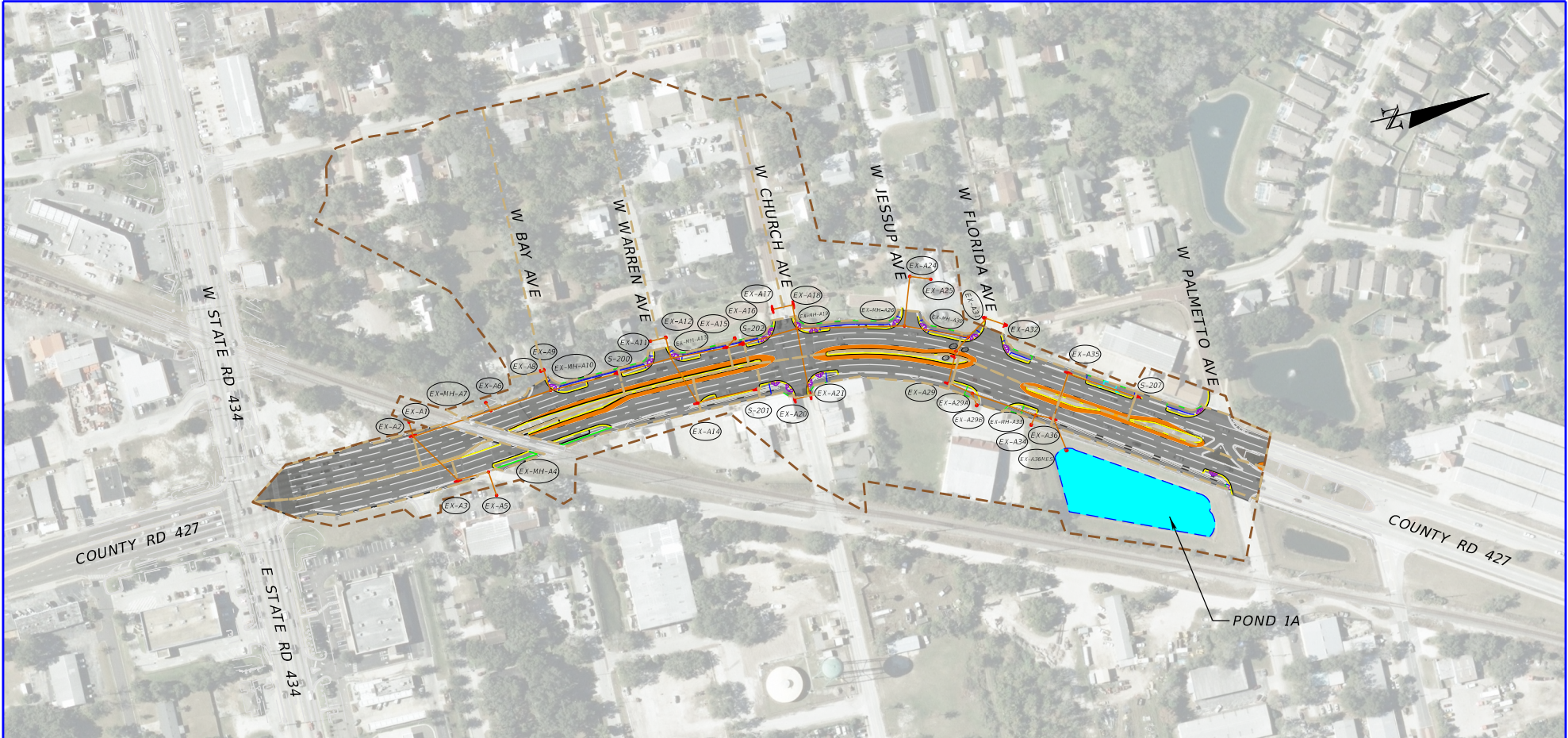


Appendix “A”

Pre-post Basin map
ICPR Model
Output Summary
Input data
CN work sheets
Pond Analysis



LEGEND:

- ADDITIONAL. PAVED AREA
- EXIST. PAVED AREA
- DRAINAGE STRUCTURE
- POND 1A
- BASIN 1A BOUNDARY

BASIN 1A

PRE-DEVELOPMENT

TOTAL BASIN AREA = 21.92 AC
PAVED AREA = 12.34 AC
PERVIOUS AREA = 9.58 AC

POST-DEVELOPMENT

TOTAL BASIN AREA = 21.92 AC
PAVED AREA = 12.84 AC
PERVIOUS AREA = 9.08 AC

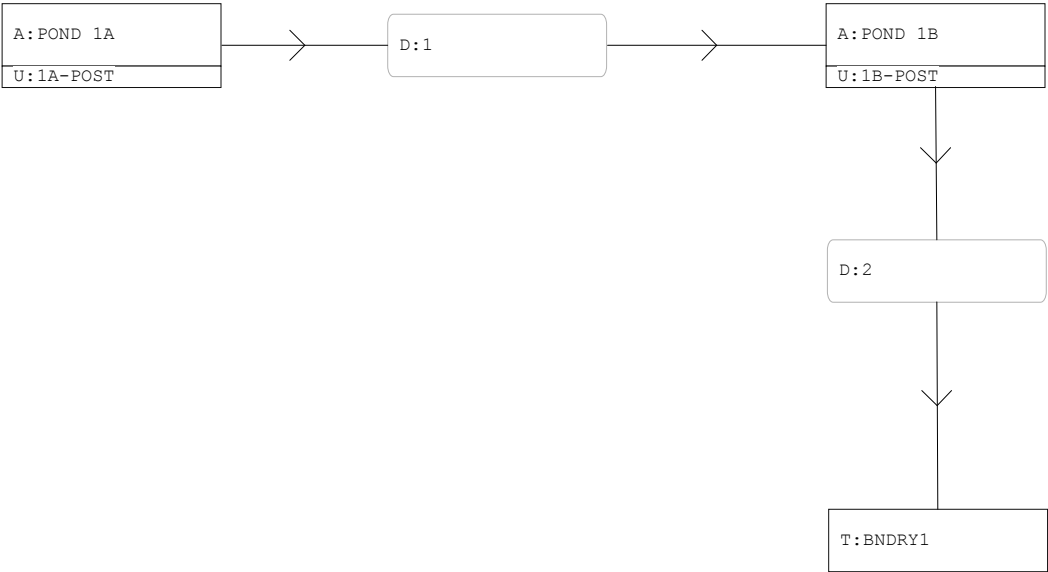
REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POND 1A PRE/POST DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		

Model created from 1996 permit model information

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
BNDRY1	POST	10024	0.00	59.00	60.00	0.0000	0	13.45	40.98	0.00	0.00
POND 1A	POST	10024	13.44	71.50	69.50	0.0050	51984	12.83	48.96	13.43	38.89
POND 1B	POST	10024	13.45	70.52	69.50	0.0050	12620	13.40	41.01	13.45	40.98
BNDRY1	POST	2524	0.00	59.00	60.00	0.0000	0	13.44	32.19	0.00	0.00
POND 1A	POST	2524	13.42	70.99	69.50	0.0050	48489	12.83	37.96	13.41	30.55
POND 1B	POST	2524	13.44	70.39	69.50	0.0050	12376	13.38	32.23	13.44	32.19

Model created from 1996 permit model information

- Nodes
- A Stage/Area
 - V Stage/Volume
 - T Time/Stage
 - M Manhole
- Basins
- O Overland Flow
 - U SCS Unit CN
 - S SBUH CN
 - Y SCS Unit GA
 - Z SBUH GA
- Links
- P Pipe
 - W Weir
 - C Channel
 - D Drop Structure
 - B Bridge
 - R Rating Curve
 - H Breach
 - E Percolation
 - F Filter
 - X Exfil Trench



==== Basins =====

```
Name: 1A-POST          Node: POND 1A          Status: Onsite
Group: POST            Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh323          Peaking Factor: 323.0
Rainfall File: Flmod           Storm Duration(hrs): 24.00
Rainfall Amount(in): 8.500     Time of Conc(min): 82.60
Area(ac): 21.920              Time Shift(hrs): 0.00
Curve Number: 83.20           Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
```

```
-----
Name: 1B-POST          Node: POND 1B          Status: Onsite
Group: POST            Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh323          Peaking Factor: 323.0
Rainfall File: Flmod           Storm Duration(hrs): 24.00
Rainfall Amount(in): 8.500     Time of Conc(min): 12.90
Area(ac): 3.610              Time Shift(hrs): 0.00
Curve Number: 79.30           Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
```

==== Nodes =====

```
Name: BNDRY1          Base Flow(cfs): 0.000      Init Stage(ft): 59.000
Group: POST            Warn Stage(ft): 60.000
Type: Time/Stage
```

DATA FROM PERMIT MODEL

Time(hrs)	Stage(ft)
0.00	59.000
30.00	59.000

```
Name: POND 1A          Base Flow(cfs): 0.000      Init Stage(ft): 68.000
Group: POST            Warn Stage(ft): 69.500
Type: Stage/Area
```

DATA FROM PERMIT MODEL

Stage(ft)	Area(ac)
60.000	0.4490
66.000	0.6470
68.000	0.8020
69.000	0.9380
71.000	1.1140
73.000	1.4290

```
Name: POND 1B          Base Flow(cfs): 0.000      Init Stage(ft): 68.000
Group: POST            Warn Stage(ft): 69.500
Type: Stage/Area
```

DATA FROM PERMIT MODEL

Stage(ft)	Area(ac)
62.000	0.0370
66.000	0.1080
68.000	0.1790
69.000	0.2280
71.000	0.3090
73.000	0.4850

==== Drop Structures =====

```
Name: 1                From Node: POND 1A      Length(ft): 147.00
Group: POST            To Node: POND 1B      Count: 1

UPSTREAM              DOWNSTREAM              Friction Equation: Automatic
Geometry: Circular    Circular                Solution Algorithm: Most Restrictive
Span(in): 42.00       42.00                  Flow: Both
Rise(in): 42.00       42.00                  Entrance Loss Coef: 0.500
```

Invert(ft): 64.000	64.000	Exit Loss Coef: 1.000
Manning's N: 0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

DATA FROM PERMIT MODEL

*** Weir 1 of 2 for Drop Structure 1 ***

Count: 1	Bottom Clip(in): 0.000
Type: Horizontal	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Rectangular	Orifice Disc Coef: 0.600
Span(in): 49.00	Invert(ft): 69.600
Rise(in): 37.00	Control Elev(ft): 69.600

TABLE

*** Weir 2 of 2 for Drop Structure 1 ***

Count: 1	Bottom Clip(in): 0.000
Type: Horizontal	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Circular	Orifice Disc Coef: 0.600
Span(in): 2.00	Invert(ft): 67.250
Rise(in): 2.00	Control Elev(ft): 68.000

TABLE

Name: 2	From Node: POND 1B	Length(ft): 847.00
Group: POST	To Node: BNDRY1	Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 36.00	36.00	Flow: Both
Rise(in): 36.00	36.00	Entrance Loss Coef: 0.500
Invert(ft): 64.100	58.910	Exit Loss Coef: 1.000
Manning's N: 0.012000	0.012000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

DATA FROM PERMIT MODEL

*** Weir 1 of 2 for Drop Structure 2 ***

Count: 1	Bottom Clip(in): 0.000
Type: Horizontal	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Rectangular	Orifice Disc Coef: 0.600
Span(in): 49.00	Invert(ft): 69.600
Rise(in): 37.00	Control Elev(ft): 69.600

TABLE

*** Weir 2 of 2 for Drop Structure 2 ***

Count: 1	Bottom Clip(in): 0.000
Type: Horizontal	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Circular	Orifice Disc Coef: 0.600
Span(in): 2.50	Invert(ft): 67.250
Rise(in): 2.50	Control Elev(ft): 68.000

TABLE

===== Hydrology Simulations =====

Name: 10024
Filename: K:\ORL_Roadway\149438000_Longwood Multi-Modal Improvements\149438000\drainage\Design\ICPR\10024.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 10.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 2524
Filename: K:\ORL_Roadway\149438000_Longwood Multi-Modal Improvements\149438000\drainage\Design\ICPR\2524.R32
Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 8.50

Time(hrs)	Print Inc(min)
30.000	5.00

==== Routing Simulations =====

Name: 10024 Hydrology Sim: 10024
Filename: K:\ORL_Roadway\149438000_Longwood Multi-Modal Improvements\149438000\drainage\Design\ICPR\10024.I32
Execute: Yes Restart: No Patch: No
Alternative: No
Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
999.000	15.000

Group	Run
POST	Yes

Name: 2524 Hydrology Sim: 2524
Filename: K:\ORL_Roadway\149438000_Longwood Multi-Modal Improvements\149438000\drainage\Design\ICPR\2524.I32
Execute: Yes Restart: No Patch: No
Alternative: No
Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
999.000	15.000

Group	Run
POST	Yes

Post Development CN

Kimley-Horn & Associates				
PROJECT TITLE:	CR 427 Section III			
PROJECT NUMBER:				DATE
BASIN DESIGNATION:	BASIN 1A	MADE BY:	AFY	14-Jun-17
BASIN ANALYSIS (PRE/POST):	POST-to Pond	CHECKED BY:	AFY	

RAINFALL (in) - P
DESIGN EVENT

8.50

25 YR-24 HR

BASIN RUNOFF CURVE NUMBER WORKSHEET

POST-DEVELOPMENT	SOIL	SOIL		AREA	
LAND-USE DESCRIPTION	NAME	GROUP	CN	(ac)	PRODUCT
<i>Total Contributing Basin</i>					
Impervious Areas					
Proposed pavement		D	98	12.34	1209.32
Proposed pervious/grass areas		D	62.21	9.58	596.01
Proposed Pond Site					
Berms		D	79	0.00	0.00
Water Surface			100	0.00	0.00
TOTALS				21.92	1805.33

Solved existing Pervious area CN from Composite CN as permitted. CN to include Pond water surface

COMPOSITE CN

82.36

ESTIMATED POST-DEVELOPMENT RUNOFF VOLUME

1) DETERMINE SOIL STORAGE - S

$$S = (1000 / CN) - 10$$

SOIL STORAGE (in)	S	2.14
-------------------	---	------

2) DETERMINE RUNOFF - R

$$R = (P - 0.2 * S)^2 / (P + 0.8 * S)$$

RUNOFF (in)	R	6.38
-------------	---	------

3) DETERMINE RUNOFF VOLUME - V(R)

$$V(R) = R / 12 * \text{AREA}$$

RUNOFF (ac-ft)	V(R)	11.65
----------------	------	-------

Post Development CN

Kimley-Horn & Associates				
PROJECT TITLE:	CR 427 Section III			
PROJECT NUMBER:				DATE
BASIN DESIGNATION:	BASIN 1A	MADE BY:	AFY	14-Jun-17
BASIN ANALYSIS (PRE/POST):	POST-to Pond	CHECKED BY:	AFY	

RAINFALL (in) - P
DESIGN EVENT

8.50

25 YR-24 HR

BASIN RUNOFF CURVE NUMBER WORKSHEET

POST-DEVELOPMENT	SOIL	SOIL		AREA	
LAND-USE DESCRIPTION	NAME	GROUP	CN	(ac)	PRODUCT
Total Contributing Basin					
Impervious Areas					
Proposed pavement		D	98	12.84	1258.32
Proposed pervious/grass areas		D	62.21	9.08	564.87
Proposed Pond Site					
Berms		D	79	0.00	0.00
Water Surface			100	0.00	0.00
			TOTALS	21.92	1823.19

COMPOSITE CN

83.2

ESTIMATED POST-DEVELOPMENT RUNOFF VOLUME

1) DETERMINE SOIL STORAGE - S			
$S = (1000 / CN) - 10$		SOIL STORAGE (in)	S
			2.02
2) DETERMINE RUNOFF - R			
$R = (P - 0.2 * S)^2 / (P + 0.8 * S)$		RUNOFF (in)	R
			6.48
3) DETERMINE RUNOFF VOLUME - V(R)			
$V(R) = R / 12 * AREA$		RUNOFF (ac-ft)	V(R)
			11.83

Post Development CN

Kimley-Horn & Associates				
PROJECT TITLE:	CR 427 Section III			
PROJECT NUMBER:				DATE
BASIN DESIGNATION:	BASIN 1B	MADE BY:	AFY	14-Jun-17
BASIN ANALYSIS (PRE/POST):	POST-to Pond	CHECKED BY:	AFY	

RAINFALL (in) - P
DESIGN EVENT

6.50

25 YR-24 HR

BASIN RUNOFF CURVE NUMBER WORKSHEET

POST-DEVELOPMENT	SOIL	SOIL		AREA	
LAND-USE DESCRIPTION	NAME	GROUP	CN	(ac)	PRODUCT
<i>Total Contributing Basin</i>					
Impervious Areas					
Proposed pavement		D	98	2.47	242.06
Proposed pervious/grass areas		D	38.8	1.14	44.23
Proposed Pond Site					
Berm		D	79	0.00	0.00
Water Surface			100	0.00	0.00
TOTALS				3.61	286.29

Solved existing
Pervious area CN
from Composite
CN as permitted
CN to include Pond
water surface

COMPOSITE CN

79.3

ESTIMATED POST-DEVELOPMENT RUNOFF VOLUME

1) DETERMINE SOIL STORAGE - S			
$S = (1000 / CN) - 10$		SOIL STORAGE (in)	S
			2.61
2) DETERMINE RUNOFF - R			
$R = (P - 0.2 * S)^2 / (P + 0.8 * S)$		RUNOFF (in)	R
			4.16
3) DETERMINE RUNOFF VOLUME - V(R)			
$V(R) = R / 12 * AREA$		RUNOFF (ac-ft)	V(R)
			1.25

Wet Detention Design

Kimley-Horn & Associates

MADE BY: AFY	DATE: 06/14/17	JOB NO.
CHECKED BY:	DATE:	SHEET NO.
CALCULATIONS FOR:	POND: Pond 1A	WMD SJRWMD

Water Quality

Basin outfall to O.F.W. (Y/N)?	n	INPUT (Y OR N)
Total Basin Area =	21.92	ac PULLED DATA
Paved Area =	12.84	ac PULLED DATA
Pond Water Surface Area =	0.80	ac PULLED DATA
Percentage Impervious =	60.80	% CALCULATED !!

Pollutant Abatement Volume

A.	1.00 " Over Total Basin Area =	1.76 Ac-Ft	CALCULATED !!
B.	2.50 " Over Paved Area =	2.68 Ac-Ft	CALCULATED !!
Pollutant Abatement Volume (PAV) =		2.68 Ac-Ft	CALCULATED !!

Controlling PAV= 2.68 Ac-Ft

NOTE: An additional 0.5 inch of dry detention/retention is required.

Dry Detention pre-treatment.

0.880 ac-ft	Remaining Pond Storage Volume after pre-treatment =	CALCULATED !!
-------------	---	---------------

Stage Storage Calculations

ELEV.		AREA	AVG	Delta	Delta	Sum
(ft)		(ac)	AREA	D	storage	Storage
			(ac)	(ft)	(ac-ft)	(ac-ft)
73.00	Outside berm	1.43				5.37
			1.27	2.00	2.54	
71.00	Inside berm	1.11				2.83
			1.03	1.40	1.44	
69.60	PAV	0.94				1.39
			0.87	1.60	1.39	
68.00	NWL	0.80				
4.01						

Min Required PAV:

Min Required Weir elevation **70.82 ft**

Proposed Weir elevation:

69.60

Provided PAV:

1.39 AC-FT

Bleed Down Calculations

Bleed Down Volume "1/2 PAV="0.5* = 0.5 * 1.39

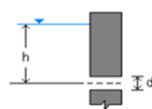
= 0.70 Ac-Ft

ELEV.		AREA	AVG	Delta	Delta
(ft)		(ac)	AREA	D	storage
			(ac)	(ft)	(ac-ft)
69.60	(PAV)	0.94			
			0.91	0.77	0.70
68.83	(at time t)	0.87			

10.3 Recovery Time

The outfall structure should be designed to drawdown one-half the required treatment volume specified above between 24 and 30 hours following a storm event. Design equations for sizing an orifice and a "V" notch weir to meet the recovery time are given in section 25.

Pond Bleed Down Design



Wet Detention Design

Kimley-Horn & Associates

MADE BY: AFY
 CHECKED BY:
 CALCULATIONS FOR:

DATE: 06/14/17
 DATE:
 POND: **Pond 1B**

JOB NO.
 SHEET NO.
 WMD **SJRWMD**

Water Quality

Basin outfall to O.F.W. (Y/N)? **n**

INPUT (Y OR N)

Total Basin Area =	3.61	ac
Paved Area =	2.47	ac
Pond Water Surface Area =	0.18	ac
Percentage Impervious =	72.01	%

PULLED DATA
 PULLED DATA
 PULLED DATA
 CALCULATED !!

Pollutant Abatement Volume

A. 1.00 " Over Total Basin Area =
 B. 2.50 " Over Paved Area =

0.29 Ac-Ft CALCULATED !!
 0.51 Ac-Ft CALCULATED !!

Pollutant Abatement Volume (PAV) =

0.51 Ac-Ft CALCULATED !!

CALCULATED !!

Controlling PAV= 0.51 Ac-Ft

NOTE: An additional 0.5 inch of dry detention/retention is required.

Dry Detention pre-treatment.

0.143 ac-ft

Remaining Pond Storage Volume after pre-treatment =

CALCULATED !!

Stage Storage Calculations

ELEV.		AREA	AVG	Delta	Delta	Sum
(ft)		(ac)	AREA	D	storage	Storage
			(ac)	(ft)	(ac-ft)	(ac-ft)
73.00	Outside berm	0.49				1.50
			0.40	2.00	0.79	
71.00	Inside berm	0.31				0.70
			0.27	1.40	0.38	
69.60	PAV	0.23				0.33
			0.20	1.60	0.33	
68.00	NWL	0.18				
4.01						

Min Required PAV:

Min Required Weir elevation **70.26 ft**

Proposed Weir elevation: **69.60**

Provided PAV: **.33 AC-FT**

Bleed Down Calculations

Bleed Down Volume "1/2 PAV="0.5* = 0.5 * 0.33

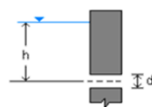
= 0.16 Ac-Ft

ELEV.	AREA	AVG	Delta	Delta
(ft)	(ac)	AREA	D	storage
		(ac)	(ft)	(ac-ft)
69.60 (PAV)	0.23			
		0.22	0.75	0.16
68.85 (at time t)	0.20			

10.3 Recovery Time

The outfall structure should be designed to drawdown one-half the required treatment volume specified above between 24 and 30 hours following a storm event. Design equations for sizing an orifice and a "V" notch weir to meet the recovery time are given in section 25.

Pond Bleed Down Design



2.50

