^{0.385)}/128]$

$T_C =$ 2.00 minutes

Use 5.00 minutes

L= 524 ft

H= 4.3 ft



Drainage Diagram for MatthewsMotors Cultec

Prepared by {enter your company name here}, Printed 3/6/2017

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Pre DA: Pre-DA1 Runoff Area=67,780 sf 0.00% Impervious Runoff Depth=0.74"
Tc=5.0 min CN=55 Runoff=1.00 cfs 0.096 af

Subcatchment S1A: Area 1A Runoff Area=14,258 sf 60.84% Impervious Runoff Depth=2.82"
Tc=5.0 min CN=84 Runoff=1.08 cfs 0.077 af

Subcatchment S1B: Area 1B Runoff Area=9,348 sf 61.62% Impervious Runoff Depth=2.82"
Tc=5.0 min CN=84 Runoff=0.71 cfs 0.050 af

Subcatchment S2A: Area 2A Runoff Area=21,228 sf 80.12% Impervious Runoff Depth=3.50"
Tc=5.0 min CN=91 Runoff=1.94 cfs 0.142 af

Subcatchment S2B: Area 2B Runoff Area=22,964 sf 92.50% Impervious Runoff Depth=3.92"
Tc=5.0 min CN=95 Runoff=2.26 cfs 0.172 af

Reach R1B: R1B to R1A Avg. Depth=0.30' Max Vel=3.49 fps Inflow=0.71 cfs 0.050 af
D=12.0" n=0.013 L=82.0' S=0.0098 '/' Capacity=3.52 cfs Outflow=0.70 cfs 0.050 af

Reach R3: OUTLET Avg. Depth=0.09' Max Vel=2.20 fps Inflow=0.09 cfs 0.001 af
D=18.0" n=0.013 L=45.0' S=0.0200 '/' Capacity=14.86 cfs Outflow=0.08 cfs 0.001 af

Pond 1A: MH 1A Peak Elev=35.32' Inflow=1.77 cfs 0.127 af
Primary=0.01 cfs 0.000 af Secondary=1.76 cfs 0.127 af Outflow=1.77 cfs 0.127 af

Pond 2A: DI 2A Peak Elev=35.29' Inflow=1.94 cfs 0.142 af
Primary=0.00 cfs 0.000 af Secondary=1.94 cfs 0.142 af Outflow=1.94 cfs 0.142 af

Pond 2B: DI 2B Peak Elev=35.35' Inflow=2.26 cfs 0.172 af
Primary=0.09 cfs 0.001 af Secondary=2.17 cfs 0.172 af Outflow=2.26 cfs 0.172 af

Pond P2: Underground BMP #2 Peak Elev=35.07' Storage=4,419 cf Inflow=5.87 cfs 0.441 af
Outflow=1.29 cfs 0.441 af

Total Runoff Area = 3.112 ac Runoff Volume = 0.538 af Average Runoff Depth = 2.07"
61.14% Pervious = 1.903 ac 38.86% Impervious = 1.209 ac

Summary for Subcatchment Pre DA: Pre-DA1

Runoff = 1.00 cfs @ 12.11 hrs, Volume= 0.096 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Yr Rainfall=4.50"

Area (sf)	CN	Description
67,780	55	Woods, Good, HSG B
67,780		Pervious Area

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

Summary for Subcatchment S1A: Area 1A

Runoff = 1.08 cfs @ 12.08 hrs, Volume= 0.077 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Yr Rainfall=4.50"

	Area (sf)	CN	Description
*	1,780	98	Building
*	6,515	98	Asphalt
*	380	98	Sidewalk
	5,583	61	>75% Grass cover, Good, HSG B
	14,258	84	Weighted Average
	5,583		Pervious Area
	8,675		Impervious Area

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

Summary for Subcatchment S1B: Area 1B

Runoff = 0.71 cfs @ 12.08 hrs, Volume= 0.050 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Yr Rainfall=4.50"

	Area (sf)	CN	Description
*	890	98	Building
*	4,870	98	Asphalt
	3,588	61	>75% Grass cover, Good, HSG B
	9,348	84	Weighted Average
	3,588		Pervious Area
	5,760		Impervious Area

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

Summary for Subcatchment S2A: Area 2A

Runoff = 1.94 cfs @ 12.07 hrs, Volume= 0.142 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Yr Rainfall=4.50"

	Area (sf)	CN	Description
*	1,780	98	Building
*	15,228	98	Asphalt
	4,220	61	>75% Grass cover, Good, HSG B
	21,228	91	Weighted Average
	4,220		Pervious Area
	17,008		Impervious Area

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

Summary for Subcatchment S2B: Area 2B

Runoff = 2.26 cfs @ 12.07 hrs, Volume= 0.172 af, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Yr Rainfall=4.50"

	Area (sf)	CN	Description
*	2,670	98	Building
*	18,571	98	Asphalt
	1,723	61	>75% Grass cover, Good, HSG B
	22,964	95	Weighted Average
	1,723		Pervious Area
	21,241		Impervious Area

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

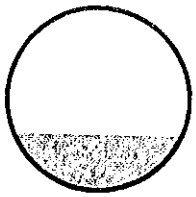
Summary for Reach R1B: R1B to R1A

Inflow Area = 0.215 ac, 61.62% Impervious, Inflow Depth = 2.82" for 2 Yr event
Inflow = 0.71 cfs @ 12.08 hrs, Volume= 0.050 af
Outflow = 0.70 cfs @ 12.09 hrs, Volume= 0.050 af, Atten= 1%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.49 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 1.1 min

Peak Storage= 17 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.52 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, straight & clean
Length= 82.0' Slope= 0.0098 '/'
Inlet Invert= 35.30', Outlet Invert= 34.50'



Stage-Area-Storage for Reach R1B: R1B to R1A

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
35.30	0.0	0
35.31	0.0	0
35.32	0.0	0
35.33	0.0	1
35.34	0.0	1
35.35	0.0	1
35.36	0.0	2
35.37	0.0	2
35.38	0.0	2
35.39	0.0	3
35.40	0.0	3
35.41	0.0	4
35.42	0.1	4
35.43	0.1	5
35.44	0.1	5
35.45	0.1	6
35.46	0.1	7
35.47	0.1	7
35.48	0.1	8
35.49	0.1	9
35.50	0.1	9
35.51	0.1	10
35.52	0.1	11
35.53	0.1	11
35.54	0.1	12
35.55	0.2	13
35.56	0.2	13
35.57	0.2	14
35.58	0.2	15
35.59	0.2	16
35.60	0.2	16
35.61	0.2	17
35.62	0.2	18
35.63	0.2	19
35.64	0.2	19
35.65	0.2	20
35.66	0.3	21
35.67	0.3	22
35.68	0.3	22
35.69	0.3	23
35.70	0.3	24
35.71	0.3	25
35.72	0.3	26
35.73	0.3	26
35.74	0.3	27
35.75	0.3	28
35.76	0.4	29
35.77	0.4	30
35.78	0.4	31
35.79	0.4	31
35.80	0.4	32
35.81	0.4	33
35.82	0.4	34
35.83	0.4	35
35.84	0.4	35
35.85	0.4	36
35.86	0.5	37
35.87	0.5	38
35.88	0.5	39
35.89	0.5	40
35.90	0.5	40
35.91	0.5	41
35.92	0.5	42
35.93	0.5	43
35.94	0.5	44
35.95	0.5	44
35.96	0.5	45
35.97	0.6	46
35.98	0.6	47
35.99	0.6	47
36.00	0.6	48
36.01	0.6	49
36.02	0.6	50
36.03	0.6	50
36.04	0.6	51
36.05	0.6	52
36.06	0.6	53
36.07	0.6	53
36.08	0.7	54
36.09	0.7	55
36.10	0.7	55
36.11	0.7	56
36.12	0.7	57
36.13	0.7	57
36.14	0.7	58
36.15	0.7	58
36.16	0.7	59
36.17	0.7	59
36.18	0.7	60
36.19	0.7	61
36.20	0.7	61
36.21	0.8	62
36.22	0.8	62
36.23	0.8	62
36.24	0.8	63
36.25	0.8	63
36.26	0.8	64
36.27	0.8	64
36.28	0.8	64
36.29	0.8	64
36.30	**0.8**	**64**

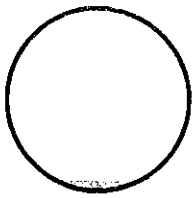
Summary for Reach R3: OUTLET

Inflow Area = 1.556 ac, 77.71% Impervious, Inflow Depth = 0.00" for 2 Yr event
Inflow = 0.09 cfs @ 12.07 hrs, Volume= 0.001 af
Outflow = 0.08 cfs @ 12.08 hrs, Volume= 0.001 af, Atten= 13%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.20 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.5 min

Peak Storage= 2 cf @ 12.07 hrs, Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 14.86 cfs

18.0" Diameter Pipe, n= 0.013 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0200 '/'
Inlet Invert= 31.90', Outlet Invert= 31.00'



Stage-Area-Storage for Reach R3: OUTLET

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
31.90	0.0	0
31.91	0.0	0
31.92	0.0	0
31.93	0.0	0
31.94	0.0	1
31.95	0.0	1
31.96	0.0	1
31.97	0.0	1
31.98	0.0	2
31.99	0.0	2
32.00	0.1	2
32.01	0.1	3
32.02	0.1	3
32.03	0.1	3
32.04	0.1	4
32.05	0.1	4
32.06	0.1	5
32.07	0.1	5
32.08	0.1	5
32.09	0.1	6
32.10	0.1	6
32.11	0.2	7
32.12	0.2	7
32.13	0.2	8
32.14	0.2	8
32.15	0.2	9
32.16	0.2	9
32.17	0.2	10
32.18	0.2	10
32.19	0.2	11
32.20	0.3	11
32.21	0.3	12
32.22	0.3	12
32.23	0.3	13
32.24	0.3	14
32.25	0.3	14
32.26	0.3	15
32.27	0.3	15
32.28	0.4	16
32.29	0.4	16
32.30	0.4	17
32.31	0.4	18
32.32	0.4	18
32.33	0.4	19
32.34	0.4	19
32.35	0.4	20
32.36	0.5	21
32.37	0.5	21
32.38	0.5	22
32.39	0.5	23
32.40	0.5	23
32.41	0.5	24
32.42	0.5	24
32.43	0.6	25
32.44	0.6	26
32.45	0.6	26
32.46	0.6	27
32.47	0.6	28
32.48	0.6	28
32.49	0.6	29
32.50	0.7	30
32.51	0.7	30
32.52	0.7	31
32.53	0.7	32
32.54	0.7	32
32.55	0.7	33
32.56	0.7	34
32.57	0.8	34
32.58	0.8	35
32.59	0.8	36
32.60	0.8	36
32.61	0.8	37
32.62	0.8	38
32.63	0.9	38
32.64	0.9	39
32.65	0.9	40
32.66	0.9	40
32.67	0.9	41
32.68	0.9	42
32.69	0.9	42
32.70	1.0	43
32.71	1.0	44
32.72	1.0	44
32.73	1.0	45
32.74	1.0	46
32.75	1.0	46
32.76	1.0	47
32.77	1.1	48
32.78	1.1	48
32.79	1.1	49
32.80	1.1	50
32.81	1.1	50
32.82	1.1	51
32.83	1.2	52
32.84	1.2	52
32.85	1.2	53
32.86	1.2	54
32.87	1.2	54
32.88	1.2	55
32.89	1.2	56
32.90	1.3	56
32.91	1.3	57

Stage-Area-Storage for Reach R3: OUTLET (continued)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
32.92	1.3	58
32.93	1.3	58
32.94	1.3	59
32.95	1.3	59
32.96	1.3	60
32.97	1.3	61
32.98	1.4	61
32.99	1.4	62
33.00	1.4	62
33.01	1.4	63
33.02	1.4	64
33.03	1.4	64
33.04	1.4	65
33.05	1.5	65
33.06	1.5	66
33.07	1.5	67
33.08	1.5	67
33.09	1.5	68
33.10	1.5	68
33.11	1.5	69
33.12	1.5	69
33.13	1.6	70
33.14	1.6	70
33.15	1.6	71
33.16	1.6	71
33.17	1.6	72
33.18	1.6	72
33.19	1.6	73
33.20	1.6	73
33.21	1.6	74
33.22	1.6	74
33.23	1.7	75
33.24	1.7	75
33.25	1.7	75
33.26	1.7	76
33.27	1.7	76
33.28	1.7	77
33.29	1.7	77
33.30	1.7	77
33.31	1.7	78
33.32	1.7	78
33.33	1.7	78
33.34	1.7	78
33.35	1.7	79
33.36	1.8	79
33.37	1.8	79
33.38	1.8	79
33.39	1.8	79
33.40	1.8	80

Summary for Pond 1A: MH 1A

Inflow Area =	0.542 ac, 61.15% Impervious,	Inflow Depth =	2.82"	for 2 Yr event
Inflow =	1.77 cfs @ 12.08 hrs,	Volume=	0.127 af	
Outflow =	1.77 cfs @ 12.08 hrs,	Volume=	0.127 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.01 cfs @ 12.10 hrs,	Volume=	0.000 af	
Secondary =	1.76 cfs @ 12.08 hrs,	Volume=	0.127 af	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.32' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	34.40'	**15.0" x 397.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0063 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 81.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0031 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.01 cfs @ 12.10 hrs HW=35.31' (Free Discharge)
↑—**1=Culvert** (Passes 0.01 cfs of 2.85 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.32 fps)

Secondary OutFlow Max=1.70 cfs @ 12.08 hrs HW=35.30' (Free Discharge)
↑—**3=Culvert** (Barrel Controls 1.70 cfs @ 2.90 fps)

Stage-Area-Storage for Pond 1A: MH 1A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
34.40	0	34.91	0	35.42	0
34.41	0	34.92	0	35.43	0
34.42	0	34.93	0	35.44	0
34.43	0	34.94	0	35.45	0
34.44	0	34.95	0	35.46	0
34.45	0	34.96	0	35.47	0
34.46	0	34.97	0	35.48	0
34.47	0	34.98	0	35.49	0
34.48	0	34.99	0	35.50	0
34.49	0	35.00	0	35.51	0
34.50	0	35.01	0	35.52	0
34.51	0	35.02	0	35.53	0
34.52	0	35.03	0	35.54	0
34.53	0	35.04	0	35.55	0
34.54	0	35.05	0	35.56	0
34.55	0	35.06	0	35.57	0
34.56	0	35.07	0	35.58	0
34.57	0	35.08	0	35.59	0
34.58	0	35.09	0	35.60	0
34.59	0	35.10	0	35.61	0
34.60	0	35.11	0	35.62	0
34.61	0	35.12	0	35.63	0
34.62	0	35.13	0	35.64	0
34.63	0	35.14	0	35.65	0
34.64	0	35.15	0	35.66	0
34.65	0	35.16	0	35.67	0
34.66	0	35.17	0	35.68	0
34.67	0	35.18	0	35.69	0
34.68	0	35.19	0	35.70	0
34.69	0	35.20	0	35.71	0
34.70	0	35.21	0	35.72	0
34.71	0	35.22	0	35.73	0
34.72	0	35.23	0	35.74	0
34.73	0	35.24	0	35.75	0
34.74	0	35.25	0		
34.75	0	35.26	0		
34.76	0	35.27	0		
34.77	0	35.28	0		
34.78	0	35.29	0		
34.79	0	35.30	0		
34.80	0	35.31	0		
34.81	0	35.32	0		
34.82	0	35.33	0		
34.83	0	35.34	0		
34.84	0	35.35	0		
34.85	0	35.36	0		
34.86	0	35.37	0		
34.87	0	35.38	0		
34.88	0	35.39	0		
34.89	0	35.40	0		
34.90	0	35.41	0		

Summary for Pond 2A: DI 2A

Inflow Area =	0.487 ac,	80.12% Impervious,	Inflow Depth =	3.50" for 2 Yr event
Inflow =	1.94 cfs @	12.07 hrs, Volume=	0.142 af	
Outflow =	1.94 cfs @	12.07 hrs, Volume=	0.142 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	
Secondary =	1.94 cfs @	12.07 hrs, Volume=	0.142 af	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.29' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	33.50'	**15.0" x 114.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0140 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 42.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=33.50' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=1.87 cfs @ 12.07 hrs HW=35.27' (Free Discharge)
↑—**3=Culvert** (Barrel Controls 1.87 cfs @ 3.35 fps)

Stage-Area-Storage for Pond 2A: DI 2A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
33.50	0	34.01	0	34.52	0
33.51	0	34.02	0	34.53	0
33.52	0	34.03	0	34.54	0
33.53	0	34.04	0	34.55	0
33.54	0	34.05	0	34.56	0
33.55	0	34.06	0	34.57	0
33.56	0	34.07	0	34.58	0
33.57	0	34.08	0	34.59	0
33.58	0	34.09	0	34.60	0
33.59	0	34.10	0	34.61	0
33.60	0	34.11	0	34.62	0
33.61	0	34.12	0	34.63	0
33.62	0	34.13	0	34.64	0
33.63	0	34.14	0	34.65	0
33.64	0	34.15	0	34.66	0
33.65	0	34.16	0	34.67	0
33.66	0	34.17	0	34.68	0
33.67	0	34.18	0	34.69	0
33.68	0	34.19	0	34.70	0
33.69	0	34.20	0	34.71	0
33.70	0	34.21	0	34.72	0
33.71	0	34.22	0	34.73	0
33.72	0	34.23	0	34.74	0
33.73	0	34.24	0	34.75	0
33.74	0	34.25	0	34.76	0
33.75	0	34.26	0	34.77	0
33.76	0	34.27	0	34.78	0
33.77	0	34.28	0	34.79	0
33.78	0	34.29	0	34.80	0
33.79	0	34.30	0	34.81	0
33.80	0	34.31	0	34.82	0
33.81	0	34.32	0	34.83	0
33.82	0	34.33	0	34.84	0
33.83	0	34.34	0	34.85	0
33.84	0	34.35	0	34.86	0
33.85	0	34.36	0	34.87	0
33.86	0	34.37	0	34.88	0
33.87	0	34.38	0	34.89	0
33.88	0	34.39	0	34.90	0
33.89	0	34.40	0	34.91	0
33.90	0	34.41	0	34.92	0
33.91	0	34.42	0	34.93	0
33.92	0	34.43	0	34.94	0
33.93	0	34.44	0	34.95	0
33.94	0	34.45	0	34.96	0
33.95	0	34.46	0	34.97	0
33.96	0	34.47	0	34.98	0
33.97	0	34.48	0	34.99	0
33.98	0	34.49	0	35.00	0
33.99	0	34.50	0	35.01	0
34.00	0	34.51	0	35.02	0

Stage-Area-Storage for Pond 2A: DI 2A (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
35.03	0	35.54	0
35.04	0	35.55	0
35.05	0	35.56	0
35.06	0	35.57	0
35.07	0	35.58	0
35.08	0	35.59	0
35.09	0	35.60	0
35.10	0	35.61	0
35.11	0	35.62	0
35.12	0	35.63	0
35.13	0	35.64	0
35.14	0	35.65	0
35.15	0	35.66	0
35.16	0	35.67	0
35.17	0	35.68	0
35.18	0	35.69	0
35.19	0	35.70	0
35.20	0	35.71	0
35.21	0	35.72	0
35.22	0	35.73	0
35.23	0	35.74	0
35.24	0	35.75	0
35.25	0		
35.26	0		
35.27	0		
35.28	0		
35.29	0		
35.30	0		
35.31	0		
35.32	0		
35.33	0		
35.34	0		
35.35	0		
35.36	0		
35.37	0		
35.38	0		
35.39	0		
35.40	0		
35.41	0		
35.42	0		
35.43	0		
35.44	0		
35.45	0		
35.46	0		
35.47	0		
35.48	0		
35.49	0		
35.50	0		
35.51	0		
35.52	0		
35.53	0		

Summary for Pond 2B: DI 2B

Inflow Area =	0.527 ac, 92.50% Impervious, Inflow Depth = 3.92"	for 2 Yr event		
Inflow =	2.26 cfs @ 12.07 hrs, Volume=	0.172 af		
Outflow =	2.26 cfs @ 12.07 hrs, Volume=	0.172 af, Atten= 0%, Lag= 0.0 min		
Primary =	0.09 cfs @ 12.06 hrs, Volume=	0.001 af		
Secondary =	2.17 cfs @ 12.07 hrs, Volume=	0.172 af		

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.35' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.20'	**15.0" x 18.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 42.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.07 cfs @ 12.06 hrs HW=35.33' (Free Discharge)
└─**1=Culvert** (Passes 0.07 cfs of 9.35 cfs potential flow)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.57 fps)

Secondary OutFlow Max=2.10 cfs @ 12.07 hrs HW=35.33' (Free Discharge)
└─**3=Culvert** (Barrel Controls 2.10 cfs @ 3.44 fps)

Stage-Area-Storage for Pond 2B: DI 2B

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
32.20	0	32.71	0	33.22	0
32.21	0	32.72	0	33.23	0
32.22	0	32.73	0	33.24	0
32.23	0	32.74	0	33.25	0
32.24	0	32.75	0	33.26	0
32.25	0	32.76	0	33.27	0
32.26	0	32.77	0	33.28	0
32.27	0	32.78	0	33.29	0
32.28	0	32.79	0	33.30	0
32.29	0	32.80	0	33.31	0
32.30	0	32.81	0	33.32	0
32.31	0	32.82	0	33.33	0
32.32	0	32.83	0	33.34	0
32.33	0	32.84	0	33.35	0
32.34	0	32.85	0	33.36	0
32.35	0	32.86	0	33.37	0
32.36	0	32.87	0	33.38	0
32.37	0	32.88	0	33.39	0
32.38	0	32.89	0	33.40	0
32.39	0	32.90	0	33.41	0
32.40	0	32.91	0	33.42	0
32.41	0	32.92	0	33.43	0
32.42	0	32.93	0	33.44	0
32.43	0	32.94	0	33.45	0
32.44	0	32.95	0	33.46	0
32.45	0	32.96	0	33.47	0
32.46	0	32.97	0	33.48	0
32.47	0	32.98	0	33.49	0
32.48	0	32.99	0	33.50	0
32.49	0	33.00	0	33.51	0
32.50	0	33.01	0	33.52	0
32.51	0	33.02	0	33.53	0
32.52	0	33.03	0	33.54	0
32.53	0	33.04	0	33.55	0
32.54	0	33.05	0	33.56	0
32.55	0	33.06	0	33.57	0
32.56	0	33.07	0	33.58	0
32.57	0	33.08	0	33.59	0
32.58	0	33.09	0	33.60	0
32.59	0	33.10	0	33.61	0
32.60	0	33.11	0	33.62	0
32.61	0	33.12	0	33.63	0
32.62	0	33.13	0	33.64	0
32.63	0	33.14	0	33.65	0
32.64	0	33.15	0	33.66	0
32.65	0	33.16	0	33.67	0
32.66	0	33.17	0	33.68	0
32.67	0	33.18	0	33.69	0
32.68	0	33.19	0	33.70	0
32.69	0	33.20	0	33.71	0
32.70	0	33.21	0	33.72	0

Stage-Area-Storage for Pond 2B: DI 2B (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
33.73	0	34.24	0	34.75	0
33.74	0	34.25	0	34.76	0
33.75	0	34.26	0	34.77	0
33.76	0	34.27	0	34.78	0
33.77	0	34.28	0	34.79	0
33.78	0	34.29	0	34.80	0
33.79	0	34.30	0	34.81	0
33.80	0	34.31	0	34.82	0
33.81	0	34.32	0	34.83	0
33.82	0	34.33	0	34.84	0
33.83	0	34.34	0	34.85	0
33.84	0	34.35	0	34.86	0
33.85	0	34.36	0	34.87	0
33.86	0	34.37	0	34.88	0
33.87	0	34.38	0	34.89	0
33.88	0	34.39	0	34.90	0
33.89	0	34.40	0	34.91	0
33.90	0	34.41	0	34.92	0
33.91	0	34.42	0	34.93	0
33.92	0	34.43	0	34.94	0
33.93	0	34.44	0	34.95	0
33.94	0	34.45	0	34.96	0
33.95	0	34.46	0	34.97	0
33.96	0	34.47	0	34.98	0
33.97	0	34.48	0	34.99	0
33.98	0	34.49	0	35.00	0
33.99	0	34.50	0	35.01	0
34.00	0	34.51	0	35.02	0
34.01	0	34.52	0	35.03	0
34.02	0	34.53	0	35.04	0
34.03	0	34.54	0	35.05	0
34.04	0	34.55	0	35.06	0
34.05	0	34.56	0	35.07	0
34.06	0	34.57	0	35.08	0
34.07	0	34.58	0	35.09	0
34.08	0	34.59	0	35.10	0
34.09	0	34.60	0	35.11	0
34.10	0	34.61	0	35.12	0
34.11	0	34.62	0	35.13	0
34.12	0	34.63	0	35.14	0
34.13	0	34.64	0	35.15	0
34.14	0	34.65	0	35.16	0
34.15	0	34.66	0	35.17	0
34.16	0	34.67	0	35.18	0
34.17	0	34.68	0	35.19	0
34.18	0	34.69	0	35.20	0
34.19	0	34.70	0	35.21	0
34.20	0	34.71	0	35.22	0
34.21	0	34.72	0	35.23	0
34.22	0	34.73	0	35.24	0
34.23	0	34.74	0	35.25	0

Stage-Area-Storage for Pond 2B: DI 2B (continued)

Elevation (feet)	Storage (cubic-feet)
35.26	0
35.27	0
35.28	0
35.29	0
35.30	0
35.31	0
35.32	0
35.33	0
35.34	0
35.35	0
35.36	0
35.37	0
35.38	0
35.39	0
35.40	0
35.41	0
35.42	0
35.43	0
35.44	0
35.45	0
35.46	0
35.47	0
35.48	0
35.49	0
35.50	0
35.51	0
35.52	0
35.53	0
35.54	0
35.55	0
35.56	0
35.57	0
35.58	0
35.59	0
35.60	0
35.61	0
35.62	0
35.63	0
35.64	0
35.65	0
35.66	0
35.67	0
35.68	0
35.69	0
35.70	0
35.71	0
35.72	0
35.73	0
35.74	0
35.75	0

Summary for Pond P2: Underground BMP #2

Inflow	=	5.87 cfs @	12.07 hrs, Volume=	0.441 af
Outflow	=	1.29 cfs @	11.75 hrs, Volume=	0.441 af, Atten= 78%, Lag= 0.0 min
Discarded	=	1.29 cfs @	11.75 hrs, Volume=	0.441 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.07' @ 12.49 hrs Surf.Area= 12,097 sf Storage= 4,419 cf

Plug-Flow detention time= 18.3 min calculated for 0.440 af (100% of inflow)
Center-of-Mass det. time= 18.3 min (807.5 - 789.2)

Volume	Invert	Avail.Storage	Storage Description
#1	34.42'	7,850 cf	**stonebottom (Prismatic)** Listed below (Recalc)
			24,678 cf Overall - 5,054 cf Embedded = 19,624 cf x 40.0% Voids
#2	34.75'	5,054 cf	**32.1"W x 12.0"H x 7.50'L Cultec C-100** x 362 Inside #1
		12,904 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.42	12,097	0	0
36.46	12,097	24,678	24,678

Device	Routing	Invert	Outlet Devices
#1	Discarded	34.42'	**4.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.29 cfs @ 11.75 hrs HW=34.44' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.29 cfs)

Stage-Area-Storage for Pond P2: Underground BMP #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.42	12,097	0
34.43	12,097	48
34.44	12,097	97
34.45	12,097	145
34.46	12,097	194
34.47	12,097	242
34.48	12,097	290
34.49	12,097	339
34.50	12,097	387
34.51	12,097	435
34.52	12,097	484
34.53	12,097	532
34.54	12,097	581
34.55	12,097	629
34.56	12,097	677
34.57	12,097	726
34.58	12,097	774
34.59	12,097	823
34.60	12,097	871
34.61	12,097	919
34.62	12,097	968
34.63	12,097	1,016
34.64	12,097	1,065
34.65	12,097	1,113
34.66	12,097	1,161
34.67	12,097	1,210
34.68	12,097	1,258
34.69	12,097	1,306
34.70	12,097	1,355
34.71	12,097	1,403
34.72	12,097	1,452
34.73	12,097	1,500
34.74	12,097	1,548
34.75	12,097	1,597
34.76	12,097	1,689
34.77	12,097	1,780
34.78	12,097	1,872
34.79	12,097	1,963
34.80	12,097	2,054
34.81	12,097	2,144
34.82	12,097	2,235
34.83	12,097	2,325
34.84	12,097	2,415
34.85	12,097	2,505
34.86	12,097	2,594
34.87	12,097	2,684
34.88	12,097	2,773
34.89	12,097	2,862
34.90	12,097	2,950
34.91	12,097	3,038
34.92	12,097	3,127
34.93	12,097	3,215
34.94	12,097	3,303
34.95	12,097	3,391
34.96	12,097	3,479
34.97	12,097	3,567
34.98	12,097	3,655
34.99	12,097	3,743
35.00	12,097	3,831
35.01	12,097	3,919
35.02	12,097	4,007
35.03	12,097	4,095
35.04	12,097	4,182
35.05	12,097	4,270
35.06	12,097	4,357
35.07	12,097	4,444
35.08	12,097	4,532
35.09	12,097	4,619
35.10	12,097	4,705
35.11	12,097	4,792
35.12	12,097	4,878
35.13	12,097	4,964
35.14	12,097	5,050
35.15	12,097	5,136
35.16	12,097	5,221
35.17	12,097	5,306
35.18	12,097	5,391
35.19	12,097	5,476
35.20	12,097	5,560
35.21	12,097	5,645
35.22	12,097	5,729
35.23	12,097	5,813
35.24	12,097	5,896
35.25	12,097	5,980
35.26	12,097	6,063
35.27	12,097	6,146
35.28	12,097	6,229
35.29	12,097	6,311
35.30	12,097	6,393
35.31	12,097	6,475
35.32	12,097	6,556
35.33	12,097	6,638
35.34	12,097	6,718
35.35	12,097	6,799
35.36	12,097	6,879
35.37	12,097	6,959
35.38	12,097	7,038
35.39	12,097	7,117
35.40	12,097	7,195
35.41	12,097	7,273
35.42	12,097	7,351
35.43	12,097	7,428

Stage-Area-Storage for Pond P2: Underground BMP #2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
35.44	12,097	7,504
35.45	12,097	7,580
35.46	12,097	7,655
35.47	12,097	7,730
35.48	12,097	7,804
35.49	12,097	7,878
35.50	12,097	7,951
35.51	12,097	8,023
35.52	12,097	8,095
35.53	12,097	8,165
35.54	12,097	8,235
35.55	12,097	8,304
35.56	12,097	8,372
35.57	12,097	8,439
35.58	12,097	8,506
35.59	12,097	8,571
35.60	12,097	8,635
35.61	12,097	8,698
35.62	12,097	8,760
35.63	12,097	8,821
35.64	12,097	8,881
35.65	12,097	8,939
35.66	12,097	8,996
35.67	12,097	9,052
35.68	12,097	9,107
35.69	12,097	9,162
35.70	12,097	9,215
35.71	12,097	9,267
35.72	12,097	9,319
35.73	12,097	9,369
35.74	12,097	9,419
35.75	12,097	9,468
35.76	12,097	9,516
35.77	12,097	9,565
35.78	12,097	9,613
35.79	12,097	9,662
35.80	12,097	9,710
35.81	12,097	9,758
35.82	12,097	9,807
35.83	12,097	9,855
35.84	12,097	9,903
35.85	12,097	9,952
35.86	12,097	10,000
35.87	12,097	10,049
35.88	12,097	10,097
35.89	12,097	10,145
35.90	12,097	10,194
35.91	12,097	10,242
35.92	12,097	10,291
35.93	12,097	10,339
35.94	12,097	10,387
35.95	12,097	10,436
35.96	12,097	10,484
35.97	12,097	10,533
35.98	12,097	10,581
35.99	12,097	10,629
36.00	12,097	10,678
36.01	12,097	10,726
36.02	12,097	10,774
36.03	12,097	10,823
36.04	12,097	10,871
36.05	12,097	10,920
36.06	12,097	10,968
36.07	12,097	11,016
36.08	12,097	11,065
36.09	12,097	11,113
36.10	12,097	11,162
36.11	12,097	11,210
36.12	12,097	11,258
36.13	12,097	11,307
36.14	12,097	11,355
36.15	12,097	11,404
36.16	12,097	11,452
36.17	12,097	11,500
36.18	12,097	11,549
36.19	12,097	11,597
36.20	12,097	11,645
36.21	12,097	11,694
36.22	12,097	11,742
36.23	12,097	11,791
36.24	12,097	11,839
36.25	12,097	11,887
36.26	12,097	11,936
36.27	12,097	11,984
36.28	12,097	12,033
36.29	12,097	12,081
36.30	12,097	12,129
36.31	12,097	12,178
36.32	12,097	12,226
36.33	12,097	12,274
36.34	12,097	12,323
36.35	12,097	12,371
36.36	12,097	12,420
36.37	12,097	12,468
36.38	12,097	12,516
36.39	12,097	12,565
36.40	12,097	12,613
36.41	12,097	12,662
36.42	12,097	12,710
36.43	12,097	12,758
36.44	12,097	12,807
36.45	12,097	12,855

Stage-Area-Storage for Pond P2: Underground BMP #2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
36.46	12,097	**12,904**

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Pre DA: Pre-DA1 Runoff Area=67,780 sf 0.00% Impervious Runoff Depth=1.95"
Tc=5.0 min CN=55 Runoff=3.31 cfs 0.253 af

Subcatchment S1A: Area 1A Runoff Area=14,258 sf 60.84% Impervious Runoff Depth=4.87"
Tc=5.0 min CN=84 Runoff=1.84 cfs 0.133 af

Subcatchment S1B: Area 1B Runoff Area=9,348 sf 61.62% Impervious Runoff Depth=4.87"
Tc=5.0 min CN=84 Runoff=1.21 cfs 0.087 af

Subcatchment S2A: Area 2A Runoff Area=21,228 sf 80.12% Impervious Runoff Depth=5.66"
Tc=5.0 min CN=91 Runoff=3.06 cfs 0.230 af

Subcatchment S2B: Area 2B Runoff Area=22,964 sf 92.50% Impervious Runoff Depth=6.13"
Tc=5.0 min CN=95 Runoff=3.44 cfs 0.269 af

Reach R1B: R1B to R1A Avg. Depth=0.40' Max Vel=4.03 fps Inflow=1.21 cfs 0.087 af
D=12.0" n=0.013 L=82.0' S=0.0098 '/' Capacity=3.52 cfs Outflow=1.19 cfs 0.087 af

Reach R3: OUTLET Avg. Depth=0.38' Max Vel=5.75 fps Inflow=2.08 cfs 0.019 af
D=18.0" n=0.013 L=45.0' S=0.0200 '/' Capacity=14.86 cfs Outflow=2.00 cfs 0.019 af

Pond 1A: MH 1A Peak Elev=35.45' Inflow=3.01 cfs 0.220 af
Primary=0.75 cfs 0.007 af Secondary=2.26 cfs 0.213 af Outflow=3.01 cfs 0.220 af

Pond 2A: DI 2A Peak Elev=35.42' Inflow=3.06 cfs 0.230 af
Primary=0.55 cfs 0.004 af Secondary=2.51 cfs 0.226 af Outflow=3.06 cfs 0.230 af

Pond 2B: DI 2B Peak Elev=35.46' Inflow=3.44 cfs 0.269 af
Primary=0.79 cfs 0.007 af Secondary=2.65 cfs 0.262 af Outflow=3.44 cfs 0.269 af

Pond P2: Underground BMP #2 Peak Elev=35.60' Storage=8,643 cf Inflow=7.42 cfs 0.700 af
Outflow=1.29 cfs 0.700 af

Total Runoff Area = 3.112 ac Runoff Volume = 0.972 af Average Runoff Depth = 3.75"
61.14% Pervious = 1.903 ac 38.86% Impervious = 1.209 ac

Summary for Subcatchment Pre DA: Pre-DA1

Runoff = 3.31 cfs @ 12.09 hrs, Volume= 0.253 af, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr Wilm Rainfall=6.72"

Area (sf)	CN	Description
67,780	55	Woods, Good, HSG B
67,780		Pervious Area

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

Summary for Subcatchment S1A: Area 1A

Runoff = 1.84 cfs @ 12.07 hrs, Volume= 0.133 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr Wilm Rainfall=6.72"

	Area (sf)	CN	Description
*	1,780	98	Building
*	6,515	98	Asphalt
*	380	98	Sidewalk
	5,583	61	>75% Grass cover, Good, HSG B
	14,258	84	Weighted Average
	5,583		Pervious Area
	8,675		Impervious Area

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

Summary for Subcatchment S1B: Area 1B

Runoff = 1.21 cfs @ 12.07 hrs, Volume= 0.087 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr Wilm Rainfall=6.72"

	Area (sf)	CN	Description
*	890	98	Building
*	4,870	98	Asphalt
	3,588	61	>75% Grass cover, Good, HSG B
	9,348	84	Weighted Average
	3,588		Pervious Area
	5,760		Impervious Area

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

Summary for Subcatchment S2A: Area 2A

Runoff = 3.06 cfs @ 12.07 hrs, Volume= 0.230 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr Wilm Rainfall=6.72"

	Area (sf)	CN	Description
*	1,780	98	Building
*	15,228	98	Asphalt
	4,220	61	>75% Grass cover, Good, HSG B
	21,228	91	Weighted Average
	4,220		Pervious Area
	17,008		Impervious Area

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

Summary for Subcatchment S2B: Area 2B

Runoff = 3.44 cfs @ 12.07 hrs, Volume= 0.269 af, Depth= 6.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr Wilm Rainfall=6.72"

	Area (sf)	CN	Description
*	2,670	98	Building
*	18,571	98	Asphalt
	1,723	61	>75% Grass cover, Good, HSG B
	22,964	95	Weighted Average
	1,723		Pervious Area
	21,241		Impervious Area

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

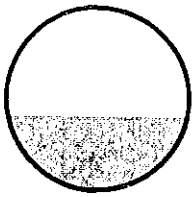
Summary for Reach R1B: R1B to R1A

Inflow Area =	0.215 ac, 61.62% Impervious,	Inflow Depth =	4.87"	for 10 Yr Wilm event
Inflow =	1.21 cfs @ 12.07 hrs,	Volume=	0.087 af	
Outflow =	1.19 cfs @ 12.09 hrs,	Volume=	0.087 af,	Atten= 2%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.03 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 1.0 min

Peak Storage= 24 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.52 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, straight & clean
Length= 82.0' Slope= 0.0098 '/'
Inlet Invert= 35.30', Outlet Invert= 34.50'



Stage-Area-Storage for Reach R1B: R1B to R1A

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
35.30	0.0	0
35.31	0.0	0
35.32	0.0	0
35.33	0.0	1
35.34	0.0	1
35.35	0.0	1
35.36	0.0	2
35.37	0.0	2
35.38	0.0	2
35.39	0.0	3
35.40	0.0	3
35.41	0.0	4
35.42	0.1	4
35.43	0.1	5
35.44	0.1	5
35.45	0.1	6
35.46	0.1	7
35.47	0.1	7
35.48	0.1	8
35.49	0.1	9
35.50	0.1	9
35.51	0.1	10
35.52	0.1	11
35.53	0.1	11
35.54	0.1	12
35.55	0.2	13
35.56	0.2	13
35.57	0.2	14
35.58	0.2	15
35.59	0.2	16
35.60	0.2	16
35.61	0.2	17
35.62	0.2	18
35.63	0.2	19
35.64	0.2	19
35.65	0.2	20
35.66	0.3	21
35.67	0.3	22
35.68	0.3	22
35.69	0.3	23
35.70	0.3	24
35.71	0.3	25
35.72	0.3	26
35.73	0.3	26
35.74	0.3	27
35.75	0.3	28
35.76	0.4	29
35.77	0.4	30
35.78	0.4	31
35.79	0.4	31
35.80	0.4	32
35.81	0.4	33
35.82	0.4	34
35.83	0.4	35
35.84	0.4	35
35.85	0.4	36
35.86	0.5	37
35.87	0.5	38
35.88	0.5	39
35.89	0.5	40
35.90	0.5	40
35.91	0.5	41
35.92	0.5	42
35.93	0.5	43
35.94	0.5	44
35.95	0.5	44
35.96	0.5	45
35.97	0.6	46
35.98	0.6	47
35.99	0.6	47
36.00	0.6	48
36.01	0.6	49
36.02	0.6	50
36.03	0.6	50
36.04	0.6	51
36.05	0.6	52
36.06	0.6	53
36.07	0.6	53
36.08	0.7	54
36.09	0.7	55
36.10	0.7	55
36.11	0.7	56
36.12	0.7	57
36.13	0.7	57
36.14	0.7	58
36.15	0.7	58
36.16	0.7	59
36.17	0.7	59
36.18	0.7	60
36.19	0.7	61
36.20	0.7	61
36.21	0.8	62
36.22	0.8	62
36.23	0.8	62
36.24	0.8	63
36.25	0.8	63
36.26	0.8	64
36.27	0.8	64
36.28	0.8	64
36.29	0.8	64
36.30	**0.8**	**64**

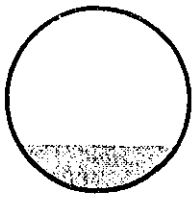
Summary for Reach R3: OUTLET

Inflow Area = 1.556 ac, 77.71% Impervious, Inflow Depth = 0.15" for 10 Yr Wilm event
Inflow = 2.08 cfs @ 12.07 hrs, Volume= 0.019 af
Outflow = 2.00 cfs @ 12.08 hrs, Volume= 0.019 af, Atten= 4%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 5.75 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.13 fps, Avg. Travel Time= 0.2 min

Peak Storage= 16 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 14.86 cfs

18.0" Diameter Pipe, n= 0.013 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0200 '/'
Inlet Invert= 31.90', Outlet Invert= 31.00'



Stage-Area-Storage for Reach R3: OUTLET

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
31.90	0.0	0	32.41	0.5	24
31.91	0.0	0	32.42	0.5	24
31.92	0.0	0	32.43	0.6	25
31.93	0.0	0	32.44	0.6	26
31.94	0.0	1	32.45	0.6	26
31.95	0.0	1	32.46	0.6	27
31.96	0.0	1	32.47	0.6	28
31.97	0.0	1	32.48	0.6	28
31.98	0.0	2	32.49	0.6	29
31.99	0.0	2	32.50	0.7	30
32.00	0.1	2	32.51	0.7	30
32.01	0.1	3	32.52	0.7	31
32.02	0.1	3	32.53	0.7	32
32.03	0.1	3	32.54	0.7	32
32.04	0.1	4	32.55	0.7	33
32.05	0.1	4	32.56	0.7	34
32.06	0.1	5	32.57	0.8	34
32.07	0.1	5	32.58	0.8	35
32.08	0.1	5	32.59	0.8	36
32.09	0.1	6	32.60	0.8	36
32.10	0.1	6	32.61	0.8	37
32.11	0.2	7	32.62	0.8	38
32.12	0.2	7	32.63	0.9	38
32.13	0.2	8	32.64	0.9	39
32.14	0.2	8	32.65	0.9	40
32.15	0.2	9	32.66	0.9	40
32.16	0.2	9	32.67	0.9	41
32.17	0.2	10	32.68	0.9	42
32.18	0.2	10	32.69	0.9	42
32.19	0.2	11	32.70	1.0	43
32.20	0.3	11	32.71	1.0	44
32.21	0.3	12	32.72	1.0	44
32.22	0.3	12	32.73	1.0	45
32.23	0.3	13	32.74	1.0	46
32.24	0.3	14	32.75	1.0	46
32.25	0.3	14	32.76	1.0	47
32.26	0.3	15	32.77	1.1	48
32.27	0.3	15	32.78	1.1	48
32.28	0.4	16	32.79	1.1	49
32.29	0.4	16	32.80	1.1	50
32.30	0.4	17	32.81	1.1	50
32.31	0.4	18	32.82	1.1	51
32.32	0.4	18	32.83	1.2	52
32.33	0.4	19	32.84	1.2	52
32.34	0.4	19	32.85	1.2	53
32.35	0.4	20	32.86	1.2	54
32.36	0.5	21	32.87	1.2	54
32.37	0.5	21	32.88	1.2	55
32.38	0.5	22	32.89	1.2	56
32.39	0.5	23	32.90	1.3	56
32.40	0.5	23	32.91	1.3	57

Stage-Area-Storage for Reach R3: OUTLET (continued)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
32.92	1.3	58
32.93	1.3	58
32.94	1.3	59
32.95	1.3	59
32.96	1.3	60
32.97	1.3	61
32.98	1.4	61
32.99	1.4	62
33.00	1.4	62
33.01	1.4	63
33.02	1.4	64
33.03	1.4	64
33.04	1.4	65
33.05	1.5	65
33.06	1.5	66
33.07	1.5	67
33.08	1.5	67
33.09	1.5	68
33.10	1.5	68
33.11	1.5	69
33.12	1.5	69
33.13	1.6	70
33.14	1.6	70
33.15	1.6	71
33.16	1.6	71
33.17	1.6	72
33.18	1.6	72
33.19	1.6	73
33.20	1.6	73
33.21	1.6	74
33.22	1.6	74
33.23	1.7	75
33.24	1.7	75
33.25	1.7	75
33.26	1.7	76
33.27	1.7	76
33.28	1.7	77
33.29	1.7	77
33.30	1.7	77
33.31	1.7	78
33.32	1.7	78
33.33	1.7	78
33.34	1.7	78
33.35	1.7	79
33.36	1.8	79
33.37	1.8	79
33.38	1.8	79
33.39	1.8	79
33.40	**1.8**	**80**

Summary for Pond 1A: MH 1A

Inflow Area =	0.542 ac, 61.15% Impervious, Inflow Depth = 4.87"		for 10 Yr Wilm event	
Inflow =	3.01 cfs @	12.08 hrs, Volume=	0.220 af	
Outflow =	3.01 cfs @	12.08 hrs, Volume=	0.220 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.75 cfs @	12.08 hrs, Volume=	0.007 af	
Secondary =	2.26 cfs @	12.08 hrs, Volume=	0.213 af	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.45' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	34.40'	**15.0" x 397.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0063 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 81.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0031 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.69 cfs @ 12.08 hrs HW=35.44' (Free Discharge)
↑—**1=Culvert** (Passes 0.69 cfs of 3.52 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.69 cfs @ 1.23 fps)

Secondary OutFlow Max=2.23 cfs @ 12.08 hrs HW=35.44' (Free Discharge)
↑—**3=Culvert** (Barrel Controls 2.23 cfs @ 3.12 fps)

Stage-Area-Storage for Pond 1A: MH 1A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
34.40	0	34.91	0	35.42	0
34.41	0	34.92	0	35.43	0
34.42	0	34.93	0	35.44	0
34.43	0	34.94	0	35.45	0
34.44	0	34.95	0	35.46	0
34.45	0	34.96	0	35.47	0
34.46	0	34.97	0	35.48	0
34.47	0	34.98	0	35.49	0
34.48	0	34.99	0	35.50	0
34.49	0	35.00	0	35.51	0
34.50	0	35.01	0	35.52	0
34.51	0	35.02	0	35.53	0
34.52	0	35.03	0	35.54	0
34.53	0	35.04	0	35.55	0
34.54	0	35.05	0	35.56	0
34.55	0	35.06	0	35.57	0
34.56	0	35.07	0	35.58	0
34.57	0	35.08	0	35.59	0
34.58	0	35.09	0	35.60	0
34.59	0	35.10	0	35.61	0
34.60	0	35.11	0	35.62	0
34.61	0	35.12	0	35.63	0
34.62	0	35.13	0	35.64	0
34.63	0	35.14	0	35.65	0
34.64	0	35.15	0	35.66	0
34.65	0	35.16	0	35.67	0
34.66	0	35.17	0	35.68	0
34.67	0	35.18	0	35.69	0
34.68	0	35.19	0	35.70	0
34.69	0	35.20	0	35.71	0
34.70	0	35.21	0	35.72	0
34.71	0	35.22	0	35.73	0
34.72	0	35.23	0	35.74	0
34.73	0	35.24	0	35.75	0
34.74	0	35.25	0		
34.75	0	35.26	0		
34.76	0	35.27	0		
34.77	0	35.28	0		
34.78	0	35.29	0		
34.79	0	35.30	0		
34.80	0	35.31	0		
34.81	0	35.32	0		
34.82	0	35.33	0		
34.83	0	35.34	0		
34.84	0	35.35	0		
34.85	0	35.36	0		
34.86	0	35.37	0		
34.87	0	35.38	0		
34.88	0	35.39	0		
34.89	0	35.40	0		
34.90	0	35.41	0		

Summary for Pond 2A: DI 2A

Inflow Area = 0.487 ac, 80.12% Impervious, Inflow Depth = 5.66" for 10 Yr Wilm event
Inflow = 3.06 cfs @ 12.07 hrs, Volume= 0.230 af
Outflow = 3.06 cfs @ 12.07 hrs, Volume= 0.230 af, Atten= 0%, Lag= 0.0 min
Primary = 0.55 cfs @ 12.07 hrs, Volume= 0.004 af
Secondary = 2.51 cfs @ 12.07 hrs, Volume= 0.226 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.42' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	33.50'	**15.0" x 114.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0140 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 42.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.49 cfs @ 12.07 hrs HW=35.41' (Free Discharge)
↑—**1=Culvert** (Passes 0.49 cfs of 6.70 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.49 cfs @ 1.09 fps)

Secondary OutFlow Max=2.45 cfs @ 12.07 hrs HW=35.41' (Free Discharge)
↑—**3=Culvert** (Barrel Controls 2.45 cfs @ 3.57 fps)

Stage-Area-Storage for Pond 2A: DI 2A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
33.50	0	34.01	0	34.52	0
33.51	0	34.02	0	34.53	0
33.52	0	34.03	0	34.54	0
33.53	0	34.04	0	34.55	0
33.54	0	34.05	0	34.56	0
33.55	0	34.06	0	34.57	0
33.56	0	34.07	0	34.58	0
33.57	0	34.08	0	34.59	0
33.58	0	34.09	0	34.60	0
33.59	0	34.10	0	34.61	0
33.60	0	34.11	0	34.62	0
33.61	0	34.12	0	34.63	0
33.62	0	34.13	0	34.64	0
33.63	0	34.14	0	34.65	0
33.64	0	34.15	0	34.66	0
33.65	0	34.16	0	34.67	0
33.66	0	34.17	0	34.68	0
33.67	0	34.18	0	34.69	0
33.68	0	34.19	0	34.70	0
33.69	0	34.20	0	34.71	0
33.70	0	34.21	0	34.72	0
33.71	0	34.22	0	34.73	0
33.72	0	34.23	0	34.74	0
33.73	0	34.24	0	34.75	0
33.74	0	34.25	0	34.76	0
33.75	0	34.26	0	34.77	0
33.76	0	34.27	0	34.78	0
33.77	0	34.28	0	34.79	0
33.78	0	34.29	0	34.80	0
33.79	0	34.30	0	34.81	0
33.80	0	34.31	0	34.82	0
33.81	0	34.32	0	34.83	0
33.82	0	34.33	0	34.84	0
33.83	0	34.34	0	34.85	0
33.84	0	34.35	0	34.86	0
33.85	0	34.36	0	34.87	0
33.86	0	34.37	0	34.88	0
33.87	0	34.38	0	34.89	0
33.88	0	34.39	0	34.90	0
33.89	0	34.40	0	34.91	0
33.90	0	34.41	0	34.92	0
33.91	0	34.42	0	34.93	0
33.92	0	34.43	0	34.94	0
33.93	0	34.44	0	34.95	0
33.94	0	34.45	0	34.96	0
33.95	0	34.46	0	34.97	0
33.96	0	34.47	0	34.98	0
33.97	0	34.48	0	34.99	0
33.98	0	34.49	0	35.00	0
33.99	0	34.50	0	35.01	0
34.00	0	34.51	0	35.02	0

Stage-Area-Storage for Pond 2A: DI 2A (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
35.03	0	35.54	0
35.04	0	35.55	0
35.05	0	35.56	0
35.06	0	35.57	0
35.07	0	35.58	0
35.08	0	35.59	0
35.09	0	35.60	0
35.10	0	35.61	0
35.11	0	35.62	0
35.12	0	35.63	0
35.13	0	35.64	0
35.14	0	35.65	0
35.15	0	35.66	0
35.16	0	35.67	0
35.17	0	35.68	0
35.18	0	35.69	0
35.19	0	35.70	0
35.20	0	35.71	0
35.21	0	35.72	0
35.22	0	35.73	0
35.23	0	35.74	0
35.24	0	35.75	0
35.25	0		
35.26	0		
35.27	0		
35.28	0		
35.29	0		
35.30	0		
35.31	0		
35.32	0		
35.33	0		
35.34	0		
35.35	0		
35.36	0		
35.37	0		
35.38	0		
35.39	0		
35.40	0		
35.41	0		
35.42	0		
35.43	0		
35.44	0		
35.45	0		
35.46	0		
35.47	0		
35.48	0		
35.49	0		
35.50	0		
35.51	0		
35.52	0		
35.53	0		

Summary for Pond 2B: DI 2B

Inflow Area = 0.527 ac, 92.50% Impervious, Inflow Depth = 6.13" for 10 Yr Wilm event
Inflow = 3.44 cfs @ 12.07 hrs, Volume= 0.269 af
Outflow = 3.44 cfs @ 12.07 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.07 hrs, Volume= 0.007 af
Secondary = 2.65 cfs @ 12.07 hrs, Volume= 0.262 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.46' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.20'	**15.0" x 18.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 42.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.71 cfs @ 12.07 hrs HW=35.44' (Free Discharge)
↑—**1=Culvert** (Passes 0.71 cfs of 9.56 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.71 cfs @ 1.24 fps)

Secondary OutFlow Max=2.60 cfs @ 12.07 hrs HW=35.44' (Free Discharge)
↑—**3=Culvert** (Barrel Controls 2.60 cfs @ 3.62 fps)

Stage-Area-Storage for Pond 2B: DI 2B

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
32.20	**0**	32.71	0	33.22	0
32.21	0	32.72	0	33.23	0
32.22	0	32.73	0	33.24	0
32.23	0	32.74	0	33.25	0
32.24	0	32.75	0	33.26	0
32.25	0	32.76	0	33.27	0
32.26	0	32.77	0	33.28	0
32.27	0	32.78	0	33.29	0
32.28	0	32.79	0	33.30	0
32.29	0	32.80	0	33.31	0
32.30	0	32.81	0	33.32	0
32.31	0	32.82	0	33.33	0
32.32	0	32.83	0	33.34	0
32.33	0	32.84	0	33.35	0
32.34	0	32.85	0	33.36	0
32.35	0	32.86	0	33.37	0
32.36	0	32.87	0	33.38	0
32.37	0	32.88	0	33.39	0
32.38	0	32.89	0	33.40	0
32.39	0	32.90	0	33.41	0
32.40	0	32.91	0	33.42	0
32.41	0	32.92	0	33.43	0
32.42	0	32.93	0	33.44	0
32.43	0	32.94	0	33.45	0
32.44	0	32.95	0	33.46	0
32.45	0	32.96	0	33.47	0
32.46	0	32.97	0	33.48	0
32.47	0	32.98	0	33.49	0
32.48	0	32.99	0	33.50	0
32.49	0	33.00	0	33.51	0
32.50	0	33.01	0	33.52	0
32.51	0	33.02	0	33.53	0
32.52	0	33.03	0	33.54	0
32.53	0	33.04	0	33.55	0
32.54	0	33.05	0	33.56	0
32.55	0	33.06	0	33.57	0
32.56	0	33.07	0	33.58	0
32.57	0	33.08	0	33.59	0
32.58	0	33.09	0	33.60	0
32.59	0	33.10	0	33.61	0
32.60	0	33.11	0	33.62	0
32.61	0	33.12	0	33.63	0
32.62	0	33.13	0	33.64	0
32.63	0	33.14	0	33.65	0
32.64	0	33.15	0	33.66	0
32.65	0	33.16	0	33.67	0
32.66	0	33.17	0	33.68	0
32.67	0	33.18	0	33.69	0
32.68	0	33.19	0	33.70	0
32.69	0	33.20	0	33.71	0
32.70	0	33.21	0	33.72	0

Stage-Area-Storage for Pond 2B: DI 2B (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
33.73	0	34.24	0	34.75	0
33.74	0	34.25	0	34.76	0
33.75	0	34.26	0	34.77	0
33.76	0	34.27	0	34.78	0
33.77	0	34.28	0	34.79	0
33.78	0	34.29	0	34.80	0
33.79	0	34.30	0	34.81	0
33.80	0	34.31	0	34.82	0
33.81	0	34.32	0	34.83	0
33.82	0	34.33	0	34.84	0
33.83	0	34.34	0	34.85	0
33.84	0	34.35	0	34.86	0
33.85	0	34.36	0	34.87	0
33.86	0	34.37	0	34.88	0
33.87	0	34.38	0	34.89	0
33.88	0	34.39	0	34.90	0
33.89	0	34.40	0	34.91	0
33.90	0	34.41	0	34.92	0
33.91	0	34.42	0	34.93	0
33.92	0	34.43	0	34.94	0
33.93	0	34.44	0	34.95	0
33.94	0	34.45	0	34.96	0
33.95	0	34.46	0	34.97	0
33.96	0	34.47	0	34.98	0
33.97	0	34.48	0	34.99	0
33.98	0	34.49	0	35.00	0
33.99	0	34.50	0	35.01	0
34.00	0	34.51	0	35.02	0
34.01	0	34.52	0	35.03	0
34.02	0	34.53	0	35.04	0
34.03	0	34.54	0	35.05	0
34.04	0	34.55	0	35.06	0
34.05	0	34.56	0	35.07	0
34.06	0	34.57	0	35.08	0
34.07	0	34.58	0	35.09	0
34.08	0	34.59	0	35.10	0
34.09	0	34.60	0	35.11	0
34.10	0	34.61	0	35.12	0
34.11	0	34.62	0	35.13	0
34.12	0	34.63	0	35.14	0
34.13	0	34.64	0	35.15	0
34.14	0	34.65	0	35.16	0
34.15	0	34.66	0	35.17	0
34.16	0	34.67	0	35.18	0
34.17	0	34.68	0	35.19	0
34.18	0	34.69	0	35.20	0
34.19	0	34.70	0	35.21	0
34.20	0	34.71	0	35.22	0
34.21	0	34.72	0	35.23	0
34.22	0	34.73	0	35.24	0
34.23	0	34.74	0	35.25	0

Stage-Area-Storage for Pond 2B: DI 2B (continued)

Elevation (feet)	Storage (cubic-feet)
35.26	0
35.27	0
35.28	0
35.29	0
35.30	0
35.31	0
35.32	0
35.33	0
35.34	0
35.35	0
35.36	0
35.37	0
35.38	0
35.39	0
35.40	0
35.41	0
35.42	0
35.43	0
35.44	0
35.45	0
35.46	0
35.47	0
35.48	0
35.49	0
35.50	0
35.51	0
35.52	0
35.53	0
35.54	0
35.55	0
35.56	0
35.57	0
35.58	0
35.59	0
35.60	0
35.61	0
35.62	0
35.63	0
35.64	0
35.65	0
35.66	0
35.67	0
35.68	0
35.69	0
35.70	0
35.71	0
35.72	0
35.73	0
35.74	0
35.75	0

Summary for Pond P2: Underground BMP #2

Inflow	=	7.42 cfs @	12.07 hrs, Volume=	0.700 af
Outflow	=	1.29 cfs @	11.65 hrs, Volume=	0.700 af, Atten= 83%, Lag= 0.0 min
Discarded	=	1.29 cfs @	11.65 hrs, Volume=	0.700 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.60' @ 12.60 hrs Surf.Area= 12,097 sf Storage= 8,643 cf

Plug-Flow detention time= 41.1 min calculated for 0.700 af (100% of inflow)
Center-of-Mass det. time= 41.1 min (819.7 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1	34.42'	7,850 cf	**stonebottom (Prismatic)** Listed below (Recalc)
			24,678 cf Overall - 5,054 cf Embedded = 19,624 cf x 40.0% Voids
#2	34.75'	5,054 cf	**32.1"W x 12.0"H x 7.50'L Cultec C-100** x 362 Inside #1
		12,904 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.42	12,097	0	0
36.46	12,097	24,678	24,678

Device	Routing	Invert	Outlet Devices
#1	Discarded	34.42'	**4.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.29 cfs @ 11.65 hrs HW=34.45' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.29 cfs)

Stage-Area-Storage for Pond P2: Underground BMP #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.42	12,097	0	34.93	12,097	3,215
34.43	12,097	48	34.94	12,097	3,303
34.44	12,097	97	34.95	12,097	3,391
34.45	12,097	145	34.96	12,097	3,479
34.46	12,097	194	34.97	12,097	3,567
34.47	12,097	242	34.98	12,097	3,655
34.48	12,097	290	34.99	12,097	3,743
34.49	12,097	339	35.00	12,097	3,831
34.50	12,097	387	35.01	12,097	3,919
34.51	12,097	435	35.02	12,097	4,007
34.52	12,097	484	35.03	12,097	4,095
34.53	12,097	532	35.04	12,097	4,182
34.54	12,097	581	35.05	12,097	4,270
34.55	12,097	629	35.06	12,097	4,357
34.56	12,097	677	35.07	12,097	4,444
34.57	12,097	726	35.08	12,097	4,532
34.58	12,097	774	35.09	12,097	4,619
34.59	12,097	823	35.10	12,097	4,705
34.60	12,097	871	35.11	12,097	4,792
34.61	12,097	919	35.12	12,097	4,878
34.62	12,097	968	35.13	12,097	4,964
34.63	12,097	1,016	35.14	12,097	5,050
34.64	12,097	1,065	35.15	12,097	5,136
34.65	12,097	1,113	35.16	12,097	5,221
34.66	12,097	1,161	35.17	12,097	5,306
34.67	12,097	1,210	35.18	12,097	5,391
34.68	12,097	1,258	35.19	12,097	5,476
34.69	12,097	1,306	35.20	12,097	5,560
34.70	12,097	1,355	35.21	12,097	5,645
34.71	12,097	1,403	35.22	12,097	5,729
34.72	12,097	1,452	35.23	12,097	5,813
34.73	12,097	1,500	35.24	12,097	5,896
34.74	12,097	1,548	35.25	12,097	5,980
34.75	12,097	1,597	35.26	12,097	6,063
34.76	12,097	1,689	35.27	12,097	6,146
34.77	12,097	1,780	35.28	12,097	6,229
34.78	12,097	1,872	35.29	12,097	6,311
34.79	12,097	1,963	35.30	12,097	6,393
34.80	12,097	2,054	35.31	12,097	6,475
34.81	12,097	2,144	35.32	12,097	6,556
34.82	12,097	2,235	35.33	12,097	6,638
34.83	12,097	2,325	35.34	12,097	6,718
34.84	12,097	2,415	35.35	12,097	6,799
34.85	12,097	2,505	35.36	12,097	6,879
34.86	12,097	2,594	35.37	12,097	6,959
34.87	12,097	2,684	35.38	12,097	7,038
34.88	12,097	2,773	35.39	12,097	7,117
34.89	12,097	2,862	35.40	12,097	7,195
34.90	12,097	2,950	35.41	12,097	7,273
34.91	12,097	3,038	35.42	12,097	7,351
34.92	12,097	3,127	35.43	12,097	7,428

Stage-Area-Storage for Pond P2: Underground BMP #2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
35.44	12,097	7,504	35.95	12,097	10,436
35.45	12,097	7,580	35.96	12,097	10,484
35.46	12,097	7,655	35.97	12,097	10,533
35.47	12,097	7,730	35.98	12,097	10,581
35.48	12,097	7,804	35.99	12,097	10,629
35.49	12,097	7,878	36.00	12,097	10,678
35.50	12,097	7,951	36.01	12,097	10,726
35.51	12,097	8,023	36.02	12,097	10,774
35.52	12,097	8,095	36.03	12,097	10,823
35.53	12,097	8,165	36.04	12,097	10,871
35.54	12,097	8,235	36.05	12,097	10,920
35.55	12,097	8,304	36.06	12,097	10,968
35.56	12,097	8,372	36.07	12,097	11,016
35.57	12,097	8,439	36.08	12,097	11,065
35.58	12,097	8,506	36.09	12,097	11,113
35.59	12,097	8,571	36.10	12,097	11,162
35.60	12,097	8,635	36.11	12,097	11,210
35.61	12,097	8,698	36.12	12,097	11,258
35.62	12,097	8,760	36.13	12,097	11,307
35.63	12,097	8,821	36.14	12,097	11,355
35.64	12,097	8,881	36.15	12,097	11,404
35.65	12,097	8,939	36.16	12,097	11,452
35.66	12,097	8,996	36.17	12,097	11,500
35.67	12,097	9,052	36.18	12,097	11,549
35.68	12,097	9,107	36.19	12,097	11,597
35.69	12,097	9,162	36.20	12,097	11,645
35.70	12,097	9,215	36.21	12,097	11,694
35.71	12,097	9,267	36.22	12,097	11,742
35.72	12,097	9,319	36.23	12,097	11,791
35.73	12,097	9,369	36.24	12,097	11,839
35.74	12,097	9,419	36.25	12,097	11,887
35.75	12,097	9,468	36.26	12,097	11,936
35.76	12,097	9,516	36.27	12,097	11,984
35.77	12,097	9,565	36.28	12,097	12,033
35.78	12,097	9,613	36.29	12,097	12,081
35.79	12,097	9,662	36.30	12,097	12,129
35.80	12,097	9,710	36.31	12,097	12,178
35.81	12,097	9,758	36.32	12,097	12,226
35.82	12,097	9,807	36.33	12,097	12,274
35.83	12,097	9,855	36.34	12,097	12,323
35.84	12,097	9,903	36.35	12,097	12,371
35.85	12,097	9,952	36.36	12,097	12,420
35.86	12,097	10,000	36.37	12,097	12,468
35.87	12,097	10,049	36.38	12,097	12,516
35.88	12,097	10,097	36.39	12,097	12,565
35.89	12,097	10,145	36.40	12,097	12,613
35.90	12,097	10,194	36.41	12,097	12,662
35.91	12,097	10,242	36.42	12,097	12,710
35.92	12,097	10,291	36.43	12,097	12,758
35.93	12,097	10,339	36.44	12,097	12,807
35.94	12,097	10,387	36.45	12,097	12,855

Stage-Area-Storage for Pond P2: Underground BMP #2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
36.46	12,097	**12,904**

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Pre DA: Pre-DA1 Runoff Area=67,780 sf 0.00% Impervious Runoff Depth=2.78"
Tc=5.0 min CN=55 Runoff=4.90 cfs 0.361 af

Subcatchment S1A: Area 1A Runoff Area=14,258 sf 60.84% Impervious Runoff Depth=6.10"
Tc=5.0 min CN=84 Runoff=2.28 cfs 0.166 af

Subcatchment S1B: Area 1B Runoff Area=9,348 sf 61.62% Impervious Runoff Depth=6.10"
Tc=5.0 min CN=84 Runoff=1.49 cfs 0.109 af

Subcatchment S2A: Area 2A Runoff Area=21,228 sf 80.12% Impervious Runoff Depth=6.92"
Tc=5.0 min CN=91 Runoff=3.69 cfs 0.281 af

Subcatchment S2B: Area 2B Runoff Area=22,964 sf 92.50% Impervious Runoff Depth=7.40"
Tc=5.0 min CN=95 Runoff=4.12 cfs 0.325 af

Reach R1B: R1B to R1A Avg. Depth=0.45' Max Vel=4.27 fps Inflow=1.49 cfs 0.109 af
D=12.0" n=0.013 L=82.0' S=0.0098 '/' Capacity=3.52 cfs Outflow=1.47 cfs 0.109 af

Reach R3: OUTLET Avg. Depth=0.49' Max Vel=6.66 fps Inflow=3.41 cfs 0.037 af
D=18.0" n=0.013 L=45.0' S=0.0200 '/' Capacity=14.86 cfs Outflow=3.31 cfs 0.037 af

Pond 1A: MH 1A Peak Elev=35.51' Inflow=3.72 cfs 0.275 af
Primary=1.23 cfs 0.014 af Secondary=2.50 cfs 0.261 af Outflow=3.72 cfs 0.275 af

Pond 2A: DI 2A Peak Elev=35.48' Inflow=3.69 cfs 0.281 af
Primary=0.95 cfs 0.009 af Secondary=2.74 cfs 0.272 af Outflow=3.69 cfs 0.281 af

Pond 2B: DI 2B Peak Elev=35.51' Inflow=4.12 cfs 0.325 af
Primary=1.23 cfs 0.013 af Secondary=2.89 cfs 0.312 af Outflow=4.12 cfs 0.325 af

Pond P2: Underground BMP #2 Peak Elev=36.06' Storage=10,950 cf Inflow=8.13 cfs 0.845 af
Outflow=1.29 cfs 0.845 af

Total Runoff Area = 3.112 ac Runoff Volume = 1.243 af Average Runoff Depth = 4.79"
61.14% Pervious = 1.903 ac 38.86% Impervious = 1.209 ac

Summary for Subcatchment Pre DA: Pre-DA1

Runoff = 4.90 cfs @ 12.09 hrs, Volume= 0.361 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr Rainfall=8.00"

Area (sf)	CN	Description
67,780	55	Woods, Good, HSG B
67,780		Pervious Area

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

Summary for Subcatchment S1A: Area 1A

Runoff = 2.28 cfs @ 12.07 hrs, Volume= 0.166 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr Rainfall=8.00"

	Area (sf)	CN	Description
*	1,780	98	Building
*	6,515	98	Asphalt
*	380	98	Sidewalk
	5,583	61	>75% Grass cover, Good, HSG B
	14,258	84	Weighted Average
	5,583		Pervious Area
	8,675		Impervious Area

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

Summary for Subcatchment S1B: Area 1B

Runoff = 1.49 cfs @ 12.07 hrs, Volume= 0.109 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr Rainfall=8.00"

	Area (sf)	CN	Description
*	890	98	Building
*	4,870	98	Asphalt
	3,588	61	>75% Grass cover, Good, HSG B
	9,348	84	Weighted Average
	3,588		Pervious Area
	5,760		Impervious Area

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

Summary for Subcatchment S2A: Area 2A

Runoff = 3.69 cfs @ 12.07 hrs, Volume= 0.281 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr Rainfall=8.00"

	Area (sf)	CN	Description
*	1,780	98	Building
*	15,228	98	Asphalt
	4,220	61	>75% Grass cover, Good, HSG B
	21,228	91	Weighted Average
	4,220		Pervious Area
	17,008		Impervious Area

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

Summary for Subcatchment S2B: Area 2B

Runoff = 4.12 cfs @ 12.07 hrs, Volume= 0.325 af, Depth= 7.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr Rainfall=8.00"

	Area (sf)	CN	Description
*	2,670	98	Building
*	18,571	98	Asphalt
	1,723	61	>75% Grass cover, Good, HSG B
	22,964	95	Weighted Average
	1,723		Pervious Area
	21,241		Impervious Area

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

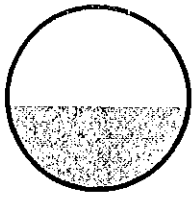
Summary for Reach R1B: R1B to R1A

Inflow Area =	0.215 ac, 61.62% Impervious,	Inflow Depth =	6.10"	for 25 Yr event
Inflow =	1.49 cfs @ 12.07 hrs,	Volume=	0.109 af	
Outflow =	1.47 cfs @ 12.08 hrs,	Volume=	0.109 af,	Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.27 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.44 fps, Avg. Travel Time= 1.0 min

Peak Storage= 28 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.52 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, straight & clean
Length= 82.0' Slope= 0.0098 '/'
Inlet Invert= 35.30', Outlet Invert= 34.50'



Stage-Area-Storage for Reach R1B: R1B to R1A

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
35.30	0.0	0	35.81	0.4	33
35.31	0.0	0	35.82	0.4	34
35.32	0.0	0	35.83	0.4	35
35.33	0.0	1	35.84	0.4	35
35.34	0.0	1	35.85	0.4	36
35.35	0.0	1	35.86	0.5	37
35.36	0.0	2	35.87	0.5	38
35.37	0.0	2	35.88	0.5	39
35.38	0.0	2	35.89	0.5	40
35.39	0.0	3	35.90	0.5	40
35.40	0.0	3	35.91	0.5	41
35.41	0.0	4	35.92	0.5	42
35.42	0.1	4	35.93	0.5	43
35.43	0.1	5	35.94	0.5	44
35.44	0.1	5	35.95	0.5	44
35.45	0.1	6	35.96	0.5	45
35.46	0.1	7	35.97	0.6	46
35.47	0.1	7	35.98	0.6	47
35.48	0.1	8	35.99	0.6	47
35.49	0.1	9	36.00	0.6	48
35.50	0.1	9	36.01	0.6	49
35.51	0.1	10	36.02	0.6	50
35.52	0.1	11	36.03	0.6	50
35.53	0.1	11	36.04	0.6	51
35.54	0.1	12	36.05	0.6	52
35.55	0.2	13	36.06	0.6	53
35.56	0.2	13	36.07	0.6	53
35.57	0.2	14	36.08	0.7	54
35.58	0.2	15	36.09	0.7	55
35.59	0.2	16	36.10	0.7	55
35.60	0.2	16	36.11	0.7	56
35.61	0.2	17	36.12	0.7	57
35.62	0.2	18	36.13	0.7	57
35.63	0.2	19	36.14	0.7	58
35.64	0.2	19	36.15	0.7	58
35.65	0.2	20	36.16	0.7	59
35.66	0.3	21	36.17	0.7	59
35.67	0.3	22	36.18	0.7	60
35.68	0.3	22	36.19	0.7	61
35.69	0.3	23	36.20	0.7	61
35.70	0.3	24	36.21	0.8	62
35.71	0.3	25	36.22	0.8	62
35.72	0.3	26	36.23	0.8	62
35.73	0.3	26	36.24	0.8	63
35.74	0.3	27	36.25	0.8	63
35.75	0.3	28	36.26	0.8	64
35.76	0.4	29	36.27	0.8	64
35.77	0.4	30	36.28	0.8	64
35.78	0.4	31	36.29	0.8	64
35.79	0.4	31	36.30	0.8	64
35.80	0.4	32			

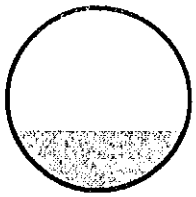
Summary for Reach R3: OUTLET

Inflow Area = 1.556 ac, 77.71% Impervious, Inflow Depth = 0.28" for 25 Yr event
Inflow = 3.41 cfs @ 12.07 hrs, Volume= 0.037 af
Outflow = 3.31 cfs @ 12.08 hrs, Volume= 0.037 af, Atten= 3%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 6.66 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.14 fps, Avg. Travel Time= 0.2 min

Peak Storage= 23 cf @ 12.07 hrs, Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 14.86 cfs

18.0" Diameter Pipe, n= 0.013 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0200 '/'
Inlet Invert= 31.90', Outlet Invert= 31.00'



Stage-Area-Storage for Reach R3: OUTLET

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
31.90	0.0	0	32.41	0.5	24
31.91	0.0	0	32.42	0.5	24
31.92	0.0	0	32.43	0.6	25
31.93	0.0	0	32.44	0.6	26
31.94	0.0	1	32.45	0.6	26
31.95	0.0	1	32.46	0.6	27
31.96	0.0	1	32.47	0.6	28
31.97	0.0	1	32.48	0.6	28
31.98	0.0	2	32.49	0.6	29
31.99	0.0	2	32.50	0.7	30
32.00	0.1	2	32.51	0.7	30
32.01	0.1	3	32.52	0.7	31
32.02	0.1	3	32.53	0.7	32
32.03	0.1	3	32.54	0.7	32
32.04	0.1	4	32.55	0.7	33
32.05	0.1	4	32.56	0.7	34
32.06	0.1	5	32.57	0.8	34
32.07	0.1	5	32.58	0.8	35
32.08	0.1	5	32.59	0.8	36
32.09	0.1	6	32.60	0.8	36
32.10	0.1	6	32.61	0.8	37
32.11	0.2	7	32.62	0.8	38
32.12	0.2	7	32.63	0.9	38
32.13	0.2	8	32.64	0.9	39
32.14	0.2	8	32.65	0.9	40
32.15	0.2	9	32.66	0.9	40
32.16	0.2	9	32.67	0.9	41
32.17	0.2	10	32.68	0.9	42
32.18	0.2	10	32.69	0.9	42
32.19	0.2	11	32.70	1.0	43
32.20	0.3	11	32.71	1.0	44
32.21	0.3	12	32.72	1.0	44
32.22	0.3	12	32.73	1.0	45
32.23	0.3	13	32.74	1.0	46
32.24	0.3	14	32.75	1.0	46
32.25	0.3	14	32.76	1.0	47
32.26	0.3	15	32.77	1.1	48
32.27	0.3	15	32.78	1.1	48
32.28	0.4	16	32.79	1.1	49
32.29	0.4	16	32.80	1.1	50
32.30	0.4	17	32.81	1.1	50
32.31	0.4	18	32.82	1.1	51
32.32	0.4	18	32.83	1.2	52
32.33	0.4	19	32.84	1.2	52
32.34	0.4	19	32.85	1.2	53
32.35	0.4	20	32.86	1.2	54
32.36	0.5	21	32.87	1.2	54
32.37	0.5	21	32.88	1.2	55
32.38	0.5	22	32.89	1.2	56
32.39	0.5	23	32.90	1.3	56
32.40	0.5	23	32.91	1.3	57

Stage-Area-Storage for Reach R3: OUTLET (continued)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
32.92	1.3	58
32.93	1.3	58
32.94	1.3	59
32.95	1.3	59
32.96	1.3	60
32.97	1.3	61
32.98	1.4	61
32.99	1.4	62
33.00	1.4	62
33.01	1.4	63
33.02	1.4	64
33.03	1.4	64
33.04	1.4	65
33.05	1.5	65
33.06	1.5	66
33.07	1.5	67
33.08	1.5	67
33.09	1.5	68
33.10	1.5	68
33.11	1.5	69
33.12	1.5	69
33.13	1.6	70
33.14	1.6	70
33.15	1.6	71
33.16	1.6	71
33.17	1.6	72
33.18	1.6	72
33.19	1.6	73
33.20	1.6	73
33.21	1.6	74
33.22	1.6	74
33.23	1.7	75
33.24	1.7	75
33.25	1.7	75
33.26	1.7	76
33.27	1.7	76
33.28	1.7	77
33.29	1.7	77
33.30	1.7	77
33.31	1.7	78
33.32	1.7	78
33.33	1.7	78
33.34	1.7	78
33.35	1.7	79
33.36	1.8	79
33.37	1.8	79
33.38	1.8	79
33.39	1.8	79
33.40	**1.8**	**80**

Summary for Pond 1A: MH 1A

Inflow Area = 0.542 ac, 61.15% Impervious, Inflow Depth = 6.10" for 25 Yr event
Inflow = 3.72 cfs @ 12.08 hrs, Volume= 0.275 af
Outflow = 3.72 cfs @ 12.08 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min
Primary = 1.23 cfs @ 12.08 hrs, Volume= 0.014 af
Secondary = 2.50 cfs @ 12.08 hrs, Volume= 0.261 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.51' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	34.40'	**15.0" x 397.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0063 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 81.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0031 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.15 cfs @ 12.08 hrs HW=35.50' (Free Discharge)
└─**1=Culvert** (Passes 1.15 cfs of 3.80 cfs potential flow)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.15 cfs @ 1.46 fps)

Secondary OutFlow Max=2.46 cfs @ 12.08 hrs HW=35.50' (Free Discharge)
└─**3=Culvert** (Barrel Controls 2.46 cfs @ 3.20 fps)

Stage-Area-Storage for Pond 1A: MH 1A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
34.40	**0**	34.91	0	35.42	0
34.41	0	34.92	0	35.43	0
34.42	0	34.93	0	35.44	0
34.43	0	34.94	0	35.45	0
34.44	0	34.95	0	35.46	0
34.45	0	34.96	0	35.47	0
34.46	0	34.97	0	35.48	0
34.47	0	34.98	0	35.49	0
34.48	0	34.99	0	35.50	0
34.49	0	35.00	0	35.51	0
34.50	0	35.01	0	35.52	0
34.51	0	35.02	0	35.53	0
34.52	0	35.03	0	35.54	0
34.53	0	35.04	0	35.55	0
34.54	0	35.05	0	35.56	0
34.55	0	35.06	0	35.57	0
34.56	0	35.07	0	35.58	0
34.57	0	35.08	0	35.59	0
34.58	0	35.09	0	35.60	0
34.59	0	35.10	0	35.61	0
34.60	0	35.11	0	35.62	0
34.61	0	35.12	0	35.63	0
34.62	0	35.13	0	35.64	0
34.63	0	35.14	0	35.65	0
34.64	0	35.15	0	35.66	0
34.65	0	35.16	0	35.67	0
34.66	0	35.17	0	35.68	0
34.67	0	35.18	0	35.69	0
34.68	0	35.19	0	35.70	0
34.69	0	35.20	0	35.71	0
34.70	0	35.21	0	35.72	0
34.71	0	35.22	0	35.73	0
34.72	0	35.23	0	35.74	0
34.73	0	35.24	0	35.75	0
34.74	0	35.25	0		
34.75	0	35.26	0		
34.76	0	35.27	0		
34.77	0	35.28	0		
34.78	0	35.29	0		
34.79	0	35.30	0		
34.80	0	35.31	0		
34.81	0	35.32	0		
34.82	0	35.33	0		
34.83	0	35.34	0		
34.84	0	35.35	0		
34.85	0	35.36	0		
34.86	0	35.37	0		
34.87	0	35.38	0		
34.88	0	35.39	0		
34.89	0	35.40	0		
34.90	0	35.41	0		

Summary for Pond 2A: DI 2A

Inflow Area = 0.487 ac, 80.12% Impervious, Inflow Depth = 6.92" for 25 Yr event
Inflow = 3.69 cfs @ 12.07 hrs, Volume= 0.281 af
Outflow = 3.69 cfs @ 12.07 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
Primary = 0.95 cfs @ 12.07 hrs, Volume= 0.009 af
Secondary = 2.74 cfs @ 12.07 hrs, Volume= 0.272 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.48' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	33.50'	**15.0" x 114.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0140 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 42.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.87 cfs @ 12.07 hrs HW=35.46' (Free Discharge)
↑—**1=Culvert** (Passes 0.87 cfs of 6.84 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.87 cfs @ 1.33 fps)

Secondary OutFlow Max=2.69 cfs @ 12.07 hrs HW=35.46' (Free Discharge)
↑—**3=Culvert** (Barrel Controls 2.69 cfs @ 3.65 fps)

Stage-Area-Storage for Pond 2A: DI 2A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
33.50	**0**	34.01	0	34.52	0
33.51	0	34.02	0	34.53	0
33.52	0	34.03	0	34.54	0
33.53	0	34.04	0	34.55	0
33.54	0	34.05	0	34.56	0
33.55	0	34.06	0	34.57	0
33.56	0	34.07	0	34.58	0
33.57	0	34.08	0	34.59	0
33.58	0	34.09	0	34.60	0
33.59	0	34.10	0	34.61	0
33.60	0	34.11	0	34.62	0
33.61	0	34.12	0	34.63	0
33.62	0	34.13	0	34.64	0
33.63	0	34.14	0	34.65	0
33.64	0	34.15	0	34.66	0
33.65	0	34.16	0	34.67	0
33.66	0	34.17	0	34.68	0
33.67	0	34.18	0	34.69	0
33.68	0	34.19	0	34.70	0
33.69	0	34.20	0	34.71	0
33.70	0	34.21	0	34.72	0
33.71	0	34.22	0	34.73	0
33.72	0	34.23	0	34.74	0
33.73	0	34.24	0	34.75	0
33.74	0	34.25	0	34.76	0
33.75	0	34.26	0	34.77	0
33.76	0	34.27	0	34.78	0
33.77	0	34.28	0	34.79	0
33.78	0	34.29	0	34.80	0
33.79	0	34.30	0	34.81	0
33.80	0	34.31	0	34.82	0
33.81	0	34.32	0	34.83	0
33.82	0	34.33	0	34.84	0
33.83	0	34.34	0	34.85	0
33.84	0	34.35	0	34.86	0
33.85	0	34.36	0	34.87	0
33.86	0	34.37	0	34.88	0
33.87	0	34.38	0	34.89	0
33.88	0	34.39	0	34.90	0
33.89	0	34.40	0	34.91	0
33.90	0	34.41	0	34.92	0
33.91	0	34.42	0	34.93	0
33.92	0	34.43	0	34.94	0
33.93	0	34.44	0	34.95	0
33.94	0	34.45	0	34.96	0
33.95	0	34.46	0	34.97	0
33.96	0	34.47	0	34.98	0
33.97	0	34.48	0	34.99	0
33.98	0	34.49	0	35.00	0
33.99	0	34.50	0	35.01	0
34.00	0	34.51	0	35.02	0

Stage-Area-Storage for Pond 2A: DI 2A (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
35.03	0	35.54	0
35.04	0	35.55	0
35.05	0	35.56	0
35.06	0	35.57	0
35.07	0	35.58	0
35.08	0	35.59	0
35.09	0	35.60	0
35.10	0	35.61	0
35.11	0	35.62	0
35.12	0	35.63	0
35.13	0	35.64	0
35.14	0	35.65	0
35.15	0	35.66	0
35.16	0	35.67	0
35.17	0	35.68	0
35.18	0	35.69	0
35.19	0	35.70	0
35.20	0	35.71	0
35.21	0	35.72	0
35.22	0	35.73	0
35.23	0	35.74	0
35.24	0	35.75	0
35.25	0		
35.26	0		
35.27	0		
35.28	0		
35.29	0		
35.30	0		
35.31	0		
35.32	0		
35.33	0		
35.34	0		
35.35	0		
35.36	0		
35.37	0		
35.38	0		
35.39	0		
35.40	0		
35.41	0		
35.42	0		
35.43	0		
35.44	0		
35.45	0		
35.46	0		
35.47	0		
35.48	0		
35.49	0		
35.50	0		
35.51	0		
35.52	0		
35.53	0		

Summary for Pond 2B: DI 2B

Inflow Area =	0.527 ac,	92.50% Impervious,	Inflow Depth =	7.40" for 25 Yr event
Inflow =	4.12 cfs @	12.07 hrs, Volume=	0.325 af	
Outflow =	4.12 cfs @	12.07 hrs, Volume=	0.325 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.23 cfs @	12.07 hrs, Volume=	0.013 af	
Secondary =	2.89 cfs @	12.07 hrs, Volume=	0.312 af	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.51' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.20'	**15.0" x 18.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 42.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.13 cfs @ 12.07 hrs HW=35.50' (Free Discharge)
↑—**1=Culvert** (Passes 1.13 cfs of 9.66 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.13 cfs @ 1.45 fps)

Secondary OutFlow Max=2.83 cfs @ 12.07 hrs HW=35.50' (Free Discharge)
↑—**3=Culvert** (Barrel Controls 2.83 cfs @ 3.70 fps)

Stage-Area-Storage for Pond 2B: DI 2B

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
32.20	**0**	32.71	0	33.22	0
32.21	0	32.72	0	33.23	0
32.22	0	32.73	0	33.24	0
32.23	0	32.74	0	33.25	0
32.24	0	32.75	0	33.26	0
32.25	0	32.76	0	33.27	0
32.26	0	32.77	0	33.28	0
32.27	0	32.78	0	33.29	0
32.28	0	32.79	0	33.30	0
32.29	0	32.80	0	33.31	0
32.30	0	32.81	0	33.32	0
32.31	0	32.82	0	33.33	0
32.32	0	32.83	0	33.34	0
32.33	0	32.84	0	33.35	0
32.34	0	32.85	0	33.36	0
32.35	0	32.86	0	33.37	0
32.36	0	32.87	0	33.38	0
32.37	0	32.88	0	33.39	0
32.38	0	32.89	0	33.40	0
32.39	0	32.90	0	33.41	0
32.40	0	32.91	0	33.42	0
32.41	0	32.92	0	33.43	0
32.42	0	32.93	0	33.44	0
32.43	0	32.94	0	33.45	0
32.44	0	32.95	0	33.46	0
32.45	0	32.96	0	33.47	0
32.46	0	32.97	0	33.48	0
32.47	0	32.98	0	33.49	0
32.48	0	32.99	0	33.50	0
32.49	0	33.00	0	33.51	0
32.50	0	33.01	0	33.52	0
32.51	0	33.02	0	33.53	0
32.52	0	33.03	0	33.54	0
32.53	0	33.04	0	33.55	0
32.54	0	33.05	0	33.56	0
32.55	0	33.06	0	33.57	0
32.56	0	33.07	0	33.58	0
32.57	0	33.08	0	33.59	0
32.58	0	33.09	0	33.60	0
32.59	0	33.10	0	33.61	0
32.60	0	33.11	0	33.62	0
32.61	0	33.12	0	33.63	0
32.62	0	33.13	0	33.64	0
32.63	0	33.14	0	33.65	0
32.64	0	33.15	0	33.66	0
32.65	0	33.16	0	33.67	0
32.66	0	33.17	0	33.68	0
32.67	0	33.18	0	33.69	0
32.68	0	33.19	0	33.70	0
32.69	0	33.20	0	33.71	0
32.70	0	33.21	0	33.72	0

Stage-Area-Storage for Pond 2B: DI 2B (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
33.73	0	34.24	0	34.75	0
33.74	0	34.25	0	34.76	0
33.75	0	34.26	0	34.77	0
33.76	0	34.27	0	34.78	0
33.77	0	34.28	0	34.79	0
33.78	0	34.29	0	34.80	0
33.79	0	34.30	0	34.81	0
33.80	0	34.31	0	34.82	0
33.81	0	34.32	0	34.83	0
33.82	0	34.33	0	34.84	0
33.83	0	34.34	0	34.85	0
33.84	0	34.35	0	34.86	0
33.85	0	34.36	0	34.87	0
33.86	0	34.37	0	34.88	0
33.87	0	34.38	0	34.89	0
33.88	0	34.39	0	34.90	0
33.89	0	34.40	0	34.91	0
33.90	0	34.41	0	34.92	0
33.91	0	34.42	0	34.93	0
33.92	0	34.43	0	34.94	0
33.93	0	34.44	0	34.95	0
33.94	0	34.45	0	34.96	0
33.95	0	34.46	0	34.97	0
33.96	0	34.47	0	34.98	0
33.97	0	34.48	0	34.99	0
33.98	0	34.49	0	35.00	0
33.99	0	34.50	0	35.01	0
34.00	0	34.51	0	35.02	0
34.01	0	34.52	0	35.03	0
34.02	0	34.53	0	35.04	0
34.03	0	34.54	0	35.05	0
34.04	0	34.55	0	35.06	0
34.05	0	34.56	0	35.07	0
34.06	0	34.57	0	35.08	0
34.07	0	34.58	0	35.09	0
34.08	0	34.59	0	35.10	0
34.09	0	34.60	0	35.11	0
34.10	0	34.61	0	35.12	0
34.11	0	34.62	0	35.13	0
34.12	0	34.63	0	35.14	0
34.13	0	34.64	0	35.15	0
34.14	0	34.65	0	35.16	0
34.15	0	34.66	0	35.17	0
34.16	0	34.67	0	35.18	0
34.17	0	34.68	0	35.19	0
34.18	0	34.69	0	35.20	0
34.19	0	34.70	0	35.21	0
34.20	0	34.71	0	35.22	0
34.21	0	34.72	0	35.23	0
34.22	0	34.73	0	35.24	0
34.23	0	34.74	0	35.25	0

Stage-Area-Storage for Pond 2B: DI 2B (continued)

Elevation (feet)	Storage (cubic-feet)
35.26	0
35.27	0
35.28	0
35.29	0
35.30	0
35.31	0
35.32	0
35.33	0
35.34	0
35.35	0
35.36	0
35.37	0
35.38	0
35.39	0
35.40	0
35.41	0
35.42	0
35.43	0
35.44	0
35.45	0
35.46	0
35.47	0
35.48	0
35.49	0
35.50	0
35.51	0
35.52	0
35.53	0
35.54	0
35.55	0
35.56	0
35.57	0
35.58	0
35.59	0
35.60	0
35.61	0
35.62	0
35.63	0
35.64	0
35.65	0
35.66	0
35.67	0
35.68	0
35.69	0
35.70	0
35.71	0
35.72	0
35.73	0
35.74	0
35.75	0

Summary for Pond P2: Underground BMP #2

Inflow	=	8.13 cfs @	12.07 hrs, Volume=	0.845 af
Outflow	=	1.29 cfs @	11.60 hrs, Volume=	0.845 af, Atten= 84%, Lag= 0.0 min
Discarded	=	1.29 cfs @	11.60 hrs, Volume=	0.845 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 36.06' @ 12.72 hrs Surf.Area= 12,097 sf Storage= 10,950 cf

Plug-Flow detention time= 55.2 min calculated for 0.844 af (100% of inflow)
Center-of-Mass det. time= 55.1 min (829.7 - 774.5)

Volume	Invert	Avail.Storage	Storage Description
#1	34.42'	7,850 cf	**stonebottom (Prismatic)** Listed below (Recalc)
			24,678 cf Overall - 5,054 cf Embedded = 19,624 cf x 40.0% Voids
#2	34.75'	5,054 cf	**32.1"W x 12.0"H x 7.50'L Cultec C-100** x 362 Inside #1
		12,904 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.42	12,097	0	0
36.46	12,097	24,678	24,678

Device	Routing	Invert	Outlet Devices
#1	Discarded	34.42'	**4.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.29 cfs @ 11.60 hrs HW=34.45' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.29 cfs)

Stage-Area-Storage for Pond P2: Underground BMP #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.42	12,097	0	34.93	12,097	3,215
34.43	12,097	48	34.94	12,097	3,303
34.44	12,097	97	34.95	12,097	3,391
34.45	12,097	145	34.96	12,097	3,479
34.46	12,097	194	34.97	12,097	3,567
34.47	12,097	242	34.98	12,097	3,655
34.48	12,097	290	34.99	12,097	3,743
34.49	12,097	339	35.00	12,097	3,831
34.50	12,097	387	35.01	12,097	3,919
34.51	12,097	435	35.02	12,097	4,007
34.52	12,097	484	35.03	12,097	4,095
34.53	12,097	532	35.04	12,097	4,182
34.54	12,097	581	35.05	12,097	4,270
34.55	12,097	629	35.06	12,097	4,357
34.56	12,097	677	35.07	12,097	4,444
34.57	12,097	726	35.08	12,097	4,532
34.58	12,097	774	35.09	12,097	4,619
34.59	12,097	823	35.10	12,097	4,705
34.60	12,097	871	35.11	12,097	4,792
34.61	12,097	919	35.12	12,097	4,878
34.62	12,097	968	35.13	12,097	4,964
34.63	12,097	1,016	35.14	12,097	5,050
34.64	12,097	1,065	35.15	12,097	5,136
34.65	12,097	1,113	35.16	12,097	5,221
34.66	12,097	1,161	35.17	12,097	5,306
34.67	12,097	1,210	35.18	12,097	5,391
34.68	12,097	1,258	35.19	12,097	5,476
34.69	12,097	1,306	35.20	12,097	5,560
34.70	12,097	1,355	35.21	12,097	5,645
34.71	12,097	1,403	35.22	12,097	5,729
34.72	12,097	1,452	35.23	12,097	5,813
34.73	12,097	1,500	35.24	12,097	5,896
34.74	12,097	1,548	35.25	12,097	5,980
34.75	12,097	1,597	35.26	12,097	6,063
34.76	12,097	1,689	35.27	12,097	6,146
34.77	12,097	1,780	35.28	12,097	6,229
34.78	12,097	1,872	35.29	12,097	6,311
34.79	12,097	1,963	35.30	12,097	6,393
34.80	12,097	2,054	35.31	12,097	6,475
34.81	12,097	2,144	35.32	12,097	6,556
34.82	12,097	2,235	35.33	12,097	6,638
34.83	12,097	2,325	35.34	12,097	6,718
34.84	12,097	2,415	35.35	12,097	6,799
34.85	12,097	2,505	35.36	12,097	6,879
34.86	12,097	2,594	35.37	12,097	6,959
34.87	12,097	2,684	35.38	12,097	7,038
34.88	12,097	2,773	35.39	12,097	7,117
34.89	12,097	2,862	35.40	12,097	7,195
34.90	12,097	2,950	35.41	12,097	7,273
34.91	12,097	3,038	35.42	12,097	7,351
34.92	12,097	3,127	35.43	12,097	7,428

Stage-Area-Storage for Pond P2: Underground BMP #2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
35.44	12,097	7,504	35.95	12,097	10,436
35.45	12,097	7,580	35.96	12,097	10,484
35.46	12,097	7,655	35.97	12,097	10,533
35.47	12,097	7,730	35.98	12,097	10,581
35.48	12,097	7,804	35.99	12,097	10,629
35.49	12,097	7,878	36.00	12,097	10,678
35.50	12,097	7,951	36.01	12,097	10,726
35.51	12,097	8,023	36.02	12,097	10,774
35.52	12,097	8,095	36.03	12,097	10,823
35.53	12,097	8,165	36.04	12,097	10,871
35.54	12,097	8,235	36.05	12,097	10,920
35.55	12,097	8,304	36.06	12,097	10,968
35.56	12,097	8,372	36.07	12,097	11,016
35.57	12,097	8,439	36.08	12,097	11,065
35.58	12,097	8,506	36.09	12,097	11,113
35.59	12,097	8,571	36.10	12,097	11,162
35.60	12,097	8,635	36.11	12,097	11,210
35.61	12,097	8,698	36.12	12,097	11,258
35.62	12,097	8,760	36.13	12,097	11,307
35.63	12,097	8,821	36.14	12,097	11,355
35.64	12,097	8,881	36.15	12,097	11,404
35.65	12,097	8,939	36.16	12,097	11,452
35.66	12,097	8,996	36.17	12,097	11,500
35.67	12,097	9,052	36.18	12,097	11,549
35.68	12,097	9,107	36.19	12,097	11,597
35.69	12,097	9,162	36.20	12,097	11,645
35.70	12,097	9,215	36.21	12,097	11,694
35.71	12,097	9,267	36.22	12,097	11,742
35.72	12,097	9,319	36.23	12,097	11,791
35.73	12,097	9,369	36.24	12,097	11,839
35.74	12,097	9,419	36.25	12,097	11,887
35.75	12,097	9,468	36.26	12,097	11,936
35.76	12,097	9,516	36.27	12,097	11,984
35.77	12,097	9,565	36.28	12,097	12,033
35.78	12,097	9,613	36.29	12,097	12,081
35.79	12,097	9,662	36.30	12,097	12,129
35.80	12,097	9,710	36.31	12,097	12,178
35.81	12,097	9,758	36.32	12,097	12,226
35.82	12,097	9,807	36.33	12,097	12,274
35.83	12,097	9,855	36.34	12,097	12,323
35.84	12,097	9,903	36.35	12,097	12,371
35.85	12,097	9,952	36.36	12,097	12,420
35.86	12,097	10,000	36.37	12,097	12,468
35.87	12,097	10,049	36.38	12,097	12,516
35.88	12,097	10,097	36.39	12,097	12,565
35.89	12,097	10,145	36.40	12,097	12,613
35.90	12,097	10,194	36.41	12,097	12,662
35.91	12,097	10,242	36.42	12,097	12,710
35.92	12,097	10,291	36.43	12,097	12,758
35.93	12,097	10,339	36.44	12,097	12,807
35.94	12,097	10,387	36.45	12,097	12,855

Stage-Area-Storage for Pond P2: Underground BMP #2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
36.46	12,097	**12,904**

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Pre DA: Pre-DA1 Runoff Area=67,780 sf 0.00% Impervious Runoff Depth=3.49"
Tc=5.0 min CN=55 Runoff=6.24 cfs 0.452 af

Subcatchment S1A: Area 1A Runoff Area=14,258 sf 60.84% Impervious Runoff Depth=7.06"
Tc=5.0 min CN=84 Runoff=2.62 cfs 0.193 af

Subcatchment S1B: Area 1B Runoff Area=9,348 sf 61.62% Impervious Runoff Depth=7.06"
Tc=5.0 min CN=84 Runoff=1.72 cfs 0.126 af

Subcatchment S2A: Area 2A Runoff Area=21,228 sf 80.12% Impervious Runoff Depth=7.91"
Tc=5.0 min CN=91 Runoff=4.19 cfs 0.321 af

Subcatchment S2B: Area 2B Runoff Area=22,964 sf 92.50% Impervious Runoff Depth=8.40"
Tc=5.0 min CN=95 Runoff=4.64 cfs 0.369 af

Reach R1B: R1B to R1A Avg. Depth=0.49' Max Vel=4.42 fps Inflow=1.72 cfs 0.126 af
D=12.0" n=0.013 L=82.0' S=0.0098 '/' Capacity=3.52 cfs Outflow=1.69 cfs 0.126 af

Reach R3: OUTLET Avg. Depth=0.57' Max Vel=7.21 fps Inflow=4.48 cfs 0.053 af
D=18.0" n=0.013 L=45.0' S=0.0200 '/' Capacity=14.86 cfs Outflow=4.37 cfs 0.054 af

Pond 1A: MH 1A Peak Elev=35.55' Inflow=4.28 cfs 0.319 af
Primary=1.61 cfs 0.021 af Secondary=2.66 cfs 0.298 af Outflow=4.28 cfs 0.319 af

Pond 2A: DI 2A Peak Elev=35.52' Inflow=4.19 cfs 0.321 af
Primary=1.28 cfs 0.014 af Secondary=2.91 cfs 0.308 af Outflow=4.19 cfs 0.321 af

Pond 2B: DI 2B Peak Elev=35.55' Inflow=4.64 cfs 0.369 af
Primary=1.59 cfs 0.019 af Secondary=3.06 cfs 0.350 af Outflow=4.64 cfs 0.369 af

Pond P2: Underground BMP #2 Peak Elev=36.43' Storage=12,773 cf Inflow=8.64 cfs 0.956 af
Outflow=1.29 cfs 0.956 af

Total Runoff Area = 3.112 ac Runoff Volume = 1.461 af Average Runoff Depth = 5.63"
61.14% Pervious = 1.903 ac 38.86% Impervious = 1.209 ac

Summary for Subcatchment Pre DA: Pre-DA1

Runoff = 6.24 cfs @ 12.08 hrs, Volume= 0.452 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr Rainfall=9.00"

Area (sf)	CN	Description
67,780	55	Woods, Good, HSG B
67,780		Pervious Area

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

Summary for Subcatchment S1A: Area 1A

Runoff = 2.62 cfs @ 12.07 hrs, Volume= 0.193 af, Depth= 7.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr Rainfall=9.00"

	Area (sf)	CN	Description
*	1,780	98	Building
*	6,515	98	Asphalt
*	380	98	Sidewalk
	5,583	61	>75% Grass cover, Good, HSG B
	14,258	84	Weighted Average
	5,583		Pervious Area
	8,675		Impervious Area

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

Summary for Subcatchment S1B: Area 1B

Runoff = 1.72 cfs @ 12.07 hrs, Volume= 0.126 af, Depth= 7.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr Rainfall=9.00"

	Area (sf)	CN	Description
*	890	98	Building
*	4,870	98	Asphalt
	3,588	61	>75% Grass cover, Good, HSG B
	9,348	84	Weighted Average
	3,588		Pervious Area
	5,760		Impervious Area

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

Summary for Subcatchment S2A: Area 2A

Runoff = 4.19 cfs @ 12.07 hrs, Volume= 0.321 af, Depth= 7.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr Rainfall=9.00"

	Area (sf)	CN	Description
*	1,780	98	Building
*	15,228	98	Asphalt
	4,220	61	>75% Grass cover, Good, HSG B
	21,228	91	Weighted Average
	4,220		Pervious Area
	17,008		Impervious Area

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

Summary for Subcatchment S2B: Area 2B

Runoff = 4.64 cfs @ 12.07 hrs, Volume= 0.369 af, Depth= 8.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr Rainfall=9.00"

	Area (sf)	CN	Description
*	2,670	98	Building
*	18,571	98	Asphalt
	1,723	61	>75% Grass cover, Good, HSG B
	22,964	95	Weighted Average
	1,723		Pervious Area
	21,241		Impervious Area

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

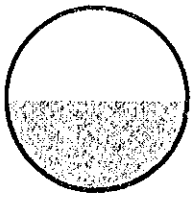
Summary for Reach R1B: R1B to R1A

Inflow Area =	0.215 ac,	61.62% Impervious,	Inflow Depth =	7.06" for 50 Yr event
Inflow =	1.72 cfs @	12.07 hrs, Volume=	0.126 af	
Outflow =	1.69 cfs @	12.08 hrs, Volume=	0.126 af,	Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.42 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 0.9 min

Peak Storage= 32 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.52 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, straight & clean
Length= 82.0' Slope= 0.0098 '/'
Inlet Invert= 35.30', Outlet Invert= 34.50'



Stage-Area-Storage for Reach R1B: R1B to R1A

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
35.30	0.0	0	35.81	0.4	33
35.31	0.0	0	35.82	0.4	34
35.32	0.0	0	35.83	0.4	35
35.33	0.0	1	35.84	0.4	35
35.34	0.0	1	35.85	0.4	36
35.35	0.0	1	35.86	0.5	37
35.36	0.0	2	35.87	0.5	38
35.37	0.0	2	35.88	0.5	39
35.38	0.0	2	35.89	0.5	40
35.39	0.0	3	35.90	0.5	40
35.40	0.0	3	35.91	0.5	41
35.41	0.0	4	35.92	0.5	42
35.42	0.1	4	35.93	0.5	43
35.43	0.1	5	35.94	0.5	44
35.44	0.1	5	35.95	0.5	44
35.45	0.1	6	35.96	0.5	45
35.46	0.1	7	35.97	0.6	46
35.47	0.1	7	35.98	0.6	47
35.48	0.1	8	35.99	0.6	47
35.49	0.1	9	36.00	0.6	48
35.50	0.1	9	36.01	0.6	49
35.51	0.1	10	36.02	0.6	50
35.52	0.1	11	36.03	0.6	50
35.53	0.1	11	36.04	0.6	51
35.54	0.1	12	36.05	0.6	52
35.55	0.2	13	36.06	0.6	53
35.56	0.2	13	36.07	0.6	53
35.57	0.2	14	36.08	0.7	54
35.58	0.2	15	36.09	0.7	55
35.59	0.2	16	36.10	0.7	55
35.60	0.2	16	36.11	0.7	56
35.61	0.2	17	36.12	0.7	57
35.62	0.2	18	36.13	0.7	57
35.63	0.2	19	36.14	0.7	58
35.64	0.2	19	36.15	0.7	58
35.65	0.2	20	36.16	0.7	59
35.66	0.3	21	36.17	0.7	59
35.67	0.3	22	36.18	0.7	60
35.68	0.3	22	36.19	0.7	61
35.69	0.3	23	36.20	0.7	61
35.70	0.3	24	36.21	0.8	62
35.71	0.3	25	36.22	0.8	62
35.72	0.3	26	36.23	0.8	62
35.73	0.3	26	36.24	0.8	63
35.74	0.3	27	36.25	0.8	63
35.75	0.3	28	36.26	0.8	64
35.76	0.4	29	36.27	0.8	64
35.77	0.4	30	36.28	0.8	64
35.78	0.4	31	36.29	0.8	64
35.79	0.4	31	36.30	**0.8**	**64**
35.80	0.4	32			

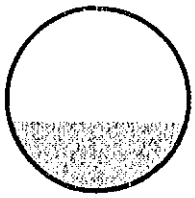
Summary for Reach R3: OUTLET

Inflow Area = 1.556 ac, 77.71% Impervious, Inflow Depth = 0.41" for 50 Yr event
Inflow = 4.48 cfs @ 12.07 hrs, Volume= 0.053 af
Outflow = 4.37 cfs @ 12.08 hrs, Volume= 0.054 af, Atten= 3%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 7.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.17 fps, Avg. Travel Time= 0.2 min

Peak Storage= 27 cf @ 12.07 hrs, Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 14.86 cfs

18.0" Diameter Pipe, n= 0.013 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0200 '/'
Inlet Invert= 31.90', Outlet Invert= 31.00'



Stage-Area-Storage for Reach R3: OUTLET

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
31.90	0.0	0	32.41	0.5	24
31.91	0.0	0	32.42	0.5	24
31.92	0.0	0	32.43	0.6	25
31.93	0.0	0	32.44	0.6	26
31.94	0.0	1	32.45	0.6	26
31.95	0.0	1	32.46	0.6	27
31.96	0.0	1	32.47	0.6	28
31.97	0.0	1	32.48	0.6	28
31.98	0.0	2	32.49	0.6	29
31.99	0.0	2	32.50	0.7	30
32.00	0.1	2	32.51	0.7	30
32.01	0.1	3	32.52	0.7	31
32.02	0.1	3	32.53	0.7	32
32.03	0.1	3	32.54	0.7	32
32.04	0.1	4	32.55	0.7	33
32.05	0.1	4	32.56	0.7	34
32.06	0.1	5	32.57	0.8	34
32.07	0.1	5	32.58	0.8	35
32.08	0.1	5	32.59	0.8	36
32.09	0.1	6	32.60	0.8	36
32.10	0.1	6	32.61	0.8	37
32.11	0.2	7	32.62	0.8	38
32.12	0.2	7	32.63	0.9	38
32.13	0.2	8	32.64	0.9	39
32.14	0.2	8	32.65	0.9	40
32.15	0.2	9	32.66	0.9	40
32.16	0.2	9	32.67	0.9	41
32.17	0.2	10	32.68	0.9	42
32.18	0.2	10	32.69	0.9	42
32.19	0.2	11	32.70	1.0	43
32.20	0.3	11	32.71	1.0	44
32.21	0.3	12	32.72	1.0	44
32.22	0.3	12	32.73	1.0	45
32.23	0.3	13	32.74	1.0	46
32.24	0.3	14	32.75	1.0	46
32.25	0.3	14	32.76	1.0	47
32.26	0.3	15	32.77	1.1	48
32.27	0.3	15	32.78	1.1	48
32.28	0.4	16	32.79	1.1	49
32.29	0.4	16	32.80	1.1	50
32.30	0.4	17	32.81	1.1	50
32.31	0.4	18	32.82	1.1	51
32.32	0.4	18	32.83	1.2	52
32.33	0.4	19	32.84	1.2	52
32.34	0.4	19	32.85	1.2	53
32.35	0.4	20	32.86	1.2	54
32.36	0.5	21	32.87	1.2	54
32.37	0.5	21	32.88	1.2	55
32.38	0.5	22	32.89	1.2	56
32.39	0.5	23	32.90	1.3	56
32.40	0.5	23	32.91	1.3	57

Stage-Area-Storage for Reach R3: OUTLET (continued)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
32.92	1.3	58
32.93	1.3	58
32.94	1.3	59
32.95	1.3	59
32.96	1.3	60
32.97	1.3	61
32.98	1.4	61
32.99	1.4	62
33.00	1.4	62
33.01	1.4	63
33.02	1.4	64
33.03	1.4	64
33.04	1.4	65
33.05	1.5	65
33.06	1.5	66
33.07	1.5	67
33.08	1.5	67
33.09	1.5	68
33.10	1.5	68
33.11	1.5	69
33.12	1.5	69
33.13	1.6	70
33.14	1.6	70
33.15	1.6	71
33.16	1.6	71
33.17	1.6	72
33.18	1.6	72
33.19	1.6	73
33.20	1.6	73
33.21	1.6	74
33.22	1.6	74
33.23	1.7	75
33.24	1.7	75
33.25	1.7	75
33.26	1.7	76
33.27	1.7	76
33.28	1.7	77
33.29	1.7	77
33.30	1.7	77
33.31	1.7	78
33.32	1.7	78
33.33	1.7	78
33.34	1.7	78
33.35	1.7	79
33.36	1.8	79
33.37	1.8	79
33.38	1.8	79
33.39	1.8	79
33.40	1.8	80

Summary for Pond 1A: MH 1A

Inflow Area =	0.542 ac, 61.15% Impervious,	Inflow Depth =	7.06"	for 50 Yr event
Inflow =	4.28 cfs @ 12.08 hrs,	Volume=	0.319 af	
Outflow =	4.28 cfs @ 12.08 hrs,	Volume=	0.319 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.61 cfs @ 12.08 hrs,	Volume=	0.021 af	
Secondary =	2.66 cfs @ 12.08 hrs,	Volume=	0.298 af	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.55' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	34.40'	**15.0" x 397.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0063 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 81.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0031 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.52 cfs @ 12.08 hrs HW=35.54' (Free Discharge)
└**1=Culvert** (Passes 1.52 cfs of 4.00 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.52 cfs @ 1.60 fps)

Secondary OutFlow Max=2.62 cfs @ 12.08 hrs HW=35.54' (Free Discharge)
└**3=Culvert** (Barrel Controls 2.62 cfs @ 3.25 fps)

Stage-Area-Storage for Pond 1A: MH 1A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
34.40	0	34.91	0	35.42	0
34.41	0	34.92	0	35.43	0
34.42	0	34.93	0	35.44	0
34.43	0	34.94	0	35.45	0
34.44	0	34.95	0	35.46	0
34.45	0	34.96	0	35.47	0
34.46	0	34.97	0	35.48	0
34.47	0	34.98	0	35.49	0
34.48	0	34.99	0	35.50	0
34.49	0	35.00	0	35.51	0
34.50	0	35.01	0	35.52	0
34.51	0	35.02	0	35.53	0
34.52	0	35.03	0	35.54	0
34.53	0	35.04	0	35.55	0
34.54	0	35.05	0	35.56	0
34.55	0	35.06	0	35.57	0
34.56	0	35.07	0	35.58	0
34.57	0	35.08	0	35.59	0
34.58	0	35.09	0	35.60	0
34.59	0	35.10	0	35.61	0
34.60	0	35.11	0	35.62	0
34.61	0	35.12	0	35.63	0
34.62	0	35.13	0	35.64	0
34.63	0	35.14	0	35.65	0
34.64	0	35.15	0	35.66	0
34.65	0	35.16	0	35.67	0
34.66	0	35.17	0	35.68	0
34.67	0	35.18	0	35.69	0
34.68	0	35.19	0	35.70	0
34.69	0	35.20	0	35.71	0
34.70	0	35.21	0	35.72	0
34.71	0	35.22	0	35.73	0
34.72	0	35.23	0	35.74	0
34.73	0	35.24	0	35.75	0
34.74	0	35.25	0		
34.75	0	35.26	0		
34.76	0	35.27	0		
34.77	0	35.28	0		
34.78	0	35.29	0		
34.79	0	35.30	0		
34.80	0	35.31	0		
34.81	0	35.32	0		
34.82	0	35.33	0		
34.83	0	35.34	0		
34.84	0	35.35	0		
34.85	0	35.36	0		
34.86	0	35.37	0		
34.87	0	35.38	0		
34.88	0	35.39	0		
34.89	0	35.40	0		
34.90	0	35.41	0		

Summary for Pond 2A: DI 2A

Inflow Area =	0.487 ac,	80.12% Impervious,	Inflow Depth =	7.91"	for 50 Yr event
Inflow =	4.19 cfs @	12.07 hrs,	Volume=	0.321 af	
Outflow =	4.19 cfs @	12.07 hrs,	Volume=	0.321 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.28 cfs @	12.07 hrs,	Volume=	0.014 af	
Secondary =	2.91 cfs @	12.07 hrs,	Volume=	0.308 af	

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.52' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	33.50'	**15.0" x 114.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0140 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 42.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.18 cfs @ 12.07 hrs HW=35.50' (Free Discharge)
↑—**1=Culvert** (Passes 1.18 cfs of 6.93 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.18 cfs @ 1.47 fps)

Secondary OutFlow Max=2.86 cfs @ 12.07 hrs HW=35.50' (Free Discharge)
↑—**3=Culvert** (Barrel Controls 2.86 cfs @ 3.70 fps)

Stage-Area-Storage for Pond 2A: DI 2A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
33.50	0	34.01	0	34.52	0
33.51	0	34.02	0	34.53	0
33.52	0	34.03	0	34.54	0
33.53	0	34.04	0	34.55	0
33.54	0	34.05	0	34.56	0
33.55	0	34.06	0	34.57	0
33.56	0	34.07	0	34.58	0
33.57	0	34.08	0	34.59	0
33.58	0	34.09	0	34.60	0
33.59	0	34.10	0	34.61	0
33.60	0	34.11	0	34.62	0
33.61	0	34.12	0	34.63	0
33.62	0	34.13	0	34.64	0
33.63	0	34.14	0	34.65	0
33.64	0	34.15	0	34.66	0
33.65	0	34.16	0	34.67	0
33.66	0	34.17	0	34.68	0
33.67	0	34.18	0	34.69	0
33.68	0	34.19	0	34.70	0
33.69	0	34.20	0	34.71	0
33.70	0	34.21	0	34.72	0
33.71	0	34.22	0	34.73	0
33.72	0	34.23	0	34.74	0
33.73	0	34.24	0	34.75	0
33.74	0	34.25	0	34.76	0
33.75	0	34.26	0	34.77	0
33.76	0	34.27	0	34.78	0
33.77	0	34.28	0	34.79	0
33.78	0	34.29	0	34.80	0
33.79	0	34.30	0	34.81	0
33.80	0	34.31	0	34.82	0
33.81	0	34.32	0	34.83	0
33.82	0	34.33	0	34.84	0
33.83	0	34.34	0	34.85	0
33.84	0	34.35	0	34.86	0
33.85	0	34.36	0	34.87	0
33.86	0	34.37	0	34.88	0
33.87	0	34.38	0	34.89	0
33.88	0	34.39	0	34.90	0
33.89	0	34.40	0	34.91	0
33.90	0	34.41	0	34.92	0
33.91	0	34.42	0	34.93	0
33.92	0	34.43	0	34.94	0
33.93	0	34.44	0	34.95	0
33.94	0	34.45	0	34.96	0
33.95	0	34.46	0	34.97	0
33.96	0	34.47	0	34.98	0
33.97	0	34.48	0	34.99	0
33.98	0	34.49	0	35.00	0
33.99	0	34.50	0	35.01	0
34.00	0	34.51	0	35.02	0

Stage-Area-Storage for Pond 2A: DI 2A (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
35.03	0	35.54	0
35.04	0	35.55	0
35.05	0	35.56	0
35.06	0	35.57	0
35.07	0	35.58	0
35.08	0	35.59	0
35.09	0	35.60	0
35.10	0	35.61	0
35.11	0	35.62	0
35.12	0	35.63	0
35.13	0	35.64	0
35.14	0	35.65	0
35.15	0	35.66	0
35.16	0	35.67	0
35.17	0	35.68	0
35.18	0	35.69	0
35.19	0	35.70	0
35.20	0	35.71	0
35.21	0	35.72	0
35.22	0	35.73	0
35.23	0	35.74	0
35.24	0	35.75	0
35.25	0		
35.26	0		
35.27	0		
35.28	0		
35.29	0		
35.30	0		
35.31	0		
35.32	0		
35.33	0		
35.34	0		
35.35	0		
35.36	0		
35.37	0		
35.38	0		
35.39	0		
35.40	0		
35.41	0		
35.42	0		
35.43	0		
35.44	0		
35.45	0		
35.46	0		
35.47	0		
35.48	0		
35.49	0		
35.50	0		
35.51	0		
35.52	0		
35.53	0		

Summary for Pond 2B: DI 2B

Inflow Area = 0.527 ac, 92.50% Impervious, Inflow Depth = 8.40" for 50 Yr event
Inflow = 4.64 cfs @ 12.07 hrs, Volume= 0.369 af
Outflow = 4.64 cfs @ 12.07 hrs, Volume= 0.369 af, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.07 hrs, Volume= 0.019 af
Secondary = 3.06 cfs @ 12.07 hrs, Volume= 0.350 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 35.55' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.20'	**15.0" x 18.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean
#2	Device 1	35.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	34.50'	**15.0" x 42.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 34.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.47 cfs @ 12.07 hrs HW=35.53' (Free Discharge)
└**1=Culvert** (Passes 1.47 cfs of 9.73 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.47 cfs @ 1.59 fps)

Secondary OutFlow Max=3.00 cfs @ 12.07 hrs HW=35.53' (Free Discharge)
└**3=Culvert** (Barrel Controls 3.00 cfs @ 3.75 fps)

Stage-Area-Storage for Pond 2B: DI 2B

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
32.20	0	32.71	0	33.22	0
32.21	0	32.72	0	33.23	0
32.22	0	32.73	0	33.24	0
32.23	0	32.74	0	33.25	0
32.24	0	32.75	0	33.26	0
32.25	0	32.76	0	33.27	0
32.26	0	32.77	0	33.28	0
32.27	0	32.78	0	33.29	0
32.28	0	32.79	0	33.30	0
32.29	0	32.80	0	33.31	0
32.30	0	32.81	0	33.32	0
32.31	0	32.82	0	33.33	0
32.32	0	32.83	0	33.34	0
32.33	0	32.84	0	33.35	0
32.34	0	32.85	0	33.36	0
32.35	0	32.86	0	33.37	0
32.36	0	32.87	0	33.38	0
32.37	0	32.88	0	33.39	0
32.38	0	32.89	0	33.40	0
32.39	0	32.90	0	33.41	0
32.40	0	32.91	0	33.42	0
32.41	0	32.92	0	33.43	0
32.42	0	32.93	0	33.44	0
32.43	0	32.94	0	33.45	0
32.44	0	32.95	0	33.46	0
32.45	0	32.96	0	33.47	0
32.46	0	32.97	0	33.48	0
32.47	0	32.98	0	33.49	0
32.48	0	32.99	0	33.50	0
32.49	0	33.00	0	33.51	0
32.50	0	33.01	0	33.52	0
32.51	0	33.02	0	33.53	0
32.52	0	33.03	0	33.54	0
32.53	0	33.04	0	33.55	0
32.54	0	33.05	0	33.56	0
32.55	0	33.06	0	33.57	0
32.56	0	33.07	0	33.58	0
32.57	0	33.08	0	33.59	0
32.58	0	33.09	0	33.60	0
32.59	0	33.10	0	33.61	0
32.60	0	33.11	0	33.62	0
32.61	0	33.12	0	33.63	0
32.62	0	33.13	0	33.64	0
32.63	0	33.14	0	33.65	0
32.64	0	33.15	0	33.66	0
32.65	0	33.16	0	33.67	0
32.66	0	33.17	0	33.68	0
32.67	0	33.18	0	33.69	0
32.68	0	33.19	0	33.70	0
32.69	0	33.20	0	33.71	0
32.70	0	33.21	0	33.72	0

Stage-Area-Storage for Pond 2B: DI 2B (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
33.73	0	34.24	0	34.75	0
33.74	0	34.25	0	34.76	0
33.75	0	34.26	0	34.77	0
33.76	0	34.27	0	34.78	0
33.77	0	34.28	0	34.79	0
33.78	0	34.29	0	34.80	0
33.79	0	34.30	0	34.81	0
33.80	0	34.31	0	34.82	0
33.81	0	34.32	0	34.83	0
33.82	0	34.33	0	34.84	0
33.83	0	34.34	0	34.85	0
33.84	0	34.35	0	34.86	0
33.85	0	34.36	0	34.87	0
33.86	0	34.37	0	34.88	0
33.87	0	34.38	0	34.89	0
33.88	0	34.39	0	34.90	0
33.89	0	34.40	0	34.91	0
33.90	0	34.41	0	34.92	0
33.91	0	34.42	0	34.93	0
33.92	0	34.43	0	34.94	0
33.93	0	34.44	0	34.95	0
33.94	0	34.45	0	34.96	0
33.95	0	34.46	0	34.97	0
33.96	0	34.47	0	34.98	0
33.97	0	34.48	0	34.99	0
33.98	0	34.49	0	35.00	0
33.99	0	34.50	0	35.01	0
34.00	0	34.51	0	35.02	0
34.01	0	34.52	0	35.03	0
34.02	0	34.53	0	35.04	0
34.03	0	34.54	0	35.05	0
34.04	0	34.55	0	35.06	0
34.05	0	34.56	0	35.07	0
34.06	0	34.57	0	35.08	0
34.07	0	34.58	0	35.09	0
34.08	0	34.59	0	35.10	0
34.09	0	34.60	0	35.11	0
34.10	0	34.61	0	35.12	0
34.11	0	34.62	0	35.13	0
34.12	0	34.63	0	35.14	0
34.13	0	34.64	0	35.15	0
34.14	0	34.65	0	35.16	0
34.15	0	34.66	0	35.17	0
34.16	0	34.67	0	35.18	0
34.17	0	34.68	0	35.19	0
34.18	0	34.69	0	35.20	0
34.19	0	34.70	0	35.21	0
34.20	0	34.71	0	35.22	0
34.21	0	34.72	0	35.23	0
34.22	0	34.73	0	35.24	0
34.23	0	34.74	0	35.25	0

Stage-Area-Storage for Pond 2B: DI 2B (continued)

Elevation (feet)	Storage (cubic-feet)
35.26	0
35.27	0
35.28	0
35.29	0
35.30	0
35.31	0
35.32	0
35.33	0
35.34	0
35.35	0
35.36	0
35.37	0
35.38	0
35.39	0
35.40	0
35.41	0
35.42	0
35.43	0
35.44	0
35.45	0
35.46	0
35.47	0
35.48	0
35.49	0
35.50	0
35.51	0
35.52	0
35.53	0
35.54	0
35.55	0
35.56	0
35.57	0
35.58	0
35.59	0
35.60	0
35.61	0
35.62	0
35.63	0
35.64	0
35.65	0
35.66	0
35.67	0
35.68	0
35.69	0
35.70	0
35.71	0
35.72	0
35.73	0
35.74	0
35.75	0

Summary for Pond P2: Underground BMP #2

Inflow	=	8.64 cfs @	12.07 hrs, Volume=	0.956 af
Outflow	=	1.29 cfs @	11.45 hrs, Volume=	0.956 af, Atten= 85%, Lag= 0.0 min
Discarded	=	1.29 cfs @	11.45 hrs, Volume=	0.956 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 36.43' @ 12.85 hrs Surf.Area= 12,097 sf Storage= 12,773 cf

Plug-Flow detention time= 66.7 min calculated for 0.955 af (100% of inflow)
Center-of-Mass det. time= 66.6 min (838.5 - 771.9)

Volume	Invert	Avail.Storage	Storage Description
#1	34.42'	7,850 cf	**stonebottom (Prismatic)** Listed below (Recalc)
			24,678 cf Overall - 5,054 cf Embedded = 19,624 cf x 40.0% Voids
#2	34.75'	5,054 cf	**32.1"W x 12.0"H x 7.50'L Cultec C-100** x 362 Inside #1
		12,904 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.42	12,097	0	0
36.46	12,097	24,678	24,678

Device	Routing	Invert	Outlet Devices
#1	Discarded	34.42'	**4.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.29 cfs @ 11.45 hrs HW=34.44' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 1.29 cfs)

Stage-Area-Storage for Pond P2: Underground BMP #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.42	12,097	0	34.93	12,097	3,215
34.43	12,097	48	34.94	12,097	3,303
34.44	12,097	97	34.95	12,097	3,391
34.45	12,097	145	34.96	12,097	3,479
34.46	12,097	194	34.97	12,097	3,567
34.47	12,097	242	34.98	12,097	3,655
34.48	12,097	290	34.99	12,097	3,743
34.49	12,097	339	35.00	12,097	3,831
34.50	12,097	387	35.01	12,097	3,919
34.51	12,097	435	35.02	12,097	4,007
34.52	12,097	484	35.03	12,097	4,095
34.53	12,097	532	35.04	12,097	4,182
34.54	12,097	581	35.05	12,097	4,270
34.55	12,097	629	35.06	12,097	4,357
34.56	12,097	677	35.07	12,097	4,444
34.57	12,097	726	35.08	12,097	4,532
34.58	12,097	774	35.09	12,097	4,619
34.59	12,097	823	35.10	12,097	4,705
34.60	12,097	871	35.11	12,097	4,792
34.61	12,097	919	35.12	12,097	4,878
34.62	12,097	968	35.13	12,097	4,964
34.63	12,097	1,016	35.14	12,097	5,050
34.64	12,097	1,065	35.15	12,097	5,136
34.65	12,097	1,113	35.16	12,097	5,221
34.66	12,097	1,161	35.17	12,097	5,306
34.67	12,097	1,210	35.18	12,097	5,391
34.68	12,097	1,258	35.19	12,097	5,476
34.69	12,097	1,306	35.20	12,097	5,560
34.70	12,097	1,355	35.21	12,097	5,645
34.71	12,097	1,403	35.22	12,097	5,729
34.72	12,097	1,452	35.23	12,097	5,813
34.73	12,097	1,500	35.24	12,097	5,896
34.74	12,097	1,548	35.25	12,097	5,980
34.75	12,097	1,597	35.26	12,097	6,063
34.76	12,097	1,689	35.27	12,097	6,146
34.77	12,097	1,780	35.28	12,097	6,229
34.78	12,097	1,872	35.29	12,097	6,311
34.79	12,097	1,963	35.30	12,097	6,393
34.80	12,097	2,054	35.31	12,097	6,475
34.81	12,097	2,144	35.32	12,097	6,556
34.82	12,097	2,235	35.33	12,097	6,638
34.83	12,097	2,325	35.34	12,097	6,718
34.84	12,097	2,415	35.35	12,097	6,799
34.85	12,097	2,505	35.36	12,097	6,879
34.86	12,097	2,594	35.37	12,097	6,959
34.87	12,097	2,684	35.38	12,097	7,038
34.88	12,097	2,773	35.39	12,097	7,117
34.89	12,097	2,862	35.40	12,097	7,195
34.90	12,097	2,950	35.41	12,097	7,273
34.91	12,097	3,038	35.42	12,097	7,351
34.92	12,097	3,127	35.43	12,097	7,428

Stage-Area-Storage for Pond P2: Underground BMP #2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
35.44	12,097	7,504	35.95	12,097	10,436
35.45	12,097	7,580	35.96	12,097	10,484
35.46	12,097	7,655	35.97	12,097	10,533
35.47	12,097	7,730	35.98	12,097	10,581
35.48	12,097	7,804	35.99	12,097	10,629
35.49	12,097	7,878	36.00	12,097	10,678
35.50	12,097	7,951	36.01	12,097	10,726
35.51	12,097	8,023	36.02	12,097	10,774
35.52	12,097	8,095	36.03	12,097	10,823
35.53	12,097	8,165	36.04	12,097	10,871
35.54	12,097	8,235	36.05	12,097	10,920
35.55	12,097	8,304	36.06	12,097	10,968
35.56	12,097	8,372	36.07	12,097	11,016
35.57	12,097	8,439	36.08	12,097	11,065
35.58	12,097	8,506	36.09	12,097	11,113
35.59	12,097	8,571	36.10	12,097	11,162
35.60	12,097	8,635	36.11	12,097	11,210
35.61	12,097	8,698	36.12	12,097	11,258
35.62	12,097	8,760	36.13	12,097	11,307
35.63	12,097	8,821	36.14	12,097	11,355
35.64	12,097	8,881	36.15	12,097	11,404
35.65	12,097	8,939	36.16	12,097	11,452
35.66	12,097	8,996	36.17	12,097	11,500
35.67	12,097	9,052	36.18	12,097	11,549
35.68	12,097	9,107	36.19	12,097	11,597
35.69	12,097	9,162	36.20	12,097	11,645
35.70	12,097	9,215	36.21	12,097	11,694
35.71	12,097	9,267	36.22	12,097	11,742
35.72	12,097	9,319	36.23	12,097	11,791
35.73	12,097	9,369	36.24	12,097	11,839
35.74	12,097	9,419	36.25	12,097	11,887
35.75	12,097	9,468	36.26	12,097	11,936
35.76	12,097	9,516	36.27	12,097	11,984
35.77	12,097	9,565	36.28	12,097	12,033
35.78	12,097	9,613	36.29	12,097	12,081
35.79	12,097	9,662	36.30	12,097	12,129
35.80	12,097	9,710	36.31	12,097	12,178
35.81	12,097	9,758	36.32	12,097	12,226
35.82	12,097	9,807	36.33	12,097	12,274
35.83	12,097	9,855	36.34	12,097	12,323
35.84	12,097	9,903	36.35	12,097	12,371
35.85	12,097	9,952	36.36	12,097	12,420
35.86	12,097	10,000	36.37	12,097	12,468
35.87	12,097	10,049	36.38	12,097	12,516
35.88	12,097	10,097	36.39	12,097	12,565
35.89	12,097	10,145	36.40	12,097	12,613
35.90	12,097	10,194	36.41	12,097	12,662
35.91	12,097	10,242	36.42	12,097	12,710
35.92	12,097	10,291	36.43	12,097	12,758
35.93	12,097	10,339	36.44	12,097	12,807
35.94	12,097	10,387	36.45	12,097	12,855

Stage-Area-Storage for Pond P2: Underground BMP #2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
36.46	12,097	**12,904**

RFTS

Soils Engineering and Testing Services

October 28, 2015

Tripp Engineering, P.C.
419 Chestnut Street
Wilmington, North Carolina 28401

Attention: Ms. Monica Valsi, EI

Reference: Infiltration Testing and Seasonal High Watertable Estimates
Proposed Matthews Motors
Market Street
Wilmington, North Carolina
RFTS Job No. 1219-15

Dear Ms. Valsi:

RFTS is pleased to provide testing services during the design phase of the proposed Matthews Motors facility located on Market Street in Wilmington, North Carolina. Specific site grading plans had not been provided to us at the time this report was prepared.

DESCRIPTION OF ACTIVITIES AND FINDINGS

As requested, our staff visited the site on October 26, 2015, to perform infiltration testing and estimate the seasonal high watertable at two locations near the front and middle portions of the property identified by you. The purpose of this testing was to provide soil parameters for stormwater infiltration design.

Seasonal High Watertable Estimates

Hand auger borings were advanced at two locations to depths of approximately 6 to 7 feet below the existing ground surface in the areas proposed by the civil designer for an infiltration structure. The encountered soils were logged and visually classified by depth and a Munsell Soil Color Chart was used to determine the hue, value, and chroma of the visually distinct soil layers. Our soil logs are presented in Table 1.

INF-1

Soils encountered in our boring consisted of interbedded relatively clean sands (USCS Soil Group "SP" and "SP-SM") through the boring termination depth of 80 inches below the ground surface. No distinct zones of soil cementation were encountered in the profile. Based on our experience with similar soils and comparisons of the soil coloration to the

Munsell Chart, it is our opinion that the seasonal high water table level occurs approximately 43 inches below the existing ground surface. A measurement made 30 minutes after augering indicated a depth to standing water in the borehole of 64 inches below the existing ground surface.

INF-2

Soils encountered in our boring consisted of interbedded relatively clean sands (USCS Soil Group "SP" and "SM") through the boring termination depth of 64 inches below the ground surface. A distinct zone of soil cementation was encountered in the profile between the depths of 18 to 31 inches below the surface. This could cause a temporary perched water condition above that depth. Based on our experience with similar soils and comparisons of the soil coloration to the Munsell Chart, it is our opinion that the seasonal high water table level occurs approximately 43 inches below the existing ground surface. A measurement made 30 minutes after augering indicated a depth to standing water in the borehole of 55 inches below the existing ground surface.

Infiltration Testing

Infiltration testing was performed using a model 2800 Guelph Permeameter which is a constant-head device which operates on the Mariotte siphon principle and is referenced in ASTM D-5126. The permeameter is used to determine field saturated hydraulic conductivity in centimeters per second for soil at a specified depth. This testing involves advancing a borehole to the desired infiltration depth and introducing water at a constant head to determine the steady state flow rate from which the hydraulic conductivity can be calculated.

Our testing was performed approximately 19 inches below the existing ground surface. The results of our permeameter testing are presented in Table 2.

RECOMMENDATIONS

Based on the results of our field testing and soil classifications at the test location, we offer the following recommendations for stormwater infiltration design:

At the test locations INF-1 and INF-2 it is our opinion that in order to achieve the steady state flow rate obtained during our testing; the areas of infiltration galleries or other infiltration structures should introduce stormwater at approximately 19 inches below the existing ground surface elevation. For purposes of sizing the structures we recommend ultimate application rates of 2.1 and 4.6 inches per hour, respectively. These recommendations should be reviewed by appropriate regulatory authorities before finalizing the details of any civil design.

CLOSURE

Please find attached our field data and a sketch showing the approximate test locations. If you have any questions after reviewing this letter, please do not hesitate to contact us at your convenience.

Sincerely,

RFTS, PLLC

David L. Winstead
Field Operations Manager

Steven D. Kelly, P.E.
Senior Engineer
NC Registration No. 17638

DLW:SDK/dlw
Attachments

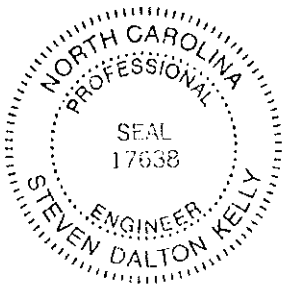


Table 1
Munsell Soil Classifications
Proposed Matthews Motors
Wilmington, North Carolina
RFTS Job No. 1219-15

Loc	Soil Description	Hue	Value	Chroma	Depth (in.)	Comments
INF-1	Topsoil	-	-	-	0-10	
	White fine SAND	10YR	8	1	10-15	
	Light Gray fine SAND	10YR	7	1	15-35	
	Gray fine SAND	10YR	6	1	35-43	Moist
	Very Dark Brown fine SAND, trace of Silt	10YR	2	2	43-71	**SHWT@43" /H_2O@64"**
	Dark Brown fine to medium SAND	7.5YR	3	3	71-80	
INF-2	Topsoil	-	-	-	0-8	
	White fine SAND	10YR	8	1	8-18	
	Dark Yellow Brown and Very Dark Brown fine SAND, trace of Silt	10YR	4/2	6/2	18-31	**Weakly Cemented**
	Dark Brown fine SAND	7.5YR	3	3	31-43	
	Gray fine SAND	7.5YR	6	1	43-54	**SHWT@43"**
	Brown fine SAND	7.5YR	5	2	54-60	**H_2O@55"**
	Black fine to medium SAND, trace of Silt	7.5YR	2.5	1	60-64	

Table 2
Guelph Permeameter Test Results
Proposed Matthews Motors
Wilmington, North Carolina
RFTS Job No. 1219-15

Location	1	2
Depth (in.)	19	19
H_1 (cm)	5	5
R_1 (cm/min)	8.8	4.6
R_{1S} (cm/sec)	0.1466	0.0766
H_2 (cm)	10	10
R_2 (cm/min)	12.2	7.4
R_{2S} (cm/sec)	0.2033	0.1233
K_{fs} (cm/sec)	1.47×10^{-3}	3.23×10^{-3}
K_{fs} (in/hr)	**2.1**	**4.6**

Definition of Terms

$R_{1,2}$ – Established 3 or more constant rate of water level change (cm/min)
$R_{1S,2S}$ – Calculated steady state flow rates (cm/sec)
$H_{1,2}$ – Maintained Head of H_2O (cm)
K_{fs} – Calculated field saturated hydraulic conductivity (cm/sec)
Depth – Depth of well hole (in.)
Location – Test location identification number
Note: Diameter of well is 3.0 cm.

Matthews Motors

October 1, 2015

1:1,000

0 0.0075 0.015 0.03 mi

0 0.0125 0.025 0.05 km

New Hanover County, NC

GIS Services
New Hanover County, NC

- Addresses
- Schools
- Landmarks
- Parks
- Cemeteries
- City Limits
- Parcels

Legend

APPROXIMATE TEST LOCATION

RFTS, PLLC
761 Sloop Pointe Lane
Kure Beach, North Carolina 28449
Office: 910-470-7450

FIGURE 1
DRAWING NOT TO SCALE
DATE: 10/28/15
SKETCH: DLW
REVIEW: SDK

INFILTRATION TESTING AND SHWT ESTIMATES
MATTHEWS MOTORS
MARKET STREET
WILMINGTON, NORTH CAROLINA
JOB NO. 1219-15

RFTS
Soils Engineering and Testing Services

Monica Valsi

From: Don Bennett <Don.Bennett@wilmingtonnc.gov>
Sent: Thursday, July 7, 2016 9:04 AM
To: Phil Tripp; Bill McDow; 'Monica Valsi'
Cc: Jeff Walton
Subject: RE: Matthews Motors- No Further Comments - Signed DW permit.
Attachments: Matthews_Market.pdf

Electronic Copy, original in interoffice to Bill. Thanks to all for ironing out the details.

From: Phil Tripp [mailto:ptripp@ec.rr.com]
Sent: Thursday, July 07, 2016 8:52 AM
To: Bill McDow <Bill.McDow@wilmingtonnc.gov>; 'Monica Valsi' <monica-trippeng@ec.rr.com>
Cc: Don Bennett <Don.Bennett@wilmingtonnc.gov>; Jeff Walton <Jeff.Walton@wilmingtonnc.gov>
Subject: RE: Matthews Motors- No Further Comments

Bill,
Thank you for the review. To keep the added area for maneuverability we respectfully request to keep the internal flares.
Again, thank you, we appreciate anything you can do to expedite this project.
Phil

From: Bill McDow [mailto:Bill.McDow@wilmingtonnc.gov]
Sent: Wednesday, July 06, 2016 4:41 PM
To: Monica Valsi <monica-trippeng@ec.rr.com>; Phillip Tripp <PTRIPP@ec.rr.com>
Subject: FW: Matthews Motors- No Further Comments

Hi Monica,
FYI,

The internal taper on the One Way driveway can be removed per the Standard Detail for One-Way driveways. Give me a call if you have any questions about Don's Comment.

Bill McDow

From: Bill McDow
Sent: Wednesday, July 06, 2016 4:38 PM
To: Don Bennett <Don.Bennett@wilmingtonnc.gov>
Cc: Jeff Walton <Jeff.Walton@wilmingtonnc.gov>; Rob Gordon <Rob.Gordon@wilmingtonnc.gov>; Richard Christensen <Richard.Christensen@wilmingtonnc.gov>
Subject: RE: Matthews Motors- No Further Comments

Don, Good idea to have the inner Taper removed on the One Way Driveways. I can pass it on to Monica and Phil Tripp.

Bill

From: Don Bennett
Sent: Wednesday, July 06, 2016 12:34 PM
To: Bill McDow <Bill.McDow@wilmingtonnc.gov>
Subject: RE: Matthews Motors- No Further Comments

Not critical, but can the flares between the driveways be omitted? Just trying to save the developer a dime or two.

From: Bill McDow
Sent: Wednesday, July 06, 2016 11:17 AM
To: Don Bennett <Don.Bennett@wilmingtonnc.gov>
Cc: Rob Gordon <Rob.Gordon@wilmingtonnc.gov>; Richard Christensen <Richard.Christensen@wilmingtonnc.gov>; Jeff Walton <Jeff.Walton@wilmingtonnc.gov>
Subject: Matthews Motors- No Further Comments

Hey Don,

The engineer changed the site plan to have 2 One Way Driveways. I have not further comments for the site. The DW permit will be based on the plans that were submitted yesterday.

Bill

E-mail correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

APPLICATION IDENTIFICATION		N.C. DEPARTMENT OF TRANSPORTATION
Driveway Permit No.	Date of Application	STREET AND DRIVEWAY ACCESS PERMIT APPLICATION
County: New Hanover		
Development Name: Matthews Motors		

LOCATION OF PROPERTY:

Route/Road: US 17 Market Street

Exact Distance 0.2 ☒ Miles ☐ Feet N ☒ S ☐ E ☒ W ☐

From the Intersection of Route No. US 17 Market St. and Route No. NC 74 Eastwood Rd Toward SR2048 Gordon Rd

Property Will Be Used For: ☐ Residential /Subdivision ☒ Commercial ☐ Educational Facilities ☐ TND ☐ Emergency Services ☐ Other

Property: ☒ is ☐ is not within Wilmington City Zoning Area.

AGREEMENT

- I, the undersigned property owner, request access and permission to construct driveway(s) or street(s) on public right-of-way at the above location.
- I agree to construct and maintain driveway(s) or street entrance(s) in absolute conformance with the current "Policy on Street and Driveway Access to North Carolina Highways" as adopted by the North Carolina Department of Transportation.
- I agree that no signs or objects will be placed on or over the public right-of-way other than those approved by NCDOT.
- I agree that the driveway(s) or street(s) will be constructed as shown on the attached plans.
- I agree that that driveway(s) or street(s) as used in this agreement include any approach tapers, storage lanes or speed change lanes as deemed necessary.
- I agree that if any future improvements to the roadway become necessary, the portion of driveway(s) or street(s) located on public right-of-way will be considered the property of the North Carolina Department of Transportation, and I will not be entitled to reimbursement or have any claim for present expenditures for driveway or street construction.
- I agree that this permit becomes void if construction of driveway(s) or street(s) is not completed within the time specified by the "Policy on Street and Driveway Access to North Carolina Highways".
- I agree to pay a $50 construction inspection fee. Make checks payable to NCDOT. This fee will be reimbursed if application is denied.
- I agree to construct and maintain the driveway(s) or street(s) in a safe manner so as not to interfere with or endanger the public travel.
- I agree to provide during construction proper signs, signal lights, flaggers and other warning devices for the protection of traffic in conformance with the current "Manual on Uniform Traffic Control Devices for Streets and Highways" and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the District Engineer.
- I agree to indemnify and save harmless the North Carolina Department of Transportation from all damages and claims for damage that may arise by reason of this construction.
- I agree that the North Carolina Department of Transportation will assume no responsibility for any damages that may be caused to such facilities, within the highway right-of-way limits, in carrying out its construction.
- I agree to provide a Performance and Indemnity Bond in the amount specified by the Division of Highways for any construction proposed on the State Highway system.
- The granting of this permit is subject to the regulatory powers of the NC Department of Transportation as provided by law and as set forth in the N.C. Policy on Driveways and shall not be construed as a contract access point.
- **I AGREE TO NOTIFY THE DISTRICT ENGINEER WHEN THE PROPOSED WORK BEGINS AND WHEN IT IS COMPLETED.**

D-065-16-013

SIGNATURES OF APPLICANT

PROPERTY OWNER (APPLICANT)

COMPANY: Matthews Motors, Inc., Steven Matthews, President
SIGNATURE:
ADDRESS: 11315 US 70 W
Clayton, NC 27520 Phone No. 919 2108150

WITNESS

NAME: Della Baird
SIGNATURE: Della Baird
ADDRESS: 419 Chestnut St.
Wilmington NC 28401

AUTHORIZED AGENT

COMPANY: Tripp Engineering, Phillip G. Tripp, President
SIGNATURE:
ADDRESS: 419 Chestnut Street
Wilmington, NC 28401 Phone No. 763-5100

WITNESS

NAME: Della Baird
SIGNATURE: Della Baird
ADDRESS: 419 Chestnut Street
Wilmington, NC 28401

APPROVALS

APPLICATION RECEIVED BY DISTRICT ENGINEER

SIGNATURE DATE

APPLICATION APPROVED BY LOCAL GOVERNMENTAL AUTHORITY (when required)

SIGNATURE CITY TRAFFIC ENG TITLE 6/7/16 DATE

APPLICATION APPROVED BY DISTRICT ENGINEER

SIGNATURE DATE

INSPECTION BY NCDOT

SIGNATURE TITLE DATE

COMMENTS:

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id: SAW-2015-02373 County: New Hanover U.S.G.S. Quad: Wrightsville Beach

GENERAL PERMIT (REGIONAL AND NATIONWIDE) VERIFICATION

Permittee: Matthews Motors
c/o Steve Matthews
1315 Highway 70 West
Clayton, North Carolina 27520

Agent: Dana Lutheran
Southern Environmental Group, Inc.
5315 S. College Road, Suite E
Wilmington, North Carolina 28412

Size (acres) 1.82-acres
Nearest Waterway Spring Branch
USGS HUC 03030007

Nearest Town Wilmington
River Basin Cape Fear
Coordinates Latitude: 34. 24981 N
Longitude: -77. 86068 W

Location description: **The property is located at 5723 Market Street (Parcel No. R05009-004-026-000), in Wilmington, New Hanover County, North Carolina. The project site is a predominantly forested, undeveloped parcel; however, a portion of the site along Market Street is cleared and maintained. The site was previously developed, but no structures currently exist. The project area borders Market Street to the south and commercial development to the north, east, and west.**

Description of project area and activity: **The project consists of the filling of 0.11-acres of non-tidal, palustrine forested wetlands for the construction of a commercial development with associated parking area, utilities, landscaping, and stormwater management facilities. Permanent project impacts will occur to 0.11-acres (4,784 square feet) of jurisdictional wetlands to construct the proposed development. The project area was subject to an approved jurisdictional determination (Corps Project No. SAW-2015-02373) issued on January 21, 2016.**

Applicable Law: ☒ Section 404 (Clean Water Act, 33 USC 1344)
☐ Section 10 (Rivers and Harbors Act, 33 USC 403)

Authorization: Regional General Permit Number or Nationwide Permit Number: **NWP 39 – Commercial & Institutional Developments**

SEE ATTACHED NWP GENERAL and REGIONAL SPECIAL CONDITIONS

Your work is authorized by the above referenced permit provided it is accomplished in strict accordance with the attached condition(s) and your submitted application, specifically, the enclosed plan sheet titled, "Wetland Impacts Exhibit, Matthews Motors, City of Wilmington, North Carolina", W-1, Sheet 1 of 1, dated January 26, 2016, unrevised. Any violation of the attached conditions or deviation from your submitted plans may subject the permittee to a stop work order, a restoration order, and/or appropriate legal action.

This verification will remain valid until the expiration date identified below unless the nationwide authorization is modified, suspended or revoked. If, prior to the expiration date identified below, the nationwide permit authorization is reissued and/or modified, this verification will remain valid until the expiration date identified below, provided it complies with all requirements of the modified nationwide permit. If the nationwide permit authorization expires or is suspended, revoked, or is modified, such that the activity would no longer comply with the terms and conditions of the nationwide permit, activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon the nationwide permit, will remain authorized provided the activity is completed within twelve months of

the date of the nationwide permit's expiration, modification or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend or revoke the authorization.

Activities subject to Section 404 (as indicated above) may also require an individual Section 401 Water Quality Certification. You should contact the NC Division of Water Resources (telephone 919-807-6300) to determine Section 401 requirements.

For activities occurring within the twenty coastal counties subject to regulation under the Coastal Area Management Act (CAMA), prior to beginning work you must contact the N.C. Division of Coastal Management in Morehead City, NC, at (252) 808-2808.

This Department of the Army verification does not relieve the permittee of the responsibility to obtain any other required Federal, State or local approvals/permits.

If there are any questions regarding this verification, any of the conditions of the Permit, or the Corps of Engineers regulatory program, please contact John N. Policarpo at (910) 251-4487.

Corps Regulatory Official _____ Date: **March 14, 2016**
Expiration Date of Verification: **March 18, 2017**

Cc:
Chad Coburn, NCDEQ (email)
Todd Tugwell, ACOE (email)
Jon Vincent, LCFUMB, LLC (email)

Determination of Jurisdiction:

A. ☐ Based on preliminary information, there appear to be waters of the US including wetlands within the above described project area. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).

B. ☐ There are Navigable Waters of the United States within the above described project area subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

C. ☐ There are waters of the US and/or wetlands within the above described project area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

D. ☒ The jurisdictional areas within the above described project area have been identified under a previous action. Please reference jurisdictional determination issued on Action ID: SAW-2015-02373

Basis For Determination: This site exhibits wetland criteria as described in the 1987 Corps Wetland Delineation Manual and the Atlantic and Gulf Coastal Plain Regional Supplement. The project area was subject to an approved jurisdictional determination (Corps Project No. SAW-2015-02373) issued on January 21, 2016.

Remarks:

E. Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

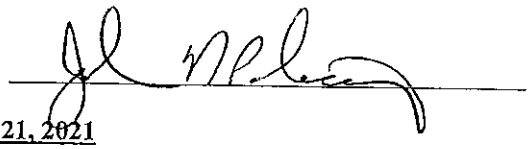
F. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B and C above).

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers
South Atlantic Division
Attn: Jason Steele, Review Officer
60 Forsyth Street SW, Room 10M15
Atlanta, Georgia 30303-8801
Phone: (404) 562-5137

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete; that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by N/A.
It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.

If there are any questions regarding this verification, any of the conditions of the Permit, or the Corps of Engineers regulatory program, please contact me at 910-251-4487 or john.n.policarpo@usace.army.mil.

Corps Regulatory Official:  Date: **March 14, 2016**

Expiration Date: **January 21, 2021**

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete our customer Satisfaction Survey online at http://per2.nwp.usace.army.mil/survey.html .

SAW-2015-02373

SPECIAL CONDITIONS
Matthews Motors; New Hanover County

1. In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.

2. No authorized work may begin in jurisdictional waters of the U.S., including wetlands, prior to submitting the attached Compensatory Mitigation Responsibility Transfer Form completed in full to the District (ATTN: John Policarpo).

3. This permit does not authorize any additional fill material in waters of the U.S., including jurisdictional wetlands, than what is stated in the permit. This permit authorizes permanent impacts to 0.11-acres (4,784 square feet) of jurisdictional wetlands.

4. All fill material used within waters of the U.S., including jurisdictional wetlands, must be clean and free of toxins and must come from an upland source. Dredging for fill material within waters of the U.S., including jurisdictional wetlands, is not permitted by this authorization.

John N. Policarpo

Action ID Number: SAW-2015-02373 County: New Hanover

Permittee: Matthews Motors

Project Name: 5723 Market Street Wilmington NC 28405

Date Verification Issued: March 14, 2016

Project Manager: John N. Policarpo

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

US ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT
Attn: John N. Policarpo

Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and condition of the said permit, and required mitigation was completed in accordance with the permit conditions.

_____ _____

Signature of Permittee Date

U.S. ARMY CORPS OF ENGINEERS
Wilmington District
Compensatory Mitigation Responsibility Transfer Form

Permittee: Matthews Motors
Project Name: 5723 Market Street Wilmington NC 28405
County: New Hanover

Action ID: SAW-2015-02373

Instructions to Permittee: The Permittee must provide a copy of this form to the Mitigation Sponsor, either an approved Mitigation Bank or the North Carolina Division of Mitigation Services (NCDMS), who will then sign the form to verify the transfer of the mitigation responsibility. Once the Sponsor has signed this form, it is the Permittee's responsibility to ensure that to the U.S. Army Corps of Engineers (USACE) Project Manager identified on page two is in receipt of a signed copy of this form before conducting authorized impacts, unless otherwise specified below. If more than one mitigation Sponsor will be used to provide the mitigation associated with the permit, or if the impacts and/or the mitigation will occur in more than one 8-digit Hydrologic Unit Code (HUC), multiple forms will be attached to the permit, and the separate forms for each Sponsor and/or HUC must be provided to the appropriate mitigation Sponsors.

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements (credits) shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the bank ledger and provide a copy of the signed form and the updated bank ledger to the Permittee, the USACE Project Manager, and the Wilmington District Mitigation Office (see contact information on page 2). The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation* **8-digit HUC and Basin:** 03030007, Cape Fear River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
					0.11-acres	

*If more than one mitigation sponsor will be used for the permit, only include impacts to be mitigated by this sponsor.

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** 03030007, Cape Fear River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
					0.11	

Mitigation Site Debited: Lower Cape Fear Umbrella Mitigation Bank
(List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCDMS, list NCDMS. If the NCDMS acceptance letter identifies a specific site, also list the specific site to be debited).

Section to be completed by the Mitigation Sponsor

Statement of Mitigation Liability Acceptance: I, the undersigned, verify that I am authorized to approve mitigation transactions for the Mitigation Sponsor shown below, and I certify that the Sponsor agrees to accept full responsibility for providing the mitigation identified in this document (see the table above), associated with the USACE Permittee and Action ID number shown. I also verify that released credits (and/or advance credits for NCDMS), as approved by the USACE, are currently available at the mitigation site identified above. Further, I understand that if the Sponsor fails to provide the required compensatory mitigation, the USACE Wilmington District Engineer may pursue measures against the Sponsor to ensure compliance associated with the mitigation requirements.

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

_____ _____

Signature of Sponsor's Authorized Representative **Date of Signature**

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

- Once this document has been signed by the Mitigation Sponsor and the USACE is in receipt of the signed form, the Permittee is no longer responsible for providing the mitigation identified in this form, though the Permittee remains responsible for any other mitigation requirements stated in the permit conditions.
- Construction within jurisdictional areas authorized by the permit identified on page one of this form can begin only after the USACE is in receipt of a copy of this document signed by the Sponsor, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein. For authorized impacts conducted by the North Carolina Department of Transportation (NCDOT), construction within jurisdictional areas may proceed upon permit issuance; however, a copy of this form signed by the Sponsor must be provided to the USACE within 30 days of permit issuance. NCDOT remains fully responsible for the mitigation until the USACE has received this form, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein.
- Signed copies of this document must be retained by the Permittee, Mitigation Sponsor, and in the USACE administrative records for both the permit and the Bank/ILF Instrument. It is the Permittee's responsibility to ensure that the USACE Project Manager (address below) is provided with a signed copy of this form.
- If changes are proposed to the type, amount, or location of mitigation after this form has been signed and returned to the USACE, the Sponsor must obtain case-by-case approval from the USACE Project Manager and/or North Carolina Interagency Review Team (NCIRT). If approved, higher mitigation ratios may be applied, as per current District guidance and a new version of this form must be completed and included in the USACE administrative records for both the permit and the Bank/ILF Instrument.

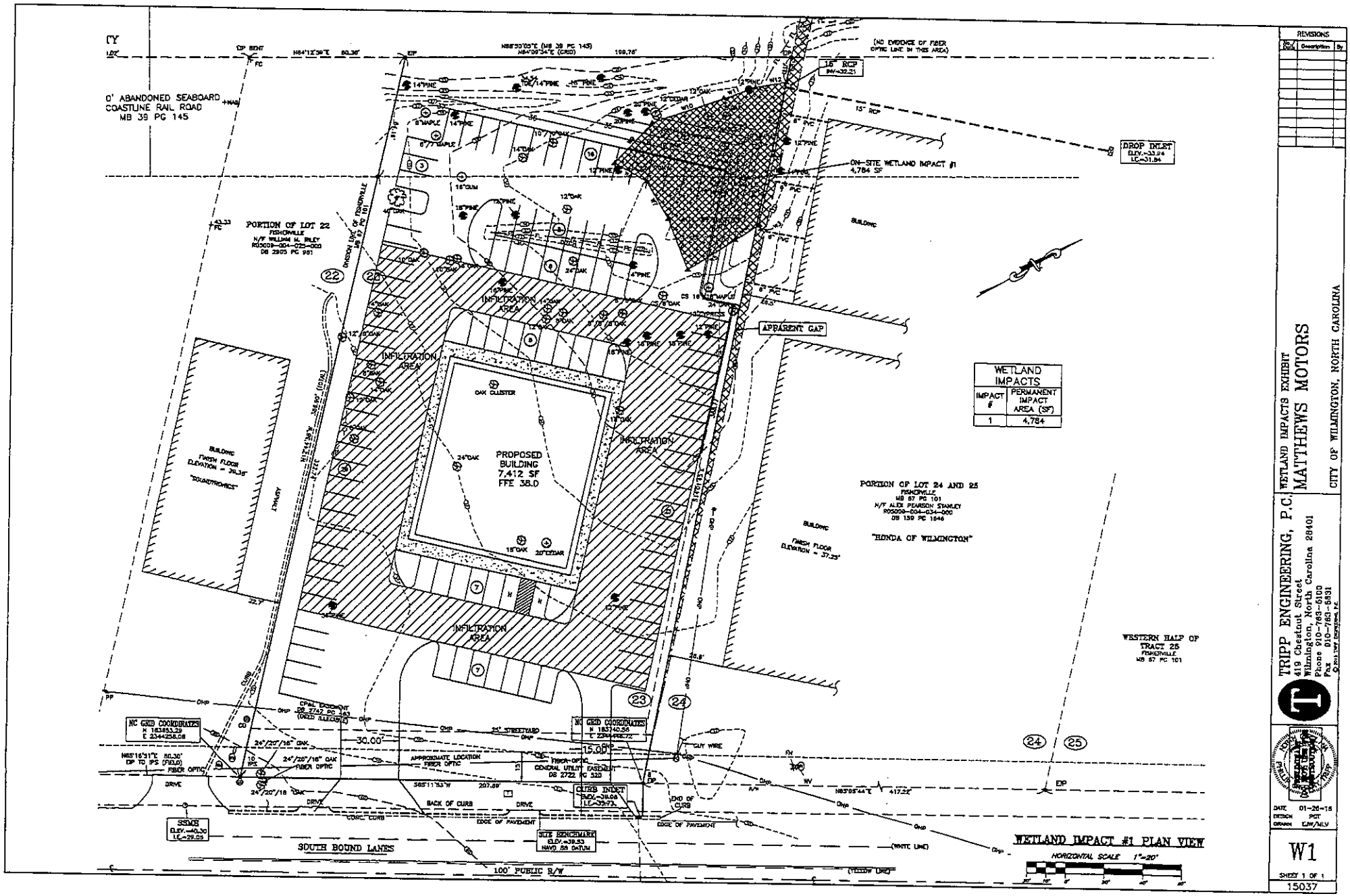
Comments/Additional Conditions:
See permit conditions.

This form is not valid unless signed below by the USACE Project Manager and by the Mitigation Sponsor on Page 1. ***Once signed, the Sponsor should provide copies of this form along with an updated bank ledger to: 1) the Permittee, 2) the USACE Project Manager at the address below, and 3) the Wilmington District Mitigation Office, Attn: Todd Tugwell, 11405 Falls of Neuse Road, Wake Forest, NC 27587 (email: todd.tugwell@usace.army.mil).*** Questions regarding this form or any of the permit conditions may be directed to the USACE Project Manager below.

USACE Project Manager: John Policarpo
USACE Field Office: Wilmington Regulatory Field Office
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403
Email: **John.N.Policarpo@USACE.ARMY.MIL**

USACE Project Manager Signature — **Date of Signature**: March 14, 2016

Current Wilmington District mitigation guidance, including information on mitigation ratios, functional assessments, and mitigation bank location and availability, and credit classifications (including stream temperature and wetland groupings) is available at http://ribits.usace.army.mil.



REVISIONS

No./Date	Description	By

WETLAND IMPACTS EXHIBIT
MATTHEWS MOTORS
CITY OF WILMINGTON, NORTH CAROLINA

TRIPP ENGINEERING, P.C.
419 Chestnut Street
Wilmington, North Carolina 28401
Phone 910-763-5100
Fax 910-763-5831

DATE 01-26-16
DESIGN PGT
DRAWN EJW/MLV

W1

SHEET 1 OF 1

15037

10 2 RLS
1100

NEW HANOVER COUNTY NC 04/10/2000
10
$1100.00
STATE OF NORTH CAROLINA
Real Estate Excise Tax

BOOK 2731 PAGE 0482

2000 APR 10 AM 11:23

RECORDED AND VERIFIED
MARY SUE COTS
REGISTER OF DEEDS
NEW HANOVER CO, NC

000074 Excise Tax $1,100.00

Recording Time, Book and Page

Tax Lot No. ..... Parcel Identifier No. R05009-004-026-000

Verified by ..... County on the ..... day of ....., 19.....

by .....

Mail after recording to .....

RETURNED TO

This instrument was prepared by DOUGLAS F. MCINTOSH, ATTORNEY AT LAW 616 MARKET STREET, WILMINGTON, NC 28401

Brief description for the Index LOT 23, FISHERVILLE

NORTH CAROLINA GENERAL WARRANTY DEED

THIS DEED made this 10th day of APRIL, 19 2000, by and between

GRANTOR	GRANTEE
GRANVILLE GREEN and wife, MARIA C. GREEN	ESSEX FIVE, LLC, a Limited Liability Company composed of STEWART W. POINT, FRED SCIALABBA, ADAM P. BROWN and JOSEPH KUSNICK 1600-31 Sturdivant Drive Wilmington, NC 28403

Enter in appropriate block for each party: name, address, and, if appropriate, character of entity, e.g. corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in the City of WILMINGTON, NEW HANOVER Township, County, North Carolina and more particularly described as follows:

ALL THAT CERTAIN TRACT OR PARCEL OF LAND DESCRIBED ON THE ATTACHED SHEET MARKED EXHIBIT "A", WHICH IS TO BE TAKEN AS A PART OF THIS INSTRUMENT AND IS INCORPORATED BY REFERENCE HEREIN.

RECEIVED
MAR 17 2016
ENGINEERING

629689

BOOK 2731 PAGE 0483

The property hereinabove described was acquired by Grantor by instrument recorded in

Book 1529 at Page 285 of the New Hanover County Registry

A map showing the above described property is recorded in Plat Book ... page ...

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever except for the exceptions hereinafter stated. Title to the property hereinabove described is subject to the following exceptions:

1. 2000 ad valorem taxes.
2. Applicable restrictive covenants and utility easements of record.
3. Applicable zoning and land use ordinances, statutes and regulations.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officers and its seal to be hereunto affixed by authority of its Board of Directors, the day and year first above written.

..... (Corporate Name)

By: .....

..... President

ATTEST:

..... Secretary (Corporate Seal)

USE BLACK INK ONLY

Granville Green (SEAL)
GRANVILLE GREEN

Maria C. Green (SEAL)
MARIA C. GREEN

..... (SEAL)

..... (SEAL)

SEAL-STAMP

DELORES McINTOSH NOTARY PUBLIC NEW HANOVER COUNTY, N.C.

NORTH CAROLINA, NEW HANOVER County.

I, a Notary Public of the County and State aforesaid, certify that GRANVILLE GREEN and wife, MARIA C. GREEN Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this 10th day of APRIL, xx 2000

My commission expires: 6-30-03 Delores McIntosh Notary Public

SEAL-STAMP

NORTH CAROLINA, ... County.

I, a Notary Public of the County and State aforesaid, certify that .....

personally came before me this day and acknowledged that ... he is ..... Secretary of ..... a North Carolina corporation, and that by authority duly given and as the act of the corporation, the foregoing instrument was signed in its name by its ..... President, sealed with its corporate seal and attested by ..... as its ..... Secretary.

Witness my hand and official stamp or seal, this ..... day of ..... 19.....

My commission expires: ..... Notary Public

Use Black Ink

The foregoing Certificate(s) of DELORES MCINTOSH, a Notary Public

.....

.....

is/are certified to be correct. This instrument and this certificate are duly registered at the date and time and in the Book and Page shown on the first page hereof.

MARY SUE COTS REGISTER OF DEEDS FOR NEW HANOVER COUNTY

By: Marva Ann Stover Deputy/~~Assistant~~ Register of Deeds

BOOK PAGE

Exhibit "A" 2731 0484

Beginning at a stake on the Macadam Road landing; from Wilmington to Scott Hill at W. Dock's eastern corner on said road and runs thence North 10' 15, East, one thousand and forty -three (1043) feet, thence North 68 degrees East two hundred and nine (209) feet to a stake, thence South 10 Degrees 15' west one thousand and forty-three (1043) feet to a stake on said Macadam road, thence with said road South 60 degrees West two hundred and nine (209) feet to the point of beginning.

The above land being Lot No. 23 in Fisherville. Also being the same property conveyed by Deed recorded in Book 1570 at page 799 of the New Hanover County Registry.

SOSID: 553445
Date Filed: 6/12/2000 11:26 AM
Elaine F. Marshall
North Carolina Secretary of State

STATE OF NORTH CAROLINA
DEPARTMENT OF SECRETARY OF

ARTICLES OF ORGANIZATION
OF

Essex Five, LLC

The undersigned hereby submits these Articles of Organization for the purpose of forming a limited liability company under the laws of the State of North Carolina.

1. The name of the limited liability company is Essex Five, LLC.

2. The latest date on which the limited liability company is to dissolve is December 31, 2099.

3. The name and address of each organizer executing these Articles of Organization are:

Name	Address
Stuart W. Point	300 Windchase Lane Wilmington, NC 28409
Adam P. Brown	1105 Shelter Cove Place Wilmington, NC 28405

4. The street address of the initial registered office of the limited liability company in the State of North Carolina is 616 Market Street, New Hanover County, Wilmington, NC 28402 and the name of its initial registered agent at such address Brian E. Edes, Esquire.

5. All members shall be managers by virtue of their status as members.

6. No person who is serving or who has served as a manager of the limited liability company shall be personally liable to the limited liability company or any of its members for monetary damages for breach of duty as a manager, except for liability with respect to (i) acts or omissions that the manager at the time of such breach knew were clearly in conflict with the best interests of the limited liability company, (ii) any transaction from which the manager derived an improper personal benefit, (iii) acts or omissions occurring prior to the effective date of this article or (iv) acts or omissions with respect to which the North Carolina Limited Liability Company Act does not permit the limitation of liability. As used herein, the term "improper personal benefit" does not include a manager's reasonable compensation or other reasonable incidental benefit for or on account of his service as a manager, employee, independent contractor, attorney or consultant of the limited liability company. No amendment or repeal of this article, nor the adoption of any provision to these Articles of Organization inconsistent with this article, shall eliminate or reduce the protection granted herein with respect to any matter that occurred prior to such amendment, repeal or adoption.

7. These articles will become effective upon filing.

This the 23rd day of March, 2000.

ESSEX FIVE, LLC

Adam P. Brown, Organizer

Stuart W. Point, Organizer

e:\brian\dozier\ART.LLC