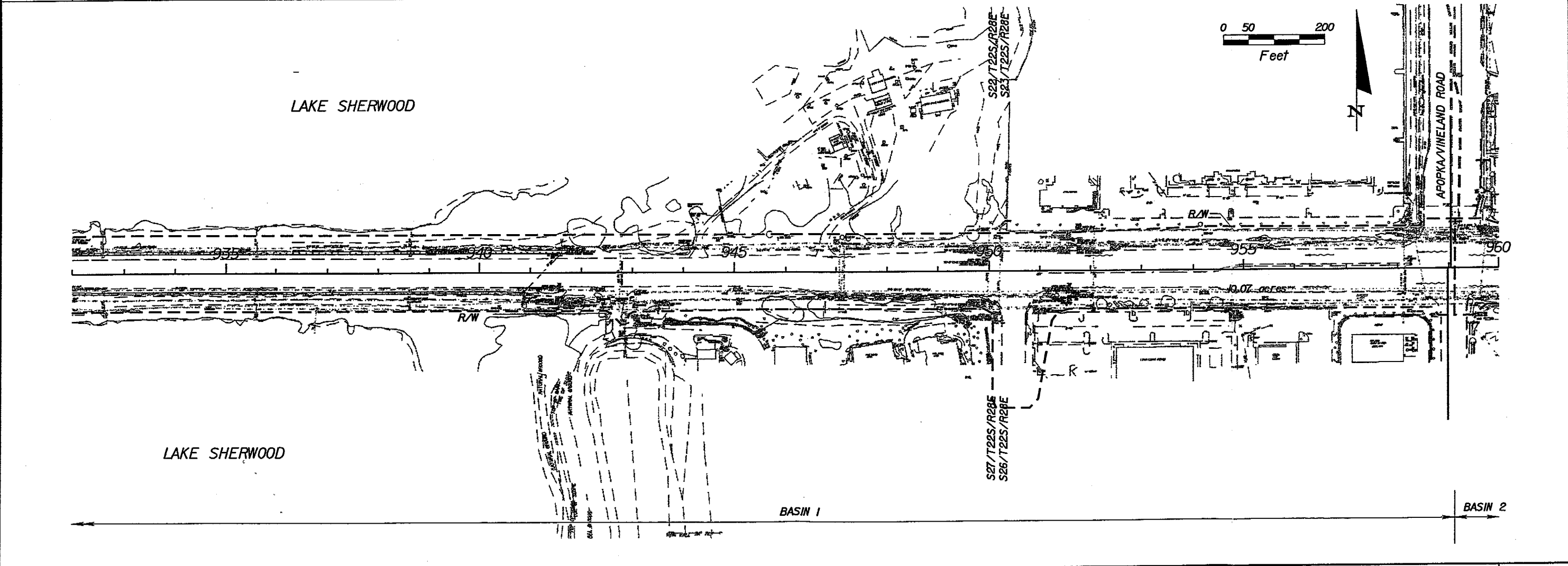
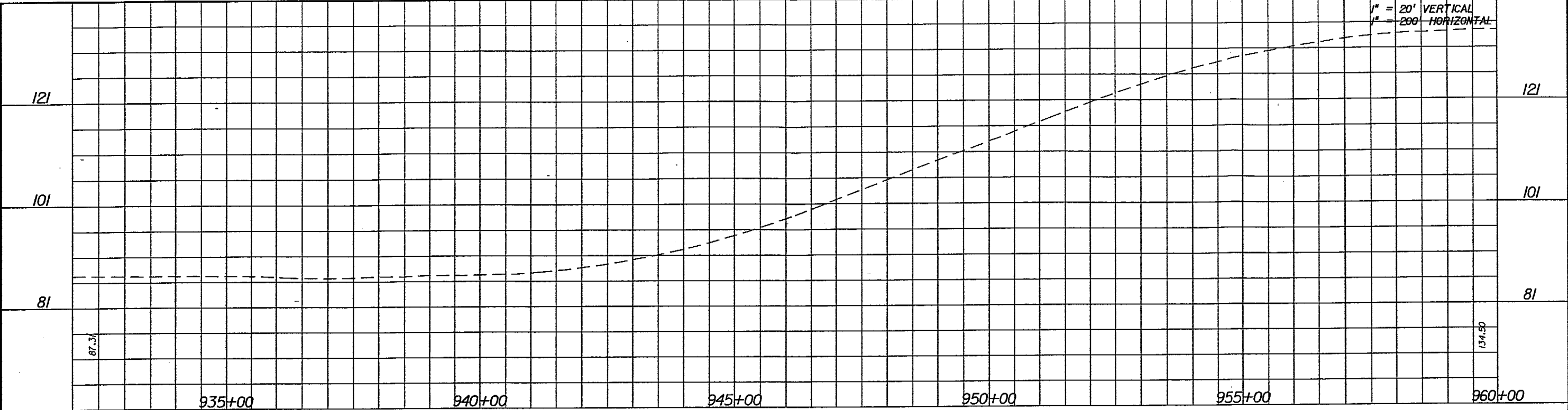




| <div style="display: flex; justify-content: space-between;"> <div> <p><b>REVISIONS</b></p> <table border="1"> <thead> <tr> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> </div> <div> <p><b>DESCRIPTION</b></p> </div> </div> |        | DATE                 | BY | DESCRIPTION |  |  |  |  |  |  |  |  |  |  |  |  | <div style="text-align: center;">  <p><b>ARCADIS G&amp;M, Inc.</b><br/> <small>Infrastructure • Environment • Utilities</small><br/>           150 Piedmont Drive, Suite 400<br/>           Atlanta, Georgia 30335<br/>           Phone (404) 711-8591 Fax (404) 614-3450<br/>           Telex (904) 711-8591<br/>           F. Certificate Number: 25 311 LC 040 13 1042<br/>           State of Georgia License No. 7-2<br/>           Florida License Number: 11092</p> </div> | <div style="text-align: center;"> <p><b>STATES OF FLORIDA</b><br/> <b>DEPARTMENT OF TRANSPORTATION</b></p> <table border="1"> <tr> <td>ROAD NO.</td> <td>COUNTY</td> <td>FINANCIAL PROJECT ID</td> </tr> <tr> <td>S.R. 50</td> <td>ORANGE</td> <td>239535-4-52-01</td> </tr> </table> </div> | ROAD NO. | COUNTY | FINANCIAL PROJECT ID | S.R. 50 | ORANGE | 239535-4-52-01 | <div style="text-align: center;"> <p><b>FIGURE 2-2</b></p> </div> | <div style="display: flex; justify-content: space-between;"> <div>SHEET NO.</div> <div>5</div> </div> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------|----|-------------|--|--|--|--|--|--|--|--|--|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|----------------------|---------|--------|----------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                    | BY     | DESCRIPTION          |    |             |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                              |          |        |                      |         |        |                |                                                                   |                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                      |    |             |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                              |          |        |                      |         |        |                |                                                                   |                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                      |    |             |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                              |          |        |                      |         |        |                |                                                                   |                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                      |    |             |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                              |          |        |                      |         |        |                |                                                                   |                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                      |    |             |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                              |          |        |                      |         |        |                |                                                                   |                                                                                                       |
| ROAD NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                | COUNTY | FINANCIAL PROJECT ID |    |             |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                              |          |        |                      |         |        |                |                                                                   |                                                                                                       |
| S.R. 50                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ORANGE | 239535-4-52-01       |    |             |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                              |          |        |                      |         |        |                |                                                                   |                                                                                                       |

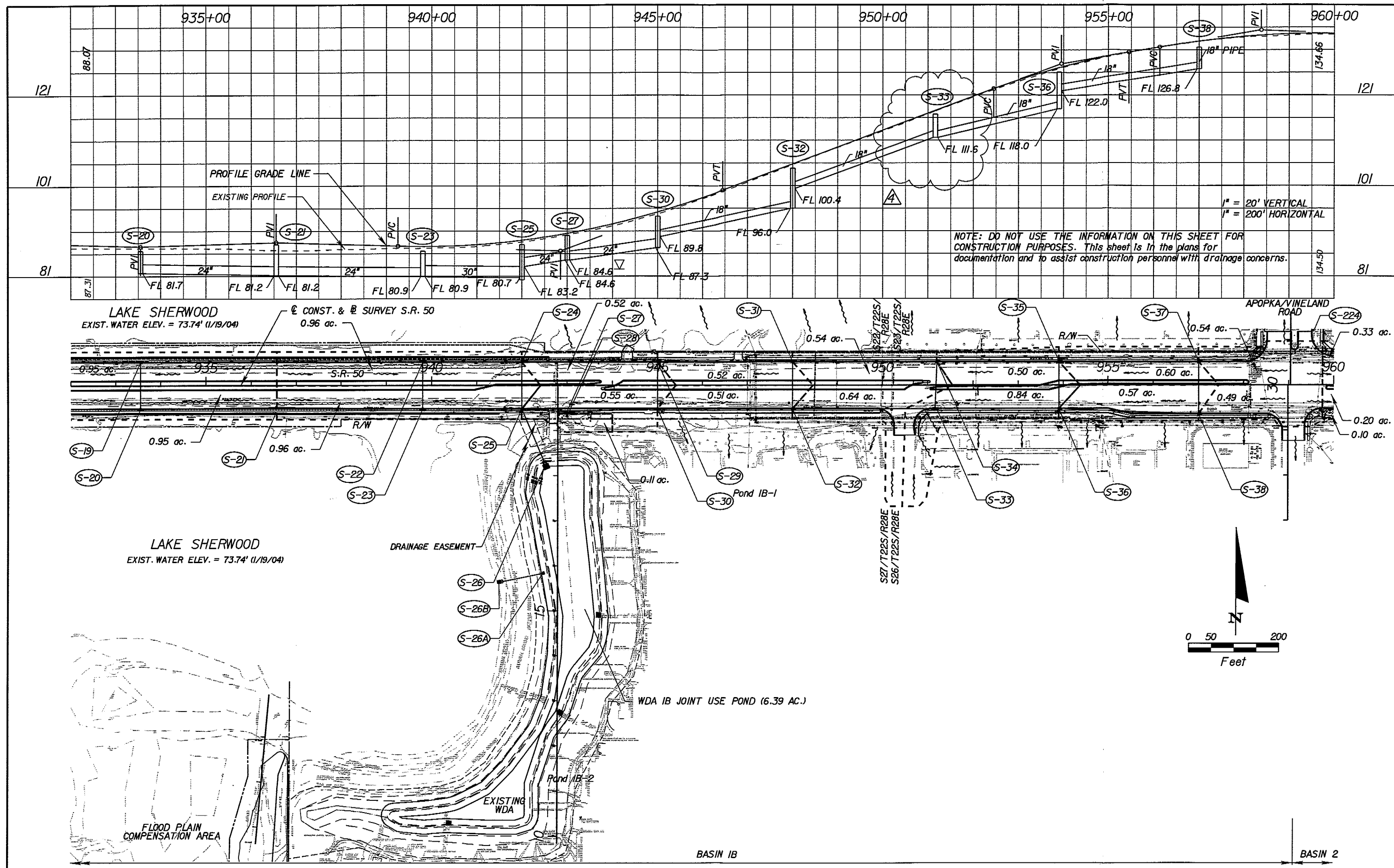
**PERMIT NUMBER 4-095-95429-2**

**DRAINAGE MAP**



| REVISIONS |    |             |      |    |             | <br>Beessent, Hammack & Ruckman, Inc.<br>Engineers • Planners • Landscape Architects • Surveyors<br>1630 Prudential Drive, Suite 400<br>Jacksonville, Florida 32207<br>Phone (904) 721-2591 Fax (904) 861-2450<br>FL Certification Number: EB 0855 LC 0120 LB 6739<br>Engineer of Record: Gene Howerton, P.E.<br>Florida Registration Number: 43992 | STATE OF FLORIDA<br>DEPARTMENT OF TRANSPORTATION |                |                      | PRE-DEVELOPMENT<br>DRAINAGE MAP | SHEET<br>NO. |
|-----------|----|-------------|------|----|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------|----------------------|---------------------------------|--------------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                                                                                                                                                                                                                                                                                                                                                                                                                                          | ROAD NO.                                         | COUNTY         | FINANCIAL PROJECT ID |                                 |              |
|           |    |             |      |    |             | S.R. 50                                                                                                                                                                                                                                                                                                                                                                                                                                  | ORANGE                                           | 239535-4-52-01 |                      |                                 |              |

NOTICE: The official record of this plan sheet is the electronic file signed & sealed under rule 61G15-23.003, F.A.C.



NOTE: DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. This sheet is in the plans for documentation and to assist construction personnel with drainage concerns.

NOTICE: The official record of this plan sheet is the electronic file signed & sealed under rule 61G15-23.003, F.A.C.

| REVISIONS |    |                                   |      |    |             |  <b>ARCADIS U.S., Inc.</b><br>Infrastructure, environment, facilities<br>1650 Prudential Drive, Suite 400<br>Jacksonville, Florida 32207<br>Phone (904) 721-2991 Fax (904) 861-2450<br>FL Certification Number: EB 7917 LC 0269 LB 7062<br>Engineer of Record: Gene Howerton, P.E.<br>Florida Registration Number: 43992 | <b>STATE OF FLORIDA</b><br><b>DEPARTMENT OF TRANSPORTATION</b> |        |                      | <b>DRAINAGE MAP</b> | SHEET NO.<br><br>4 |
|-----------|----|-----------------------------------|------|----|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------|----------------------|---------------------|--------------------|
| DATE      | BY | DESCRIPTION                       | DATE | BY | DESCRIPTION |                                                                                                                                                                                                                                                                                                                                                                                                               | ROAD NO.                                                       | COUNTY | FINANCIAL PROJECT ID |                     |                    |
| 12/22/08  | HN | CHANGED S-33 INVERT ELE. TO 111.6 |      |    |             |                                                                                                                                                                                                                                                                                                                                                                                                               | S.R. 50                                                        | ORANGE | 239535-4-52-01       |                     |                    |

**PERMIT NUMBER 4-095-95429-2**

## **DRAINAGE CALCULATIONS**

Engineer: Hoa Nguyen, PE  
Date: 6/10/2010  
ARCADIS No.: JK003032

Checked by: Bryon Wuczynski, PE  
Date: 7/2/2010

## SR 50 Basin 1B - 931+20 to 959+12 PRE-DEVELOPMENT POND 1B-2 DRAINAGE AREA ASSESSMENT

### Pre-development Basin Analysis

| SUB-BASIN NAME | BASIN (ACRES) | Within R/W (ACRES) | Within R/W (ACRES) | Offsite (ACRES) | Within R/W CN | Within R/W CN | Offsite CN | COMPOSITE CN |
|----------------|---------------|--------------------|--------------------|-----------------|---------------|---------------|------------|--------------|
| BASIN 1B       | 10.31         | 5.33               | 2.95               | 2.03            | 98.00         | 39.00         | 74.00      | 76.4         |
| Bala Pines     | 27.36         | 0.00               | 26.59              | 0.77            | 98.00         | 36.81         | 35.00      | 36.8         |
| TOTALS         | 37.67         | 5.33               | 29.54              | 2.80            |               |               |            | 47.6         |

### EQUIVALENT RUNOFF COEFFICIENT 'C'

| SUB-BASIN NAME | COMPOSITE CN | SOIL STORAGE S (in) | EQUIV. 'C' MEAN ANNUAL | EQUIV. 'C' 5 YEAR | EQUIV. 'C' 10 YEAR | EQUIV. 'C' 25 YEAR | EQUIV. 'C' 100 YEAR | EQUIV. 'C' 25 YR/96 HR |
|----------------|--------------|---------------------|------------------------|-------------------|--------------------|--------------------|---------------------|------------------------|
| BASIN 1B       | 76           | 3.09                | 0.56                   | 0.59              | 0.63               | 0.67               | 0.73                | 0.73                   |
| Bala Pines     | 37           | 17.20               | 0.05                   | 0.07              | 0.10               | 0.14               | 0.21                | 0.21                   |
| ENTIRE BASIN   | 48           | 11.01               | 0.15                   | 0.18              | 0.25               | 0.28               | 0.35                | 0.35                   |

| (Pt) | Return Period   | MEAN YR. (in) | 5 YR (in) | 10 YR (in) | 25 YR (in) | 100 YR (in) | 25 YR/96 HR (in) |
|------|-----------------|---------------|-----------|------------|------------|-------------|------------------|
|      | Rainfall Amount | 5.76          | 6.48      | 7.44       | 8.64       | 11.04       | 11.00            |

$$C = 1 - (S/Pt) * (1.2 - (S / (Pt + 0.8*S)))$$

$$\text{Where } S = (1000/CN) - 10$$

SOURCES: SCS SOILS SURVEY FOR ORANGE COUNTY, FLORIDA  
SCS TR 55, URBAN HYDROLOGY FOR SMALL WATERSHEDS  
FDOT DRAINAGE MANUAL, VOLUME TWO (1987)

### SCS CURVE NUMBERS (Ref. FDOT Drainage Manual, Vol. IIA, Table 5-8,5-9,5-10)

#### Impervious:

Assume Group D (Streets and Roads, Paved)

CN<sub>imp</sub> = 98

#### Pervious:

Soil Type/Hydrologic Group: Candler  
Hydrologic Group A

CN<sub>per</sub> = 39

Soil Types/Hydrologic Group: Arents  
Hydrologic Group C

CN<sub>per</sub> = 74

Example: BASIN 1B

CN = (Imp. Area \* CN<sub>imp</sub> + Perv. Area \* CN<sub>per</sub> + Offsite Area \* CN<sub>offsite</sub>) / Total /

CN = 76

\* Bala Pines CN = 39.52 was taken from the SJRWMD permit for the site

Engineer: Hoa Nguyen, PE  
Date: 6/10/2010  
ARCADIS No.: JK003032

Checked by: Bryon Wuczynski, PE  
Date: 7/2/2010

## SR 50 Basin 1B - 931+20 to 959+12

### Pre-development Time of Concentration

Find basin time of concentration:

Time of Concentration =  $T_c = T_{t1} + T_{t2} + \dots + T_{tm}$

Tt = travel time (hr)

**Tt1 - Sheet Flow** (across median)  $T = 0.007 (nL)^{0.8} P2^{0.5} s^{0.4}$

n = Manning's roughness coefficient  $n = 0.012$   
L = Flow length  $L = 9.5 \text{ ft}$   
P2 = 2-Year, 24 Hour rainfall (in)  $P2 = 5.04 \text{ in}$   
s = slope of hydraulic grade line  $s = 0.0200 \text{ ft/ft}$

$s = ((E-1) - (E-2)) / L$  E-1 = N/A (Upstream Invert)  
E-2 = N/A (Downstream Invert)

$Tt = (0.007 (nL)^{0.8}) / [(P2)^{0.5} s^{0.4}]$  **Tt1 = 0.0026 hrs**

**Tt2 - Overland Flow - Paved (Shallow Concentrated)** (across inside lanes)

Tt = Travel Time (min)  
s = slope over plane surface  $s = 0.0200 \text{ ft/ft}$   
L = Flow length (ft)  $L = 24 \text{ ft}$   
V = Velocity (ft/s)  $V = 2.87484161 \text{ ft/s}$

$V = 16.1345 (s)^{0.5}$  (Unpaved)  
 $V = 20.3282 (s)^{0.5}$  (Paved)

$s = ((E-1) - (E-2)) / L$  E-1 = N/A (Upstream Invert)  
E-2 = N/A (Downstream Invert)

$Tt = (L / (V * 3600)) \text{ hrs}$  **Tt2 = 0.0023 hrs**

**Tt3 - Overland Flow - Paved (Shallow Concentrated)** (across outside lane to inlet)

Tt = Travel Time (min)  
s = slope over plane surface  $s = 0.0300 \text{ ft/ft}$   
L = Flow length (ft)  $L = 16 \text{ ft}$   
V = Velocity (ft/s)  $V = 3.52094752 \text{ ft/s}$

$V = 16.1345 (s)^{0.5}$  (Unpaved)  
 $V = 20.3282 (s)^{0.5}$  (Paved)

$s = ((E-1) - (E-2)) / L$  E-1 = N/A (Upstream Invert)  
E-2 = N/A (Downstream Invert)

$Tt = (L / (V * 3600)) \text{ hrs}$  **Tt2 = 0.0013 hrs**

Engineer: Hoa Nguyen, PE  
Date: 6/10/2010  
ARCADIS No.: JK003032

Checked by: Bryon Wuczynski, PE  
Date: 7/2/2010

**SR 50 Basin 1B - 931+20 to 959+12**

| <u>Pre-development Time of Concentration (Con't)</u> |                         |
|------------------------------------------------------|-------------------------|
| <b>Tt4 - Pipe Flow</b>                               | (from inlet to pond)    |
| L = Length of Pipe                                   | L= 1250 ft              |
| v = Velocity                                         | v= 2.5 ft/sec           |
|                                                      | <b>Tt4= 0.14 hrs</b>    |
|                                                      | <b>Ttotal= 0.15 hrs</b> |
|                                                      | <b>= 8.71 min</b>       |
|                                                      | <b>use 10 minutes</b>   |

Engineer: Hoa Nguyen, PE  
Date: 6/10/2010  
ARCADIS No.: JK003032

Checked by: Bryon Wuczynski, PE  
Date: 7/2/2010

## SR 50 Basin 1B - 931+20 to 959+12 POST-DEVELOPMENT POND 1B-2 DRAINAGE AREA ASSESSMENT

| SUB-BASIN NAME | BASIN (ACRES) | Impervious (ACRES) | Pervious (ACRES) | Offsite (ACRES) | Impervious CN | Pervious CN | Offsite CN | COMPOSITE CN |
|----------------|---------------|--------------------|------------------|-----------------|---------------|-------------|------------|--------------|
| BASIN 1B       | 10.31         | 7.24               | 2.53             | 0.54            | 98.00         | 39.00       | 74.00      | 82.3         |
| Pond1B         | 1.77          | 1.77               |                  |                 | 100.00        |             |            | 100.0        |
| Bala Pines     | 25.59         | 12.32              | 12.50            | 0.77            | 98.00         | 36.81       | 35.00      | 66.2         |
| TOTALS         | 37.67         | 21.33              | 15.03            | 1.31            |               |             |            | 72.2         |

### EQUIVALENT RUNOFF COEFFICIENT 'C'

| SUB-BASIN NAME | COMPOSITE CN | SOIL STORAGE S (in) | EQUIV. 'C' MEAN ANNUAL | EQUIV. 'C' 5 YEAR | EQUIV. 'C' 10 YEAR | EQUIV. 'C' 25 YEAR | EQUIV. 'C' 100 YEAR | EQUIV. 'C' 25 YR/96 HR |
|----------------|--------------|---------------------|------------------------|-------------------|--------------------|--------------------|---------------------|------------------------|
| BASIN 1B       | 82.3         | 2.16                | 0.66                   | 0.69              | 0.72               | 0.75               | 0.80                | 0.80                   |
| Pond1B         | 100.0        | 0.00                | 1.00                   | 1.00              | 1.00               | 1.00               | 1.00                | 1.00                   |
| Bala Pines     | 66.2         | 5.10                | 0.40                   | 0.44              | 0.48               | 0.53               | 0.60                | 0.60                   |
| ENTIRE BASIN   | 72.2         | 3.85                | 0.49                   | 0.53              | 0.57               | 0.61               | 0.68                | 0.68                   |

| (Pt) | Return Period   | MEAN YR. (in) | 5 YR (in) | 10 YR (in) | 25 YR (in) | 100 YR (in) | 25 YR/96 HR (in) |
|------|-----------------|---------------|-----------|------------|------------|-------------|------------------|
|      | Rainfall Amount | 5.76          | 6.48      | 7.44       | 8.64       | 11.04       | 11.00            |

$$C = 1 - (S/Pt) * (1.2 - (S / (Pt + 0.8*S)))$$

$$\text{Where } S = (1000/CN) - 10$$

SOURCES: SCS SOILS SURVEY FOR ORANGE COUNTY, FLORIDA  
SCS TR 55, URBAN HYDROLOGY FOR SMALL WATERSHEDS  
FDOT DRAINAGE MANUAL, VOLUME TWO (1987)

### SCS CURVE NUMBERS (Ref. FDOT Drainage Manual, Vol. IIA, Table 5-8,5-9,5-10)

#### Impervious:

Assume Group D (Streets and Roads, Paved)

CN<sub>imp</sub> = 98

#### Pervious:

Soil Type/Hydrologic Group: Candler  
Hydrologic Group A

CN<sub>per</sub> = 39

Soil Types/Hydrologic Group: Arents  
Hydrologic Group C

CN<sub>per</sub> = 74

Example: BASIN 1B

$$CN = (\text{Imp. Area} * CN_{\text{imp}} + \text{Perv. Area} * CN_{\text{per}} + \text{Offsite Area} * CN_{\text{offsite}}) / \text{Total} \quad CN = 82$$

\* Bala Pines CN's were taken from the SJRWMD permit for the site

Engineer: Hoa Nguyen, PE  
Date: 6/10/2010  
ARCADIS No.: JK003032

Checked by: Bryon Wuczynski, PE  
Date: 7/2/2010

ARCADIS  
1650 Prudential Drive  
Suite 400  
Jacksonville  
Florida 32207  
Tel: 904.721.2991  
Fax: 904.861.2450

**SR 50 Basin 1B - 931+20 to 959+12**

**Post-development Time of Concentration**

**T<sub>c</sub> - Pipe Flow** (from inlet to pond)

L = Length of Pipe

V<sub>a</sub> = Ave. Velocity

L = 785 ft

V<sub>a</sub> = 2.5 ft/sec

T<sub>c</sub> = 0.25 hrs

T<sub>c</sub> = 15.23 min.

Engineer: Hoa Nguyen, PE  
Date: 6/10/2010  
ARCADIS No.: JK003032

Checked by: Bryon Wuczynski, PE  
Date: 7/2/2010

**SR 50 Basin 1B - 931+20 to 959+12**

**Treatment Volume Analysis - Water Quality**

**Treatment Volume (TV) Calculation**

Treatment Volume, TV = (1" of runoff) \* (Total Drainage Area)  
TV = [(1 inch) \* (37.67 ac)] / (12 in/ft)  
TV = 3.14 ac-ft

or

Treatment Volume, TV = (2.5" of runoff) \* (Total Impervious Area - Pond Area)  
TV = [(2.5 inch) \* (19.56 ac)] / (12 in/ft)  
TV = 4.08 ac-ft

|                                   |
|-----------------------------------|
| Treatment Volume, TV = 4.08 ac-ft |
|-----------------------------------|

Engineer: Hoa Nguyen, PE  
Date: 6/10/2010  
ARCADIS No.: JK003032

Checked by: Bryon Wuczynski, PE  
Date: 7/2/2010

## SR 50 Basin 1B - 931+20 to 959+12

### Pond Design Parameters

#### Calculate Required Permanent Pool Volume (PPV)

$$\text{Required Permanent Pool Volume, PPV} = \frac{\text{DA} * \text{C} * \text{R} * \text{RT}}{\text{WS} * \text{CF}}$$

where

DA = 37.67 ac = Drainage area to pond (ac)  
C = 0.61 = Runoff coefficient  
R = 29.0 in = Wet season rainfall depth (in)  
RT = 21 days = Residence time (days)  
WS = 153 days = Length of wet season (days)  
CF = 12 in/ft = Conversion factor

$$\text{Required PPV} = \frac{37.67 \text{ ac} * 0.61 * 29.0 \text{ in} * 21 \text{ days}}{153 \text{ days} * 12 \text{ in/ft}}$$

$$\text{Required PPV} = 7.64 \text{ ac-ft}$$

#### Size the Circular Drawdown Structure (Orifice)

Treatment Volume = 4.08 ac-ft ac-ft  
177507 ft<sup>3</sup>  
Diameter of orifice = 5.00 in  
Area of orifice opening = 0.1363538 ft<sup>2</sup>

Flow line elevation of orifice = 80.208333 ft  
Treatment Volume Depth; h1 = 2.2916667 ft  
Stage at half the treatment volume = 82.144063 ft  
Depth at Half Treatment Volume; h2 = 1.93573 ft  
h = 2.1136983 ft

These calculations are based upon the flow line  
(center) of the orifice

Engineer: Hoa Nguyen, PE  
Date: 6/10/2010  
ARCADIS No.: JK003032

Checked by: Bryon Wuczynski, PE  
Date: 7/2/2010

## SR 50 Basin 1B - 931+20 to 959+12

Ave. Flow Rate Based on orifice size;  $Q = 0.9545157$  cfs  
Time Period to Bleed Down 1/2 Treatment Volume = 25.828543 hr

24 hrs < T= 25.83 hrs > 30hrs OK

Install a 5 in. circular orifice.

### Pond Stage-Area Parameters (1:2 SLOPE)

| Pond Feature | (feet) | Area       | Area     | I Volume    | Volume      |
|--------------|--------|------------|----------|-------------|-------------|
| Bottom       | 74.5   | 48,310 sf  | 1.109 ac | 0.00 ac-ft  | 0.00 ac-ft  |
| NWL          | 80     | 77,096 sf  | 1.770 ac | 7.92 ac-ft  | 7.92 ac-ft  |
| Weir         | 82.5   | 88,484 sf  | 2.031 ac | 4.75 ac-ft  | 12.67 ac-ft |
| Inside TOB   | 89     | 118,830 sf | 2.728 ac | 15.47 ac-ft | 28.14 ac-ft |
| Outside TOB  | 90     | 133,000 sf | 3.053 ac | 2.89 ac-ft  | 31.03 ac-ft |

### Check Pond Volumes and Depth

Required Treatment Volume, TV = 4.08 ac-ft

Provided Treatment Volume, TV = 4.75 ac-ft , Provided Treatment Volume is sufficient

Required Permanent Pool Volume, PPV = 7.64 ac-ft

Provided Permanent Pool Volume, PPV = 7.92 ac-ft , Provided Permanent Pool Volume is sufficient

Required Mean Pond Depth = between 2 feet and 8 feet deep

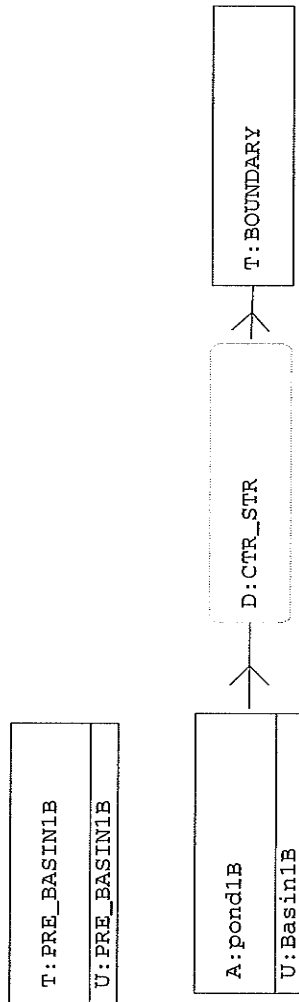
Provided Mean Pond Depth = 4.32 ft , Provided Mean Pond Depth is sufficient

State Road 50 PSR  
 Post- Development - Pond 1B  
 Modification of Pond 1B from Dry to Wet Pond

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: Basin1B              | Node: pond1B                     | Status: Onsite |
| Group: POST                | Type: SCS Unit Hydrograph CN     |                |
| Unit Hydrograph: Uh484     | Peaking Factor: 484.0            |                |
| Rainfall File:             | Storm Duration(hrs): 0.00        |                |
| Rainfall Amount(in): 0.000 | Time of Conc(min): 15.23         |                |
| Area(ac): 37.670           | Time Shift(hrs): 0.00            |                |
| Curve Number: 72.20        | Max Allowable Q(cfs): 999999.000 |                |
| DCIA(%): 0.00              |                                  |                |

|                            |                                  |                |
|----------------------------|----------------------------------|----------------|
| Name: PRE_BASIN1B          | Node: PRE_BASIN1B                | Status: Onsite |
| Group: PRE                 | Type: SCS Unit Hydrograph CN     |                |
| Unit Hydrograph: Uh323     | Peaking Factor: 323.0            |                |
| Rainfall File:             | Storm Duration(hrs): 0.00        |                |
| Rainfall Amount(in): 0.000 | Time of Conc(min): 10.00         |                |
| Area(ac): 10.310           | Time Shift(hrs): 0.00            |                |
| Curve Number: 76.40        | Max Allowable Q(cfs): 999999.000 |                |
| DCIA(%): 0.00              |                                  |                |

==== Nodes =====

|                  |                       |                        |
|------------------|-----------------------|------------------------|
| Name: BOUNDARY   | Base Flow(cfs): 0.000 | Init Stage(ft): 77.000 |
| Group: POST      |                       | Warn Stage(ft): 77.000 |
| Type: Time/Stage |                       |                        |

| Time(hrs) | Stage(ft) |
|-----------|-----------|
| 0.00      | 77.000    |
| 24.00     | 77.000    |
| 100.00    | 77.000    |

|                  |                       |                        |
|------------------|-----------------------|------------------------|
| Name: pond1B     | Base Flow(cfs): 0.000 | Init Stage(ft): 80.000 |
| Group: POST      |                       | Warn Stage(ft): 88.000 |
| Type: Stage/Area |                       |                        |

| Stage(ft) | Area(ac) |
|-----------|----------|
| 74.500    | 1.1090   |
| 80.000    | 1.7700   |
| 82.500    | 2.0310   |
| 89.000    | 2.7280   |
| 90.000    | 3.0530   |

|                   |                       |                        |
|-------------------|-----------------------|------------------------|
| Name: PRE_BASIN1B | Base Flow(cfs): 0.000 | Init Stage(ft): 80.000 |
| Group: PRE        |                       | Warn Stage(ft): 80.000 |
| Type: Time/Stage  |                       |                        |

| Time(hrs) | Stage(ft) |
|-----------|-----------|
| 0.00      | 80.000    |
| 30.00     | 80.000    |

State Road 50 Permit Application  
Post- Development - Pond 1B  
Modification of Pond 1B from Dry to Wet Pond

==== Drop Structures =====

|                       |                   |                                       |
|-----------------------|-------------------|---------------------------------------|
| Name: CTR_STR         | From Node: pond1B | Length(ft): 90.00                     |
| Group: POST           | To Node: BOUNDARY | Count: 1                              |
| UPSTREAM              | DOWNSTREAM        | Friction Equation: Average Conveyance |
| Geometry: Circular    | Circular          | Solution Algorithm: Automatic         |
| Span(in): 30.00       | 30.00             | Flow: Both                            |
| Rise(in): 30.00       | 30.00             | Entrance Loss Coef: 0.000             |
| Invert(ft): 77.500    | 77.000            | Exit Loss Coef: 0.000                 |
| 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 dn               |
| 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

\*\*\* Weir 1 of 2 for Drop Structure CTR\_STR \*\*\*

|                       |                          |       |
|-----------------------|--------------------------|-------|
| Count: 1              | Bottom Clip(in): 0.000   | TABLE |
| Type: Vertical: Mavis | Top Clip(in): 0.000      |       |
| Flow: Both            | Weir Disc Coef: 3.200    |       |
| Geometry: Circular    | Orifice Disc Coef: 0.600 |       |
| Span(in): 5.00        | Invert(ft): 80.000       |       |
| Rise(in): 5.00        | Control Elev(ft): 80.000 |       |

\*\*\* Weir 2 of 2 for Drop Structure CTR\_STR \*\*\*

|                       |                          |       |
|-----------------------|--------------------------|-------|
| Count: 1              | Bottom Clip(in): 0.000   | TABLE |
| Type: Vertical: Mavis | Top Clip(in): 0.000      |       |
| Flow: Both            | Weir Disc Coef: 3.200    |       |
| Geometry: Rectangular | Orifice Disc Coef: 0.600 |       |
| Span(in): 60.00       | Invert(ft): 82.500       |       |
| Rise(in): 999.00      | Control Elev(ft): 82.500 |       |

==== Hydrology Simulations =====

Name: 10YR24HR  
Filename: G:\TRA\03032 SR 50 Good Hms Rd\23953545201\drainage\10YR24HR.R32

Override Defaults: Yes  
Storm Duration(hrs): 24.00  
Rainfall File: Flmod  
Rainfall Amount(in): 7.44

| Time(hrs) | Print Inc(min) |
|-----------|----------------|
| 15.000    | 5.00           |
| 42.000    | 5.00           |

Name: 25YR24HR  
Filename: G:\TRA\03032 SR 50 Good Hms Rd\23953545201\drainage\25YR24HR.R32

Override Defaults: Yes  
Storm Duration(hrs): 24.00  
Rainfall File: Flmod  
Rainfall Amount(in): 8.64

State Road 50 Permit Application  
Post- Development - Pond 1B  
Modification of Pond 1B from Dry to Wet Pond

| Time(hrs) | Print Inc(min) |
|-----------|----------------|
| 15.000    | 5.00           |
| 42.000    | 5.00           |

Name: 25yr96hr  
Filename: G:\TRA\03032 SR 50 Good Hms Rd\23953545201\drainage\25yr96hr.R32

Override Defaults: Yes  
Storm Duration(hrs): 96.00  
Rainfall File: Flmod  
Rainfall Amount(in): 11.00

| Time(hrs) | Print Inc(min) |
|-----------|----------------|
| 15.000    | 15.00          |
| 42.000    | 15.00          |
| 96.000    | 15.00          |
| 120.000   | 60.00          |
| 240.000   | 60.00          |

Name: 3yr24hr  
Filename: G:\TRA\03032 SR 50 Good Hms Rd\23953545201\drainage\3yr24hr.R32

Override Defaults: Yes  
Storm Duration(hrs): 24.00  
Rainfall File: Flmod  
Rainfall Amount(in): 5.76

| Time(hrs) | Print Inc(min) |
|-----------|----------------|
| 15.000    | 5.00           |
| 42.000    | 5.00           |

=====  
=== Routing Simulations ===  
=====

Name: 10YR24HR                      Hydrology Sim: 10YR24HR  
Filename: G:\TRA\03032 SR 50 Good Hms Rd\23953545201\drainage\10YR24HR.I32

Execute: Yes                      Restart: No                      Patch: No  
Alternative: No

Max Delta Z(ft): 1.00                      Delta Z Factor: 0.00500  
Time Step Optimizer: 1.000  
Start Time(hrs): 0.000                      End Time(hrs): 42.00  
Min Calc Time(sec): 1.0000                      Max Calc Time(sec): 300.0000  
Boundary Stages:                      Boundary Flows:

| Time(hrs) | Print Inc(min) |
|-----------|----------------|
| 10.000    | 30.000         |
| 20.000    | 5.000          |
| 30.000    | 30.000         |
| 42.000    | 30.000         |

| Group | Run |
|-------|-----|
| POST  | Yes |
| PRE   | Yes |

Name: 25YR24HR                      Hydrology Sim: 25YR24HR  
Filename: G:\TRA\03032 SR 50 Good Hms Rd\23953545201\drainage\25YR24HR.I32

Execute: Yes                      Restart: No                      Patch: No

State Road 50 Permit Application  
 Post- Development - Pond 1B  
 Modification of Pond 1B from Dry to Wet Pond

Alternative: No

|                            |                              |
|----------------------------|------------------------------|
| Max Delta Z(ft): 1.00      | Delta Z Factor: 0.00500      |
| Time Step Optimizer: 1.000 |                              |
| Start Time(hrs): 0.000     | End Time(hrs): 42.00         |
| Min Calc Time(sec): 1.0000 | Max Calc Time(sec): 300.0000 |
| Boundary Stages:           | Boundary Flows:              |

| Time(hrs) | Print Inc(min) |
|-----------|----------------|
| 10.000    | 30.000         |
| 20.000    | 5.000          |
| 30.000    | 30.000         |
| 42.000    | 30.000         |

| Group | Run |
|-------|-----|
| POST  | Yes |
| PRE   | Yes |

Name: 25YR96HR Hydrology Sim: 25yr96hr  
 Filename: G:\TRA\03032 SR 50 Good Hms Rd\23953545201\drainage\25YR96HR.I32

Execute: Yes Restart: No Patch: No  
 Alternative: No

|                            |                              |
|----------------------------|------------------------------|
| Max Delta Z(ft): 1.00      | Delta Z Factor: 0.00500      |
| Time Step Optimizer: 1.000 |                              |
| Start Time(hrs): 0.000     | End Time(hrs): 240.00        |
| Min Calc Time(sec): 1.0000 | Max Calc Time(sec): 300.0000 |
| Boundary Stages:           | Boundary Flows:              |

| Time(hrs) | Print Inc(min) |
|-----------|----------------|
| 10.000    | 30.000         |
| 20.000    | 5.000          |
| 30.000    | 30.000         |
| 42.000    | 30.000         |
| 96.000    | 30.000         |
| 120.000   | 60.000         |
| 240.000   | 60.000         |

| Group | Run |
|-------|-----|
| POST  | Yes |
| PRE   | Yes |

Name: Mean Hydrology Sim: 3yr24hr  
 Filename: G:\TRA\03032 SR 50 Good Hms Rd\23953545201\drainage\Mean.I32

Execute: Yes Restart: No Patch: No  
 Alternative: No

|                            |                              |
|----------------------------|------------------------------|
| Max Delta Z(ft): 1.00      | Delta Z Factor: 0.00500      |
| Time Step Optimizer: 1.000 |                              |
| Start Time(hrs): 0.000     | End Time(hrs): 42.00         |
| Min Calc Time(sec): 1.0000 | Max Calc Time(sec): 300.0000 |
| Boundary Stages:           | Boundary Flows:              |

| Time(hrs) | Print Inc(min) |
|-----------|----------------|
| 10.000    | 30.000         |

State Road 50 Permit Application  
Post- Development - Pond 1B  
Modification of Pond 1B from Dry to Wet Pond

---

|        |        |
|--------|--------|
| 0.000  | 5.000  |
| 30.000 | 30.000 |
| 42.000 | 30.000 |

|       |       |
|-------|-------|
| Group | Run   |
| ----- | ----- |
| POST  | Yes   |
| PRE   | Yes   |

State Road 50 Permit Application  
Post- Development - Pond 1B  
Modification of Pond 1B from Dry to Wet Pond

---

Basin Name: Basin1B  
Group Name: POST  
Simulation: 10YR24HR  
Node Name: pond1B  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484  
Peaking Fator: 484.0  
Spec Time Inc (min): 2.03  
Comp Time Inc (min): 2.03  
Rainfall File: Flmod  
Rainfall Amount (in): 7.440  
Storm Duration (hrs): 24.00  
Status: Onsite  
Time of Conc (min): 15.23  
Time Shift (hrs): 0.00  
Area (ac): 37.670  
Vol of Unit Hyd (in): 1.001  
Curve Number: 72.200  
DCIA (%): 0.000  
  
Time Max (hrs): 12.05  
Flow Max (cfs): 130.296  
Runoff Volume (in): 4.223  
Runoff Volume (ft3): 577436.028

---

Basin Name: PRE\_BASIN1B  
Group Name: PRE  
Simulation: 10YR24HR  
Node Name: PRE\_BASIN1B  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh323  
Peaking Fator: 323.0  
Spec Time Inc (min): 1.33  
Comp Time Inc (min): 1.33  
Rainfall File: Flmod  
Rainfall Amount (in): 7.440  
Storm Duration (hrs): 24.00  
Status: Onsite  
Time of Conc (min): 10.00  
Time Shift (hrs): 0.00  
Area (ac): 10.310  
Vol of Unit Hyd (in): 1.001  
Curve Number: 76.400  
DCIA (%): 0.000  
  
Time Max (hrs): 12.04  
Flow Max (cfs): 37.700  
Runoff Volume (in): 4.698  
Runoff Volume (ft3): 175821.395

---

Basin Name: Basin1B  
Group Name: POST  
Simulation: 25YR24HR  
Node Name: pond1B  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484  
Peaking Fator: 484.0  
Spec Time Inc (min): 2.03  
Comp Time Inc (min): 2.03  
Rainfall File: Flmod  
Rainfall Amount (in): 8.640  
Storm Duration (hrs): 24.00  
Status: Onsite

State Road 50 Permit Application  
Post- Development - Pond 1B  
Modification of Pond 1B from Dry to Wet Pond

---

Time of Conc (min): 15.23  
Time Shift (hrs): 0.00  
Area (ac): 37.670  
Vol of Unit Hyd (in): 1.001  
Curve Number: 72.200  
DCIA (%): 0.000  
  
Time Max (hrs): 12.05  
Flow Max (cfs): 162.406  
Runoff Volume (in): 5.277  
Runoff Volume (ft3): 721596.208

---

Basin Name: PRE\_BASIN1B  
Group Name: PRE  
Simulation: 25YR24HR  
Node Name: PRE\_BASIN1B  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh323  
Peaking Fator: 323.0  
Spec Time Inc (min): 1.33  
Comp Time Inc (min): 1.33  
Rainfall File: Flmod  
Rainfall Amount (in): 8.640  
Storm Duration (hrs): 24.00  
Status: Onsite  
Time of Conc (min): 10.00  
Time Shift (hrs): 0.00  
Area (ac): 10.310  
Vol of Unit Hyd (in): 1.001  
Curve Number: 76.400  
DCIA (%): 0.000  
  
Time Max (hrs): 12.04  
Flow Max (cfs): 46.213  
Runoff Volume (in): 5.794  
Runoff Volume (ft3): 216857.903

---

Basin Name: Basin1B  
Group Name: POST  
Simulation: 25yr96hr  
Node Name: pond1B  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484  
Peaking Fator: 484.0  
Spec Time Inc (min): 2.03  
Comp Time Inc (min): 2.03  
Rainfall File: Flmod  
Rainfall Amount (in): 11.000  
Storm Duration (hrs): 96.00  
Status: Onsite  
Time of Conc (min): 15.23  
Time Shift (hrs): 0.00  
Area (ac): 37.670  
Vol of Unit Hyd (in): 1.001  
Curve Number: 72.200  
DCIA (%): 0.000  
  
Time Max (hrs): 47.99  
Flow Max (cfs): 64.740  
Runoff Volume (in): 7.422  
Runoff Volume (ft3): 1014908.936

---

State Road 50 Permit Application  
Post- Development - Pond 1B  
Modification of Pond 1B from Dry to Wet Pond

---

Basin Name: PRE\_BASIN1B  
Group Name: PRE  
Simulation: 25yr96hr  
Node Name: PRE\_BASIN1B  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh323  
Peaking Fator: 323.0  
Spec Time Inc (min): 1.33  
Comp Time Inc (min): 1.33  
Rainfall File: Flmod  
Rainfall Amount (in): 11.000  
Storm Duration (hrs): 96.00  
Status: Onsite  
Time of Conc (min): 10.00  
Time Shift (hrs): 0.00  
Area (ac): 10.310  
Vol of Unit Hyd (in): 1.001  
Curve Number: 76.400  
DCIA (%): 0.000  
  
Time Max (hrs): 48.00  
Flow Max (cfs): 18.711  
Runoff Volume (in): 8.005  
Runoff Volume (ft3): 299586.330

---

Basin Name: Basin1B  
Group Name: POST  
Simulation: 3yr24hr  
Node Name: pond1B  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484  
Peaking Fator: 484.0  
Spec Time Inc (min): 2.03  
Comp Time Inc (min): 2.03  
Rainfall File: Flmod  
Rainfall Amount (in): 5.760  
Storm Duration (hrs): 24.00  
Status: Onsite  
Time of Conc (min): 15.23  
Time Shift (hrs): 0.00  
Area (ac): 37.670  
Vol of Unit Hyd (in): 1.001  
Curve Number: 72.200  
DCIA (%): 0.000  
  
Time Max (hrs): 12.08  
Flow Max (cfs): 86.579  
Runoff Volume (in): 2.813  
Runoff Volume (ft3): 384598.594

---

Basin Name: PRE\_BASIN1B  
Group Name: PRE  
Simulation: 3yr24hr  
Node Name: PRE\_BASIN1B  
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh323  
Peaking Fator: 323.0  
Spec Time Inc (min): 1.33  
Comp Time Inc (min): 1.33  
Rainfall File: Flmod  
Rainfall Amount (in): 5.760  
Storm Duration (hrs): 24.00

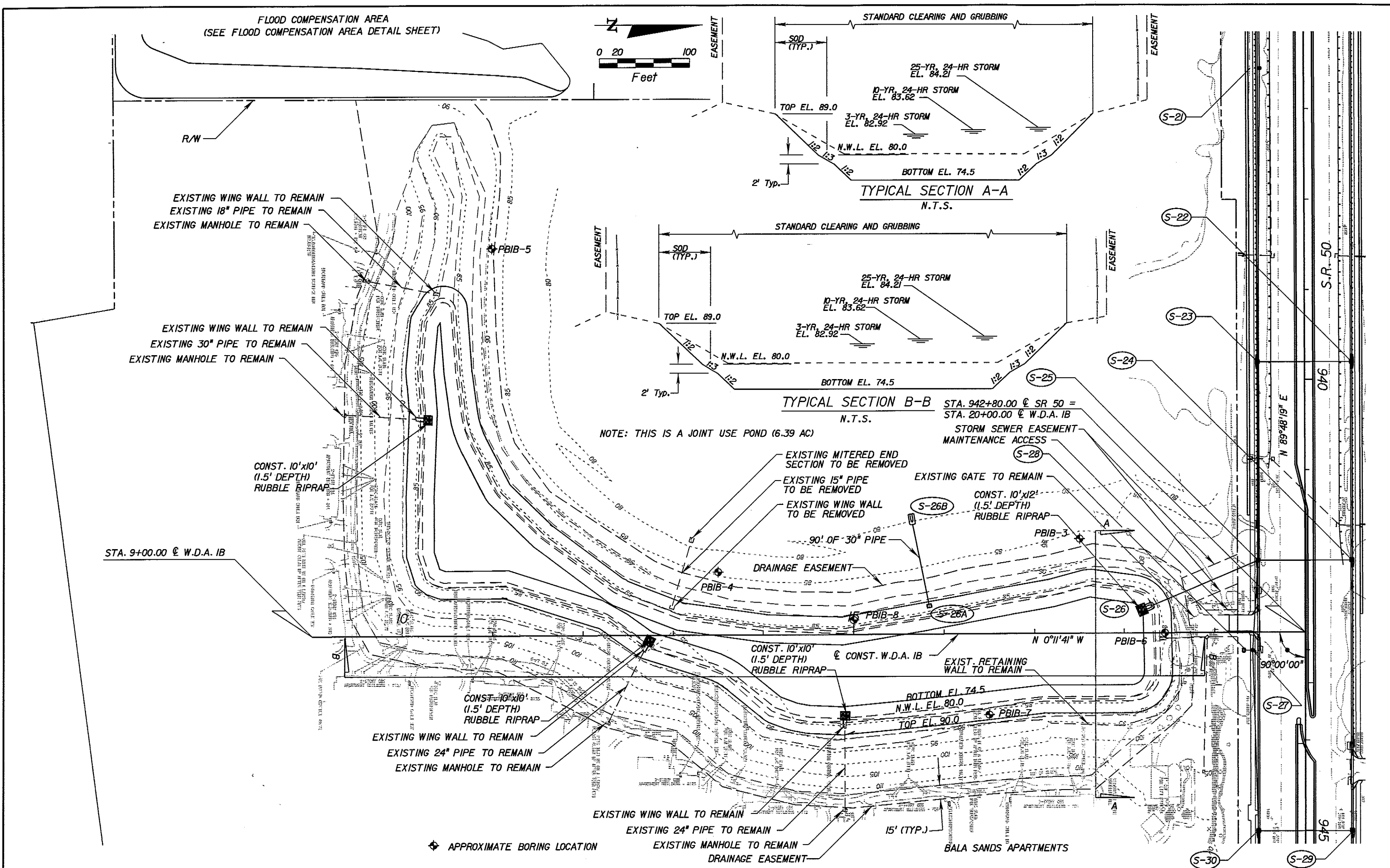
State Road 50 Permit Application  
Post- Development - Pond 1B  
Modification of Pond 1B from Dry to Wet Pond

---

Status: Onsite  
Time of Conc (min): 10.00  
Time Shift (hrs): 0.00  
Area (ac): 10.310  
Vol of Unit Hyd (in): 1.001  
Curve Number: 76.400  
DCIA (%): 0.000  
  
Time Max (hrs): 12.04  
Flow Max (cfs): 25.942  
Runoff Volume (in): 3.214  
Runoff Volume (ft3): 120277.245

State Road 50 Permit Application  
Post- Development - Pond 1B  
Modification of Pond 1B from Dry to Wet Pond

| Name        | Group | Simulation | Max Time<br>Stage<br>hrs | Max<br>Stage<br>ft | Warning<br>Stage<br>ft | Max Delta<br>Stage<br>ft | Max Surf<br>Area<br>ft2 | Max Time<br>Inflow<br>hrs | Max Inflow<br>cfs | Max Time<br>Outflow<br>hrs | Max<br>Outflow<br>cfs |
|-------------|-------|------------|--------------------------|--------------------|------------------------|--------------------------|-------------------------|---------------------------|-------------------|----------------------------|-----------------------|
| BOUNDARY    | POST  | 10YR24HR   | 0.00                     | 77.000             | 77.000                 | 0.0000                   | 0                       | 12.83                     | 20.258            | 0.00                       | 0.000                 |
| pond1B      | POST  | 10YR24HR   | 12.83                    | 83.623             | 88.000                 | 0.0050                   | 93717                   | 12.08                     | 129.337           | 12.83                      | 20.258                |
| PRE_EASIN1B | PRE   | 10YR24HR   | 0.00                     | 80.000             | 80.000                 | 0.0000                   | 0                       | 12.00                     | 36.627            | 0.00                       | 0.000                 |
| BOUNDARY    | POST  | 25YR24HR   | 0.00                     | 77.000             | 77.000                 | 0.0000                   | 0                       | 12.63                     | 37.172            | 0.00                       | 0.000                 |
| pond1B      | POST  | 25YR24HR   | 12.63                    | 84.213             | 88.000                 | 0.0050                   | 96470                   | 12.08                     | 160.773           | 12.63                      | 37.172                |
| PRE_EASIN1B | PRE   | 25YR24HR   | 0.00                     | 80.000             | 80.000                 | 0.0000                   | 0                       | 12.00                     | 45.042            | 0.00                       | 0.000                 |
| BOUNDARY    | POST  | 25YR96HR   | 0.00                     | 77.000             | 77.000                 | 0.0000                   | 0                       | 48.23                     | 39.273            | 0.00                       | 0.000                 |
| pond1B      | POST  | 25YR96HR   | 48.23                    | 84.279             | 88.000                 | 0.0050                   | 96778                   | 48.00                     | 64.670            | 48.23                      | 39.273                |
| PRE_EASIN1B | PRE   | 25YR96HR   | 0.00                     | 80.000             | 80.000                 | 0.0000                   | 0                       | 48.00                     | 18.704            | 0.00                       | 0.000                 |
| BOUNDARY    | POST  | Mean       | 0.00                     | 77.000             | 77.000                 | 0.0000                   | 0                       | 14.83                     | 5.489             | 0.00                       | 0.000                 |
| pond1B      | POST  | Mean       | 14.83                    | 82.923             | 88.000                 | 0.0050                   | 90448                   | 12.08                     | 86.435            | 14.83                      | 5.489                 |
| PRE_EASIN1B | PRE   | Mean       | 0.00                     | 80.000             | 80.000                 | 0.0000                   | 0                       | 12.00                     | 25.043            | 0.00                       | 0.000                 |



| REVISIONS |    |             |      |    |             |
|-----------|----|-------------|------|----|-------------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |
|           |    |             |      |    |             |
|           |    |             |      |    |             |

|                                                                                                                                                                                                                                                                                                                         |        |                      |                                                                |  |                                          |                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------|----------------------------------------------------------------|--|------------------------------------------|--------------------------------|
| <b>ARCADIS U.S., Inc.</b><br>Infrastructure, environment, facilities<br>1650 Prudential Drive, Suite 400<br>Jacksonville, Florida 32207<br>Phone (904) 721-2991 Fax (904) 861-2450<br>FL Certification Number: EB 7917 LC 0269 LB 7062<br>Engineer of Record: Gene Howerton, P.E.<br>Florida Registration Number: 43992 |        |                      | <b>STATE OF FLORIDA</b><br><b>DEPARTMENT OF TRANSPORTATION</b> |  | <b>W.D.A. 1B</b><br><b>GEOMETRY PLAN</b> | <b>SHEET NO.</b><br><b>296</b> |
| ROAD NO.                                                                                                                                                                                                                                                                                                                | COUNTY | FINANCIAL PROJECT ID |                                                                |  |                                          |                                |
| S.R. 50                                                                                                                                                                                                                                                                                                                 | ORANGE | 239535-4-52-01       |                                                                |  |                                          |                                |

NOTICE: The official record of this plan sheet is the electronic file signed & sealed under rule 61615-23.003, F.A.C.

**STORM SEWER HYDRAULICS**

System: WDA1B

**PROJECT**

|              |                |               |                       |
|--------------|----------------|---------------|-----------------------|
| Number:      | 239535-4-52-01 | Organization: | Arcadis G and M, Inc. |
| Description: | S.R. 50        | Designed by:  | Hoa Nguyen            |
| County:      | ORANGE         | Checked by:   | David Shearer         |

|                        |       |                         |                   |        |        |
|------------------------|-------|-------------------------|-------------------|--------|--------|
| Outfall Tailwater El:  | 83.50 | Storm Event - IDF Curve | <b>CONDITIONS</b> |        |        |
| Exit Loss at Outfall:  | 0.00  | Frequency               |                   |        |        |
| Storm Sewer Control El | 83.50 | Zone                    | 7                 | Area 1 | Area 2 |
|                        |       |                         |                   | 0.95   | 0.40   |
|                        |       |                         |                   | 0.95   | 0.20   |

**HGL method: Standard FDOT (Jump HGL to pipe crown).**

| FROM Station Type | TO Offset Brls Len | Drainage Areas    |         |                           | Tc (min) | Travel Time (min) | Inten. (in/hr) | Total CA (ac) | Flow (cfs)       |                  |              | Inlet Elevations     |                      |               | Pipe Elevations   |                   |                       | Fall (ft) | Pipe                  |       | HGL (%) | Flow Type | Velocity |        | Capacity | Mann'n 'N' |
|-------------------|--------------------|-------------------|---------|---------------------------|----------|-------------------|----------------|---------------|------------------|------------------|--------------|----------------------|----------------------|---------------|-------------------|-------------------|-----------------------|-----------|-----------------------|-------|---------|-----------|----------|--------|----------|------------|
|                   |                    | Area Runoff Coeff | C*A (C) | Lcl CA JpStrm Tot CA (CA) |          |                   |                |               | Qb Qfd Qdw       | S-Qb S-Qfd S-Qdw | CIA TOTAL    | Inlet Clear.         | HGL Min HGL Jnc Loss | HGL Flow Line | Crown Line        | Height Width (in) | FL (%)                |           | Actual Physical (fps) | (cfs) |         |           |          |        |          |            |
|                   |                    | (A)               | (C)     | (CA)                      | (min)    | (in/hr)           | (ac)           | Qb Qfd Qdw    | S-Qb S-Qfd S-Qdw | CIA TOTAL        | Inlet Clear. | HGL Min HGL Jnc Loss | HGL Flow Line        | Crown Line    | Height Width (in) | FL (%)            | Actual Physical (fps) | (cfs)     |                       |       |         |           |          |        |          |            |
| S-19              | S-20               | 0.65              | 0.95    | 0.62                      | 0.73     |                   |                | 0.00          | 0.00             | 0.00             | 86.65        | 85.07                | 85.07                | 84.89         | 0.18              | 0.1758            | Full                  |           |                       | 2.70  |         |           | 5.05     | 0.0120 |          |            |
| 933+55            | -52.25             | 0.29              | 0.40    | 0.12                      | 0.00     | 10.00             | 0.63           | 0.00          | 0.00             | 4.77             | 1.58         | 0.00                 | 83.90                | 83.70         | 0.20              | 0.1970            |                       |           |                       | 2.86  |         |           |          |        |          |            |
| P-6               | 1 101.50           | 0.00              | 0.20    | 0.00                      | 0.73     |                   |                | 0.00          | 0.00             | 4.77             |              |                      | 82.40                | 82.20         |                   |                   | 18.00                 | 0.1970    |                       |       |         |           |          |        |          |            |
| S-20              | S-21               | 0.65              | 0.95    | 0.62                      | 0.73     |                   |                | 0.00          | 0.00             | 0.00             | 86.65        | 84.89                | 84.89                | 84.46         | 0.43              | 0.1448            | Full                  |           |                       | 2.97  |         |           | 10.06    | 0.0120 |          |            |
| 933+55            | 52.25              | 0.29              | 0.40    | 0.12                      | 0.73     | 10.63             | 1.67           | 0.00          | 0.00             | 9.33             | 1.76         | 0.00                 | 83.70                | 83.20         |                   |                   | 24.00                 | 0.1448    | Full                  |       | 3.20    |           |          |        |          |            |
| P-6               | 1 297.02           | 0.00              | 0.20    | 0.00                      | 1.47     |                   |                | 0.00          | 0.00             | 9.33             |              |                      | 81.70                | 81.20         | 0.50              | 0.1683            |                       |           |                       | 2.80  |         |           | 7.48     | 0.0120 |          |            |
| S-21              | S-23               | 0.00              | 0.95    | 0.00                      | 0.00     |                   |                | 0.00          | 0.00             | 0.00             | 87.63        | 84.46                | 84.46                | 84.05         | 0.42              | 0.1293            | Full                  |           |                       | 2.38  |         |           |          |        |          |            |
| 936+55            | 48.50              | 0.00              | 0.40    | 0.00                      | 1.47     | 12.29             | 1.91           | 0.00          | 0.00             | 8.81             | 3.17         | 0.00                 | 83.20                | 82.90         |                   |                   | 24.00                 | 0.0932    | Full                  |       | 2.89    |           | 5.05     | 0.0120 |          |            |
| MHP-8             | 1 322.02           | 0.00              | 0.20    | 0.00                      | 1.47     |                   |                | 0.00          | 0.00             | 8.81             |              |                      | 81.20                | 80.90         | 0.30              | 0.2016            | Full                  |           |                       | 2.86  |         |           | 13.52    | 0.0120 |          |            |
| S-22              | S-23               | 0.73              | 0.95    | 0.69                      | 0.79     |                   |                | 0.00          | 0.00             | 0.00             | 86.62        | 84.25                | 84.25                | 84.05         | 0.20              | 0.1990            | Partial super         |           |                       | 2.75  |         |           |          |        |          |            |
| 939+80            | -52.25             | 0.23              | 0.40    | 0.09                      | 0.00     | 10.00             | 0.59           | 0.00          | 0.00             | 5.11             | 2.37         | 0.00                 | 84.10                | 83.90         |                   |                   | 18.00                 | 0.1970    | Full                  |       | 2.91    |           | 5.08     | 0.0120 |          |            |
| P-6               | 1 101.50           | 0.00              | 0.20    | 0.00                      | 0.79     |                   |                | 0.00          | 0.00             | 5.11             |              |                      | 82.60                | 82.40         | 0.20              | 0.0926            |                       |           |                       | 2.87  |         |           |          |        |          |            |
| S-23              | S-25               | 0.73              | 0.95    | 0.69                      | 0.79     |                   |                | 0.00          | 0.00             | 0.00             | 86.58        | 84.05                | 84.05                | 83.72         | 0.32              | 0.1500            | Full                  |           |                       | 1.73  |         |           | 7.55     | 0.0120 |          |            |
| 939+80            | 52.25              | 0.23              | 0.40    | 0.09                      | 2.25     | 14.21             | 1.03           | 0.00          | 0.00             | 17.21            | 2.54         | 0.00                 | 83.40                | 83.20         |                   |                   | 30.00                 | 0.1500    | Full                  |       | 2.87    |           |          |        |          |            |
| P-6               | 1 216.00           | 0.00              | 0.20    | 0.00                      | 3.04     |                   |                | 0.00          | 0.00             | 17.21            |              |                      | 80.90                | 80.70         | 0.20              | 0.0926            |                       |           |                       | 4.27  |         |           |          |        |          |            |
| S-24              | S-25               | 0.37              | 0.95    | 0.35                      | 0.41     |                   |                | 0.00          | 0.00             | 0.00             | 88.03        | 84.17                | 84.17                | 83.97         | 0.20              | 0.1990            | Partial super         |           |                       | 2.91  |         |           |          |        |          |            |
| 942+00            | -52.25             | 0.15              | 0.40    | 0.06                      | 0.00     | 10.00             | 0.57           | 0.00          | 0.00             | 2.68             | 3.86         | 0.00                 | 84.90                | 84.70         |                   |                   | 18.00                 | 0.1990    | Partial super         |       | 2.87    |           | 5.08     | 0.0120 |          |            |
| P-5               | 1 100.50           | 0.00              | 0.20    | 0.00                      | 0.41     |                   |                | 0.00          | 0.00             | 2.68             |              |                      | 83.40                | 83.20         | 0.20              | 0.1990            |                       |           |                       | 2.91  |         |           |          |        |          |            |
| S-37              | S-38               | 0.46              | 0.95    | 0.44                      | 0.47     |                   |                | 0.00          | 0.00             | 0.00             | 131.96       | 128.38               | 128.38               | 128.30        | 0.08              | 0.0719            | Full                  |           |                       | 1.73  |         |           | 7.55     | 0.0120 |          |            |
| 957+00            | -52.25             | 0.08              | 0.40    | 0.03                      | 0.00     | 10.00             | 0.95           | 0.00          | 0.00             | 3.05             | 3.58         | 0.00                 | 128.80               | 128.30        |                   |                   | 18.00                 | 0.4405    | Full                  |       | 2.87    |           |          |        |          |            |
| P-5               | 1 113.50           | 0.00              | 0.20    | 0.00                      | 0.47     |                   |                | 0.00          | 0.00             | 3.05             |              |                      | 127.30               | 126.80        | 0.50              | 0.4405            |                       |           |                       | 4.27  |         |           |          |        |          |            |
| S-38              | S-36               | 0.47              | 0.95    | 0.45                      | 0.46     |                   |                | 0.00          | 0.00             | 0.00             | 131.60       | 127.47               | 127.47               | 127.67        | 4.80              | 1.5623            | Partial sub           |           |                       | 7.66  |         |           | 14.22    | 0.0120 |          |            |
| 957+00            | 64.25              | 0.03              | 0.40    | 0.01                      | 0.47     | 10.95             | 0.67           | 0.00          | 0.00             | 5.83             | 4.13         | 0.00                 | 126.80               | 123.50        |                   |                   | 18.00                 | 1.5623    | Partial sub           |       | 7.66    |           |          |        |          |            |
| P-5               | 1 307.23           | 0.00              | 0.20    | 0.00                      | 0.93     |                   |                | 0.00          | 0.00             | 5.83             |              |                      | 126.30               | 122.00        | 4.80              | 1.5623            |                       |           |                       | 8.05  |         |           |          |        |          |            |
| S-35              | S-36               | 0.40              | 0.95    | 0.38                      | 0.46     |                   |                | 0.00          | 0.00             | 0.00             | 126.11       | 123.03               | 123.03               | 122.73        | 0.30              | 0.2956            | Partial super         |           |                       | 3.48  |         |           | 6.19     | 0.0120 |          |            |
| 953+90            | -52.25             | 0.20              | 0.40    | 0.08                      | 0.00     | 10.00             | 0.49           | 0.00          | 0.00             | 2.99             | 3.07         | 0.00                 | 123.80               | 123.50        |                   |                   | 18.00                 | 0.2956    | Partial super         |       | 3.48    |           |          |        |          |            |
| P-5               | 1 101.50           | 0.00              | 0.20    | 0.00                      | 0.46     |                   |                | 0.00          | 0.00             | 2.99             |              |                      | 122.30               | 122.00        | 0.30              | 0.2956            |                       |           |                       | 3.50  |         |           |          |        |          |            |
| S-36              | S-33               | 0.49              | 0.95    | 0.47                      | 0.49     |                   |                | 0.00          | 0.00             | 0.00             | 126.11       | 118.89               | 118.89               | 113.10        | 5.79              | 2.1357            | Partial sub           |           |                       | 10.59 |         |           | 17.49    | 0.0120 |          |            |
| 953+90            | 52.25              | 0.06              | 0.40    | 0.02                      | 1.39     | 11.61             | 0.43           | 0.00          | 0.00             | 11.53            | 7.22         | 0.00                 | 119.50               | 113.10        |                   |                   | 18.00                 | 2.1357    | Partial sub           |       | 10.59   |           |          |        |          |            |
| P-5               | 1 271.00           | 0.00              | 0.20    | 0.00                      | 1.88     |                   |                | 0.00          | 0.00             | 11.53            |              |                      | 118.00               | 111.60        | 6.40              | 2.3616            |                       |           |                       | 9.90  |         |           |          |        |          |            |
| S-34              | S-33               | 0.38              | 0.95    | 0.36                      | 0.42     |                   |                | 0.00          | 0.00             | 0.00             | 116.77       | 113.16               | 113.16               | 113.10        | 0.06              | 0.0568            | Full                  |           |                       | 1.53  |         |           | 7.14     | 0.0120 |          |            |
| 951+20            | -52.25             | 0.14              | 0.40    | 0.06                      | 0.00     | 10.00             | 0.85           | 0.00          | 0.00             | 2.71             | 3.61         | 0.00                 | 113.50               | 113.10        |                   |                   | 18.00                 | 0.0568    | Full                  |       | 1.53    |           |          |        |          |            |
| P-5               | 1 101.58           | 0.00              | 0.20    | 0.00                      | 0.42     |                   |                | 0.00          | 0.00             | 2.71             |              |                      | 112.00               | 111.60        | 0.40              | 0.3938            |                       |           |                       | 4.04  |         |           |          |        |          |            |
| S-33              | S-32               | 0.60              | 0.95    | 0.57                      | 0.67     |                   |                | 0.00          | 0.00             | 0.00             | 116.43       | 112.64               | 112.64               | 103.77        | 8.88              | 2.8365            | Partial sub           |           |                       | 13.67 |         |           | 21.53    | 0.0120 |          |            |
| 951+16            | 52.25              | 0.25              | 0.40    | 0.10                      | 2.29     | 12.04             | 0.38           | 0.00          | 0.00             | 17.95            | 3.79         | 0.00                 | 113.10               | 101.90        |                   |                   | 18.00                 | 2.8365    | Partial sub           |       | 13.67   |           |          |        |          |            |
| P-6               | 1 313.02           | 0.00              | 0.20    | 0.00                      | 2.96     |                   |                | 0.00          | 0.00             | 17.95            |              |                      | 111.60               | 100.40        | 11.20             | 3.5780            |                       |           |                       | 12.18 |         |           |          |        |          |            |

Units: ENGLISH

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 Portions of ASAD were developed by Kenneth J. Learning, P.E. at International Engineering Consultants, Inc.

T60V11.RPT 7/10/2008

**STORM SEWER HYDRAULICS**

System: WDA1B

| PROJECT                                             |                    |                      |            | Organization: Arcadis G and M, Inc.<br>Designed by: Hoa Nguyen<br>Checked by: David Shearer |          |                         |                | CONDITIONS              |            |            |           |                 |                  |            |           |                  |         |               |                       |                |        |           |
|-----------------------------------------------------|--------------------|----------------------|------------|---------------------------------------------------------------------------------------------|----------|-------------------------|----------------|-------------------------|------------|------------|-----------|-----------------|------------------|------------|-----------|------------------|---------|---------------|-----------------------|----------------|--------|-----------|
| Number: 239535-4-52-01                              |                    | Description: S.R. 50 |            | Outfall Tailwater El: 83.50                                                                 |          | Storm Event - IDF Curve |                | Runoff Coeff. (default) |            |            |           |                 |                  |            |           |                  |         |               |                       |                |        |           |
| County: ORANGE                                      |                    |                      |            | Exit Loss at Outfall: 0.00                                                                  |          | Zone 7                  |                | Area 1 Area 2 Area 3    |            |            |           |                 |                  |            |           |                  |         |               |                       |                |        |           |
|                                                     |                    |                      |            | Storm Sewer Control El: 83.50                                                               |          | Frequency 3             |                | 0.95 0.40 0.20          |            |            |           |                 |                  |            |           |                  |         |               |                       |                |        |           |
| HGL method: Standard FDOT (Jump HGL to pipe crown). |                    |                      |            |                                                                                             |          |                         |                |                         |            |            |           |                 |                  |            |           |                  |         |               |                       |                |        |           |
| FROM Station Type                                   | TO Offset Brls Len | Drainage Areas       |            |                                                                                             | Tc (min) | Travel Time (min)       | Inten. (in/hr) | Total CA (ac)           | Flow (cfs) |            |           | Pipe Elevations |                  |            | Fall (ft) | Pipe Height (in) | HGL (%) | Flow Type     | Velocity/Capacity     |                | 'N'    |           |
|                                                     |                    | Area (A)             | Runoff (C) | C*A Coeff                                                                                   |          |                         |                |                         | Qb Qdw     | S-Qb S-Qdw | CIA TOTAL | Inlet Clear     | HGL Min Jnc Loss | HGL        |           |                  |         |               | Actual Physical (fps) | Capacity (cfs) |        |           |
|                                                     |                    |                      |            |                                                                                             |          |                         |                |                         |            |            |           |                 |                  | Crown Line |           |                  |         |               |                       |                |        | Flow Line |
| S-31 948+00 P-5 1                                   | S-32 -52.25 101.50 | 0.36                 | 0.95       | 0.34 0.41                                                                                   | 10.00    | 0.85                    | 6.50           | 0.41                    | 0.00       | 0.00       | 0.00      | 0.00            | 103.82           | 103.77     | 0.06      | 18.00            | 0.0560  | Full          | 1.52                  | 5.05           | 0.0120 |           |
| S-32 948+00 P-5 1                                   | S-30 52.25 297.00  | 0.49                 | 0.95       | 0.47 0.52                                                                                   | 12.42    | 0.38                    | 5.98           | 3.90                    | 0.00       | 0.00       | 0.00      | 0.00            | 102.10           | 101.90     | 0.20      | 18.00            | 0.1970  | Full          | 2.86                  |                | 0.0120 |           |
| S-29 945+00 P-5 1                                   | S-30 -52.25 101.50 | 0.37                 | 0.95       | 0.35 0.42                                                                                   | 10.00    | 0.58                    | 6.50           | 0.42                    | 0.00       | 0.00       | 0.00      | 0.00            | 97.50            | 91.30      | 6.20      | 18.00            | 2.0875  | Partial super | 2.93                  | 5.05           | 0.0120 |           |
| S-30 945+00 P-5 1                                   | S-27 52.25 197.10  | 0.34                 | 0.95       | 0.32 0.40                                                                                   | 12.80    | 0.31                    | 5.91           | 4.72                    | 0.00       | 0.00       | 0.00      | 0.00            | 90.79            | 90.59      | 0.20      | 18.00            | 0.1970  | Partial sub   | 10.43                 | 28.68          | 0.0120 |           |
| S-28 943+00 DBI-C 1                                 | S-27 68.23 7.23    | 0.00                 | 0.95       | 0.00 0.04                                                                                   | 10.00    | 0.04                    | 6.50           | 0.04                    | 0.00       | 0.00       | 0.00      | 0.00            | 88.89            | 86.15      | 0.10      | 18.00            | 1.3831  | Partial sub   | 3.04                  | 13.38          | 0.0120 |           |
| S-27 943+00 MHP-8 1                                 | S-25 58.50 96.20   | 0.00                 | 0.95       | 0.00 0.00                                                                                   | 13.11    | 0.15                    | 5.85           | 4.76                    | 0.00       | 0.00       | 0.00      | 0.00            | 86.25            | 87.50      | 0.10      | 18.00            | 1.3831  | Partial sub   | 7.57                  |                | 0.0120 |           |
| S-25 942+00 J-5 1                                   | S-26 52.25 115.88  | 0.40                 | 0.95       | 0.38 0.46                                                                                   | 15.23    | 0.00                    | 5.50           | 8.67                    | 0.00       | 0.00       | 0.00      | 0.00            | 86.10            | 86.00      | 0.10      | 18.00            | 1.4554  | Partial sub   | 10.73                 | 29.57          | 0.0120 |           |
|                                                     |                    | 0.15                 | 0.40       | 0.06 8.21                                                                                   |          |                         |                |                         | 0.00       | 0.00       | 0.00      | 0.00            | 83.72            | 83.50      | 0.22      | 42.00            | 0.1915  | Full          | 4.96                  | 45.28          | 0.0120 |           |
|                                                     |                    | 0.10                 | 0.20       | 0.02 8.67                                                                                   |          |                         |                |                         | 0.00       | 0.00       | 0.00      | 0.00            | 83.70            | 80.00      | 0.20      | 42.00            | 0.1726  |               | 4.71                  |                | 0.0120 |           |

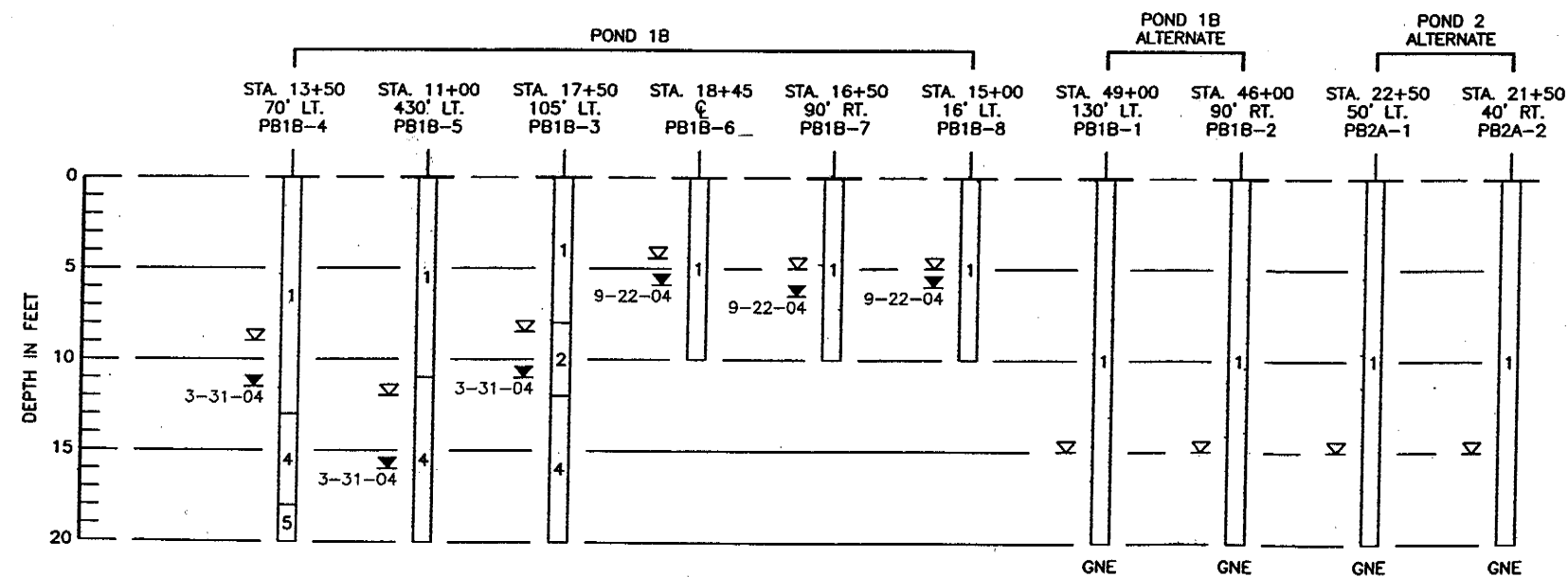
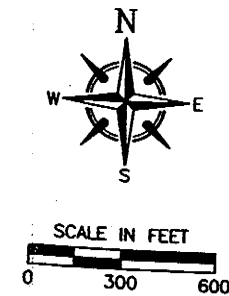
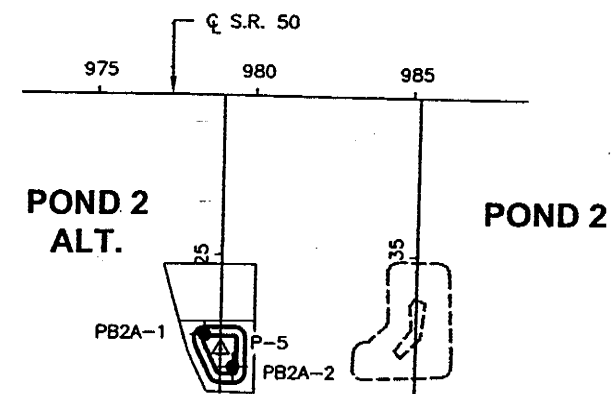
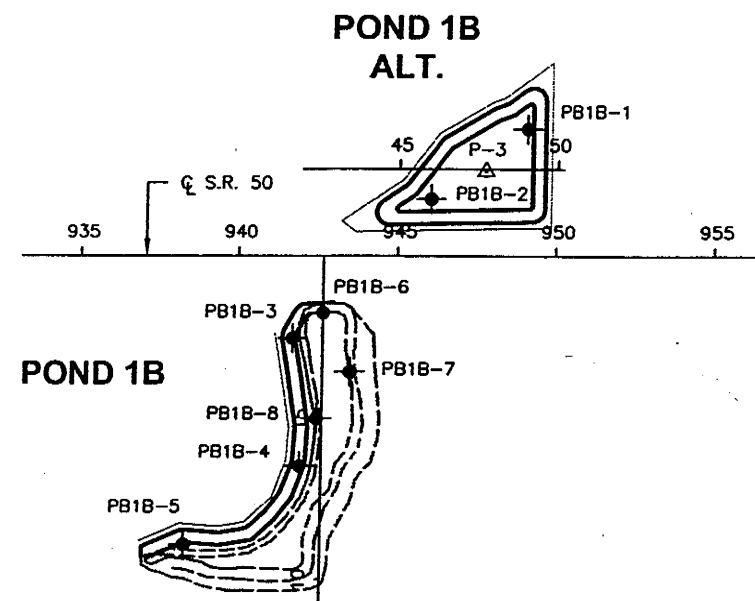
Units: ENGLISH

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 Portions of ASAD were developed by Kenneth J. Leeming, P.E. at International Engineering Consultants, Inc.

T60v11.RPT 7/10/2008

**PERMIT NUMBER 4-095-95429-2**

# **POND AUGER BORING PROFILES**



- LEGEND**
- 1 Light yellow-brown to dark gray-brown fine SAND to slightly silty fine sand, (A-3)
  - 2 Orange-brown to gray-brown silty fine SAND, (A-2-4)
  - 4 Light gray-brown clayey fine SAND, (A-2-6)
  - 5 Light green-gray CLAY, (A-7-6)
  - (A-3) A.A.S.H.T.O. soil classification group symbol
  - ▼ Depth to groundwater level in feet with date of reading.
  - 3-31-04
  - Σ Estimated seasonal high groundwater level
  - GNE Groundwater not encountered
  - ◆ Approximate location of auger boring
  - △ Approximate location of permeability test

| REVISIONS |    |             |  |
|-----------|----|-------------|--|
| Date      | By | Description |  |
|           |    |             |  |
|           |    |             |  |

ENGINEER OF RECORD:  
 ROBERT A. TROMPKE, P.E. #55456  
 PROFESSIONAL SERVICE INDUSTRIES, INC.  
 1748 33RD STREET  
 ORLANDO, FLORIDA 32839  
 (407)304-5560

LOGO: **PSI** Information To Build On  
 Engineering • Consulting • Testing  
 CERTIFICATE OF AUTHORIZATION  
 No. 00003684

STATE OF FLORIDA  
 DEPARTMENT OF TRANSPORTATION

| ROAD NO. | COUNTY | FINANCIAL PROJECT ID |
|----------|--------|----------------------|
| 50       | ORANGE | 239535-4-52-01       |

POND 1B ALT.  
 S.R. 50 FROM STA. 13+50 TO 18+45  
 ORANGE COUNTY