

APPENDIX D
DRAINAGE ANALYSIS
DOCUMENTATION



SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Seasonal High Groundwater Table, Minimum Swale Bottom & Minimum Profile Grade Elevation Summary

Well ID No.	Project System No.	Location			Average Wet Season Elev.	October Average Elev.	Approximate SHGWT Elev.	Minimum Swale Bottom Elev.	Minimum Profile Grade Elev.
		Station	Offset	Side	(ft.)	(ft.)	(ft.)	(ft.)	(ft.)
MW-1	System 1	3002+86.57	61.11	RT	21.68	21.59	22.00	23.00	26.33
MW-2		3014+41.69	23.85	RT	21.12	21.07			
MW-3	System 2	3030+95.74	46.92	LT	21.26	21.38	22.00	23.00	26.33
MW-4		3051+70.48	2.93	RT	21.75	21.87			
MW-5		3075+18.52	61.38	LT	20.67	20.65			
MW-6		3097+50.38	0.43	LT	21.98	22.10			
MW-7		3119+05.68	55.63	LT	21.59	21.76			
MW-8		3141+50.60	0.49	LT	22.21	22.16			
MW-9	System 3	3164+95.87	46.29	LT	23.44	23.58	23.50	24.50	27.83
MW-10		3184+73.12	1.52	LT	23.67	23.76			
MW-11		3208+42.23	46.78	LT	22.88	22.86			
MW-12	System 3	3229+55.86	0.64	LT	23.71	23.82	24.00	25.00	28.33
MW-13		3252+75.37	61.39	LT	23.84	24.01			
MW-14	System 4	3275+80.30	5.46	LT	23.93	24.10	24.00	25.00	28.33
MW-15		3298+82.57	43.44	LT	23.63	23.84			

Notes:

- Groundwater Table Elevation data is referenced Summary of Well Monitoring, data provided by C.H. Perez & Associates Consulting Engineers, Inc.
- Monitoring Well data are referenced from Top of Casing Elevations, data provided by C.H. Perez & Associates Consulting Engineers, Inc.
- Minimum Profile Grade Elevations are based on Pavement Design & Typical Section data provided by C.H. Perez & Associates Consulting Engineers, Inc.
- Average Wet Season Elevations are based on an average of Measured Groundwater Levels between 8/22/14 and 10/31/14.
- Average October Elevations are based on an average of Measured Groundwater Levels between 10/3/14 and 10/31/14.
- Station Offset Locations are based on "Elevation at Pipe's Reading Mark" data provided by Groundwater Survey.
- Station & Offset Values are based on Centerline of Construction.

Orthometric Height Conversion

Orthometric height conversion is performed by calculating the [datum shift](#) based from modeled values. The resulting datum shift is displayed.

The converted orthometric height is displayed only if the height to be converted from was not left blank.

***** See input format details below *****

Latitude and Longitude within the Contiguous United States are REQUIRED:

Positions may be entered in any of the following three formats:

1. degrees, minutes and decimal seconds (including leading zeros)

Lon: (XXX XX XX.XXX)	Lat: (XX XX XX.XXX)
Lon: 098 33 23.232 good	Lat: 45 33 23.232 good
Lon: 98 33 23.232 bad	Lat: 5 33 23.232 bad
Lon: 098 03 23.342 good	Lat: 45 03 03.232 good
Lon: 098 3 23.342 bad	Lat: 45 3 3.232 bad

2. degrees and decimal minutes (including leading zeros)

Lon: (XXX XX.XXX)	Lat: (XX XX.XXX)
Lon: 098 23.232 good	Lat: 45 33.232 good
Lon: 98 23.232 bad	Lat: 5 23.232 bad
Lon: 098 03.342 good	Lat: 45 03.232 good
Lon: 098 3.342 bad	Lat: 45 3.232 bad

3. decimal degrees (including leading zeros)

Lon: (XXX.XXX)	Lat: (XX.XXX)
Lon: 098.232 good	Lat: 45.232 good
Lon: 98.232 bad	Lat: 5.232 bad

Note: There MUST be one or more blanks between entry fields

Decimals can be keyed commensurate with the field's precision, but are not required.

Orthometric Height to be converted FROM is OPTIONAL:

Height may be entered in either meters or U.S. survey feet:

1. meters: xxxx.xxx
2. feet : xxxx.xx FT (MUST include FT or ft for feet !)

ENTER North Latitude :.....

ENTER West Longitude :.....

ENTER Orthometric Height : -- Entry is Optional; Default units (meters) --

SELECT Vertical Datum ☒ NGVD 29 ☐ NAVD 88 -- of the entered height --

If the orthometric height is unknown DO NOT ENTER ZERO; leave the entry field BLANK !

It is possible that the datum shift computation may not succeed.

There could be many reasons for this, including position and height entry errors. In such a case, an [error code](#)

Questions concerning the VERTCON process may be mailed to [NGS](#)

Latitude: 26 59 09.190

Longitude: 080 25 00.690

NGVD 29 height:

Datum shift (NAVD 88 minus NGVD 29): -0.420 meter = -1.38 feet

LAND USE TABLES

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS

PRE-DEVELOPMENT LAND-USE

System 1 SHGWT EL. (ft-NAVD): 20.00

System 2 SHGWT EL. (ft-NAVD): 22.00

System 3A SHGWT EL. (ft-NAVD): 23.50

System 3B SHGWT EL. (ft-NAVD): 24.00

System 4A SHGWT EL. (ft-NAVD): 24.00

System 4B SHGWT EL. (ft-NAVD): 24.00

BASIN	Time of Conc. t_c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
SYSTEM 1														
BASIN 500 (WEST PROJECT)	10	10.74	10.74	1.78	0.00	8.96	0.00	0.00	0.00	0.00	--	--	8.18	83.00
			CN=	98	CN=	80								
SYSTEM TOTALS:		10.74	10.74	1.78	0.00	8.96	0.00	0.00	0.00	0.00	--	--	--	--
SYSTEM 2														
BASIN 3A	10	30.04	30.04	4.73	0.00	25.31	0.00	0.00	0.00	0.00	24.00	2.00	1.58	88.25
BASIN 4	10	15.15	15.15	1.94	0.00	13.21	0.00	0.00	0.00	0.00	24.00	2.00	1.58	87.89
BASIN 5	10	10.17	10.17	1.34	0.00	8.83	0.00	0.00	0.00	0.00	24.00	2.00	1.58	87.94
BASIN 6	10	3.37	3.37	0.48	0.00	2.89	0.00	0.00	0.00	0.00	24.00	2.00	1.58	88.07
COMPOSITE CN														88.09
OFFSITE BASIN 1	10	12.10	0.00	0.00	0.00	0.00	12.10	2.18	0.00	9.92	23.00	1.00	0.45	96.44
OFFSITE BASIN 2	10	8.08	0.00	0.00	0.00	0.00	8.08	1.59	0.00	6.49	23.00	1.00	0.45	96.51
OFFSITE BASIN 3	10	2.91	0.00	0.00	0.00	0.00	2.91	0.85	0.00	2.06	24.00	2.00	1.58	89.94
SYSTEM TOTALS:		81.82	58.73	8.49	0.00	50.24	23.09	4.62	0.00	18.47	--	--	--	--
SYSTEM 3A														
BASIN 3B	10	22.48	22.48	3.63	0.00	18.85	0.00	0.00	0.00	0.00	24.00	1.00	0.45	96.36
BASIN 7	10	37.71	37.71	4.84	0.00	32.87	0.00	0.00	0.00	0.00	23.00	-1.00	0.00	100.00
COMPOSITE CN														98.64
OFFSITE BASIN 4	10	29.84	0.00	0.00	0.00	0.00	29.84	5.71	0.00	24.13	22.00	-2.00	0.00	100.00
SYSTEM TOTALS:		90.03	60.19	8.47	0.00	51.72	29.84	5.71	0.00	24.13	--	--	--	--

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS

PRE-DEVELOPMENT LAND-USE

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System 3B SHGWT EL. (ft-NAVD):	24.00
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System 4B SHGWT EL. (ft-NAVD):	24.00

BASIN	Time of Conc. t _c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
SYSTEM 3B														
BASIN 8	10	4.25	4.25	0.76	0.00	3.49	0.00	0.00	0.00	0.00	24.00	0.00	0.00	100.00
BASIN 9	10	8.05	8.05	1.06	0.00	6.99	0.00	0.00	0.00	0.00	23.00	-1.00	0.00	100.00
BASIN 10	10	2.68	2.68	0.44	0.00	2.24	0.00	0.00	0.00	0.00	25.00	1.00	0.45	96.38
COMPOSITE CN														99.35
OFFSITE BASIN 5	10	6.24	0.00	0.00	0.00	0.00	6.24	0.88	0.00	5.36	21.00	-3.00	0.00	100.00
SYSTEM TOTALS:		21.22	14.98	2.26	0.00	12.72	6.24	0.88	0.00	5.36	--	--	--	--
SYSTEM 4A														
BASIN WEST (EAST PROJECT)	10	3.01	3.01	0.69	0.00	2.32	0.00	0.00	0.00	0.00	--	--	--	79.50
SYSTEM TOTALS:		3.01	3.01	0.69	0.00	2.32	0.00	0.00	0.00	0.00	--	--	--	--
SYSTEM 4B														
BASIN 1 (EAST PROJECT)	10	6.28	6.28	1.66	0.00	4.62	0.00	0.00	0.00	0.00	--	--	--	80.30
BASIN 2 (EAST PROJECT)	10	5.02	5.02	1.72	0.00	3.30	0.00	0.00	0.00	0.00	--	--	--	82.20
SYSTEM TOTALS:		11.30	11.30	3.38	0.00	7.92	0.00	0.00	0.00	0.00	--	--	--	--

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS

PRE-DEVELOPMENT LAND-USE

System 1 SHGWT EL. (ft-NAVD):	20.00
System 2 SHGWT EL. (ft-NAVD):	22.00
System 3A SHGWT EL. (ft-NAVD):	23.50
System 3B SHGWT EL. (ft-NAVD):	24.00
System 4A SHGWT EL. (ft-NAVD):	24.00
System 4B SHGWT EL. (ft-NAVD):	24.00

BASIN	Time of Conc. t _c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
PROJECT TOTALS:		218.12	158.95	25.07	0.00	133.88	59.17	11.21	0.00	47.96	--	--	--	--

Notes:

- Basins 300 and 400 of the adjacent Big John Monahan Bridge Project at the western limits of this project have been included in the ICPR model for System 1 in order to simulate the Pre-Development condition for this system. Basin 500 of the project has been included in the ICPR model as well as this Pre-Development Land Use Table due to the fact that additional pavement will be added to this basin and the existing swale will be re-aligned as a result of this project.
- A small portion of Basins 1 and 2 of the adjacent project at the eastern limits of this project, located in System 4 has been included in the Land Use Table and ICPR model for System 4 in order to simulate the Pre-Development condition for this system. These basins have been included in this analysis due to the fact that additional pavement will be added to these basins as a result of this project. Only a portion of Basins 1 & 2 are within the project limits.
- Basin areas & CN's for Basin 500 are based on Design Calculations for adjacent Big John Monahan Bridge project: FPID No. 419250-2-52-01.
- Basin areas & CN's for Basin 1 (East Project), Basin 2 (East Project) & Basin West (East Project) are based on Design Calculations for adjacent SR 710 Design-Build project: FPID 432704-1-52-01 & 432706-1-52-01.

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS

POST-DEVELOPMENT LAND-USE

System 1 SHGWT EL. (ft-NAVD): 20.00
 System 2A SHGWT EL. (ft-NAVD): 22.00
 System 2B SHGWT EL. (ft-NAVD): 22.00
 System 2C SHGWT EL. (ft-NAVD): 22.25
 System 3A SHGWT EL. (ft-NAVD): 23.50
 System 3B SHGWT EL. (ft-NAVD): 23.50
 System 3C SHGWT EL. (ft-NAVD): 23.50
 System 3D SHGWT EL. (ft-NAVD): 24.00
 System 3E SHGWT EL. (ft-NAVD): 24.00
 System 3F SHGWT EL. (ft-NAVD): 24.00
 System 4A SHGWT EL. (ft-NAVD): 24.00
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BASIN	Time of Conc. t _c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
SYSTEM 1														
BASIN 500 (WEST PROJECT)	10	10.74	10.74	2.60	0.00	8.14	0.00	0.00	0.00	0.00	--	--	--	84.36
			CN=	98	CN=	80								
SYSTEM TOTALS:		10.74	10.74	2.60	0.00	8.14	0.00	0.00	0.00	0.00	--	--	--	--
SYSTEM 2A														
BASIN 3A-1	10	15.64	15.64	4.40	0.00	11.24	0.00	0.00	0.00	0.00	24.00	2.00	1.58	89.80
BASIN 4	10	9.96	9.96	3.54	0.00	6.42	0.00	0.00	0.00	0.00	25.00	3.00	3.30	82.46
BASIN 5A	10	2.49	2.49	0.90	0.00	1.59	0.00	0.00	0.00	0.00	25.00	3.00	3.30	82.60
BASIN M1	10	2.42	2.42	0.57	0.00	1.85	0.00	0.00	0.00	0.00	26.00	4.00	5.10	71.95
BASIN M2	10	2.43	2.43	0.57	0.00	1.86	0.00	0.00	0.00	0.00	26.00	4.00	5.10	71.92
BASIN M3A	10	1.21	1.21	0.30	0.00	0.91	0.00	0.00	0.00	0.00	26.00	4.00	5.10	72.28
COMPOSITE CN														83.98
OFFSITE BASIN 1	10	12.10	0.00	0.00	0.00	0.00	12.10	2.18	0.00	9.92	23.00	1.00	0.45	96.44
OFFSITE BASIN 2	10	8.08	0.00	0.00	0.00	0.00	8.08	1.59	0.00	6.49	23.00	1.00	0.45	96.51
SYSTEM TOTALS:		54.33	34.15	10.28	0.00	23.87	20.18	3.77	0.00	16.41	--	--	--	--

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POST-DEVELOPMENT LAND-USE

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System 2B SHGWT EL. (ft-NAVD):	22.00
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System 3B SHGWT EL. (ft-NAVD):	23.50
System 3C SHGWT EL. (ft-NAVD):	23.50
System 3D SHGWT EL. (ft-NAVD):	24.00
System 3E SHGWT EL. (ft-NAVD):	24.00
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BASIN	Time of Conc. t _c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
SYSTEM 2B														
BASIN 3A-2	10	7.83	7.83	2.22	0.00	5.61	0.00	0.00	0.00	0.00	24.00	2.00	1.58	89.83
BASIN 5B	10	4.21	4.21	1.50	0.00	2.71	0.00	0.00	0.00	0.00	25.00	3.00	3.30	82.48
BASIN 6	10	2.27	2.27	0.82	0.00	1.45	0.00	0.00	0.00	0.00	25.00	3.00	3.30	82.59
BASIN M3B	10	2.05	2.05	0.38	0.00	1.67	0.00	0.00	0.00	0.00	26.00	4.00	5.10	70.65
BASIN M4	10	3.50	3.50	0.69	0.00	2.81	0.00	0.00	0.00	0.00	26.00	4.00	5.10	70.95
COMPOSITE CN														82.14
OFFSITE BASIN 3	10	2.91	0.00	0.00	0.00	0.00	2.91	0.85	0.00	2.06	24.00	2.00	1.58	89.94
SYSTEM TOTALS:		22.77	19.86	5.61	0.00	14.25	2.91	0.85	0.00	2.06	--	--	--	--
SYSTEM 2C														
BASIN 3A-3	10	6.47	6.47	1.83	0.00	4.64	0.00	0.00	0.00	0.00	24.00	2.00	1.58	89.82
BASIN 7A	10	4.90	4.90	1.74	0.00	3.16	0.00	0.00	0.00	0.00	25.00	3.00	3.30	82.45
COMPOSITE CN														86.65
SYSTEM TOTALS:		11.37	11.37	3.57	0.00	7.80	0.00	0.00	0.00	0.00	--	--	--	--

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS

POST-DEVELOPMENT LAND-USE

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System 2A SHGWT EL. (ft-NAVD):	22.00
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System 3E SHGWT EL. (ft-NAVD):	24.00
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System 4A SHGWT EL. (ft-NAVD):	24.00
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BASIN	Time of Conc. t _c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
SYSTEM 3A														
BASIN 3B	10	6.24	6.24	1.76	0.00	4.48	0.00	0.00	0.00	0.00	26.00	3.00	3.30	80.85
BASIN 7B	10	4.97	4.97	1.76	0.00	3.21	0.00	0.00	0.00	0.00	26.00	3.00	3.30	82.43
BASIN M5	10	2.42	2.42	0.57	0.00	1.85	0.00	0.00	0.00	0.00	27.00	4.00	5.10	71.95
COMPOSITE CN														79.84
SYSTEM TOTALS:		13.63	13.63	4.09	0.00	9.54	0.00	0.00	0.00	0.00	--	--	--	--
SYSTEM 3B														
BASIN 3C	10	6.24	6.24	1.76	0.00	4.48	0.00	0.00	0.00	0.00	26.00	3.00	3.30	80.85
BASIN 7C	10	4.97	4.97	1.76	0.00	3.21	0.00	0.00	0.00	0.00	26.00	3.00	3.30	82.43
BASIN M6	10	2.42	2.42	0.57	0.00	1.85	0.00	0.00	0.00	0.00	27.00	4.00	5.10	71.95
COMPOSITE CN														79.84
SYSTEM TOTALS:		13.63	13.63	4.09	0.00	9.54	0.00	0.00	0.00	0.00	--	--	--	--
SYSTEM 3C														
BASIN 3D	10	6.24	6.24	1.76	0.00	4.48	0.00	0.00	0.00	0.00	26.00	3.00	3.30	80.85
BASIN 7D	10	4.97	4.97	1.76	0.00	3.21	0.00	0.00	0.00	0.00	27.00	4.00	5.10	75.22
BASIN M7	10	2.42	2.42	0.57	0.00	1.85	0.00	0.00	0.00	0.00	27.00	4.00	5.10	71.95
COMPOSITE CN														77.22
OFFSITE BASIN 4	10	29.84	0.00	0.00	0.00	0.00	29.84	5.71	0.00	24.13	22.00	-2.00	0.00	100.00
SYSTEM TOTALS:		43.47	13.63	4.09	0.00	9.54	29.84	5.71	0.00	24.13	--	--	--	--

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System 3D SHGWT EL. (ft-NAVD):	24.00
System 3E SHGWT EL. (ft-NAVD):	24.00
System 3F SHGWT EL. (ft-NAVD):	24.00
System 4A SHGWT EL. (ft-NAVD):	24.00
System 4B SHGWT EL. (ft-NAVD):	24.00

BASIN	Time of Conc. t _c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
SYSTEM 3D														
BASIN 3E	10	5.57	5.57	1.60	0.00	3.97	0.00	0.00	0.00	0.00	26.00	2.00	1.58	89.88
BASIN 7E	10	4.86	4.86	1.73	0.00	3.13	0.00	0.00	0.00	0.00	27.00	3.00	3.30	82.47
BASIN M8	10	2.36	2.36	0.60	0.00	1.76	0.00	0.00	0.00	0.00	28.00	4.00	5.10	72.45
COMPOSITE CN														83.85
SYSTEM TOTALS:		12.79	12.79	3.93	0.00	8.86	0.00	0.00	0.00	0.00	--	--	--	--
SYSTEM 3E														
BASIN 8A	10	3.11	3.11	1.31	0.00	1.80	0.00	0.00	0.00	0.00	26.00	2.00	1.58	91.62
BASIN 8B	10	0.89	0.89	0.00	0.00	0.89	0.00	0.00	0.00	0.00	26.00	2.00	1.58	86.36
BASIN 9A-1	10	2.11	2.11	1.17	0.00	0.94	0.00	0.00	0.00	0.00	27.00	3.00	3.30	87.18
BASIN 9A-2	10	0.67	0.67	0.00	0.00	0.67	0.00	0.00	0.00	0.00	26.00	2.00	1.58	86.36
BASIN M9A	10	1.36	1.36	0.43	0.00	0.93	0.00	0.00	0.00	0.00	28.00	4.00	5.10	74.14
COMPOSITE CN														86.54
SYSTEM TOTALS:		8.14	8.14	2.91	0.00	5.23	0.00	0.00	0.00	0.00	--	--	--	--

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS

POST-DEVELOPMENT LAND-USE

System 1 SHGWT EL. (ft-NAVD):	20.00
System 2A SHGWT EL. (ft-NAVD):	22.00
System 2B SHGWT EL. (ft-NAVD):	22.00
System 2C SHGWT EL. (ft-NAVD):	22.25
System 3A SHGWT EL. (ft-NAVD):	23.50
System 3B SHGWT EL. (ft-NAVD):	23.50
System 3C SHGWT EL. (ft-NAVD):	23.50
System 3D SHGWT EL. (ft-NAVD):	24.00
System 3E SHGWT EL. (ft-NAVD):	24.00
System 3F SHGWT EL. (ft-NAVD):	24.00
System 4A SHGWT EL. (ft-NAVD):	24.00
System 4B SHGWT EL. (ft-NAVD):	24.00

BASIN	Time of Conc. t _c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
SYSTEM 3F														
BASIN 9B-1	10	2.88	2.88	1.43	0.00	1.45	0.00	0.00	0.00	0.00	27.00	3.00	3.30	85.75
BASIN 9B-2	10	0.70	0.70	0.00	0.00	0.70	0.00	0.00	0.00	0.00	26.00	2.00	1.58	86.36
BASIN 10A	10	2.26	2.26	1.10	0.00	1.16	0.00	0.00	0.00	0.00	26.00	2.00	1.58	92.50
BASIN 10B	10	0.99	0.99	0.00	0.00	0.99	0.00	0.00	0.00	0.00	26.00	2.00	1.58	86.36
BASIN M9B	10	1.24	1.24	0.37	0.00	0.87	0.00	0.00	0.00	0.00	28.00	4.00	5.10	73.65
COMPOSITE CN														85.91
OFFSITE BASIN 5	10	6.24	0.00	0.00	0.00	0.00	6.24	0.88	0.00	5.36	21.00	-3.00	0.00	100.00
SYSTEM TOTALS:		14.31	8.07	2.90	0.00	5.17	6.24	0.88	0.00	5.36	--	--	--	--
SYSTEM 4A														
BASIN 11	10	1.24	1.24	0.37	0.00	0.87	0.00	0.00	0.00	0.00	26.00	2.00	1.58	90.02
SYSTEM TOTALS:		1.24	1.24	0.37	0.00	0.87	0.00	0.00	0.00	0.00	--	--	--	--

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS

POST-DEVELOPMENT LAND-USE

System 1 SHGWT EL. (ft-NAVD):	20.00
System 2A SHGWT EL. (ft-NAVD):	22.00
System 2B SHGWT EL. (ft-NAVD):	22.00
System 2C SHGWT EL. (ft-NAVD):	22.25
System 3A SHGWT EL. (ft-NAVD):	23.50
System 3B SHGWT EL. (ft-NAVD):	23.50
System 3C SHGWT EL. (ft-NAVD):	23.50
System 3D SHGWT EL. (ft-NAVD):	24.00
System 3E SHGWT EL. (ft-NAVD):	24.00
System 3F SHGWT EL. (ft-NAVD):	24.00
System 4A SHGWT EL. (ft-NAVD):	24.00
System 4B SHGWT EL. (ft-NAVD):	24.00

BASIN	Time of Conc. t _c (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)	AVERAGE GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	COMPACTED SOIL STORAGE (in)	CURVE NUMBER
SYSTEM 4B														
BASIN 1 (EAST PROJECT)	10	6.28	6.28	2.31	0.00	3.97	0.00	0.00	0.00	0.00	--	--	--	80.94
			CN=	98										
BASIN 2 (EAST PROJECT)	10	5.02	5.02	1.90	0.00	3.12	0.00	0.00	0.00	0.00	--	--	--	84.21
			CN=	98										
BASIN M10	10	0.50	0.50	0.07	0.00	0.43	0.00	0.00	0.00	0.00	28.00	4.00	5.10	69.51
SYSTEM TOTALS:		11.80	11.80	4.28	0.00	7.52	0.00	0.00	0.00	0.00	--	--	--	--
PROJECT TOTALS:		218.22	159.05	48.72	0.00	110.33	59.17	11.21	0.00	47.96	--	--	--	--

Notes:

- Basins 300 and 400 of the adjacent Big John Monahan Bridge Project at the western limits of this project have been included in the ICPR model for System 1 in order to simulate the Post-Development condition for this system. Basin 500 of the project has been included in the ICPR model as well as this Pre-Development Land Use Table due to the fact that additional pavement will be added to this basin and the existing swale will be re-aligned as a result of this project.
- A small portion of Basins 1 and 2 of the adjacent project at the eastern limits of this project, located in System 4 has been included in the Land Use Table and ICPR model for System 4 in order to simulate the Post-Development condition for this system. These basins have been included in this analysis due to the fact that additional pavement will be added to these basins as a result of this project. Only a portion of Basins 1 & 2 are within the project limits.
- Basin areas & CN's for Basin 500 are based on Design Calculations for adjacent Big John Monahan Bridge project: FPID No. 419250-2-52-01.
- Basin areas & CN's for Basin 1 (East Project) & Basin 2 (East Project) are based on Design Calculations for adjacent SR 710 Design-Build project: FPID 432704-1-52-01 & 432706-1-52-01.

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Indian Sun Groves - Permitted Site Data

SFWMD Permit No.: 43-00347, Application No.: 12125-D

NAVD-NGVD Conversion factor: 1.38 ft

Stage-Area Calculations*

Indian Sun Groves - Grove

ISG AGRICULT (GROVE)		
STAGE (ft-NGVD)	STAGE (ft-NAVD)	VOLUME (Ac-ft)
--	--	--
22.00	20.62	0.00
22.50	21.12	31.50
23.00	21.62	63.00
23.50	22.12	94.50
24.00	22.62	126.00
24.50	23.12	201.63
25.00	23.62	365.50
25.50	24.12	617.63
26.00	24.62	958.00

Indian Sun Groves - Reservoir

ISG RESERVOIR		
STAGE (ft-NGVD)	STAGE (ft-NAVD)	VOLUME (Ac-ft)
--	--	--
27.00	25.62	0.00
27.50	26.12	35.00
28.00	26.62	70.00
28.50	27.12	105.00
29.00	27.62	140.00
29.50	28.12	175.00
30.00	28.62	210.00

* Refer to Tables 3 & 4 for Stage Storage Tables

Pump Rating Curves & Operating Tables***

Pump No.	On Elev.		Off Elev.		Discharge Rate
	NAVD (ft)	NGVD (ft)	NAVD (ft)	NGVD (ft)	
-					(cfs)
1	22.5	21.12	22	20.62	40
2	23	21.62	22.5	21.12	120

*** Refer to Table 6 for for Pump Operating Schedule

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Indian Sun Groves - Permitted Site Data

Land Use Breakdown**

Area Breakdown - Grove

Land use	Area	Area
Type	Total (Acres)	Impervious (Acres)
Canals	63	63
Roads	60	0
Swales	706	0
Tree Beds	706	0
Total	1535	63

Area Breakdown - Reservoir

Land use	Area	Area
Type	Total (Acres)	Impervious (Acres)
Reservoir	70	70
Total	70	70

Curve Number (CN): 70

Curve Number (CN): 100

** Refer to Table 1 for Proposed Land Use Table

Existing Outfall Information to SFWMD C-44 Canal					
Weir Elevation:	29.00	ft-NGVD	27.62	ft-NAVD	
V-Notch Elevation:	27.00	ft-NGVD	25.62	ft-NAVD	
Weir Length (ft):	25.13	Existing V-Notch(s) Angle (deg):			161.9
Culvert Length (ft):	60.00	Existing V-Notch Angle (rad):			2.83
Culvert Diameter (ft):	6.00	V-Notch Height [= <i>H</i>] (ft):			2.00
Culvert Invert (ft-NGVD):	23.00	V-Notch Top Width (ft):			25.11
Culvert Invert (ft-NAVD):	21.62	V-Notch Sideslope [horz./vert.]:			6.2783
Culvert N-value:	0.013				

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS

Percolation Parameters

System 2

System 2A SHGWT EL. (ft-NAVD): 22.00

System 2B SHGWT EL. (ft-NAVD): 22.00

System 2C SHGWT EL. (ft-NAVD): 22.25

Linear Dry Retention Pond Name	Length (L) @ Elev. 24.00' (ft.)	Width (W) @ Elev. 24.00' (ft.)	Perimeter 1 (P1) (ft.)	Distance 1-2 X(1-2) / R1 (ft.)	Spacing 1-2 (ft.)	Number of Cells (1-2)	Perimeter 2 (P2) (ft.)	Distance 2-3 X(2-3) / R1 (ft.)	Perimeter 3 (P3) (ft.)	Spacing 2-3 (ft.)	Number of Cells (2-3)
Swale 3A-1	6524.00	52.00	13152.00	50	5	10	13466.00	450	16292.00	10	45
Swale 3A-2*	3234.00	51.00	6519.00	50	5	10	6833.00	450	9659.00	10	45
Swale 3A-3*	2676.00	44.50	5396.50	50	5	10	5710.50	450	8536.50	10	45
Swale 4	5192.00	29.00	10442.00	50	5	10	10756.00	450	13582.00	10	45
Swale 5A	1224.00	39.00	2526.00	50	5	10	2840.00	450	5666.00	10	45
Swale 5B	2157.00	33.00	4380.00	50	5	10	4694.00	450	7520.00	10	45
Swale 6*	1133.00	34.50	2300.50	50	5	10	2614.50	450	5440.50	10	45
Swale 7A*	2546.00	24.00	5116.00	50	5	10	5430.00	450	8256.00	10	45

* - width of swale removed from perimeter calculation due to higher groundwater conditions at interface between Systems 2B & 2C, and between Systems 2C and 3A.

ADICPR PERCOLATION PARAMETERS		
Surface Area Option	Vary based on Stage/Area Table	
Vertical Flow Termination	Horizontal Flow Algorighm	
Aquifer Base Elevation (ft)**	-20.00	
Annual Recharge Rate (in/yr)**	0.00	
Horizontal Conductivity (ft/day)	7.08	
Vertical Conductivity (ft/day)	4.72	
Effective Porosity (dec)**	0.20	
Suction Head (in)**	5.59	
Layer Thickness (ft)**	0.00	

HYDRAULIC CONDUCTIVITY - PT-1***	Hydraulic Conductivity, K	Infiltration Rate (ft-day)
Unsaturated Vertical Hydraulic Conductivity (K_{vu})	8.20E-05	7.08
Horizontal Hydraulic Conductivity ($K_h = K_{vu}$)		7.08
Saturated Vertical Hydraulic Conductivity ($K_{vs} = K_h / 1.5$)		4.72

** - Information was taken from Stormwater Management Report for SR 710 Big John Monahan Bridge Replacement Design Build (FPID 419250-2-52-01) (SFWMD Permit No: 43-00802-S, Application No: 110909-1)

*** - Information was taken from SR 710 PD&E Pond Siting Report - Geotechnical Report, Percolation Test PT-1

NUTRIENT LOADING CALCULATIONS

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
NUTRIENT LOADING ANALYSIS - SYSTEM 3A-3D

*NOTES: Calculations are based upon the Final Report of the Evaluation of Current Stormwater Design Criteria within the State of Florida (FDEP New Rule).

References made on this spreadsheet to equations, tables, figures, and page numbers are to the FDEP Stormwater Quality Applicant's Handbook (March 2010 Draft)

Pre-Development Conditions

Total Area	60.19	ac
Impervious Area	8.47	ac
Pervious Area	51.72	ac
Percent Impervious Area	14.07%	%
Percent Pervious Area	85.93%	%

Refer to Drainage Maps and Land Use Tables.

Impervious Area Breakdown

DCIA	0.00	ac	%DCIA	0.00%
NDCIA	8.47	ac	%NDCIA	100.00%

Post-Development Conditions

Total Area	53.68	ac
Impervious Area	16.20	ac
Pervious Area	37.48	ac
Percent Impervious Area	30.18%	%
Percent Pervious Area	69.82%	%

Refer to Drainage Maps and Land Use Tables.

Impervious Area Breakdown

DCIA	0.00	ac	%DCIA	0.00%
NDCIA	16.20	ac	%NDCIA	100.00%

Curve Number Calculations

Florida Meteorological Zone:

5

(From Figure 3.1)

Pre-Development:

Composite CN: 98.64

Refer to Land Use Tables.

Post-Development:

Composite CN: 72.89

Refer to Land Use Tables.

Pre-Development:

Non-DCIA CN= 98.00

Post-Development:

Non-DCIA CN= 72.89

C-values Calculations:

(from Appendix E)

Pre-Development

		DCIA %	
		0	5
NDCIA CN	95	0.445	0.464
	98	0.614	0.624

Pre-Development DCIA % =	0.00
Pre-Development NDCIA CN =	98.00
Pre-Development C-value =	0.614

Post-Development

		DCIA %	
		0	5
NDCIA CN	70	0.093	0.129
	75	0.120	0.155

Post-Development DCIA % =	0.00
Post-Development NDCIA CN =	72.89
Post-Development C-value =	0.109

Treatment Calculations

Determine retention volume required for 85% treatment:

(from Appendix D)

Post-Development

		DCIA %	
		10	15
NDCIA CN	70	1.880	1.700
	75	2.020	1.880

Post-Development DCIA % =	10.00
Post-Development NDCIA CN =	72.89
Dry Detention Depth for an Annual Mass Removal Efficiency of 85%	1.96

Retention Volume (ac-ft):	8.77	(Page 172)
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Nutrient Loading Calculations

Calculation of Pre- and Post-Development Loadings:

Annual Rainfall Depth (in/yr):	56	(from Figure 3.5)
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Total Annual Runoff Volume (ac-ft/yr) = Area (Ac) x Annual Rainfall Depth (ft/yr) x C (Page 11)

Pre-Development Total Annual Runoff Volume (ac-ft/yr)	172.46
Post-Development Total Annual Runoff Volume (ac-ft/yr)	27.20

Event Mean Concentrations (EMC's):		
Land Use	Total P (mg/L)	Total N (mg/L)
Highway	0.170	1.370

(From Table 3.4)

Annual Mass Loadings (kg/yr) =
Annual Runoff Volume (ac-ft/year)
x EMC (mg/L) [Equation 3-2]

With Conversions: Annual Mass Loadings (kg/yr) =
Vol (ac-ft/yr) x (43,560 ft²/yr) x (7.48 gal/ft³) x
(3.875 liter/gal) x EMC (mg/L) x (1 kg/106 mg)

Total Pre-Development Phosphorus Load:	37.02	kg/yr
Total Post-Development Phosphorus Load:	5.84	kg/yr
Required Phosphorous Removal Efficiency:	-534.0%	

Total Pre-Development Nitrogen Load:	298.32	kg/yr
Total Post-Development Nitrogen Load:	47.05	kg/yr
Required Nitrogen Removal Efficiency:	-534.0%	

Additional Nutrient Removal Required?	No
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SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
NUTRIENT LOADING ANALYSIS - SYSTEM 3E-4A

*NOTES: Calculations are based upon the Final Report of the Evaluation of Current Stormwater Design Criteria within the State of Florida (FDEP New Rule).

References made on this spreadsheet to equations, tables, figures, and page numbers are to the FDEP Stormwater Quality Applicant's Handbook (March 2010 Draft)

Pre-Development Conditions

Total Area	17.99	ac
Impervious Area	2.95	ac
Pervious Area	15.04	ac
Percent Impervious Area	16.40%	%
Percent Pervious Area	83.60%	%

Refer to Drainage Maps and Land Use Tables.

Impervious Area Breakdown

DCIA	0.00	ac	%DCIA	0.00%
NDCIA	2.95	ac	%NDCIA	100.00%

Post-Development Conditions

Total Area	17.45	ac
Impervious Area	6.18	ac
Pervious Area	11.27	ac
Percent Impervious Area	35.42%	%
Percent Pervious Area	64.58%	%

Refer to Drainage Maps and Land Use Tables.

Impervious Area Breakdown

DCIA	0.00	ac	%DCIA	0.00%
NDCIA	6.18	ac	%NDCIA	100.00%

Curve Number Calculations

Florida Meteorological Zone:

5

(From Figure 3.1)

Pre-Development:

Composite CN: 96.03

Refer to Land Use Tables.

Post-Development:

Composite CN: 82.47

Refer to Land Use Tables.

Pre-Development:

Non-DCIA CN= 96.03

Post-Development:

Non-DCIA CN= 82.47

C-values Calculations:

(from Appendix E)

Pre-Development

		DCIA %	
		0	5
NDCIA CN	95	0.445	0.464
	98	0.614	0.624

Pre-Development DCIA % =	0.00
Pre-Development NDCIA CN =	96.03
Pre-Development C-value =	0.503

Post-Development

		DCIA %	
		0	5
NDCIA CN	80	0.157	0.189
	85	0.209	0.239

Post-Development DCIA % =	0.00
Post-Development NDCIA CN =	82.47
Post-Development C-value =	0.183

Treatment Calculations

Determine retention volume required for 85% treatment:

(from Appendix D)

Post-Development

		DCIA %	
		10	15
NDCIA CN	80	2.160	2.050
	85	2.280	2.190

Post-Development DCIA % =	10.00
Post-Development NDCIA CN =	82.47
Dry Detention Depth for an Annual Mass Removal Efficiency of 85% (in) =	2.22

Retention Volume (ac-ft):	3.23	(Page 172)
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Nutrient Loading Calculations

Calculation of Pre- and Post-Development Loadings:

Annual Rainfall Depth (in/yr):	56	(from Figure 3.5)
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Total Annual Runoff Volume (ac-ft/yr) = Area (Ac) x Annual Rainfall Depth (ft/yr) x C (Page 11)

Pre-Development Total Annual Runoff Volume (ac-ft/yr)	42.23
Post-Development Total Annual Runoff Volume (ac-ft/yr)	14.88

Event Mean Concentrations (EMC's):		
Land Use	Total P (mg/L)	Total N (mg/L)
Highway	0.170	1.370

(From Table 3.4)

Annual Mass Loadings (kg/yr) =
Annual Runoff Volume (ac-ft/year)
x EMC (mg/L) [Equation 3-2]

With Conversions: Annual Mass Loadings (kg/yr) =
Vol (ac-ft/yr) x (43,560 ft²/yr) x (7.48 gal/ft³) x
(3.875 liter/gal) x EMC (mg/L) x (1 kg/106 mg)

Total Pre-Development Phosphorus Load:	9.06	kg/yr
Total Post-Development Phosphorus Load:	3.19	kg/yr
Required Phosphorous Removal Efficiency:	-183.8%	

Total Pre-Development Nitrogen Load:	73.05	kg/yr
Total Post-Development Nitrogen Load:	25.74	kg/yr
Required Nitrogen Removal Efficiency:	-183.8%	

Additional Nutrient Removal Required?	No
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WATER QUALITY CALCULATIONS

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	*DIRECT DISCHARGE TO IMPAIRED WATERWAY (150%)	*TREATMENT CREDIT: DRY RETENTION (50%) DRY DETENTION (75%)	*TREATMENT VOLUME REQUIRED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 1 (WEST PROJECT)											
POST-DEVELOPMENT CONDITION											
POST-DEVELOPMENT SYSTEM 1 (BASIN 500) TOTALS:	10.74	2.60	8.14	0.895	0.54	0.895	1.343	0.671	0.671	1.593	0.922
PRE-DEVELOPMENT CONDITION											
*PRE-DEVELOPMENT SYSTEM 1 (BASIN 500) TOTALS:	10.74	1.78	8.96	0.895	0.371	0.895	1.343	0.671	0.671	1.625	0.954
WEST PROJECT - POST DEVELOPMENT CONDITION SUMMARY											
ADDITIONAL WATER QUALITY TREATMENT VOLUME REQUIREMENT (DUE TO THIS PROJECT):										0.00	Ac-Ft
WATER QUALITY TREATMENT VOLUME PROVIDED REDUCED (DUE TO THIS PROJECT):										0.03	Ac-Ft
TOTAL WATER QUALITY TREATMENT VOLUME PROVIDED REDUCTION (DUE TO THIS PROJECT):										0.03	Ac-Ft
PREVIOUS PROJECT WATER QUALITY TREATMENT VOLUME REQUIREMENT (ENTIRE WEST PROJECT BASIN 500):										0.671	Ac-Ft
PREVIOUS PROJECT WATER QUALITY TREATMENT VOLUME PROVIDED (ENTIRE WEST PROJECT BASIN 500):										1.625	Ac-Ft
PREVIOUS PROJECT SURPLUS WATER QUALITY TREATMENT PROVIDED (ENTIRE WEST PROJECT BASIN 500):										0.954	Ac-Ft
POST-DEVELOPMENT TOTAL WATER QUALITY TREATMENT VOLUME REQUIRED (BOTH PROJECTS):										0.671	Ac-Ft
POST-DEVELOPMENT TOTAL WATER QUALITY TREATMENT VOLUME PROVIDED (BOTH PROJECTS):										1.593	Ac-Ft
POST-DEVELOPMENT SURPLUS WATER QUALITY TREATMENT VOLUME PROVIDED (BOTH PROJECTS):										0.922	Ac-Ft

*Refer to SFWMD Permit No. 43-00802-S for Water Quality Calculations for FPID No. 419250-2-52-01. Water quality treatment volume provided within Basin 500.

¹Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

SYSTEM 1														
BASIN 500 / SWALE 2 WEST PROJECT (PERMIT CONDITION)			BASIN 500 / SWALE 2 WEST PROJECT AREA DIFFERENTIAL (POST-DEVELOPMENT CONDITON)			BASIN 500 / SWALE 2 WEST PROJECT (POST-DEVELOPMENT CONDITION)			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
20.00	0.200	0.00	20.00	0.00	0.00	20.00	0.20	0.00			0.00			0.00
21.00	0.850	0.525	21.00	-0.082	-0.041	21.00	0.77	0.484			0.00			0.00
22.00	1.350	1.625	22.00	0.101	-0.032	22.00	1.45	1.593			0.00			0.00
23.00	1.870	3.235	23.00	0.284	0.160	23.00	2.15	3.395						

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) [POST-DEV.]	ONSITE IMPERVIOUS AREA (Ac.) [POST-DEV.]	ONSITE PERVIOUS AREA (Ac.) [POST-DEV.]	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 2A												
SYSTEM 2A TOTALS:	34.15	10.28	23.87	2.85	2.14	2.85	0.00	0.00	18.98	0.00	37.95	35.11

¹Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

* Water quality treatment provided by adjacent project.

SYSTEM 2A														
SWALE 3A-1			SWALE 4			SWALE 5A			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
23.00	6.78	0.00	23.00	2.85	0.00	23.00	0.64	0.00			--			--
23.50	7.46	3.56	23.50	3.45	1.58	23.50	0.80	0.36			0.00			0.00
24.00	8.19	7.47	24.00	4.10	3.46	24.00	0.96	0.80			0.00			0.00
24.50	9.47	11.89	24.50	5.07	5.76	24.50	1.18	1.34			0.00			0.00
25.00	9.67	16.67	25.00	5.20	8.32	25.00	1.21	1.93			0.00			0.00
SYSTEM 2A TOTALS	STAGE-AREA RELATIONSHIP					REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
	TYPE:		DRY RETENTION											
	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)			ELEVATION (ft-NAVD)			BERM ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)		
	23.00	10.27	0.00	DRY RETENTION			DRY RETENTION							
	23.50	11.71	5.50	1.42			23.13			24.50	18.98	17.55		
	24.00	13.25	11.74											
	24.50	15.72	18.98											
	25.00	16.08	26.93											

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 2B												
SYSTEM 2B TOTALS:	19.86	5.61	14.25	1.66	1.17	1.66	0.00	0.00	9.56	0.00	19.12	17.47

¹ Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

* Water quality treatment provided by adjacent project.

SYSTEM 2B														
SWALE 3A-2			SWALE 5B			SWALE 6			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
23.00	3.31	0.00	23.00	1.15	0.00	23.00	0.61	0.00			--			--
23.50	3.70	1.75	23.50	1.43	0.65	23.50	0.75	0.34			0.00			0.00
24.00	4.12	3.71	24.00	1.72	1.43	24.00	0.90	0.75			0.00			0.00
24.50	4.72	5.92	24.50	2.11	2.39	24.50	1.11	1.26			0.00			0.00
25.00	4.80	8.30	25.00	2.16	3.46	25.00	1.14	1.82			0.00			0.00
25.50	4.81	10.70												
SYSTEM 2B TOTALS	STAGE-AREA RELATIONSHIP					REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
	TYPE:		DRY RETENTION											
	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)			ELEVATION (ft-NAVD)			BERM ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)		
	23.00	5.07	0.00	DRY RETENTION			DRY RETENTION							
	23.50	5.88	2.74	0.83			23.15			24.50	9.56	8.73		
	24.00	6.74	5.89											
	24.50	7.94	9.56											
	25.00	8.10	13.57											

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 2C												
SYSTEM 2C TOTALS:	11.37	3.57	7.80	0.95	0.74	0.95	0.00	0.00	6.56	0.00	13.12	12.18

¹ Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

* Water quality treatment provided by adjacent project.

SYSTEM 2C														
SWALE 3A-3			SWALE 7A			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
23.25	2.49	0.00	23.25	0.96	0.00			--			--			--
23.50	2.65	0.64	23.50	1.13	0.26			0.00			0.00			0.00
24.00	2.98	2.05	24.00	1.47	0.91			0.00			0.00			0.00
24.50	3.34	3.63	24.50	1.81	1.73			0.00			0.00			0.00
25.00	3.83	5.42	25.00	2.27	2.75			0.00			0.00			0.00
25.50	3.95	7.37	25.50	2.38	3.91									
SYSTEM 2C TOTALS			STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
			TYPE:	DRY RETENTION										
			STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)			ELEVATION (ft-NAVD)			BERM ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)
			23.25	3.45	0.00	DRY RETENTION			DRY RETENTION					
			23.50	3.78	0.90	0.47			23.38			24.75	6.56	6.09
			24.00	4.45	2.96									
			24.50	5.15	5.36									
			25.00	6.10	8.17									
			25.50	6.33	11.28									

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) [POST-DEV.]	ONSITE IMPERVIOUS AREA (Ac.) [POST-DEV.]	ONSITE PERVIOUS AREA (Ac.) [POST-DEV.]	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 3A												
SYSTEM 3A TOTALS:	13.63	4.09	9.54	1.14	0.85	1.14	3.08	0.00	0.00	0.00	4.10	2.97

¹Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

*Water quality treatment provided by adjacent project.

SYSTEM 3A														
SWALE 3B			SWALE 7B			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
24.50	2.59	0.00	24.50	0.93	0.00			--			--			--
25.00	2.94	1.38	25.00	1.28	0.55			0.00			0.00			0.00
25.50	3.29	2.94	25.50	1.63	1.28			0.00			0.00			0.00
26.00	3.73	4.70	26.00	2.07	2.21			0.00			0.00			0.00
26.50	3.76	6.57	26.50	2.10	3.25			0.00			0.00			0.00
SYSTEM 3A TOTALS			STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
			TYPE:	DRY DETENTION										
			STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)			ELEVATION (ft-NAVD)			WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)
			24.50	3.52	0.00	DRY DETENTION			DRY DETENTION					
			25.00	4.22	1.94	0.85			24.72			25.25	3.08	2.23
			25.50	4.92	4.22									
			26.00	5.80	6.90									
			26.50	5.86	9.82									

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 3B												
SYSTEM 3B TOTALS:	13.63	4.09	9.54	1.14	0.85	1.14	3.08	0.00	0.00	0.00	4.11	2.98

¹ Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

* Water quality treatment provided by adjacent project.

SYSTEM 3B														
SWALE 3C			SWALE 7C			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
24.50	2.34	0.00	24.50	0.91	0.00			--			--			--
25.00	2.69	1.26	25.00	1.25	0.54			0.00			0.00			0.00
25.50	3.04	2.69	25.50	1.60	1.25			0.00			0.00			0.00
26.00	3.51	4.33	26.00	2.07	2.17			0.00			0.00			0.00
26.50	3.57	6.10	26.50	2.13	3.22			0.00			0.00			0.00
SYSTEM 3B TOTALS			STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
			TYPE:	DRY DETENTION										
			STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)	ELEVATION (ft-NAVD)	WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)				
			24.50	3.25	0.00	DRY DETENTION			DRY DETENTION					
			25.00	3.94	1.80	0.85			24.74			25.30	3.08	2.23
			25.50	4.64	3.94									
			26.00	5.58	6.50									
			26.50	5.70	9.32									

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) [POST-DEV.]	ONSITE IMPERVIOUS AREA (Ac.) [POST-DEV.]	ONSITE PERVIOUS AREA (Ac.) [POST-DEV.]	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 3C												
SYSTEM 3C TOTALS:	13.63	4.09	9.54	1.14	0.85	1.14	2.88	0.00	0.00	0.00	3.84	2.71

¹Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

* Water quality treatment provided by adjacent project.

SYSTEM 3C																		
SWALE 3D			SWALE 7D			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]						
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)				
24.50	2.34	0.00	24.50	0.92	0.00			--			--			--				
25.00	2.69		25.00	1.27	0.55			0.00			0.00			0.00				
25.50	3.04	2.69	25.50	1.62	1.27			0.00			0.00			0.00				
26.00	3.50	4.33	26.00	2.09	2.20			0.00			0.00			0.00				
26.50	3.62	6.11	26.50	2.21	3.27			0.00			0.00			0.00				
27.00	3.63	7.92	27.00	2.22	4.38			0.00			0.00			0.00				
SYSTEM 3C TOTALS	STAGE-AREA RELATIONSHIP					REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT						
	TYPE:		DRY DETENTION															
	STAGE (ft-NAVD)		AREA (Ac.)		VOLUME (Ac-ft)		VOLUME (Ac-ft)			ELEVATION (ft-NAVD)			WEIR ELEVATION (ft-NAVD)		VOLUME PROVIDED (Ac-ft)		SURPLUS VOLUME (Ac-ft)	
	24.50		3.26		0.00		DRY DETENTION			DRY DETENTION								
	25.00		3.96		1.81		0.85			24.74			25.25		2.88		2.03	
	25.50		4.66		3.96													
	26.00		5.59		6.52													
	26.50		5.83		9.38													
	27.00		5.85		12.30													

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 3D												
SYSTEM 3D TOTALS:	12.79	3.93	8.86	1.07	0.82	1.07	2.63	0.00	0.00	0.00	3.50	2.43

¹Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

*Water quality treatment provided by adjacent project.

SYSTEM 3D														
SWALE 3E			SWALE 7E			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
25.00	1.99	0.00	25.00	0.73	0.00			--			--			--
25.50	2.30	1.07	25.50	1.06	0.45			0.00			0.00			0.00
26.00	2.61	2.30	26.00	1.40	1.06			0.00			0.00			0.00
26.50	3.02	3.71	26.50	1.85	1.88			0.00			0.00			0.00
27.00	3.07	5.23	27.00	1.91	2.82			0.00			0.00			0.00
SYSTEM 3D TOTALS	STAGE-AREA RELATIONSHIP					REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
	TYPE:	DRY DETENTION												
	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)			ELEVATION (ft-NAVD)			WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)		
	25.00	2.72	0.00	DRY DETENTION			DRY DETENTION							
	25.50	3.36	1.52	0.80			25.26			25.80	2.63	1.83		
	26.00	4.01	3.36											
	26.50	4.87	5.58											
	27.00	4.98	8.05											

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
WATER QUALITY TREATMENT CALCULATIONS

SYSTEM	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 3E												
SYSTEM 3E TOTALS:	8.14	2.91	5.23	0.68	0.61	0.68	1.01	0.00	0.00	0.00	1.34	0.67

¹ Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

² Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

* Water quality treatment provided by adjacent project.

SYSTEM 3E														
SWALE 8			SWALE 9A			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
25.00	0.86	0.00	25.00	0.19	0.00			--			--			--
25.50	1.00	0.47	25.50	0.29	0.12			0.00			0.00			0.00
26.00	1.14	1.00	26.00	0.39	0.29			0.00			0.00			0.00
26.50	1.32	1.62	26.50	0.52	0.52			0.00			0.00			0.00
27.00	1.35	2.28	27.00	0.54	0.78			0.00			0.00			0.00
SYSTEM 3E TOTALS			STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
			TYPE:	DRY DETENTION										
			STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)			ELEVATION (ft-NAVD)			WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)
			25.00	1.05	0.00	DRY DETENTION			DRY DETENTION					
			25.50	1.29	0.59	0.51			25.45			25.80	1.01	0.50
			26.00	1.53	1.29									
			26.50	1.84	2.13									
			27.00	1.89	3.07									

SYSTEM	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 3F												
SYSTEM 3F TOTALS:	8.07	2.90	5.17	0.67	0.60	0.67	0.83	0.00	0.00	0.00	1.11	0.44

* Water quality treatment provided by adjacent project.

SYSTEM 3F														
SWALE 9B			SWALE 10			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
25.00	0.27	0.00	25.00	0.56	0.00			--			--			--
25.50	0.42	0.17	25.50	0.65	0.30			0.00			0.00			0.00
26.00	0.57	0.42	26.00	0.74	0.65			0.00			0.00			0.00
26.50	0.78	0.76	26.50	0.86	1.05			0.00			0.00			0.00
27.00	0.81	1.16	27.00	0.88	1.49			0.00			0.00			0.00
SYSTEM 3F TOTALS			STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
			TYPE:	DRY DETENTION										
			STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)	ELEVATION (ft-NAVD)	WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)				
			25.00	0.83	0.00	DRY DETENTION			DRY DETENTION					
			25.50	1.07	0.48	0.50			25.52			25.80	0.83	0.33
			26.00	1.31	1.07									
			26.50	1.64	1.81									
			27.00	1.69	2.64									

SYSTEM	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 4A												
SYSTEM 4A TOTALS:	1.24	0.37	0.87	0.10	0.08	0.10	0.25	0.00	0.00	0.00	0.34	0.23

* Water quality treatment provided by adjacent project.

SYSTEM 4A														
SWALE 11			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
25.00	0.38	0.00			0.00			--			--			--
25.50	0.44	0.21			0.00			0.00			0.00			0.00
26.00	0.50	0.44			0.00			0.00			0.00			0.00
26.50	0.58	0.71			0.00			0.00			0.00			0.00
27.00	0.59	1.00			0.00			0.00			0.00			0.00
SYSTEM 4A TOTALS			STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME			MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT			PROVIDED WATER QUALITY TREATMENT		
			TYPE:	DRY DETENTION										
			STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)	ELEVATION (ft-NAVD)	WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)				
			25.00	0.38	0.00	DRY DETENTION			DRY DETENTION					
			25.50	0.44	0.21	0.08			25.19			25.60	0.25	0.17
			26.00	0.50	0.44									
			26.50	0.58	0.71									
			27.00	0.59	1.00									

SYSTEM	BASIN	TOTAL ONSITE AREA (Ac.) [POST-DEV.]	ONSITE IMPERVIOUS AREA (Ac.) [POST-DEV.]	ONSITE PERVIOUS AREA (Ac.) [POST-DEV.]	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	1" WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET- DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET- RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	2" TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM 4B (EAST PROJECT)													
POST-DEVELOPMENT CONDITION													
4B	BASIN 1	6.28	2.31	3.97	0.52	0.48	0.52	0.40	0.00	0.00	0.00	0.53	0.01
	BASIN 2	5.02	1.90	3.12	0.42	0.40	0.42	0.25	0.00	0.00	0.00	0.33	-0.09
	BASIN M10	0.50	0.07	0.43	0.04	0.01	0.04	0.00	0.00	0.00	0.00	0.00	-0.04
POST-DEVELOPMENT SYSTEM 4B TOTALS:		11.80	4.28	7.52	0.98	0.89	0.98	0.65	0.00	0.00	0.00	0.86	-0.12
PRE-DEVELOPMENT CONDITION													
4B	BASIN 1	6.28	1.66	4.62	0.52	0.35	0.52	0.40	0.00	0.00	0.00	0.53	0.01
	BASIN 2	5.02	1.72	3.30	0.42	0.36	0.42	0.33	0.00	0.00	0.00	0.44	0.02
*PRE-DEVELOPMENT SYSTEM 4B TOTALS:		11.30	3.38	7.92	0.94	0.70	0.94	0.73	0.00	0.00	0.00	0.97	0.03
EAST PROJECT - POST DEVELOPMENT CONDITION SUMMARY													
ADDITIONAL WATER QUALITY TREATMENT VOLUME REQUIREMENT (DUE TO THIS PROJECT):												0.03	Ac-Ft
WATER QUALITY TREATMENT VOLUME PROVIDED REDUCED (DUE TO THIS PROJECT):												0.11	Ac-Ft
TOTAL WATER QUALITY TREATMENT VOLUME PROVIDED REDUCTION (DUE TO THIS PROJECT):												0.14	Ac-Ft
ONSITE AREA REMOVED FROM EAST PROJECT DRAINAGE BASIN (DUE TO THIS PROJECT):												3.01	Ac
WATER QUALITY TREATMENT VOLUME REQUIREMENT REDUCTION FROM ONSITE AREA REMOVED (DUE TO THIS PROJECT):												0.25	Ac-Ft
TOTAL WATER QUALITY TREATMENT VOLUME REQUIREMENT REDUCTION (DUE TO THIS PROJECT):												0.11	Ac-Ft
PREVIOUS PROJECT WATER QUALITY TREATMENT VOLUME REQUIREMENT (ENTIRE EAST PROJECT):												9.41	Ac-Ft
PREVIOUS PROJECT WATER QUALITY TREATMENT VOLUME PROVIDED (ENTIRE EAST PROJECT):												9.74	Ac-Ft
PREVIOUS PROJECT SURPLUS WATER QUALITY TREATMENT PROVIDED (ENTIRE EAST PROJECT):												0.33	Ac-Ft
POST-DEVELOPMENT TOTAL WATER QUALITY TREATMENT VOLUME REQUIRED (BOTH PROJECTS):												9.30	Ac-Ft
POST-DEVELOPMENT TOTAL WATER QUALITY TREATMENT VOLUME PROVIDED (BOTH PROJECTS):												9.63	Ac-Ft
POST-DEVELOPMENT SURPLUS WATER QUALITY TREATMENT VOLUME PROVIDED (BOTH PROJECTS):												0.33	Ac-Ft

1. Refer to SFWMD Permit No. 50-04716-P for Water Quality Calculations for FPID No. 432704-1-52-01 & 432706-1-52-01.
2. Existing Treatment Provided = Swale 1 (0.40 ac-ft) + Swale 2 (0.33 ac-ft) = 0.73 ac-ft / 0.75 for Dry Detention = 0.97 ac-ft.
3. Proposed Treatment Provided = Swale 1 (0.40 ac-ft) + Swale 2 (0.33 ac-ft - 0.09 ac-ft) = 0.40+0.24 ac-ft = 0.64 / 0.75 for Dry Detention = 0.85 ac-ft.

SYSTEM 4B														
SWALE 1 - EAST PROJECT (PERMIT CONDITION)			SWALE 2 - EAST PROJECT (PERMIT CONDITION)			SWALE 2 - EAST PROJECT AREA ELIMINATED (POST-DEVELOPMENT CONDITION)			SWALE 2 - EAST PROJECT (POST-DEVELOPMENT CONDITION)			[POND/SWALE]		
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
25.20	0.415	0.00	25.20	0.313	0.00	25.20	-0.027	0.00	25.20	0.286	0.00			-
25.90	0.727	0.40	25.90	0.626	0.33	25.90	-0.210	-0.08	25.90	0.416	0.25			0.00
26.70	1.085	1.12	26.70	0.983	0.97	26.70	-0.293	-0.28	26.70	0.690	0.69			0.00
26.90	1.174	1.35												0.00

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
SUMMARY OF WATER QUALITY TREATMENT

SYSTEM	SHGWT EL. (ft-NAVD)	TOTAL ONSITE AREA (Ac.) [POST-DEV.]	ONSITE IMPERVIOUS AREA (Ac.) [POST-DEV.]	ONSITE PERVIOUS AREA (Ac.) [POST-DEV.]	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
SYSTEM SUMMARY									
*SYSTEM 1 TOTALS:		10.74	2.60	8.14	0.90	0.54	0.67	1.59	0.92
SYSTEM 2A TOTALS:		34.15	10.28	23.87	2.85	2.14	2.85	37.95	35.11
SYSTEM 2B TOTALS:		19.86	5.61	14.25	1.66	1.17	1.66	19.12	17.47
SYSTEM 2C TOTALS:		11.37	3.57	7.80	0.95	0.74	0.95	13.12	12.18
SYSTEM 2 TOTALS:		65.38	19.46	45.92	5.45	4.05	5.45	70.20	64.75
SYSTEM 3A TOTALS:		13.63	4.09	9.54	1.14	0.85	1.14	4.10	2.97
SYSTEM 3B TOTALS:		13.63	4.09	9.54	1.14	0.85	1.14	4.11	2.98
SYSTEM 3C TOTALS:		13.63	4.09	9.54	1.14	0.85	1.14	3.84	2.71
SYSTEM 3D TOTALS:		12.79	3.93	8.86	1.07	0.82	1.07	3.50	2.43
SYSTEM 3E TOTALS:		8.14	2.91	5.23	0.68	0.61	0.68	1.34	0.67
SYSTEM 3F TOTALS:		8.07	2.90	5.17	0.67	0.60	0.67	1.11	0.44
SYSTEM 3 TOTALS:		69.89	22.01	47.88	5.82	4.59	5.82	18.01	12.19
SYSTEM 4A TOTALS:		1.24	0.37	0.87	0.10	0.08	0.10	0.34	0.23
*SYSTEM 4B TOTALS:		11.80	4.28	7.52	0.98	0.89	0.98	0.86	-0.12
SYSTEM 4 TOTALS: (REFER TO EAST PROJECT SUMMARY)		13.04	4.65	8.39	1.09	0.97	1.09	1.20	0.11
PROJECT TOTALS									
PROJECT TOTALS:		159.05	48.72	110.33	13.25	10.15	13.03	91.01	77.98

¹Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

²Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

* Water quality treatment provided by adjacent project.

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
SUMMARY OF WATER QUALITY TREATMENT

SYSTEM	SHGWT EL. (ft-NAVD)	TOTAL ONSITE AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE IMPERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	ONSITE PERVIOUS AREA (Ac.) <i>[POST-DEV.]</i>	¹ WATER QUALITY TREATMENT REQUIRED (Ac-ft)	² TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
EAST PROJECT SUMMARY							
EAST PROJECT PRE-DEVELOPMENT TOTALS:		149.89	48.87	101.02	9.41	9.74	0.33
EAST PROJECT POST-DEVELOPMENT TOTALS:		146.88	49.08	98.30	9.30	9.63	0.33

*V-NOTCH BLEEDER
CALCULATIONS*

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Bleeder Sizing/Design

Drainage System: **SYSTEM**
3A

Pond/Swale Name:	SWALE 3B
Control Structure No.:	CS-3
Contributing Area (Ac.):	13.63
Detention Volume, 1" x Total Area (Ac-ft):	1.14
Bleed-Down Volume, V_{DET} (1/2 Detention Vol.) (Ac-ft):	0.57
Bleed-Down Time (hrs):	24.00
Bleed-Down Time (sec):	86400
Average Discharge Rate, Q (cfs):	0.29
Weir Elevation (ft-NAVD):	25.25
Bleeder Invert EL. [SHGWT EL.] (ft-NAVD):	23.50
Head, H (ft):	1.75
Weir Coefficient:	0.60

V-Notch Sizing	
<i>Minimum V-Notch Angle = 20°</i>	
Number of V-Notches Proposed:	1
Bleed-Down Volume per V-Notch, V_{DET} (Ac-ft):	0.57
Maximum V-Notch Angle, θ , (rad):	0.14
Maximum V-Notch Angle, θ , (deg):	7.89
$\theta = 2 \tan^{-1} \left[0.492 \frac{V_{DET}}{H^{2.5}} \right]$	
Proposed V-Notch(s) Angle (deg):	20
Proposed V-Notch Angle (rad):	0.35
V-Notch Height [= H] (ft):	1.75
V-Notch Top Width (ft):	0.62
V-Notch Sideslope [horz./vert.]:	0.1763

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Bleeder Sizing/Design

Drainage System: **SYSTEM**
3B

Pond/Swale Name:	SWALE 3C
Control Structure No.:	CS-4
Contributing Area (Ac.):	13.63
Detention Volume, 1" x Total Area (Ac-ft):	1.14
Bleed-Down Volume, V_{DET} (1/2 Detention Vol.) (Ac-ft):	0.57
Bleed-Down Time (hrs):	24.00
Bleed-Down Time (sec):	86400
Average Discharge Rate, Q (cfs):	0.29
Weir Elevation (ft-NAVD):	25.30
Bleeder Invert EL. [SHGWT EL.] (ft-NAVD):	23.50
Head, H (ft):	1.80
Weir Coefficient:	0.60

V-Notch Sizing	
<i>Minimum V-Notch Angle = 20°</i>	
Number of V-Notches Proposed:	1
Bleed-Down Volume per V-Notch, V_{DET} (Ac-ft):	0.57
Maximum V-Notch Angle, θ , (rad):	0.13
Maximum V-Notch Angle, θ , (deg):	7.36
$\theta = 2 \tan^{-1} \left[0.492 \frac{V_{DET}}{H^{2.5}} \right]$	
Proposed V-Notch(s) Angle (deg):	20
Proposed V-Notch Angle (rad):	0.35
V-Notch Height [= H] (ft):	1.80
V-Notch Top Width (ft):	0.63
V-Notch Sideslope [horz./vert.]:	0.1763

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Bleeder Sizing/Design

Drainage System: **SYSTEM**
3C

Pond/Swale Name:	SWALE 3D
Control Structure No.:	CS-5
Contributing Area (Ac.):	13.63
Detention Volume, 1" x Total Area (Ac-ft):	1.14
Bleed-Down Volume, V_{DET} (1/2 Detention Vol.) (Ac-ft):	0.57
Bleed-Down Time (hrs):	24.00
Bleed-Down Time (sec):	86400
Average Discharge Rate, Q (cfs):	0.29
Weir Elevation (ft-NAVD):	25.25
Bleeder Invert EL. [SHGWT EL.] (ft-NAVD):	23.50
Head, H (ft)	1.75
Weir Coefficient:	0.60

V-Notch Sizing	
<i>Minimum V-Notch Angle = 20°</i>	
Number of V-Notches Proposed:	1
Bleed-Down Volume per V-Notch, V_{DET} (Ac-ft):	0.57
Maximum V-Notch Angle, θ , (rad):	0.14
Maximum V-Notch Angle, θ , (deg):	7.89
$\theta = 2 \tan^{-1} \left[0.492 \frac{V_{DET}}{H^{2.5}} \right]$	
Proposed V-Notch(s) Angle (deg):	20
Proposed V-Notch Angle (rad):	0.35
V-Notch Height [= H] (ft):	1.75
V-Notch Top Width (ft):	0.62
V-Notch Sideslope [horz./vert.]:	0.1763

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Bleeder Sizing/Design

Drainage System: **SYSTEM**
3D

Pond/Swale Name:	SWALE 3E
Control Structure No.:	CS-6
Contributing Area (Ac.):	12.79
Detention Volume, 1" x Total Area (Ac-ft):	1.07
Bleed-Down Volume, V_{DET} (1/2 Detention Vol.) (Ac-ft):	0.53
Bleed-Down Time (hrs):	24.00
Bleed-Down Time (sec):	86400
Average Discharge Rate, Q (cfs):	0.27
Weir Elevation (ft-NAVD):	25.80
Bleeder Invert EL. [SHGWT EL.] (ft-NAVD):	24.00
Head, H (ft):	1.80
Weir Coefficient:	0.60

V-Notch Sizing	
<i>Minimum V-Notch Angle = 20°</i>	
Number of V-Notches Proposed:	1
Bleed-Down Volume per V-Notch, V_{DET} (Ac-ft):	0.53
Maximum V-Notch Angle, θ , (rad):	0.12
Maximum V-Notch Angle, θ , (deg):	6.90
$\theta = 2 \tan^{-1} \left[0.492 \frac{V_{DET}}{H^{2.5}} \right]$	
Proposed V-Notch(s) Angle (deg):	20
Proposed V-Notch Angle (rad):	0.35
V-Notch Height [= H] (ft):	1.80
V-Notch Top Width (ft):	0.63
V-Notch Sideslope [horz./vert.]:	0.1763

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Bleeder Sizing/Design

Drainage System: **SYSTEM**
3E

Pond/Swale Name:	SWALE 8
Control Structure No.:	CS-7
Contributing Area (Ac.):	8.14
Detention Volume, 1" x Total Area (Ac-ft):	0.68
Bleed-Down Volume, V_{DET} (1/2 Detention Vol.) (Ac-ft):	0.34
Bleed-Down Time (hrs):	24.00
Bleed-Down Time (sec):	86400
Average Discharge Rate, Q (cfs):	0.17
Weir Elevation (ft-NAVD):	25.80
Bleeder Invert EL. [SHGWT EL.] (ft-NAVD):	24.00
Head, H (ft)	1.80
Weir Coefficient:	0.60

V-Notch Sizing	
<i>Minimum V-Notch Angle = 20°</i>	
Number of V-Notches Proposed:	1
Bleed-Down Volume per V-Notch, V_{DET} (Ac-ft):	0.34
Maximum V-Notch Angle, θ , (rad):	0.08
Maximum V-Notch Angle, θ , (deg):	4.40
$\theta = 2 \tan^{-1} \left[0.492 \frac{V_{DET}}{H^{2.5}} \right]$	
Proposed V-Notch(s) Angle (deg):	20
Proposed V-Notch Angle (rad):	0.35
V-Notch Height [= H] (ft):	1.80
V-Notch Top Width (ft):	0.63
V-Notch Sideslope [horz./vert.]:	0.1763

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Bleeder Sizing/Design

Drainage System: **SYSTEM**
3F

Pond/Swale Name:	SWALE 10
Control Structure No.:	CS-8
Contributing Area (Ac.):	8.07
Detention Volume, 1" x Total Area (Ac-ft):	0.67
Bleed-Down Volume, V_{DET} (1/2 Detention Vol.) (Ac-ft):	0.34
Bleed-Down Time (hrs):	24.00
Bleed-Down Time (sec):	86400
Average Discharge Rate, Q (cfs):	0.17
Weir Elevation (ft-NAVD):	25.80
Bleeder Invert EL. [SHGWT EL.] (ft-NAVD):	24.00
Head, H (ft)	1.80
Weir Coefficient:	0.60

V-Notch Sizing	
<i>Minimum V-Notch Angle = 20°</i>	
Number of V-Notches Proposed:	1
Bleed-Down Volume per V-Notch, V_{DET} (Ac-ft):	0.34
Maximum V-Notch Angle, θ , (rad):	0.08
Maximum V-Notch Angle, θ , (deg):	4.36
$\theta = 2 \tan^{-1} \left[0.492 \frac{V_{DET}}{H^{2.5}} \right]$	
Proposed V-Notch(s) Angle (deg):	20
Proposed V-Notch Angle (rad):	0.35
V-Notch Height [= H] (ft):	1.80
V-Notch Top Width (ft):	0.63
V-Notch Sideslope [horz./vert.]:	0.1763

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
Bleeder Sizing/Design

Drainage System: **SYSTEM**
4A

Pond/Swale Name:	SWALE 11
Control Structure No.:	CS-9
Contributing Area (Ac.):	1.24
Detention Volume, 1" x Total Area (Ac-ft):	0.10
Bleed-Down Volume, V_{DET} (1/2 Detention Vol.) (Ac-ft):	0.05
Bleed-Down Time (hrs):	24.00
Bleed-Down Time (sec):	86400
Average Discharge Rate, Q (cfs):	0.03
Weir Elevation (ft-NAVD):	25.60
Bleeder Invert EL. [SHGWT EL.] (ft-NAVD):	24.00
Head, H (ft):	1.60
Weir Coefficient:	0.60

V-Notch Sizing	
<i>Minimum V-Notch Angle = 20°</i>	
Number of V-Notches Proposed:	1
Bleed-Down Volume per V-Notch, V_{DET} (Ac-ft):	0.05
Maximum V-Notch Angle, θ , (rad):	0.02
Maximum V-Notch Angle, θ , (deg):	0.90
$\theta = 2 \tan^{-1} \left[0.492 \frac{V_{DET}}{H^{2.5}} \right]$	
Proposed V-Notch(s) Angle (deg):	20
Proposed V-Notch Angle (rad):	0.35
V-Notch Height [= H] (ft):	1.60
V-Notch Top Width (ft):	0.56
V-Notch Sideslope [horz./vert.]:	0.1763

SPREAD CALCULATIONS

SR 710 (Warfield Blvd) Reconstruction

Wildlife Crossing - Spread Calculations - 10YR-24HR Design Storm (TOC = 10 min)

Structure No.	Structure Type	Flow Direction	Station	Side	Total Area (Ac)	Pervious Area (Ac)	Impervious Area (Ac)	Overland Runoff (cfs)	Previous By-pass (cfs)	Total Flow (cfs)	Cross Slope (ft/ft)	Long Slope (ft/ft)	Calculated Spread (ft)	Allowable Spread (ft)	Intercepted Flow (cfs)	By-pass Flow (cfs)	Remarks
S-51A	Type S		3267+27.50	LT	0.27	0.00	0.27	1.95	0.00	1.95	0.050	0.0110	5.01	6.00	1.95	0.00	Ok
S-51	Type S		3264+32.33	LT	0.27	0.00	0.27	1.95	0.00	1.95	0.050	0.0110	5.01	6.00	1.95	0.00	Ok
S-52A	Type S		3267+27.50	RT	0.27	0.00	0.27	1.95	0.00	1.95	0.050	0.0110	5.01	6.00	1.95	0.00	Ok
S-52	Type S		3264+32.33	RT	0.27	0.00	0.27	1.95	0.00	1.95	0.050	0.0110	5.01	6.00	1.95	0.00	Ok
S-54A	Type S		3273+12.50	LT	0.27	0.00	0.27	1.95	0.00	1.95	0.050	0.0110	5.01	6.00	1.95	0.00	Ok
S-54	Type S		3276+07.67	LT	0.27	0.00	0.27	1.95	0.00	1.95	0.050	0.0110	5.01	6.00	1.95	0.00	Ok
S-55A	Type S		3273+12.50	RT	0.27	0.00	0.27	1.95	0.00	1.95	0.050	0.0110	5.01	6.00	1.95	0.00	Ok
S-55	Type S		3276+07.67	RT	0.27	0.00	0.27	1.95	0.00	1.95	0.050	0.0110	5.01	6.00	1.95	0.00	Ok

Equation (Integrated Manning's Equation, FDOT Storm Drain Handbook)

1.) $Q = (0.56/n) * (S_x^{5/3}) * (S_L^{1/2}) * T^{8/3}$

Parameters:

Design Speed =	65	mph
Allowable Spread =	6.00	ft (Fill Slope Protection)
Manning's n =	0.015	
Pervious Runoff Coefficient =	0.20	
Impervious Runoff Coefficient =	0.95	
Intensity (10yr-24hr Storm, 10 min TOC) =	7.60	in/hr

Typical Section Information:

Total Shoulder Gutter Width =	3.50	ft	Asphalt Shoulder Cross-Slope =
Guardrail Behind Gutter Slope Width =	4.00	ft	Shoulder Gutter Cross-Slope =
			Miscellaneous Asphalt Cross-Slope =

Areas:

	Structure	Area	Total Area
1)	S-51	11846.36 sf	23692.72 sf
	S-51A	11846.36 sf	
2)	S-52	11881.21 sf	23762.43 sf
	S-52A	11881.21 sf	
3)	S-54	11881.23 sf	23762.47 sf
	S-54A	11881.23 sf	
4)	S-55	11846.42 sf	23692.84 sf
	S-55A	11846.42 sf	

Longitudinal Slope Information:

Longitudinal Slope =	1.100%
Longitudinal Slope =	0.0110 ft/ft
(refer to plans for Profile Grade)	

* Per FDOT Storm Drain Handbook, fill slopes will be protected according by calculating spread within shoulder gutter sections according to the method in Section 3.2.3, Figure 3-4.

Per FDOT Storm Drain Handbook, Fig 3-4:

Approximate Triangular Gutter Width =	6.00	ft	Composite Shoulder Cross-Slope =	0.05	ft/ft
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Per FDOT Storm Drain Handbook, Fig 3-4:

SR 710 (Warfield Blvd) Reconstruction

Wildlife Crossing - Spread Calculations - 4 in/hr

Structure No.	Structure Type	Flow Direction	Station	Side	Total Area (Ac)	Pervious Area (Ac)	Impervious Area (Ac)	Overland Runoff (cfs)	Previous By-pass (cfs)	Total Flow (cfs)	Cross Slope (ft/ft)	Long Slope (ft/ft)	Calculated Spread (ft)	Allowable Spread (ft)	Intercepted Flow (cfs)	By-pass Flow (cfs)	Remarks
S-51A	Type S		3267+27.50	LT	0.27	0.00	0.27	1.03	0.00	1.03	0.060	0.0110	3.52	9.00	1.03	0.00	Ok
S-51	Type S		3264+32.33	LT	0.27	0.00	0.27	1.03	0.00	1.03	0.060	0.0110	3.52	9.00	1.03	0.00	Ok
S-52A	Type S		3267+27.50	RT	0.27	0.00	0.27	1.03	0.00	1.03	0.060	0.0110	3.52	9.00	1.03	0.00	Ok
S-52	Type S		3264+32.33	RT	0.27	0.00	0.27	1.03	0.00	1.03	0.060	0.0110	3.52	9.00	1.03	0.00	Ok
S-54A	Type S		3273+12.50	LT	0.27	0.00	0.27	1.03	0.00	1.03	0.060	0.0110	3.52	9.00	1.03	0.00	Ok
S-54	Type S		3276+07.67	LT	0.27	0.00	0.27	1.03	0.00	1.03	0.060	0.0110	3.52	9.00	1.03	0.00	Ok
S-55A	Type S		3273+12.50	RT	0.27	0.00	0.27	1.03	0.00	1.03	0.060	0.0110	3.52	9.00	1.03	0.00	Ok
S-55	Type S		3276+07.67	RT	0.27	0.00	0.27	1.03	0.00	1.03	0.060	0.0110	3.52	9.00	1.03	0.00	Ok

Equation (Integrated Manning's Equation, FDOT Storm Drain Handbook)

1.) $Q = (0.56/n) * (S_x^{5/3}) * (S_L^{1/2}) * T^{8/3}$

Parameters:

Design Speed =	65	mph
Allowable Spread =	9.00	ft (No Encroachment of Travel Lane)
Manning's n =	0.015	
Pervious Runoff Coefficient =	0.20	
Impervious Runoff Coefficient =	0.95	
Intensity =	4.00	in/hr

Typical Section Information:

Travel Lane Width =	12.00	ft	Travel Lane Cross-Slope =	0.02	ft/ft
Concrete Shoulder Width =	1.00	ft	Concrete Shoulder Cross-Slope =	0.02	ft/ft
Asphalt Shoulder Width =	6.00	ft	Asphalt Shoulder Cross-Slope =	0.06	ft/ft
Total Shoulder Width =	7.00	ft			
Shoulder Gutter Width (Toward Lane) =	2.00	ft	Shoulder Gutter Cross-Slope =	0.06	ft/ft
Total Shoulder/Shoulder Gutter Width =	9.00	ft	Composite Shoulder Cross-Slope =	0.06	ft/ft

Areas:

	Structure	Area	Total Area
1)	S-51	11846.36 sf	23692.72 sf
	S-51A	11846.36 sf	
2)	S-52	11881.21 sf	23762.43 sf
	S-52A	11881.21 sf	
3)	S-54	11881.23 sf	23762.47 sf
	S-54A	11881.23 sf	
4)	S-55	11846.42 sf	23692.84 sf
	S-55A	11846.42 sf	

Longitudinal Slope Information:

Longitudinal Slope =	1.100%
Longitudinal Slope =	0.0110 ft/ft
(refer to plans for Profile Grade)	

SR 710 (Warfield Blvd) Reconstruction																
Wildlife Crossing - Spread Calculations - 4 in/hr																
Structure No.	Structure Type	Station	Side	Total Area (Ac)	Pervious Area (Ac)	Impervious Area (Ac)	Overland Runoff (cfs)	Previous By-pass (cfs)	Total Flow (cfs)	Cross Slope (ft/ft)	Long Slope (ft/ft)	Calculated Spread (ft)	Allowable Spread (ft)	Intercepted Flow (cfs)	By-pass Flow (cfs)	Remarks
S-51	Type S	3266+15.03	LT	0.54	0.00	0.54	2.06	0.00	2.06	0.060	0.0110	4.56	9.00	2.06	0.00	Ok
S-52	Type S	3266+15.03	RT	0.55	0.00	0.55	2.09	0.00	2.09	0.060	0.0110	4.59	9.00	2.09	0.00	Ok
S-54	Type S	3274+24.97	LT	0.55	0.00	0.55	2.09	0.00	2.09	0.060	0.0110	4.59	9.00	2.09	0.00	Ok
S-55	Type S	3274+24.97	RT	0.54	0.00	0.54	2.06	0.00	2.06	0.060	0.0110	4.56	9.00	2.06	0.00	Ok

Equation (Integrated Manning's Equation, FDOT Storm Drain Handbook)

1.) $Q = (0.56/n) * (S_x^{5/3}) * (S_L^{1/2}) * T^{8/3}$

Parameters:				Areas:			
Design Speed =	65	mph		Structure	Area		
Allowable Spread =	9.00	ft	(No Encroachment of Travel Lane)	1)	S-51	23692.72	sf
Manning's n =	0.015			2)	S-52	23762.43	sf
Pervious Runoff Coefficient =	0.20			3)	S-54	23762.47	sf
Impervious Runoff Coefficient =	0.95			4)	S-55	23692.84	sf
Intensity =	4.00	in/hr					
Typical Section Information:				Cross-Slope Information:			
Travel Lane Width =	12.00	ft	Travel Lane Cross-Slope =	0.02	ft/ft	Longitudinal Slope =	1.100%
Concrete Shoulder Width =	1.00	ft	Concrete Shoulder Cross-Slope =	0.02	ft/ft	Longitudinal Slope =	0.0110 ft/ft
Asphalt Shoulder Width =	6.00	ft	Asphalt Shoulder Cross-Slope =	0.06	ft/ft	(refer to plans for Profile Grade)	
Total Shoulder Width =	7.00	ft					
Shoulder Gutter Width (Toward Lane) =	2.00	ft	Shoulder Gutter Cross-Slope =	0.06	ft/ft		
Total Shoulder/Shoulder Gutter Width =	9.00	ft	Composite Shoulder Cross-Slope =	0.06	ft/ft		

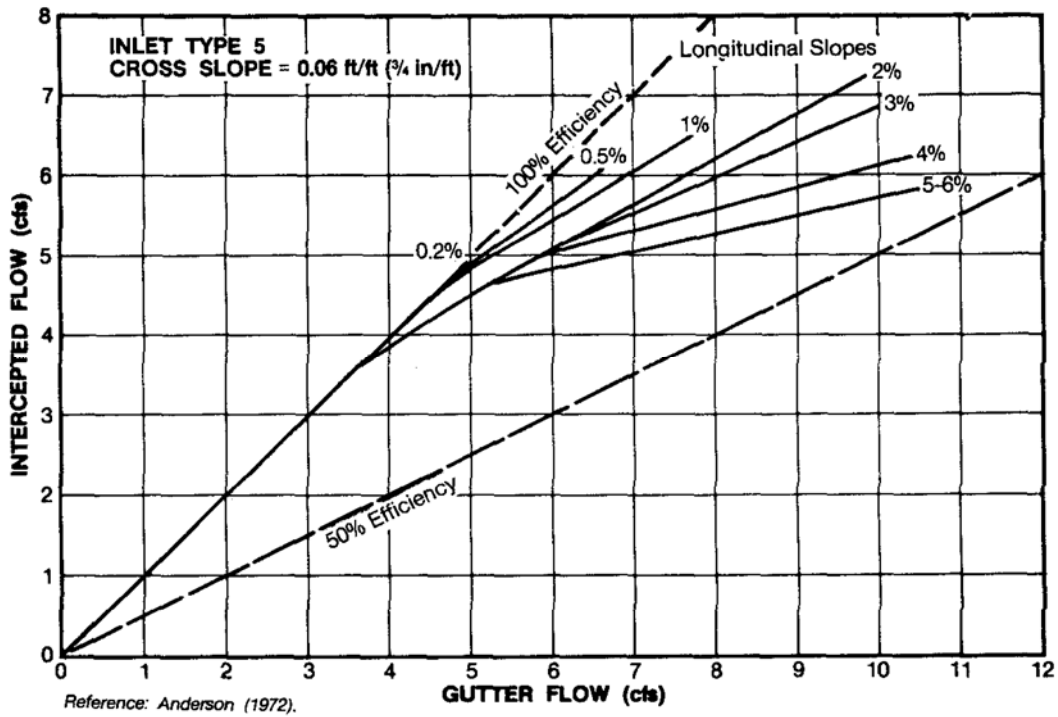


Figure A-15

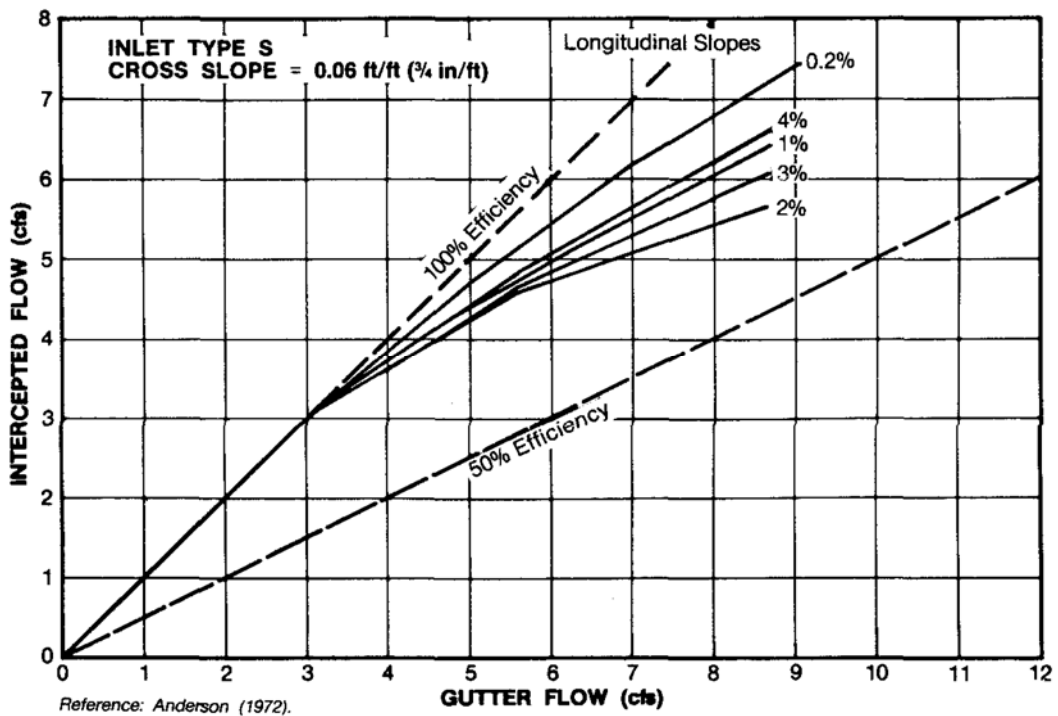


Figure A-16

*FLOOD DATA
SUMMARY BOX
BACKUP INFORMATION*

Cross-Drain No. 1 (CD-1) @ Station 3023+87.71

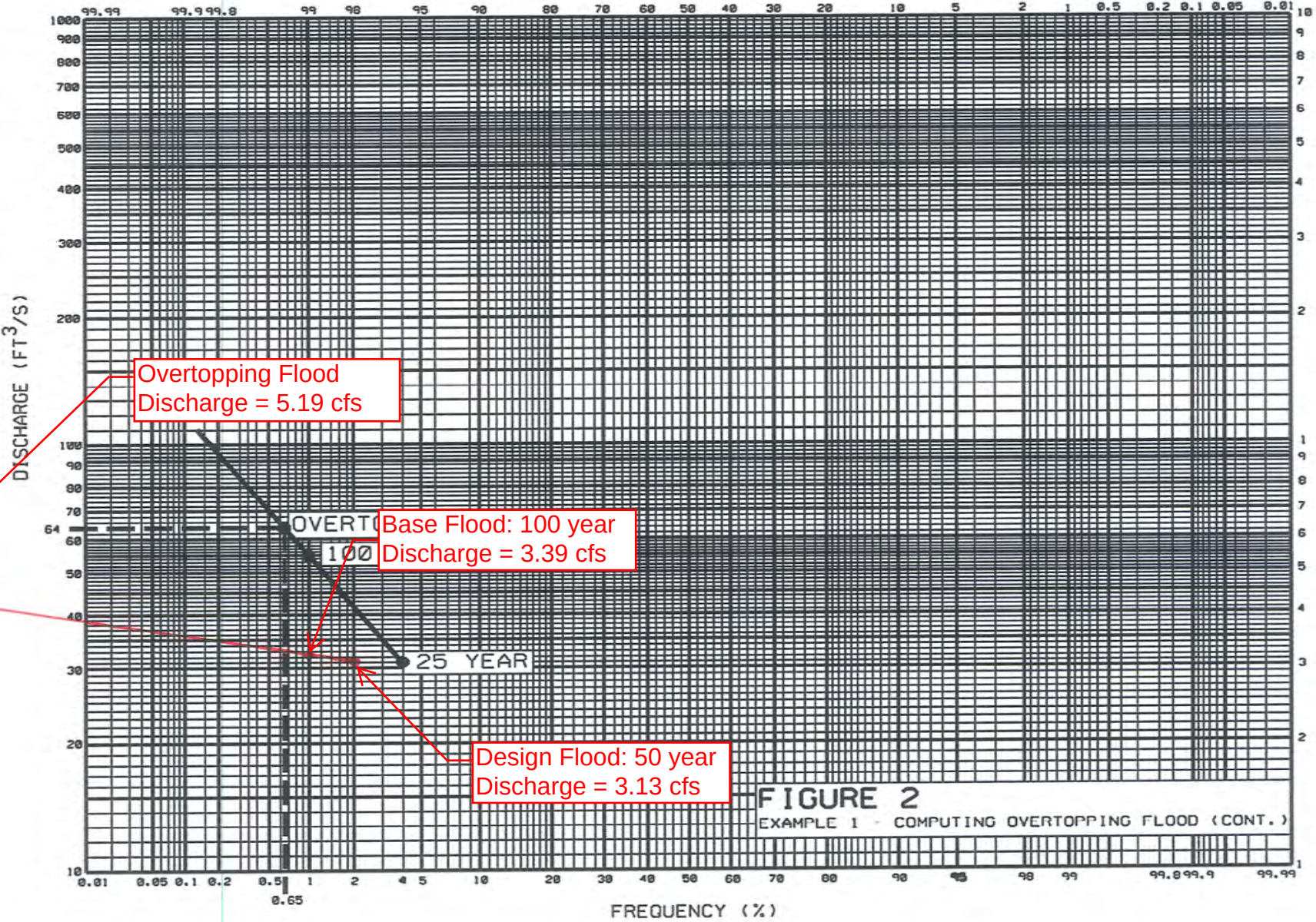


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)

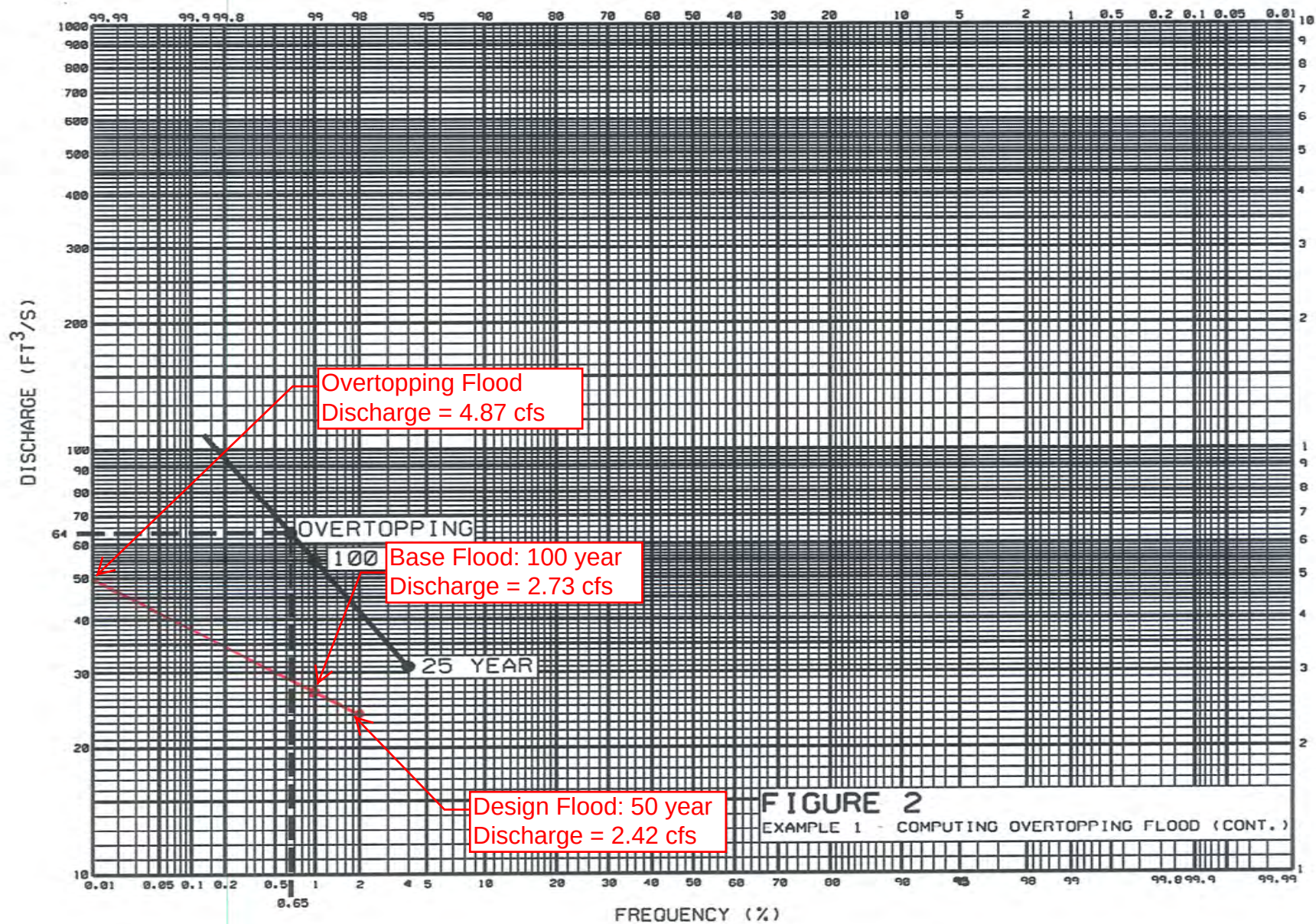
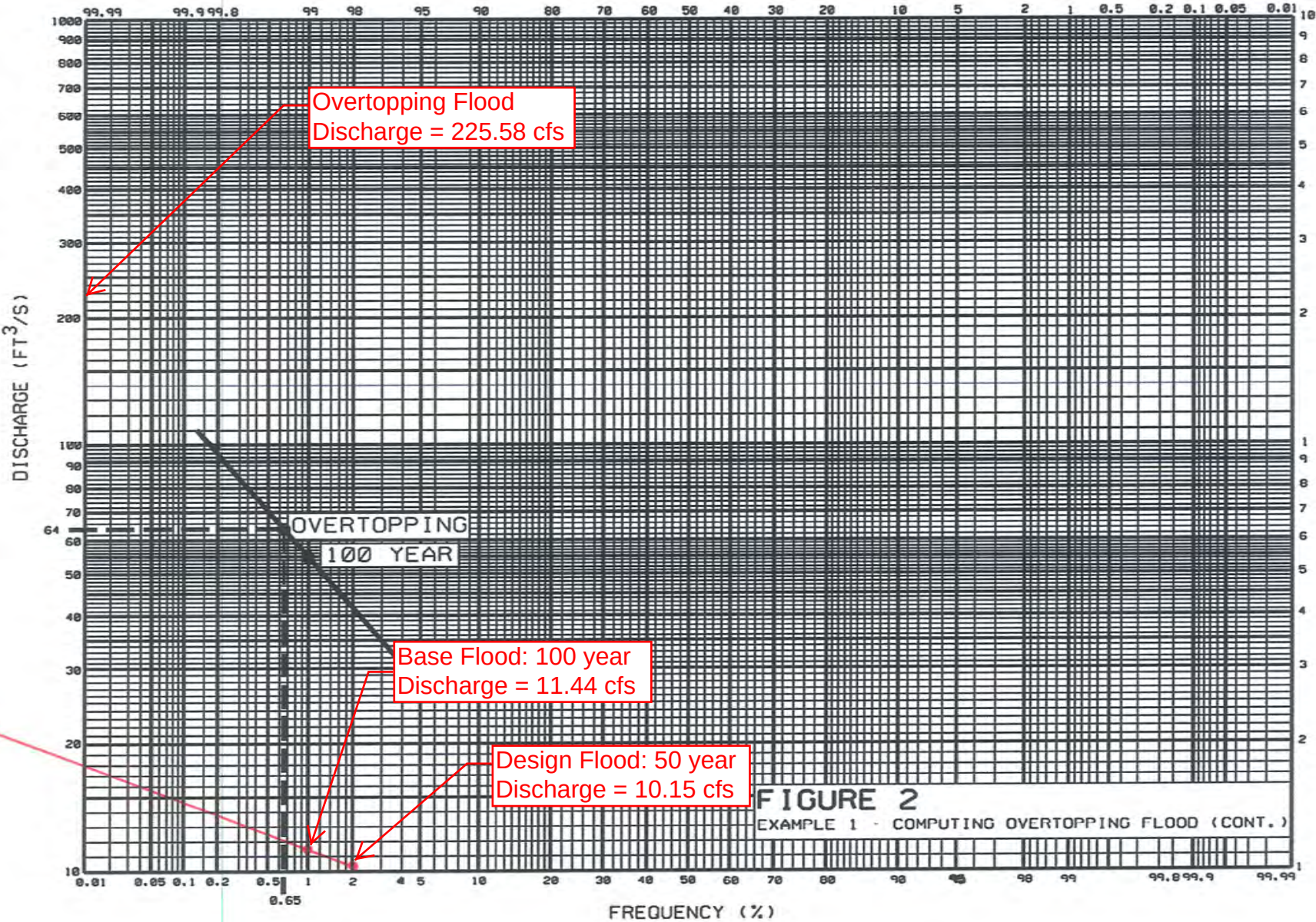
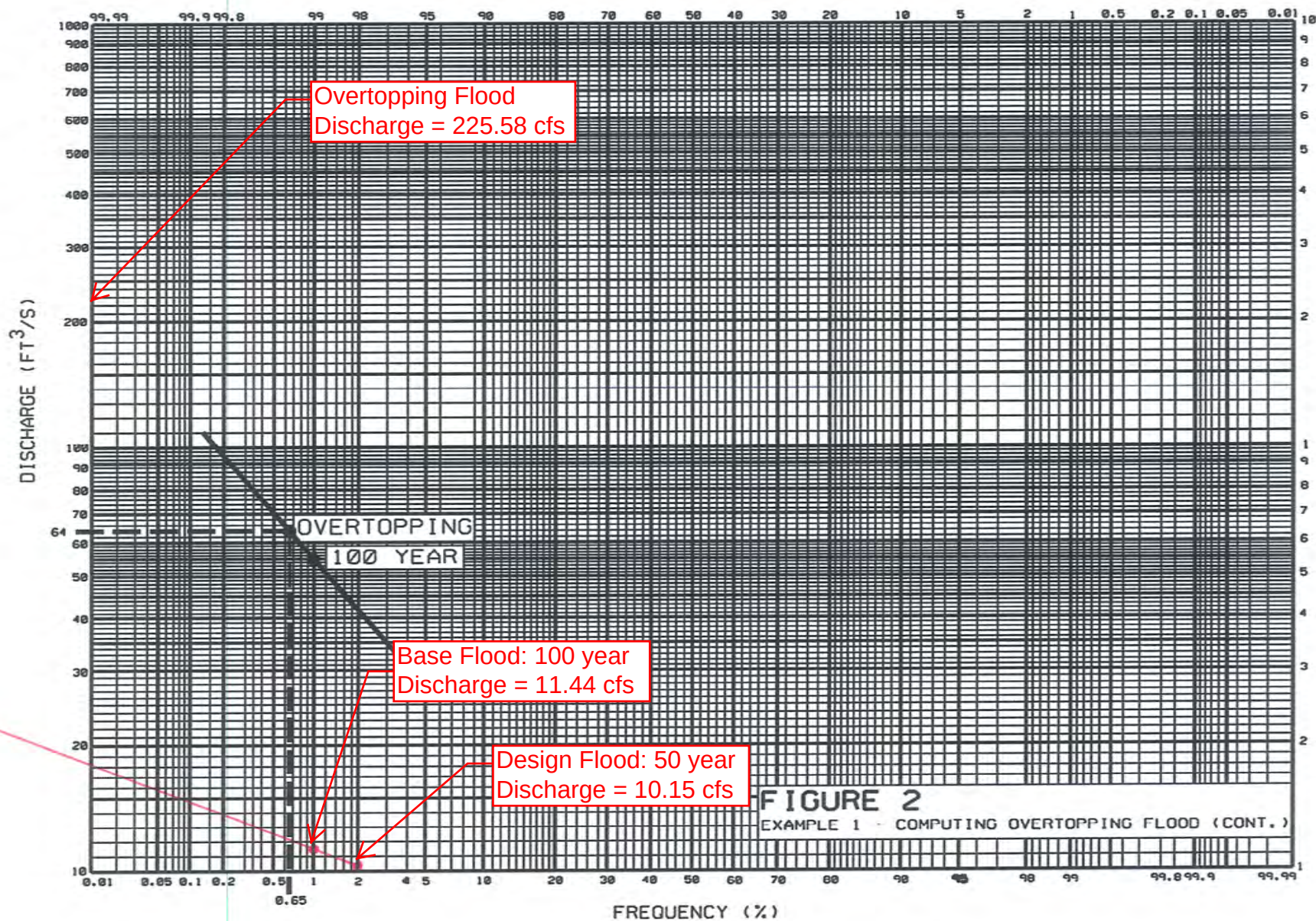


FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)

Cross-Drain No. 3 (CD-3) @ Station 3176+87.69





Cross-Drain No. 5 (CD-5) @ Station 3229+69.69

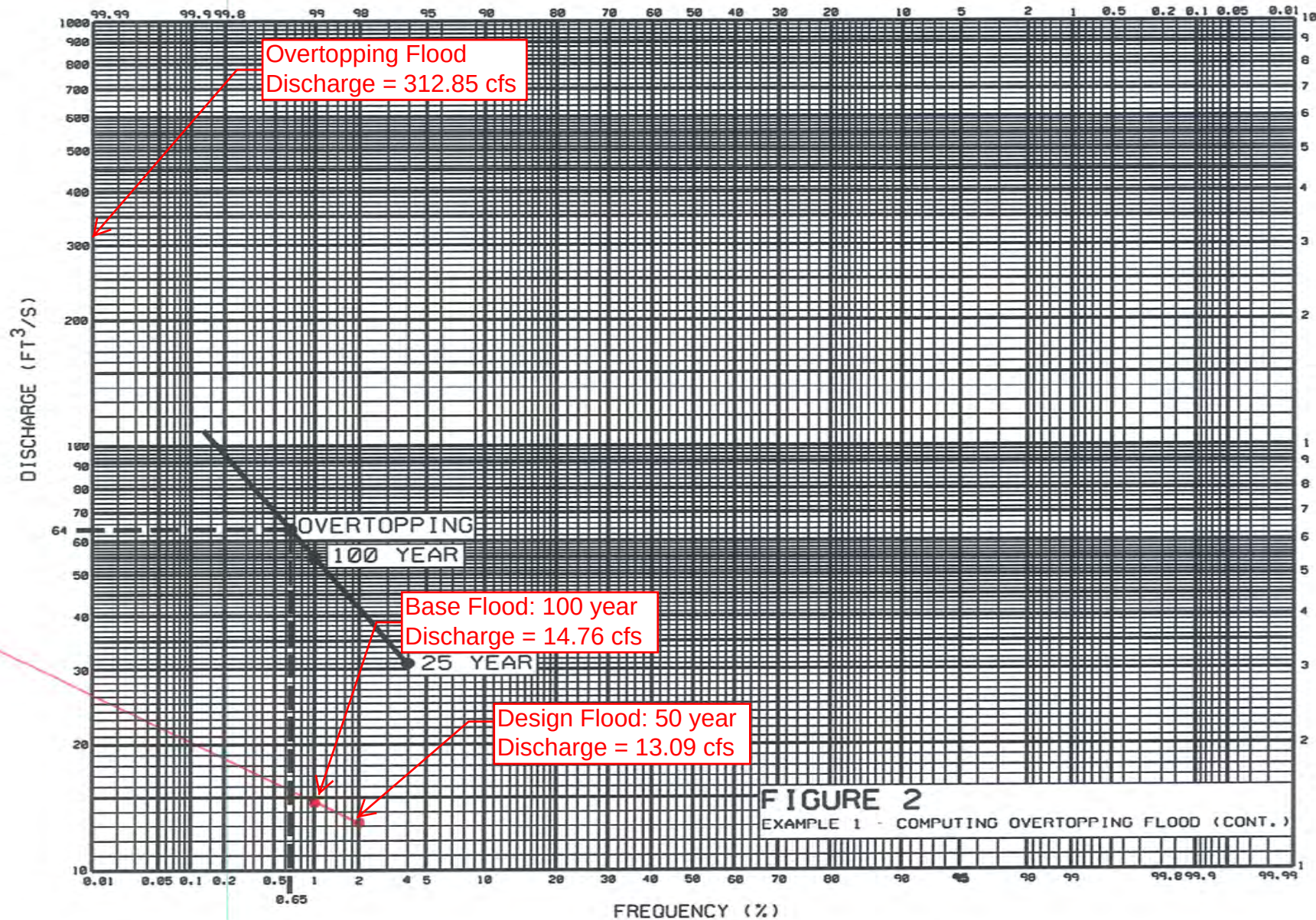
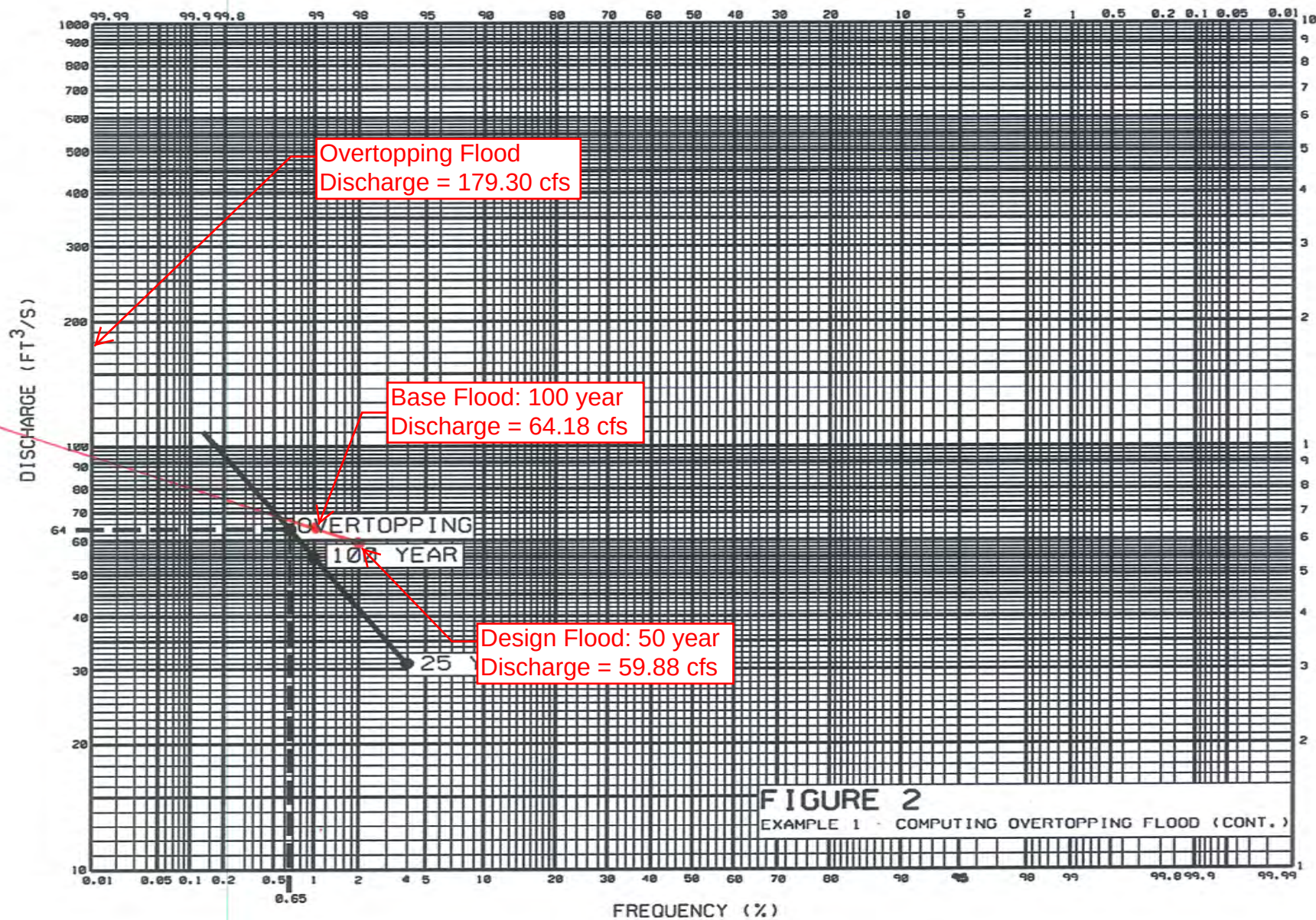


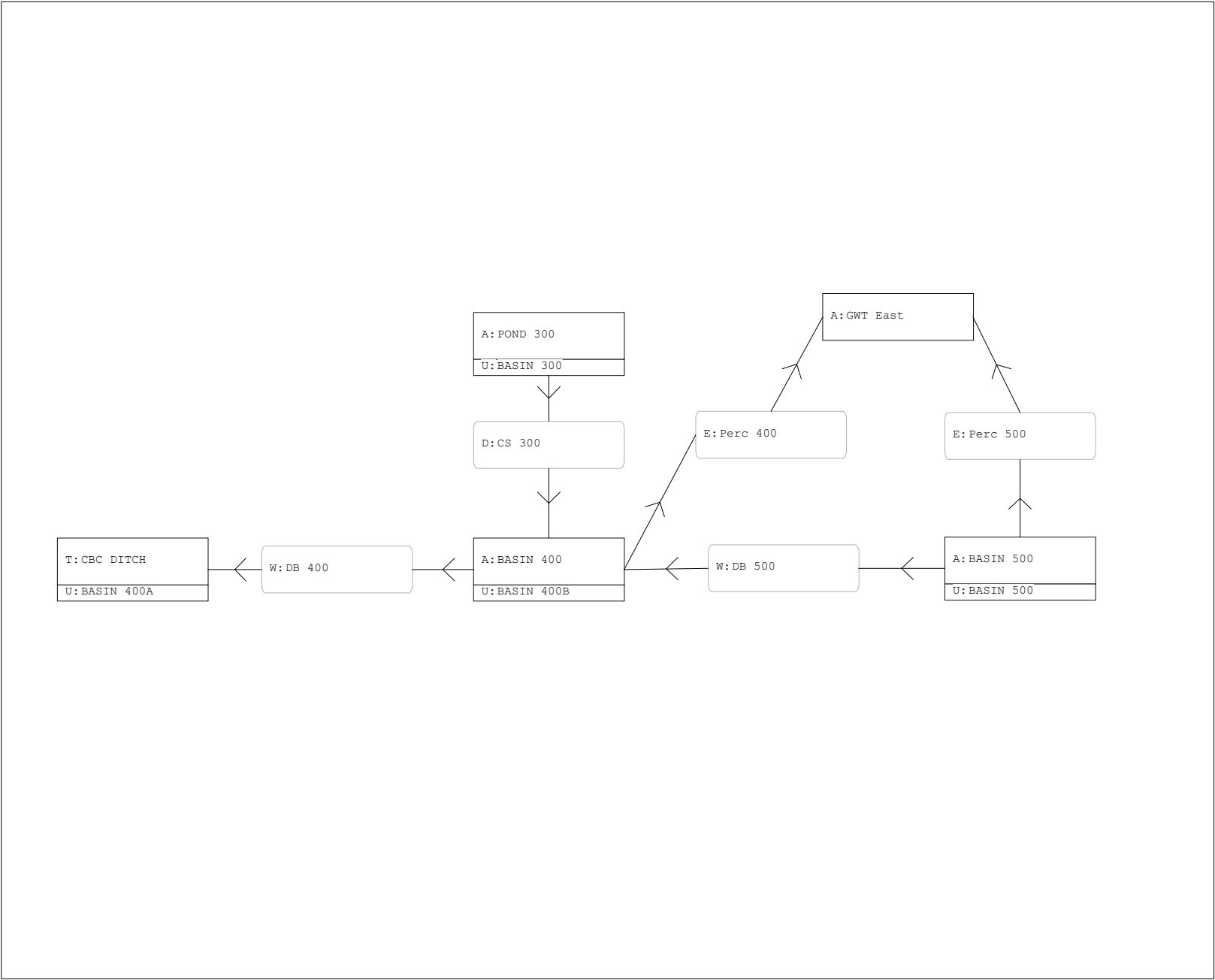
FIGURE 2
EXAMPLE 1 - COMPUTING OVERTOPPING FLOOD (CONT.)



PRE-DEVELOPMENT MODEL

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEM 1 - NODAL LINK SCHEMATIC

- 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



SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEM 1 - NODE MAXIMUM CONDITIONS REPORT

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
BASIN 400	System 1	100YR-24HR	12.55	21.77	22.00	0.0044	10752	12.49	32.40	12.55
BASIN 500	System 1	100YR-24HR	12.54	22.70	23.00	0.0050	74656	12.25	54.32	12.54
CBC DITCH	System 1	100YR-24HR	0.00	20.00	20.00	0.0000	0	12.52	34.56	0.00
GWT East	System 1	100YR-24HR	30.00	20.09	20.00	0.0001	871200	12.54	1.62	0.00
POND 300	System 1	100YR-24HR	18.25	24.38	26.00	0.0050	115117	12.25	95.84	18.26
BASIN 400	System 1	10YR-24HR	12.89	21.36	22.00	0.0041	8994	12.82	10.05	12.89
BASIN 500	System 1	10YR-24HR	12.88	22.32	23.00	0.0050	65991	12.25	34.67	12.88
CBC DITCH	System 1	10YR-24HR	0.00	20.00	20.00	0.0000	0	12.85	10.62	0.00
GWT East	System 1	10YR-24HR	30.01	20.09	20.00	0.0001	871200	12.88	1.42	0.00
POND 300	System 1	10YR-24HR	22.01	23.06	26.00	0.0050	106151	12.25	64.39	22.06
BASIN 400	System 1	10YR-72HR	60.35	21.57	22.00	0.0029	9885	60.29	20.08	60.35
BASIN 500	System 1	10YR-72HR	60.33	22.51	23.00	0.0050	70337	60.00	37.01	60.33
CBC DITCH	System 1	10YR-72HR	0.00	20.00	20.00	0.0000	0	60.32	21.36	0.00
GWT East	System 1	10YR-72HR	83.99	20.13	20.00	0.0001	871200	60.34	1.52	0.00
POND 300	System 1	10YR-72HR	68.26	23.91	26.00	0.0050	111977	60.00	64.47	68.78
BASIN 400	System 1	25YR-72HR	60.23	21.77	22.00	0.0034	10758	60.18	32.53	60.23
BASIN 500	System 1	25YR-72HR	60.22	22.70	23.00	0.0047	74636	60.00	45.92	60.22
CBC DITCH	System 1	25YR-72HR	0.00	20.00	20.00	0.0000	0	60.20	34.66	0.00
GWT East	System 1	25YR-72HR	83.99	20.14	20.00	0.0001	871200	60.22	1.62	0.00
POND 300	System 1	25YR-72HR	64.18	24.48	26.00	0.0050	115849	60.00	78.73	64.19
BASIN 400	System 1	3YR-24HR	21.05	21.07	22.00	0.0038	7729	21.00	0.95	21.05
BASIN 500	System 1	3YR-24HR	21.22	21.61	23.00	0.0042	50246	12.00	3.11	21.22
CBC DITCH	System 1	3YR-24HR	0.00	20.00	20.00	0.0000	0	19.00	0.96	0.00
GWT East	System 1	3YR-24HR	30.00	20.07	20.00	0.0001	871200	16.98	1.05	0.00
POND 300	System 1	3YR-24HR	22.43	21.84	26.00	0.0041	97881	12.00	6.40	22.57

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEM 1 - LINK MAXIMUM CONDITIONS REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CS 300	System 1	100YR-24HR	18.26	2.78	0.009	18.25	24.38	12.55	21.77
DB 400	System 1	100YR-24HR	12.55	31.95	0.143	12.55	21.77	0.00	20.00
DB 500	System 1	100YR-24HR	12.54	27.47	0.140	12.54	22.70	12.55	21.77
Perc 400	System 1	100YR-24HR	12.55	0.20	-0.001	12.55	21.77	30.00	20.09
Perc 500	System 1	100YR-24HR	12.54	1.42	-0.006	12.54	22.70	30.00	20.09
CS 300	System 1	10YR-24HR	22.06	1.31	0.004	22.01	23.06	12.89	21.36
DB 400	System 1	10YR-24HR	12.89	9.78	-0.054	12.89	21.36	0.00	20.00
DB 500	System 1	10YR-24HR	12.88	7.86	0.057	12.88	22.32	12.89	21.36
Perc 400	System 1	10YR-24HR	12.89	0.17	-0.001	12.89	21.36	30.01	20.09
Perc 500	System 1	10YR-24HR	12.88	1.25	-0.008	12.88	22.32	30.01	20.09
CS 300	System 1	10YR-72HR	68.78	1.57	0.003	68.26	23.91	60.35	21.57
DB 400	System 1	10YR-72HR	60.35	19.73	-0.132	60.35	21.57	0.00	20.00
DB 500	System 1	10YR-72HR	60.33	16.52	0.130	60.33	22.51	60.35	21.57
Perc 400	System 1	10YR-72HR	60.35	0.19	-0.003	60.35	21.57	83.99	20.13
Perc 500	System 1	10YR-72HR	60.33	1.34	-0.008	60.33	22.51	83.99	20.13
CS 300	System 1	25YR-72HR	64.19	3.30	0.011	64.18	24.48	60.23	21.77
DB 400	System 1	25YR-72HR	60.23	32.04	-0.160	60.23	21.77	0.00	20.00
DB 500	System 1	25YR-72HR	60.22	27.41	-0.149	60.22	22.70	60.23	21.77
Perc 400	System 1	25YR-72HR	60.23	0.20	-0.003	60.23	21.77	83.99	20.14
Perc 500	System 1	25YR-72HR	60.22	1.42	-0.014	60.22	22.70	83.99	20.14
CS 300	System 1	3YR-24HR	22.57	0.82	0.004	22.43	21.84	21.05	21.07
DB 400	System 1	3YR-24HR	21.05	0.85	0.017	21.05	21.07	0.00	20.00
DB 500	System 1	3YR-24HR	0.00	0.00	0.000	21.22	21.61	21.05	21.07
Perc 400	System 1	3YR-24HR	16.98	0.15	-0.001	21.05	21.07	30.00	20.07
Perc 500	System 1	3YR-24HR	21.22	0.95	-0.007	21.22	21.61	30.00	20.07

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEM 1 - BASIN MAXIMUM CONDITIONS REPORT

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
100YR-24HR	BASIN 300	System 1	12.27	95.95	8.294	529595
100YR-24HR	BASIN 400A	System 1	12.27	4.93	7.345	25861
100YR-24HR	BASIN 400B	System 1	12.27	6.91	7.345	36259
100YR-24HR	BASIN 500	System 1	12.27	54.47	7.320	285369
10YR-24HR	BASIN 300	System 1	12.27	64.52	5.434	346978
10YR-24HR	BASIN 400A	System 1	12.27	3.16	4.578	16119
10YR-24HR	BASIN 400B	System 1	12.27	4.43	4.578	22600
10YR-24HR	BASIN 500	System 1	12.27	34.83	4.556	177625
10YR-72HR	BASIN 300	System 1	60.02	64.70	7.404	472748
10YR-72HR	BASIN 400A	System 1	60.02	3.36	6.478	22809
10YR-72HR	BASIN 400B	System 1	60.02	4.72	6.478	31979
10YR-72HR	BASIN 500	System 1	60.02	37.18	6.454	251605
25YR-72HR	BASIN 300	System 1	60.02	79.00	9.186	586526
25YR-72HR	BASIN 400A	System 1	60.02	4.17	8.216	28930
25YR-72HR	BASIN 400B	System 1	60.02	5.85	8.216	40562
25YR-72HR	BASIN 500	System 1	60.02	46.11	8.191	319324
3YR-24HR	BASIN 300	System 1	12.00	6.40	3.102	198076
3YR-24HR	BASIN 400A	System 1	12.00	0.28	2.390	8414
3YR-24HR	BASIN 400B	System 1	12.00	0.40	2.390	11796
3YR-24HR	BASIN 500	System 1	12.00	3.11	2.372	92491

=====
Basins
=====

Name: BASIN 300	Node: POND 300	Status: Onsite
Group: System 1	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 17.590	Time Shift(hrs): 0.00	
Curve Number: 90.90	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 400A	Node: CBC DITCH	Status: Onsite
Group: System 1	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 0.970	Time Shift(hrs): 0.00	
Curve Number: 83.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 400B	Node: BASIN 400	Status: Onsite
Group: System 1	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 1.360	Time Shift(hrs): 0.00	
Curve Number: 83.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 500	Node: BASIN 500	Status: Onsite
Group: System 1	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 10.740	Time Shift(hrs): 0.00	
Curve Number: 83.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

=====
Nodes
=====

Name: BASIN 400	Base Flow(cfs): 0.000	Init Stage(ft): 20.000
Group: System 1		Warn Stage(ft): 22.000
Type: Stage/Area		

Stage(ft)	Area(ac)
20.000	0.0800
21.000	0.1700
22.000	0.2700

Name: BASIN 500	Base Flow(cfs): 0.000	Init Stage(ft): 20.000
Group: System 1		Warn Stage(ft): 23.000
Type: Stage/Area		

Stage(ft)	Area(ac)
20.000	0.2000
21.000	0.8500
22.000	1.3500
23.000	1.8700

Name: CBC DITCH Base Flow(cfs): 0.000 Init Stage(ft): 20.000
Group: System 1 Warn Stage(ft): 20.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	20.000
1000.00	20.000

Name: GWT East Base Flow(cfs): 0.000 Init Stage(ft): 20.000
Group: System 1 Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	20.0000
1000.000	20.0000

Name: POND 300 Base Flow(cfs): 0.000 Init Stage(ft): 20.000
Group: System 1 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
20.000	1.9600
25.000	2.7400
26.000	3.1400

==== Drop Structures =====

Name: CS 300	From Node: POND 300	Length(ft): 200.00
Group: System 1	To Node: BASIN 400	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Average Conveyance
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.000
Invert(ft): 17.300	18.200	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

*** Weir 1 of 3 for Drop Structure CS 300 ***

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): 25.000
Rise(in): 37.00	Control Elev(ft): 25.000

TABLE

*** Weir 2 of 3 for Drop Structure CS 300 ***

Count: 1	Bottom Clip(in): 0.000
Type: Vertical: Mavis	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Circular	Orifice Disc Coef: 0.600
Span(in): 6.00	Invert(ft): 19.500
Rise(in): 6.00	Control Elev(ft): 20.000

TABLE

*** Weir 3 of 3 for Drop Structure CS 300 ***

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): 18.00 Invert(ft): 24.000
Rise(in): 12.00 Control Elev(ft): 24.000

==== Weirs =====

Name: DB 400 From Node: BASIN 400
Group: System 1 To Node: CBC DITCH
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 13.00
Left Side Slope(h/v): 3.00
Right Side Slope(h/v): 3.00
Invert(ft): 21.000
Control Elevation(ft): 21.000
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: DB 500 From Node: BASIN 500
Group: System 1 To Node: BASIN 400
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 13.00
Left Side Slope(h/v): 3.00
Right Side Slope(h/v): 3.00
Invert(ft): 22.000
Control Elevation(ft): 22.000
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

==== Percolation Links =====

Name: Perc 400 From Node: BASIN 400 Flow: Both
Group: System 1 To Node: GWT East Count: 1

Surface Area Option: Vary based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): -20.000 Perimeter 1(ft): 1490.000
Water Table Elev(ft): 20.000 Perimeter 2(ft): 1804.000
*****0.000 Perimeter 3(ft): 4632.000
Horiz Conductivity(ft/day): 3.280 Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 1.640 Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200 Num Cells 1 to 2: 10
Suction Head(in): 5.590 Num Cells 2 to 3: 90
Layer Thickness(ft): 0.000

Name: Perc 500 From Node: BASIN 500 Flow: Both
Group: System 1 To Node: GWT East Count: 1

Surface Area Option: Vary based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): -20.000 Perimeter 1(ft): 7510.000
Water Table Elev(ft): 20.000 Perimeter 2(ft): 7824.000
*****0.000 Perimeter 3(ft): 10652.000
Horiz Conductivity(ft/day): 3.280 Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 1.640 Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200 Num Cells 1 to 2: 10
Suction Head(in): 5.590 Num Cells 2 to 3: 90

Layer Thickness(ft): 0.000

=====
----- Hydrology Simulations -----
=====

Name: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\100YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii
Rainfall Amount(in): 9.40

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\10YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii
Rainfall Amount(in): 6.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 10YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\10YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 8.50

Time(hrs)	Print Inc(min)
48.000	15.00
72.000	5.00
84.000	15.00

Name: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\25YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 10.30

Time(hrs)	Print Inc(min)
48.000	15.00
72.000	5.00
84.000	15.00

Name: 3YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\3YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 4.10

Time(hrs)	Print Inc(min)
30.000	5.00

=====
----- Routing Simulations -----
=====

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\100YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 1	Yes

Name: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\10YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 1	Yes

Name: 10YR-72HR Hydrology Sim: 10YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\10YR-72HR.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): 84.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	15.000
72.000	5.000
84.000	15.000

Group	Run
BASE	Yes
System 1	Yes

Name: 25YR-72HR Hydrology Sim: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\25YR-72HR.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): 84.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	15.000
72.000	5.000
84.000	15.000

Group	Run
BASE	Yes
System 1	Yes

Name: 3YR-24HR Hydrology Sim: 3YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 1\3YR-24HR.I32

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

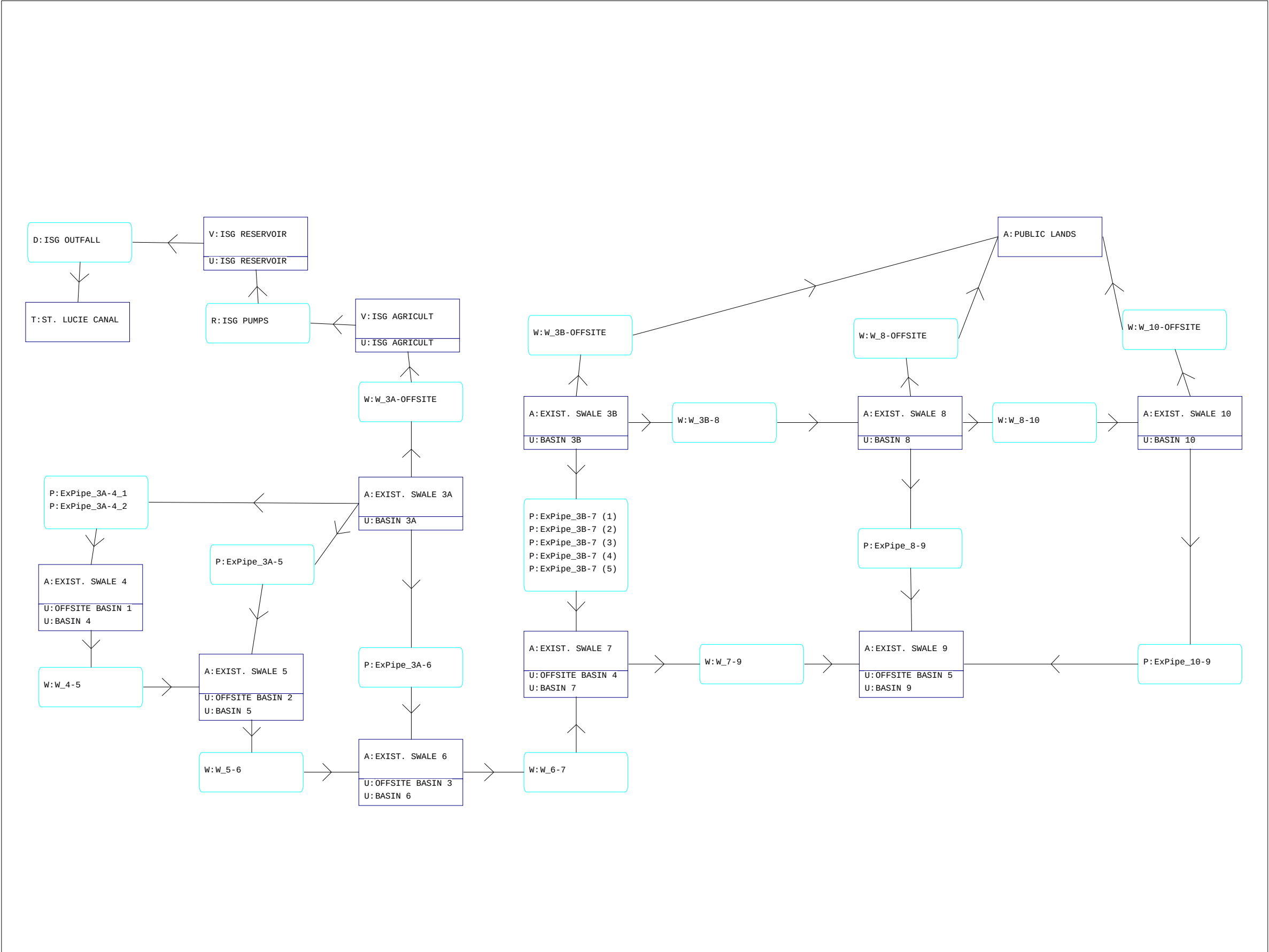
Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 30.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes
System 1	Yes

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEMS 2 AND 3 - NODE-LINK DIAGRAM

- 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



SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEMS 2 AND 3 - NODE MAXIMUM CONDITIONS REPORT

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
EXIST. SWALE 10	System 3	100YR-24HR	12.74	22.62	26.00	0.0049	4680	12.25	15.01	12.25	14.94
EXIST. SWALE 3A	System 2	100YR-24HR	30.00	24.26	26.00	0.0050	868510	12.25	160.31	11.94	46.81
EXIST. SWALE 3B	System 3	100YR-24HR	12.55	22.79	26.00	-0.0030	101452	12.25	125.88	12.25	107.88
EXIST. SWALE 4	System 2	100YR-24HR	25.00	24.26	26.00	0.0049	808017	12.25	200.29	0.00	0.00
EXIST. SWALE 5	System 2	100YR-24HR	25.00	24.26	26.00	-0.0050	583437	12.25	141.26	0.00	0.00
EXIST. SWALE 6	System 2	100YR-24HR	25.00	24.26	26.00	0.0029	172645	12.25	45.84	0.00	0.00
EXIST. SWALE 7	System 3	100YR-24HR	12.82	22.89	26.00	0.0015	1519981	12.17	417.32	0.00	0.00
EXIST. SWALE 8	System 3	100YR-24HR	12.34	22.34	26.00	-0.0037	10050	12.25	23.93	12.25	23.17
EXIST. SWALE 9	System 3	100YR-24HR	12.76	22.62	26.00	0.0014	310873	12.18	76.62	0.00	0.00
ISG AGRICULT	System 2	100YR-24HR	30.00	24.26	25.62	0.0031	27902240	12.25	6156.14	0.00	0.00
ISG RESERVOIR	System 2	100YR-24HR	23.65	26.32	28.62	0.0009	3049200	12.25	394.21	23.65	6.54
PUBLIC LANDS	System 3	100YR-24HR	30.00	21.01	21.01	0.0000	470448000	12.53	203.54	0.00	0.00
ST. LUCIE CANAL	System 2	100YR-24HR	0.00	20.00	20.00	0.0000	0	23.65	6.54	0.00	0.00
EXIST. SWALE 10	System 3	10YR-24HR	12.85	22.35	26.00	-0.0064	267	12.25	10.32	12.28	10.92
EXIST. SWALE 3A	System 2	10YR-24HR	25.03	23.69	26.00	-0.0049	641241	12.25	106.11	12.26	71.18
EXIST. SWALE 3B	System 3	10YR-24HR	13.12	22.65	26.00	0.0030	71752	12.25	86.57	12.26	78.40
EXIST. SWALE 4	System 2	10YR-24HR	25.00	23.69	26.00	0.0048	652446	12.47	82.94	0.00	0.00
EXIST. SWALE 5	System 2	10YR-24HR	25.00	23.69	26.00	-0.0060	524357	12.47	56.63	0.00	0.00
EXIST. SWALE 6	System 2	10YR-24HR	25.00	23.69	26.00	-0.0011	129782	12.45	17.24	0.00	0.00
EXIST. SWALE 7	System 3	10YR-24HR	13.17	22.66	26.00	0.0010	1436948	12.25	337.19	0.00	0.00
EXIST. SWALE 8	System 3	10YR-24HR	12.62	22.25	26.00	-0.0048	8352	12.25	16.55	12.25	15.11
EXIST. SWALE 9	System 3	10YR-24HR	12.84	22.35	26.00	0.0009	289127	12.17	71.46	0.00	0.00
ISG AGRICULT	System 2	10YR-24HR	25.00	23.69	25.62	0.0033	19134147	12.25	3712.56	0.00	0.00
ISG RESERVOIR	System 2	10YR-24HR	24.12	26.13	28.62	0.0003	3049200	12.25	272.62	24.12	2.90
PUBLIC LANDS	System 3	10YR-24HR	30.00	21.00	21.01	0.0000	470448000	13.02	73.30	0.00	0.00
ST. LUCIE CANAL	System 2	10YR-24HR	0.00	20.00	20.00	0.0000	0	24.12	2.90	0.00	0.00
EXIST. SWALE 10	System 3	25YR-72HR	60.42	22.56	26.00	-0.0053	3337	60.00	12.07	60.05	12.45
EXIST. SWALE 3A	System 2	25YR-72HR	73.00	24.39	26.00	0.0050	904338	60.00	131.52	72.04	22.94
EXIST. SWALE 3B	System 3	25YR-72HR	60.11	22.81	26.00	0.0031	104970	60.00	101.27	60.01	94.15
EXIST. SWALE 4	System 2	25YR-72HR	73.00	24.39	26.00	0.0048	840683	60.00	160.57	0.00	0.00
EXIST. SWALE 5	System 2	25YR-72HR	73.00	24.39	26.00	-0.0049	591750	60.00	117.38	0.00	0.00
EXIST. SWALE 6	System 2	25YR-72HR	72.99	24.39	26.00	0.0025	180489	60.00	35.36	72.99	0.04
EXIST. SWALE 7	System 3	25YR-72HR	60.45	22.93	26.00	0.0007	1532927	59.92	239.66	0.00	0.00
EXIST. SWALE 8	System 3	25YR-72HR	60.09	22.32	26.00	-0.0034	9716	60.00	19.21	60.00	18.62
EXIST. SWALE 9	System 3	25YR-72HR	60.49	22.56	26.00	0.0009	306299	60.00	57.35	0.00	0.00
ISG AGRICULT	System 2	25YR-72HR	73.00	24.39	25.62	0.0024	29968512	60.00	5508.35	0.00	0.00
ISG RESERVOIR	System 2	25YR-72HR	68.28	26.36	28.62	0.0010	3049200	60.00	316.33	68.28	7.46
PUBLIC LANDS	System 3	25YR-72HR	84.00	21.01	21.01	0.0000	470448000	60.11	223.22	0.00	0.00
ST. LUCIE CANAL	System 2	25YR-72HR	0.00	20.00	20.00	0.0000	0	68.28	7.46	0.00	0.00

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEMS 2 AND 3 - LINK MAXIMUM CONDITIONS REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
ExPipe_10-9	System 3	100YR-24HR	12.25	14.94	5.958	12.74	22.62	12.76	22.62
ExPipe_3A-4_1	System 2	100YR-24HR	12.38	27.12	-8.329	30.00	24.26	25.00	24.26
ExPipe_3A-4_2	System 2	100YR-24HR	12.37	27.69	-2.714	30.00	24.26	25.00	24.26
ExPipe_3A-5	System 2	100YR-24HR	12.47	47.68	-3.617	30.00	24.26	25.00	24.26
ExPipe_3A-6	System 2	100YR-24HR	12.22	12.25	2.427	30.00	24.26	25.00	24.26
ExPipe_3B-7 (1)	System 3	100YR-24HR	12.04	4.86	-9.021	12.63	22.79	12.82	22.89
ExPipe_3B-7 (2)	System 3	100YR-24HR	12.02	15.14	1.581	12.55	22.79	12.82	22.89
ExPipe_3B-7 (3)	System 3	100YR-24HR	12.02	18.39	1.577	12.55	22.79	12.82	22.89
ExPipe_3B-7 (4)	System 3	100YR-24HR	12.02	19.18	-1.354	12.55	22.79	12.82	22.89
ExPipe_3B-7 (5)	System 3	100YR-24HR	12.02	16.63	-1.057	12.55	22.79	12.82	22.89
ExPipe_8-9	System 3	100YR-24HR	11.90	4.19	-0.807	12.34	22.34	12.76	22.62
ISG OUTFALL	BASE	100YR-24HR	23.65	6.54	0.012	23.65	26.32	0.00	20.00
ISG PUMPS	BASE	100YR-24HR	0.00	0.00	0.000	30.00	24.26	23.65	26.32
W_10-OFFSITE	System 3	100YR-24HR	0.00	0.00	0.000	12.74	22.62	30.00	21.01
W_3A-OFFSITE	System 2	100YR-24HR	11.94	73.34	33.573	30.00	24.26	30.00	24.26
W_3B-8	System 3	100YR-24HR	0.00	0.00	0.000	12.55	22.79	12.34	22.34
W_3B-OFFSITE	System 3	100YR-24HR	12.55	161.14	-1.400	12.55	22.79	30.00	21.01
W_4-5	System 2	100YR-24HR	0.00	0.00	0.000	25.00	24.26	25.00	24.26
W_5-6	System 2	100YR-24HR	0.00	0.00	0.000	25.00	24.26	25.00	24.26
W_6-7	System 2	100YR-24HR	0.00	0.00	0.000	25.00	24.26	12.82	22.89
W_7-9	System 3	100YR-24HR	0.00	0.00	0.000	12.82	22.89	12.76	22.62
W_8-10	System 3	100YR-24HR	0.00	0.00	0.000	12.34	22.34	12.74	22.62
W_8-OFFSITE	System 3	100YR-24HR	12.34	45.13	0.157	12.34	22.34	30.00	21.01
ExPipe_10-9	System 3	10YR-24HR	12.28	10.92	-4.950	12.85	22.35	12.84	22.35
ExPipe_3A-4_1	System 2	10YR-24HR	12.67	12.86	-8.505	25.03	23.69	25.00	23.69
ExPipe_3A-4_2	System 2	10YR-24HR	12.67	13.38	-2.725	25.03	23.69	25.00	23.69
ExPipe_3A-5	System 2	10YR-24HR	12.75	23.55	-5.662	25.03	23.69	25.00	23.69
ExPipe_3A-6	System 2	10YR-24HR	12.48	3.58	2.564	25.03	23.69	25.00	23.69
ExPipe_3B-7 (1)	System 3	10YR-24HR	12.25	4.67	-0.448	13.12	22.65	13.17	22.66
ExPipe_3B-7 (2)	System 3	10YR-24HR	12.22	15.19	1.499	13.12	22.65	13.17	22.66
ExPipe_3B-7 (3)	System 3	10YR-24HR	12.21	18.61	-1.610	13.12	22.65	13.17	22.66
ExPipe_3B-7 (4)	System 3	10YR-24HR	12.21	19.40	-1.478	13.12	22.65	13.17	22.66
ExPipe_3B-7 (5)	System 3	10YR-24HR	12.22	16.68	-1.153	13.12	22.65	13.17	22.66
ExPipe_8-9	System 3	10YR-24HR	12.04	11.55	-0.921	12.62	22.25	12.84	22.35
ISG OUTFALL	BASE	10YR-24HR	24.12	2.90	0.002	24.12	26.13	0.00	20.00
ISG PUMPS	BASE	10YR-24HR	0.00	0.00	0.000	25.00	23.69	24.12	26.13
W_10-OFFSITE	System 3	10YR-24HR	0.00	0.00	0.000	12.85	22.35	30.00	21.00
W_3A-OFFSITE	System 2	10YR-24HR	12.27	127.37	9.543	25.03	23.69	25.00	23.69
W_3B-8	System 3	10YR-24HR	0.00	0.00	0.000	13.12	22.65	12.62	22.25
W_3B-OFFSITE	System 3	10YR-24HR	13.12	52.54	0.083	13.12	22.65	30.00	21.00
W_4-5	System 2	10YR-24HR	0.00	0.00	0.000	25.00	23.69	25.00	23.69
W_5-6	System 2	10YR-24HR	0.00	0.00	0.000	25.00	23.69	25.00	23.69
W_6-7	System 2	10YR-24HR	0.00	0.00	0.000	25.00	23.69	13.17	22.66
W_7-9	System 3	10YR-24HR	0.00	0.00	0.000	13.17	22.66	12.84	22.35
W_8-10	System 3	10YR-24HR	0.00	0.00	0.000	12.62	22.25	12.85	22.35
W_8-OFFSITE	System 3	10YR-24HR	12.62	23.43	0.108	12.62	22.25	30.00	21.00
ExPipe_10-9	System 3	25YR-72HR	60.05	12.45	5.282	60.42	22.56	60.49	22.56
ExPipe_3A-4_1	System 2	25YR-72HR	60.14	21.10	-8.263	73.00	24.39	73.00	24.39
ExPipe_3A-4_2	System 2	25YR-72HR	60.14	21.21	-2.626	73.00	24.39	73.00	24.39
ExPipe_3A-5	System 2	25YR-72HR	60.05	37.63	2.307	73.00	24.39	73.00	24.39
ExPipe_3A-6	System 2	25YR-72HR	59.94	8.72	-2.299	73.00	24.39	72.99	24.39
ExPipe_3B-7 (1)	System 3	25YR-72HR	53.48	0.18	-9.015	60.19	22.80	60.45	22.93
ExPipe_3B-7 (2)	System 3	25YR-72HR	2.77	0.81	1.521	60.11	22.81	60.45	22.93
ExPipe_3B-7 (3)	System 3	25YR-72HR	2.77	1.18	-1.557	60.11	22.81	60.45	22.93
ExPipe_3B-7 (4)	System 3	25YR-72HR	2.77	0.99	-1.224	60.11	22.81	60.45	22.93
ExPipe_3B-7 (5)	System 3	25YR-72HR	2.77	0.77	-0.985	60.11	22.81	60.45	22.93
ExPipe_8-9	System 3	25YR-72HR	2.79	0.82	1.408	60.09	22.32	60.49	22.56
ISG OUTFALL	BASE	25YR-72HR	68.28	7.46	0.018	68.28	26.36	0.00	20.00
ISG PUMPS	BASE	25YR-72HR	0.00	0.00	0.000	73.00	24.39	68.28	26.36
W_10-OFFSITE	System 3	25YR-72HR	0.00	0.00	0.000	60.42	22.56	84.00	21.01
W_3A-OFFSITE	System 2	25YR-72HR	72.33	21.02	42.302	73.00	24.39	73.00	24.39
W_3B-8	System 3	25YR-72HR	0.00	0.00	0.000	60.11	22.81	60.09	22.32
W_3B-OFFSITE	System 3	25YR-72HR	60.11	183.15	-1.061	60.11	22.81	84.00	21.01
W_4-5	System 2	25YR-72HR	0.00	0.00	0.000	73.00	24.39	73.00	24.39
W_5-6	System 2	25YR-72HR	0.00	0.00	0.000	73.00	24.39	72.99	24.39
W_6-7	System 2	25YR-72HR	72.99	0.04	0.000	72.99	24.39	60.45	22.93
W_7-9	System 3	25YR-72HR	0.00	0.00	0.000	60.45	22.93	60.49	22.56
W_8-10	System 3	25YR-72HR	0.00	0.00	0.000	60.09	22.32	60.42	22.56
W_8-OFFSITE	System 3	25YR-72HR	60.09	40.18	0.076	60.09	22.32	84.00	21.01

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEMS 2 AND 3 - BASIN MAXIMUM CONDITIONS REPORT

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
100YR-24HR	BASIN 10	System 3	12.27	15.02	8.961	87174
100YR-24HR	BASIN 3A	System 2	12.27	160.60	7.969	868979
100YR-24HR	BASIN 3B	System 3	12.27	125.97	8.958	731027
100YR-24HR	BASIN 4	System 2	12.27	80.75	7.925	435813
100YR-24HR	BASIN 5	System 2	12.27	54.23	7.931	292783
100YR-24HR	BASIN 6	System 2	12.27	17.99	7.947	97214
100YR-24HR	BASIN 7	System 3	12.27	212.48	9.397	1286309
100YR-24HR	BASIN 8	System 3	12.27	23.95	9.397	144970
100YR-24HR	BASIN 9	System 3	12.27	45.36	9.397	274590
100YR-24HR	ISG AGRICULT	BASE	12.27	6351.59	5.687	31688101
100YR-24HR	ISG RESERVOIR	BASE	12.27	394.42	9.397	2387738
100YR-24HROFFSITE	BASIN 1	System 2	12.27	67.82	8.968	393905
100YR-24HROFFSITE	BASIN 2	System 2	12.27	45.30	8.977	263285
100YR-24HROFFSITE	BASIN 3	System 2	12.27	15.77	8.177	86371
100YR-24HROFFSITE	BASIN 4	System 3	12.27	168.14	9.397	1017859
100YR-24HROFFSITE	BASIN 5	System 3	12.27	35.16	9.397	212850
10YR-24HR	BASIN 10	System 3	12.27	10.33	6.068	59032
10YR-24HR	BASIN 3A	System 2	12.27	106.38	5.135	559933
10YR-24HR	BASIN 3B	System 3	12.27	86.63	6.066	494971
10YR-24HR	BASIN 4	System 2	12.27	53.37	5.095	280174
10YR-24HR	BASIN 5	System 2	12.27	35.85	5.100	188283
10YR-24HR	BASIN 6	System 2	12.27	11.90	5.115	62569
10YR-24HR	BASIN 7	System 3	12.27	146.93	6.498	889469
10YR-24HR	BASIN 8	System 3	12.27	16.56	6.498	100245
10YR-24HR	BASIN 9	System 3	12.27	31.36	6.498	189876
10YR-24HR	ISG AGRICULT	BASE	12.27	3622.07	3.206	17864019
10YR-24HR	ISG RESERVOIR	BASE	12.27	272.74	6.498	1651096
10YR-24HROFFSITE	BASIN 1	System 2	12.27	46.65	6.075	266834
10YR-24HROFFSITE	BASIN 2	System 2	12.27	31.16	6.083	178425
10YR-24HROFFSITE	BASIN 3	System 2	12.27	10.55	5.325	56251
10YR-24HROFFSITE	BASIN 4	System 3	12.27	116.26	6.498	703839
10YR-24HROFFSITE	BASIN 5	System 3	12.27	24.31	6.498	147183
25YR-72HR	BASIN 10	System 3	60.02	12.10	9.759	94943
25YR-72HR	BASIN 3A	System 2	60.02	131.92	8.757	954863
25YR-72HR	BASIN 3B	System 3	60.02	101.52	9.757	796186
25YR-72HR	BASIN 4	System 2	60.02	66.41	8.712	479085
25YR-72HR	BASIN 5	System 2	60.02	44.59	8.718	321835
25YR-72HR	BASIN 6	System 2	60.02	14.79	8.734	106844
25YR-72HR	BASIN 7	System 3	60.02	170.82	10.196	1395767
25YR-72HR	BASIN 8	System 3	60.02	19.25	10.196	157306
25YR-72HR	BASIN 9	System 3	60.02	36.47	10.196	297956
25YR-72HR	ISG AGRICULT	BASE	60.02	5677.80	6.403	35675542
25YR-72HR	ISG RESERVOIR	BASE	60.02	317.10	10.196	2590922
25YR-72HROFFSITE	BASIN 1	System 2	60.02	54.65	9.767	428979
25YR-72HROFFSITE	BASIN 2	System 2	60.02	36.50	9.775	286708
25YR-72HROFFSITE	BASIN 3	System 2	60.02	12.88	8.967	94725
25YR-72HROFFSITE	BASIN 4	System 3	60.02	135.17	10.196	1104473
25YR-72HROFFSITE	BASIN 5	System 3	60.02	28.27	10.196	230962

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Basins

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Name: BASIN 10 Node: EXIST. SWALE 10 Status: Onsite
Group: System 3 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 2.680 Time Shift(hrs): 0.00
Curve Number: 96.38 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 3A Node: EXIST. SWALE 3A Status: Onsite
Group: System 2 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 30.040 Time Shift(hrs): 0.00
Curve Number: 88.25 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 3B Node: EXIST. SWALE 3B Status: Onsite
Group: System 3 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 22.480 Time Shift(hrs): 0.00
Curve Number: 96.36 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 4 Node: EXIST. SWALE 4 Status: Onsite
Group: System 2 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 15.150 Time Shift(hrs): 0.00
Curve Number: 87.89 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 5 Node: EXIST. SWALE 5 Status: Onsite
Group: System 2 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 10.170 Time Shift(hrs): 0.00
Curve Number: 87.94 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 6 Node: EXIST. SWALE 6 Status: Onsite
Group: System 2 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 3.370 Time Shift(hrs): 0.00
Curve Number: 88.07 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 7 Node: EXIST. SWALE 7 Status: Onsite
Group: System 3 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 37.710	Time Shift(hrs): 0.00
Curve Number: 100.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 8	Node: EXIST. SWALE 8	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 4.250	Time Shift(hrs): 0.00
Curve Number: 100.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 9	Node: EXIST. SWALE 9	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 8.050	Time Shift(hrs): 0.00
Curve Number: 100.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: ISG AGRICULT	Node: ISG AGRICULT	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 1535.000	Time Shift(hrs): 0.00
Curve Number: 70.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Indian Sun Groves Agricultural Area

Indian Sun Groves - per Indian Sun Groves Surface Water Management Report, November 1985
SFWM D Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

Name: ISG RESERVOIR	Node: ISG RESERVOIR	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 70.000	Time Shift(hrs): 0.00
Curve Number: 100.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Indian Sun Groves Reservoir

Indian Sun Reservoir - per Indian Sun Groves Surface Water Management Report, November 1985
SFWM D Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

Name: OFFSITE BASIN 1	Node: EXIST. SWALE 4	Status: Offsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 12.100	Time Shift(hrs): 0.00
Curve Number: 96.44	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: OFFSITE BASIN 2	Node: EXIST. SWALE 5	Status: Offsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00

Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 8.080 Time Shift(hrs): 0.00
Curve Number: 96.51 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: OFFSITE BASIN 3 Node: EXIST. SWALE 6 Status: Offsite
Group: System 2 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 2.910 Time Shift(hrs): 0.00
Curve Number: 89.94 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: OFFSITE BASIN 4 Node: EXIST. SWALE 7 Status: Offsite
Group: System 3 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 29.840 Time Shift(hrs): 0.00
Curve Number: 100.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: OFFSITE BASIN 5 Node: EXIST. SWALE 9 Status: Offsite
Group: System 3 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 6.240 Time Shift(hrs): 0.00
Curve Number: 100.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

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Nodes
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Name: EXIST. SWALE 10 Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
22.500	0.0400
23.000	0.3000
23.500	0.8100
24.000	1.4700
24.500	1.8400
25.000	1.9700
25.500	2.0900
26.000	2.2100
26.500	2.5300
27.000	2.6600

Name: EXIST. SWALE 3A Base Flow(cfs): 0.000 Init Stage(ft): 20.620
Group: System 2 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
20.500	0.0100
21.000	0.0500
21.500	0.1700
22.000	0.7000
22.500	3.0000
23.000	6.5800
23.500	12.5600
24.000	18.3700

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEMS 2 AND 3 - INPUT REPORT

24.500	21.4300
25.000	23.5800
25.500	25.6300
26.000	28.9900
26.500	30.0600

Name: EXIST. SWALE 3B	Base Flow(cfs): 0.000	Init Stage(ft): 21.000
Group: System 3		Warn Stage(ft): 26.000
Type: Stage/Area		

Stage(ft)	Area(ac)
21.500	0.0100
22.000	0.1000
22.500	0.9000
23.000	3.3300
23.500	8.5500
24.000	13.9200
24.500	15.8900
25.000	16.9700
25.500	18.0300
26.000	19.1200
26.500	22.4500
27.000	22.4800

Name: EXIST. SWALE 4	Base Flow(cfs): 0.000	Init Stage(ft): 20.620
Group: System 2		Warn Stage(ft): 26.000
Type: Stage/Area		

Stage(ft)	Area(ac)
20.000	0.0100
20.500	0.0200
21.000	0.0400
21.500	0.4900
22.000	2.0000
22.500	5.3800
23.000	9.6500
23.500	13.7100
24.000	17.1200
24.500	19.9100
25.000	21.9900
25.500	23.3200
26.000	24.9700
26.500	25.2100
27.000	25.3000
27.500	25.3100

Name: EXIST. SWALE 5	Base Flow(cfs): 0.000	Init Stage(ft): 20.620
Group: System 2		Warn Stage(ft): 26.000
Type: Stage/Area		

Stage(ft)	Area(ac)
22.000	0.2200
22.500	3.2400
23.000	7.8200
23.500	11.4500
24.000	13.0300
24.500	13.7400
25.000	14.1800
25.500	14.8500
26.000	15.6300
26.500	15.6500
27.000	15.6600

Name: EXIST. SWALE 6	Base Flow(cfs): 0.000	Init Stage(ft): 20.620
Group: System 2		Warn Stage(ft): 26.000
Type: Stage/Area		

Stage(ft)	Area(ac)
20.000	0.0100
20.500	0.0200

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEMS 2 AND 3 - INPUT REPORT

21.000	0.0300
21.500	0.0500
22.000	0.1000
22.500	0.5400
23.000	1.6200
23.500	2.6000
24.000	3.6200
24.500	4.2900
25.000	4.6300
25.500	4.9700
26.000	5.4200
26.500	5.4500
27.000	5.4700

Name: EXIST. SWALE 7 Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.500	0.0200
19.000	0.1000
19.500	0.3100
20.000	0.9400
20.500	2.3600
21.000	5.4800
21.500	11.7500
22.000	23.3800
22.500	31.6600
23.000	35.7400
23.500	39.6100
24.000	42.5600
24.500	44.1600
25.000	45.5900
25.500	46.9600
26.000	48.4400
26.500	52.9100
27.000	52.9300

Name: EXIST. SWALE 8 Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
21.500	0.0200
22.000	0.0900
22.500	0.2900
23.000	0.6900
23.500	1.4900
24.000	2.5700
24.500	2.9300
25.000	3.1600
25.500	3.3800
26.000	3.6100
26.500	4.2100
27.000	4.2500

Name: EXIST. SWALE 9 Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.500	0.0100
19.000	0.0400
19.500	0.1700
20.000	0.4100
20.500	1.4000
21.000	2.9800
21.500	4.6700
22.000	5.9500
22.500	6.9300
23.000	7.7600
23.500	8.5000
24.000	9.9800
24.500	9.3200

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEMS 2 AND 3 - INPUT REPORT

25.000	9.6500
25.500	9.9600
26.000	10.3300
26.500	11.1500
27.000	11.2200

Name: ISG AGRICULT Base Flow(cfs): 0.000 Init Stage(ft): 20.620
Group: System 2 Warn Stage(ft): 25.620
Type: Stage/Volume

Indian Sun Groves Agricultural Area

Indian Sun Groves - per Indian Sun Groves Surface Water Management Report, November 1985
SFWMD Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

Stage(ft)	Volume(af)
18.780	0.0000
20.610	0.0000
20.620	0.0000
21.120	31.5000
21.620	63.0000
22.120	94.5000
22.620	126.0000
23.120	201.6300
23.620	365.5000
24.120	617.6300
24.620	958.0000

Name: ISG RESERVOIR Base Flow(cfs): 0.000 Init Stage(ft): 25.620
Group: System 2 Warn Stage(ft): 28.620
Type: Stage/Volume

Indian Sun Groves Reservoir

Indian Sun Reservoir - per Indian Sun Groves Surface Water Management Report, November 1985
SFWMD Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

Stage(ft)	Volume(af)
25.620	0.0000
26.120	35.0000
26.620	70.0000
27.120	105.0000
27.620	140.0000
28.120	175.0000
28.620	210.0000

Name: PUBLIC LANDS Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 3 Warn Stage(ft): 21.010
Type: Stage/Area

Hungryland/SFWMD Parcels & John C. and Mariana Jones Hungryland Wildlife Environmental Area

Public Lands - per Drainage Design Documentation SR 710 Reconstruction from Martin/Palm Beach County to Pratt Whitney Entrance,
SFWMD Permit No. 50-04716-P, Application No. 150220-9, Issued 04/07/15

Stage(ft)	Area(ac)
21.000	10800.0000
25.000	10800.0000

Name: ST. LUCIE CANAL Base Flow(cfs): 0.000 Init Stage(ft): 20.000
Group: System 2 Warn Stage(ft): 20.000
Type: Time/Stage

Saint Lucie Canal (SFWMD C-44)

St. Lucie Canal - Per Stormwater Management Report for SR 710 Big John Monahan Bridge Replacement Design Build from SW Trail Dri
SFWMD Permit No. 43-00802-S, Application No. 110909-1, Issued 12/19/2011

Time(hrs)	Stage(ft)
0.00	20.000
1000.00	20.000

==== Cross Sections =====

Name: XS_W_10-OFFSITE
Encroachment: No

Group: System 3

Station(ft)	Elevation(ft)	Manning's N
0.000	25.240	0.060000
101.590	24.900	0.060000
279.360	24.020	0.060000
487.060	23.810	0.060000
633.200	23.710	0.060000
909.790	23.100	0.060000
1209.940	23.400	0.060000
1215.000	23.400	0.060000

Name: XS_W_3A-OFFSITE
Encroachment: No

Group: System 2

Station(ft)	Elevation(ft)	Manning's N
0.000	24.800	0.060000
124.690	24.200	0.060000
139.690	23.280	0.060000
168.450	26.300	0.060000
266.220	26.280	0.060000
368.150	25.990	0.060000
462.970	23.700	0.060000
525.160	23.950	0.060000
630.260	25.240	0.060000
635.940	23.300	0.060000
724.330	23.700	0.060000
741.860	25.300	0.060000
852.300	24.340	0.060000
875.810	26.400	0.060000
919.190	24.200	0.060000
1023.850	24.600	0.060000
1038.680	26.600	0.060000
1092.210	24.300	0.060000
1131.830	25.570	0.060000
1179.560	25.800	0.060000
1180.810	24.400	0.060000
1220.150	24.900	0.060000
1262.940	25.890	0.060000
1326.910	24.900	0.060000
1384.740	25.260	0.060000
1498.810	26.200	0.060000
1592.200	26.350	0.060000
1635.620	24.800	0.060000
1648.930	23.500	0.060000
1680.320	23.400	0.060000
1692.280	24.470	0.060000
1742.460	26.100	0.060000
1808.590	24.020	0.060000
1819.260	23.000	0.060000
1875.130	25.600	0.060000
1933.840	23.600	0.060000
1967.510	26.000	0.060000
1999.070	23.800	0.060000
2080.650	25.700	0.060000
2179.510	24.190	0.060000
2283.830	25.070	0.060000
2394.340	25.770	0.060000
2539.470	24.510	0.060000
2676.070	24.050	0.060000
2835.600	23.830	0.060000
2949.580	25.290	0.060000
3067.100	24.620	0.060000
3202.190	21.800	0.060000
3343.440	25.390	0.060000
3453.990	24.820	0.060000
3604.220	24.400	0.060000
3713.530	24.550	0.060000
3822.010	24.990	0.060000
3926.850	24.700	0.060000
4029.780	23.820	0.060000
4230.390	23.410	0.060000
4346.360	23.550	0.060000
4469.480	22.640	0.060000
4575.380	23.180	0.060000
4687.810	23.450	0.060000

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4795.280	24.610	0.060000
4910.540	24.530	0.060000
5011.770	24.100	0.060000
5166.840	24.370	0.060000
5271.780	24.930	0.060000
5384.280	24.330	0.060000
5496.420	25.270	0.060000
5611.240	22.410	0.060000
5711.690	24.980	0.060000
5889.470	22.910	0.060000
5991.730	22.610	0.060000
6094.050	25.060	0.060000
6213.450	24.050	0.060000
6322.450	23.900	0.060000
6487.800	23.980	0.060000
6591.240	23.220	0.060000
6700.750	23.040	0.060000
7030.750	24.410	0.060000
7164.860	22.500	0.060000
7283.180	22.970	0.060000
7409.610	23.040	0.060000
7521.260	23.010	0.060000
7651.230	24.420	0.060000
7787.610	23.610	0.060000
7944.620	23.710	0.060000
8052.400	25.990	0.060000
8175.750	23.160	0.060000
8284.860	23.050	0.060000
8391.230	23.080	0.060000
8887.270	23.600	0.060000
9032.080	23.770	0.060000
9245.470	24.290	0.060000
9357.140	24.010	0.060000
9521.340	24.150	0.060000
9647.940	25.140	0.060000
9762.030	24.830	0.060000
9890.240	24.880	0.060000
9994.220	23.180	0.060000
10130.660	23.680	0.060000
10232.420	23.800	0.060000
10345.320	22.720	0.060000
10472.150	22.890	0.060000
10587.040	24.380	0.060000
10690.730	23.130	0.060000
10791.780	24.930	0.060000
10897.880	22.850	0.060000
11002.630	23.360	0.060000
11148.610	23.470	0.060000
11250.820	24.350	0.060000
11403.920	23.290	0.060000
11509.850	23.730	0.060000
11639.710	23.330	0.060000
11764.390	23.600	0.060000
11896.310	24.390	0.060000
12011.920	24.050	0.060000
12120.000	24.380	0.060000
12239.980	25.000	0.060000
12353.710	23.620	0.060000
12471.010	23.250	0.060000
12576.820	24.770	0.060000
12728.930	24.650	0.060000
12836.010	24.710	0.060000
12938.540	25.910	0.060000
13055.860	24.410	0.060000
13133.110	23.920	0.060000

Name: XS_W_3B-8 Group: System 3
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	26.770	0.020000
12.920	26.600	0.020000
31.720	25.200	0.020000
105.930	24.440	0.020000

Name: XS_W_3B-OFFSITE Group: System 3
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
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SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEMS 2 AND 3 - INPUT REPORT

0.000	23.920	0.060000
230.740	23.860	0.060000
334.010	23.840	0.060000
443.120	24.620	0.060000
570.860	24.000	0.060000
691.900	24.400	0.060000
810.350	24.370	0.060000
978.850	24.480	0.060000
1169.890	23.810	0.060000
1301.740	24.350	0.060000
1501.410	23.730	0.060000
1660.970	24.370	0.060000
1803.670	23.320	0.060000
1917.160	24.060	0.060000
2098.540	22.930	0.060000
2290.720	22.340	0.060000
2478.260	23.240	0.060000
2604.260	23.330	0.060000
2806.860	23.540	0.060000
2812.560	23.530	0.060000
2921.260	23.050	0.060000
3086.220	22.900	0.060000
3209.410	23.540	0.060000
3327.880	23.620	0.060000
3498.180	23.850	0.060000
3690.500	23.140	0.060000
3805.320	23.080	0.060000
3914.100	22.680	0.060000
4056.360	22.690	0.060000
4156.510	23.410	0.060000
4271.320	23.370	0.060000
4411.110	22.350	0.060000
4512.360	23.230	0.060000
4633.970	24.150	0.060000
4794.630	23.870	0.060000
4934.550	24.120	0.060000
5094.470	24.090	0.060000
5244.800	23.670	0.060000
5381.410	23.790	0.060000
5529.170	23.450	0.060000
5676.640	23.360	0.060000
5824.620	23.660	0.060000
6279.310	23.110	0.060000
6469.750	22.650	0.060000
6599.420	23.280	0.060000
6745.410	23.460	0.060000
6928.700	23.820	0.060000
7139.410	24.020	0.060000
7357.030	24.320	0.060000
7458.450	24.070	0.060000
7600.510	23.680	0.060000
7708.450	23.120	0.060000
8010.220	23.100	0.060000
8092.660	22.740	0.060000
8253.930	22.890	0.060000
8399.470	22.850	0.060000
8548.030	22.730	0.060000
8741.240	23.260	0.060000
8870.150	23.650	0.060000
9027.510	23.740	0.060000
9197.300	23.510	0.060000
9388.720	23.710	0.060000
9521.910	23.560	0.060000
9687.030	24.240	0.060000
9804.480	24.440	0.060000

Name: XS_W_4-5 Group: System 2
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	26.250	0.020000
67.480	24.700	0.020000
107.580	25.210	0.020000
200.240	27.200	0.020000
224.730	26.580	0.020000

Name: XS_W_5-6 Group: System 2
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	26.350	0.020000
50.710	25.600	0.020000
101.780	25.900	0.020000
195.080	27.700	0.020000
222.650	26.780	0.020000

Name: XS_W_6-7 Group: System 2
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	26.390	0.020000
37.290	24.800	0.020000
62.620	24.600	0.020000
106.180	25.050	0.020000
178.340	24.700	0.020000
208.440	24.350	0.020000

Name: XS_W_7-9 Group: System 3
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	26.690	0.020000
54.060	25.200	0.020000
86.830	25.200	0.020000
89.890	23.500	0.020000
102.250	24.180	0.020000
128.700	25.100	0.020000
162.110	25.200	0.020000
178.910	24.400	0.020000
208.400	26.110	0.020000
274.160	26.500	0.020000

Name: XS_W_8-10 Group: System 3
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	25.240	0.060000
30.220	23.800	0.060000
36.010	24.500	0.060000
50.820	23.400	0.060000
79.720	25.100	0.060000
110.360	26.820	0.060000
131.270	27.060	0.060000

Name: XS_W_8-OFFSITE Group: System 3
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	24.440	0.060000
107.830	23.300	0.060000
237.310	23.090	0.060000
339.940	22.880	0.060000
449.300	21.920	0.060000
563.760	22.520	0.060000
677.130	22.480	0.060000
787.330	22.720	0.060000
934.060	23.390	0.060000
1035.920	23.860	0.060000
1215.470	22.830	0.060000
1391.890	23.810	0.060000
1624.720	23.780	0.060000
1746.970	23.580	0.060000
1819.320	25.240	0.060000

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==== Operating Tables =====
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Name: ISG PUMP 1 Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
21.120	40.00
30.000	40.00

Name: ISG PUMP 2 Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
21.620	120.00
30.000	120.00

==== Pipes =====

Name: ExPipe_10-9	From Node: EXIST. SWALE 10	Length(ft): 78.54
Group: System 3	To Node: EXIST. SWALE 9	Count: 1
	Friction Equation: Automatic	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 48.00	48.00	Entrance Loss Coef: 0.50
Rise(in): 48.00	48.00	Exit Loss Coef: 0.00
Invert(ft): 20.130	19.680	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

Name: ExPipe_3A-4_1	From Node: EXIST. SWALE 3A	Length(ft): 82.55
Group: System 2	To Node: EXIST. SWALE 4	Count: 1
	Friction Equation: Automatic	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 48.00	48.00	Entrance Loss Coef: 0.50
Rise(in): 48.00	48.00	Exit Loss Coef: 0.00
Invert(ft): 18.940	17.890	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

Name: ExPipe_3A-4_2	From Node: EXIST. SWALE 3A	Length(ft): 78.57
Group: System 2	To Node: EXIST. SWALE 4	Count: 1
	Friction Equation: Automatic	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 48.00	48.00	Entrance Loss Coef: 0.50
Rise(in): 48.00	48.00	Exit Loss Coef: 1.00
Invert(ft): 19.700	18.550	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

Name: ExPipe_3A-5	From Node: EXIST. SWALE 3A	Length(ft): 78.90
Group: System 2	To Node: EXIST. SWALE 5	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.650	19.590	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

Name: ExPipe_3A-6	From Node: EXIST. SWALE 3A	Length(ft): 78.09
Group: System 2	To Node: EXIST. SWALE 6	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.600	19.290	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

Name: ExPipe_3B-7 (1)	From Node: EXIST. SWALE 3B	Length(ft): 77.40
Group: System 3	To Node: EXIST. SWALE 7	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: 0.50
Invert(ft): 19.290	21.280	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

Name: ExPipe_3B-7 (2)	From Node: EXIST. SWALE 3B	Length(ft): 77.60
Group: System 3	To Node: EXIST. SWALE 7	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
		Flow: Both

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Span(in): 48.00	48.00	Entrance Loss Coef: 0.50
Rise(in): 48.00	48.00	Exit Loss Coef: 0.00
Invert(ft): 19.920	20.170	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

Name: ExPipe_3B-7 (3)	From Node: EXIST. SWALE 3B	Length(ft): 77.41
Group: System 3	To Node: EXIST. SWALE 7	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 20.050	19.910	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

Name: ExPipe_3B-7 (4)	From Node: EXIST. SWALE 3B	Length(ft): 77.74
Group: System 3	To Node: EXIST. SWALE 7	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 20.350	19.950	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

Name: ExPipe_3B-7 (5)	From Node: EXIST. SWALE 3B	Length(ft): 78.14
Group: System 3	To Node: EXIST. SWALE 7	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 20.360	20.130	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

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Name: ExPipe_8-9      From Node: EXIST. SWALE 8      Length(ft): 77.62
Group: System 3       To Node: EXIST. SWALE 9      Count: 1
                        Friction Equation: Automatic
                        Solution Algorithm: Most Restrictive
                        Flow: Both
UPSTREAM              DOWNSTREAM
Geometry: Circular    Circular
Span(in): 48.00        48.00
Rise(in): 48.00        48.00
Invert(ft): 20.160     19.990
Manning's N: 0.013000  0.013000
Top Clip(in): 0.000    0.000
Bot Clip(in): 0.000    0.000
Entrance Loss Coef: 0.50
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None
-----
```

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

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

```
=====
==== Drop Structures =====
=====
```

```
Name: ISG OUTFALL      From Node: ISG RESERVOIR      Length(ft): 60.00
Group: BASE            To Node: ST. LUCIE CANAL      Count: 1
                        Friction Equation: Automatic
                        Solution Algorithm: Most Restrictive
                        Flow: Both
UPSTREAM              DOWNSTREAM
Geometry: Circular    Circular
Span(in): 72.00        72.00
Rise(in): 72.00        72.00
Invert(ft): 21.620     21.620
Manning's N: 0.013000  0.013000
Top Clip(in): 0.000    0.000
Bot Clip(in): 0.000    0.000
Entrance Loss Coef: 0.500
Exit Loss Coef: 1.000
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
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

Indian Sun Groves Reservoir Outfall Structure to St. Lucie Canal (SFWMD C-44)

Indian Sun Reservoir - per Indian Sun Groves Surface Water Management Report, November 1985
SFWMD Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

*** Weir 1 of 1 for Drop Structure ISG OUTFALL ***

TABLE

```
Count: 1
Type: Vertical: Mavis
Flow: Both
Geometry: Trapezoidal
Bottom Width(ft): 0.00
Left Sd Slp(h/v): 6.28
Right Sd Slp(h/v): 6.28
Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Disc Coef: 3.200
Orifice Disc Coef: 0.600
Invert(ft): 25.620
Control Elev(ft): 25.620
Struct Opening Dim(ft): 99999.00
-----
```

```
=====
==== Weirs =====
=====
```

```
Name: W_10-OFFSITE      From Node: EXIST. SWALE 10
Group: System 3         To Node: Public Lands
Flow: Both              Count: 1
Type: Vertical: Fread   Geometry: Irregular
                        XSec: XS_W_10-OFFSITE
                        Invert(ft): 23.100
                        Control Elevation(ft): 23.100
                        Struct Opening Dim(ft): 9999.00
                        TABLE
                        Bottom Clip(ft): 0.000
                        Top Clip(ft): 0.000
                        Weir Discharge Coef: 3.200
                        Orifice Discharge Coef: 0.600
-----
```

```
Name: W_3A-OFFSITE      From Node: EXIST. SWALE 3A
Group: System 2         To Node: ISG AGRICULT
-----
```

Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

 XSec: XS_W_3A-OFFSITE
 Invert(ft): 21.800
Control Elevation(ft): 21.800
Struct Opening Dim(ft): 9999.00

 TABLE

 Bottom Clip(ft): 0.000
 Top Clip(ft): 0.000
 Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_3B-8 From Node: EXIST. SWALE 3B
Group: System 3 To Node: EXIST. SWALE 8
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

 XSec: XS_W_3B-8
 Invert(ft): 24.440
Control Elevation(ft): 24.440
Struct Opening Dim(ft): 9999.00

 TABLE

 Bottom Clip(ft): 0.000
 Top Clip(ft): 0.000
 Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_3B-OFFSITE From Node: EXIST. SWALE 3B
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

 XSec: XS_W_3B-OFFSITE
 Invert(ft): 22.340
Control Elevation(ft): 22.340
Struct Opening Dim(ft): 9999.00

 TABLE

 Bottom Clip(ft): 0.000
 Top Clip(ft): 0.000
 Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_4-5 From Node: EXIST. SWALE 4
Group: System 2 To Node: EXIST. SWALE 5
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

 XSec: XS_W_4-5
 Invert(ft): 24.700
Control Elevation(ft): 24.700
Struct Opening Dim(ft): 9999.00

 TABLE

 Bottom Clip(ft): 0.000
 Top Clip(ft): 0.000
 Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_5-6 From Node: EXIST. SWALE 5
Group: System 2 To Node: EXIST. SWALE 6
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

 XSec: XS_W_5-6
 Invert(ft): 25.600
Control Elevation(ft): 25.600
Struct Opening Dim(ft): 9999.00

 TABLE

 Bottom Clip(ft): 0.000
 Top Clip(ft): 0.000
 Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_6-7 From Node: EXIST. SWALE 6
Group: System 2 To Node: EXIST. SWALE 7
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: XS_W_6-7
Invert(ft): 24.350
Control Elevation(ft): 24.350
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_7-9 From Node: EXIST. SWALE 7
Group: System 3 To Node: EXIST. SWALE 9
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: XS_W_7-9
Invert(ft): 23.500
Control Elevation(ft): 23.500
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_8-10 From Node: EXIST. SWALE 8
Group: System 3 To Node: EXIST. SWALE 10
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: XS_W_8-10
Invert(ft): 23.400
Control Elevation(ft): 23.400
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_8-OFFSITE From Node: EXIST. SWALE 8
Group: System 3 To Node: Public Lands
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: XS_W_8-OFFSITE
Invert(ft): 21.920
Control Elevation(ft): 21.920
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

=====
Rating Curves
=====

Name: ISG PUMPS From Node: ISG AGRICULT Count: 1
Group: BASE To Node: ISG RESERVOIR Flow: Positive

TABLE

	ELEV ON(ft)	ELEV OFF(ft)
#1: ISG PUMP 1	21.120	20.620
#2: ISG PUMP 2	21.620	21.120
#3:	0.000	0.000
#4:	0.000	0.000

Indian Sun Groves Agricultural Area Pumps to Reservoir

Indian Sun Groves - per Indian Sun Groves Surface Water Management Report, November 1985
SFWMD Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

==== Percolation Links =====

Name: From Node: Flow: Both
Group: BASE To Node: Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): 0.000 Perimeter 1(ft): 0.000
Water Table Elev(ft): 0.000 Perimeter 2(ft): 0.000
Ann Recharge Rate(in/year): 0.000 Perimeter 3(ft): 0.000
Horiz Conductivity(ft/day): 0.000 Distance 1 to 2(ft): 0.000
Vert Conductivity(ft/day): 0.000 Distance 2 to 3(ft): 0.000
Effective Porosity(dec): 0.000 Num Cells 1 to 2: 0
Suction Head(in): 0.000 Num Cells 2 to 3: 0
Layer Thickness(ft): 0.000

==== Hydrology Simulations =====

Name: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 2-3\100YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii
Rainfall Amount(in): 9.40

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 2-3\10YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii
Rainfall Amount(in): 6.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 2-3\25YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 10.20

Time(hrs)	Print Inc(min)
48.000	15.00
72.000	5.00
84.000	15.00

==== Routing Simulations =====

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 2-3\100YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 2	Yes
System 3	Yes

Name: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 2-3\10YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 2	Yes
System 3	Yes

Name: 25YR-72HR Hydrology Sim: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 2-3\25YR-72HR.I32

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

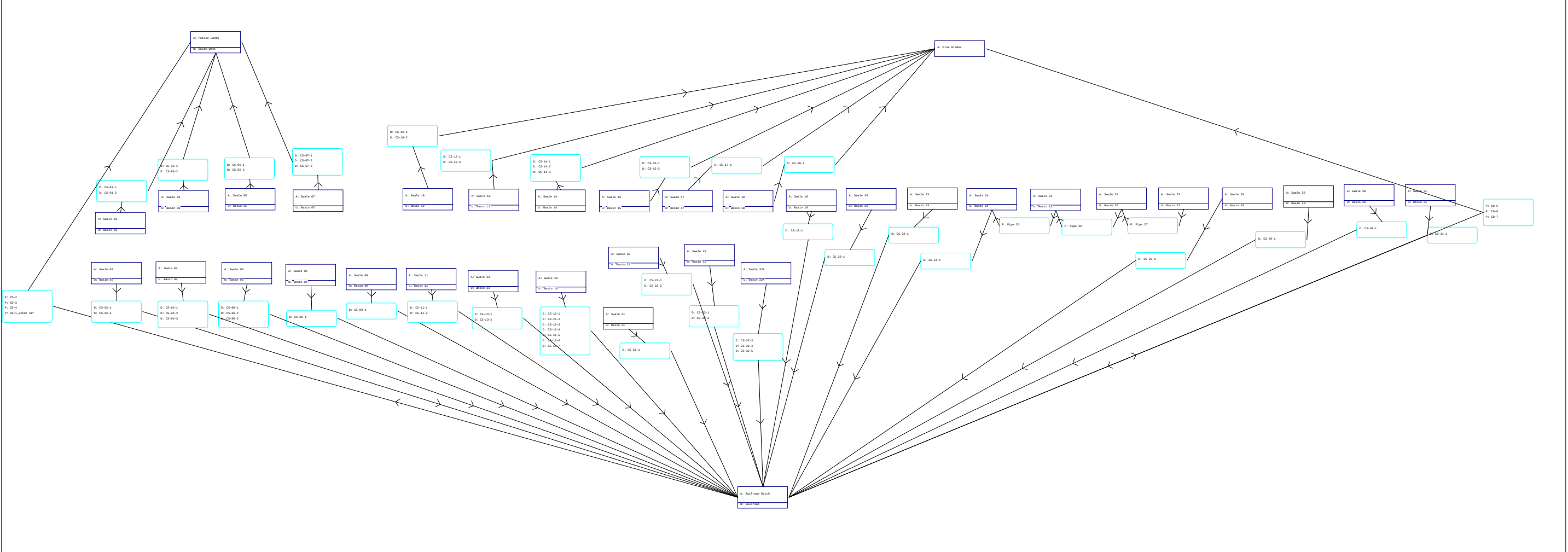
Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 84.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	15.000
72.000	5.000
84.000	15.000

Group	Run
BASE	Yes
System 2	Yes
System 3	Yes

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEM 4 - NODE-LINK DIAGRAM

- 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



SR 710/BEELINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEM 4 - NODE MAXIMUM CONDITIONS REPORT

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
Pine Glades	System 4	100YR-24HR	30.00	21.00	21.01	0.0000	289456614	12.34	140.34	0.00	0.00
Public Lands	System 4	100YR-24HR	30.00	21.00	21.01	-0.0042	470448607	12.34	161.25	0.00	0.00
Railroad Ditch	System 4	100YR-24HR	16.94	22.41	25.00	0.0034	1815820	12.25	817.73	16.94	39.22
Swale 01	System 4	100YR-24HR	12.34	26.34	26.90	0.0047	40309	12.25	30.69	12.34	27.45
Swale 02	System 4	100YR-24HR	12.33	26.29	26.70	0.0042	34879	12.25	25.14	12.33	22.80
Pine Glades	System 4	10YR-24HR	30.00	21.00	21.01	0.0000	289456455	12.38	78.78	0.00	0.00
Public Lands	System 4	10YR-24HR	30.00	21.00	21.01	-0.0042	470448275	12.38	82.61	0.00	0.00
Railroad Ditch	System 4	10YR-24HR	22.17	21.78	25.00	0.0030	1576565	12.32	476.73	22.17	12.39
Swale 01	System 4	10YR-24HR	12.38	26.20	26.90	0.0037	37445	12.25	19.18	12.38	15.15
Swale 02	System 4	10YR-24HR	12.37	26.17	26.70	0.0032	32494	12.25	15.95	12.37	13.11
Pine Glades	System 4	25YR-72HR	84.00	21.01	21.01	0.0000	289456530	60.10	169.67	0.00	0.00
Public Lands	System 4	25YR-72HR	84.00	21.01	21.01	-0.0042	470448558	60.10	207.02	0.00	0.00
Railroad Ditch	System 4	25YR-72HR	61.63	23.10	25.00	0.0031	2076041	60.00	896.07	61.63	92.37
Swale 01	System 4	25YR-72HR	60.09	26.38	26.90	0.0039	41034	60.00	34.08	60.09	30.94
Swale 02	System 4	25YR-72HR	60.08	26.32	26.70	0.0034	35426	60.00	27.55	60.08	25.27

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
PRE-DEVELOPMENT
SYSTEM 4 - LINK MAXIMUM CONDITIONS REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CD-1_EXIST 48"	System 4	100YR-24HR	16.94	20.84	-2.598	16.94	22.41	16.94	21.48
CS-01-1	System 4	100YR-24HR	12.34	13.90	0.221	12.34	26.34	30.00	21.00
CS-01-2	System 4	100YR-24HR	12.34	13.56	0.063	12.34	26.34	30.00	21.00
CS-02-1	System 4	100YR-24HR	12.33	11.57	0.221	12.33	26.29	16.94	22.41
CS-02-2	System 4	100YR-24HR	12.33	11.24	0.053	12.33	26.29	16.94	22.41
CD-1_EXIST 48"	System 4	10YR-24HR	22.17	11.08	-2.598	22.17	21.78	22.17	21.11
CS-01-1	System 4	10YR-24HR	12.38	7.74	0.221	12.38	26.20	30.00	21.00
CS-01-2	System 4	10YR-24HR	12.38	7.41	0.057	12.38	26.20	30.00	21.00
CS-02-1	System 4	10YR-24HR	12.37	6.71	0.221	12.37	26.17	22.17	21.78
CS-02-2	System 4	10YR-24HR	12.37	6.39	0.050	12.37	26.17	22.17	21.78
CD-1_EXIST 48"	System 4	25YR-72HR	61.63	34.07	-2.598	61.63	23.10	61.63	21.88
CS-01-1	System 4	25YR-72HR	60.09	15.64	0.221	60.09	26.38	84.00	21.01
CS-01-2	System 4	25YR-72HR	60.09	15.30	-0.072	60.09	26.38	84.00	21.01
CS-02-1	System 4	25YR-72HR	60.08	12.80	0.221	60.08	26.32	61.63	23.10
CS-02-2	System 4	25YR-72HR	60.08	12.47	-0.059	60.08	26.32	61.63	23.10

SR 710/BEE LINE HIGHWAY
 FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
 PRE-DEVELOPMENT
 SYSTEM 4 - BASIN MAXIMUM CONDITIONS REPORT

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
100YR-24HR	Basin 01	System 4	12.27	30.80	6.983	159196
100YR-24HR	Basin 02	System 4	12.27	25.22	7.220	131572
100YR-24HR	Basin West	System 4	12.27	14.60	6.883	75210
100YR-24HR	Railroad	System 4	12.27	459.08	7.444	2418414
10YR-24HR	Basin 01	System 4	12.27	19.29	4.266	97245
10YR-24HR	Basin 02	System 4	12.27	16.03	4.470	81447
10YR-24HR	Basin West	System 4	12.27	9.09	4.181	45680
10YR-24HR	Railroad	System 4	12.27	295.66	4.665	1515550
25YR-72HR	Basin 01	System 4	60.02	34.21	10.455	238328
25YR-72HR	Basin 02	System 4	60.02	27.65	10.716	195273
25YR-72HR	Basin West	System 4	60.02	16.31	10.343	113016
25YR-72HR	Railroad	System 4	60.02	497.51	10.960	3560825

=====
Basins
=====

Name: Basin 01	Node: Swale 01	Status: Onsite
Group: System 4	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 6.280	Time Shift(hrs): 0.00	
Curve Number: 80.30	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Station 1249+00 to 1270+88 (LT)

Name: Basin 02	Node: Swale 02	Status: Onsite
Group: System 4	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 5.020	Time Shift(hrs): 0.00	
Curve Number: 82.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Station 1249+00 to 1270+88 (RT)

Name: Basin West	Node: Public Lands	Status: Onsite
Group: System 4	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 3.010	Time Shift(hrs): 0.00	
Curve Number: 79.50	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Station 1217+00 to 1249+00

Name: Railroad	Node: Railroad Ditch	Status: Offsite
Group: System 4	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 89.500	Time Shift(hrs): 0.00	
Curve Number: 84.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

The basin covers the CSX railroad, located south of SR 710, along the entire project limits.

=====
Nodes
=====

Name: Pine Glades	Base Flow(cfs): 0.000	Init Stage(ft): 21.000
Group: System 4		Warn Stage(ft): 21.010
Type: Stage/Area		

Natural Area northeast of SR 710 from Station 1350+00 to the end of the project.

Stage(ft)	Area(ac)
21.000	6645.0000
25.000	6645.0000

Name: Public Lands	Base Flow(cfs): 0.000	Init Stage(ft): 21.000
Group: System 4		Warn Stage(ft): 21.010
Type: Stage/Area		

Natural Area northeast of SR 710 from the beginning of the project to Station 1350+00.

Stage(ft)	Area(ac)
21.000	10800.0000
25.000	10800.0000

Name: Railroad Ditch	Base Flow(cfs): 0.000	Init Stage(ft): 20.000
----------------------	-----------------------	------------------------

Group: System 4
Type: Stage/Area

Warn Stage(ft): 25.000

The ditch between the railroad and roadway

Stage(ft)	Area(ac)
20.000	20.7000
25.000	64.1200

Name: Swale 01
Group: System 4
Type: Stage/Area

Base Flow(cfs): 0.000

Init Stage(ft): 25.200
Warn Stage(ft): 26.900

Station 1249+00 to 1270+88 (LT)

Stage(ft)	Area(ac)
24.200	0.0100
25.190	0.0100
25.200	0.4150
25.900	0.7270
26.900	1.1740

Name: Swale 02
Group: System 4
Type: Stage/Area

Base Flow(cfs): 0.000

Init Stage(ft): 25.200
Warn Stage(ft): 26.700

Station 1249+00 to 1270+88 (RT)

Stage(ft)	Area(ac)
24.200	0.0100
25.190	0.0100
25.200	0.3130
25.900	0.6260
26.700	0.9830

==== Pipes =====

Name: CD-1_EXIST 48"
Group: System 4

From Node: Railroad Ditch
To Node: Public Lands

Length(ft): 77.02
Count: 1

UPSTREAM	DOWNSTREAM
Geometry: Circular	Circular
Span(in): 48.00	48.00
Rise(in): 48.00	48.00
Invert(ft): 20.200	20.140
Manning's N: 0.013000	0.013000
Top Clip(in): 0.000	0.000
Bot Clip(in): 0.000	0.000

Friction Equation: Automatic
Solution Algorithm: Most Restrictive
Flow: Both
Entrance Loss Coef: 0.00
Exit Loss Coef: 1.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None

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

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

Existing 48" RCP @ Approx Station 3089+00

==== Drop Structures =====

Name: CS-01-1
Group: System 4

From Node: Swale 01
To Node: Public Lands

Length(ft): 40.00
Count: 1

UPSTREAM	DOWNSTREAM
Geometry: Circular	Circular
Span(in): 24.00	24.00
Rise(in): 24.00	24.00
Invert(ft): 21.900	21.500
Manning's N: 0.012000	0.012000
Top Clip(in): 0.000	0.000
Bot Clip(in): 0.000	0.000

Friction Equation: Average Conveyance
Solution Algorithm: Most Restrictive
Flow: Both
Entrance Loss Coef: 0.000
Exit Loss Coef: 1.000
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
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 CS-01-1 ***

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): 37.00	Invert(ft): 25.900
Rise(in): 49.00	Control Elev(ft): 25.900

TABLE

*** Weir 2 of 2 for Drop Structure CS-01-1 ***

Count: 1	Bottom Clip(in): 0.000
Type: Vertical: Mavis	Top Clip(in): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Circular	Orifice Disc Coef: 0.600
Span(in): 3.00	Invert(ft): 24.200
Rise(in): 3.00	Control Elev(ft): 24.200

TABLE

Name: CS-01-2	From Node: Swale 01	Length(ft): 40.00
Group: System 4	To Node: Public Lands	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Average Conveyance
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 24.00	24.00	Flow: Both
Rise(in): 24.00	24.00	Entrance Loss Coef: 0.000
Invert(ft): 21.900	21.500	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

*** Weir 1 of 1 for Drop Structure CS-01-2 ***

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): 37.00	Invert(ft): 25.900
Rise(in): 49.00	Control Elev(ft): 25.900

TABLE

Name: CS-02-1	From Node: Swale 02	Length(ft): 40.00
Group: System 4	To Node: Railroad Ditch	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Average Conveyance
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 24.00	24.00	Flow: Both
Rise(in): 24.00	24.00	Entrance Loss Coef: 0.000
Invert(ft): 21.900	19.600	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

*** Weir 1 of 2 for Drop Structure CS-02-1 ***

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

TABLE

Span(in): 37.00 Invert(ft): 25.900
Rise(in): 49.00 Control Elev(ft): 25.900

*** Weir 2 of 2 for Drop Structure CS-02-1 ***

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Both Weir Disc Coef: 3.200
Geometry: Circular Orifice Disc Coef: 0.600

Span(in): 3.00 Invert(ft): 24.200
Rise(in): 3.00 Control Elev(ft): 24.200

TABLE

Name: CS-02-2 From Node: Swale 02 Length(ft): 40.00
Group: System 4 To Node: Railroad Ditch Count: 1

UPSTREAM DOWNSTREAM Friction Equation: Average Conveyance
Geometry: Circular Circular Solution Algorithm: Most Restrictive
Span(in): 24.00 24.00 Flow: Both
Rise(in): 24.00 24.00 Entrance Loss Coef: 0.000
Invert(ft): 21.900 19.600 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

*** Weir 1 of 1 for Drop Structure CS-02-2 ***

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): 37.00 Invert(ft): 25.900
Rise(in): 49.00 Control Elev(ft): 25.900

TABLE

==== Hydrology Simulations =====

Name: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 4\100YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii
Rainfall Amount(in): 9.40

Time(hrs) Print Inc(min)

30.000 5.00

Name: 100YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 4\100YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 16.00

Time(hrs) Print Inc(min)

48.000 15.00
72.000 5.00
84.000 15.00

Name: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 4\10YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii

Rainfall Amount(in): 6.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 4\25YR-72HR.R32
Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 13.00

Time(hrs)	Print Inc(min)
48.000	15.00
72.000	5.00
84.000	15.00

==== Routing Simulations =====

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 4\100YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 4	Yes

Name: 100YR-72HR Hydrology Sim: 100YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 4\100YR-72HR.I32

Execute: No 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): 84.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	15.000
72.000	5.000
84.000	15.000

Group	Run
BASE	Yes
System 4	Yes

Name: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 4\10YR-24HR.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
Min Calc Time(sec): 0.5000
Boundary Stages:

End Time(hrs): 30.00
Max Calc Time(sec): 60.0000
Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes
System 4	Yes

Name: 25YR-72HR Hydrology Sim: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Pre-Development\System 4\25YR-72HR.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): 84.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

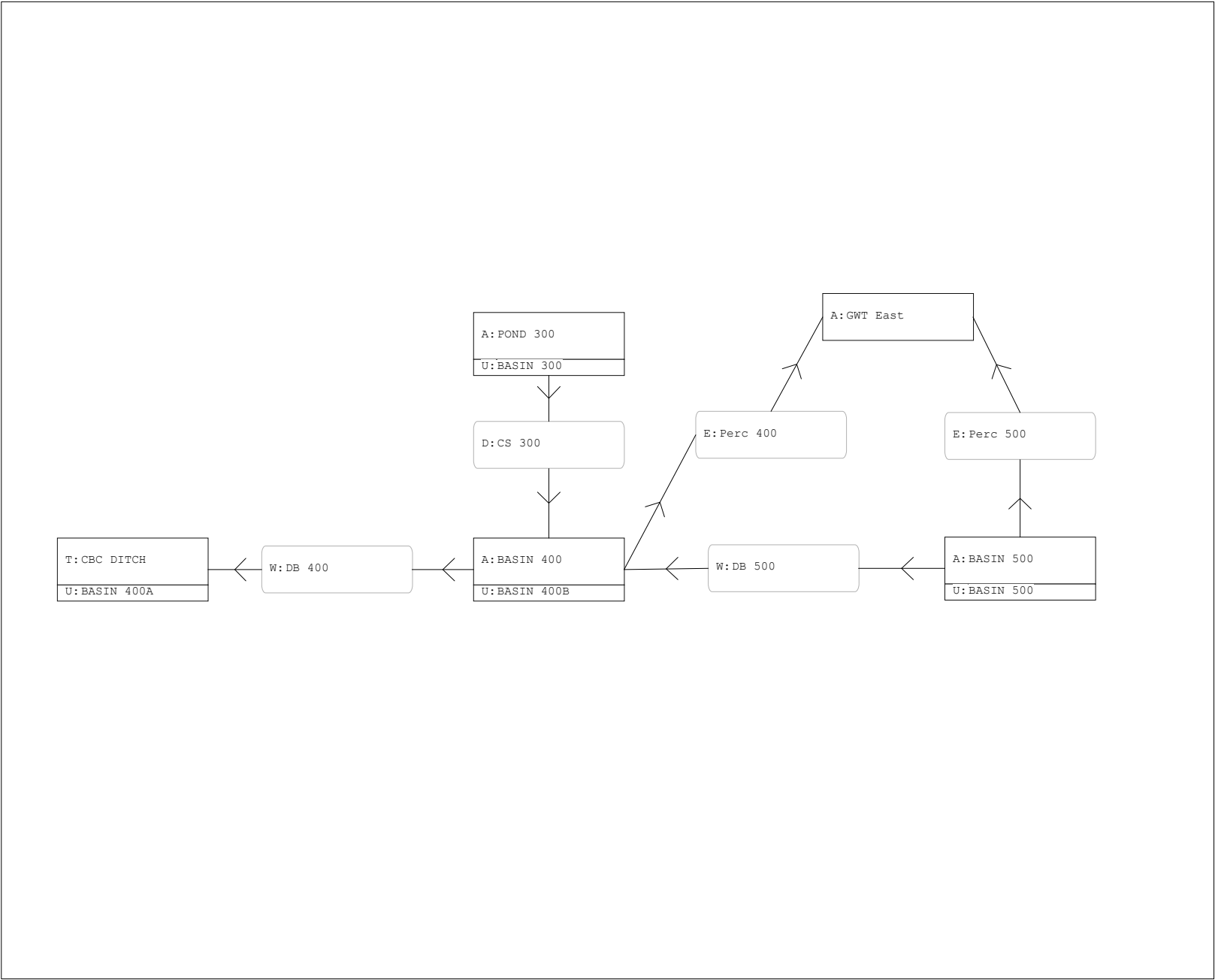
Time(hrs)	Print Inc(min)
48.000	15.000
72.000	5.000
84.000	15.000

Group	Run
BASE	Yes
System 4	Yes

POST-DEVELOPMENT MODEL

SR 710/BEEELINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEM 1 - NODAL LINK SCHEMATIC

- 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



SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEM 1 - NODE MAXIMUM CONDITIONS REPORT

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
BASIN 400	System 1	100YR-24HR	12.55	21.77	22.00	0.0043	10743	12.49	32.23	12.55
BASIN 500	System 1	100YR-24HR	12.54	22.70	23.00	0.0050	84429	12.25	55.15	12.54
CBC DITCH	System 1	100YR-24HR	0.00	20.00	20.00	0.0000	0	12.52	34.43	0.00
GWT East	System 1	100YR-24HR	30.00	20.10	20.00	0.0001	871200	12.54	1.81	0.00
POND 300	System 1	100YR-24HR	18.25	24.38	26.00	0.0050	115118	12.25	95.80	18.26
BASIN 400	System 1	10YR-24HR	12.85	21.38	22.00	0.0038	9081	12.79	10.89	12.85
BASIN 500	System 1	10YR-24HR	12.84	22.34	23.00	0.0050	73428	12.25	35.57	12.84
CBC DITCH	System 1	10YR-24HR	0.00	20.00	20.00	0.0000	0	12.81	11.54	0.00
GWT East	System 1	10YR-24HR	30.00	20.09	20.00	0.0001	871200	12.85	1.57	0.00
POND 300	System 1	10YR-24HR	22.00	23.06	26.00	0.0050	106154	12.25	64.38	22.07
BASIN 400	System 1	10YR-72HR	60.35	21.57	22.00	0.0028	9867	60.29	19.83	60.35
BASIN 500	System 1	10YR-72HR	60.34	22.50	23.00	0.0049	78551	60.00	37.50	60.34
CBC DITCH	System 1	10YR-72HR	0.00	20.00	20.00	0.0000	0	60.31	21.13	0.00
GWT East	System 1	10YR-72HR	83.99	20.13	20.00	0.0001	871200	60.35	1.68	0.00
POND 300	System 1	10YR-72HR	68.26	23.91	26.00	0.0050	111980	60.00	64.49	68.79
BASIN 400	System 1	25YR-72HR	60.24	21.75	22.00	0.0032	10688	60.19	31.42	60.24
BASIN 500	System 1	25YR-72HR	60.23	22.68	23.00	0.0043	83985	60.00	46.37	60.23
CBC DITCH	System 1	25YR-72HR	0.00	20.00	20.00	0.0000	0	60.21	33.55	0.00
GWT East	System 1	25YR-72HR	84.01	20.14	20.00	0.0001	871200	60.23	1.80	0.00
POND 300	System 1	25YR-72HR	64.17	24.48	26.00	0.0050	115850	60.00	78.73	64.19
BASIN 400	System 1	3YR-24HR	21.05	21.07	22.00	0.0038	7729	21.00	0.95	21.05
BASIN 500	System 1	3YR-24HR	21.15	21.70	23.00	0.0045	54136	12.00	3.25	21.15
CBC DITCH	System 1	3YR-24HR	0.00	20.00	20.00	0.0000	0	19.00	0.96	0.00
GWT East	System 1	3YR-24HR	30.00	20.08	20.00	0.0001	871200	19.22	1.12	0.00
POND 300	System 1	3YR-24HR	22.43	21.84	26.00	0.0041	97881	12.00	6.40	22.57

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEM 1 - LINK MAXIMUM CONDITIONS REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CS 300	System 1	100YR-24HR	18.26	2.78	0.009	18.25	24.38	12.55	21.77
DB 400	System 1	100YR-24HR	12.55	31.81	-0.140	12.55	21.77	0.00	20.00
DB 500	System 1	100YR-24HR	12.54	27.32	0.127	12.54	22.70	12.55	21.77
Perc 400	System 1	100YR-24HR	12.55	0.20	-0.001	12.55	21.77	30.00	20.10
Perc 500	System 1	100YR-24HR	12.54	1.60	-0.008	12.54	22.70	30.00	20.10
CS 300	System 1	10YR-24HR	22.07	1.31	0.004	22.00	23.06	12.85	21.38
DB 400	System 1	10YR-24HR	12.85	10.63	-0.059	12.85	21.38	0.00	20.00
DB 500	System 1	10YR-24HR	12.84	8.63	0.054	12.84	22.34	12.85	21.38
Perc 400	System 1	10YR-24HR	12.85	0.17	-0.001	12.85	21.38	30.00	20.09
Perc 500	System 1	10YR-24HR	12.84	1.39	-0.009	12.84	22.34	30.00	20.09
CS 300	System 1	10YR-72HR	68.79	1.57	0.003	68.26	23.91	60.35	21.57
DB 400	System 1	10YR-72HR	60.35	19.50	-0.127	60.35	21.57	0.00	20.00
DB 500	System 1	10YR-72HR	60.34	16.29	0.120	60.34	22.50	60.35	21.57
Perc 400	System 1	10YR-72HR	60.35	0.19	-0.003	60.35	21.57	83.99	20.13
Perc 500	System 1	10YR-72HR	60.34	1.49	-0.014	60.34	22.50	83.99	20.13
CS 300	System 1	25YR-72HR	64.19	3.30	0.011	64.17	24.48	60.24	21.75
DB 400	System 1	25YR-72HR	60.24	30.97	-0.157	60.24	21.75	0.00	20.00
DB 500	System 1	25YR-72HR	60.23	26.41	-0.148	60.23	22.68	60.24	21.75
Perc 400	System 1	25YR-72HR	60.24	0.20	-0.003	60.24	21.75	84.01	20.14
Perc 500	System 1	25YR-72HR	60.23	1.59	-0.019	60.23	22.68	84.01	20.14
CS 300	System 1	3YR-24HR	22.57	0.82	0.004	22.43	21.84	21.05	21.07
DB 400	System 1	3YR-24HR	21.05	0.85	0.017	21.05	21.07	0.00	20.00
DB 500	System 1	3YR-24HR	0.00	0.00	0.000	21.15	21.70	21.05	21.07
Perc 400	System 1	3YR-24HR	16.98	0.15	-0.001	21.05	21.07	30.00	20.08
Perc 500	System 1	3YR-24HR	21.15	1.03	-0.007	21.15	21.70	30.00	20.08

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEM 1 - BASIN MAXIMUM CONDITIONS REPORT

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
100YR-24HR	BASIN 300	System 1	12.27	95.95	8.294	529595
100YR-24HR	BASIN 400A	System 1	12.27	4.93	7.345	25861
100YR-24HR	BASIN 400B	System 1	12.27	6.91	7.345	36259
100YR-24HR	BASIN 500	System 1	12.27	55.31	7.489	291950
10YR-24HR	BASIN 300	System 1	12.27	64.52	5.434	346978
10YR-24HR	BASIN 400A	System 1	12.27	3.16	4.578	16119
10YR-24HR	BASIN 400B	System 1	12.27	4.43	4.578	22600
10YR-24HR	BASIN 500	System 1	12.27	35.71	4.704	183399
10YR-72HR	BASIN 300	System 1	60.02	64.70	7.404	472748
10YR-72HR	BASIN 400A	System 1	60.02	3.36	6.478	22809
10YR-72HR	BASIN 400B	System 1	60.02	4.72	6.478	31979
10YR-72HR	BASIN 500	System 1	60.02	37.66	6.617	257980
25YR-72HR	BASIN 300	System 1	60.02	79.00	9.186	586526
25YR-72HR	BASIN 400A	System 1	60.02	4.17	8.216	28930
25YR-72HR	BASIN 400B	System 1	60.02	5.85	8.216	40562
25YR-72HR	BASIN 500	System 1	60.02	46.56	8.364	326082
3YR-24HR	BASIN 300	System 1	12.00	6.40	3.102	198076
3YR-24HR	BASIN 400A	System 1	12.00	0.28	2.390	8414
3YR-24HR	BASIN 400B	System 1	12.00	0.40	2.390	11796
3YR-24HR	BASIN 500	System 1	12.00	3.25	2.490	97077

Name: BASIN 300		Node: POND 300		Status: Onsite	
Group: System 1		Type: SCS Unit Hydrograph CN			
Unit Hydrograph: UN256		Peaking Factor: 256.0			
Rainfall File:		Storm Duration(hrs): 0.00			
Rainfall Amount(in): 0.000		Time of Conc(min): 10.00			
Area(ac): 17.590		Time Shift(hrs): 0.00			
Curve Number: 90.90		Max Allowable Q(cfs): 999999.0000			
DCIA(%): 0.00					

Name:	BASIN 400A	Node:	CBC DITCH	Status:	onsite
Group:	System 1	Type:	SCS Unit Hydrograph CN		
Unit Hydrograph:	Uht256	Peaking Factor:	256.0		
Rainfall File:		Storm Duration(hrs):	0.00		
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00		
Area(ac):	0.970	Time Shift(hrs):	0.00		
Curve Number:	83.20	Max Allowable q(cts):	999999.000		
DCIA(%):	0.00				

Name:	BASIN 400B	Node:	BASIN 400	Status:	onsite
Group:	System 1	Type:	SCS Unit Hydrograph CN		
Unit Hydrograph:	Uht256	Peaking Factor:	256.0		
Rainfall File:		Storm Duration(hrs):	0.00		
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00		
Area(ac):	1.360	Time Shift(hrs):	0.00		
Curve Number:	83.20	Max Allowable Q(cfs):	999999.000		
DCIA(%):	0.00				

Name:	BASIN 500	Node:	BASIN 500	Status:	onsite
Group:	System 1	Type:	SCS unit Hydrograph CN		
Unit Hydrograph:	Uh256	Peaking Factor:	256.0		
Rainfall File:		Storm Duration(hrs):	0.00		
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00		
Area(ac):	10.740	Time Shift(hrs):	0.00		
Curve Number:	84.36	Max Allowable q(cts):	999999.000		
DCIA(%):	0.00				

```

=====
Nodes =====
=====
Name: BASIN 400      Base Flow(cfs) : 0.000      Init Stage(ft) : 20.000
Group: System 1      Warn Stage(ft) : 22.000
Type: Stage/Area
=====

```

Stage(ft)	Area(ac)
20.000	0.0800
21.000	0.1700
22.000	0.2700

```
-----
Name: BASIN 500      Base Flow(cfs): 0.000      Init Stage(ft): 20.000
Group: System 1      Warn Stage(ft): 23.000
Type: Stage/Area
```

Stage(ft)	Area(ac)
20,000	0.2000
21,000	0.7700
22,000	1.4500
23,000	2.1500

Type: Vertical: Mavis	Top Clip(In): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Rectangular	Orifice Disc Coef: 0.600
Span(In): 18.00	Invert(ft): 24.000
Rise(In): 12.00	Control Elev(ft): 24.000

=====

===== Weirs =====

Name: DB 400 From Node: BASIN 400
Group: System 1 To Node: CBC DITCH
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 13.00
Left Side Slope(h/v): 3.00
Right Side Slope(h/v): 3.00
Invert(ft): 21.000
Control Elevation(ft): 21.000
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: DB 500 From Node: BASIN 500
Group: System 1 To Node: BASIN 400
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 13.00
Left Side Slope(h/v): 3.00
Right Side Slope(h/v): 3.00
Invert(ft): 22.000
Control Elevation(ft): 22.000
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

===== Percolation links =====

Name: Perc 400	From Node: BASIN 400	Flow: Both
Group: System 1	To Node: GMT East	Count: 1

Surface Area Option: Vary based on Stage/Area Table

Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): -20.000 Perimeter 1(ft): 1490.000
Water Table Elev(ft): 20.000 Perimeter 2(ft): 1804.000
*****0.000 Perimeter 3(ft): 4632.000
Horiz Conductivity(ft/day): 3.280 Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 1.640 Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200 Num Cells 1 to 2: 10
Suction Head(In): 5.590 Num Cells 2 to 3: 90
Layer Thickness(ft): 0.000

Name: Perc 500	From Node: BASIN 500	Flow: Both
Group: System 1	To Node: GMT East	Count: 1

Surface Area Option: Vary based on Stage/Area Table

Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): -20.000 Perimeter 1(ft): 7510.000
Water Table Elev(ft): 20.000 Perimeter 2(ft): 7824.000
*****0.000 Perimeter 3(ft): 10652.000
Horiz Conductivity(ft/day): 3.280 Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 1.640 Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200 Num Cells 1 to 2: 10
Suction Head(In): 5.590 Num Cells 2 to 3: 90

Layer Thickness(ft): 0.000

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

Name: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\100YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scs111
Rainfall Amount(in): 9.40

Time(hrs) Print Inc(min)

30.000 5.00

Name: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\10YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scs111
Rainfall Amount(in): 6.50

Time(hrs) Print Inc(min)

30.000 5.00

Name: 10YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\10YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 8.50

Time(hrs) Print Inc(min)

48.000 15.00
72.000 5.00
84.000 15.00

Name: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\25YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 10.30

Time(hrs) Print Inc(min)

48.000 15.00
72.000 5.00
84.000 15.00

Name: 3YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\3YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 4.10

Time(hrs) Print Inc(min)

30.000 5.00

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

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\100YR-24HR.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	End Time(hrs): 30.00
Start Time(hrs): 0.000	Max Calc Time(sec): 60.0000
Min Calc Time(sec): 0.5000	Boundary Flows:

Time(hrs) Print Inc(min)

30.000 5.000

Group Run

BASE Yes
System 1 Yes

Name: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\10YR-24HR.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 End Time(hrs): 30.00
Start Time(hrs): 0.000 Max Calc Time(sec): 60.0000
Min Calc Time(sec): 0.5000 Boundary Flows:
Boundary Stages:

Time(hrs) Print Inc(min)

30.000 5.000

Group Run

BASE Yes
System 1 Yes

Name: 10YR-72HR Hydrology Sim: 10YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\10YR-72HR.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 End Time(hrs): 84.00
Start Time(hrs): 0.000 Max Calc Time(sec): 60.0000
Min Calc Time(sec): 0.5000 Boundary Flows:
Boundary Stages:

Time(hrs) Print Inc(min)

48.000 15.000
72.000 5.000
84.000 15.000

Group Run

BASE Yes
System 1 Yes

Name: 25YR-72HR Hydrology Sim: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 1\25YR-72HR.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 End Time(hrs): 84.00
Start Time(hrs): 0.000 Max Calc Time(sec): 60.0000
Min Calc Time(sec): 0.5000 Boundary Flows:
Boundary Stages:

Time(hrs)	Print	Inc(min)
48.000	15.000	
72.000	5.000	
84.000	15.000	
Group	Run	
BASE	Yes	
System 1	Yes	

Name: 3YR-24HR Hydrology Sim: 3YR-24HR
Filename: X:\P\43270515201\Calculations\AdicPR\Post-Development\System 1\3YR-24HR.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:

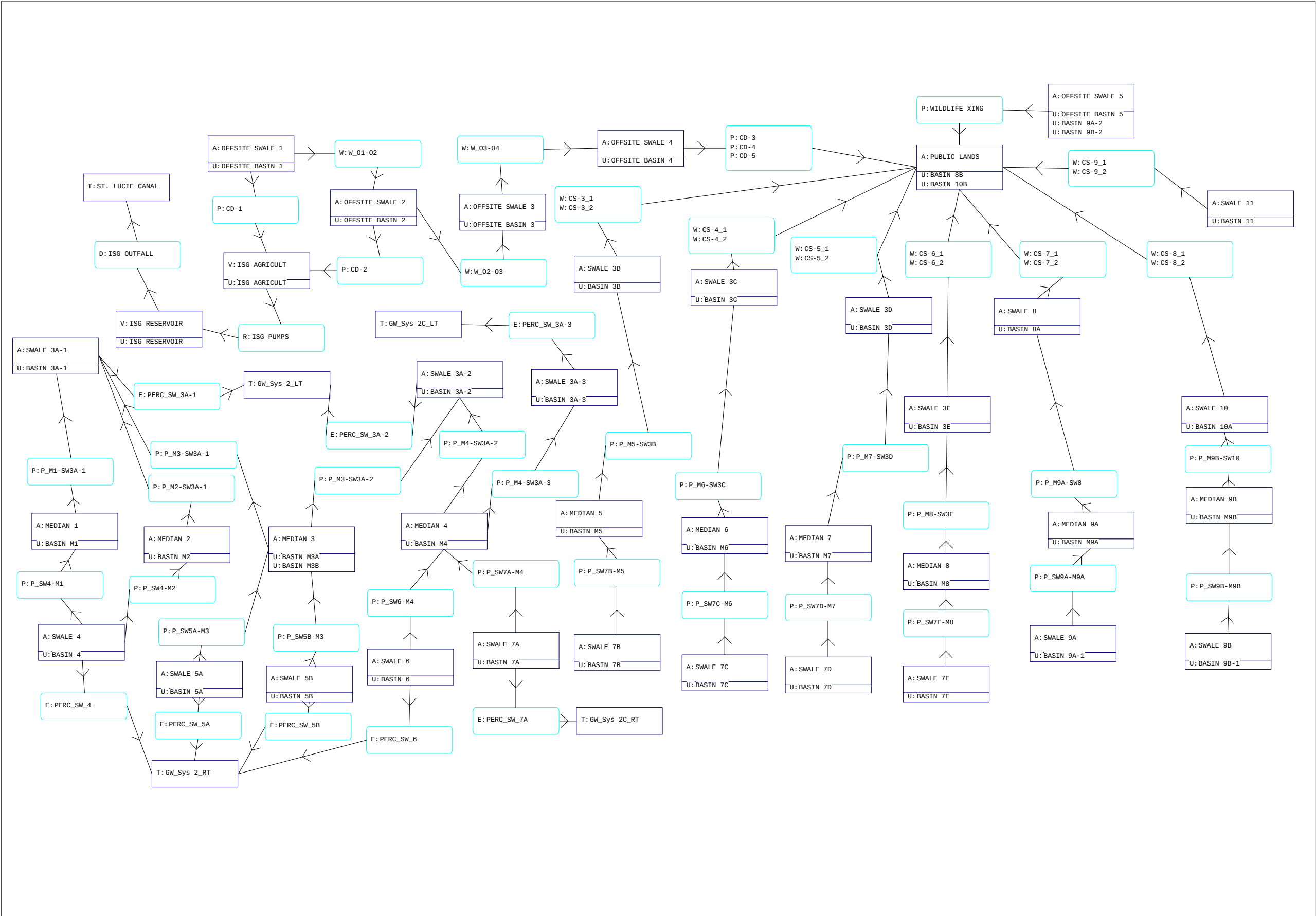
Time(hrs)	Print	Inc(min)

30.000	5.000	
Group	Run	

BASE	Yes	
System 1	Yes	

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - NODE-LINK DIAGRAM

- 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



SR 710/BEELINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - NODE MAXIMUM CONDITIONS REPORT

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
GW_Sys 2_LT	System 2	100YR-24HR	0.00	22.00	23.00	0.0000	0	12.44	10.21	0.00	0.00
GW_Sys 2_RT	System 2	100YR-24HR	0.00	22.00	23.00	0.0000	0	12.39	10.44	0.00	0.00
GW_Sys 2C_LT	System 2	100YR-24HR	0.00	22.25	23.25	0.0000	0	12.42	2.90	0.00	0.00
GW_Sys 2C_RT	System 2	100YR-24HR	0.00	22.25	23.25	0.0000	0	12.37	2.81	0.00	0.00
ISG AGRICULT	System 2	100YR-24HR	24.90	24.38	25.62	0.0002	29817513	12.25	6296.39	0.00	0.00
ISG RESERVOIR	System 2	100YR-24HR	23.65	26.32	28.62	0.0001	3049200	12.25	394.28	23.65	6.54
MEDIAN 1	System 2	100YR-24HR	18.25	24.14	26.33	0.0224	125	12.42	8.04	12.27	7.39
MEDIAN 2	System 2	100YR-24HR	18.25	24.14	26.33	0.0224	125	12.42	8.00	12.27	7.40
MEDIAN 3	System 2	100YR-24HR	17.97	24.13	26.33	0.0118	137	12.29	19.27	12.25	8.70
MEDIAN 4	System 2	100YR-24HR	17.25	24.13	26.33	0.0942	137	0.00	22.99	12.28	16.61
MEDIAN 5	System 3	100YR-24HR	12.82	25.46	27.83	0.0224	129	11.93	15.18	4.15	16.45
MEDIAN 6	System 3	100YR-24HR	12.81	25.52	27.83	0.0227	129	12.25	18.09	4.15	16.50
MEDIAN 7	System 3	100YR-24HR	12.81	25.46	27.83	0.0275	129	12.25	18.32	12.44	11.14
MEDIAN 8	System 3	100YR-24HR	12.63	26.09	28.33	0.0279	128	12.25	18.27	12.54	14.94
MEDIAN 9A	System 3	100YR-24HR	12.42	26.17	28.33	0.0073	124	12.38	11.82	12.38	11.81
MEDIAN 9B	System 3	100YR-24HR	12.37	26.12	28.33	-0.0068	124	12.39	14.91	12.39	14.91
OFFSITE SWALE 1	System 2	100YR-24HR	25.53	24.38	24.50	0.0624	388665	12.25	67.79	8.09	2.03
OFFSITE SWALE 2	System 2	100YR-24HR	25.00	24.38	24.50	0.0624	232078	12.25	45.27	8.07	2.00
OFFSITE SWALE 3	System 2	100YR-24HR	25.00	24.09	24.50	-1.3800	68094	12.25	15.75	0.00	0.00
OFFSITE SWALE 4	System 3	100YR-24HR	12.56	21.84	24.50	0.0002	383530	12.25	168.08	12.56	82.80
OFFSITE SWALE 5	System 3	100YR-24HR	24.24	23.10	26.50	0.0002	136075	12.25	42.33	24.24	0.25
PUBLIC LANDS	System 3	100YR-24HR	30.00	21.01	21.01	0.0000	470449524	12.65	205.54	0.00	0.00
ST. LUCIE CANAL	System 2	100YR-24HR	0.00	20.00	20.00	0.0000	0	23.65	6.54	0.00	0.00
SWALE 10	System 3	100YR-24HR	12.35	25.97	26.50	0.0033	32024	12.31	25.83	12.35	25.47
SWALE 11	System 4A	100YR-24HR	12.61	25.65	26.50	-0.0012	19949	12.25	6.71	12.61	2.99
SWALE 3A-1	System 2	100YR-24HR	18.27	24.15	24.50	0.0187	373337	12.25	106.83	12.45	6.78
SWALE 3A-2	System 2	100YR-24HR	17.38	24.15	24.50	0.0224	187344	12.25	53.52	12.43	3.43
SWALE 3A-3	System 2	100YR-24HR	17.29	24.15	24.75	-0.0799	134578	12.25	41.49	12.42	2.90
SWALE 3B	System 3	100YR-24HR	12.85	25.44	26.00	-0.0122	141576	12.25	44.93	12.85	18.77
SWALE 3C	System 3	100YR-24HR	12.84	25.49	26.00	-0.0122	132269	12.26	44.30	12.84	19.18
SWALE 3D	System 3	100YR-24HR	12.84	25.44	26.00	0.0120	130669	12.25	40.60	12.84	18.70
SWALE 3E	System 3	100YR-24HR	12.65	26.05	26.50	0.0121	115473	12.27	43.24	12.65	26.95
SWALE 4	System 2	100YR-24HR	18.27	24.15	24.50	0.0133	191071	12.25	50.06	9.50	15.79
SWALE 5A	System 2	100YR-24HR	18.00	24.15	24.50	0.0087	44670	12.25	12.54	9.50	8.32
SWALE 5B	System 2	100YR-24HR	18.06	24.15	24.50	0.0087	79949	12.25	21.16	9.50	8.67
SWALE 6	System 2	100YR-24HR	17.08	24.15	24.50	0.0407	41974	12.25	11.43	0.00	8.61
SWALE 7A	System 2	100YR-24HR	17.01	24.15	24.75	-0.0823	68492	12.25	24.62	0.00	22.99
SWALE 7B	System 3	100YR-24HR	12.82	25.47	26.00	-0.0117	70187	12.25	24.97	11.93	9.89
SWALE 7C	System 3	100YR-24HR	12.82	25.53	26.00	-0.0119	70749	12.25	24.97	11.93	10.03
SWALE 7D	System 3	100YR-24HR	12.82	25.47	26.00	0.0155	69639	12.25	22.50	4.54	17.83
SWALE 7E	System 3	100YR-24HR	12.65	26.11	26.50	0.0157	65282	12.25	24.43	2.35	17.95
SWALE 8	System 3	100YR-24HR	12.44	26.09	26.50	-0.0036	51002	12.25	27.53	12.44	22.76
SWALE 9A	System 3	100YR-24HR	12.43	26.21	26.50	-0.0041	19362	12.25	11.16	12.50	7.67
SWALE 9B	System 3	100YR-24HR	12.41	26.19	26.50	0.0038	28269	12.25	15.02	12.48	11.18
GW_Sys 2_LT	System 2	10YR-24HR	0.00	22.00	23.00	0.0000	0	12.42	8.05	0.00	0.00
GW_Sys 2_RT	System 2	10YR-24HR	0.00	22.00	23.00	0.0000	0	12.39	8.14	0.00	0.00
GW_Sys 2C_LT	System 2	10YR-24HR	0.00	22.25	23.25	0.0000	0	12.39	2.27	0.00	0.00
GW_Sys 2C_RT	System 2	10YR-24HR	0.00	22.25	23.25	0.0000	0	12.36	2.21	0.00	0.00
ISG AGRICULT	System 2	10YR-24HR	25.00	23.85	25.62	0.0002	21613553	12.25	3574.82	0.00	0.00
ISG RESERVOIR	System 2	10YR-24HR	24.12	26.13	28.62	0.0000	3049200	12.25	272.64	24.12	2.90
MEDIAN 1	System 2	10YR-24HR	16.96	23.69	26.33	0.0222	125	3.33	6.68	12.27	4.22
MEDIAN 2	System 2	10YR-24HR	16.96	23.69	26.33	0.0222	125	3.33	6.68	12.27	4.22
MEDIAN 3	System 2	10YR-24HR	16.93	23.67	26.33	0.0127	137	3.33	15.73	12.42	0.73
MEDIAN 4	System 2	10YR-24HR	16.89	23.68	26.33	0.0942	137	0.00	22.99	12.27	7.56
MEDIAN 5	System 3	10YR-24HR	15.83	25.30	27.83	0.0275	129	5.61	17.64	12.41	13.19
MEDIAN 6	System 3	10YR-24HR	16.15	25.34	27.83	0.0227	129	12.12	15.27	5.61	16.50
MEDIAN 7	System 3	10YR-24HR	16.07	25.25	27.83	0.0278	129	6.06	17.83	12.25	3.45
MEDIAN 8	System 3	10YR-24HR	13.44	25.86	28.33	0.0279	128	3.30	17.95	12.00	9.32

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - NODE MAXIMUM CONDITIONS REPORT

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
MEDIAN 9A	System 3	10YR-24HR	12.71	25.94	28.33	-0.0068	124	12.26	5.86	12.26	5.81
MEDIAN 9B	System 3	10YR-24HR	12.52	25.93	28.33	0.0075	124	12.53	7.06	12.53	7.06
OFFSITE SWALE 1	System 2	10YR-24HR	25.00	23.85	24.50	0.0624	339263	12.25	46.62	9.18	2.09
OFFSITE SWALE 2	System 2	10YR-24HR	25.00	23.85	24.50	0.0624	219321	12.25	31.15	10.34	1.88
OFFSITE SWALE 3	System 2	10YR-24HR	25.00	23.62	24.50	-1.3800	61370	12.25	10.53	0.00	0.00
OFFSITE SWALE 4	System 3	10YR-24HR	12.47	21.60	24.50	0.0002	257210	12.25	116.22	12.47	70.36
OFFSITE SWALE 5	System 3	10YR-24HR	25.00	22.52	26.50	0.0001	134666	12.25	29.00	0.00	0.00
PUBLIC LANDS	System 3	10YR-24HR	30.00	21.00	21.01	0.0000	470449031	12.55	98.75	0.00	0.00
ST. LUCIE CANAL	System 2	10YR-24HR	0.00	20.00	20.00	0.0000	0	24.12	2.90	0.00	0.00
SWALE 10	System 3	10YR-24HR	12.52	25.90	26.50	0.0033	31422	12.25	13.12	12.52	11.71
SWALE 11	System 4A	10YR-24HR	12.88	25.45	26.50	-0.0013	18891	12.25	4.49	12.88	1.13
SWALE 3A-1	System 2	10YR-24HR	17.00	23.69	24.50	0.0170	337311	12.25	71.24	12.44	5.31
SWALE 3A-2	System 2	10YR-24HR	16.95	23.70	24.50	0.0224	168365	12.25	31.95	12.41	2.74
SWALE 3A-3	System 2	10YR-24HR	16.92	23.70	24.75	-0.0799	121119	12.25	21.29	12.39	2.27
SWALE 3B	System 3	10YR-24HR	15.86	25.27	26.00	0.0127	136420	12.25	29.19	15.86	2.58
SWALE 3C	System 3	10YR-24HR	16.18	25.32	26.00	-0.0122	126847	12.25	26.11	16.18	2.41
SWALE 3D	System 3	10YR-24HR	16.10	25.27	26.00	0.0120	125392	12.25	22.75	16.10	2.37
SWALE 3E	System 3	10YR-24HR	13.47	25.87	26.50	0.0121	110057	12.25	25.51	13.47	5.33
SWALE 4	System 2	10YR-24HR	16.97	23.69	24.50	0.0133	161220	12.25	31.83	10.83	16.20
SWALE 5A	System 2	10YR-24HR	16.94	23.69	24.50	0.0087	37564	12.25	7.98	10.82	8.38
SWALE 5B	System 2	10YR-24HR	16.95	23.69	24.50	0.0087	67191	12.25	13.46	10.82	8.78
SWALE 6	System 2	10YR-24HR	16.90	23.70	24.50	0.0407	35248	12.25	7.27	0.00	8.61
SWALE 7A	System 2	10YR-24HR	16.89	23.70	24.75	-0.0823	55039	12.25	15.66	0.00	22.99
SWALE 7B	System 3	10YR-24HR	15.84	25.28	26.00	0.0144	64384	12.25	15.87	5.61	17.64
SWALE 7C	System 3	10YR-24HR	16.14	25.33	26.00	-0.0119	64378	12.25	15.87	12.42	10.79
SWALE 7D	System 3	10YR-24HR	16.08	25.28	26.00	0.0155	63782	12.25	13.47	6.06	17.83
SWALE 7E	System 3	10YR-24HR	13.44	25.88	26.50	0.0157	57528	12.25	15.53	3.30	17.95
SWALE 8	System 3	10YR-24HR	12.73	25.93	26.50	0.0033	48777	12.25	17.29	12.73	8.17
SWALE 9A	System 3	10YR-24HR	12.70	25.94	26.50	0.0038	16498	12.25	7.33	7.85	5.00
SWALE 9B	System 3	10YR-24HR	12.53	25.95	26.50	0.0038	24121	12.25	9.78	12.58	5.33
GW_Sys 2_LT	System 2	25YR-72HR	0.00	22.00	23.00	0.0000	0	60.20	7.88	0.00	0.00
GW_Sys 2_RT	System 2	25YR-72HR	0.00	22.00	23.00	0.0000	0	60.15	8.03	0.00	0.00
GW_Sys 2C_LT	System 2	25YR-72HR	0.00	22.25	23.25	0.0000	0	60.18	2.25	0.00	0.00
GW_Sys 2C_RT	System 2	25YR-72HR	0.00	22.25	23.25	0.0000	0	60.13	2.16	0.00	0.00
ISG AGRICULT	System 2	25YR-72HR	73.00	24.51	25.62	0.0001	31798865	60.00	5636.14	0.00	0.00
ISG RESERVOIR	System 2	25YR-72HR	68.28	26.36	28.62	0.0001	3049200	60.00	316.38	68.28	7.46
MEDIAN 1	System 2	25YR-72HR	68.19	24.12	26.33	0.0324	125	60.15	7.92	60.03	6.82
MEDIAN 2	System 2	25YR-72HR	68.19	24.12	26.33	0.0324	125	60.15	7.91	60.03	6.83
MEDIAN 3	System 2	25YR-72HR	68.18	24.10	26.33	0.0128	137	60.01	18.43	60.00	7.40
MEDIAN 4	System 2	25YR-72HR	68.15	24.10	26.33	0.0942	137	0.00	22.99	60.02	14.73
MEDIAN 5	System 3	25YR-72HR	60.54	25.46	27.83	0.0224	129	60.00	16.74	9.28	16.45
MEDIAN 6	System 3	25YR-72HR	60.53	25.51	27.83	0.0227	129	60.09	12.23	9.28	16.50
MEDIAN 7	System 3	25YR-72HR	60.52	25.46	27.83	0.0277	129	10.29	17.83	61.26	12.87
MEDIAN 8	System 3	25YR-72HR	60.37	26.06	28.33	0.0225	128	60.15	13.63	4.82	16.60
MEDIAN 9A	System 3	25YR-72HR	60.20	26.09	28.33	-0.0068	124	60.12	9.58	60.12	9.57
MEDIAN 9B	System 3	25YR-72HR	60.13	26.05	28.33	0.0073	124	60.15	12.56	60.15	12.56
OFFSITE SWALE 1	System 2	25YR-72HR	73.00	24.51	24.50	0.0624	400509	60.00	54.53	18.82	0.48
OFFSITE SWALE 2	System 2	25YR-72HR	73.00	24.51	24.50	0.0624	234415	60.00	36.41	24.79	0.45
OFFSITE SWALE 3	System 2	25YR-72HR	73.00	24.21	24.50	-1.3800	70098	60.00	12.85	0.00	0.00
OFFSITE SWALE 4	System 3	25YR-72HR	60.26	21.69	24.50	0.0002	303344	60.00	134.87	60.26	75.58
OFFSITE SWALE 5	System 3	25YR-72HR	72.02	23.16	26.50	0.0001	136127	60.00	34.14	72.02	0.66
PUBLIC LANDS	System 3	25YR-72HR	84.00	21.01	21.01	0.0000	470449524	60.38	187.56	0.00	0.00
ST. LUCIE CANAL	System 2	25YR-72HR	0.00	20.00	20.00	0.0000	0	68.28	7.46	0.00	0.00
SWALE 10	System 3	25YR-72HR	60.12	25.95	26.50	-0.0036	31842	60.08	21.46	60.12	20.90
SWALE 11	System 4A	25YR-72HR	60.66	25.56	26.50	-0.0012	19493	60.00	5.48	60.66	1.37
SWALE 3A-1	System 2	25YR-72HR	68.23	24.12	24.50	0.0170	370370	60.00	88.58	60.21	5.24
SWALE 3A-2	System 2	25YR-72HR	68.22	24.12	24.50	0.0224	185869	60.00	44.38	60.19	2.64
SWALE 3A-3	System 2	25YR-72HR	68.20	24.12	24.75	-0.0799	133651	60.00	34.83	60.18	2.25

SR 710/BEELINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - NODE MAXIMUM CONDITIONS REPORT

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
SWALE 3B	System 3	25YR-72HR	60.57	25.44	26.00	-0.0122	141510	60.00	38.70	60.57	18.49
SWALE 3C	System 3	25YR-72HR	60.56	25.49	26.00	-0.0122	132173	60.00	39.17	60.56	18.76
SWALE 3D	System 3	25YR-72HR	60.55	25.44	26.00	0.0120	130704	60.00	34.31	60.55	18.85
SWALE 3E	System 3	25YR-72HR	60.40	26.03	26.50	-0.0114	114676	60.00	37.91	60.40	23.68
SWALE 4	System 2	25YR-72HR	68.20	24.12	24.50	0.0133	188861	60.00	41.98	50.67	14.48
SWALE 5A	System 2	25YR-72HR	68.18	24.12	24.50	0.0087	44154	60.00	10.51	50.67	8.06
SWALE 5B	System 2	25YR-72HR	68.20	24.12	24.50	0.0087	79042	60.00	17.75	50.67	8.21
SWALE 6	System 2	25YR-72HR	68.17	24.12	24.50	0.0407	41443	60.00	9.58	0.00	8.61
SWALE 7A	System 2	25YR-72HR	68.15	24.12	24.75	-0.0823	67636	60.00	20.65	0.00	22.99
SWALE 7B	System 3	25YR-72HR	60.54	25.47	26.00	-0.0117	70082	60.00	20.94	59.69	9.85
SWALE 7C	System 3	25YR-72HR	60.54	25.52	26.00	-0.0119	70555	60.00	20.94	60.62	7.21
SWALE 7D	System 3	25YR-72HR	60.53	25.47	26.00	0.0155	69697	60.00	19.54	10.29	17.83
SWALE 7E	System 3	25YR-72HR	60.38	26.08	26.50	-0.0126	63932	60.00	20.49	60.44	9.20
SWALE 8	System 3	25YR-72HR	60.23	26.03	26.50	0.0033	50200	60.01	22.32	60.23	17.41
SWALE 9A	System 3	25YR-72HR	60.21	26.11	26.50	0.0038	18253	60.00	9.19	60.25	5.92
SWALE 9B	System 3	25YR-72HR	60.16	26.10	26.50	-0.0041	26688	60.00	12.43	60.23	9.29

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - LINK MAXIMUM CONDITIONS REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CD-1	System 2	100YR-24HR	8.09	2.03	-15.722	25.53	24.38	24.90	24.38
CD-2	System 2	100YR-24HR	8.07	2.00	-15.722	25.00	24.38	24.90	24.38
CD-3	System 3	100YR-24HR	12.56	24.84	0.084	12.56	21.84	30.00	21.01
CD-4	System 3	100YR-24HR	12.56	24.84	0.084	12.56	21.84	30.00	21.01
CD-5	System 3	100YR-24HR	12.56	33.11	0.108	12.56	21.84	12.56	21.68
CS-3_1	System 3	100YR-24HR	12.85	16.41	0.008	12.85	25.44	30.00	21.01
CS-3_2	System 3	100YR-24HR	12.85	2.35	0.000	12.85	25.44	30.00	21.01
CS-4_1	System 3	100YR-24HR	12.84	16.66	0.009	12.84	25.49	30.00	21.01
CS-4_2	System 3	100YR-24HR	12.84	2.51	0.000	12.84	25.49	30.00	21.01
CS-5_1	System 3	100YR-24HR	12.84	16.35	0.008	12.84	25.44	30.00	21.01
CS-5_2	System 3	100YR-24HR	12.84	2.35	0.003	12.84	25.44	30.00	21.01
CS-6_1	System 3	100YR-24HR	12.65	24.26	0.014	12.65	26.05	30.00	21.01
CS-6_2	System 3	100YR-24HR	12.65	2.69	0.004	12.65	26.05	30.00	21.01
CS-7_1	System 3	100YR-24HR	12.44	19.95	0.012	12.44	26.09	30.00	21.01
CS-7_2	System 3	100YR-24HR	12.44	2.81	0.001	12.44	26.09	30.00	21.01
CS-8_1	System 3	100YR-24HR	12.35	23.02	0.020	12.35	25.97	30.00	21.01
CS-8_2	System 3	100YR-24HR	12.35	2.44	0.001	12.35	25.97	30.00	21.01
CS-9_1	System 4A	100YR-24HR	12.61	1.43	0.002	12.61	25.65	30.00	21.01
CS-9_2	System 4A	100YR-24HR	12.61	1.56	-0.001	12.61	25.65	30.00	21.01
ISG OUTFALL	BASE	100YR-24HR	23.65	6.54	0.001	23.65	26.32	0.00	20.00
ISG PUMPS	BASE	100YR-24HR	0.00	0.00	0.000	24.90	24.38	23.65	26.32
P_M1-SW3A-1	System 2	100YR-24HR	12.27	7.39	4.542	18.25	24.14	18.27	24.15
P_M2-SW3A-1	System 2	100YR-24HR	12.27	7.40	4.542	18.25	24.14	18.27	24.15
P_M3-SW3A-1	System 2	100YR-24HR	12.25	7.54	-3.754	17.97	24.13	18.27	24.15
P_M3-SW3A-2	System 2	100YR-24HR	12.25	1.16	-5.856	17.97	24.13	17.38	24.15
P_M4-SW3A-2	System 2	100YR-24HR	0.00	10.46	10.465	17.25	24.13	17.38	24.15
P_M4-SW3A-3	System 2	100YR-24HR	12.27	6.53	-22.311	17.25	24.13	17.29	24.15
P_M5-SW3B	System 3	100YR-24HR	4.15	16.45	12.070	12.82	25.46	12.85	25.44
P_M6-SW3C	System 3	100YR-24HR	4.15	16.50	12.106	12.81	25.52	12.84	25.49
P_M7-SW3D	System 3	100YR-24HR	12.44	11.14	-8.929	12.81	25.46	12.84	25.44
P_M8-SW3E	System 3	100YR-24HR	12.54	14.94	-8.790	12.63	26.09	12.65	26.05
P_M9A-SW8	System 3	100YR-24HR	12.38	11.81	3.296	12.42	26.17	12.44	26.09
P_M9B-SW10	System 3	100YR-24HR	12.39	14.91	-2.690	12.37	26.12	12.35	25.97
P_SW4-M1	System 2	100YR-24HR	2.33	6.68	6.155	18.27	24.15	18.25	24.14
P_SW4-M2	System 2	100YR-24HR	2.33	6.68	6.155	18.27	24.15	18.25	24.14
P_SW5A-M3	System 2	100YR-24HR	2.33	7.86	4.013	18.00	24.15	17.97	24.13
P_SW5B-M3	System 2	100YR-24HR	2.33	7.87	4.013	18.06	24.15	17.97	24.13
P_SW6-M4	System 2	100YR-24HR	0.00	8.36	-10.534	17.08	24.15	17.25	24.13
P_SW7A-M4	System 2	100YR-24HR	0.00	22.99	22.990	17.01	24.15	17.25	24.13
P_SW7B-M5	System 3	100YR-24HR	11.93	9.89	-12.571	12.82	25.47	12.82	25.46
P_SW7C-M6	System 3	100YR-24HR	11.93	10.03	-12.768	12.82	25.53	12.81	25.52
P_SW7D-M7	System 3	100YR-24HR	4.54	17.83	9.611	12.82	25.47	12.81	25.46
P_SW7E-M8	System 3	100YR-24HR	2.35	17.95	9.686	12.65	26.11	12.63	26.09
P_SW9A-M9A	System 3	100YR-24HR	12.50	7.67	-3.714	12.43	26.21	12.42	26.17
P_SW9B-M9B	System 3	100YR-24HR	12.48	11.18	2.577	12.41	26.19	12.37	26.12
PERC_SW_3A-1	System 2	100YR-24HR	12.45	6.78	0.348	18.27	24.15	0.00	22.00
PERC_SW_3A-2	System 2	100YR-24HR	12.43	3.43	0.201	17.38	24.15	0.00	22.00
PERC_SW_3A-3	System 2	100YR-24HR	12.42	2.90	1.268	17.29	24.15	0.00	22.25
PERC_SW_4	System 2	100YR-24HR	12.39	5.51	0.191	18.27	24.15	0.00	22.00
PERC_SW_5A	System 2	100YR-24HR	12.40	1.35	0.030	18.00	24.15	0.00	22.00
PERC_SW_5B	System 2	100YR-24HR	12.40	2.32	0.052	18.06	24.15	0.00	22.00
PERC_SW_6	System 2	100YR-24HR	12.38	1.27	0.129	17.08	24.15	0.00	22.00
PERC_SW_7A	System 2	100YR-24HR	12.37	2.81	1.185	17.01	24.15	0.00	22.25
W_01-02	BASE	100YR-24HR	0.00	0.00	0.000	25.53	24.38	25.00	24.38
W_02-03	BASE	100YR-24HR	0.00	0.00	0.000	25.00	24.38	25.00	24.09
W_03-04	BASE	100YR-24HR	0.00	0.00	0.000	25.00	24.09	12.56	21.84
WILDLIFE XING	System 3	100YR-24HR	24.24	0.25	-0.000	24.24	23.10	24.24	23.03
CD-1	System 2	10YR-24HR	9.18	2.09	-15.722	25.00	23.85	25.00	23.85
CD-2	System 2	10YR-24HR	10.34	1.88	-15.722	25.00	23.85	25.00	23.85
CD-3	System 3	10YR-24HR	12.47	21.62	0.084	12.47	21.60	30.00	21.00
CD-4	System 3	10YR-24HR	12.47	21.62	0.084	12.47	21.60	30.00	21.00
CD-5	System 3	10YR-24HR	12.47	27.12	0.108	12.47	21.60	12.47	21.32
CS-3_1	System 3	10YR-24HR	15.86	0.70	0.000	15.86	25.27	30.00	21.00
CS-3_2	System 3	10YR-24HR	15.86	1.87	0.004	15.86	25.27	30.00	21.00
CS-4_1	System 3	10YR-24HR	16.18	0.42	0.000	16.18	25.32	30.00	21.00
CS-4_2	System 3	10YR-24HR	16.18	1.99	0.000	16.18	25.32	30.00	21.00
CS-5_1	System 3	10YR-24HR	16.10	0.51	0.000	16.10	25.27	30.00	21.00
CS-5_2	System 3	10YR-24HR	16.10	1.86	0.008	16.10	25.27	30.00	21.00
CS-6_1	System 3	10YR-24HR	13.47	3.20	0.001	13.47	25.87	30.00	21.00
CS-6_2	System 3	10YR-24HR	13.47	2.13	0.005	13.47	25.87	30.00	21.00
CS-7_1	System 3	10YR-24HR	12.73	5.87	0.004	12.73	25.93	30.00	21.00
CS-7_2	System 3	10YR-24HR	12.73	2.31	0.003	12.73	25.93	30.00	21.00
CS-8_1	System 3	10YR-24HR	12.52	9.49	0.012	12.52	25.90	30.00	21.00
CS-8_2	System 3	10YR-24HR	12.52	2.21	0.003	12.52	25.90	30.00	21.00
CS-9_1	System 4A	10YR-24HR	0.00	0.00	0.000	12.88	25.45	30.00	21.00
CS-9_2	System 4A	10YR-24HR	12.88	1.13	-0.001	12.88	25.45	30.00	21.00
ISG OUTFALL	BASE	10YR-24HR	24.12	2.90	0.000	24.12	26.13	0.00	20.00
ISG PUMPS	BASE	10YR-24HR	0.00	0.00	0.000	25.00	23.85	24.12	26.13
P_M1-SW3A-1	System 2	10YR-24HR	12.27	4.22	-3.926	16.96	23.69	17.00	23.69
P_M2-SW3A-1	System 2	10YR-24HR	12.27	4.22	-3.926	16.96	23.69	17.00	23.69
P_M3-SW3A-1	System 2	10YR-24HR	12.42	6.43	-3.754	16.93	23.67	17.00	23.69
P_M3-SW3A-2	System 2	10YR-24HR	0.00	0.00	-5.856	16.93	23.67	16.95	23.70

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - LINK MAXIMUM CONDITIONS REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
P_M4-SW3A-2	System 2	10YR-24HR	11.94	11.67	10.465	16.89	23.68	16.95	23.70
P_M4-SW3A-3	System 2	10YR-24HR	12.29	-1.80	-22.311	16.89	23.68	16.92	23.70
P_M5-SW3B	System 3	10YR-24HR	12.41	13.19	-8.905	15.83	25.30	15.86	25.27
P_M6-SW3C	System 3	10YR-24HR	5.61	16.50	12.107	16.15	25.34	16.18	25.32
P_M7-SW3D	System 3	10YR-24HR	12.25	3.45	-8.757	16.07	25.25	16.10	25.27
P_M8-SW3E	System 3	10YR-24HR	12.00	9.32	-8.791	13.44	25.86	13.47	25.87
P_M9A-SW8	System 3	10YR-24HR	12.26	5.81	-2.451	12.71	25.94	12.73	25.93
P_M9B-SW10	System 3	10YR-24HR	12.53	7.06	-2.741	12.52	25.93	12.52	25.90
P_SW4-M1	System 2	10YR-24HR	3.33	6.68	6.155	16.97	23.69	16.96	23.69
P_SW4-M2	System 2	10YR-24HR	3.33	6.68	6.155	16.97	23.69	16.96	23.69
P_SW5A-M3	System 2	10YR-24HR	3.33	7.86	4.013	16.94	23.69	16.93	23.67
P_SW5B-M3	System 2	10YR-24HR	3.33	7.87	4.013	16.95	23.69	16.93	23.67
P_SW6-M4	System 2	10YR-24HR	0.00	8.36	-10.534	16.90	23.70	16.89	23.68
P_SW7A-M4	System 2	10YR-24HR	0.00	22.99	22.990	16.89	23.70	16.89	23.68
P_SW7B-M5	System 3	10YR-24HR	5.61	17.64	9.088	15.84	25.28	15.83	25.30
P_SW7C-M6	System 3	10YR-24HR	12.42	10.79	-12.768	16.14	25.33	16.15	25.34
P_SW7D-M7	System 3	10YR-24HR	6.06	17.83	9.612	16.08	25.28	16.07	25.25
P_SW7E-M8	System 3	10YR-24HR	3.30	17.95	9.686	13.44	25.88	13.44	25.86
P_SW9A-M9A	System 3	10YR-24HR	7.85	5.00	2.569	12.70	25.94	12.71	25.94
P_SW9B-M9B	System 3	10YR-24HR	12.58	5.33	2.578	12.53	25.95	12.52	25.93
PERC_SW_3A-1	System 2	10YR-24HR	12.44	5.31	0.307	17.00	23.69	0.00	22.00
PERC_SW_3A-2	System 2	10YR-24HR	12.41	2.74	0.201	16.95	23.70	0.00	22.00
PERC_SW_3A-3	System 2	10YR-24HR	12.39	2.27	1.268	16.92	23.70	0.00	22.25
PERC_SW_4	System 2	10YR-24HR	12.40	4.25	0.191	16.97	23.69	0.00	22.00
PERC_SW_5A	System 2	10YR-24HR	12.39	1.06	0.030	16.94	23.69	0.00	22.00
PERC_SW_5B	System 2	10YR-24HR	12.40	1.83	0.052	16.95	23.69	0.00	22.00
PERC_SW_6	System 2	10YR-24HR	12.37	1.00	0.129	16.90	23.70	0.00	22.00
PERC_SW_7A	System 2	10YR-24HR	12.36	2.21	1.185	16.89	23.70	0.00	22.25
W_01-02	BASE	10YR-24HR	0.00	0.00	0.000	25.00	23.85	25.00	23.85
W_02-03	BASE	10YR-24HR	0.00	0.00	0.000	25.00	23.85	25.00	23.62
W_03-04	BASE	10YR-24HR	0.00	0.00	0.000	25.00	23.62	12.47	21.60
WILDLIFE XING	System 3	10YR-24HR	0.00	0.00	0.000	25.00	22.52	30.00	21.00
CD-1	System 2	25YR-72HR	18.82	0.48	-15.722	73.00	24.51	73.00	24.51
CD-2	System 2	25YR-72HR	24.79	0.45	-15.722	73.00	24.51	73.00	24.51
CD-3	System 3	25YR-72HR	60.26	23.14	0.084	60.26	21.69	84.00	21.01
CD-4	System 3	25YR-72HR	60.26	23.14	0.084	60.26	21.69	84.00	21.01
CD-5	System 3	25YR-72HR	60.25	29.29	0.108	60.26	21.69	60.25	21.43
CS-3_1	System 3	25YR-72HR	60.57	16.14	0.008	60.57	25.44	84.00	21.01
CS-3_2	System 3	25YR-72HR	60.57	2.35	0.000	60.57	25.44	84.00	21.01
CS-4_1	System 3	25YR-72HR	60.56	16.26	0.009	60.56	25.49	84.00	21.01
CS-4_2	System 3	25YR-72HR	60.56	2.50	0.000	60.56	25.49	84.00	21.01
CS-5_1	System 3	25YR-72HR	60.55	16.49	0.009	60.55	25.44	84.00	21.01
CS-5_2	System 3	25YR-72HR	60.55	2.36	0.004	60.55	25.44	84.00	21.01
CS-6_1	System 3	25YR-72HR	60.40	21.06	0.012	60.40	26.03	84.00	21.01
CS-6_2	System 3	25YR-72HR	60.40	2.62	0.000	60.40	26.03	84.00	21.01
CS-7_1	System 3	25YR-72HR	60.23	14.77	0.010	60.23	26.03	84.00	21.01
CS-7_2	System 3	25YR-72HR	60.23	2.64	0.002	60.23	26.03	84.00	21.01
CS-8_1	System 3	25YR-72HR	60.12	18.52	0.017	60.12	25.95	84.00	21.01
CS-8_2	System 3	25YR-72HR	60.12	2.37	-0.001	60.12	25.95	84.00	21.01
CS-9_1	System 4A	25YR-72HR	0.00	0.00	0.000	60.66	25.56	84.00	21.01
CS-9_2	System 4A	25YR-72HR	60.66	1.37	-0.001	60.66	25.56	84.00	21.01
ISG OUTFALL	BASE	25YR-72HR	68.28	7.46	0.001	68.28	26.36	0.00	20.00
ISG PUMPS	BASE	25YR-72HR	0.00	0.00	0.000	73.00	24.51	68.28	26.36
P_M1-SW3A-1	System 2	25YR-72HR	60.03	6.82	5.252	68.19	24.12	68.23	24.12
P_M2-SW3A-1	System 2	25YR-72HR	60.03	6.83	5.252	68.19	24.12	68.23	24.12
P_M3-SW3A-1	System 2	25YR-72HR	60.01	5.95	-3.754	68.18	24.10	68.23	24.12
P_M3-SW3A-2	System 2	25YR-72HR	60.00	1.45	-5.856	68.18	24.10	68.22	24.12
P_M4-SW3A-2	System 2	25YR-72HR	0.00	10.46	10.465	68.15	24.10	68.22	24.12
P_M4-SW3A-3	System 2	25YR-72HR	60.02	6.30	-22.311	68.15	24.10	68.20	24.12
P_M5-SW3B	System 3	25YR-72HR	9.28	16.45	12.069	60.54	25.46	60.57	25.44
P_M6-SW3C	System 3	25YR-72HR	9.28	16.50	12.107	60.53	25.51	60.56	25.49
P_M7-SW3D	System 3	25YR-72HR	61.26	12.87	-8.758	60.52	25.46	60.55	25.44
P_M8-SW3E	System 3	25YR-72HR	4.82	16.60	11.406	60.37	26.06	60.40	26.03
P_M9A-SW8	System 3	25YR-72HR	60.12	9.57	-2.470	60.20	26.09	60.23	26.03
P_M9B-SW10	System 3	25YR-72HR	60.15	12.56	3.300	60.13	26.05	60.12	25.95
P_SW4-M1	System 2	25YR-72HR	5.00	6.68	-9.455	68.20	24.12	68.19	24.12
P_SW4-M2	System 2	25YR-72HR	5.00	6.68	-9.455	68.20	24.12	68.19	24.12
P_SW5A-M3	System 2	25YR-72HR	5.00	7.86	4.013	68.18	24.12	68.18	24.10
P_SW5B-M3	System 2	25YR-72HR	5.00	7.87	4.013	68.20	24.12	68.18	24.10
P_SW6-M4	System 2	25YR-72HR	0.00	8.36	-10.534	68.17	24.12	68.15	24.10
P_SW7A-M4	System 2	25YR-72HR	0.00	22.99	22.990	68.15	24.12	68.15	24.10
P_SW7B-M5	System 3	25YR-72HR	59.69	9.85	-12.571	60.54	25.47	60.54	25.46
P_SW7C-M6	System 3	25YR-72HR	60.62	7.21	-12.768	60.54	25.52	60.53	25.51
P_SW7D-M7	System 3	25YR-72HR	10.29	17.83	9.613	60.53	25.47	60.52	25.46
P_SW7E-M8	System 3	25YR-72HR	60.44	9.20	-13.528	60.38	26.08	60.37	26.06
P_SW9A-M9A	System 3	25YR-72HR	60.25	5.92	2.571	60.21	26.11	60.20	26.09
P_SW9B-M9B	System 3	25YR-72HR	60.23	9.29	-3.727	60.16	26.10	60.13	26.05
PERC_SW_3A-1	System 2	25YR-72HR	60.21	5.24	0.307	68.23	24.12	0.00	22.00
PERC_SW_3A-2	System 2	25YR-72HR	60.19	2.64	0.201	68.22	24.12	0.00	22.00
PERC_SW_3A-3	System 2	25YR-72HR	60.18	2.25	1.268	68.20	24.12	0.00	22.25
PERC_SW_4	System 2	25YR-72HR	60.14	4.24	0.191	68.20	24.12	0.00	22.00
PERC_SW_5A	System 2	25YR-72HR	60.16	1.04	0.030	68.18	24.12	0.00	22.00

SR 710/BEELINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - LINK MAXIMUM CONDITIONS REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
PERC_SW_5B	System 2	25YR-72HR	60.16	1.78	0.052	68.20	24.12	0.00	22.00
PERC_SW_6	System 2	25YR-72HR	60.14	0.98	0.129	68.17	24.12	0.00	22.00
PERC_SW_7A	System 2	25YR-72HR	60.13	2.16	1.185	68.15	24.12	0.00	22.25
W_01-02	BASE	25YR-72HR	0.00	0.00	0.000	73.00	24.51	73.00	24.51
W_02-03	BASE	25YR-72HR	0.00	0.00	0.000	73.00	24.51	73.00	24.21
W_03-04	BASE	25YR-72HR	0.00	0.00	0.000	73.00	24.21	60.26	21.69
WILDLIFE XING	System 3	25YR-72HR	72.02	0.66	-0.000	72.02	23.16	72.02	23.06

SR 710/BEE LINE HIGHWAY
 FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
 POST-DEVELOPMENT
 SYSTEMS 2 - 4A - LINK MAXIMUM CONDITIONS REPORT
 HYDRAULIC FLOOD DATA SHEET - DESIGN FLOOD AND BASE FLOOD

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CD-1	System 2	100YR_FDOT	3.66	3.39	-15.722	26.21	24.88	24.89	24.88
CD-2	System 2	100YR_FDOT	3.54	2.73	-15.722	24.94	24.88	24.89	24.88
CD-3	System 3	100YR_FDOT	12.03	11.44	0.095	12.04	21.19	30.00	21.01
CD-4	System 3	100YR_FDOT	12.03	11.44	0.095	12.04	21.19	30.00	21.01
CD-5	System 3	100YR_FDOT	12.03	14.76	0.122	12.04	21.19	30.00	21.01
CD-1	System 2	50YR_FDOT	3.92	3.13	-15.722	25.95	24.67	24.89	24.67
CD-2	System 2	50YR_FDOT	3.84	2.42	-15.722	25.00	24.67	24.89	24.67
CD-3	System 3	50YR_FDOT	12.02	10.15	0.095	12.02	21.15	30.00	21.01
CD-4	System 3	50YR_FDOT	12.02	10.15	0.095	12.02	21.15	30.00	21.01
CD-5	System 3	50YR_FDOT	12.02	13.09	0.121	12.02	21.15	30.00	21.01

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - BASIN MAXIMUM CONDITIONS REPORT

Simulation	Basin	Group	Time hrs	Max Flow cfs	Volume in	Volume ft3
100YR-24HR	BASIN 10A	System 3	12.27	12.45	8.490	69647
100YR-24HR	BASIN 10B	System 3	12.27	5.20	7.736	27801
100YR-24HR	BASIN 11	System 4A	12.27	6.72	8.186	36848
100YR-24HR	BASIN 3A-1	System 2	12.27	84.65	8.159	463234
100YR-24HR	BASIN 3A-2	System 2	12.27	42.39	8.163	232018
100YR-24HR	BASIN 3A-3	System 2	12.27	35.02	8.162	191690
100YR-24HR	BASIN 3B	System 3	12.27	30.82	7.052	159737
100YR-24HR	BASIN 3C	System 3	12.27	30.82	7.052	159737
100YR-24HR	BASIN 3D	System 3	12.27	30.82	7.052	159737
100YR-24HR	BASIN 3E	System 3	12.27	30.17	8.169	165174
100YR-24HR	BASIN 4	System 2	12.27	50.19	7.253	262216
100YR-24HR	BASIN 5A	System 2	12.27	12.57	7.270	65711
100YR-24HR	BASIN 5B	System 2	12.27	21.22	7.255	110874
100YR-24HR	BASIN 6	System 2	12.27	11.46	7.269	59895
100YR-24HR	BASIN 7A	System 2	12.27	24.69	7.251	128980
100YR-24HR	BASIN 7B	System 3	12.27	25.04	7.249	130778
100YR-24HR	BASIN 7C	System 3	12.27	25.04	7.249	130778
100YR-24HR	BASIN 7D	System 3	12.27	22.61	6.346	114496
100YR-24HR	BASIN 7E	System 3	12.27	24.49	7.254	127971
100YR-24HR	BASIN 8A	System 3	12.27	17.05	8.382	94629
100YR-24HR	BASIN 8B	System 3	12.27	4.68	7.736	24993
100YR-24HR	BASIN 9A-1	System 3	12.27	11.17	7.837	60027
100YR-24HR	BASIN 9A-2	System 3	12.27	3.52	7.736	18815
100YR-24HR	BASIN 9B-1	System 3	12.27	15.05	7.661	80087
100YR-24HR	BASIN 9B-2	System 3	12.27	3.68	7.736	19657
100YR-24HR	BASIN M1	System 2	12.27	10.40	5.934	52126
100YR-24HR	BASIN M2	System 2	12.27	10.43	5.930	52308
100YR-24HR	BASIN M3A	System 2	12.27	5.23	5.976	26246
100YR-24HR	BASIN M3B	System 2	12.27	8.59	5.769	42932
100YR-24HR	BASIN M4	System 2	12.27	14.76	5.807	73782
100YR-24HR	BASIN M5	System 3	12.27	10.40	5.934	52126
100YR-24HR	BASIN M6	System 3	12.27	10.40	5.934	52126
100YR-24HR	BASIN M7	System 3	12.27	10.40	5.934	52126
100YR-24HR	BASIN M8	System 3	12.27	10.23	5.997	51375
100YR-24HR	BASIN M9A	System 3	12.27	6.08	6.210	30659
100YR-24HR	BASIN M9B	System 3	12.27	5.49	6.149	27676
100YR-24HR	ISG AGRICULT	BASE	12.27	6351.59	5.687	31688101
100YR-24HR	ISG RESERVOIR	BASE	12.27	394.42	9.397	2387738
100YR-24HROFFSITE	BASIN 1	System 2	12.27	67.82	8.968	393905
100YR-24HROFFSITE	BASIN 2	System 2	12.27	45.30	8.977	263285
100YR-24HROFFSITE	BASIN 3	System 2	12.27	15.77	8.177	86371
100YR-24HROFFSITE	BASIN 4	System 3	12.27	168.14	9.397	1017859
100YR-24HROFFSITE	BASIN 5	System 3	12.27	35.16	9.397	212850
10YR-24HR	BASIN 10A	System 3	12.27	8.44	5.617	46082
10YR-24HR	BASIN 10B	System 3	12.27	3.41	4.924	17697
10YR-24HR	BASIN 11	System 4A	12.27	4.50	5.334	24010
10YR-24HR	BASIN 3A-1	System 2	12.27	56.58	5.309	301427
10YR-24HR	BASIN 3A-2	System 2	12.27	28.34	5.313	151003
10YR-24HR	BASIN 3A-3	System 2	12.27	23.41	5.312	124748
10YR-24HR	BASIN 3B	System 3	12.27	19.39	4.325	97956
10YR-24HR	BASIN 3C	System 3	12.27	19.39	4.325	97956
10YR-24HR	BASIN 3D	System 3	12.27	19.39	4.325	97956
10YR-24HR	BASIN 3E	System 3	12.27	20.17	5.318	107533
10YR-24HR	BASIN 4	System 2	12.27	31.97	4.498	162611
10YR-24HR	BASIN 5A	System 2	12.27	8.01	4.513	40790
10YR-24HR	BASIN 5B	System 2	12.27	13.52	4.500	68767
10YR-24HR	BASIN 6	System 2	12.27	7.30	4.512	37177
10YR-24HR	BASIN 7A	System 2	12.27	15.72	4.497	79980
10YR-24HR	BASIN 7B	System 3	12.27	15.94	4.494	81084
10YR-24HR	BASIN 7C	System 3	12.27	15.94	4.494	81084
10YR-24HR	BASIN 7D	System 3	12.27	13.56	3.734	67356
10YR-24HR	BASIN 7E	System 3	12.27	15.60	4.499	79365
10YR-24HR	BASIN 8A	System 3	12.27	11.50	5.516	62275
10YR-24HR	BASIN 8B	System 3	12.27	3.06	4.924	15909
10YR-24HR	BASIN 9A-1	System 3	12.27	7.35	5.015	38414
10YR-24HR	BASIN 9A-2	System 3	12.27	2.30	4.924	11976
10YR-24HR	BASIN 9B-1	System 3	12.27	9.81	4.857	50776
10YR-24HR	BASIN 9B-2	System 3	12.27	2.41	4.924	12513
10YR-24HR	BASIN M1	System 2	12.27	6.05	3.401	29874
10YR-24HR	BASIN M2	System 2	12.27	6.07	3.398	29971
10YR-24HR	BASIN M3A	System 2	12.27	3.05	3.434	15083
10YR-24HR	BASIN M3B	System 2	12.27	4.93	3.271	24338
10YR-24HR	BASIN M4	System 2	12.27	8.50	3.300	41933
10YR-24HR	BASIN M5	System 3	12.27	6.05	3.401	29874
10YR-24HR	BASIN M6	System 3	12.27	6.05	3.401	29874
10YR-24HR	BASIN M7	System 3	12.27	6.05	3.401	29874
10YR-24HR	BASIN M8	System 3	12.27	5.98	3.451	29565
10YR-24HR	BASIN M9A	System 3	12.27	3.61	3.623	17885
10YR-24HR	BASIN M9B	System 3	12.27	3.25	3.573	16082
10YR-24HR	ISG AGRICULT	BASE	12.27	3622.07	3.206	17864019
10YR-24HR	ISG RESERVOIR	BASE	12.27	272.74	6.498	1651096
10YR-24HROFFSITE	BASIN 1	System 2	12.27	46.65	6.075	266834
10YR-24HROFFSITE	BASIN 2	System 2	12.27	31.16	6.083	178425

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - BASIN MAXIMUM CONDITIONS REPORT

Simulation	Basin	Group	Time hrs	Max Flow cfs	Volume in	Volume ft3
10YR-24HROFFSITE	BASIN 3	System 2	12.27	10.55	5.325	56251
10YR-24HROFFSITE	BASIN 4	System 3	12.27	116.26	6.498	703839
10YR-24HROFFSITE	BASIN 5	System 3	12.27	24.31	6.498	147183
25YR-72HR	BASIN 10A	System 3	60.02	10.11	9.284	76167
25YR-72HR	BASIN 10B	System 3	60.02	4.30	8.519	30616
25YR-72HR	BASIN 11	System 4A	60.02	5.49	8.977	40409
25YR-72HR	BASIN 3A-1	System 2	60.02	69.21	8.950	508120
25YR-72HR	BASIN 3A-2	System 2	60.02	34.65	8.954	254491
25YR-72HR	BASIN 3A-3	System 2	60.02	28.63	8.952	210259
25YR-72HR	BASIN 3B	System 3	60.02	26.05	7.819	177105
25YR-72HR	BASIN 3C	System 3	60.02	26.05	7.819	177105
25YR-72HR	BASIN 3D	System 3	60.02	26.05	7.819	177105
25YR-72HR	BASIN 3E	System 3	60.02	24.66	8.960	181162
25YR-72HR	BASIN 4	System 2	60.02	42.13	8.025	290136
25YR-72HR	BASIN 5A	System 2	60.02	10.54	8.043	72696
25YR-72HR	BASIN 5B	System 2	60.02	17.81	8.027	122677
25YR-72HR	BASIN 6	System 2	60.02	9.61	8.041	66262
25YR-72HR	BASIN 7A	System 2	60.02	20.72	8.024	142715
25YR-72HR	BASIN 7B	System 3	60.02	21.02	8.021	144708
25YR-72HR	BASIN 7C	System 3	60.02	21.02	8.021	144708
25YR-72HR	BASIN 7D	System 3	60.02	19.63	7.090	127908
25YR-72HR	BASIN 7E	System 3	60.02	20.56	8.026	141595
25YR-72HR	BASIN 8A	System 3	60.02	13.87	9.176	103588
25YR-72HR	BASIN 8B	System 3	60.02	3.87	8.519	27523
25YR-72HR	BASIN 9A-1	System 3	60.02	9.21	8.622	66042
25YR-72HR	BASIN 9A-2	System 3	60.02	2.91	8.519	20720
25YR-72HR	BASIN 9B-1	System 3	60.02	12.47	8.442	88260
25YR-72HR	BASIN 9B-2	System 3	60.02	3.04	8.519	21648
25YR-72HR	BASIN M1	System 2	60.02	9.19	6.661	58510
25YR-72HR	BASIN M2	System 2	60.02	9.22	6.657	58717
25YR-72HR	BASIN M3A	System 2	60.02	4.61	6.704	29446
25YR-72HR	BASIN M3B	System 2	60.02	7.65	6.489	48286
25YR-72HR	BASIN M4	System 2	60.02	13.12	6.528	82944
25YR-72HR	BASIN M5	System 3	60.02	9.19	6.661	58510
25YR-72HR	BASIN M6	System 3	60.02	9.19	6.661	58510
25YR-72HR	BASIN M7	System 3	60.02	9.19	6.661	58510
25YR-72HR	BASIN M8	System 3	60.02	9.02	6.726	57624
25YR-72HR	BASIN M9A	System 3	60.02	5.31	6.949	34303
25YR-72HR	BASIN M9B	System 3	60.02	4.81	6.884	30987
25YR-72HR	ISG AGRICULT	BASE	60.02	5677.80	6.403	35675542
25YR-72HR	ISG RESERVOIR	BASE	60.02	317.10	10.196	2590922
25YR-72HROFFSITE	BASIN 1	System 2	60.02	54.65	9.767	428979
25YR-72HROFFSITE	BASIN 2	System 2	60.02	36.50	9.775	286708
25YR-72HROFFSITE	BASIN 3	System 2	60.02	12.88	8.967	94725
25YR-72HROFFSITE	BASIN 4	System 3	60.02	135.17	10.196	1104473
25YR-72HROFFSITE	BASIN 5	System 3	60.02	28.27	10.196	230962

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Basins
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Name: BASIN 10A Node: SWALE 10 Status: Onsite
Group: System 3 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 2.260 Time Shift(hrs): 0.00
Curve Number: 92.50 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 10B Node: PUBLIC LANDS Status: Onsite
Group: System 3 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 0.990 Time Shift(hrs): 0.00
Curve Number: 86.36 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 11 Node: SWALE 11 Status: Onsite
Group: System 4A Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 1.240 Time Shift(hrs): 0.00
Curve Number: 90.02 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 3A-1 Node: SWALE 3A-1 Status: Onsite
Group: System 2 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 15.640 Time Shift(hrs): 0.00
Curve Number: 89.80 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 3A-2 Node: SWALE 3A-2 Status: Onsite
Group: System 2 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 7.830 Time Shift(hrs): 0.00
Curve Number: 89.83 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 3A-3 Node: SWALE 3A-3 Status: Onsite
Group: System 2 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 6.470 Time Shift(hrs): 0.00
Curve Number: 89.82 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 3B Node: SWALE 3B Status: Onsite
Group: System 3 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 6.240	Time Shift(hrs): 0.00
Curve Number: 80.85	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 3C	Node: SWALE 3C	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 6.240	Time Shift(hrs): 0.00
Curve Number: 80.85	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 3D	Node: SWALE 3D	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 6.240	Time Shift(hrs): 0.00
Curve Number: 80.85	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 3E	Node: SWALE 3E	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 5.570	Time Shift(hrs): 0.00
Curve Number: 89.88	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 4	Node: SWALE 4	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 9.960	Time Shift(hrs): 0.00
Curve Number: 82.46	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 5A	Node: SWALE 5A	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 2.490	Time Shift(hrs): 0.00
Curve Number: 82.60	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 5B	Node: SWALE 5B	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 4.210	Time Shift(hrs): 0.00
Curve Number: 82.48	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN 6	Node: SWALE 6	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 2.270	Time Shift(hrs): 0.00	
Curve Number: 82.59	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 7A	Node: SWALE 7A	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 4.900	Time Shift(hrs): 0.00	
Curve Number: 82.45	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 7B	Node: SWALE 7B	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 4.970	Time Shift(hrs): 0.00	
Curve Number: 82.43	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 7C	Node: SWALE 7C	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 4.970	Time Shift(hrs): 0.00	
Curve Number: 82.43	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 7D	Node: SWALE 7D	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 4.970	Time Shift(hrs): 0.00	
Curve Number: 75.22	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 7E	Node: SWALE 7E	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 4.860	Time Shift(hrs): 0.00	
Curve Number: 82.47	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN 8A	Node: SWALE 8	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00
Area(ac):	3.110	Time Shift(hrs):	0.00
Curve Number:	91.62	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name:	BASIN 8B	Node:	PUBLIC LANDS	Status:	Onsite
Group:	System 3	Type:	SCS Unit Hydrograph CN		

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00
Area(ac):	0.890	Time Shift(hrs):	0.00
Curve Number:	86.36	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name:	BASIN 9A-1	Node:	SWALE 9A	Status:	Onsite
Group:	System 3	Type:	SCS Unit Hydrograph CN		

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00
Area(ac):	2.110	Time Shift(hrs):	0.00
Curve Number:	87.18	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name:	BASIN 9A-2	Node:	OFFSITE SWALE 5	Status:	Onsite
Group:	System 3	Type:	SCS Unit Hydrograph CN		

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00
Area(ac):	0.670	Time Shift(hrs):	0.00
Curve Number:	86.36	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name:	BASIN 9B-1	Node:	SWALE 9B	Status:	Onsite
Group:	System 3	Type:	SCS Unit Hydrograph CN		

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00
Area(ac):	2.880	Time Shift(hrs):	0.00
Curve Number:	85.75	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name:	BASIN 9B-2	Node:	OFFSITE SWALE 5	Status:	Onsite
Group:	System 3	Type:	SCS Unit Hydrograph CN		

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00
Area(ac):	0.700	Time Shift(hrs):	0.00
Curve Number:	86.36	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name:	BASIN M1	Node:	MEDIAN 1	Status:	Onsite
Group:	System 2	Type:	SCS Unit Hydrograph CN		

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	10.00
Area(ac):	2.420	Time Shift(hrs):	0.00
Curve Number:	71.95	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: BASIN M2	Node: MEDIAN 2	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 2.430	Time Shift(hrs): 0.00
Curve Number: 71.92	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN M3A	Node: MEDIAN 3	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 1.210	Time Shift(hrs): 0.00
Curve Number: 72.28	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN M3B	Node: MEDIAN 3	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 2.050	Time Shift(hrs): 0.00
Curve Number: 70.65	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN M4	Node: MEDIAN 4	Status: Onsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 3.500	Time Shift(hrs): 0.00
Curve Number: 70.95	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN M5	Node: MEDIAN 5	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 2.420	Time Shift(hrs): 0.00
Curve Number: 71.95	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN M6	Node: MEDIAN 6	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 2.420	Time Shift(hrs): 0.00
Curve Number: 71.95	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN M7	Node: MEDIAN 7	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
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Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 2.420	Time Shift(hrs): 0.00
Curve Number: 71.95	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: BASIN M8	Node: MEDIAN 8	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 2.360	Time Shift(hrs): 0.00	
Curve Number: 72.45	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN M9A	Node: MEDIAN 9A	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 1.360	Time Shift(hrs): 0.00	
Curve Number: 74.14	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN M9B	Node: MEDIAN 9B	Status: Onsite
Group: System 3	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 1.240	Time Shift(hrs): 0.00	
Curve Number: 73.65	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: ISG AGRICULT	Node: ISG AGRICULT	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 1535.000	Time Shift(hrs): 0.00	
Curve Number: 70.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Indian Sun Groves Agricultural Area

Indian Sun Groves - per Indian Sun Groves Surface Water Management Report, November 1985
SFWM D Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

Name: ISG RESERVOIR	Node: ISG RESERVOIR	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 70.000	Time Shift(hrs): 0.00	
Curve Number: 100.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Indian Sun Groves Reservoir

Indian Sun Reservoir - per Indian Sun Groves Surface Water Management Report, November 1985
SFWM D Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

Name: OFFSITE BASIN 1	Node: OFFSITE SWALE 1	Status: Offsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 12.100	Time Shift(hrs): 0.00
Curve Number: 96.44	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: OFFSITE BASIN 2	Node: OFFSITE SWALE 2	Status: Offsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 8.080	Time Shift(hrs): 0.00
Curve Number: 96.51	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: OFFSITE BASIN 3	Node: OFFSITE SWALE 3	Status: Offsite
Group: System 2	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 2.910	Time Shift(hrs): 0.00
Curve Number: 89.94	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: OFFSITE BASIN 4	Node: OFFSITE SWALE 4	Status: Offsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 29.840	Time Shift(hrs): 0.00
Curve Number: 100.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Name: OFFSITE BASIN 5	Node: OFFSITE SWALE 5	Status: Offsite
Group: System 3	Type: SCS Unit Hydrograph CN	

Unit Hydrograph: Uh256	Peaking Factor: 256.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00
Area(ac): 6.240	Time Shift(hrs): 0.00
Curve Number: 100.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

==== Nodes =====

Name: GW_Sys 2_LT	Base Flow(cfs): 0.000	Init Stage(ft): 22.000
Group: System 2		Warn Stage(ft): 23.000
Type: Time/Stage		

Time(hrs)	Stage(ft)
0.00	22.000
100.00	22.000

Name: GW_Sys 2_RT	Base Flow(cfs): 0.000	Init Stage(ft): 22.000
Group: System 2		Warn Stage(ft): 23.000
Type: Time/Stage		

Time(hrs)	Stage(ft)
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0.00 22.000
100.00 22.000

Name: GW_Sys 2C_LT Base Flow(cfs): 0.000 Init Stage(ft): 22.250
Group: System 2 Warn Stage(ft): 23.250
Type: Time/Stage

Time(hrs) Stage(ft)
0.00 22.250
100.00 22.250

Name: GW_Sys 2C_RT Base Flow(cfs): 0.000 Init Stage(ft): 22.250
Group: System 2 Warn Stage(ft): 23.250
Type: Time/Stage

Time(hrs) Stage(ft)
0.00 22.250
100.00 22.250

Name: ISG AGRICULT Base Flow(cfs): 0.000 Init Stage(ft): 22.000
Group: System 2 Warn Stage(ft): 25.620
Type: Stage/Volume

Indian Sun Groves Agricultural Area

Indian Sun Groves - per Indian Sun Groves Surface Water Management Report, November 1985
SFWMD Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

Stage(ft) Volume(af)
18.780 0.0000
20.610 0.0000
20.620 0.0000
21.120 31.5000
21.620 63.0000
22.120 94.5000
22.620 126.0000
23.120 201.6300
23.620 365.5000
24.120 617.6300
24.620 958.0000

Name: ISG RESERVOIR Base Flow(cfs): 0.000 Init Stage(ft): 25.620
Group: System 2 Warn Stage(ft): 28.620
Type: Stage/Volume

Indian Sun Groves Reservoir

Indian Sun Reservoir - per Indian Sun Groves Surface Water Management Report, November 1985
SFWMD Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

Stage(ft) Volume(af)
25.620 0.0000
26.120 35.0000
26.620 70.0000
27.120 105.0000
27.620 140.0000
28.120 175.0000
28.620 210.0000

Name: MEDIAN 1 Base Flow(cfs): 0.000 Init Stage(ft): 22.000
Group: System 2 Warn Stage(ft): 26.330
Type: Stage/Area

Stage(ft) Area(ac)
16.600 0.0003

26.000	0.0003		

Name: MEDIAN 2	Base Flow(cfs): 0.000	Init Stage(ft): 22.000	
Group: System 2		Warn Stage(ft): 26.330	
Type: Stage/Area			
Stage(ft)	Area(ac)		

16.600	0.0003		
26.000	0.0003		

Name: MEDIAN 3	Base Flow(cfs): 0.000	Init Stage(ft): 22.000	
Group: System 2		Warn Stage(ft): 26.330	
Type: Stage/Area			
Stage(ft)	Area(ac)		

16.600	0.0006		
26.000	0.0006		

Name: MEDIAN 4	Base Flow(cfs): 0.000	Init Stage(ft): 22.000	
Group: System 2		Warn Stage(ft): 26.330	
Type: Stage/Area			
Stage(ft)	Area(ac)		

16.600	0.0006		
26.000	0.0006		

Name: MEDIAN 5	Base Flow(cfs): 0.000	Init Stage(ft): 23.500	
Group: System 3		Warn Stage(ft): 27.830	
Type: Stage/Area			
Stage(ft)	Area(ac)		

18.100	0.0003		
27.500	0.0003		

Name: MEDIAN 6	Base Flow(cfs): 0.000	Init Stage(ft): 23.500	
Group: System 3		Warn Stage(ft): 27.830	
Type: Stage/Area			
Stage(ft)	Area(ac)		

18.100	0.0003		
27.500	0.0003		

Name: MEDIAN 7	Base Flow(cfs): 0.000	Init Stage(ft): 23.500	
Group: System 3		Warn Stage(ft): 27.830	
Type: Stage/Area			
Stage(ft)	Area(ac)		

18.100	0.0003		
27.500	0.0003		

Name: MEDIAN 8	Base Flow(cfs): 0.000	Init Stage(ft): 24.000	
Group: System 3		Warn Stage(ft): 28.330	
Type: Stage/Area			
Stage(ft)	Area(ac)		

18.600	0.0003		
28.000	0.0003		

Name: MEDIAN 9A Base Flow(cfs): 0.000 Init Stage(ft): 24.000
Group: System 3 Warn Stage(ft): 28.330
Type: Stage/Area

Stage(ft)	Area(ac)
18.600	0.0003
28.000	0.0003

Name: MEDIAN 9B Base Flow(cfs): 0.000 Init Stage(ft): 24.000
Group: System 3 Warn Stage(ft): 28.330
Type: Stage/Area

Stage(ft)	Area(ac)
18.600	0.0003
28.000	0.0003

Name: OFFSITE SWALE 1 Base Flow(cfs): 0.000 Init Stage(ft): 20.620
Group: System 2 Warn Stage(ft): 24.500
Type: Stage/Area

Stage(ft)	Area(ac)
18.800	0.0000
21.490	0.0000
21.500	0.4000
22.000	1.7300
22.500	4.0800
23.000	5.9200
23.500	7.0800
24.000	8.1000
24.500	9.1800
25.000	9.9200
25.500	10.0700
26.000	10.1100
26.500	10.1400
27.000	10.1500

Name: OFFSITE SWALE 2 Base Flow(cfs): 0.000 Init Stage(ft): 20.620
Group: System 2 Warn Stage(ft): 24.500
Type: Stage/Area

Stage(ft)	Area(ac)
18.800	0.0000
21.990	0.0000
22.000	0.1000
22.500	1.9300
23.000	3.7800
23.500	4.7500
24.000	5.1600
24.500	5.3800
25.000	5.4400
25.500	5.4600
26.000	5.4800
26.500	5.5000
27.000	5.5100

Name: OFFSITE SWALE 3 Base Flow(cfs): 0.000 Init Stage(ft): 20.620
Group: System 2 Warn Stage(ft): 24.500
Type: Stage/Area

Stage(ft)	Area(ac)
22.000	0.0200
22.500	0.3900
23.000	1.1600
23.500	1.3700

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEMS 2 - 4A - INPUT REPORT

24.000	1.5300
24.500	1.7200
25.000	1.8400
25.500	2.0100
26.000	2.0900
26.500	2.1200
27.000	2.1400

Name: OFFSITE SWALE 4 Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 3 Warn Stage(ft): 24.500
Type: Stage/Area

Stage(ft)	Area(ac)
19.800	0.0000
19.990	0.0000
20.000	0.0500
20.500	0.3400
21.000	1.4600
21.500	4.7300
22.000	10.6800
22.500	14.6100
23.000	14.9700
23.500	15.0900
24.000	15.1600
24.500	15.2000
25.000	15.2200
25.500	15.2300

Name: OFFSITE SWALE 5 Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 3 Warn Stage(ft): 26.500
Type: Stage/Area

Stage(ft)	Area(ac)
20.000	0.0500
20.500	0.5100
21.000	1.4900
21.500	2.5100
22.000	2.9400
22.500	3.0900
23.000	3.1100
23.500	3.1200
24.000	3.1300
24.500	3.1400
25.000	3.1500

Name: PUBLIC LANDS Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 3 Warn Stage(ft): 21.010
Type: Stage/Area

Hungryland/SFWMD Parcels & John C. and Mariana Jones Hungryland Wildlife Environmental Area

Public Lands - per Drainage Design Documentation SR 710 Reconstruction from Martin/Palm Beach County to Pratt Whitney Entrance, SFWMD Permit No. 50-04716-P, Application No. 150220-9, Issued 04/07/15

Stage(ft)	Area(ac)
21.000	10800.0000
25.000	10800.0000

Name: ST. LUCIE CANAL Base Flow(cfs): 0.000 Init Stage(ft): 20.000
Group: System 2 Warn Stage(ft): 20.000
Type: Time/Stage

Saint Lucie Canal (SFWMD C-44)

St. Lucie Canal - Per Stormwater Management Report for SR 710 Big John Monahan Bridge Replacement Design Build from SW Trail Dri SFWMD Permit No. 43-00802-S, Application No. 110909-1, Issued 12/19/2011

Time(hrs)	Stage(ft)
0.00	20.000
1000.00	20.000

Name: SWALE 10	Base Flow(cfs): 0.000	Init Stage(ft): 24.000
Group: System 3		Warn Stage(ft): 26.500
Type: Stage/Area		

Stage(ft)	Area(ac)
18.500	0.0003
24.990	0.0003
25.000	0.5600
25.500	0.6500
26.000	0.7400
26.500	0.8600
27.000	0.8800

Name: SWALE 11	Base Flow(cfs): 0.000	Init Stage(ft): 24.000
Group: System 4A		Warn Stage(ft): 26.500
Type: Stage/Area		

Stage(ft)	Area(ac)
24.000	0.0000
24.990	0.0000
25.000	0.3800
25.500	0.4400
26.000	0.5000
26.500	0.5800
27.000	0.5900

Name: SWALE 3A-1	Base Flow(cfs): 0.000	Init Stage(ft): 22.000
Group: System 2		Warn Stage(ft): 24.500
Type: Stage/Area		

Stage(ft)	Area(ac)
16.500	0.0009
22.990	0.0009
23.000	6.7800
23.500	7.4600
24.000	8.1900
24.500	9.4700
25.000	9.6700

Name: SWALE 3A-2	Base Flow(cfs): 0.000	Init Stage(ft): 22.000
Group: System 2		Warn Stage(ft): 24.500
Type: Stage/Area		

Stage(ft)	Area(ac)
16.500	0.0009
22.990	0.0009
23.000	3.3100
23.500	3.7000
24.000	4.1200
24.500	4.7200
25.000	4.8000

Name: SWALE 3A-3	Base Flow(cfs): 0.000	Init Stage(ft): 22.250
Group: System 2		Warn Stage(ft): 24.750
Type: Stage/Area		

Stage(ft)	Area(ac)
16.750	0.0009
23.240	0.0009
23.250	2.4900
23.500	2.6500
24.000	2.9800
24.500	3.3400
25.000	3.8300
25.500	3.9500

Name: SWALE 3B Base Flow(cfs): 0.000 Init Stage(ft): 23.500
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.000	0.0003
24.490	0.0003
24.500	2.5900
25.000	2.9400
25.500	3.2900
26.000	3.7300
26.500	3.7600

Name: SWALE 3C Base Flow(cfs): 0.000 Init Stage(ft): 23.500
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.000	0.0003
24.490	0.0003
24.500	2.3400
25.000	2.6900
25.500	3.0400
26.000	3.5100
26.500	3.5700

Name: SWALE 3D Base Flow(cfs): 0.000 Init Stage(ft): 23.500
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.000	0.0003
24.490	0.0003
24.500	2.3400
25.000	2.6900
25.500	3.0400
26.000	3.5000
26.500	3.6200

Name: SWALE 3E Base Flow(cfs): 0.000 Init Stage(ft): 24.000
Group: System 3 Warn Stage(ft): 26.500
Type: Stage/Area

Stage(ft)	Area(ac)
18.500	0.0003
24.990	0.0003
25.000	1.9900
25.500	2.3000
26.000	2.6100
26.500	3.0200
27.000	3.0700

Name: SWALE 4 Base Flow(cfs): 0.000 Init Stage(ft): 22.000
Group: System 2 Warn Stage(ft): 24.500
Type: Stage/Area

Stage(ft)	Area(ac)
16.700	0.0006
22.990	0.0006
23.000	2.8500
23.500	3.4500
24.000	4.1000
24.500	5.0700
25.000	5.2000

Name: SWALE 5A Base Flow(cfs): 0.000 Init Stage(ft): 22.000
Group: System 2 Warn Stage(ft): 24.500
Type: Stage/Area

Stage(ft)	Area(ac)
16.700	0.0003
22.990	0.0003
23.000	0.6400
23.500	0.8000
24.000	0.9600
24.500	1.1800
25.000	1.2100

Name: SWALE 5B Base Flow(cfs): 0.000 Init Stage(ft): 22.000
Group: System 2 Warn Stage(ft): 24.500
Type: Stage/Area

Stage(ft)	Area(ac)
16.700	0.0003
22.990	0.0003
23.000	1.1500
23.500	1.4300
24.000	1.7200
24.500	2.1100
25.000	2.1600

Name: SWALE 6 Base Flow(cfs): 0.000 Init Stage(ft): 22.000
Group: System 2 Warn Stage(ft): 24.500
Type: Stage/Area

Stage(ft)	Area(ac)
16.700	0.0003
22.990	0.0003
23.000	0.6100
23.500	0.7500
24.000	0.9000
24.500	1.1100
25.000	1.1400

Name: SWALE 7A Base Flow(cfs): 0.000 Init Stage(ft): 22.250
Group: System 2 Warn Stage(ft): 24.750
Type: Stage/Area

Stage(ft)	Area(ac)
16.950	0.0003
23.240	0.0003
23.250	0.9600
23.500	1.1300
24.000	1.4700
24.500	1.8100
25.000	2.2700
25.500	2.3800

Name: SWALE 7B Base Flow(cfs): 0.000 Init Stage(ft): 23.500
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.200	0.0003
24.490	0.0003
24.500	0.9300
25.000	1.2800
25.500	1.6300
26.000	2.0700
26.500	2.1000

Name: SWALE 7C Base Flow(cfs): 0.000 Init Stage(ft): 23.500
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.200	0.0003
24.490	0.0003
24.500	0.9100
25.000	1.2500
25.500	1.6000
26.000	2.0700
26.500	2.1300

Name: SWALE 7D Base Flow(cfs): 0.000 Init Stage(ft): 23.500
Group: System 3 Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.200	0.0003
24.490	0.0003
24.500	0.9200
25.000	1.2700
25.500	1.6200
26.000	2.0900
26.500	2.2100

Name: SWALE 7E Base Flow(cfs): 0.000 Init Stage(ft): 24.000
Group: System 3 Warn Stage(ft): 26.500
Type: Stage/Area

Stage(ft)	Area(ac)
18.700	0.0003
24.990	0.0003
25.000	0.7300
25.500	1.0600
26.000	1.4000
26.500	1.8500
27.000	1.9100

Name: SWALE 8 Base Flow(cfs): 0.000 Init Stage(ft): 24.000
Group: System 3 Warn Stage(ft): 26.500
Type: Stage/Area

Stage(ft)	Area(ac)
18.500	0.0003
24.990	0.0003
25.000	0.8600
25.500	1.0000
26.000	1.1400
26.500	1.3200
27.000	1.3500

Name: SWALE 9A Base Flow(cfs): 0.000 Init Stage(ft): 24.000
Group: System 3 Warn Stage(ft): 26.500
Type: Stage/Area

Stage(ft)	Area(ac)
18.700	0.0003
24.990	0.0003
25.000	0.1900
25.500	0.2900
26.000	0.3900
26.500	0.5200
27.000	0.5400

Name: SWALE 9B Base Flow(cfs): 0.000 Init Stage(ft): 24.000
Group: System 3 Warn Stage(ft): 26.500
Type: Stage/Area

Stage(ft)	Area(ac)
18.700	0.0003
24.990	0.0003
25.000	0.2700
25.500	0.4200
26.000	0.5700
26.500	0.7800
27.000	0.8100

==== Cross Sections =====

Name: XS_W_01-02 Group: System 2
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	25.210	0.060000
92.660	27.200	0.060000
117.150	26.580	0.060000

Name: XS_W_02-03 Group: System 2
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	25.900	0.020000
93.300	27.700	0.020000
120.870	26.780	0.020000

Name: XS_W_03-04 Group: System 2
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	26.390	0.020000
72.160	24.800	0.020000
102.260	24.600	0.020000

==== Operating Tables =====

Name: ISG PUMP 1 Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
21.120	40.00
30.000	40.00

Name: ISG PUMP 2 Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
21.620	120.00
30.000	120.00

==== Pipes =====
=====

Name: CD-1	From Node: OFFSITE SWALE 1	Length(ft): 164.00
Group: System 2	To Node: ISG AGRICULT	Count: 2
	Friction Equation: Automatic	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 18.00	18.00	Entrance Loss Coef: 0.50
Rise(in): 18.00	18.00	Exit Loss Coef: 0.00
Invert(ft): 18.800	18.550	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

S-41 to S-40

Name: CD-2	From Node: OFFSITE SWALE 2	Length(ft): 164.00
Group: System 2	To Node: ISG AGRICULT	Count: 2
	Friction Equation: Automatic	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 18.00	18.00	Entrance Loss Coef: 0.50
Rise(in): 18.00	18.00	Exit Loss Coef: 0.00
Invert(ft): 18.800	18.550	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

S-43 to S-42

Name: CD-3	From Node: OFFSITE SWALE 4	Length(ft): 164.00
Group: System 3	To Node: PUBLIC LANDS	Count: 2
	Friction Equation: Automatic	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 24.00	24.00	Entrance Loss Coef: 0.50
Rise(in): 24.00	24.00	Exit Loss Coef: 0.00
Invert(ft): 19.800	19.550	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

S-45 to S-44

Name: CD-4	From Node: OFFSITE SWALE 4	Length(ft): 164.00
Group: System 3	To Node: PUBLIC LANDS	Count: 2
	Friction Equation: Automatic	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 24.00	24.00	Entrance Loss Coef: 0.50
Rise(in): 24.00	24.00	Exit Loss Coef: 0.00
Invert(ft): 19.800	19.550	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

S-47 to S-46

```
-----
Name: CD-5          From Node: OFFSITE SWALE 4   Length(ft): 164.00
Group: System 3     To Node: PUBLIC LANDS       Count: 2
                                          Friction Equation: Automatic
                                          Solution Algorithm: Most Restrictive
                                          Flow: Both
      UPSTREAM      DOWNSTREAM
Geometry: Circular  Circular
Span(in): 30.00     30.00
Rise(in): 30.00     30.00
Invert(ft): 19.800  19.550
Manning's N: 0.013000 0.013000
Top Clip(in): 0.000  0.000
Bot Clip(in): 0.000  0.000
Entrance Loss Coef: 0.50
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None
```

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

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

S-49 to S-48

```
-----
Name: P_M1-SW3A-1   From Node: MEDIAN 1       Length(ft): 83.00
Group: System 2     To Node: SWALE 3A-1   Count: 1
                                          Friction Equation: Automatic
                                          Solution Algorithm: Most Restrictive
                                          Flow: Both
      UPSTREAM      DOWNSTREAM
Geometry: Circular  Circular
Span(in): 36.00     36.00
Rise(in): 36.00     36.00
Invert(ft): 18.600  18.500
Manning's N: 0.013000 0.013000
Top Clip(in): 0.000  0.000
Bot Clip(in): 0.000  0.000
Entrance Loss Coef: 0.50
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None
```

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

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

S-5 to S-4

```
-----
Name: P_M2-SW3A-1   From Node: MEDIAN 2       Length(ft): 83.00
Group: System 2     To Node: SWALE 3A-1   Count: 1
                                          Friction Equation: Automatic
                                          Solution Algorithm: Most Restrictive
                                          Flow: Both
      UPSTREAM      DOWNSTREAM
Geometry: Circular  Circular
Span(in): 36.00     36.00
Rise(in): 36.00     36.00
Invert(ft): 18.600  18.500
Manning's N: 0.013000 0.013000
Top Clip(in): 0.000  0.000
Bot Clip(in): 0.000  0.000
Entrance Loss Coef: 0.50
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None
```

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

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

S-8 to S-7

```
-----
Name: P_M3-SW3A-1   From Node: MEDIAN 3       Length(ft): 83.00
Group: System 2     To Node: SWALE 3A-1   Count: 1
                                          Friction Equation: Automatic
                                          Solution Algorithm: Most Restrictive
                                          Flow: Both
      UPSTREAM      DOWNSTREAM
Geometry: Circular  Circular
Span(in): 36.00     36.00
Entrance Loss Coef: 0.50
```

Rise(in): 36.00	36.00	Exit Loss Coef: 0.00
Invert(ft): 18.600	18.500	Bend Loss Coef: 0.00
Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

S-11 to S-10

Name: P_M3-SW3A-2	From Node: MEDIAN 3	Length(ft): 83.00
Group: System 2	To Node: SWALE 3A-2	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: 0.50
Invert(ft): 18.600	18.500	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-14 to S-13

Name: P_M4-SW3A-2	From Node: MEDIAN 4	Length(ft): 84.00
Group: System 2	To Node: SWALE 3A-2	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: 0.50
Invert(ft): 18.600	18.500	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-17 to S-16

Name: P_M4-SW3A-3	From Node: MEDIAN 4	Length(ft): 85.00
Group: System 2	To Node: SWALE 3A-3	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: 0.50
Invert(ft): 18.850	18.750	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-20 to S-19

Name: P_M5-SW3B	From Node: MEDIAN 5	Length(ft): 85.00
Group: System 3	To Node: SWALE 3B	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.100	19.000	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-23 to S-22

Name: P_M6-SW3C	From Node: MEDIAN 6	Length(ft): 86.00
Group: System 3	To Node: SWALE 3C	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.100	19.000	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-26 to S-25

Name: P_M7-SW3D	From Node: MEDIAN 7	Length(ft): 84.00
Group: System 3	To Node: SWALE 3D	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.100	19.000	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-29 to S-28

Name: P_M8-SW3E	From Node: MEDIAN 8	Length(ft): 84.00
Group: System 3	To Node: SWALE 3E	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.600	19.500	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

Upstream FHWA Inlet Edge Description:

Circular Concrete: Square edge w/ headwall

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

S-32 to S-31

```
-----
Name: P_M9A-SW8      From Node: MEDIAN 9A      Length(ft): 84.00
Group: System 3      To Node: SWALE 8          Count: 1
                                     Friction Equation: Automatic
                                     Solution Algorithm: Most Restrictive
                                     Flow: Both
      UPSTREAM          DOWNSTREAM
Geometry: Circular      Circular
Span(in): 36.00         36.00
Rise(in): 36.00         36.00
Invert(ft): 20.600      20.500
Manning's N: 0.013000   0.013000
Top Clip(in): 0.000     0.000
Bot Clip(in): 0.000     0.000
      Entrance Loss Coef: 0.50
      Exit Loss Coef: 0.00
      Bend Loss Coef: 0.00
      Outlet Ctrl Spec: Use dc or tw
      Inlet Ctrl Spec: Use dc
      Stabilizer Option: None
-----
```

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

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

S-35 to S-34

```
-----
Name: P_M9B-SW10     From Node: MEDIAN 9B      Length(ft): 84.00
Group: System 3      To Node: SWALE 10         Count: 1
                                     Friction Equation: Automatic
                                     Solution Algorithm: Most Restrictive
                                     Flow: Both
      UPSTREAM          DOWNSTREAM
Geometry: Circular      Circular
Span(in): 36.00         36.00
Rise(in): 36.00         36.00
Invert(ft): 20.600      20.500
Manning's N: 0.013000   0.013000
Top Clip(in): 0.000     0.000
Bot Clip(in): 0.000     0.000
      Entrance Loss Coef: 0.50
      Exit Loss Coef: 0.00
      Bend Loss Coef: 0.00
      Outlet Ctrl Spec: Use dc or tw
      Inlet Ctrl Spec: Use dc
      Stabilizer Option: None
-----
```

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

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

S-38 to S-37

```
-----
Name: P_SW4-M1       From Node: SWALE 4      Length(ft): 74.00
Group: System 2      To Node: MEDIAN 1        Count: 1
                                     Friction Equation: Automatic
                                     Solution Algorithm: Most Restrictive
                                     Flow: Both
      UPSTREAM          DOWNSTREAM
Geometry: Circular      Circular
Span(in): 36.00         36.00
Rise(in): 36.00         36.00
Invert(ft): 18.700      18.600
Manning's N: 0.013000   0.013000
Top Clip(in): 0.000     0.000
Bot Clip(in): 0.000     0.000
      Entrance Loss Coef: 0.50
      Exit Loss Coef: 0.00
      Bend Loss Coef: 0.00
      Outlet Ctrl Spec: Use dc or tw
      Inlet Ctrl Spec: Use dc
      Stabilizer Option: None
-----
```

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

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

S-6 to S-5

```
-----
Name: P_SW4-M2       From Node: SWALE 4      Length(ft): 74.00
Group: System 2      To Node: MEDIAN 2        Count: 1
                                     Friction Equation: Automatic
                                     Solution Algorithm: Most Restrictive
                                     Flow: Both
      UPSTREAM          DOWNSTREAM
Geometry: Circular      Circular
Span(in): 36.00         36.00
Rise(in): 36.00         36.00
Invert(ft): 18.700      18.600
      Entrance Loss Coef: 0.50
      Exit Loss Coef: 0.00
      Bend Loss Coef: 0.00
-----
```

Manning's N: 0.013000	0.013000	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	Stabilizer Option: None

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

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

S-9 to S-8

Name: P_SW5A-M3	From Node: SWALE 5A	Length(ft): 74.00
Group: System 2	To Node: MEDIAN 3	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: 0.50
Invert(ft): 18.700	18.600	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-12 to S-11

Name: P_SW5B-M3	From Node: SWALE 5B	Length(ft): 74.00
Group: System 2	To Node: MEDIAN 3	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: 0.50
Invert(ft): 18.700	18.600	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-15 to S-14

Name: P_SW6-M4	From Node: SWALE 6	Length(ft): 73.00
Group: System 2	To Node: MEDIAN 4	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: 0.50
Invert(ft): 18.700	18.600	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-18 to S-17

Name: P_SW7A-M4	From Node: SWALE 7A	Length(ft): 72.00
-----------------	---------------------	-------------------

Group: System 2	To Node: MEDIAN 4	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: 0.50
Invert(ft): 18.950	18.850	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-21 to S-20

Name: P_SW7B-M5	From Node: SWALE 7B	Length(ft): 74.00
Group: System 3	To Node: MEDIAN 5	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.200	19.100	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-24 to S-23

Name: P_SW7C-M6	From Node: SWALE 7C	Length(ft): 69.00
Group: System 3	To Node: MEDIAN 6	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.200	19.100	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-27 to S-26

Name: P_SW7D-M7	From Node: SWALE 7D	Length(ft): 71.00
Group: System 3	To Node: MEDIAN 7	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 19.200	19.100	Exit Loss Coef: 0.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: None

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

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

S-30 to S-29

```

-----
Name: P_SW7E-M8      From Node: SWALE 7E      Length(ft): 69.00
Group: System 3      To Node: MEDIAN 8      Count: 1
                        Friction Equation: Automatic
                        Solution Algorithm: Most Restrictive
                        Flow: Both
                        Entrance Loss Coef: 0.50
                        Exit Loss Coef: 0.00
                        Bend Loss Coef: 0.00
                        Outlet Ctrl Spec: Use dc or tw
                        Inlet Ctrl Spec: Use dc
                        Stabilizer Option: None

UPSTREAM      DOWNSTREAM
Geometry: Circular      Circular
Span(in): 48.00      48.00
Rise(in): 48.00      48.00
Invert(ft): 19.700      19.600
Manning's N: 0.013000      0.013000
Top Clip(in): 0.000      0.000
Bot Clip(in): 0.000      0.000

```

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

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

S-33 to S-32

```

-----
Name: P_SW9A-M9A      From Node: SWALE 9A      Length(ft): 69.00
Group: System 3      To Node: MEDIAN 9A      Count: 1
                        Friction Equation: Automatic
                        Solution Algorithm: Most Restrictive
                        Flow: Both
                        Entrance Loss Coef: 0.50
                        Exit Loss Coef: 0.00
                        Bend Loss Coef: 0.00
                        Outlet Ctrl Spec: Use dc or tw
                        Inlet Ctrl Spec: Use dc
                        Stabilizer Option: None

UPSTREAM      DOWNSTREAM
Geometry: Circular      Circular
Span(in): 36.00      36.00
Rise(in): 36.00      36.00
Invert(ft): 20.700      20.600
Manning's N: 0.013000      0.013000
Top Clip(in): 0.000      0.000
Bot Clip(in): 0.000      0.000

```

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

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

S-36 to S-35

```

-----
Name: P_SW9B-M9B      From Node: SWALE 9B      Length(ft): 68.00
Group: System 3      To Node: MEDIAN 9B      Count: 1
                        Friction Equation: Automatic
                        Solution Algorithm: Most Restrictive
                        Flow: Both
                        Entrance Loss Coef: 0.50
                        Exit Loss Coef: 0.00
                        Bend Loss Coef: 0.00
                        Outlet Ctrl Spec: Use dc or tw
                        Inlet Ctrl Spec: Use dc
                        Stabilizer Option: None

UPSTREAM      DOWNSTREAM
Geometry: Circular      Circular
Span(in): 36.00      36.00
Rise(in): 36.00      36.00
Invert(ft): 20.700      20.600
Manning's N: 0.013000      0.013000
Top Clip(in): 0.000      0.000
Bot Clip(in): 0.000      0.000

```

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

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

S-39 to S-38

```

-----
Name: WILDLIFE XING      From Node: OFFSITE SWALE 5      Length(ft): 130.00
Group: System 3      To Node: PUBLIC LANDS      Count: 1
                        Friction Equation: Automatic
                        Solution Algorithm: Most Restrictive
                        Flow: Both
                        Entrance Loss Coef: 0.50
                        Exit Loss Coef: 0.00
                        Bend Loss Coef: 0.00
                        Outlet Ctrl Spec: Use dc or tw
                        Inlet Ctrl Spec: Use dc

UPSTREAM      DOWNSTREAM
Geometry: Rectangular      Rectangular
Span(in): 96.00      96.00
Rise(in): 72.00      72.00
Invert(ft): 23.000      23.000
Manning's N: 0.013000      0.013000
Top Clip(in): 0.000      0.000

```

Bot Clip(in): 0.000 0.000 Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 90° headwall w/ 3/4" chamfers

Downstream FHWA Inlet Edge Description:
Rectangular Box: 90° headwall w/ 3/4" chamfers

==== Drop Structures =====

Name: ISG OUTFALL	From Node: ISG RESERVOIR	Length(ft): 60.00
Group: BASE	To Node: ST. LUCIE CANAL	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 72.00	72.00	Flow: Both
Rise(in): 72.00	72.00	Entrance Loss Coef: 0.500
Invert(ft): 21.620	21.620	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	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

Indian Sun Groves Reservoir Outfall Structure to St. Lucie Canal (SFWMD C-44)

Indian Sun Reservoir - per Indian Sun Groves Surface Water Management Report, November 1985
SFWMD Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

*** Weir 1 of 1 for Drop Structure ISG OUTFALL ***

TABLE

Count: 1	Bottom Clip(ft): 0.000
Type: Vertical: Mavis	Top Clip(ft): 0.000
Flow: Both	Weir Disc Coef: 3.200
Geometry: Trapezoidal	Orifice Disc Coef: 0.600
Bottom Width(ft): 0.00	Invert(ft): 25.620
Left Sd Slp(h/v): 6.28	Control Elev(ft): 25.620
Right Sd Slp(h/v): 6.28	Struct Opening Dim(ft): 99999.00

==== Weirs =====

Name: CS-3.1	From Node: SWALE 3B
Group: System 3	To Node: PUBLIC LANDS
Flow: Both	Count: 1
Type: Vertical: Fread	Geometry: Trapezoidal
Bottom Width(ft): 60.00	
Left Side Slope(h/v): 4.00	
Right Side Slope(h/v): 4.00	
Invert(ft): 25.250	
Control Elevation(ft): 25.250	
Struct Opening Dim(ft): 9999.00	
Bottom Clip(ft): 0.000	TABLE
Top Clip(ft): 0.000	
Weir Discharge Coef: 3.200	
Orifice Discharge Coef: 0.600	

Name: CS-3.2	From Node: SWALE 3B
Group: System 3	To Node: PUBLIC LANDS
Flow: Both	Count: 1
Type: Vertical: Fread	Geometry: Trapezoidal
Bottom Width(ft): 0.00	
Left Side Slope(h/v): 0.18	
Right Side Slope(h/v): 0.18	
Invert(ft): 23.500	
Control Elevation(ft): 23.500	

Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: CS-4_1 From Node: SWALE 3C
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 60.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 25.300
Control Elevation(ft): 25.300
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: CS-4_2 From Node: SWALE 3C
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 0.00
Left Side Slope(h/v): 0.18
Right Side Slope(h/v): 0.18
Invert(ft): 23.500
Control Elevation(ft): 23.500
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: CS-5_1 From Node: SWALE 3D
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 60.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 25.250
Control Elevation(ft): 25.250
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: CS-5_2 From Node: SWALE 3D
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 0.00
Left Side Slope(h/v): 0.18
Right Side Slope(h/v): 0.18
Invert(ft): 23.500
Control Elevation(ft): 23.500
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200

Orifice Discharge Coef: 0.600

Name: CS-6_1 From Node: SWALE 3E
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 60.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 25.800
Control Elevation(ft): 25.800
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: CS-6_2 From Node: SWALE 3E
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 0.00
Left Side Slope(h/v): 0.18
Right Side Slope(h/v): 0.18
Invert(ft): 24.000
Control Elevation(ft): 24.000
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: CS-7_1 From Node: SWALE 8
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 40.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 25.800
Control Elevation(ft): 25.800
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: CS-7_2 From Node: SWALE 8
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 0.00
Left Side Slope(h/v): 0.18
Right Side Slope(h/v): 0.18
Invert(ft): 24.000
Control Elevation(ft): 24.000
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: CS-8_1 From Node: SWALE 10
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 100.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 25.800
Control Elevation(ft): 25.800
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: CS-8_2 From Node: SWALE 10
Group: System 3 To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 0.00
Left Side Slope(h/v): 0.18
Right Side Slope(h/v): 0.18
Invert(ft): 24.000
Control Elevation(ft): 24.000
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: CS-9_1 From Node: SWALE 11
Group: System 4A To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 40.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 25.600
Control Elevation(ft): 25.600
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: CS-9_2 From Node: SWALE 11
Group: System 4A To Node: PUBLIC LANDS
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Trapezoidal

Bottom Width(ft): 0.00
Left Side Slope(h/v): 0.18
Right Side Slope(h/v): 0.18
Invert(ft): 24.000
Control Elevation(ft): 24.000
Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

TABLE

Name: W_01-02 From Node: OFFSITE SWALE 1
Group: BASE To Node: OFFSITE SWALE 2
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: XS_W_01-02
Invert(ft): 25.210
Control Elevation(ft): 25.210
Struct Opening Dim(ft): 9999.00
TABLE
Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_02-03 From Node: OFFSITE SWALE 2
Group: BASE To Node: OFFSITE SWALE 3
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: XS_W_02-03
Invert(ft): 25.900
Control Elevation(ft): 25.900
Struct Opening Dim(ft): 9999.00
TABLE
Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: W_03-04 From Node: OFFSITE SWALE 3
Group: BASE To Node: OFFSITE SWALE 4
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: XS_W_03-04
Invert(ft): 24.600
Control Elevation(ft): 24.600
Struct Opening Dim(ft): 9999.00
TABLE
Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

==== Rating Curves =====

Name: ISG PUMPS From Node: ISG AGRICULT Count: 1
Group: BASE To Node: ISG RESERVOIR Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	ISG PUMP 1	21.120	20.620
#2:	ISG PUMP 2	21.620	21.120
#3:		0.000	0.000
#4:		0.000	0.000

Indian Sun Groves Agricultural Area Pumps to Reservoir

Indian Sun Groves - per Indian Sun Groves Surface Water Management Report, November 1985
SFWMD Permint No. 43-00347-S/W, Application No. 12125-D, Issued 02/13/86

==== Percolation Links =====

Name: PERC_SW_3A-1 From Node: SWALE 3A-1 Flow: Both
Group: System 2 To Node: GW_Sys 2_LT Count: 1

Surface Area Option: Vary based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): -20.000 Perimeter 1(ft): 13152.000
Water Table Elev(ft): 22.000 Perimeter 2(ft): 13466.000
*****0.000 Perimeter 3(ft): 16292.000
Horiz Conductivity(ft/day): 7.080 Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 4.720 Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200 Num Cells 1 to 2: 10
Suction Head(in): 5.590 Num Cells 2 to 3: 45
Layer Thickness(ft): 0.000

Name: PERC_SW_3A-2 Group: System 2	From Node: SWALE 3A-2 To Node: GW_Sys 2_LT	Flow: Both Count: 1
Surface Area Option: Vary based on Stage/Area Table Vertical Flow Termination: Horizontal Flow Algorithm Aquifer Base Elev(ft): -20.000 Water Table Elev(ft): 22.000 *****0.000 Horiz Conductivity(ft/day): 7.080 Vert Conductivity(ft/day): 4.720 Effective Porosity(dec): 0.200 Suction Head(in): 5.590 Layer Thickness(ft): 0.000		
Perimeter 1(ft): 6519.000 Perimeter 2(ft): 6833.000 Perimeter 3(ft): 9659.000 Distance 1 to 2(ft): 50.000 Distance 2 to 3(ft): 450.000 Num Cells 1 to 2: 10 Num Cells 2 to 3: 45		
Name: PERC_SW_3A-3 Group: System 2	From Node: SWALE 3A-3 To Node: GW_Sys 2C_LT	Flow: Both Count: 1
Surface Area Option: Vary based on Stage/Area Table Vertical Flow Termination: Horizontal Flow Algorithm Aquifer Base Elev(ft): -20.000 Water Table Elev(ft): 22.000 *****0.000 Horiz Conductivity(ft/day): 7.080 Vert Conductivity(ft/day): 4.720 Effective Porosity(dec): 0.200 Suction Head(in): 5.590 Layer Thickness(ft): 0.000		
Perimeter 1(ft): 5396.500 Perimeter 2(ft): 5710.500 Perimeter 3(ft): 8536.500 Distance 1 to 2(ft): 50.000 Distance 2 to 3(ft): 450.000 Num Cells 1 to 2: 10 Num Cells 2 to 3: 45		
Name: PERC_SW_4 Group: System 2	From Node: SWALE 4 To Node: GW_Sys 2_RT	Flow: Both Count: 1
Surface Area Option: Vary based on Stage/Area Table Vertical Flow Termination: Horizontal Flow Algorithm Aquifer Base Elev(ft): -20.000 Water Table Elev(ft): 22.000 *****0.000 Horiz Conductivity(ft/day): 7.080 Vert Conductivity(ft/day): 4.720 Effective Porosity(dec): 0.200 Suction Head(in): 5.590 Layer Thickness(ft): 0.000		
Perimeter 1(ft): 10442.000 Perimeter 2(ft): 10756.000 Perimeter 3(ft): 13582.000 Distance 1 to 2(ft): 50.000 Distance 2 to 3(ft): 450.000 Num Cells 1 to 2: 10 Num Cells 2 to 3: 45		
Name: PERC_SW_5A Group: System 2	From Node: SWALE 5A To Node: GW_Sys 2_RT	Flow: Both Count: 1
Surface Area Option: Vary based on Stage/Area Table Vertical Flow Termination: Horizontal Flow Algorithm Aquifer Base Elev(ft): -20.000 Water Table Elev(ft): 22.000 *****0.000 Horiz Conductivity(ft/day): 7.080 Vert Conductivity(ft/day): 4.720 Effective Porosity(dec): 0.200 Suction Head(in): 5.590 Layer Thickness(ft): 0.000		
Perimeter 1(ft): 2526.000 Perimeter 2(ft): 2840.000 Perimeter 3(ft): 5666.000 Distance 1 to 2(ft): 50.000 Distance 2 to 3(ft): 450.000 Num Cells 1 to 2: 10 Num Cells 2 to 3: 45		
Name: PERC_SW_5B Group: System 2	From Node: SWALE 5B To Node: GW_Sys 2_RT	Flow: Both Count: 1
Surface Area Option: Vary based on Stage/Area Table Vertical Flow Termination: Horizontal Flow Algorithm Aquifer Base Elev(ft): -20.000 Water Table Elev(ft): 22.000 *****0.000 Horiz Conductivity(ft/day): 7.080 Vert Conductivity(ft/day): 4.720		
Perimeter 1(ft): 4380.000 Perimeter 2(ft): 4694.000 Perimeter 3(ft): 7520.000 Distance 1 to 2(ft): 50.000 Distance 2 to 3(ft): 450.000		

Effective Porosity(dec): 0.200 Num Cells 1 to 2: 10
Suction Head(in): 5.590 Num Cells 2 to 3: 45
Layer Thickness(ft): 0.000

Name: PERC_SW_6 From Node: SWALE 6 Flow: Both
Group: System 2 To Node: GW_Sys 2_RT Count: 1

Surface Area Option: Vary based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): -20.000 Perimeter 1(ft): 2300.500
Water Table Elev(ft): 22.000 Perimeter 2(ft): 2614.500
*****0.000 Perimeter 3(ft): 5440.500
Horiz Conductivity(ft/day): 7.080 Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 4.720 Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200 Num Cells 1 to 2: 10
Suction Head(in): 5.590 Num Cells 2 to 3: 45
Layer Thickness(ft): 0.000

Name: PERC_SW_7A From Node: SWALE 7A Flow: Both
Group: System 2 To Node: GW_Sys 2C_RT Count: 1

Surface Area Option: Vary based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Aquifer Base Elev(ft): -20.000 Perimeter 1(ft): 5116.000
Water Table Elev(ft): 22.000 Perimeter 2(ft): 5430.000
*****0.000 Perimeter 3(ft): 8256.000
Horiz Conductivity(ft/day): 7.080 Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 4.720 Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200 Num Cells 1 to 2: 10
Suction Head(in): 5.590 Num Cells 2 to 3: 45
Layer Thickness(ft): 0.000

==== Hydrology Simulations =====

Name: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\100YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii
Rainfall Amount(in): 9.40

Time(hrs) Print Inc(min)

30.000 5.00

Name: 100YR_FDOT
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\100YR_FDOT.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 12.75

Time(hrs) Print Inc(min)

30.000 5.00

Name: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\10YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii
Rainfall Amount(in): 6.50

Time(hrs) Print Inc(min)

30.000 5.00

Name: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\25YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 10.20

Time(hrs)	Print Inc(min)
48.000	15.00
72.000	5.00
84.000	15.00

Name: 50YR_FD0T
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\50YR_FD0T.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 11.25

Time(hrs)	Print Inc(min)
30.000	5.00

==== Routing Simulations =====

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\100YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 2	Yes
System 3	Yes
System 4A	Yes

Name: 100YR_FD0T Hydrology Sim: 100YR_FD0T
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\100YR_FD0T.I32

Execute: No	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)
30.000	5.000

Group	Run
BASE	Yes
System 2	Yes
System 3	Yes
System 4A	Yes

Name: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\10YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 2	Yes
System 3	Yes
System 4A	Yes

Name: 25YR-72HR Hydrology Sim: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\25YR-72HR.I32

Execute: No 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): 84.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	15.000
72.000	5.000
84.000	15.000

Group	Run
BASE	Yes
System 2	Yes
System 3	Yes
System 4A	Yes

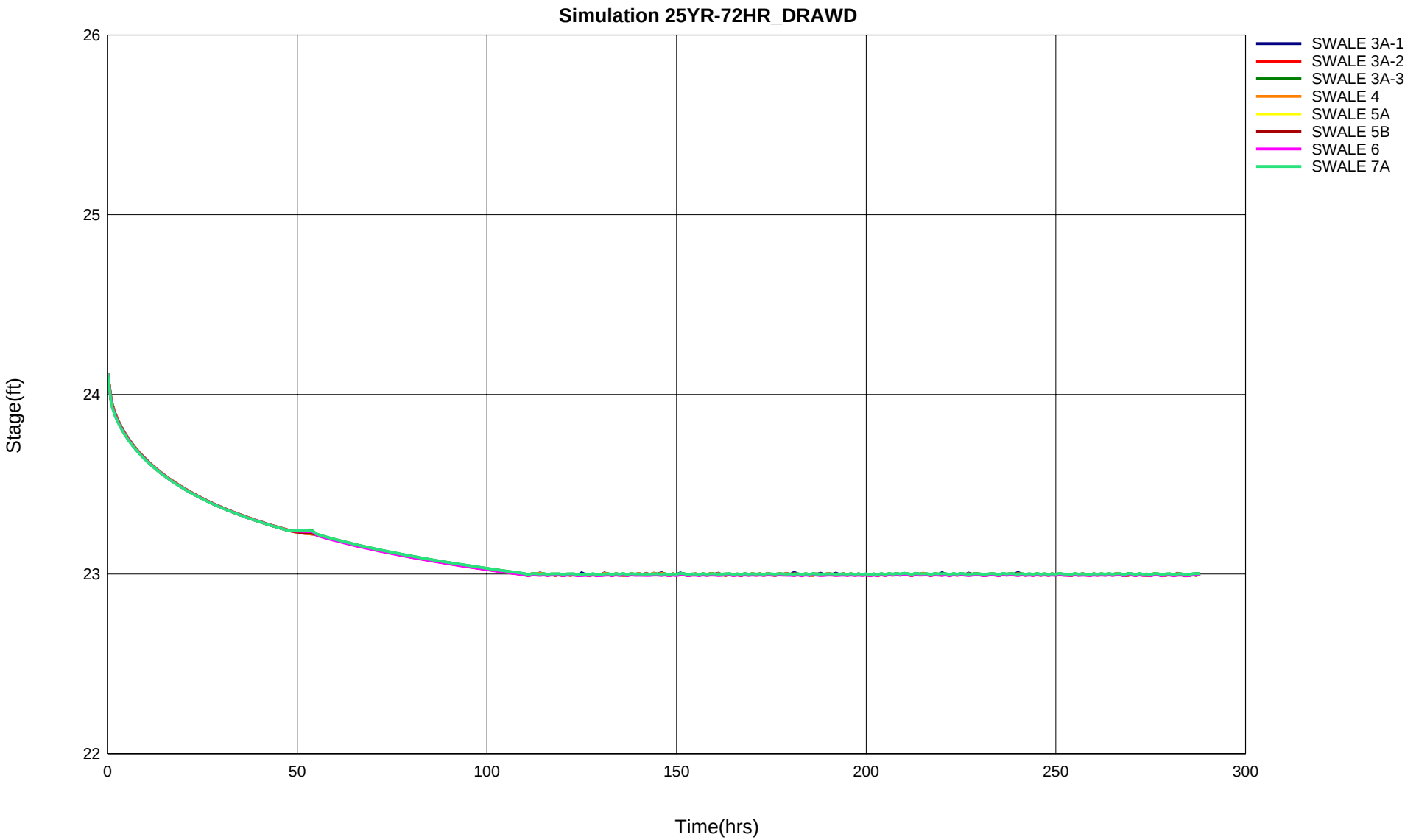
Name: 50YR_FDOT Hydrology Sim: 50YR_FDOT
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 2-4A\50YR_FDOT.I32

Execute: No 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)
30.000	5.000

Group	Run
BASE	Yes
System 2	Yes
System 3	Yes
System 4A	Yes

SR 710/BEE LINE HIGHWAY
FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
RETENTION SYSTEM DRAWDOWN FOR SFWMD 25YR-72HR DESIGN STORM
SYSTEM 2 - NODE TIME VS. STAGE GRAPH



Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEM 4B - NODE MAXIMUM CONDITIONS REPORT

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
Pine Glades	System 4	100YR-24HR	30.00	21.00	21.01	0.0000	289456320	12.34	140.35	0.00	0.00
Public Lands	System 4	100YR-24HR	30.00	21.01	21.01	-0.0142	470448514	12.37	180.33	0.00	0.00
Railroad Ditch	System 4	100YR-24HR	14.70	22.18	25.00	0.0033	1726617	12.25	821.22	14.70	68.29
Swale 01	System 4	100YR-24HR	12.34	26.35	26.90	0.0040	40366	12.25	30.96	12.34	27.73
Swale 02	System 4	100YR-24HR	12.30	26.33	26.70	-0.0029	24469	12.25	27.29	12.30	25.80
Pine Glades	System 4	10YR-24HR	30.00	21.00	21.01	0.0000	289456318	12.38	78.71	0.00	0.00
Public Lands	System 4	10YR-24HR	30.00	21.00	21.01	-0.0142	470448517	12.53	85.94	0.00	0.00
Railroad Ditch	System 4	10YR-24HR	15.37	21.47	25.00	0.0016	1458990	12.31	480.01	15.37	38.60
Swale 01	System 4	10YR-24HR	12.38	26.20	26.90	0.0033	37545	12.25	19.46	12.38	15.53
Swale 02	System 4	10YR-24HR	12.31	26.21	26.70	0.0031	22744	12.25	17.34	12.31	16.14
Pine Glades	System 4	25YR-72HR	84.00	21.01	21.01	0.0000	289456324	60.10	162.26	0.00	0.00
Public Lands	System 4	25YR-72HR	84.00	21.01	21.01	-0.0142	470448516	60.11	223.06	0.00	0.00
Railroad Ditch	System 4	25YR-72HR	61.36	22.76	25.00	0.0036	1948047	60.00	899.75	61.36	107.42
Swale 01	System 4	25YR-72HR	60.09	26.38	26.90	-0.0029	41060	60.00	34.23	60.09	31.07
Swale 02	System 4	25YR-72HR	60.05	26.36	26.70	-0.0029	24915	60.00	29.99	60.05	28.53

FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEM 4B - LINK MAXIMUM CONDITIONS REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CD-1_WEST CD-6	System 4	100YR-24HR	14.70	58.89	-18.712	14.70	22.18	30.00	21.01
CS-01-1	System 4	100YR-24HR	12.34	14.03	0.221	12.34	26.35	30.00	21.01
CS-01-2	System 4	100YR-24HR	12.34	13.69	-0.067	12.34	26.35	30.00	21.01
CS-02-1	System 4	100YR-24HR	12.30	13.07	0.221	12.30	26.33	14.70	22.18
CS-02-2	System 4	100YR-24HR	12.30	12.73	0.062	12.30	26.33	14.70	22.18
CD-1_WEST CD-6	System 4	10YR-24HR	15.37	38.58	-18.712	15.37	21.47	30.00	21.00
CS-01-1	System 4	10YR-24HR	12.38	7.93	0.221	12.38	26.20	30.00	21.00
CS-01-2	System 4	10YR-24HR	12.38	7.60	0.022	12.38	26.20	30.00	21.00
CS-02-1	System 4	10YR-24HR	12.31	8.23	0.221	12.31	26.21	15.37	21.47
CS-02-2	System 4	10YR-24HR	12.31	7.91	0.056	12.31	26.21	15.37	21.47
CD-1_WEST CD-6	System 4	25YR-72HR	61.37	70.98	-18.712	61.36	22.76	84.00	21.01
CS-01-1	System 4	25YR-72HR	60.09	15.70	0.221	60.09	26.38	84.00	21.01
CS-01-2	System 4	25YR-72HR	60.09	15.37	-0.076	60.09	26.38	84.00	21.01
CS-02-1	System 4	25YR-72HR	60.05	14.43	0.221	60.05	26.36	61.36	22.76
CS-02-2	System 4	25YR-72HR	60.05	14.10	0.077	60.05	26.36	61.36	22.76

FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
POST-DEVELOPMENT
SYSTEM 4B - LINK MAXIMUM CONDITIONS REPORT
HYDRAULIC FLOOD DATA SHEET - DESIGN FLOOD AND BASE FLOOD

Name		Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CD-1_WEST	CD-6	System 4	100YR_FDOT	19.11	64.18	-18.712	19.10	22.44	30.00	21.01
CD-1_WEST	CD-6	System 4	50YR_FDOT	19.17	59.88	-18.712	19.16	22.22	30.00	21.01

FROM E OF SR 76 TO PALM BEACH/MARTIN COUNTY LINE
 POST-DEVELOPMENT
 SYSTEM 4B - BASIN MAXIMUM CONDITIONS REPORT

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
100YR-24HR	Basin 01	System 4	12.27	31.06	7.063	161017
100YR-24HR	Basin 02	System 4	12.27	25.81	7.470	136122
100YR-24HR	Basin M10	System 4	12.27	1.56	4.249	7713
100YR-24HR	Railroad	System 4	12.27	459.08	7.444	2418414
10YR-24HR	Basin 01	System 4	12.27	19.55	4.334	98803
10YR-24HR	Basin 02	System 4	12.27	16.65	4.688	85424
10YR-24HR	Basin M10	System 4	12.29	0.77	2.138	3880
10YR-24HR	Railroad	System 4	12.27	295.66	4.665	1515550
25YR-72HR	Basin 01	System 4	60.02	34.34	10.543	240344
25YR-72HR	Basin 02	System 4	60.02	27.93	10.989	200240
25YR-72HR	Basin M10	System 4	60.02	2.16	7.212	13089
25YR-72HR	Railroad	System 4	60.02	497.51	10.960	3560825

=====
Basins
=====

Name: Basin 01 Node: Swale 01 Status: Onsite
Group: System 4 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 6.280 Time Shift(hrs): 0.00
Curve Number: 80.94 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Station 1249+00 to 1270+88 (LT)

Name: Basin 02 Node: Swale 02 Status: Onsite
Group: System 4 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 5.020 Time Shift(hrs): 0.00
Curve Number: 84.21 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Station 1249+00 to 1270+88 (RT)

Name: Basin M10 Node: Swale 02 Status: Onsite
Group: System 4 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 0.500 Time Shift(hrs): 0.00
Curve Number: 58.70 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Station 1244+00 to 1262+15.00

Name: Railroad Node: Railroad Ditch Status: Offsite
Group: System 4 Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 10.00
Area(ac): 89.500 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

The basin covers the CSX railroad, located south of SR 710, along the entire project limits.

=====
Nodes
=====

Name: Pine Glades Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 4 Warn Stage(ft): 21.010
Type: Stage/Area

Natural Area northeast of SR 710 from Station 1350+00 to the end of the project.

Stage(ft)	Area(ac)
21.000	6645.0000
25.000	6645.0000

Name: Public Lands Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: System 4 Warn Stage(ft): 21.010
Type: Stage/Area

Natural Area northeast of SR 710 from the beginning of the project to Station 1350+00.

Stage(ft)	Area(ac)
21.000	10800.0000
25.000	10800.0000

Name: Railroad Ditch Base Flow(cfs): 0.000 Init Stage(ft): 20.000
Group: System 4 Warn Stage(ft): 25.000

Type: Stage/Area

The ditch between the railroad and roadway

Stage(ft)	Area(ac)
20.000	20.7000
25.000	64.1200

Name: Swale 01	Base Flow(cfs): 0.000	Init Stage(ft): 25.200
Group: System 4		Warn Stage(ft): 26.900
Type: Stage/Area		

Station 1249+00 to 1270+88 (LT)

Stage(ft)	Area(ac)
24.200	0.0100
25.190	0.0100
25.200	0.4150
25.900	0.7270
26.900	1.1740

Name: Swale 02	Base Flow(cfs): 0.000	Init Stage(ft): 25.200
Group: System 4		Warn Stage(ft): 26.700
Type: Stage/Area		

Station 1249+00 to 1270+88 (RT)

Stage(ft)	Area(ac)
24.200	0.0100
25.190	0.0100
25.200	0.2860
25.900	0.4160
26.700	0.6900

==== Pipes =====

Name: CD-1_WEST CD-6	From Node: Railroad Ditch	Length(ft): 164.00
Group: System 4	To Node: Public Lands	Count: 2
	Friction Equation: Automatic	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 36.00	36.00	Entrance Loss Coef: 0.00
Rise(in): 36.00	36.00	Exit Loss Coef: 1.00
Invert(ft): 19.300	19.050	Bend Loss Coef: 0.00
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	Stabilizer Option: None

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

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

PROPOSED CD-6
FOR FPID 432705-1-52-01

==== Drop Structures =====

Name: CS-01-1	From Node: Swale 01	Length(ft): 40.00
Group: System 4	To Node: Public Lands	Count: 1
	Friction Equation: Average Conveyance	
	Solution Algorithm: Most Restrictive	
	Flow: Both	
UPSTREAM	DOWNSTREAM	
Geometry: Circular	Circular	
Span(in): 24.00	24.00	Entrance Loss Coef: 0.000
Rise(in): 24.00	24.00	Exit Loss Coef: 1.000
Invert(ft): 21.900	21.500	Bend Loss Coef: 0.00
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

*** Weir 1 of 2 for Drop Structure CS-01-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Horizontal	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 37.00	Invert(ft): 25.900	
Rise(in): 49.00	Control Elev(ft): 25.900	

*** Weir 2 of 2 for Drop Structure CS-01-1 ***

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): 3.00	Invert(ft): 24.200	
Rise(in): 3.00	Control Elev(ft): 24.200	

Name: CS-01-2	From Node: Swale 01	Length(ft): 40.00
Group: System 4	To Node: Public Lands	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Average Conveyance
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 24.00	24.00	Flow: Both
Rise(in): 24.00	24.00	Entrance Loss Coef: 0.000
Invert(ft): 21.900	21.500	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

*** Weir 1 of 1 for Drop Structure CS-01-2 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Horizontal	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 37.00	Invert(ft): 25.900	
Rise(in): 49.00	Control Elev(ft): 25.900	

Name: CS-02-1	From Node: Swale 02	Length(ft): 40.00
Group: System 4	To Node: Railroad Ditch	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Average Conveyance
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 24.00	24.00	Flow: Both
Rise(in): 24.00	24.00	Entrance Loss Coef: 0.000
Invert(ft): 21.900	19.600	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

*** Weir 1 of 2 for Drop Structure CS-02-1 ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Horizontal	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 37.00	Invert(ft): 25.900	

Rise(in): 49.00 Control Elev(ft): 25.900

*** Weir 2 of 2 for Drop Structure CS-02-1 ***

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Both Weir Disc Coef: 3.200
Geometry: Circular Orifice Disc Coef: 0.600
Span(in): 3.00 Invert(ft): 24.200
Rise(in): 3.00 Control Elev(ft): 24.200

TABLE

Name: CS-02-2 From Node: Swale 02 Length(ft): 40.00
Group: System 4 To Node: Railroad Ditch Count: 1

UPSTREAM DOWNSTREAM Friction Equation: Average Conveyance
Geometry: Circular Circular Solution Algorithm: Most Restrictive
Span(in): 24.00 24.00 Flow: Both
Rise(in): 24.00 24.00 Entrance Loss Coef: 0.000
Invert(ft): 21.900 19.600 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

*** Weir 1 of 1 for Drop Structure CS-02-2 ***

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): 37.00 Invert(ft): 25.900
Rise(in): 49.00 Control Elev(ft): 25.900

TABLE

==== Hydrology Simulations =====

Name: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\100YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsiii
Rainfall Amount(in): 9.40

Time(hrs) Print Inc(min)

30.000 5.00

Name: 100YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\100YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 16.00

Time(hrs) Print Inc(min)

48.000 15.00
72.000 5.00
84.000 15.00

Name: 100YR_FDOT
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\100YR_FDOT.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 12.75

Time(hrs) Print Inc(min)

30.000 5.00

Name: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\10YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsii
Rainfall Amount(in): 6.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\25YR-72HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 13.00

Time(hrs)	Print Inc(min)
48.000	15.00
72.000	5.00
84.000	15.00

Name: 50YR_FDOT
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\50YR_FDOT.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 11.25

Time(hrs)	Print Inc(min)
30.000	5.00

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

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\100YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 4	Yes

Name: 100YR-72HR Hydrology Sim: 100YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\100YR-72HR.I32

Execute: No 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): 84.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	15.000
72.000	5.000
84.000	15.000

Group	Run
BASE	Yes
System 4	Yes

Name: 100YR_FDOT Hydrology Sim: 100YR_FDOT
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\100YR_FDOT.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)
30.000	5.000

Group	Run
BASE	Yes
System 4	Yes

Name: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\10YR-24HR.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)
30.000	5.000

Group	Run
BASE	Yes
System 4	Yes

Name: 25YR-72HR Hydrology Sim: 25YR-72HR
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\25YR-72HR.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): 84.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	15.000
72.000	5.000
84.000	15.000

Group	Run
-------	-----

BASE Yes
System 4 Yes

Name: 50YR_FDOT Hydrology Sim: 50YR_FDOT
Filename: X:\P\43270515201\Calculations\AdICPR\Post-Development\System 4B\50YR_FDOT.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)

30.000 5.000

Group Run

BASE Yes
System 4 Yes

SUMMARY TABLES

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
DRAINAGE SYSTEM SUMMARY TABLES

Control Structure Summary Table - Proposed Locations & Adjacent Property Owners									
Control Structure:	Location							Adjacent Receiving Water Body Name	Adjacent Property Owner
	Geographic		Station / Offset			State Plane			
	Latitude	Longitude	Station	Offset	Side	Northing	Easting		
CS-3	26°58'43.76"	80°24'17.26"	3175+20.00	109.32	LT	961929.57	850015.83	Public Lands (John C. and Mariana Jones Hungryland Wildlife & Environmental Area (WEA) / Hungryland/SFWMD Parcels)	South Florida Water Management District (SFWMD) 3301 Gun Club Rd West Palm Beach, FL 33406
CS-4	26°58'32.05"	80°23'59.70"	3195+00.00	108.38	LT	960755.29	851610.03		
CS-5	26°58'17.58"	80°23'37.96"	3219+50.00	108.88	LT	959303.60	853583.64		
CS-6	26°58'06.65"	80°23'21.56"	3238+00.00	107.84	LT	958206.3	855073.06		
CS-7	26°57'53.64"	80°23'02.05"	3259+00.00	106.31	LT	956901.16	856844.09		
CS-8	26°57'40.65"	80°22'42.53"	3282+00.00	108.55	LT	955599.03	858617.39		
CS-9	26°57'38.79"	80°22'39.75"	3285+13.94	107.20	LT	955411.88	858869.45		

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
DRAINAGE SYSTEM SUMMARY TABLES

Control Structure Summary Table - Proposed Conditions							
Control Structure:	Swale	Disposition [Exist./ Prop./ Modified]	Weir Type/ Geometry	Weir Width (ft)	Weir EL. (ft-NAVD)	Bleeder Type/ Geometry	Bleeder Invert EL. (ft-NAVD)
CS-3	Swale 3B	Prop.	Trapezoidal Weir	60.00	25.25	V-Notch Bleeder	23.50
CS-4	Swale 3C	Prop.	Trapezoidal Weir	60.00	25.30	V-Notch Bleeder	23.50
CS-5	Swale 3D	Prop.	Trapezoidal Weir	60.00	25.25	V-Notch Bleeder	23.50
CS-6	Swale 3E	Prop.	Trapezoidal Weir	60.00	25.80	V-Notch Bleeder	24.00
CS-7	Swale 8	Prop.	Trapezoidal Weir	40.00	25.80	V-Notch Bleeder	24.00
CS-8	Swale 10	Prop.	Trapezoidal Weir	100.00	25.80	V-Notch Bleeder	24.00
CS-9	Swale 11	Prop.	Trapezoidal Weir	40.00	25.60	V-Notch Bleeder	24.00

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
DRAINAGE SYSTEM SUMMARY TABLES

Summary of Peak Stages																	
Pre-Development Pond/Swale	Post- Development Pond/Swale	Type: [Wet/Dry, Det./Ret., FD]	Berm EL. (ft-NAVD)	Min. Edge of Travel Lane [EOTL] EL. (ft-NAVD)	Warning EL. [Min. Berm/ Min. EOTL] (ft-NAVD)	PRE-DEVELOPMENT						POST-DEVELOPMENT					
						Max 10yr-24hr Stage (ft-NAVD)	10yr-24hr Freeboard (ft-NAVD)	Max 25yr-72hr Stage (ft-NAVD)	25yr-72hr Freeboard (ft-NAVD)	Max 100yr-24hr Stage (ft-NAVD)	100yr-24hr Freeboard (ft-NAVD)	Max 10yr-24hr Stage (ft-NAVD)	10yr-24hr Freeboard (ft-NAVD)	Max 25yr-72hr Stage (ft-NAVD)	25yr-72hr Freeboard (ft-NAVD)	Max 100yr-24hr Stage (ft-NAVD)	100yr-24hr Freeboard (ft-NAVD)
Basin 500	Basin 500	Dry Detention	23.00	25.85	23.00	22.32	0.68	22.70	0.30	22.70	0.30	22.34	0.66	22.68	0.32	22.70	0.30
Swale 3A	Swale 3A-1	Dry Retention	24.50	25.85	24.50	23.69	N/A	24.39	N/A	24.26	N/A	23.69	0.81	24.12	0.38	24.15	0.35
	Swale 3A-2	Dry Retention	24.50	25.85	24.50							23.70	0.80	24.12	0.38	24.15	0.35
	Swale 3A-3	Dry Retention	24.50	25.85	24.50							23.70	0.80	24.12	0.38	24.15	0.35
	Swale 3B	Dry Detention	26.00	26.75	26.00							25.27	0.73	25.44	0.56	25.44	0.56
	Swale 3C	Dry Detention	26.00	27.35	26.00							25.32	0.68	25.49	0.51	25.49	0.51
	Swale 3D	Dry Detention	26.00	27.35	26.00							25.27	0.73	25.44	0.56	25.44	0.56
Swale 3B	Swale 3E	Dry Detention	26.50	27.85	26.50	22.65	N/A	22.81	N/A	22.79	N/A	25.87	0.63	26.03	0.47	26.05	0.45
Swale 4	Swale 4	Dry Retention	24.50	25.85	24.50	23.69	N/A	24.39	N/A	24.26	N/A	23.69	0.81	24.12	0.38	24.15	0.35
	Offsite Swale 1	Offsite	24.50	N/A	24.50							23.85	N/A	24.51	N/A	24.38	N/A
Swale 5	Swale 5A	Dry Retention	24.50	25.85	24.50	23.69	N/A	24.39	N/A	24.26	N/A	23.69	0.81	24.12	0.38	24.15	0.35
	Swale 5B	Dry Detention	24.50	25.85	24.50							23.69	0.81	24.12	0.38	24.15	0.35
	Offsite Swale 2	Offsite	24.50	N/A	24.50							23.85	N/A	24.51	N/A	24.38	N/A
Swale 6	Swale 6	Dry Retention	24.50	25.85	24.50	23.69	N/A	24.39	N/A	24.26	N/A	23.70	0.80	24.12	0.38	24.15	0.35
	Offsite Swale 3	Offsite	24.50	N/A	24.50							23.62	N/A	24.21	N/A	24.09	N/A
Swale 7	Swale 7A	Dry Retention	24.50	25.85	24.50	22.66	N/A	22.93	N/A	22.89	N/A	23.70	0.80	24.12	0.38	24.15	0.35
	Swale 7B	Dry Detention	26.00	26.75	26.00							25.28	0.72	25.47	0.53	25.47	0.53
	Swale 7C	Dry Detention	26.00	27.35	26.00							25.33	0.67	25.52	0.48	25.53	0.47
	Swale 7D	Dry Detention	26.00	27.35	26.00							25.28	0.72	25.47	0.53	25.47	0.53
	Swale 7E	Dry Detention	26.50	27.85	26.50							25.88	0.62	26.08	0.42	26.11	0.39
	Offsite Swale 4	Offsite	26.50	N/A	26.50							21.60	N/A	21.69	N/A	21.84	N/A
Swale 8	Swale 8	Dry Detention	26.50	27.85	26.50	22.25	N/A	22.32	N/A	22.34	N/A	25.93	0.57	26.03	0.47	26.09	0.41
Swale 9	Swale 9A	Dry Detention	26.50	27.85	26.50	22.35	N/A	22.56	N/A	22.62	N/A	25.94	0.56	26.11	0.39	26.21	0.29
	Swale 9B	Dry Detention	26.50	27.85	26.50							25.95	0.55	26.10	0.40	26.19	0.31
	Offsite Swale 5	Offsite	26.50	N/A	26.50							22.52	N/A	23.16	N/A	23.10	N/A
Swale 10	Swale 10	Dry Detention	26.50	27.85	26.50	22.35	N/A	22.56	N/A	22.62	N/A	25.90	0.60	25.95	0.55	25.97	0.53
Basin West	Swale 11	Dry Detention	26.50	27.85	26.50	N/A	N/A	N/A	N/A	N/A	N/A	25.45	1.05	25.56	0.94	25.65	0.85
Swale 1	Swale 1	Dry Detention	26.90	27.85	26.90	26.20	0.70	26.38	0.52	26.34	0.56	26.20	0.70	26.38	0.52	26.35	0.55
Swale 2	Swale 2	Dry Detention	26.70	27.85	26.70	26.17	0.53	26.32	0.38	26.29	0.41	26.21	0.49	26.36	0.34	26.33	0.37

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
DRAINAGE SYSTEM SUMMARY TABLES

Summary of Peak Discharges						
PRE-DEVELOPMENT						
Project	Receiving Waterbody	ICPR Link:	Outfall Description:	10yr-24hr Peak Flow Rate (cfs)	25yr-72hr Peak Flow Rate (cfs)	100yr-24hr Peak Flow Rate (cfs)
System 1	CBC Ditch	--	--	12.85	34.66	34.56
System 1 Total				12.85	34.66	34.56
System 2	Indian Sun Groves Agricultural Area	W_3A-OFFSITE	Weir	127.37	21.02	73.34
System 2 Total				127.37	21.02	73.34
System 3A	Public Lands: SFWMD Hungryland Parcels & WEA	W_3B-OFFSITE	Weir	52.54	183.15	161.14
System 3B		W_8-OFFSITE	Weir	23.43	40.18	45.13
		W_10-OFFSITE	Weir	0.00	0.00	0.00
System 3 Total				75.97	223.33	206.27
System 4A	Public Lands: SFWMD Hungryland Parcels & WEA	Basin West	Direct Discharge	9.09	16.31	14.60
System 4A Total				9.09	16.31	14.60
System 4B	Public Lands: SFWMD Hungryland Parcels & WEA	All upstream links from FPID 432704-1-52-01 & 432706-1-52-01: SR 710 Reconstruction from Martin/Palm Beach County line to Pratt & Whitney Entrance excluding Basin West		73.52	190.89	146.65
System 4B Total				73.52	190.89	146.65
System 4 Total				82.61	207.20	161.25
System 3 & 4 Total				158.58	430.53	367.52
PRE-DEVELOPMENT TOTALS:				--	486.21	--

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
DRAINAGE SYSTEM SUMMARY TABLES

Summary of Peak Discharges												
POST-DEVELOPMENT												
Project	Receiving Waterbody	ICPR Link:	Outfall Description:	10yr-24hr Flow Area (ft²)	10yr-24hr Peak Flow Rate (cfs)	10yr-24hr Peak Flow Velocity (fps)	25yr-72hr Flow Area (ft2)	25yr-72hr Peak Flow Rate (cfs)	25yr-72hr Peak Flow Velocity (fps)	100yr-24hr Flow Area (ft2)	100yr-24hr Peak Flow Rate (cfs)	100yr-24hr Peak Flow Velocity (fps)
System 1	CBC Ditch	--	--	-	11.54	-	-	33.55	-	-	34.43	-
System 1 Total					11.54			33.55			34.43	
System 2A	Indian Sun Groves Agricultural Area	CD-1	2-18" Pipe	3.53	2.09	0.59	3.53	0.48	0.14	3.53	2.03	0.57
System 2A Total					2.09			0.48			2.03	
System 2B	Indian Sun Groves Agricultural Area	CD-2	2-18" Pipe	3.53	1.88	0.53	3.53	0.45	0.13	3.53	2.00	0.57
System 2B Total					1.88			0.45			2.00	
System 2 Total					3.97			0.93			4.03	
System 3A	Public Lands: SFWMD Hungryland Parcels & WEA	CS-3	Broad-Crested Concrete Weir	1.75	2.57	1.47	12.07	18.49	1.53	12.07	18.76	1.55
		CD-3	2-24" Pipe	6.28	21.62	3.44	6.28	23.14	3.68	6.28	24.84	3.96
System 3A Total					24.19			41.63			43.60	
System 3B	Public Lands: SFWMD Hungryland Parcels & WEA	CS-4	Broad-Crested Concrete Weir	1.78	2.41	1.36	12.10	18.76	1.55	12.10	19.17	1.58
		CD-4	2-24" Pipe	6.28	21.62	3.44	6.28	23.14	3.68	6.28	24.84	3.96
System 3B Total					24.03			41.90			44.01	
System 3C	Public Lands: SFWMD Hungryland Parcels & WEA	CS-5	Broad-Crested Concrete Weir	1.75	2.37	1.36	12.07	18.85	1.56	12.07	18.70	1.55
		CD-5	2-30" Pipe	9.81	27.12	2.76	9.81	29.29	2.98	9.81	33.11	3.37
System 3C Total					29.49			48.14			51.81	
System 3D	Public Lands: SFWMD Hungryland Parcels & WEA	CS-6	Broad-Crested Concrete Weir	4.80	5.33	1.11	14.55	23.68	1.63	15.78	26.95	1.71
System 3D Total					5.33			23.68			26.95	

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
DRAINAGE SYSTEM SUMMARY TABLES

Summary of Peak Discharges												
POST-DEVELOPMENT												
Project	Receiving Waterbody	ICPR Link:	Outfall Description:	10yr-24hr Flow Area (ft²)	10yr-24hr Peak Flow Rate (cfs)	10yr-24hr Peak Flow Velocity (fps)	25yr-72hr Flow Area (ft2)	25yr-72hr Peak Flow Rate (cfs)	25yr-72hr Peak Flow Velocity (fps)	100yr-24hr Flow Area (ft2)	100yr-24hr Peak Flow Rate (cfs)	100yr-24hr Peak Flow Velocity (fps)
System 3E	Public Lands: SFWMD Hungryland Parcels & WEA	CS-7	Broad-Crested Concrete Weir	5.85	8.18	1.40	9.95	17.41	1.75	12.43	22.76	1.83
		Wildlife Crossing	6' X 8' Box Culvert	48.00	0.00	0.00	48.00	0.66	0.01	48.00	0.25	0.01
		Basin 8B	Direct Discharge	-	3.06	-	-	3.87	-	-	4.68	-
System 3E Total					11.24			21.94			27.69	
System 3F	Public Lands: SFWMD Hungryland Parcels & WEA	CS-8	Broad-Crested Concrete Weir	10.62	11.70	1.10	15.66	20.89	1.33	17.68	25.46	1.44
		Basin 10B	Direct Discharge	-	3.41	-	-	4.30	-	-	5.20	-
System 3F Total					15.11			25.19			30.66	
System 3 Total					109.39			202.48			224.72	
System 4A	Public Lands: SFWMD Hungryland Parcels & WEA	CS-9	Broad-Crested Concrete Weir	0.41	1.13	2.76	0.44	1.37	3.11	2.47	2.99	1.21
System 4A Total					1.13			1.37			2.99	
System 4B	Public Lands: SFWMD Hungryland Parcels & WEA	--	--	-	85.94	-	-	223.06	-	-	180.33	-
System 4B Total					85.94			223.06			180.33	
System 4 Total					87.07			224.43			183.32	
System 3 & 4 Total					196.46			426.91			408.04	

SR 710 (Warfield Blvd) DRAINAGE CALCULATIONS
DRAINAGE SYSTEM SUMMARY TABLES

Summary of Peak Discharges												
POST-DEVELOPMENT												
Project	Receiving Waterbody	ICPR Link:	Outfall Description:	10yr-24hr Flow Area (ft²)	10yr-24hr Peak Flow Rate (cfs)	10yr-24hr Peak Flow Velocity (fps)	25yr-72hr Flow Area (ft2)	25yr-72hr Peak Flow Rate (cfs)	25yr-72hr Peak Flow Velocity (fps)	100yr-24hr Flow Area (ft2)	100yr-24hr Peak Flow Rate (cfs)	100yr-24hr Peak Flow Velocity (fps)
POST-DEVELOPMENT TOTALS:							461.39					
POST-DEVELOPMENT Discharge Reductions (25yr-72hr Design Storm)										Receiving Waterbody		
System 1 Pre-Post 25yr-72hr Peak Discharge Reduction (cfs):							1.11			CBC Ditch		
System 2 Pre-Post 25yr-72hr Peak Discharge Reduction (cfs):							20.09			ISG Agricultural Area		
Total System 3 & 4 Pre-Post 25yr-72hr Peak Discharge Reduction (cfs):							3.62			Public Lands: Hungryland WEA / SFWMD Hungryland Parcels		
Total Project (All Systems) Pre-Post 25yr-72hr Peak Discharge Reduction (cfs):							24.82					

APPENDIX E
EXISTING
PERMITS



WEST PROJECT
(SFWMD PERMIT # 43-00802-S)



Form #0941
08/95

**SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE
STANDARD GENERAL PERMIT NO. 43-00802-S
DATE ISSUED: December 19, 2011**

PERMITTEE: FLORIDA DEPARTMENT OF TRANSPORTATION
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309-3421

PROJECT DESCRIPTION: Construction and operation of a surface water management system to serve a 50.15-acre project known as the Big John Monahan Bridge Replacement.

PROJECT LOCATION: MARTIN COUNTY, SEC 8 TWP 40S RGE 39E

PERMIT DURATION: See Special Condition No:1. Pursuant to Rule 40E-4.321, Florida Administrative Code.

This is to notify you of the District's agency action concerning Notice of Intent for Permit Application No. 110909-1, dated September 9, 2011. This action is taken pursuant to Rule 40E-1.603 and Chapter 40E-40, Florida Administrative Code (F.A.C.).

Based on the information provided, District rules have been adhered to and an Environmental Resource General Permit is in effect for this project subject to:

1. Not receiving a filed request for a Chapter 120, Florida Statutes, administrative hearing.
2. the attached 19 General Conditions (See Pages : 2 - 4 of 8),
3. the attached 20 Special Conditions (See Pages : 5 - 8 of 8) and
4. the attached 2.6 Exhibit(s)

Should you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights," we will assume that you concur with the District's action.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the Permittee (and the persons listed in the attached distribution list) no later than 5:00 p.m. on this 19th day of December, 2011, in accordance with Section 120.60(3), Florida Statutes.

BY:

Anita R. Bain
Bureau Chief - Environmental Resource Permitting
Regulation Division

Page 1 of 8

GENERAL CONDITIONS

1. All activities authorized by this permit shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit and Part IV, Chapter 373, F.S.
2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.
3. Activities approved by this permit shall be conducted in a manner which does not cause violations of State water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of State water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), incorporated by reference in Rule 40E-4.091, F.A.C. unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.
4. The permittee shall notify the District of the anticipated construction start date within 30 days of the date that this permit is issued. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District an Environmental Resource Permit Construction Commencement Notice Form Number 0960 indicating the actual start date and the expected construction completion date.
5. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual status report form. Status report forms shall be submitted the following June of each year.
6. Within 30 days after completion of construction of the permitted activity, the permittee shall submit a written statement of completion and certification by a professional engineer or other individual authorized by law, utilizing the supplied Environmental Resource/Surface Water Management Permit Construction Completion/Certification Form Number 0881A, or Environmental Resource/Surface Water Management Permit Construction Completion Certification - For Projects Permitted prior to October 3, 1995 Form No. 0881B, incorporated by reference in Rule 40E-1.659, F.A.C. The statement of completion and certification shall be based on onsite observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the District that the system is ready for inspection. Additionally, if deviation from the approved drawings are discovered during the certification process, the certification must be accompanied by a copy of the approved permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations shall be certified by a registered surveyor.
7. The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, and submitted a request for conversion of Environmental Resource Permit from Construction Phase to Operation Phase, Form No. 0920; the District determines the system to

GENERAL CONDITIONS

be in compliance with the permitted plans and specifications; and the entity approved by the District in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 40E-1.6107, F.A.C., the permittee shall be liable for compliance with the terms of the permit.

8. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.
9. For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the District along with any other final operation and maintenance documents required by Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit applications within the South Florida Water Management District, prior to lot or units sales or prior to the completion of the system, whichever comes first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State, county or municipal entities. Final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions.
10. Should any other regulatory agency require changes to the permitted system, the permittee shall notify the District in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.
11. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40E-4 or Chapter 40E-40, F.A.C..
12. The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the State, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.
13. The permittee must obtain a Water Use permit prior to construction dewatering, unless the work qualifies for a general permit pursuant to Subsection 40E-20.302(3), F.A.C., also known as the "No Notice" Rule.
14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities

GENERAL CONDITIONS

which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the permit.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding, unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.
16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rules 40E-1.6105 and 40E-1.6107, F.A.C.. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.
17. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.
18. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate District service center.
19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

SPECIAL CONDITIONS

1. The construction phase of this permit shall expire on December 19, 2016.
2. Operation of the surface water management system shall be the responsibility of the permittee.
3. Discharge Facilities:

Basin: 100A

1-3" dia. CIRCULAR ORIFICE with invert at elev. 26' NAVD 88.
1-36" W X 54" L drop inlet with crest at elev. 29' NAVD 88.

Receiving body : Pond 100B
Control elev : 21 feet NAVD 88.

Basin: 100B

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
1-36" W X 54" L drop inlet with crest at elev. 27' NAVD 88.

Receiving body : St. Lucie Canal
Control elev : 21 feet NAVD 88.

Basin: 200

1-20' W X 2' H TRAPEZOIDAL weir with crest at elev. 24' NAVD 88.

Receiving body : St. Lucie Canal
Control elev : 21 feet NAVD 88.

Basin: 300

1-18" W X 12" H RECTANGULAR NOTCH weir with crest at elev. 24' NAVD 88.
1-20" dia. CIRCULAR ORIFICE with invert at elev. 20' NAVD 88.
1-37" W X 49" L drop inlet with crest at elev. 25' NAVD 88.

Receiving body : Basin 400
Control elev : 20 feet NAVD 88.

Basin: 400

1-13' WIDE OTHER weir with crest at elev. 21' NAVD 88.

Receiving body : CBC Ditch
Control elev : 20 feet NAVD 88.

Basin: 500

1-13' WIDE OTHER weir with crest at elev. 22' NAVD 88.

SPECIAL CONDITIONS

Receiving body : Basin 400
Control elev : 20 feet NAVD 88.

4. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.
5. Measures shall be taken during construction to insure that sedimentation and/or turbidity violations do not occur in the receiving water.
6. The District reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.
7. Lake side slopes shall be no steeper than 4:1 (horizontal:vertical) to a depth of two feet below the control elevation. Side slopes shall be nurtured or planted from 2 feet below to 1 foot above control elevation to insure vegetative growth, unless shown on the plans.
8. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.
9. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.
10. The permittee shall provide routine maintenance of all of the components of the surface water management system in order to remove all trapped sediments/debris. All materials shall be properly disposed of as required by law. Failure to properly maintain the system may result in adverse flooding conditions.
11. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse water resource related impacts will not be caused by the completed permit activity. Should any adverse impacts caused by the completed surface water management system occur, the District will require the permittee to provide appropriate mitigation to the District or other impacted party. The District will require the permittee to modify the surface water management system, if necessary, to eliminate the cause of the adverse impacts.
12. The permittee acknowledges that, pursuant to Rule 40E-4.101(2), F.A.C., a notice of Environmental Resource or Surface Water Management Permit may be recorded in the county public records. Pursuant to the specific language of the rule, this notice shall not be considered an encumbrance upon the property.
13. If prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, the permitted project should cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries. The permittee, or other designee, should contact the Florida Department of State, Division of Historical Resources, Review and Compliance Section at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Project activities should not resume without verbal and/or written authorization from the Division of Historical Resources. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes.
14. Minimum road crown elevation:

West side-33.47 ft NAVD88;

SPECIAL CONDITIONS

East side-26.15 ft NAVD88

15. Prior to the commencement of construction, the permittee shall conduct a pre-construction meeting with field representatives, contractors and District staff. The purpose of the meeting will be to discuss construction methods and sequencing, including type and location of turbidity and erosion controls to be implemented during construction, mobilization and staging of contractor equipment, phasing of construction, methods of vegetation clearing, construction dewatering, and ownership documentation for eminent domain authority with the permittee and contractors. The permittee shall contact District Environmental Resource Compliance staff to schedule the pre-construction meeting.
16. Silt screens, synthetic bales, turbidity screens/barriers or other such sediment control measures shall be utilized during construction. The selected sediment control measure shall be installed landward of the upland buffer zones around all protected wetlands and shall be properly "trenched" etc, in accordance with Exhibit No.2.1. All areas shall be stabilized and vegetated immediately after construction to prevent erosion into the wetlands and upland buffer zones.
17. The permittee shall comply with the following conditions intended to protect manatees and marine turtles from direct project effects:
 - a. All personnel associated with the project shall be instructed about the presence of marine turtles, manatees and manatee speed zones, and the need to avoid collisions with and injuries to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
 - b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
 - c. Siltation or turbidity barriers shall be made of material in which manatees and marine turtles cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee and marine turtle entanglement or entrapment. Barriers must not impede manatee movement.
 - d. All on-site project personnel are responsible for observing water-related activities for the presence of marine turtles and manatee(s). All in-water operations, including vessels, must be shutdown if a marine turtle or manatee(s) comes within 50 feet of the operation. Activities will not resume until the animal(s) have moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the animal(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
 - e. Any collision with or injury to a marine turtle or manatee shall be reported immediately to the FWC Hotline at 1-888-404-FWCC. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-232-2580) for north Florida or Vero Beach (1-772-562-3909) for south Florida.
 - f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used. One sign measuring at least 3 ft. by 4 ft. which reads Caution: Manatee Area must be posted. A

SPECIAL CONDITIONS

second sign measuring at least 8 1/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities.

18. A water quality monitoring program shall be implemented as outlined below:

Turbidity expressed in nephelometric turbidity units (ntu). Background samples shall be taken 200 feet upstream of any construction activity within adjacent surface waters. Compliance samples shall be taken 200 feet downstream. Samples shall be taken twice daily, with at least a four-hour interval, during all work authorized by this permit.

Monitoring shall begin on the first day of construction for all activities within or adjacent to surface waters. The monitoring data must demonstrate that turbidity 200 feet downstream of all proposed activities is less than or equal to 29 NTU's above natural background turbidity (or meets OFW standards) and 200 feet upstream of each proposed activity for a period of 7 consecutive days after completion of construction. If monitoring shows such levels to be exceeded, construction shall cease and District compliance staff shall be notified immediately. Work shall not resume until District staff is satisfied that adequate corrective measures have been taken and turbidity has returned to acceptable levels.

All monitoring data shall be maintained on site and be available to District staff during regular business hours. The content of the data shall include:

1) permit and application number; (2) dates of sampling and analysis; (3) statement describing the methods used in collection, handling, storage and analysis of the samples; (4) a map indicating the sampling locations and (5) a statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection and accuracy of the data.

Monitoring reports shall also include the following information for each sample that is taken:

- (a) time of day samples taken;
- (b) depth of water body;
- (c) depth of samples;
- (d) antecedent weather conditions;
- (e) wind direction and velocity;
- (f) direction of tide.

19. Reference is made to Exhibit No. 2.1, by Wantman Group, Inc., consisting of drainage plans and detail sheets. The drawings have been signed and sealed by Douglas Burg, P.E., of Wantman Group, Inc. on November 9, 2011, and have been included in this permit by reference (please see permit file).
20. The exhibits and special conditions in this permit apply only to this application. They do not supersede or delete any requirements for other applications covered in Permit No. 43-00802-S unless otherwise specified herein.

NOTICE OF RIGHTS

As required by Sections 120.569(1), and 120.60(3), Fla. Stat., following is notice of the opportunities which may be available for administrative hearing or judicial review when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Not all the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (SFWMD or District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Fla. Stat. Persons seeking a hearing on a District decision which does or may determine their substantial interests shall file a petition for hearing with the District Clerk within 21 days of receipt of written notice of the decision, unless one of the following shorter time periods apply: 1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Fla. Stat.; or 2) within 14 days of service of an Administrative Order pursuant to Subsection 373.119(1), Fla. Stat. "Receipt of written notice of agency decision" means receipt of either written notice through mail, or electronic mail, or posting that the District has or intends to take final agency action, or publication of notice that the District has or intends to take final agency action. Any person who receives written notice of a SFWMD decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

Filing Instructions

The Petition must be filed with the Office of the District Clerk of the SFWMD. Filings with the District Clerk may be made by mail, hand-delivery or facsimile. **Filings by e-mail will not be accepted.** Any person wishing to receive a clerked copy with the date and time stamped must provide an additional copy. A petition for administrative hearing is deemed filed upon receipt during normal business hours by the District Clerk at SFWMD headquarters in West Palm Beach, Florida. Any document received by the office of the SFWMD Clerk after 5:00 p.m. shall be filed as of 8:00 a.m. on the next regular business day. Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the SFWMD Clerk, P.O. Box 24680, West Palm Beach, Florida 33416.
- Filings by hand-delivery must be delivered to the Office of the SFWMD Clerk. **Delivery of a petition to the SFWMD's security desk does not constitute filing. To ensure proper filing, it will be necessary to request the SFWMD's security officer to contact the Clerk's office.** An employee of the SFWMD's Clerk's office will receive and file the petition.
- Filings by facsimile must be transmitted to the SFWMD Clerk's Office at (561) 682-6010. Pursuant to Subsections 28-106.104(7), (8) and (9), Fla. Admin. Code, a party who files a document by facsimile represents that the original physically signed document will be retained by that party for the duration of that proceeding and of any subsequent appeal or subsequent proceeding in that cause. Any party who elects to file any document by facsimile shall be responsible for any delay, disruption, or interruption of the electronic signals and accepts the full risk that the document may not be properly filed with the clerk as a result. The filing date for a document filed by facsimile shall be the date the SFWMD Clerk receives the complete document.

Initiation of an Administrative Hearing

Pursuant to Rules 28-106.201 and 28-106.301, Fla. Admin. Code, initiation of an administrative hearing shall be made by written petition to the SFWMD in legible form and on 8 and 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, District file number or any other SFWMD identification number, if known.
2. The name, address and telephone number of the petitioner and petitioner's representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency determination.
4. A statement of when and how the petitioner received notice of the SFWMD's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the SFWMD's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the SFWMD's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the SFWMD to take with respect to the SFWMD's proposed action.

A person may file a request for an extension of time for filing a petition. The SFWMD may, for good cause, grant the request. Requests for extension of time must be filed with the SFWMD prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and that the SFWMD and any other parties agree to or oppose the extension. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

If the District takes action with substantially different impacts on water resources from the notice of intended agency decision, the persons who may be substantially affected shall have an additional point of entry pursuant to Rule 28-106.111, Fla. Admin. Code, unless otherwise provided by law.

Mediation

The procedures for pursuing mediation are set forth in Section 120.573, Fla. Stat., and Rules 28-106.111 and 28-106.401-.405, Fla. Admin. Code. The SFWMD is not proposing mediation for this agency action under Section 120.573, Fla. Stat., at this time.

RIGHT TO SEEK JUDICIAL REVIEW

Pursuant to Sections 120.60(3) and 120.68, Fla. Stat., a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal pursuant to Florida Rule of Appellate Procedure 9.110 in the Fourth District Court of Appeal or in the appellate district where a party resides and filing a second copy of the notice with the SFWMD Clerk within 30 days of rendering of the final SFWMD action.

Last Date For Agency Action: December 24, 2011

GENERAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: Big John Monahan Bridge Replacement

Permit No.: 43-00802-S

Application No.: 110909-1 **Associated File:** 111025-5 WU Concurrent

Application Type: Environmental Resource (General Permit Modification)

Location: Martin County, S8/T40S/R39E

Permittee : Florida Department Of Transportation

Operating Entity : Florida Department Of Transportation

Project Area: 50.15 acres

Project Land Use: Roadway

Drainage Basin: C-44

Receiving Body: St. Lucie Canal

Class: CLASS III

Special Drainage District: NA

Conservation Easement To District : No

Sovereign Submerged Lands: No

This application is a request for an Environmental Resource Permit (ERP) modification of a Surface Water Management Permit to authorize construction and operation of a surface water management system to serve a 50.15-acre roadway project known as Big John Monahan Bridge Replacement. Approval is granted with conditions.

PROJECT EVALUATION:

The site is located southeast of Indiantown, in Martin County. Please refer to Exhibit 1.

There are permitted surface water management facilities within the project area. The site contains the existing two-lane Big John Monahan Bridge over the St. Lucie Canal (Bridge No. 890016). The project area also includes State Route (SR) 710, a two-, three- and five- lane rural divided roadway, beginning at SW Trail Drive (Milepost 16.484). The proposed project area will terminate southeast of the intersection of the SR 76 connector ramps (Milepost 18.249), a rural, undivided two-lane roadway with open drainage system. The land use surrounding the project area consists of commercial and agricultural use.

There are no wetlands located within or affected by the proposed project.

Permit No. 43-00802-S, issued February 14, 1994, authorized the improvement of a 2.11 mile section (approximately 80.35-acre drainage area) of S.R. 710 (a.k.a. Warfield Boulevard). The area of approved road work began north of Indiantown and continued south through Indiantown to the foot of the St. Lucie Canal bridge, the majority of the right-of-way passing through urban areas. The improvements consisted of widening the existing two-lane roadway to five lanes (for the section within the limits of Indiantown) and the remainder section to three lanes. The approved surface water management (swm) system consists of inlets and culverts which direct storm runoff to roadside ditches and dry detention areas for treatment and attenuation. The required water quality treatment volume for the entire project is provided in ditches and detention areas. Discharge from the approved swm system is through control structures into the Rowland and St. Lucie Canals.

The proposed project is the replacement of the existing two-lane Big John Monahan Bridge over the St. Lucie Canal (Bridge No. 890016) with two, two-lane, high-level structures. The proposed new bridges will provide 55- and 100-foot vertical and horizontal navigational clearances under the bridge, respectively. The proposed structures will be designed to accommodate the future addition of a third, internal lane in each direction. The project also proposes the widening of State Route (SR) 710 from a two-, three- and five- lane rural divided roadway to a four-lane urban divided roadway. Beginning at SW Trail Drive, the proposed roadway will transition to an urban, four-lane divided roadway. Southeast of the intersection of the SR 76 connector ramps, the proposed roadway will transition back to the existing rural undivided two-lane roadway with open drainage system.

Reference is made to Exhibit No. 2.1, by Wantman Group, Inc., consisting of drainage plans and detail sheets. The drawings have been signed and sealed by Douglas Burg, P.E., of Wantman Group, Inc. on November 9, 2011, and have been included in this permit by reference (please see permit file).

The vertical datum for the proposed project is North American Vertical Datum, 1988 (NAVD88). The conversion from NAVD88 to National Geodetic Vertical Datum 1929 (NGVD29) is 1.35 feet (NAVD88 + 1.35'=NGVD29).

OTHER refers to Offsite Development Area with an assumed Curve Number of 72.

Construction:

Basin : 100A

Total Basin		
Impervious	2.09	acres
Other	12.93	acres
Pervious	.71	acres
Total:	15.73	

Basin : 100B

Total Basin		
Impervious	1.46	acres
Pervious	1.06	acres
Total:	2.52	

Basin : 100C

Total Basin		
Pervious	3.01	acres
Total:	3.01	

Basin : 200

Total Basin		
Impervious	6.46	acres
Pervious	5.65	acres
Total:	12.11	

Basin : 300

Total Basin		
Impervious	8.45	acres
Pervious	7.18	acres
Water Mgmt Acreage	1.96	acres
Total:	17.59	

Basin : 400

Total Basin		
Impervious	.42	acres
Pervious	1.91	acres
Total:	2.33	

Basin : 500

Basin : 500

Total Basin

Impervious	1.78	acres
Pervious	8.96	acres
Total:	10.74	

Discharge Rate :

The post-development discharge rates do not exceed the pre-development discharge rates for the project area to the one receiving body, the St. Lucie Canal. The pre-and post-development discharge rates to the St. Lucie Canal are expressed as the sum of the discharges from the major west and east basins (sides). See Exhibit 2.4 (Appendix G.10), page 2 of 2, for pre and post discharge comparisons for the design storm event.

Discharge Storm Frequency : 25 YEAR-3 DAY

Design Rainfall : 10.3 inches

Road Design :

The minimum road center lines have been set at or above the calculated design storm flood elevation. Specifically, the West side minimum road center line elevation is 33.47 ft NAVD88 (STA 1101+00.00); the calculated design storm flood elevation is 30.99 ft NAVD88 (Basin 100A). The East side minimum road center line elevation is 26.15 ft NAVD88 (STA 1162+00.00); the calculated design storm flood elevation is 24.55 ft NAVD88 (Basin 300).

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NAVD 88)	WSWT Ctrl Elev (ft, NAVD 88)	Method Of Determination
100A	15.73	21	21.00	Wet Season Soil Borings
100B	2.52	21	21.00	Wet Season Soil Borings
100C	3.01	21	21.00	Wet Season Soil Borings
200	12.11	21	21.00	Wet Season Soil Borings
300	17.59	20	20.00	Wet Season Soil Borings
400	2.33	20	20.00	Wet Season Soil Borings
500	10.74	20	20.00	Wet Season Soil Borings

Receiving Body :

Basin	Str.#	Receiving Body
100a	CS100A(S-7	Pond 100B
100b	CS100B(S-1	St. Lucie Canal
200	CS200	St. Lucie Canal
300	CS300(S-52	Basin 400
400	DBI-400	CBC Ditch
500	DBI-500	Basin 400

Discharge Structures: Note: The units for all the elevation values of structures are (ft, NAVD 88)**Bleeders:**

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev.
100B	CS100B(S-14)	1	Circular Orifice				3"		23

Inlets:

Basin	Str#	Count	Type	Width	Length	Dia.	Crest Elev.
100B	CS100B(S-14)	1	Drop Inlet	36"	54"		27

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev.
200	CS200	1	Trapezoidal	20'	2'			24 (crest)
400	DBI-400	1	Other	13'				21 (crest)

SWM(Internal) Structures: Note: The units for all the elevation values of structures are (ft, NAVD 88)**Bleeders:**

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev.
100A	CS100A(S-7)	1	Circular Orifice				3"		26
300	CS300(S-52)	1	Circular Orifice				6"		20

Inlets:

Basin	Str#	Count	Type	Width	Length	Dia.	Crest Elev.
100A	CS100A(S-7)	1	Drop Inlet	36"	54"		29
300	CS300(S-52)	1	Drop Inlet	37"	49"		25

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev.
300	CS300(S-52)	1	Rectangular Notch	18"	12"			24 (crest)
500	DBI-500	1	Other	13'				22 (crest)

Water quality treatment of the wet detention volume for 150 percent of 2.5 inches times the percent impervious shall be provided for the roadway project area in Basin 300 served by Pond 300. Water quality treatment of the dry detention (retention) volume for 150 percent of 2.5 inches times the percent impervious shall be provided the roadway project area in Basins 100A, 100B, 200, 400B and 500 served by the respective water management areas/ditches in each of the basins. See Exhibit 2.5 (one page) for a summary of the Water Quality requirements by drainage basin. Please refer to Exhibit 2.6 (one page) that lists the specific nodes proposed to provide the required treatment volumes.

The proposed project discharges to an impaired water body (the St. Lucie Canal). To provide reasonable assurance that the proposed project will not contribute to the existing impairment, an additional 50% of water quality treatment volume will be provided. The applicant has provided a site

specific pre and post development analysis of nutrient discharge demonstrating that the proposed system will not increase the annual nutrient loading over existing conditions.

No adverse water quality impacts are anticipated as a result of the proposed project. The applicant has provided reasonable assurance that water quality standards will not be violated during construction of the proposed work. Best Management Practices (BMPs) will be implemented and silt screens will be placed so as to contain turbidity during construction of the proposed project. All erosion and turbidity control measures shall remain in place until the completion of onsite construction. Please refer to Exhibit No. 2.1, pages 157 through 159, Exhibit Nos. 2.2 and 2.3, and Special Conditions.

Basin	Treatment Method		Vol Req.d (ac-ft)	Vol Prov'd
100A	Treatment	Dry Detention	.38 acres	.49
100B	Treatment	Dry Detention	.34 acres	.82
200	Treatment	Dry Detention	1.06 acres	1.68
300	Treatment	Wet Detention	1.96 acres	2.64
400	Treatment	Swale	.08 acres	.12
500	Treatment	Swale	.2 acres	1.62

No wetland-dependent endangered/threatened species or species of special concern were observed onsite; however, the proposed project is in the known range of the West Indian manatee (*Trichechus manatus*). The standard manatee construction conditions will be followed for all in-water construction (see special conditions). This permit does not relieve the applicant from complying with all applicable rules and any other agencies' requirements if, in the future, endangered/threatened species or species of special concern are discovered on the site.

It is suggested that the permittee retain the services of a Professional Engineer registered in the State of Florida for periodic observation of construction of the surface water management (SWM) system. This will facilitate the completion of construction completion certification Form #0881 which is required pursuant to Section 10 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, and Rule 40E-4.361(2), Florida Administrative Code (F.A.C.).

Pursuant to Chapter 40E-4 F.A.C., this permit may not be converted from the construction phase to the operation phase until certification of the SWM system is submitted to and accepted by this District. Rule 40E-4.321(7) F.A.C. states that failure to complete construction of the SWM system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization unless a permit extension is granted.

For SWM systems permitted with an operating entity who is different from the permittee, it should be noted that until the permit is transferred to the operating entity pursuant to Rule 40E-1.6107, F.A.C., the permittee is liable for compliance with the terms of this permit.

The permittee is advised that the efficiency of a SWM system will normally decrease over time unless the system is periodically maintained. A significant reduction in flow capacity can usually be attributed to partial blockages of the conveyance system. Once flow capacity is compromised, flooding of the project may result. Maintenance of the SWM system is required to protect the public health, safety and the natural resources of the state. Therefore, the permittee must have periodic inspections of the SWM system

performed to ensure performance for flood protection and water quality purposes. If deficiencies are found, it is the responsibility of the permittee to correct these deficiencies in a timely manner.

RELATED CONCERNS:

Water Use Permit Status:

The applicant has indicated that a groundwater well will be used as a source for irrigation water for the project. Water Use application number 111025-5 has been submitted and is being processed concurrently for this project.

The applicant has indicated that dewatering is required for construction of this project. Water Use application number 111110-4 has been submitted and is being processed concurrently for this project.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation.

CERP:

The proposed project is not located within or adjacent to a Comprehensive Everglades Restoration Project component.

Potable Water Supplier:

None required.

Waste Water System/Supplier:

None required.

Right-Of-Way Permit Status:

A District Right-of-Way Permit is not required for this project.

DRI Status:

This project is not a DRI.

Historical/Archeological Resources:

No information has been received that indicates the presence of archaeological or historical resources or that the proposed activities could cause adverse impacts to archaeological or historical resources.

DCA/CZIM Consistency Review:

The issuance of this permit constitutes a finding of consistency with the Florida Coastal Management Program.

Third Party Interest:

No third party has contacted the District with concerns about this application.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF REVIEW:

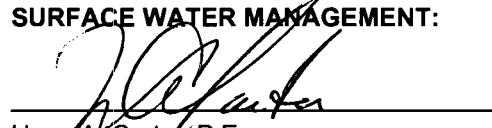
DIVISION APPROVAL:

NATURAL RESOURCE MANAGEMENT:

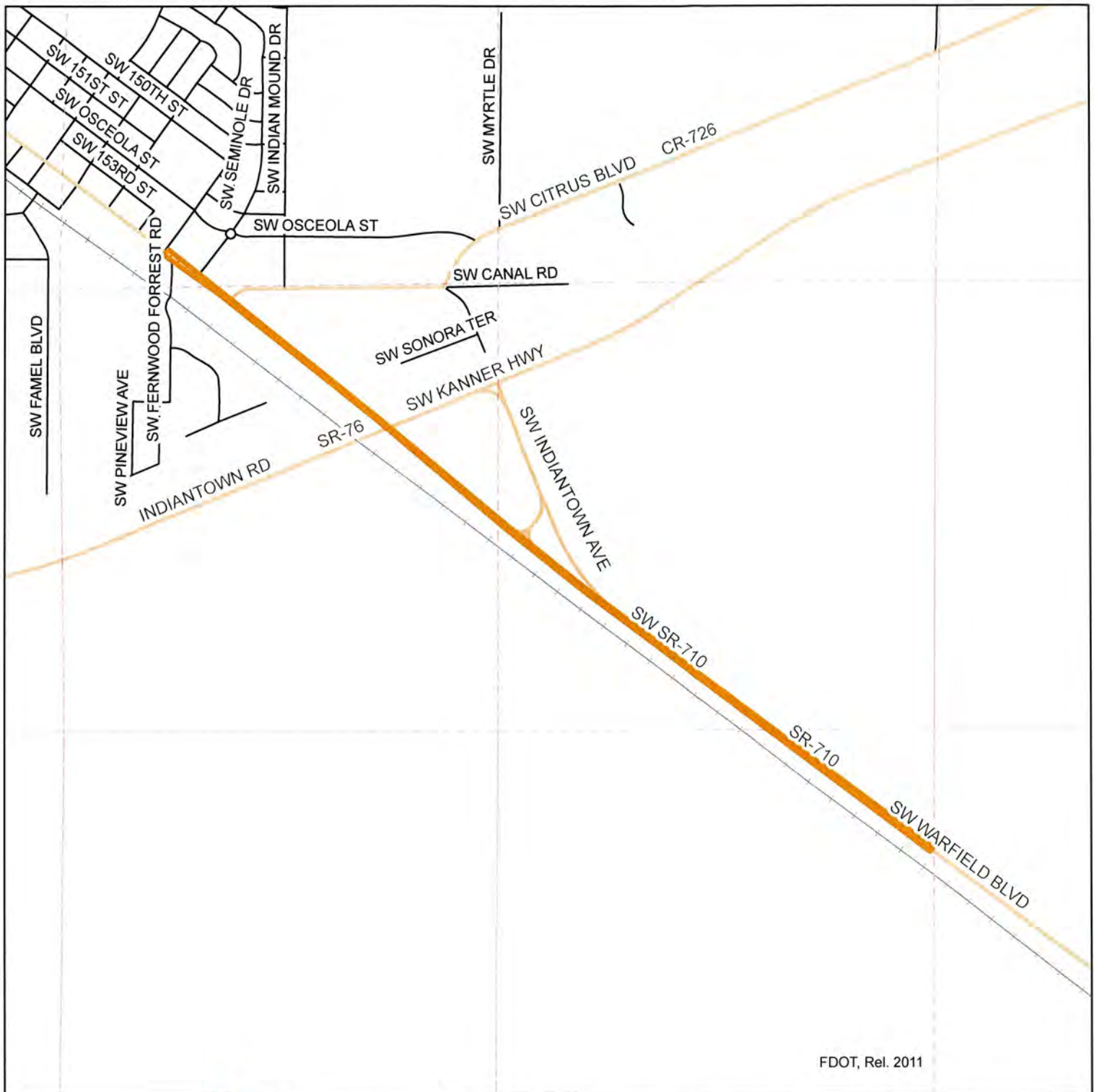

Barbara J. Conmy

DATE: 12/16/11

SURFACE WATER MANAGEMENT:


Hugo A. Carter, P.E.

DATE: 13 Dec 11



MARTIN COUNTY, FLORIDA

Legend

 Application

Application Number: 110909-1

Sec 8 / Twp 40 / Rge 39

Project Name: Name: BIG JOHN MONAHAN BRIDGE REPLACEMENT

0 1,900 3,800 Feet

N
Map Date: 2011-12-05

Permit Number: 43-00802-S

Exhibit Number: 1



Wantman Group, Inc.

Engineering ♦ Surveying ♦ Environmental ♦ Planning

SUMMARY

Project: SR 710 Big John Monahan Bridge Replacement
 Financial Project Number: 419250-2-52-01
 County: Martin

Designer: JBS
 Reviewer: JDW
 9/2/2011

WATER QUALITY

Basin:	Required:	Provided:
100A	0.49 ac-ft	0.53 ac-ft
100B	0.34 ac-ft	0.83 ac-ft
200	1.51 ac-ft	1.68 ac-ft
300	2.64 ac-ft	9.09 ac-ft
400B	0.13 ac-ft	0.13 ac-ft
500	0.67 ac-ft	1.63 ac-ft
	5.79 ac-ft	13.87 ac-ft

FLOOD ROUTING

	<u>Pre-Development</u>	<u>Post Development</u>
3 Yr.-24 Hour Storm:		
Basin:	Stage:	Stage:
100A	29.01 ft. NAVD	29.13 ft. NAVD
100B	27.73 ft. NAVD	27.14 ft. NAVD
200		24.57 ft. NAVD
300		21.82 ft. NAVD
400B		21.06 ft. NAVD
500		21.61 ft. NAVD
Discharge West Side:	5.71 cfs	3.96 cfs
Discharge East Side:	4.68 cfs	0.96 cfs
Total Discharge:	10.39 cfs	4.92 cfs



Wantman Group, Inc.

Engineering ♦ Surveying ♦ Environmental ♦ Planning

SUMMARY

Project: SR 710 Big John Monahan Bridge Replacement

Financial Project Number: 419250-2-52-01

County: Martin

Designer: JBS

Reviewer: JDW

9/2/2011

	<u>Pre-Development</u>	<u>Post Development</u>
10 Yr.-72 Hour Storm:		
Basin:	Stage:	Stage:
100A	30.33 ft. NAVD	30.27 ft. NAVD
100B	28.51 ft. NAVD	28.41 ft. NAVD
200		25.14 ft. NAVD
300		23.84 ft. NAVD
400B		21.56 ft. NAVD
500		22.51 ft. NAVD

Discharge West Side:	100.79 cfs	82.57 cfs
Discharge East Side:	65.16 cfs	21.26 cfs
Total Discharge:	165.95 cfs	103.83 cfs

	<u>Pre-Development</u>	<u>Post Development</u>
25 Yr.-72 Hour Storm:		
Basin:	Stage:	Stage:
100A	31.08 ft. NAVD	30.99 ft. NAVD
100B	28.79 ft. NAVD	28.83 ft. NAVD
200		25.24 ft. NAVD
300		24.45 ft. NAVD
400B		21.76 ft. NAVD
500		22.69 ft. NAVD

Discharge West Side:	121.58 cfs	95.73 cfs
Discharge East Side:	82.24 cfs	34.20 cfs
Total Discharge:	203.82 cfs	129.93 cfs



STORAGE VOLUME CALCULATIONS FOR ADDITIONAL IMPERVIOUS

Project: SR 710 Big John Monahan Bridge Replacement from SW Trail Dr to east of the S.R. 76 Connector Ramps
Financial Project Number: 419250-2-52-01
County: Martin

Designer: JBS
Reviewer: JDW
9/2/2011

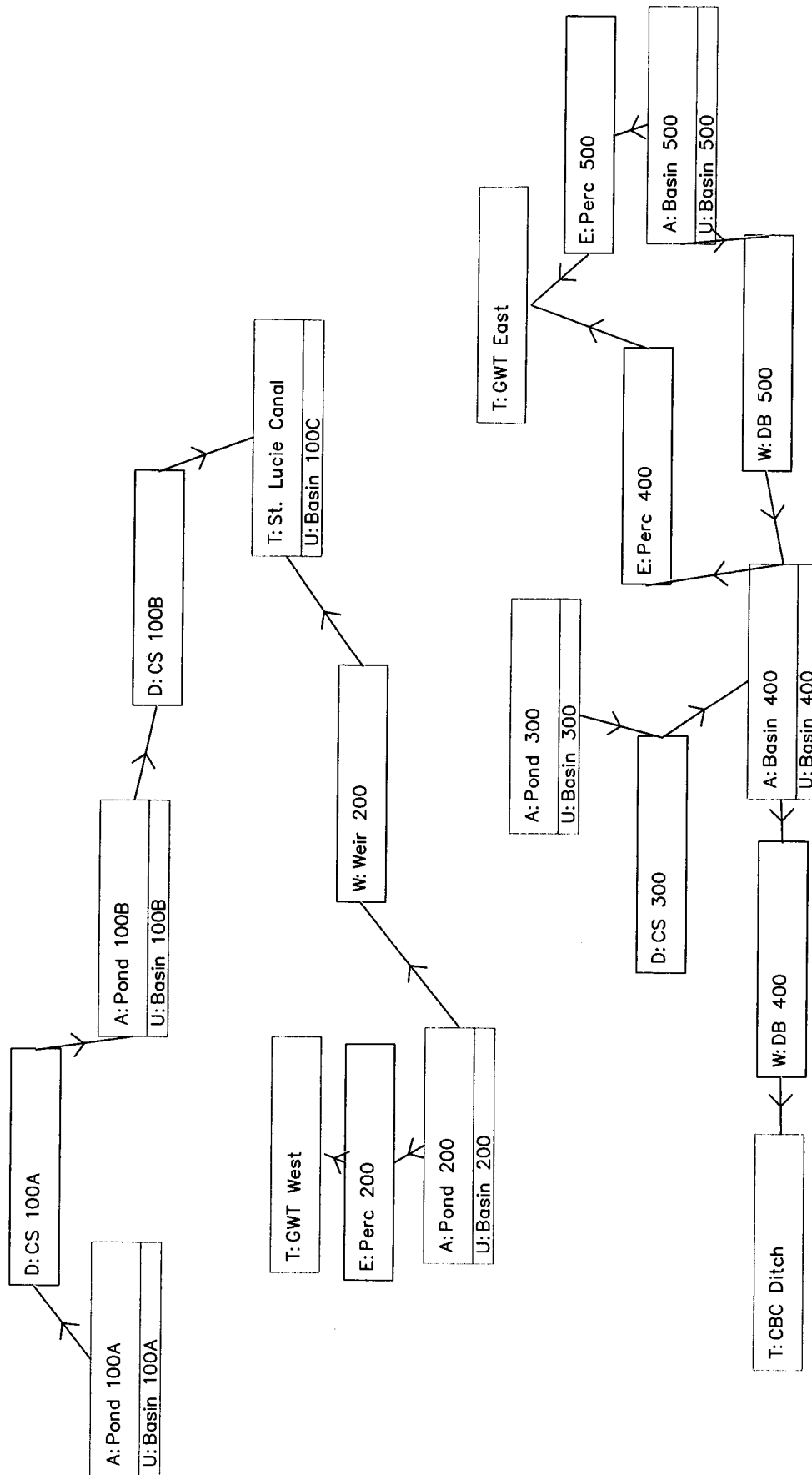
APPENDIX G.2

Basin	Basin Limits	Basin Area				Calculated Volume (ac-ft)					Treatment Volume (Ac-Ft)	
		Total Proposed Impervious Area (Ac)	Total Wet Pond Area (Ac)	Total Proposed Pervious Area (Ac)	Total Basin Area (Ac)	1-in Over Entire Basin Area	2.5-in Over Total Impervious Area	Controlling Treatment Volume	Direct Discharge to Impaired Waterway (150%)	Treatment Credit: Dry Retention (50%) Dry Detention (75%)	Required	Provided
100A	Begin at Sta. 1099+55.31 to Sta. 1105+00	2.09	0.00	0.71	2.80	0.233	0.435	0.435	0.653	0.490	0.490	0.530
100B	Station 1105+00 to Station 1110+00	1.46	0.00	1.06	2.52	0.210	0.304	0.304	0.456	0.342	0.342	0.825
200	Station 1110+00 to Station 1131+66	6.46	0.00	5.65	12.11	1.009	1.346	1.346	2.019	1.514	1.514	1.680
300	Station 1131+66 to Station 1167+80	8.45	1.96	7.18	17.59	1.466	1.760	1.760	2.641	2.641	2.641	9.088
400B	Station 1155+30 to Station 1162+00	0.42	0.00	0.94	1.36	0.113	0.088	0.113	0.170	0.128	0.128	0.125
500	Station 1162+00 to Station 1184+50	1.78	0.00	8.96	10.74	0.895	0.371	0.895	1.343	0.671	0.671	1.625
	Total	20.66	1.96	24.50	47.12	3.927	4.304	4.854	7.261	5.785	5.785	13.873

Note - Basin 400B area:

Basin 400 =	2.33 ac
Basin 400A =	0.97 ac
Basin 400B =	<u>1.36 ac</u>

CPR NODE DIAGRAM -
POST-DEVELOPMENT



STAFF REPORT DISTRIBUTION LIST

BIG JOHN MONAHAN BRIDGE REPLACEMENT

Application No: 110909-1

Permit No: 43-00802-S

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Stormwater Management Report

FOR

SR 710 Big John Monahan Bridge Replacement Design Build

from SW Trail Drive to east of the S.R. 76 Connector Ramps

Financial Project ID: 419250-2-52-01

WGI Job No.: 21011063

Martin County, Florida

October 2011

**Prepared for:
Florida Department of Transportation
District Four**



Prepared by:



Wantman Group, Inc.

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APPENDICES

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Appendix B - Drainage Maps

Appendix C - Geotechnical Report Excerpts

Appendix D - Soils Map and USGS Quadrangle Map

Appendix E - FEMA FIRM Map

Appendix F - Pre-Development Calculations

Appendix G - Post-Development Calculations

Appendix H - Nutrient Loading Analysis

Appendix I - Correspondence, Excerpts from Previous Permits

SECTION 1 – GENERAL INFORMATION

1.1 Introduction and Project Location

The Florida Department of Transportation (FDOT) - District IV is proposing to replace the existing Big John Monahan Bridge that crosses the C-44 Canal (St. Lucie Canal) and Kanner Highway (SR 76). Improvements are also proposed for the sections of State Road (SR) 710 approaching the bridge. The total project area is 51.10 acres. The total contributing drainage area is 64.03 acres. (Project Area = 50.10 ac - SR 710, SR 76 Ramp Connector and SW Indiantown Avenue right-of-way (R/W) plus 12.93 ac - beyond the R/W). The project limits are from Southwest Trail Drive (Milepost 16.484) to east of the SR 76 Connector Ramp (Milepost 18.249) for a distance of approximately 1.77 miles. The surrounding land includes a mixture of agricultural and commercial properties. The project is located in Martin County, Florida, within Sections 5, 8, and 9, Township 40 South, Range 39 East. See Project Location Map (**Appendix A**).

1.2 Purpose

The purpose of the project is to improve the capacity and safety of Big John Monahan Bridge and the SR 710 approaches. The proposed project will replace the existing two-lane bridge with two side-by-side high level bridges. The bridges will provide a minimum 55-ft vertical clearance above the Mean High Water (MHW) elevation and a minimum 100-ft horizontal clearance between the fender system at the St. Lucie Canal. Improvements to SR 710 include widening the existing roadway from a two-lane to a four-lane semi-urban facility.

1.3 Vertical Datum

The vertical datum for the proposed improvements is referred to the North American Vertical Datum (NAVD), 1988, and expressed in feet. Note the conversion from NAVD 1988 to National Geodetic Vertical Datum (NGVD) 1929 is 1.35' (NAVD88 + 1.35' = NGVD29).

1.4 Geotechnical Information

According to the Natural Resources Conservation Service (NRCS), Web Soil Survey of Martin County, Florida, eight mapped soil units occur within the project area. Floridana (west end of project) and Malabar (east end of project) are the two soils most prevalent within the project limits and are described below. The soils along the project corridor as mapped by the NRCS are provided in **Appendix D**.

Floridana (fine sand, depressional) is a very poorly drained soil and occurs in nearly level wet sloughs and depressions with slopes of 0 to 2 percent. The Floridana soil is ponded for more than 6 months during most years and a depth of less than 10 inches for much of the remainder of the year. Permeability is rapid in the surface and subsurface layers and slow to very slow in the subsoil. It has a hydrologic group of C/D and a map symbol of 38.

Malabar (fine sand) is a poorly drained soil and occurs on nearly level broad, low areas of flatwoods and sloughs with slopes of 0 to 2 percent. The Malabar soil has a water table that ranges from within 10 inches of the surface for 2 to 6 months and within 10 to 40 inches most of the rest of

each year. Permeability is rapid in all layers above the subsoil and slow to very slow in the subsoil. It has a hydrologic group of A/D and a map symbol of 52. See **Appendices C and D** for additional information.

1.5 Seasonal High Ground Water Table

The estimated Seasonal High Ground Water Table (SHGWT) elevations are based on the Geotechnical Report completed by Tierra of South Florida. Excerpts from the Geotechnical Report are included in **Appendix C**.

The water level in the canal is estimated to be about +13.15-ft (NAVD 88). Based on historic groundwater elevations and field data, the SHGWT value is about 22.35-ft NGVD (21.00-ft NAVD) at the west end of the project and 21.35-ft NGVD (20.00-ft NAVD) at the east end of the project, and gradually drops to the control elevation of the St. Lucie Canal.

1.6 Floodplain

Floodplain information for the project area was obtained from the following Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM): Panels 12085C0275F dated October 4, 2002. FEMA has designated the entire project area as Zone X, described as areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood. 100-year floodplain impacts are not anticipated for the proposed project. Consequently, floodplain compensation is not required. There are no regulatory floodways within the project limits. A FEMA Map with the proposed project limits is provided in **Appendix E**.

SECTION 2 – DRAINAGE DESIGN CRITERIA

2.1 Permitting Agencies

The anticipated permits include a Coast Guard Permit from the United States Coast Guard, a Dredge and Fill Nationwide Permit from the United States Army Corps of Engineers (USACE), an Environmental Resource Permit (ERP) from South Florida Water Management District (SFWMD), a SFWMD water use permit for dewatering activities, and a Storm Water Pollution Prevention Plan (SWPPP) in compliance with the National Pollutant Discharge Elimination System (NPDES) permitting, as administered by Florida Department of Environmental Protection (FDEP).

2.2 Tailwater

Boundary conditions used in the Advanced Interconnected Channel and Pond Routing (AdICPR) analysis, representing design storm stages for both the pre- and post-development conditions, were based on the ground elevations at the point of discharge or the SHGWT whichever is higher.

2.3 FDOT Requirements

The project, and its stormwater management facilities, is designed to meet or exceed all applicable FDOT criteria set forth by FDOT-District IV, the FDOT Drainage Manual and the design handbooks published by FDOT.

2.4 SFWMD Requirements

A) Water Quality/Volumetric Requirements

- i. The presumptive water quality volume for wet detention shall be provided for the first inch of runoff from the developed project or the total runoff of 2.5 inches times the percentage of impervious area, whichever is greater.
- ii. Dry detention volume shall be provided equal to 75 percent of the presumptive treatment volume computed for wet detention.
- iii. Retention volume shall be provided equal to 50 percent of the presumptive treatment volume computed for wet detention.
- iv. All outfalls shall meet SFWMD presumptive water quality requirements for Outstanding Florida Waters (OFW), which requires 1.5 times the required treatment volume per SFWMD Basis of Review - Sections 4.1.1 and 4.1.2.
- v. All outfalls shall meet SFWMD nutrient loading requirements for Outstanding Florida Waters (OFW). The post-development nutrient loading shall not exceed that of the pre-development condition per SFWMD Basis of Review - Section 4.2.4.5.

B) Water Quantity

- i. A design storm event of 3-day duration and 25-year return frequency shall be used in computing off-site discharge rates.
- ii. Discharge rates for the post-development condition shall not exceed that of the pre-development condition for the design storm event.
- iii. Offsite discharge rates shall be limited to rates not causing adverse impacts to existing offsite properties, such as historic discharge rates, rates determined in previous District permit actions, or rates specified by District criteria.
- iv. The project shall recover to the designed control elevation or dry pond bottom within 12-days of a storm event.

2.5 Rainfall Intensities and Precipitation Data

The 10-year/3-day and 25-year/3-day storm event rainfall amounts were determined from the SFWMD's Hyetographs and were found to be 8.50 and 10.30 inches, respectively. The Soil Conservation Service (SCS) unit hydrograph method was used to develop the runoff hydrographs using the 72-hour rainfall distribution and a Peak Rate Factor of 256.

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WGI Project No.: 21011063

SECTION 3 – EXISTING DRAINAGE SYSTEM

The project is divided into two major drainage basins that are separated by the St. Lucie Canal. The western basin outfalls into the St. Lucie Canal and the eastern basin drains into existing roadside ditches along SR 76 and SR 710. There are four existing cross-drains, two west and two east of the St. Lucie Canal that maintain historic offsite flows across the corridor from north to south. The existing cross drains are described below:

Station	Length (feet)	Description	Upstream Invert (ft NAVD)	Downstream Invert (ft NAVD)
1113+77	121	24" RCP	21.78	21.76
1118+36	132	3' x 3' CBC	21.22	21.13
1152+26	161	48" RCP	18.74	18.42
1184+10*	73	48" RCP	19.99	19.64

*Existing cross-drain is located just east and outside the project limits.

The cross-drains are shown on the USGS Quadrangle Map in **Appendix D**.

The western basin is divided into four sub-basins (100A, 100B, 100C and 200). Basin 100A begins outside the project limits and extends from SW Jackson Avenue to SW Seminole Drive. The total basin area is 15.22 ac (2.29 ac from SR 710 R/W and 12.93 ac off-site area outside of the SR 710 R/W). Approximately 13.98 ac (1.05 ac from SR 710 R/W and 12.93 ac off-site area outside of the SR 710 R/W) is included in SFWMD Permit Number 43-00802-S, Basin 2A. Stormwater runoff is conveyed to a dry detention pond located on the north side of SR 710 between SW Trail Drive and SW Seminole Drive. This pond is designed to provide water quality for approximately 2.29 ac from SR 710 R/W prior to discharging into the dry pond within Basin 100B. The documents from the existing SFWMD Permit Number 43-00802-S are included in **Appendix I**.

Basin 100B runs along the north side of SR 710 and extends from SW Seminole Drive to SW Citrus Boulevard. The total basin area is 1.81 ac. Stormwater runoff is conveyed to a dry detention pond located on the north side of SR 710 between SW Seminole Drive and SW Citrus Boulevard. This pond is designed to provide water quality for approximately 1.0 ac from SR 710 R/W prior to discharging into an open area located immediately northeast of the SR 710 / SW Citrus Boulevard intersection. The open area is located within Basin 100C.

Basin 100C consists of the open space north of the SR 710 roadway that extends from SW Citrus Boulevard to the St. Lucie Canal. Also included in the basin limits, are the westbound lanes of SR 710 from SW Citrus Boulevard to Station 1117+20, comprising a total of approximately 5.17 ac. The open space north of the roadway is graded such that the runoff is conveyed via overland flow into the St. Lucie Canal. The south side of SR 710 along the Basin 100C limits flows away from the existing roadway and eventually discharges into the St. Lucie Canal.

Basin 200 extends from Sta. 1117+20 to Sta. 1131+66, comprising a total of approximately 7.76 ac which includes 0.29 ac of impervious area from the SR 710 bridge, via scuppers, and 4.12 ac of acquired offsite property. The open space south of the roadway and the ground underneath the bridge is graded such that the runoff is conveyed via overland flow into the St. Lucie Canal.

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The eastern basin is divided into three sub-basins (300, 400 and 500). Basin 300 extends from Sta. 1131+66 to Sta. 1153+20, comprising a total of approximately 8.61 ac. Included in the 8.61 ac is 0.42 ac of impervious area from the SR 710 bridge, via scuppers, and the existing pavement from the driveway area off SR 76. Stormwater runoff is conveyed via overland flow into the existing roadside ditch along SR 76.

Basin 400 extends from Sta. 1153+20 to 1166+00, comprising a total of approximately 11.80 ac. Stormwater runoff from the north side of SR 710 flows into the existing roadside ditch adjacent to SR 710, then crosses underneath SR 710 through an existing 48" RCP cross-drain at Sta. 1152+26. Stormwater runoff from the south side of SR 710 flows into an existing roadside ditch adjacent to SR 710 and towards the downstream end of the 48" RCP. Here, runoff is then conveyed to a small concrete box culvert (CBC) located just inside the CSX R/W at approximately Sta. 1154+38 (167' RT) and should ultimately outfall into the St. Lucie Canal. However, flow is blocked through the existing CBC because it has collapsed. Previous studies associated with the RFP recommended replacement of the collapsed CBC. The replacement of the existing CBC is currently under review by the Department.

Basin 500 extends from Sta. 1166+20 to Sta. 1184+50, comprising a total of approximately 9.52 ac. Stormwater runoff from the north side of SR 710 flows into a shallow flat area and eventually crosses underneath SR 710 through an existing 48" RCP cross-drain at Sta. 1184+10. Here, runoff joins with the runoff from the south side of SR 710 in adjacent roadside ditches. Stormwater runoff from this basin is ultimately routed towards the aforementioned collapsed CBC.

The pre-development site data (contributing drainage area) is summarized in the table below:

Table 3.1

PRE-DEVELOPMENT SITE DATA						
Basins	Impervious Area		Pervious Area		Total Area	CN
	Ac	%	Ac	%	Ac	
100A*	1.48	64.63%	0.81	35.37%	2.29	73.3
100B	0.51	28.18%	1.30	71.82%	1.81	62.8
100C	0.36	6.96%	4.81	93.04%	5.17	80.3
200	1.23	15.85%	6.53	84.15%	7.76	82.0
300	2.16	25.09%	6.45	74.91%	8.61	61.3
400	2.55	21.61%	9.25	78.39%	11.80	74.5
500	1.54	16.18%	7.98	83.82%	9.52	80.4
TOTAL	9.83	20.93%	37.13	79.07%	46.96	

* minus offsite development area, CN based on entire basin area.

An AdICPR stormwater model was performed to determine the peak discharges for the existing drainage basins for the 3-yr, 10-yr and 25-yr design storms. The tailwater is based on the ground elevations at the point of discharge or the SHGWT, whichever is higher (Section 2.2).

SR 710 Big John Monahan Bridge Replacement Design Build

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Calculations are included in **Appendix F** and summarized below:

Table 3.2

Pre-Development Peak Flow Data (SFWMD 25-year/ 72-hour Storm Event)		
Major Basin	Drainage Basins	Flow (cfs)
West	100 - 200	121.58
East	300 - 500	82.24
	Total:	203.82

Table 3.3

Pre-Development Peak Stage Data (ft. NAVD)		
Major Basin	Drainage Basin	25 Yr.-72 Hour Storm:
West	100A	31.08
West	100B	28.79
West	200	N/A
East	300	N/A
East	400	N/A
East	500	N/A

SECTION 4 – PROPOSED DRAINAGE SYSTEM

The existing stormwater management system (SWM) will be modified to accommodate the proposed roadway improvements. Treatment and attenuation were provided for the sections of the project that involved reconstruction and intersection improvements. Stormwater runoff within the proposed semi-urban facility will be collected by inlets and underground drainage pipe. Stormwater runoff from the proposed rural facility will be collected in roadside ditches. Proposed stormwater management facilities are required to treat and attenuate the post-development discharge for the 25-year/72-hour storm event. The proposed stormwater management facilities accommodate the ultimate six-lane typical section for SR 710. The SWM requirements for the drainage basins are summarized in Section 2.4.

The St. Lucie Canal is considered an Impaired Water Body and Outstanding Florida Waters (OFW). Stormwater runoff from the proposed roadway is contributing discharge to the OFW. Therefore, the treatment provided includes an additional 50% of the required volume. The proposed treatment volumes are quantified in the Water Quality Table located within the Post-Development Calculations. **(Appendix G)**

As in the pre-development condition, the project is divided into two major drainage basins that are separated by the St. Lucie Canal. The western basin outfalls into the St. Lucie Canal and the eastern basin drains into existing roadside ditches along SR 76 and SR 710.

Similarly to the pre-development condition, the western basin is divided into four sub-basins (100A, 100B, 100C and 200). Basin 100A begins outside the project limits and extends from SW Jackson

SR 710 Big John Monahan Bridge Replacement Design Build

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WGI Project No.: 21011063

Avenue to SW Seminole Drive. The total basin area is 15.73 ac (2.80 ac from SR 710 R/W and 12.93 ac off-site area outside of the SR 710 R/W). Stormwater runoff is conveyed to the dry detention pond (Pond 100A) located on the north side of SR 710 between SW Trail Drive and SW Seminole Drive. This pond will provide the required treatment and attenuation for approximately 2.80 ac from SR 710 R/W prior to discharging into the dry pond within Basin 100B.

Basin 100B extends from SW Seminole Drive to SW Citrus Boulevard, comprising a total of approximately 2.52 ac. Stormwater runoff is conveyed to a dry detention pond (Pond 100B) located on the north side of SR 710 between SW Seminole Drive and SW Citrus Boulevard. This pond will provide the required treatment and attenuation for this basin prior to discharging into an open area located immediately northeast of the SR 710 / SW Citrus Boulevard intersection. The open area is located within Basin 100C.

Basin 100C consists of the open space north of the SR 710 roadway that extends from SW Citrus Boulevard to the St. Lucie Canal, comprising a total of approximately 3.01 ac. The open space north of the roadway is graded such that the runoff is conveyed via overland flow into the St. Lucie Canal.

Basin 200 extends from SW Citrus Boulevard to Sta. 1131+66, comprising a total of approximately 12.11 ac, which includes 4.12 ac of acquired offsite property. Stormwater runoff from the roadway is collected by a network of inlets and underground drainage pipes and conveyed to a proposed dry retention pond (Pond 200) situated in the acquired offsite property. This pond will provide the required treatment and attenuation for this basin prior to discharging via overland flow into the St. Lucie Canal. The offsite area normally conveyed through the existing 3'x 3' CBC will be re-routed around Pond 200 to maintain historic flow.

The eastern basin is divided into three sub-basins (300, 400 and 500). Basin 300 extends from Sta. 1131+66 to Sta. 1167+80, comprising a total of approximately 17.59 ac. This basin includes the entire SR 710 R/W up to the SR 76 Connector Ramp, the north side of SR 710 from the SR 76 Connector Ramp to Sta 1167+80, and the vacated section of the SW Indiantown Avenue R/W that accommodates the proposed wet detention pond (Pond 300). Stormwater runoff from the roadway will either be collected by a network of inlets and underground drainage pipes or by overland flow discharging into Pond 300 for treatment and attenuation. The outfall for Pond 300 is the existing roadside ditch adjacent to the south side of SR 710 within Basin 400. Flow is then directed towards the downstream end of an existing 48" RCP where it is then conveyed to a small CBC located just inside the CSX R/W at approximately Sta. 1154+38 (167' RT) and ultimately outfalls into the St. Lucie Canal. The same issue remains with the collapsed CBC as in the pre-development condition. The existing 48" RCP cross-drain will be extended to accommodate the widening, thereby maintaining historic flow.

Basin 400 extends from Sta. 1155+30 to 1162+00, comprising a total of approximately 2.33 ac. Stormwater runoff from the south side of SR 710 sheet flows into the existing roadside ditch. A proposed ditch block located at Sta 1155+00 will provide the required treatment and attenuation for this basin. Stormwater runoff from this basin is ultimately routed towards the aforementioned collapsed CBC. A portion of Basin 400 (Basin 400A, 0.97 ac) drains the bridge embankment directly to the CBC.

SR 710 Big John Monahan Bridge Replacement Design Build

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Basin 500 extends from Sta. 1162+00 to Sta. 1184+50, comprising a total of approximately 10.74 ac. Stormwater runoff from the north side of SR 710 drains into a shallow flat area then flows east within the roadside ditch that is adjacent to SR 710 and eventually crosses underneath SR 710 through an existing 48" RCP cross-drain at Sta. 1184+10. Here runoff joins with the runoff from the south side of SR 710 in adjacent roadside ditches. A proposed ditch block located at Sta 1162+00 will provide the required treatment and attenuation for this basin. Stormwater runoff from this basin flows through Basin 400 and is ultimately routed towards the aforementioned collapsed CBC.

The post-development site data is summarized in the table below:

Table 4.1

POST-DEVELOPMENT SITE DATA								
Basins	Impervious Area		Pervious Area		Lake Area		Total Area	CN
	Ac	%	Ac	%	Ac	%	Ac	
100A*	2.09	74.64%	0.71	25.36%	0.00	0.00%	2.80	75.8
100B	1.46	57.94%	1.06	42.06%	0.00	0.00%	2.52	90.4
100C	0.00	0.00%	3.01	100.00%	0.00	0.00%	3.01	80.0
200	6.46	53.34%	5.65	46.66%	0.00	0.00%	12.11	89.6
300	8.45	48.04%	7.18	40.82%	1.96	11.14%	17.59	90.9
400	0.42	18.03%	1.91	81.97%	0.00	0.00%	2.33	83.2
500	1.78	16.57%	8.96	83.43%	0.00	0.00%	10.74	83.0
TOTAL	20.66	40.43%	28.48	55.73%	1.96	3.84%	51.10	

* minus offsite development area, CN based on entire basin area.

An AdICPR stormwater model was performed to determine the peak discharges for the proposed drainage basins for the 3-yr, 10-yr and 25-yr design storms. The tailwater will be based on the ground elevations at the point of discharge or the SHGWT whichever is higher. (Section 2.2).

Calculations are included in **Appendix G** and summarized below:

Table 4.2

Post-Development Peak Flow Data (SFWMD 25-year/ 72-hour Storm Event)		
Major Basin	Drainage Basins	Flow (cfs)
West	100 - 200	95.14
East	300 - 500	29.93
	Total:	125.07

Table 4.3

Post-Development Peak Stage Data (ft. NAVD)		
Major Basin	Drainage Basin	25 Yr.-72 Hour Storm:
West	100A	30.99
West	100B	28.83
West	200	24.74
East	300	24.44
East	400	21.70
East	500	22.63

SECTION 5 – SYSTEM RECOVERY

The post-development system is required by SFWMD to recover to the control elevation within 12 days following the design storm event. The control devices proposed for Ponds 100A, 100B, and 300 are traditional discharge control structures that include a bleed down mechanism with the elevation set at either the pond bottom (dry) or at the maintained water elevation of the pond (wet). The recovery will be achieved through steady discharge through the bleeder. The results from the AdICPR analysis demonstrate that the dry and wet ponds are able to recover to the control elevation within 12 days following the storm. Section 2.3 of the SFWMD Basis of Review defines the “Control Elevation” as the lowest elevation at which water can be released through the control device. For a dry pond, the control is either the weir or the bottom of the dry pond. For a wet pond the control is the maintained water elevation of the pond.

The proposed control device for Pond 200 is a break in the retention pond bank set at the weir elevation. The proposed control devices for Basins 400 and 500 are ditch blocks. The ditch block for basin 400 will include a bleeder. System recovery will be achieved through soil percolation within the ponds and ditches. Due to poor soil percolation, the soil at the pond bottom will be replaced with suitable material. The AdICPR stormwater analysis of the post-development condition utilized AdICPR PercPak to model the soil percolation. The results from the AdICPR analysis demonstrate that the dry ditches and infield areas are able to recover to the control elevation within 12 days following the storm. Calculations are included in **Appendix G**.

SECTION 6 – NUTRIENT LOADING ANALYSIS

A pre versus post-development nutrient analysis has been performed that demonstrates the proposed design will not contribute nutrients to an impaired water body as indicated in Section 2.4. As previously stated, the St. Lucie Canal is considered an Impaired Water Body.

The methodology used to complete the analysis was based on the study developed by Harvey H. Harper, PhD “Evaluation of Current Stormwater Design Criteria Within the State of Florida – Final Report 2007”. The nutrient loading analysis is included in **Appendix H**.

SR 710 Big John Monahan Bridge Replacement Design Build

Financial Project ID: 419250-2-52-01

WGI Project No.: 21011063

SECTION 7 – BASE CLEARANCE & DESIGN HIGH WATER ANALYSIS

The Design High Water (DHW) elevation for setting the roadway grade is generally based on a determination of the ground water elevation, which occurs for a duration of 24 hours or more. The DHW elevation is usually established by evaluating the SHGWT elevation, and elevations of the existing water bodies in the vicinity of the project.

The roadway within the limits of this project will have sufficient vertical elevation to exceed the required base clearance criteria set by FDOT for any of the relevant water bodies.

TABLE 7.1

DHW BASE CLEARANCE				
	Lowest EOP Elevation (Mainline and Ramps) ft. NAVD	*Base Elevation (Mainline and Ramps) ft. NAVD	SHGWT Elevation ft. NAVD	Clearance ft.
West Side	28.00	26.60	21.00	5.60
East Side	24.00	22.60	20.00	2.60

*Pavement thickness assumes OBG 12 (12-1/2" Limerock), SP (3-1/2"), and FC-5 (3/4")

Appendix A

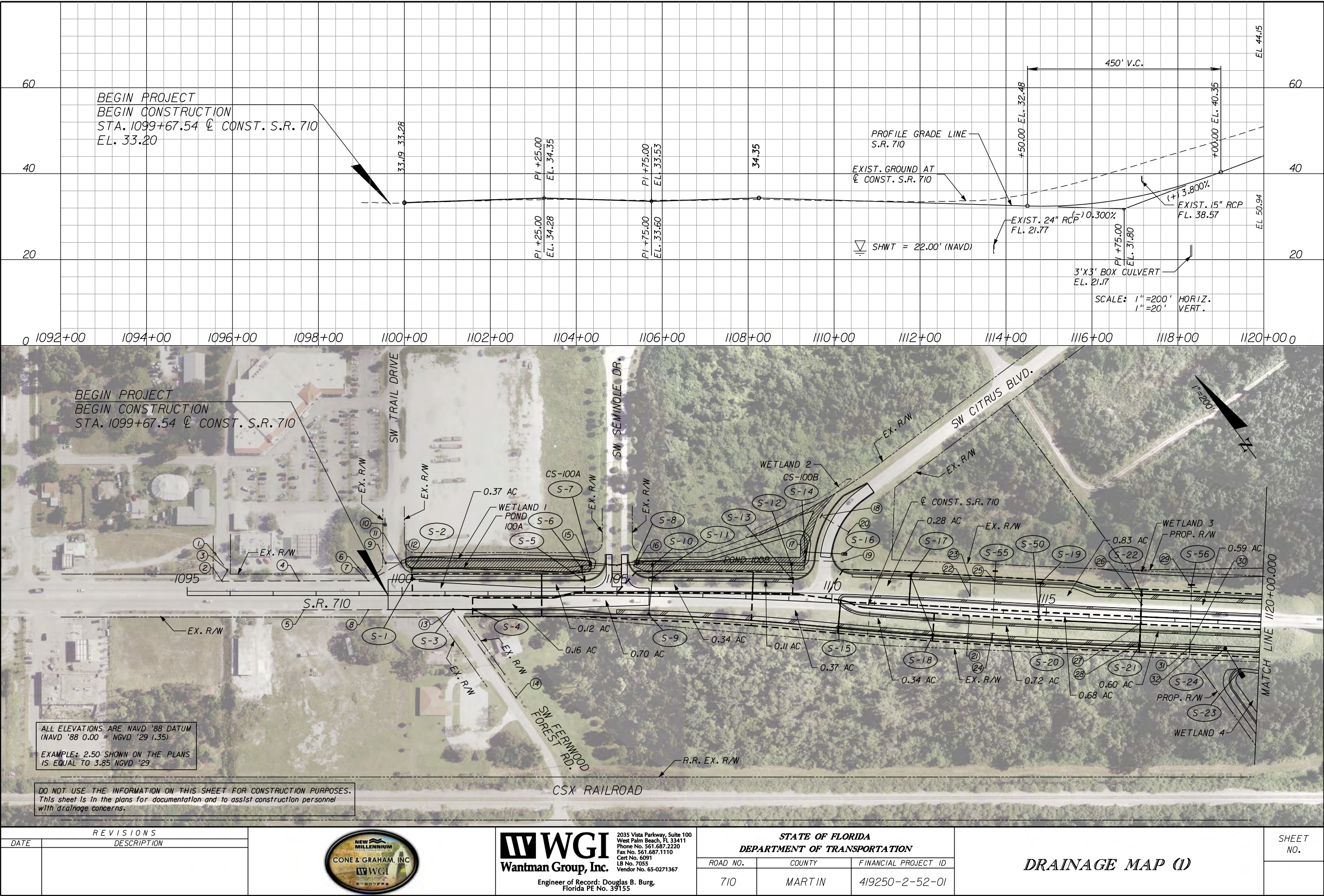
Project Location Map

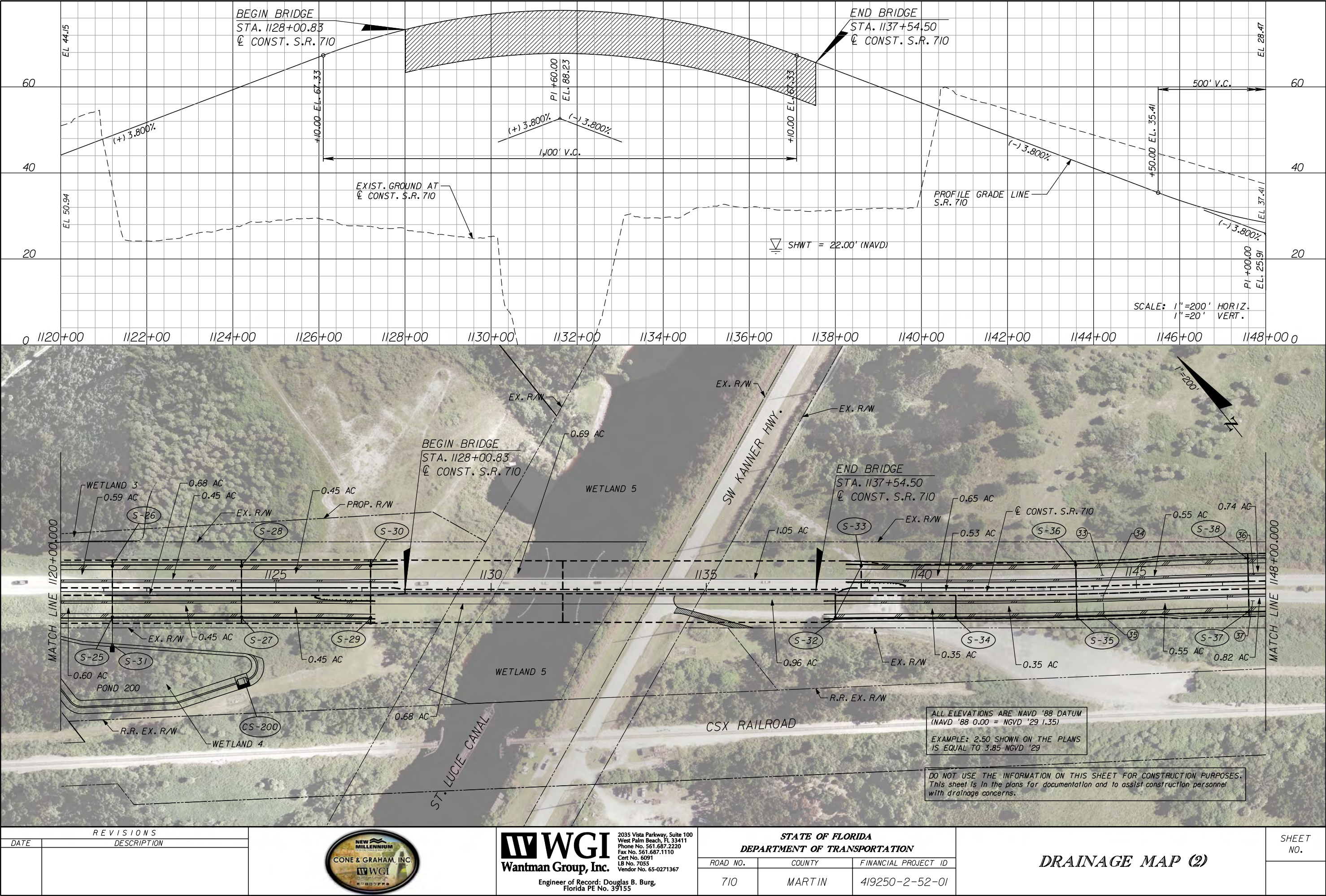


PROJECT LOCATION MAP

Appendix B

Drainage Maps





REVISIONS	
DATE	DESCRIPTION

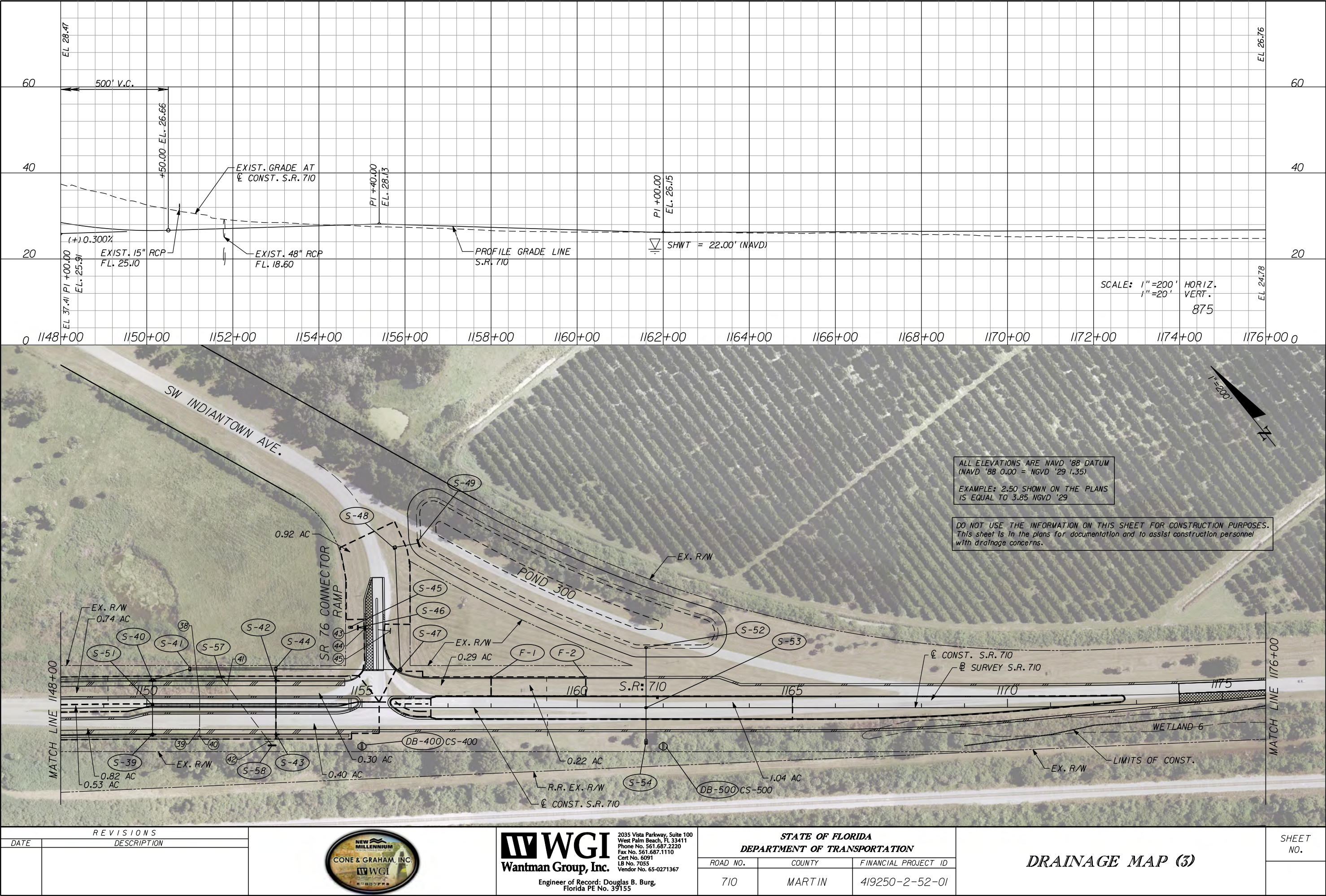


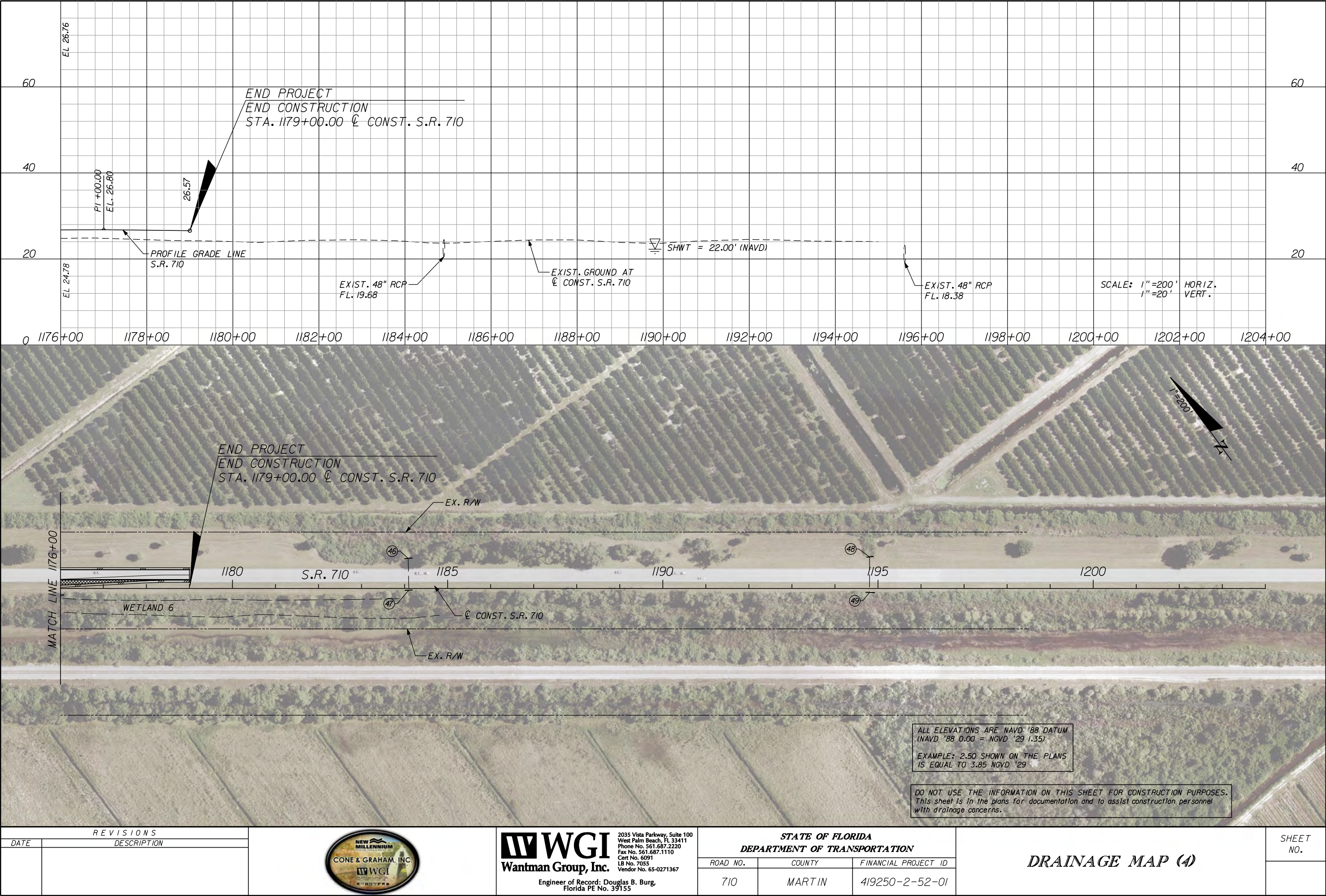
WGI
Wantman Group, Inc.
2035 Vista Parkway, Suite 100
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6091
LB No. 7055
Vendor No. 65-0271367
Engineer of Record: Douglas B. Burg,
Florida PE No. 39155

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
710	MARTIN	419250-2-52-01

DRAINAGE MAP (2)

SHEET NO.





REVISIONS	
DATE	DESCRIPTION



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LB No. 7055
Vendor No. 65-0271367

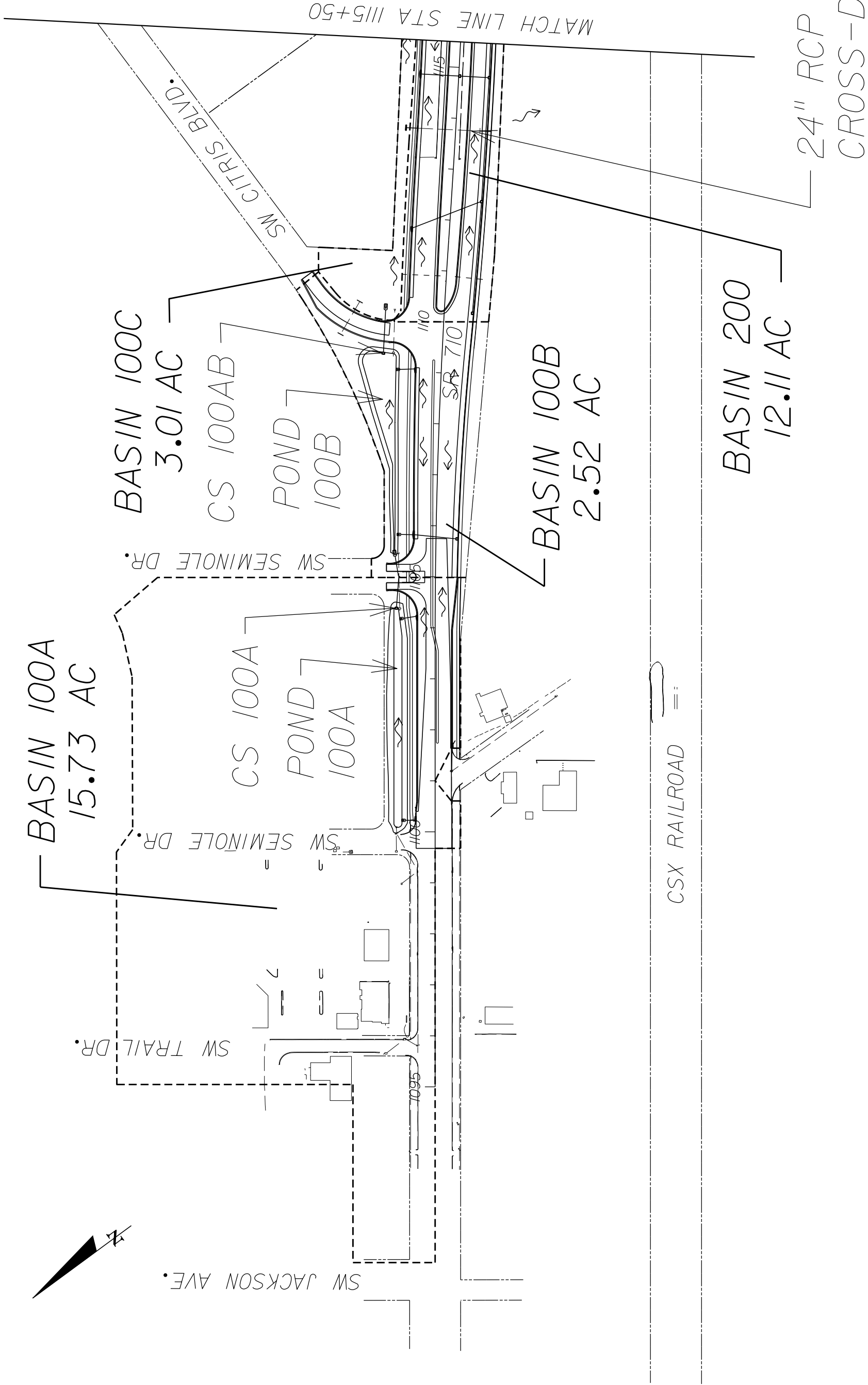
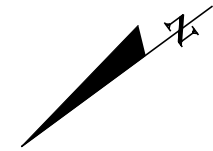
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
710	MARTIN	419250-2-52-01

DRAINAGE MAP (4)

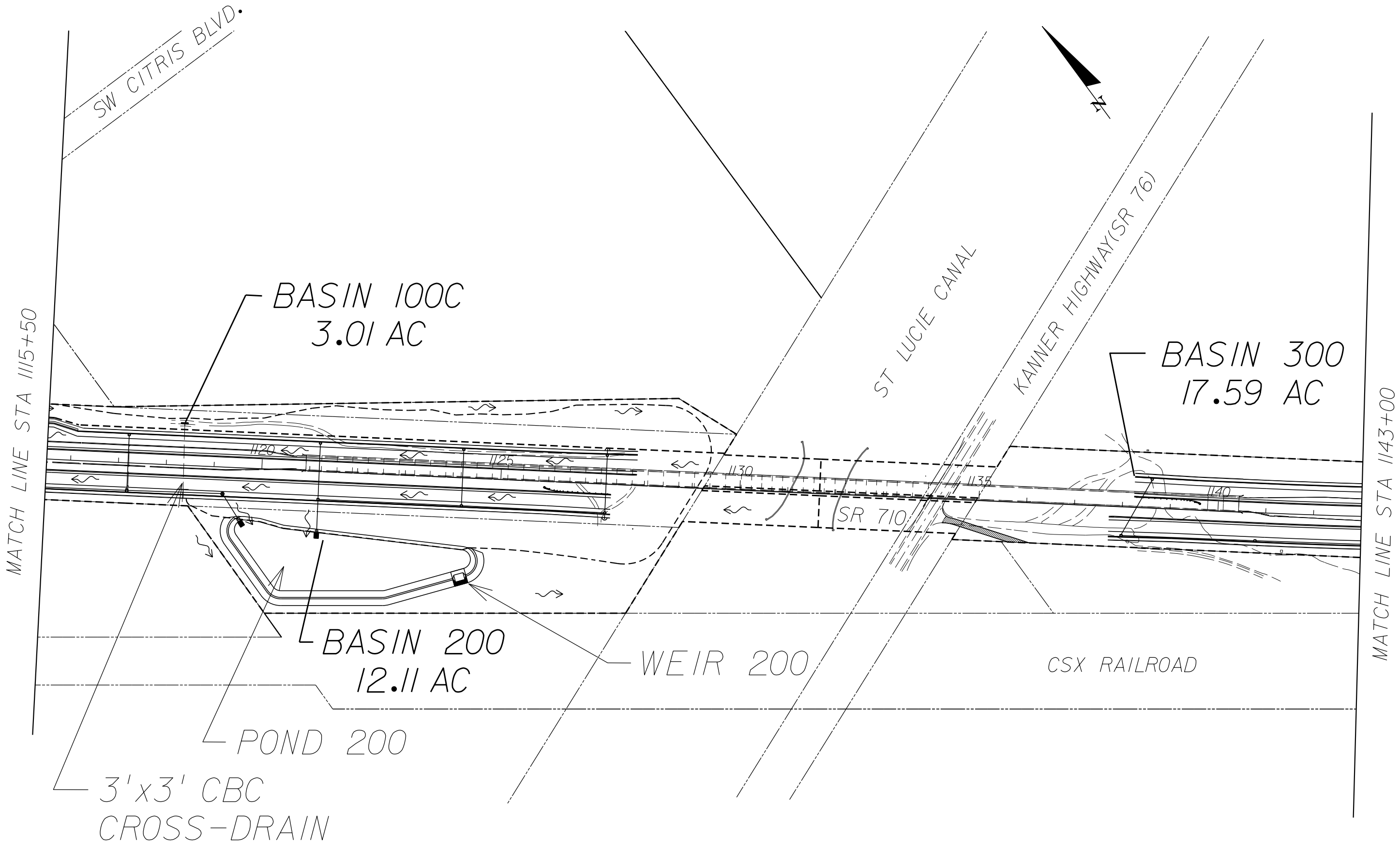
SHEET NO.

Appendix G

Post-Development Calculations



DATE	REVISIONS	DESCRIPTION	 WGI Wantman Group, Inc. 2035 Vega Parkway, Suite 100 West Palm Beach, FL 33411 Phone No. 561.687.2220 Fax No. 561.687.1110 Cell No. 6091 US No. 705555-0271367 Vendor No. 65-0271367 Engineer of Record: Douglas B. Burg, Florida PE No. 39155	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		POST-DEV ICPR DRAINAGE MAP (1)	SHEET NO.
				ROAD NO.	COUNTY		
				710	MARTIN	419250-2-52-01	



REVISIONS	
DATE	DESCRIPTION



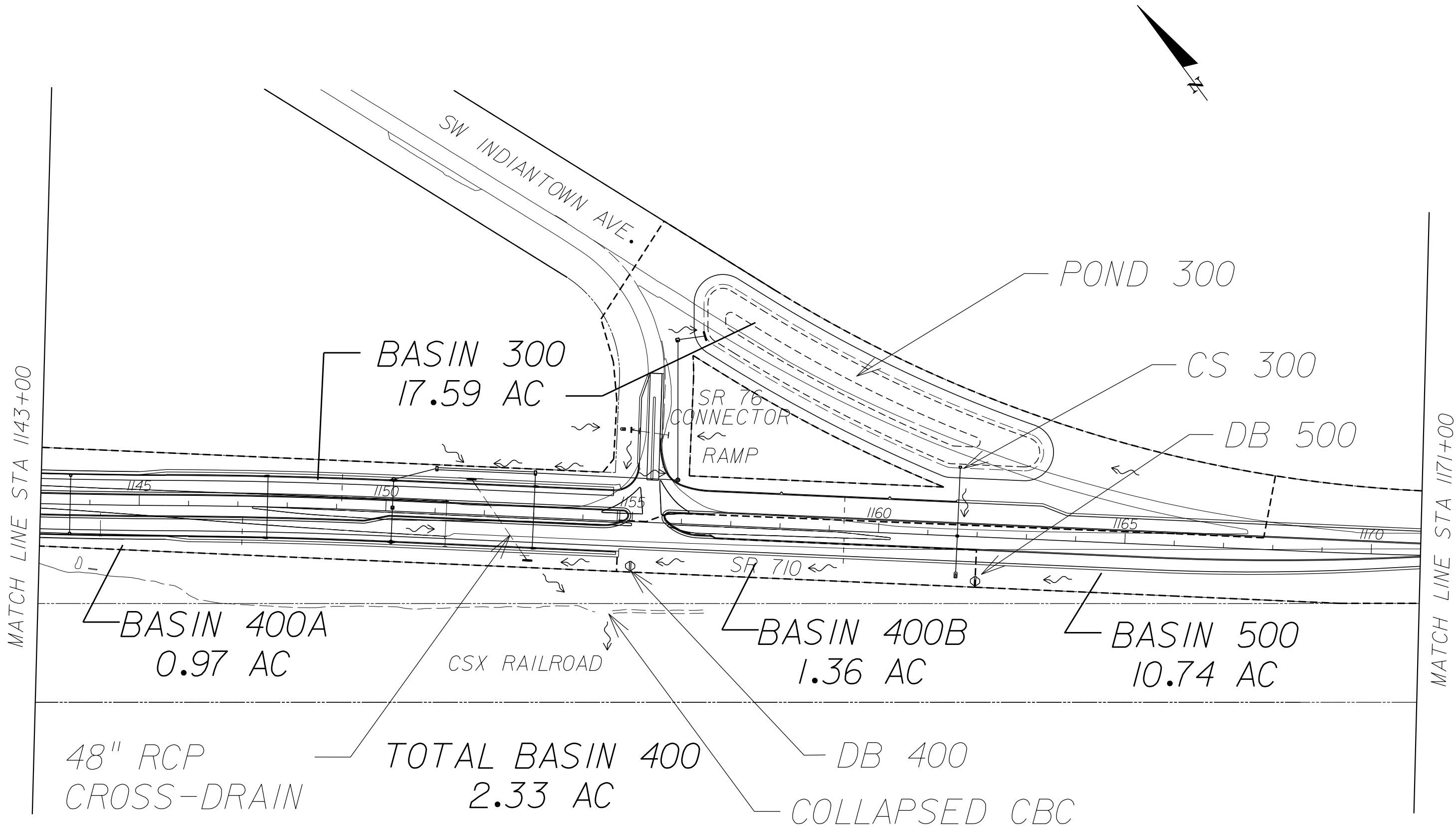
**WGI**
Wantman Group, Inc.

2035 Vista Parkway, Suite 100
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6091
LB No. 7055
Vendor No. 65-0271367
Engineer of Record: Douglas B. Burg,
Florida PE No. 39155

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
710	MARTIN	419250-2-52-01

**POST-DEV ICPR
DRAINAGE MAP (2)**

SHEET NO.



REVISIONS	
DATE	DESCRIPTION



WGI

Wantman Group, Inc.

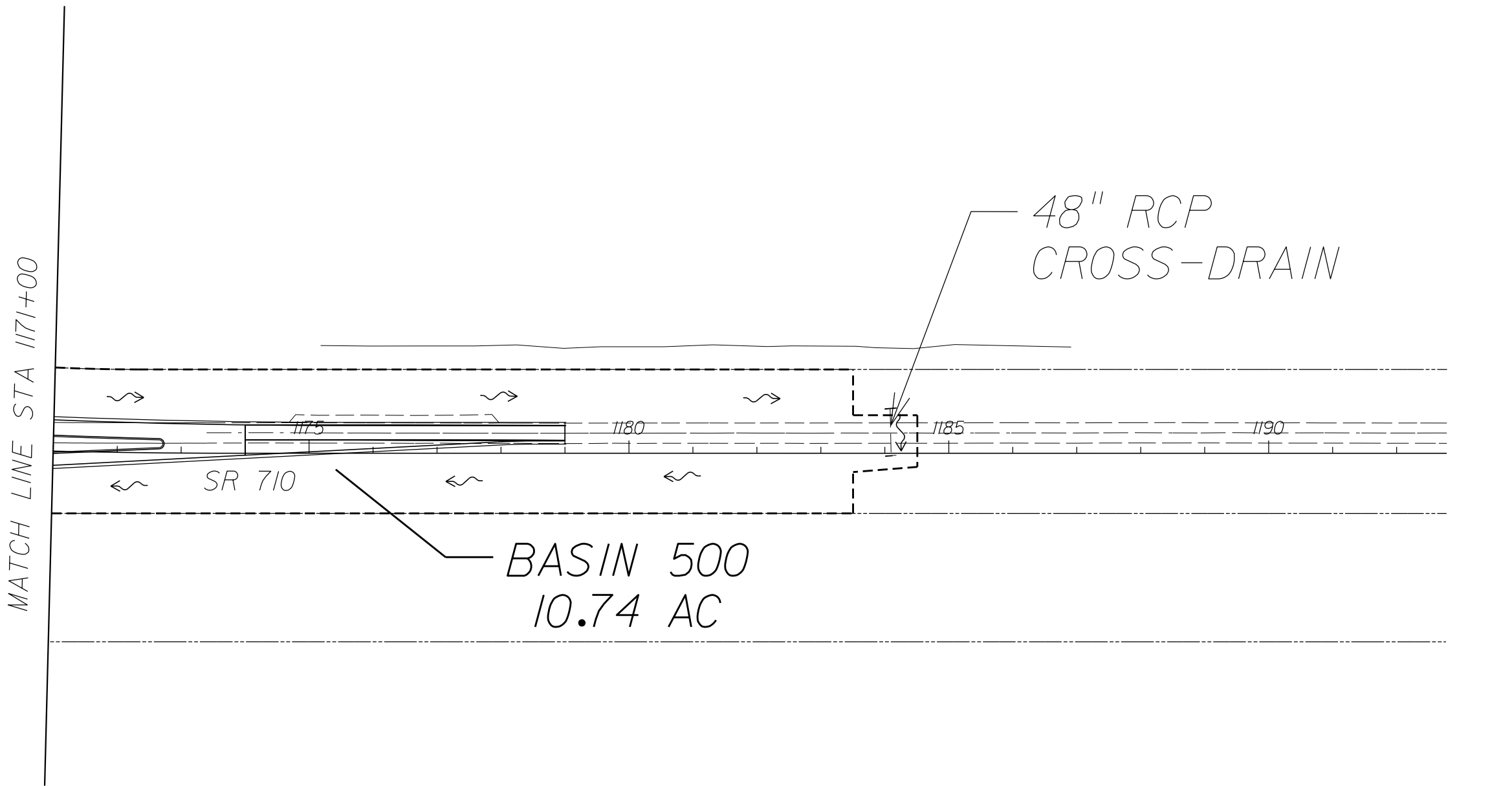
Engineer of Record: Douglas B. Burg,
Florida PE No. 39155

2035 Vista Parkway, Suite 100
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6091
LB No. 7055
Vendor No. 65-0271367

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
710	MARTIN	419250-2-52-01

POST-DEV ICPR
DRAINAGE MAP (3)

SHEET NO.



REVISIONS			 Wantman Group, Inc. 2035 Vista Parkway, Suite 100 West Palm Beach, FL 33411 Phone No. 561.687.2220 Fax No. 561.687.1110 Cert No. 6091 LB No. 7055 Vendor No. 65-0271367 Engineer of Record: Douglas B. Burg, Florida PE No. 39155	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POST-DEV ICPR DRAINAGE MAP (4)	SHEET NO.
DATE	DESCRIPTION			ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				710	MARTIN	419250-2-52-01		



STORAGE VOLUME CALCULATIONS FOR ADDITIONAL IMPERVIOUS
Project SR 710 Big John Monahan Bridge Replacement from SW Trail Dr to east of the S.R. 76 Connector Ramps
Financial Project Number: 419250-2-52-01
County: Martin

Designer: JBS
Reviewer: JDW
9/2/2011

Basin	Basin Limits	Basin Area				Calculated Volume (ac-ft)					Treatment Volume (Ac-Ft)	
		Total Proposed Impervious Area (Ac)	Total Wet Pond Area (Ac)	Total Proposed Pervious Area (Ac)	Total Basin Area (Ac)	1-in Over Entire Basin Area	2.5-in Over Total Impervious Area	Controlling Treatment Volume	Direct Discharge to Impaired Waterway (150%)	Treatment Credit: Dry Retention (50%) Dry Detention (75%)	Required	Provided
100A	Begin at Sta. 1099+55.31 to Sta. 1105+00	2.09	0.00	0.71	2.80	0.233	0.435	0.435	0.653	0.490	0.490	0.530
100B	Station 1105+00 to Station 1110+00	1.46	0.00	1.06	2.52	0.210	0.304	0.304	0.456	0.342	0.342	0.825
200	Station 1110+00 to Station 1131+66	6.46	0.00	5.65	12.11	1.009	1.346	1.346	2.019	1.514	1.514	1.680
300	Station 1131+66 to Station 1167+80	8.45	1.96	7.18	17.59	1.466	1.760	1.760	2.641	2.641	2.641	9.088
400B	Station 1155+30 to Station 1162+00	0.42	0.00	0.94	1.36	0.113	0.088	0.113	0.170	0.128	0.128	0.125
500	Station 1162+00 to Station 1184+50	1.78	0.00	8.96	10.74	0.895	0.371	0.895	1.343	0.671	0.671	1.625
	Total	20.66	1.96	24.50	47.12	3.927	4.304	4.854	7.281	5.785	5.785	13.873

Note - Basin 400B area:
Basin 400 = 2.33 ac
Basin 400A = 0.97 ac
Basin 400B = 1.36 ac



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STAGE/AREA STAGE/VOLUME CALCULATIONS FOR WATER QUALITY TREATMENT

Project SR 710 Big John Monahan Bridge Replacement from SW Trail Dr to east of the S.R. 76 Connector Ramps
 Financial Project Number: 419250-2-52-01
 County: Martin

Designer: JBS
 Reviewer: JDW
 9/2/2011

Basin	Elevation (ft. NAVD)	POST DEVELOPMENT			Accumulated Volume (ac-ft)	Total Volume Provided (ac-ft)
		Area (Ac)	Incr. Vol (ac-ft)			
100A	27.00	0.15				Vp = 0.53 Ac-ft
	29.00	0.38	0.53	Control	0.53	
	31.00	0.49	0.87		1.40	
100B	24.00	0.21				Vp = 0.83 Ac-ft
	27.00	0.34	0.83	Control	0.83	
	29.00	0.43	0.77		1.60	
200	23.00	1.06				Vp = 1.68 Ac-ft
	24.50	1.18	1.68	Control	1.68	
	25.00	1.22	0.60		2.28	
	26.50	1.34	1.92		4.20	
300	20.00	1.96				Vp = 9.09 Ac-ft
	24.00	2.58	9.09	Control	9.09	
	25.00	2.74	2.66		11.75	
	26.00	3.14	2.94		14.69	
400	20.00	0.08				Vp = 0.13 Ac-ft
	21.00	0.17	0.13	Control	0.13	
	22.00	0.27	0.22		0.35	



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STAGE/AREA STAGE/VOLUME CALCULATIONS FOR WATER QUALITY TREATMENT

Project SR 710 Big John Monahan Bridge Replacement from SW Trail Dr to east of the S.R. 76 Connector Ramps
Financial Project Number: 419250-2-52-01
County: Martin

Designer: JBS
Reviewer: JDW
9/2/2011

POST DEVELOPMENT					
Basin	Elevation (ft. NAVD)	Area (Ac)	Incr. Vol (ac-ft)	Accumulated Volume (ac-ft)	Total Volume Provided (ac-ft)
500	20.00	0.20			
	21.00	0.85	0.53		
	22.00	1.35	1.10	<i>Control</i>	
	23.00	1.87	1.61		
					Vp = 1.63 Ac-ft
				Total:	Vp = 13.87 Ac-ft

CURVE NUMBER CALCULATIONS - POST-DEVELOPMENT

Project: SR 710 Big John Monahan Bridge Replacement

Financial Project Number: 419250-2-52-01

County: Martin

Designer: JBS

Reviewer: JDW

9/2/2011

BASIN 100A

Description	Area (A)	Curve No. (CN)	CN x A	Cover Type & Hydrologic Cond.
Pervious Area	0.71	80	56.8	Open Space, Good Condition A/D
Developed Area	12.93	72	931.0	Offsite Development
Impervious Area	2.09	98	204.8	Roadway Pavement
Totals	15.73		1192.6	75.8= Weighted CN

BASIN 100B

Description	Area (A)	Curve No. (CN)	CN x A	Cover Type & Hydrologic Cond.
Pervious Area	1.06	80	84.8	Open Space, Good Condition A/D
Impervious Area	1.46	98	143.1	Roadway Pavement
Totals	2.52		227.9	90.4= Weighted CN

BASIN 100C

Description	Area (A)	Curve No. (CN)	CN x A	Cover Type & Hydrologic Cond.
Pervious Area	3.01	80	240.8	Open Space, Good Condition C/D
Impervious Area	0.00	98	0.0	Roadway Pavement
Totals	3.01		240.8	80= Weighted CN

BASIN 200

Description	Area (A)	Curve No. (CN)	CN x A	Cover Type & Hydrologic Cond.
Pervious Area	5.65	80	452.0	Open Space, Good Condition C/D
Impervious Area	6.46	98	633.1	Roadway Pavement
Totals	12.11		1085.1	89.6= Weighted CN

CURVE NUMBER CALCULATIONS - POST-DEVELOPMENT

Project: SR 710 Big John Monahan Bridge Replacement

Financial Project Number: 419250-2-52-01

County: Martin

Designer: JBS

Reviewer: JDW

9/2/2011

BASIN 300

Description	Area (A)	Curve No. (CN)	CN x A	Cover Type & Hydrologic Cond.
Pervious Area	7.18	80	574.4	Open Space, Good Condition A/D C/D
Wet Pond	1.96	100	196.0	Water
Impervious Area	8.45	98	828.1	Roadway Pavement
Totals	17.59		1598.5	90.9= Weighted CN

BASIN 400

Description	Area (A)	Curve No. (CN)	CN x A	Cover Type & Hydrologic Cond.
Pervious Area	1.91	80	152.8	Open Space, Good Condition A/D C/D
Impervious Area	0.42	98	41.2	Roadway Pavement
Totals	2.33		194.0	83.2= Weighted CN

BASIN 500

Description	Area (A)	Curve No. (CN)	CN x A	Cover Type & Hydrologic Cond.
Pervious Area	8.96	80	716.8	Open Space, Good Condition A/D C/D
Impervious Area	1.78	98	174.4	Roadway Pavement
Totals	10.74		891.2	83= Weighted CN



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RECOVERY CALCULATIONS

Project: SR 710 Big John Monahan Bridge Replacement
 Financial Project Number: 419250-2-52-01
 County: Martin

Designer: JBS
 Reviewer: JDW
 9/30/2011

Ditch / Pond Parameters

Side	Basin	Inlet or Weir Elev. (ft. NAVD)	Bottom Elev. (ft. NAVD)	Length (ft)	Width (ft)
West	200	24.00	23.00	450	120
East	400B	21.00	20.00	700	45
East	500	22.00	21.00	3700	55

ICPR Perc Pak Parameters

ICPR Perc Pak Horizontal conductivity (K): 4.80 ft/day
 ICPR Perc Pak Vertical conductivity (K): 4.80 ft/day
 Effective Porosity: 0.200

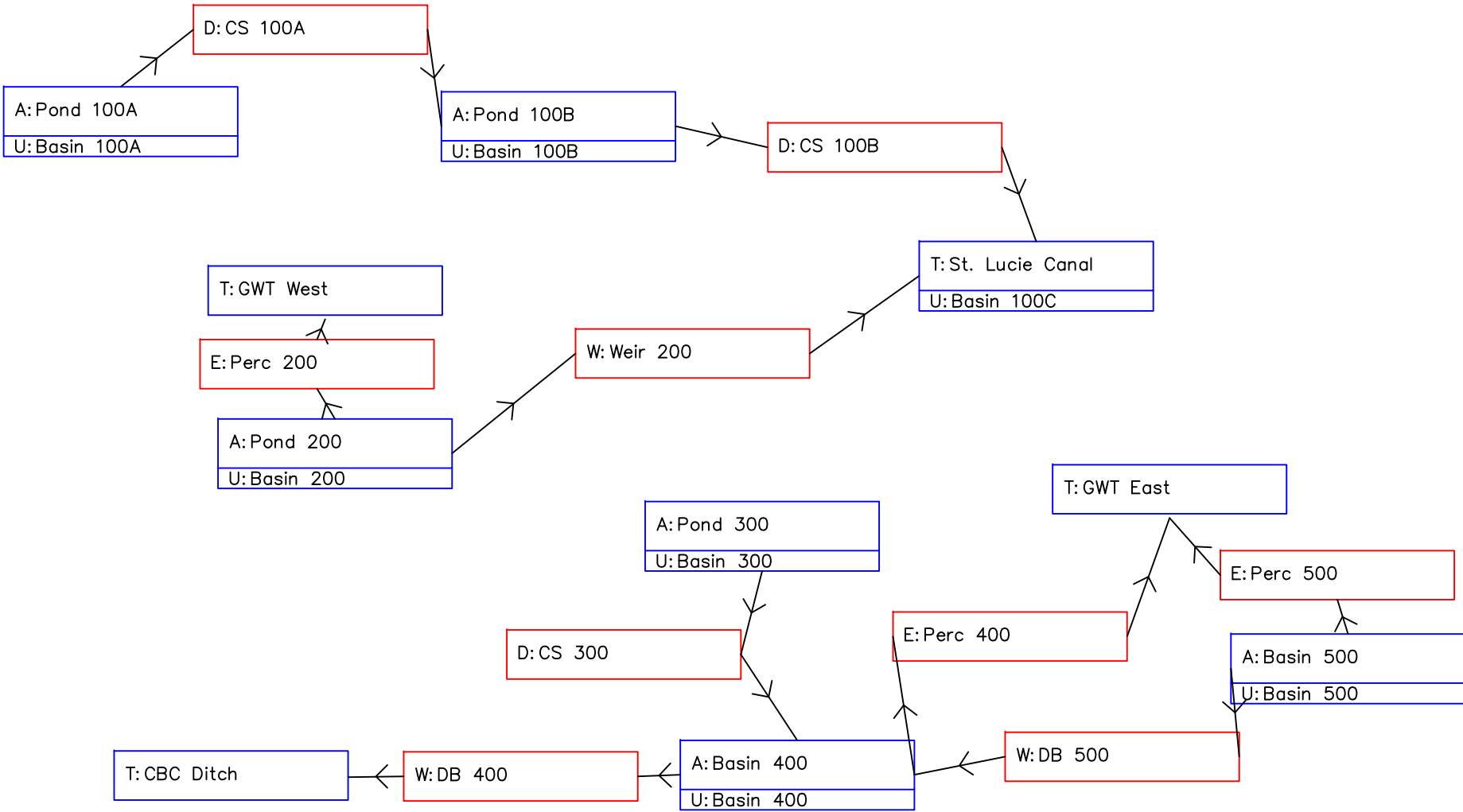
Perimeter Ring Dist 1-2 (ft): **50**
 Perimeter Ring Dist 2-3 (ft): **450**

Cell Spacing (ft): **5**

Basin	Perimeter:1 (ft)	Perimeter:2 (ft)	Perimeter:3 (ft)	Cells:1-2	Cells:2-3	Water Table	**Layer Thk (ft)
200	1140	1454	4282	10	90	21.00	0.00
400B	1490	1804	4632	10	90	20.00	0.00
500	7510	7824	10652	10	90	20.00	0.00

** Layer thickness set to zero to model saturated soil column prior to storm commencement.

ICPR NODE DIAGRAM -
POST-DEVELOPMENT



SR 710 Big John Monahan Bridge Replacement

Financial Project ID: 419250-2-52-01

- Post-Development Input Data

APPENDIX G.7

=====
Basins
=====

Name: Basin 100A Node: Pond 100A Status: Onsite
Group: WEST Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 10.000 Time of Conc(min): 10.00
Area(ac): 15.730 Time Shift(hrs): 0.00
Curve Number: 75.80 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Basin 100B Node: Pond 100B Status: Onsite
Group: WEST Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 10.000 Time of Conc(min): 10.00
Area(ac): 2.520 Time Shift(hrs): 0.00
Curve Number: 90.40 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Basin 100C Node: St. Lucie Canal Status: Onsite
Group: WEST Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 10.000 Time of Conc(min): 10.00
Area(ac): 3.010 Time Shift(hrs): 0.00
Curve Number: 80.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Basin 200 Node: Pond 200 Status: Onsite
Group: WEST Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 10.000 Time of Conc(min): 10.00
Area(ac): 12.110 Time Shift(hrs): 0.00
Curve Number: 89.60 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Basin 300 Node: Pond 300 Status: Onsite
Group: EAST Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 10.000 Time of Conc(min): 10.00
Area(ac): 17.590 Time Shift(hrs): 0.00
Curve Number: 90.90 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Basin 400A Node: CBC Ditch Status: Onsite
Group: EAST Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 10.000 Time of Conc(min): 10.00
Area(ac): 0.970 Time Shift(hrs): 0.00
Curve Number: 83.20 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Basin 400B Node: Basin 400 Status: Onsite
Group: EAST Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 10.000 Time of Conc(min): 10.00
Area(ac): 1.360 Time Shift(hrs): 0.00
Curve Number: 83.20 Max Allowable Q(cfs): 999999.000

SR 710 Big John Monahan Bridge Replacement

Financial Project ID: 419250-2-52-01

- Post-Development Input Data

DCIA(%): 0.00

```
-----
Name: Basin 500      Node: Basin 500      Status: Onsite
Group: EAST          Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256      Peaking Factor: 256.0
Rainfall File: Sfwmd72     Storm Duration(hrs): 72.00
Rainfall Amount(in): 10.000 Time of Conc(min): 10.00
Area(ac): 10.740          Time Shift(hrs): 0.00
Curve Number: 83.00       Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00
=====
```

==== Nodes =====

```
-----
Name: Basin 400      Base Flow(cfs): 0.000      Init Stage(ft): 20.000
Group: EAST          Warn Stage(ft): 22.000
Type: Stage/Area
```

Stage(ft)	Area(ac)
20.000	0.0800
21.000	0.1700
22.000	0.2700

```
-----
Name: Basin 500      Base Flow(cfs): 0.000      Init Stage(ft): 20.000
Group: EAST          Warn Stage(ft): 23.000
Type: Stage/Area
```

Stage(ft)	Area(ac)
20.000	0.2000
21.000	0.8500
22.000	1.3500
23.000	1.8700

```
-----
Name: CBC Ditch      Base Flow(cfs): 0.000      Init Stage(ft): 20.000
Group: EAST          Warn Stage(ft): 20.000
Type: Time/Stage
```

Time(hrs)	Stage(ft)
0.00	20.000
1000.00	20.000

```
-----
Name: GWT East       Base Flow(cfs): 0.000      Init Stage(ft): 20.000
Group: EAST          Warn Stage(ft): 20.000
Type: Time/Stage
```

Time(hrs)	Stage(ft)
0.00	20.000
1000.00	20.000

```
-----
Name: GWT West       Base Flow(cfs): 0.000      Init Stage(ft): 21.000
Group: WEST          Warn Stage(ft): 21.000
Type: Time/Stage
```

Time(hrs)	Stage(ft)
0.00	21.000
1000.00	21.000

```
-----
Name: Pond 100A      Base Flow(cfs): 0.000      Init Stage(ft): 26.000
Group: WEST          Warn Stage(ft): 31.000
Type: Stage/Area
```

Stage(ft)	Area(ac)
26.000	0.0100
26.990	0.0100

- Post-Development Input Data

SR 710 Big John Monahan Bridge Replacement

Financial Project ID: 419250-2-52-01

- Post-Development Input Data

Span(in): 54.00 Invert(ft): 29.000
Rise(in): 36.00 Control Elev(ft): 29.000

*** Weir 2 of 2 for Drop Structure CS 100A ***

TABLE

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Both Weir Disc Coef: 3.200
Geometry: Circular Orifice Disc Coef: 0.600

Span(in): 3.00 Invert(ft): 26.000
Rise(in): 3.00 Control Elev(ft): 26.000

Name: CS 100B From Node: Pond 100B Length(ft): 82.00
Group: WEST To Node: St. Lucie Canal Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Average Conveyance
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.000
Invert(ft): 23.740	23.460	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

*** Weir 1 of 2 for Drop Structure CS 100B ***

TABLE

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): 54.00 Invert(ft): 27.000
Rise(in): 36.00 Control Elev(ft): 27.000

*** Weir 2 of 2 for Drop Structure CS 100B ***

TABLE

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Both Weir Disc Coef: 3.200
Geometry: Circular Orifice Disc Coef: 0.600

Span(in): 3.00 Invert(ft): 23.000
Rise(in): 3.00 Control Elev(ft): 23.000

Name: CS 300 From Node: Pond 300 Length(ft): 200.00
Group: EAST To Node: Basin 400 Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Average Conveyance
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.000
Invert(ft): 17.300	18.200	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

*** Weir 1 of 3 for Drop Structure CS 300 ***

TABLE

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

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Span(in): 49.00 Invert(ft): 25.000
Rise(in): 37.00 Control Elev(ft): 25.000

*** Weir 2 of 3 for Drop Structure CS 300 ***

TABLE

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Both Weir Disc Coef: 3.200
Geometry: Circular Orifice Disc Coef: 0.600

Span(in): 6.00 Invert(ft): 19.500
Rise(in): 6.00 Control Elev(ft): 20.000

*** Weir 3 of 3 for Drop Structure CS 300 ***

TABLE

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Both Weir Disc Coef: 3.200
Geometry: Rectangular Orifice Disc Coef: 0.600

Span(in): 18.00 Invert(ft): 24.000
Rise(in): 12.00 Control Elev(ft): 24.000

===== Weirs =====

Name: DB 400 From Node: Basin 400
Group: EAST To Node: CBC Ditch
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 13.00
Left Side Slope(h/v): 3.00
Right Side Slope(h/v): 3.00
Invert(ft): 21.000
Control Elevation(ft): 21.000
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Ditch Block DB-400

Name: DB 500 From Node: Basin 500
Group: EAST To Node: Basin 400
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 13.00
Left Side Slope(h/v): 3.00
Right Side Slope(h/v): 3.00
Invert(ft): 22.000
Control Elevation(ft): 22.000
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Ditch Block DB-500

Name: Weir 200 From Node: Pond 200
Group: WEST To Node: St. Lucie Canal
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 20.00
Left Side Slope(h/v): 3.00
Right Side Slope(h/v): 3.00
Invert(ft): 24.500
Control Elevation(ft): 24.500
Struct Opening Dim(ft): 9999.00

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TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

=====
==== Percolation Links =====
=====

Name: Perc 200 From Node: Pond 200 Flow: Both
Group: WEST To Node: GWT West Count: 1

Surface Area Option: Vary based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): -20.000	Perimeter 1(ft): 1140.000
Water Table Elev(ft): 21.000	Perimeter 2(ft): 1454.000
*****0.000	Perimeter 3(ft): 1454.000
Horiz Conductivity(ft/day): 3.280	Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 1.640	Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200	Num Cells 1 to 2: 10
Suction Head(in): 5.590	Num Cells 2 to 3: 90
Layer Thickness(ft): 2.000	

Horizontal infiltration infiltration rate = 3.28 ft/day - Safety Factor =2 (6.55/2)
Vertical infiltration rate = vertical infiltration rate /2

Name: Perc 400 From Node: Basin 400 Flow: Both
Group: EAST To Node: GWT East Count: 1

Surface Area Option: Vary based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): -20.000	Perimeter 1(ft): 1490.000
Water Table Elev(ft): 20.000	Perimeter 2(ft): 1804.000
*****0.000	Perimeter 3(ft): 4632.000
Horiz Conductivity(ft/day): 3.280	Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 1.640	Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200	Num Cells 1 to 2: 10
Suction Head(in): 5.590	Num Cells 2 to 3: 90
Layer Thickness(ft): 0.000	

Horizontal infiltration infiltration rate = 3.28 ft/day - Safety Factor =2 (6.55/2)
Vertical infiltration rate = vertical infiltration rate /2

Name: Perc 500 From Node: Basin 500 Flow: Both
Group: EAST To Node: GWT East Count: 1

Surface Area Option: Vary based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm

Aquifer Base Elev(ft): -20.000	Perimeter 1(ft): 7510.000
Water Table Elev(ft): 20.000	Perimeter 2(ft): 7824.000
*****0.000	Perimeter 3(ft): 10652.000
Horiz Conductivity(ft/day): 3.280	Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 1.640	Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200	Num Cells 1 to 2: 10
Suction Head(in): 5.590	Num Cells 2 to 3: 90
Layer Thickness(ft): 1.000	

Horizontal infiltration infiltration rate = 3.28 ft/day - Safety Factor =2 (6.55/2)
Vertical infiltration rate = vertical infiltration rate /2

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

Name: 03Yr-24Hr
Filename: T:\21011063.00 SR 710 BIG JOHN MONAHAN BRIDGE D-
B\41925025201\RAINAGE\RAINAGE_CALC\ICPR\POST\03Yr-24Hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Fdot-24
Rainfall Amount(in): 4.10

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Time(hrs)	Print Inc(min)
24.000	5.00

Name: 10Yr-72Hr
Filename: T:\21011063.00 SR 710 BIG JOHN MONAHAN BRIDGE D-
B\41925025201\DRAINAGE\DRAINAGE_CALCS\ICPR\POST\10Yr-72Hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 8.50

Time(hrs)	Print Inc(min)
72.000	10.00

Name: 25Yr-72Hr
Filename: T:\21011063.00 SR 710 BIG JOHN MONAHAN BRIDGE D-
B\41925025201\DRAINAGE\DRAINAGE_CALCS\ICPR\POST\25Yr-72Hr.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 10.30

Time(hrs)	Print Inc(min)
72.000	10.00

==== Routing Simulations =====

Name: 03Yr-24Hr Hydrology Sim: 03Yr-24Hr
Filename: T:\21011063.00 SR 710 BIG JOHN MONAHAN BRIDGE D-
B\41925025201\DRAINAGE\DRAINAGE_CALCS\ICPR\POST\03Yr-24Hr.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)
30.000	5.000

Group	Run
BASE	Yes
EAST	Yes
WEST	Yes

Name: 10Yr-72Hr Hydrology Sim: 10Yr-72Hr
Filename: T:\21011063.00 SR 710 BIG JOHN MONAHAN BRIDGE D-
B\41925025201\DRAINAGE\DRAINAGE_CALCS\ICPR\POST\10Yr-72Hr.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): 100.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
100.000	15.000

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Group	Run
BASE	Yes
EAST	Yes
WEST	Yes

Name: 25Yr-72Hr Hydrology Sim: 25Yr-72Hr
Filename: T:\21011063.00 SR 710 BIG JOHN MONAHAN BRIDGE D-
B\41925025201\DRAINAGE\DRAINAGE_CALC\ICPR\POST\25Yr-72Hr.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): 360.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
360.000	15.000

Group	Run
BASE	Yes
EAST	Yes
WEST	Yes

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APPENDIX G.8

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
Basin 400	EAST	03Yr-24Hr	21.06	21.07	22.00	0.0019	7729	21.00	0.95	21.05	0.95
Basin 500	EAST	03Yr-24Hr	21.21	21.61	23.00	0.0028	50240	12.00	3.11	21.21	0.95
CBC Ditch	EAST	03Yr-24Hr	0.00	20.00	20.00	0.0000	0	19.01	0.96	0.00	0.00
GWT East	EAST	03Yr-24Hr	0.00	20.00	20.00	0.0000	0	17.00	1.05	0.00	0.00
GWT West	WEST	03Yr-24Hr	0.00	21.00	21.00	0.0000	0	11.19	0.90	0.00	0.00
Pond 100A	WEST	03Yr-24Hr	13.09	29.13	31.00	0.0050	16862	12.00	3.44	13.09	2.63
Pond 100B	WEST	03Yr-24Hr	15.33	27.14	29.00	0.0050	15087	13.06	3.27	15.33	2.92
Pond 200	WEST	03Yr-24Hr	19.23	24.57	26.50	0.0024	51661	12.00	4.27	19.21	1.61
Pond 300	EAST	03Yr-24Hr	22.45	21.84	26.00	0.0020	97881	12.00	6.40	22.56	0.82
St. Lucie Canal	BASE	03Yr-24Hr	0.00	20.00	20.00	0.0000	0	19.10	3.96	0.00	0.00
Basin 400	EAST	10Yr-72Hr	60.36	21.57	22.00	0.0029	9880	60.29	20.05	60.36	19.86
Basin 500	EAST	10Yr-72Hr	60.34	22.51	23.00	0.0049	70313	60.00	37.04	60.34	17.80
CBC Ditch	EAST	10Yr-72Hr	0.00	20.00	20.00	0.0000	0	60.31	21.29	0.00	0.00
GWT East	EAST	10Yr-72Hr	0.00	20.00	20.00	0.0000	0	60.34	1.52	0.00	0.00
GWT West	WEST	10Yr-72Hr	0.00	21.00	21.00	0.0000	0	29.83	0.48	0.00	0.00
Pond 100A	WEST	10Yr-72Hr	60.15	30.27	31.00	0.0050	19591	60.00	49.75	60.03	37.57
Pond 100B	WEST	10Yr-72Hr	60.31	28.41	29.00	0.0050	17570	60.00	46.74	60.31	39.53
Pond 200	WEST	10Yr-72Hr	60.10	25.14	26.50	0.0031	53646	60.00	44.08	60.10	36.08
Pond 300	EAST	10Yr-72Hr	68.27	23.92	26.00	0.0049	111982	60.00	64.53	68.77	1.57
St. Lucie Canal	BASE	10Yr-72Hr	0.00	20.00	20.00	0.0000	0	60.09	82.57	0.00	0.00
Basin 400	EAST	25Yr-72Hr	60.24	21.76	22.00	0.0027	10731	60.20	32.07	60.24	31.84
Basin 500	EAST	25Yr-72Hr	60.23	22.69	23.00	0.0047	74497	60.00	45.93	60.23	28.44
CBC Ditch	EAST	25Yr-72Hr	0.00	20.00	20.00	0.0000	0	60.22	34.22	0.00	0.00
GWT East	EAST	25Yr-72Hr	0.00	20.00	20.00	0.0000	0	60.23	1.62	0.00	0.00
GWT West	WEST	25Yr-72Hr	0.00	21.00	21.00	0.0000	0	25.91	0.58	0.00	0.00
Pond 100A	WEST	25Yr-72Hr	60.23	30.99	31.00	0.0050	21331	60.00	62.96	60.11	40.47
Pond 100B	WEST	25Yr-72Hr	60.41	28.83	29.00	-0.0050	18389	60.00	50.99	60.41	42.27
Pond 200	WEST	25Yr-72Hr	60.09	25.24	26.50	0.0027	53993	60.00	53.91	60.09	45.13
Pond 300	EAST	25Yr-72Hr	64.18	24.48	26.00	0.0050	115851	60.00	78.75	64.18	3.30
St. Lucie Canal	BASE	25Yr-72Hr	0.00	20.00	20.00	0.0000	0	60.08	95.73	0.00	0.00

SR 710 Big John Monahan Bridge Replacement

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- Post-Development Node Time Series

APPENDIX G.9

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25Yr-72Hr	Pond 100A	WEST	81.01	28.36	31.00	13370	0.00	0.29	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	81.26	28.34	31.00	13271	0.00	0.29	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	81.51	28.33	31.00	13172	0.00	0.29	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	81.76	28.31	31.00	13072	0.00	0.29	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	82.01	28.29	31.00	12972	0.00	0.29	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	82.26	28.27	31.00	12872	0.00	0.29	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	82.51	28.25	31.00	12771	0.00	0.29	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	82.76	28.23	31.00	12671	0.00	0.28	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	83.01	28.20	31.00	12569	0.00	0.28	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	83.26	28.18	31.00	12468	0.00	0.28	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	83.51	28.16	31.00	12366	0.00	0.28	9.5	9.2
25Yr-72Hr	Pond 100A	WEST	83.76	28.14	31.00	12264	0.00	0.28	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	84.01	28.12	31.00	12161	0.00	0.28	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	84.26	28.10	31.00	12058	0.00	0.28	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	84.51	28.08	31.00	11955	0.00	0.27	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	84.76	28.06	31.00	11851	0.00	0.27	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	85.01	28.04	31.00	11747	0.00	0.27	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	85.26	28.02	31.00	11642	0.00	0.27	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	85.51	28.00	31.00	11537	0.00	0.27	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	85.76	27.98	31.00	11432	0.00	0.27	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	86.01	27.96	31.00	11326	0.00	0.27	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	86.26	27.94	31.00	11219	0.00	0.27	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	86.51	27.91	31.00	11113	0.00	0.26	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	86.76	27.89	31.00	11006	0.00	0.26	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	87.01	27.87	31.00	10898	0.00	0.26	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	87.26	27.85	31.00	10790	0.00	0.26	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	87.51	27.83	31.00	10681	0.00	0.26	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	87.76	27.81	31.00	10572	0.00	0.26	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	88.01	27.78	31.00	10463	0.00	0.25	9.5	9.3
25Yr-72Hr	Pond 100A	WEST	88.26	27.76	31.00	10353	0.00	0.25	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	88.51	27.74	31.00	10242	0.00	0.25	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	88.76	27.72	31.00	10131	0.00	0.25	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	89.01	27.70	31.00	10019	0.00	0.25	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	89.26	27.67	31.00	9907	0.00	0.25	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	89.51	27.65	31.00	9794	0.00	0.25	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	89.76	27.63	31.00	9681	0.00	0.24	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	90.01	27.61	31.00	9567	0.00	0.24	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	90.26	27.58	31.00	9452	0.00	0.24	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	90.51	27.56	31.00	9337	0.00	0.24	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	90.76	27.54	31.00	9221	0.00	0.24	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	91.01	27.51	31.00	9105	0.00	0.24	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	91.26	27.49	31.00	8988	0.00	0.23	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	91.51	27.47	31.00	8870	0.00	0.23	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	91.76	27.44	31.00	8752	0.00	0.23	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	92.01	27.42	31.00	8632	0.00	0.23	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	92.26	27.39	31.00	8513	0.00	0.23	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	92.51	27.37	31.00	8392	0.00	0.23	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	92.76	27.35	31.00	8270	0.00	0.22	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	93.01	27.32	31.00	8148	0.00	0.22	9.5	9.4
25Yr-72Hr	Pond 100A	WEST	93.26	27.30	31.00	8025	0.00	0.22	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	93.51	27.27	31.00	7901	0.00	0.22	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	93.76	27.25	31.00	7776	0.00	0.22	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	94.01	27.22	31.00	7651	0.00	0.21	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	94.26	27.20	31.00	7524	0.00	0.21	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	94.51	27.17	31.00	7396	0.00	0.21	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	94.76	27.15	31.00	7268	0.00	0.21	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	95.01	27.12	31.00	7138	0.00	0.21	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	95.26	27.09	31.00	7008	0.00	0.20	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	95.51	27.07	31.00	6876	0.00	0.20	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	95.76	27.04	31.00	6743	0.00	0.20	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	96.01	27.02	31.00	6609	0.00	0.20	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	96.25	26.93	31.00	436	0.00	0.19	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	96.50	26.60	31.00	436	0.00	0.13	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	96.75	26.38	31.00	436	0.00	0.08	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	97.00	26.27	31.00	436	0.00	0.03	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	97.25	26.25	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	97.51	26.22	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	97.76	26.19	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	98.01	26.17	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	98.26	26.15	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	98.51	26.13	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	98.76	26.11	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	99.01	26.09	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	99.26	26.07	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	99.51	26.06	31.00	436	0.00	0.01	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	99.76	26.05	31.00	436	0.00	0.00	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	100.01	26.04	31.00	436	0.00	0.00	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	100.26	26.04	31.00	436	0.00	0.00	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	100.51	26.03	31.00	436	0.00	0.00	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	100.76	26.03	31.00	436	0.00	0.00	9.5	9.5
25Yr-72Hr	Pond 100A	WEST	101.01	26.03	31.00	436	0.00	0.00	9.5	9.5

- Post-Development Node Time Series

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SR 710 Big John Monahan Bridge Replacement

Financial Project ID: 419250-2-52-01

- Post-Development Node Time Series

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25Yr-72Hr	Pond 200	WEST	352.26	23.53	26.50	48020	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	352.51	23.53	26.50	48019	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	352.76	23.53	26.50	48017	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	353.01	23.53	26.50	48015	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	353.26	23.53	26.50	48014	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	353.51	23.53	26.50	48012	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	353.76	23.53	26.50	48010	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	354.01	23.53	26.50	48009	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	354.26	23.53	26.50	48007	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	354.51	23.53	26.50	48005	0.00	0.03	9.1	8.5
25Yr-72Hr	Pond 200	WEST	354.76	23.53	26.50	48004	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	355.01	23.52	26.50	48002	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	355.26	23.52	26.50	48001	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	355.51	23.52	26.50	47999	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	355.76	23.52	26.50	47997	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	356.01	23.52	26.50	47996	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	356.26	23.52	26.50	47994	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	356.51	23.52	26.50	47992	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	356.76	23.52	26.50	47991	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	357.01	23.52	26.50	47989	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	357.26	23.52	26.50	47988	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	357.51	23.52	26.50	47986	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	357.76	23.52	26.50	47984	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	358.01	23.52	26.50	47983	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	358.26	23.52	26.50	47981	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	358.51	23.52	26.50	47979	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	358.76	23.52	26.50	47978	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	359.01	23.52	26.50	47976	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	359.26	23.52	26.50	47975	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	359.51	23.52	26.50	47973	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	359.76	23.52	26.50	47971	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 200	WEST	360.00	23.52	26.50	47970	0.00	0.02	9.1	8.5
25Yr-72Hr	Pond 300	EAST	0.00	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	0.26	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	0.50	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	0.77	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	1.02	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	1.27	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	1.52	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	1.77	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	2.02	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	2.27	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	2.52	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	2.77	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	3.02	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	3.27	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	3.52	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	3.77	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	4.02	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	4.27	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	4.52	20.00	26.00	85378	0.00	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	4.77	20.00	26.00	85378	0.01	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	5.02	20.00	26.00	85380	0.03	-0.00	0.0	-0.0
25Yr-72Hr	Pond 300	EAST	5.27	20.00	26.00	85382	0.05	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	5.52	20.00	26.00	85386	0.06	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	5.77	20.00	26.00	85391	0.08	0.00	0.0	0.0
25Yr-72Hr	Pond 300	EAST	6.02	20.00	26.00	85397	0.10	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	6.27	20.00	26.00	85404	0.11	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	6.52	20.01	26.00	85412	0.13	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	6.77	20.01	26.00	85421	0.14	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	7.02	20.01	26.00	85431	0.16	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	7.27	20.01	26.00	85442	0.17	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	7.52	20.01	26.00	85454	0.18	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	7.77	20.01	26.00	85467	0.19	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	8.02	20.02	26.00	85480	0.21	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	8.27	20.02	26.00	85494	0.22	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	8.52	20.02	26.00	85509	0.23	0.01	0.0	0.0
25Yr-72Hr	Pond 300	EAST	8.77	20.02	26.00	85525	0.24	0.02	0.0	0.0
25Yr-72Hr	Pond 300	EAST	9.02	20.02	26.00	85542	0.25	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	9.27	20.03	26.00	85559	0.26	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	9.52	20.03	26.00	85577	0.27	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	9.77	20.03	26.00	85595	0.28	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	10.02	20.03	26.00	85615	0.29	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	10.27	20.04	26.00	85635	0.30	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	10.52	20.04	26.00	85655	0.31	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	10.77	20.04	26.00	85676	0.32	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	11.02	20.05	26.00	85698	0.33	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	11.27	20.05	26.00	85721	0.34	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	11.52	20.05	26.00	85744	0.35	0.02	0.1	0.0
25Yr-72Hr	Pond 300	EAST	11.77	20.06	26.00	85767	0.36	0.02	0.1	0.0

SR 710 Big John Monahan Bridge Replacement

Financial Project ID: 419250-2-52-01

- Post-Development Node Time Series

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25Yr-72Hr	Pond 300	EAST	356.26	20.25	26.00	87055	0.00	0.04	13.4	12.9
25Yr-72Hr	Pond 300	EAST	356.51	20.25	26.00	87052	0.00	0.04	13.4	12.9
25Yr-72Hr	Pond 300	EAST	356.76	20.25	26.00	87050	0.00	0.04	13.4	12.9
25Yr-72Hr	Pond 300	EAST	357.01	20.25	26.00	87047	0.00	0.04	13.4	12.9
25Yr-72Hr	Pond 300	EAST	357.26	20.25	26.00	87045	0.00	0.04	13.4	12.9
25Yr-72Hr	Pond 300	EAST	357.51	20.24	26.00	87042	0.00	0.04	13.4	12.9
25Yr-72Hr	Pond 300	EAST	357.76	20.24	26.00	87039	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	358.01	20.24	26.00	87037	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	358.26	20.24	26.00	87034	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	358.51	20.24	26.00	87032	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	358.76	20.24	26.00	87029	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	359.01	20.24	26.00	87027	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	359.26	20.24	26.00	87024	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	359.51	20.24	26.00	87022	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	359.76	20.24	26.00	87019	0.00	0.04	13.4	13.0
25Yr-72Hr	Pond 300	EAST	360.00	20.24	26.00	87017	0.00	0.04	13.4	13.0
25Yr-72Hr	Basin 400	EAST	0.00	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	0.26	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	0.50	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	0.77	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	1.02	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	1.27	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	1.52	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	1.77	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	2.02	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	2.27	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	2.52	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	2.77	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	3.02	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	3.27	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	3.52	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	3.77	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	4.02	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	4.27	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	4.52	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	4.77	20.00	22.00	3485	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	5.02	20.00	22.00	3486	-0.00	0.00	-0.0	0.0
25Yr-72Hr	Basin 400	EAST	5.27	20.00	22.00	3488	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	5.52	20.00	22.00	3490	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	5.77	20.00	22.00	3493	0.00	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	6.02	20.00	22.00	3496	0.01	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	6.27	20.00	22.00	3500	0.01	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	6.52	20.01	22.00	3505	0.01	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	6.77	20.01	22.00	3510	0.01	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	7.02	20.01	22.00	3516	0.01	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	7.27	20.01	22.00	3522	0.01	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	7.52	20.01	22.00	3529	0.01	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	7.77	20.01	22.00	3536	0.01	0.00	0.0	0.0
25Yr-72Hr	Basin 400	EAST	8.02	20.01	22.00	3544	0.01	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	8.27	20.02	22.00	3552	0.01	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	8.52	20.02	22.00	3561	0.01	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	8.77	20.02	22.00	3570	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	9.02	20.02	22.00	3579	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	9.27	20.03	22.00	3589	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	9.52	20.03	22.00	3599	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	9.77	20.03	22.00	3610	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	10.02	20.03	22.00	3621	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	10.27	20.04	22.00	3632	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	10.52	20.04	22.00	3644	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	10.77	20.04	22.00	3656	0.02	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	11.02	20.05	22.00	3669	0.03	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	11.27	20.05	22.00	3682	0.03	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	11.52	20.05	22.00	3695	0.03	0.01	0.0	0.0
25Yr-72Hr	Basin 400	EAST	11.77	20.06	22.00	3708	0.03	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	12.02	20.06	22.00	3722	0.03	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	12.27	20.06	22.00	3736	0.03	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	12.52	20.07	22.00	3750	0.03	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	12.77	20.07	22.00	3765	0.03	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	13.02	20.07	22.00	3780	0.04	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	13.27	20.08	22.00	3795	0.04	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	13.52	20.08	22.00	3810	0.04	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	13.77	20.09	22.00	3825	0.04	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	14.02	20.09	22.00	3841	0.04	0.02	0.0	0.0
25Yr-72Hr	Basin 400	EAST	14.27	20.09	22.00	3857	0.04	0.03	0.0	0.0
25Yr-72Hr	Basin 400	EAST	14.52	20.10	22.00	3873	0.04	0.03	0.0	0.0
25Yr-72Hr	Basin 400	EAST	14.77	20.10	22.00	3889	0.05	0.03	0.0	0.0
25Yr-72Hr	Basin 400	EAST	15.02	20.11	22.00	3905	0.05	0.03	0.0	0.0
25Yr-72Hr	Basin 400	EAST	15.27	20.11	22.00	3922	0.05	0.03	0.0	0.0
25Yr-72Hr	Basin 400	EAST	15.52	20.12	22.00	3939	0.05	0.03	0.0	0.0
25Yr-72Hr	Basin 400	EAST	15.77	20.12	22.00	3956	0.05	0.03	0.0	0.0

SR 710 Big John Monahan Bridge Replacement

Financial Project ID: 419250-2-52-01

- Post-Development Node Time Series

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25Yr-72Hr	Basin 500	EAST	182.01	21.02	23.00	37460	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	182.26	21.02	23.00	37440	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	182.51	21.02	23.00	37420	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	182.76	21.02	23.00	37400	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	183.01	21.02	23.00	37380	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	183.26	21.02	23.00	37360	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	183.51	21.01	23.00	37341	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	183.76	21.01	23.00	37321	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	184.01	21.01	23.00	37301	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	184.26	21.01	23.00	37281	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	184.51	21.01	23.00	37262	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	184.76	21.01	23.00	37242	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	185.01	21.01	23.00	37222	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	185.26	21.01	23.00	37203	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	185.51	21.01	23.00	37183	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	185.76	21.01	23.00	37164	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	186.01	21.01	23.00	37145	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	186.26	21.00	23.00	37125	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	186.51	21.00	23.00	37106	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	186.76	21.00	23.00	37087	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	187.01	21.00	23.00	37068	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	187.26	21.00	23.00	37048	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	187.51	21.00	23.00	37029	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	187.76	21.00	23.00	37006	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	188.01	21.00	23.00	36981	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	188.26	21.00	23.00	36956	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	188.51	21.00	23.00	36932	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	188.76	21.00	23.00	36907	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	189.01	20.99	23.00	36882	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	189.26	20.99	23.00	36858	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	189.51	20.99	23.00	36834	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	189.76	20.99	23.00	36809	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	190.01	20.99	23.00	36785	0.00	0.04	7.3	6.8
25Yr-72Hr	Basin 500	EAST	190.26	20.99	23.00	36761	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	190.51	20.99	23.00	36737	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	190.76	20.99	23.00	36713	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	191.01	20.99	23.00	36688	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	191.26	20.99	23.00	36664	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	191.51	20.99	23.00	36640	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	191.76	20.99	23.00	36617	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	192.01	20.98	23.00	36593	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	192.26	20.98	23.00	36569	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	192.51	20.98	23.00	36545	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	192.76	20.98	23.00	36521	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	193.01	20.98	23.00	36498	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	193.26	20.98	23.00	36474	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	193.51	20.98	23.00	36451	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	193.76	20.98	23.00	36427	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	194.01	20.98	23.00	36404	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	194.26	20.98	23.00	36380	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	194.51	20.98	23.00	36357	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	194.76	20.98	23.00	36334	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	195.01	20.97	23.00	36310	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	195.26	20.97	23.00	36287	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	195.51	20.97	23.00	36264	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	195.76	20.97	23.00	36241	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	196.01	20.97	23.00	36218	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	196.26	20.97	23.00	36195	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	196.51	20.97	23.00	36172	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	196.76	20.97	23.00	36149	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	197.01	20.97	23.00	36126	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	197.26	20.97	23.00	36104	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	197.51	20.97	23.00	36081	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	197.76	20.97	23.00	36058	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	198.01	20.97	23.00	36036	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	198.26	20.96	23.00	36013	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	198.51	20.96	23.00	35990	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	198.76	20.96	23.00	35968	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	199.01	20.96	23.00	35945	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	199.26	20.96	23.00	35923	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	199.51	20.96	23.00	35901	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	199.76	20.96	23.00	35878	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	200.01	20.96	23.00	35856	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	200.26	20.96	23.00	35834	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	200.51	20.96	23.00	35812	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	200.76	20.96	23.00	35790	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	201.01	20.96	23.00	35768	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	201.26	20.95	23.00	35746	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	201.51	20.95	23.00	35724	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	201.76	20.95	23.00	35702	0.00	0.03	7.3	6.8
25Yr-72Hr	Basin 500	EAST	202.01	20.95	23.00	35680	0.00	0.03	7.3	6.8



Wantman Group, Inc.

Engineering ♦ Surveying ♦ Environmental ♦ Planning

SUMMARY

Project: SR 710 Big John Monahan Bridge Replacement
 Financial Project Number: 419250-2-52-01
 County: Martin

Designer: JBS
 Reviewer: JDW
 9/2/2011

WATER QUALITY

Basin:	Required:	Provided:
100A	0.49 ac-ft	0.53 ac-ft
100B	0.34 ac-ft	0.83 ac-ft
200	1.51 ac-ft	1.68 ac-ft
300	2.64 ac-ft	9.09 ac-ft
400B	0.13 ac-ft	0.13 ac-ft
500	0.67 ac-ft	1.63 ac-ft
	5.79 ac-ft	13.87 ac-ft

FLOOD ROUTING

	<u>Pre-Development</u>	<u>Post Development</u>
3 Yr.-24 Hour Storm:		
Basin:	Stage:	Stage:
100A	29.01 ft. NAVD	29.13 ft. NAVD
100B	27.73 ft. NAVD	27.14 ft. NAVD
200		24.57 ft. NAVD
300		21.82 ft. NAVD
400B		21.06 ft. NAVD
500		21.61 ft. NAVD
Discharge West Side:	5.71 cfs	3.96 cfs
Discharge East Side:	4.68 cfs	0.96 cfs
Total Discharge:	10.39 cfs	4.92 cfs



SUMMARY

Project: SR 710 Big John Monahan Bridge Replacement
Financial Project Number: 419250-2-52-01
County: Martin

Designer: JBS
Reviewer: JDW
9/2/2011

	<u>Pre-Development</u>	<u>Post Development</u>
10 Yr.-72 Hour Storm:		
Basin:	Stage:	Stage:
100A	30.33 ft. NAVD	30.27 ft. NAVD
100B	28.51 ft. NAVD	28.41 ft. NAVD
200		25.14 ft. NAVD
300		23.84 ft. NAVD
400B		21.56 ft. NAVD
500		22.51 ft. NAVD

Discharge West Side:	100.79 cfs	82.57 cfs
Discharge East Side:	65.16 cfs	21.26 cfs
Total Discharge:	165.95 cfs	103.83 cfs

	<u>Pre-Development</u>	<u>Post Development</u>
25 Yr.-72 Hour Storm:		
Basin:	Stage:	Stage:
100A	31.08 ft. NAVD	30.99 ft. NAVD
100B	28.79 ft. NAVD	28.83 ft. NAVD
200		25.24 ft. NAVD
300		24.45 ft. NAVD
400B		21.76 ft. NAVD
500		22.69 ft. NAVD

Discharge West Side:	121.58 cfs	95.73 cfs
Discharge East Side:	82.24 cfs	34.20 cfs
Total Discharge:	203.82 cfs	129.93 cfs



Wantman Group, Inc.
Engineering ♦ Surveying ♦ Environmental ♦ Planning

SUMMARY

Project: SR 710 Big John Monahan Bridge Replacement

Financial Project Number: 419250-2-52-01

County: Martin

Designer: JBS

Reviewer: JDW

9/2/2011

RECOVERY

Basin:	Elevation at Recovery (ft-NAVD)	Time at Recovery to Bottom of Ditch or Infield
100A	27.00	96.25
100B	24.00	128.01
200	23.52	360.00
300	20.24	360.00
400B	20.24	360.00
500	21.00	186.26

EAST PROJECT
(SFWMD PERMIT # 50-04716-P)



FORM #0157
Rev. 07/09

**SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE
PERMIT MODIFICATION NO. 50-04716-P
DATE ISSUED: AUGUST 4, 2014**

PERMITTEE: FLORIDA DEPARTMENT OF TRANSPORTATION
(S R 710 MARTIN/P B COUNTY LINE TO PRATT WHITNEY ENTRANCE)
3400 WEST COMMERCIAL BOULEVARD,
FORT LAUDERDALE, FL 33309

ORIGINAL PERMIT ISSUED: NOVEMBER 22, 2000

ORIGINAL PROJECT DESCRIPTION: A SURFACE WATER MANAGEMENT SYSTEM SERVING 1.87 ACRE(S) OF HIGHWAY DEVELOPMENT KNOWN AS SR 710 BEELINE HIGHWAY.

APPROVED MODIFICATION: CONSTRUCTION AND OPERATION OF A PROJECT THAT INCLUDES A STORMWATER MANAGEMENT SYSTEM SERVING 149.93 ACRES OF ROAD DEVELOPMENT, INCLUDING 92.58 ACRES OF WETLAND IMPACTS WITH OFFSITE MITIGATION KNOWN AS SR 710 MARTIN/PALM BEACH COUNTY LINE TO PRATT WHITNEY ENTRANCE.

PROJECT LOCATION: PALM BEACH COUNTY , SECTION 31-33 TWP 40S RGE 40E
SECTION 3-5 TWP 41S RGE 40E, SECTION 10-11 TWP 41S RGE 40E
MARTIN COUNTY , SECTION 30 TWP 40S RGE 40E

PERMIT DURATION: See Special Condition No:1.

This is to notify you of the District's agency action concerning Permit Application No. 131203-1, dated December 2, 2013. This action is taken pursuant to the provisions of Chapter 373, Part IV, Florida Statutes (F.S.).

Based on the information provided, District rules have been adhered to and an Environmental Resource Permit Modification is in effect for this project subject to:

1. Not receiving a filed request for an administrative hearing pursuant to Section 120.57 and Section 120.569, or request a judicial review pursuant Section 120.68, Florida Statutes.
2. The attached 18 General Conditions.
3. The attached 11 Special Conditions.
4. The attached 5 Exhibits.

Should you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Should you wish to object to the proposed agency action or file a petition, please provide written objections, petitions and/or waivers to:

Office of the District Clerk
South Florida Water Management District
Post Office Box 24680
West Palm Beach, FL 33416-4680
e-mail: clerk@sfwmd.gov

Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights", we will assume that you concur with the District's action.

CERTIFICATION OF SERVICE

I HEREBY CERTIFY THAT this written notice has been mailed or electronically submitted to the Permittee (and the persons listed on the attached distribution list) this 5th day of August, 2014, in accordance with Section 120.60(3), F.S. Notice was also electronically posted on this date through a link on the home page of the District's website (my.sfwmd.gov/ePermitting).

By 
DEPUTY CLERK
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Attachments

PAGE 1 OF 15

SPECIAL CONDITIONS

1. The construction phase of this permit shall expire on August 4, 2019.
2. Operation of the stormwater management system shall be the responsibility of the permittee.
3. Discharge Facilities:

Basin: 1, Structure: DS_1_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.2' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.4' NAVD 88.

Receiving body : Public Lands
Control elev : 24.2 feet NAVD 88.

Basin: 1, Structure: DS_1_2

1-49" W X 37" L drop inlet with crest at elev. 25.4' NAVD 88.

Receiving body : Public Lands
Control elev : 24.2 feet NAVD 88.

Basin: 2, Structure: DS_2_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.2' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.74' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.2 feet NAVD 88.

Basin: 2, Structure: DS_2_2

1-49" W X 37" L drop inlet with crest at elev. 25.74' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.2 feet NAVD 88.

Basin: 2, Structure: DS_2_3

1-49" W X 37" L drop inlet with crest at elev. 25.74' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.2 feet NAVD 88.

Basin: 3, Structure: DS_3_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.1' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.31' NAVD 88.

Receiving body : Public Lands
Control elev : 24.1 feet NAVD 88.

Basin: 3, Structure: DS_3_2

1-49" W X 37" L drop inlet with crest at elev. 25.31' NAVD 88.

Receiving body : Public Lands
Control elev : 24.1 feet NAVD 88.

Basin: 4, Structure: DS_4_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.1' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.62' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.1 feet NAVD 88.

Basin: 4, Structure: DS_4_2

1-49" W X 37" L drop inlet with crest at elev. 25.62' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.1 feet NAVD 88.

Basin: 4, Structure: DS_4_3

1-49" W X 37" L drop inlet with crest at elev. 25.62' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.1 feet NAVD 88.

Basin: 4, Structure: DS_4_4

1-49" W X 37" L drop inlet with crest at elev. 25.62' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.1 feet NAVD 88.

Basin: 5, Structure: DS_5_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.07' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.29' NAVD 88.

Receiving body : Public Lands
Control elev : 24.07 feet NAVD 88.

Basin: 5, Structure: DS_5_2

1-49" W X 37" L drop inlet with crest at elev. 25.29' NAVD 88.

Receiving body : Public Lands
Control elev : 24.07 feet NAVD 88.

Basin: 6, Structure: DS_6_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.07' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.54' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.07 feet NAVD 88.

Basin: 6, Structure: DS_6_2

1-49" W X 37" L drop inlet with crest at elev. 25.54' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.07 feet NAVD 88.

Basin: 6, Structure: DS_6_3

1-49" W X 37" L drop inlet with crest at elev. 25.54' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.07 feet NAVD 88.

Basin: 6, Structure: DS_6_4

1-49" W X 37" L drop inlet with crest at elev. 25.54' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.07 feet NAVD 88.

Basin: 7, Structure: DS_7_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.8' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.05' NAVD 88.

Receiving body : Public Lands
Control elev : 23.8 feet NAVD 88.

Basin: 7, Structure: DS_7_2

1-49" W X 37" L drop inlet with crest at elev. 25.05' NAVD 88.

Receiving body : Public Lands
Control elev : 23.8 feet NAVD 88.

Basin: 7, Structure: DS_7_3

1-49" W X 37" L drop inlet with crest at elev. 25.05' NAVD 88.

Receiving body : Public Lands
Control elev : 23.8 feet NAVD 88.

Basin: 7, Structure: DS_7_4

1-49" W X 37" L drop inlet with crest at elev. 25.05' NAVD 88.

Receiving body : Public Lands
Control elev : 23.8 feet NAVD 88.

Basin: 8

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.8' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.37' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.8 feet NAVD 88.

Basin: 9, Structure: DS_9_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.62' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.18' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.62 feet NAVD 88.

Basin: 9, Structure: DS_9_2

1-49" W X 37" L drop inlet with crest at elev. 25.18' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.62 feet NAVD 88.

Basin: 10, Structure: DS_10_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.25' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.53' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.25 feet NAVD 88.

Basin: 10, Structure: DS_10_2

1-49" W X 37" L drop inlet with crest at elev. 24.53' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.25 feet NAVD 88.

Basin: 10, Structure: DS_10_3

1-49" W X 37" L drop inlet with crest at elev. 24.53' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.25 feet NAVD 88.

Basin: 11, Structure: DS_11_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.23' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.68' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.23 feet NAVD 88.

Basin: 11, Structure: DS_11_2

1-49" W X 37" L drop inlet with crest at elev. 24.68' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.23 feet NAVD 88.

Basin: 12, Structure: DS_12_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.07' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.55' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.07 feet NAVD 88.

Basin: 12, Structure: DS_12_2

1-49" W X 37" L drop inlet with crest at elev. 24.55' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.07 feet NAVD 88.

Basin: 12, Structure: DS_12_3

1-49" W X 37" L drop inlet with crest at elev. 24.55' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.07 feet NAVD 88.

Basin: 13, Structure: DS_13_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.07' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.51' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.07 feet NAVD 88.

Basin: 13, Structure: DS_13_2

1-49" W X 37" L drop inlet with crest at elev. 24.51' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.07 feet NAVD 88.

Basin: 13, Structure: DS_13_3

1-49" W X 37" L drop inlet with crest at elev. 24.51' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.07 feet NAVD 88.

Basin: 14, Structure: DS_14_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.83' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.83 feet NAVD 88.

Basin: 14, Structure: DS_14_2

1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.83 feet NAVD 88.

Basin: 14, Structure: DS_14_3

1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.83 feet NAVD 88.

Basin: 15, Structure: DS_15_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.09' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.59' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.09 feet NAVD 88.

Basin: 15, Structure: DS_15_2

1-49" W X 37" L drop inlet with crest at elev. 24.59' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.09 feet NAVD 88.

Basin: 16, Structure: DS_16_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.93' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_2

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_3

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_4

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_5

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_6

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 17, Structure: DS_17_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 17, Structure: DS_17_2

1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 17, Structure: DS_17_3

1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 17, Structure: DS_17_4

1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades

Control elev : 23 feet NAVD 88.

Basin: 17, Structure: DS_17_5

1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 18, Structure: DS-18_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.82' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.82 feet NAVD 88.

Basin: 18, Structure: DS-18_2

1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.82 feet NAVD 88.

Basin: 19

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.7' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.17' NAVD 88.

Receiving body : Offsite Swale
Control elev : 22.7 feet NAVD 88.

Basin: 20

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.95' NAVD 88.
1-40" W X 37" L drop inlet with crest at elev. 24.39' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.95 feet NAVD 88.

Basin: 21

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.95' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.13' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.95 feet NAVD 88.

Basin: 22, Structure: DS-22_2

1-49" W X 37" L drop inlet with crest at elev. 24.25' NAVD 88.

Receiving body : Offsite Ditch

Control elev : 22.8 feet NAVD 88.

Basin: 22, Structure: DS_22_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.8' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.25' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.8 feet NAVD 88.

Basin: 23

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.3' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23 feet NAVD 88.

Basin: 24

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.43' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23 feet NAVD 88.

Basin: 25

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.43' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23 feet NAVD 88.

Basin: 26

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.53' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.01' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.53 feet NAVD 88.

Basin: 27

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.2' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 23.73' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.2 feet NAVD 88.

Basin: 28

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.2' NAVD 88.

1-49" W X 37" L drop inlet with crest at elev. 23.6' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.2 feet NAVD 88.

Basin: 29, Structure: DS_29_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.2' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 23.96' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.2 feet NAVD 88.

Basin: 29, Structure: DS_29_2

1-49" W X 37" L drop inlet with crest at elev. 23.96' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.2 feet NAVD 88.

Basin: 29, Structure: DS_29_3

1-49" W X 37" L drop inlet with crest at elev. 23.96' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.2 feet NAVD 88.

Basin: 30

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.19' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 23.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.19 feet NAVD 88.

Basin: 31

1-3" dia. CIRCULAR ORIFICE with invert at elev. 21.5' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 22.88' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 21.5 feet NAVD 88.

Basin: 32, Structure: DS_32_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.29' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_2

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_3

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_4

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_5

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_6

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

4. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.
5. Prior to the commencement of construction, the limits of construction adjacent to public lands, wetlands and/ or preservation areas shall be staked/roped/fenced to prevent encroachment into the protected areas. The permittee shall notify the District's Environmental Resource Compliance staff in writing upon completion of staking/roping/fencing and schedule an inspection of this work. The staking/roping/fencing shall be subject to District staff approval. The permittee shall modify the staking/roping/fencing if District staff determines that it is insufficient or is not in conformance with the intent of this permit. The staking/roping/fencing shall remain in place until all adjacent construction activities are complete.
6. The District reserves the right to require remedial measures to be taken by the permittee if monitoring or other information demonstrates that adverse impacts to onsite or offsite wetlands, upland conservation areas or buffers, or other surface waters have occurred due to project related activities.
7. Construction of the permitted activities shall be conducted in accordance with Exhibit No. 5.
8. Endangered species, threatened species and/or species of special concern have been observed onsite and/or the project contains suitable habitat for these species. It shall be the permittee's responsibility to coordinate with the Florida

Fish and Wildlife Conservation Commission and/or the U.S. Fish and Wildlife Service for appropriate guidance, recommendations and/or necessary permits to avoid impacts to listed species.

9. A project- specific dewatering plan must be submitted a minimum of two weeks prior to any dewatering to be conducted under FDOT's Master Dewatering Water Use Permit. Dewatering effluent shall be contained on site. At no time shall dewatering effluent be discharged into adjacent wetlands or preserve areas.
10. Prior to the commencement of construction, the permittee shall conduct a pre-construction meeting with field representatives, contractors and District staff. The purpose of the meeting will be to discuss construction methods and sequencing, including type and location of turbidity and erosion controls to be implemented during construction, mobilization and staging of contractor equipment, phasing of construction, methods of vegetation clearing, construction dewatering if required, coordination with other entities on adjacent construction projects, wetland/buffer protection methods, and/or endangered species protection with the permittee and contractors. The permittee shall contact District Environmental Resource Compliance staff from the Martin/St. Lucie Regulatory Office at (863) 462-5260 ext 3613 to schedule the pre-construction meeting.
11. The following exhibits for the permit are incorporated by reference herein and are located in the permit file. In addition, these exhibits can be viewed on the District's ePermitting website under this application number.

Exhibit No. 2.1 Drainage Maps, Typical Sections, Roadway Plan and Profile
Exhibit No. 2.2 Drainage Details, Drainage Structures

The drawings have been signed and sealed electronically by Elizabeth M. Bartell P.E., of TranSystems on June 30, 2014.

GENERAL CONDITIONS

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C. Any deviations that are not so authorized shall subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S. (2012).
2. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with Rule 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.
3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the "State of Florida Erosion and Sediment Control Designer and Reviewer Manual" (Florida Department of Environmental Protection and Florida Department of Transportation June 2007), and the "Florida Stormwater Erosion and Sedimentation Control Inspector's Manual" (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.
4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice" indicating the expected start and completion dates. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.
5. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.
6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
 - a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex- "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit"[Form 62-330.310(3)]; or
 - b. For all other activities- "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
 - c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.
7. If the final operation and maintenance entity is a third party:
 - a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as-built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Applicant's Handbook Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
 - b. Within 30 days of submittal of the as- built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.
8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.
9. This permit does not:
 - a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified

herein or in Chapter 62-330, F.A.C.;

- b. Convey to the permittee or create in the permittee any interest in real property;
 - c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
 - d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.
10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.
 11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.
 12. The permittee shall notify the Agency in writing:
 - a. Immediately if any previously submitted information is discovered to be inaccurate; and
 - b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.
 13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.
 14. If any prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, work involving subsurface disturbance in the immediate vicinity of such discoveries shall cease. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section, at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Such subsurface work shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and notification shall be provided in accordance with Section 872.05, F.S.
 15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.
 16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.
 17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.
 18. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

NOTICE OF RIGHTS

As required by Sections 120.569(1), and 120.60(3), Fla. Stat., the following is notice of the opportunities which may be available for administrative hearing or judicial review when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Not all the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (SFWMD or District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Fla. Stat. Persons seeking a hearing on a SFWMD decision which does or may affect their substantial interests shall file a petition for hearing with the District Clerk within 21 days of receipt of written notice of the decision, unless one of the following shorter time periods apply: 1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Fla. Stat.; or 2) within 14 days of service of an Administrative Order pursuant to Subsection 373.119(1), Fla. Stat. "Receipt of written notice of agency decision" means receipt of either written notice through mail, electronic mail, or posting that the SFWMD has or intends to take final agency action, or publication of notice that the SFWMD has or intends to take final agency action. Any person who receives written notice of a SFWMD decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

FILING INSTRUCTIONS

The Petition must be filed with the Office of the District Clerk of the SFWMD. Filings with the District Clerk may be made by mail, hand-delivery, or e-mail. **Filings by facsimile will not be accepted after October 1, 2014.** A petition for administrative hearing or other document is deemed filed upon receipt during normal business hours by the District Clerk at SFWMD headquarters in West Palm Beach, Florida. Any document received by the office of the District Clerk after 5:00 p.m. shall be filed as of 8:00 a.m. on the next regular business day. Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the District Clerk, P.O. Box 24680, West Palm Beach, Florida 33416.
- Filings by hand-delivery must be delivered to the Office of the District Clerk. **Delivery of a petition to the SFWMD's security desk does not constitute filing. To ensure proper filing, it will be necessary to request the SFWMD's security officer to contact the Clerk's office.** An employee of the SFWMD's Clerk's office will receive and file the petition.
- Filings by e-mail must be transmitted to the District Clerk's Office at clerk@sfwmd.gov. The filing date for a document transmitted by electronic mail shall be the date the District Clerk receives the complete document. A party who files a document by e-mail shall (1) represent that the original physically signed document will be retained by that party for the duration of the proceeding and of any subsequent appeal or subsequent proceeding in that cause and that the party shall produce it upon the request of other parties; and (2) be responsible for any delay, disruption, or interruption of the electronic signals and accepts the full risk that the document may not be properly filed.

INITIATION OF AN ADMINISTRATIVE HEARING

Pursuant to Rules 28-106.201 and 28-106.301, Fla. Admin. Code, initiation of an administrative hearing shall be made by written petition to the SFWMD in legible form and on 8 and 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, SFWMD file number or any other SFWMD identification number, if known.
2. The name, address and telephone number of the petitioner and petitioner's representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency decision.
4. A statement of when and how the petitioner received notice of the SFWMD's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the SFWMD's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the SFWMD's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the SFWMD to take with respect to the SFWMD's proposed action.

A person may file a request for an extension of time for filing a petition. The SFWMD may, for good cause, grant the request. Requests for extension of time must be filed with the SFWMD prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and that the SFWMD and any other parties agree to or oppose the extension. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

If the SFWMD takes action with substantially different impacts on water resources from the notice of intended agency decision, the persons who may be substantially affected shall have an additional point of entry pursuant to Rule 28-106.111, Fla. Admin. Code, unless otherwise provided by law.

MEDIATION

The procedures for pursuing mediation are set forth in Section 120.573, Fla. Stat., and Rules 28-106.111 and 28-106.401-405, Fla. Admin. Code. The SFWMD is not proposing mediation for this agency action under Section 120.573, Fla. Stat., at this time.

RIGHT TO SEEK JUDICIAL REVIEW

Pursuant to Sections 120.60(3) and 120.68, Fla. Stat., a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal pursuant to Florida Rule of Appellate Procedure 9.110 in the Fourth District Court of Appeal or in the appellate district where a party resides and filing a second copy of the notice with the District Clerk within 30 days of rendering of the final SFWMD action.

**FINAL APPROVED BY
EXECUTIVE DIRECTOR
AUGUST 4, 2014**

Last Date For Agency Action: August 29, 2014

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: S R 710 Martin/P B County Line To Pratt Whitney Entrance
Permit No.: 50-04716-P
Application No.: 131203-1
Application Type: Environmental Resource (Construction/Operation Modification)
Location: Palm Beach County, S31-33/T40S/R40E
S3-5/T41S/R40E
S10-11, 13-14/T41S/R40E
Location: Martin County, S30/T40S/R40E
Permittee : Florida Department Of Transportation
Operating Entity : Permittee
Project Area: 149.93 acres
Permit Area: 149.93 acres
Project Land Use: Highway
Special Drainage District: NA

Total Acres Wetland Onsite: 92.58
Total Acres Impacted Onsite : 92.58
Offsite Mitigation Credits-Mit.Bank: 66.53 Bluefield Ranch
Conservation Easement To District : No
Sovereign Submerged Lands: No

PROJECT PURPOSE:

This application is a request for an Environmental Resource Permit to authorize construction and operation of a project that includes a stormwater management system serving 149.93 acres of road development, including 92.58 acres of wetland impacts with offsite mitigation.

PROJECT EVALUATION:**PROJECT SITE DESCRIPTION:**

The site is located in northern Palm Beach County from just northwest of the Martin-Palm Beach County line to the Pratt Whitney entrance road (0.8 miles northwest of County Road 711/ Pratt Whitney Road) and is within the District's Palmar, L-8 and C-18 Basins. The site includes the existing 5.7 miles of State Road (SR) 710, consisting of two, twelve-foot lanes. The existing Florida Department of Transportation (FDOT) right of way is 225 feet wide northwest of Indiantown Road, and 200 feet wide from Indiantown Road to the end of the project, and will accommodate the proposed project systems. Please refer to Exhibits 1.1 and 1.2 for general and detailed location maps, respectively.

The existing surrounding land uses are conservation lands, industrial, and low density residential. The SR 710 alignment runs on the north side and parallel to the CSX railroad.

The existing roadway was constructed prior to District stormwater management regulations; therefore, there are no permitted stormwater management facilities within the project limits. Under current conditions, stormwater runoff from the existing roadway flows over grassed shoulders into wetlands located on both sides of SR 710. The wetland/swale on the south side is confined by the CSX railroad tracks and SR 710. The north wetlands are not confined and are hydrologically contiguous with adjacent preserved lands in Hungryland Wildlife and Environmental Area and Pine Glades Natural Area and with privately-owned lands adjacent to SR710.

PROPOSED PROJECT:

Authorization is requested for the construction and operation of a project that includes a stormwater management system associated with the widening of an existing roadway [State Route (SR) 710] from the Martin/Palm Beach County Line to the Pratt & Whitney entrance. The existing roadway will be widened from a two-lane roadway to a four-lane divided rural roadway. The proposed SR 710 typical section generally consists of two 12-foot lanes in each direction with 12-foot outside shoulders (5 feet paved) and 8-foot inside shoulders (2 feet paved) and is divided by a 40-foot median. The project also includes improvements to the intersection of SR 710 and Indiantown Road.

Runoff from the roadway will overland sheet flow to roadside swales, with 1:6 front slopes and 1:3 back slopes, provided along each side of the roadway, where water quality treatment and storm attenuation will be provided. The treatment swales are dry detention systems that will treat and attenuate on-site runoff within the existing right-of-way. The swales discharge to wetlands/natural areas within the Pine Glades or public lands north of SR 710, or the offsite-ditch between SR 710 and the CSX roadway. The off-site ditch between SR 710 and the railroad is connected to Pine Glades and public lands via cross drains. All existing cross drains within the project area have been extended or replaced to maintain existing drainage patterns.

The proposed outlet control structures have been located at the low-lying areas of the adjacent wetlands. Endwalls with baffles are proposed at the points of discharge to dissipate energy and reduce the possibility of erosion. Please see Exhibit 2.2 for the drainage structure design details.

The following exhibits for the permit are incorporated by reference herein and are located in the permit file. In addition, these exhibits can be viewed on the District's ePermitting website under this application number. The plans were prepared by TranSystems, and dated June 30, 2014.

Exhibit No. 2.1: Drainage Maps (Sheets 2-6), Typical Sections (Sheets 7-8), Roadway Plan and Profile (Sheets 9-32).

Exhibit No. 2.2: Drainage Details (Sheet 33), Drainage Structures (Sheets 34-91), and Cross Sections (Sheets 92-251).

LAND USE:

Construction

Basin : 1

Total Basin

Impervious	2.27	acres
Pervious	5.68	acres
Total:	7.95	

Basin : 10

Total Basin

Impervious	2.58	acres
Pervious	5.63	acres
Total:	8.21	

Basin : 11

Total Basin

Impervious	1.77	acres
Pervious	3.40	acres
Total:	5.17	

Basin : 12

Total Basin

Impervious	1.52	acres
Pervious	3.18	acres
Total:	4.70	

Basin : 13

Total Basin

Impervious	1.46	acres
Pervious	3.24	acres
Total:	4.70	

Basin : 14

Basin : 14

Total Basin

Impervious	2.38	acres
Pervious	5.29	acres
Total:	7.67	

Basin : 15

Total Basin

Impervious	1.51	acres
Pervious	3.22	acres
Total:	4.73	

Basin : 16

Total Basin

Impervious	4.87	acres
Pervious	10.28	acres
Total:	15.15	

Basin : 17

Total Basin

Impervious	1.02	acres
Pervious	1.75	acres
Total:	2.77	

Basin : 18

Total Basin

Impervious	1.22	acres
Pervious	2.48	acres
Total:	3.70	

Basin : 19

Total Basin

Impervious	.77	acres
Pervious	1.37	acres
Total:	2.14	

Basin : 2

Basin : 2

Total Basin

Impervious	1.80	acres
Pervious	4.56	acres
Total:	6.36	

Basin : 20

Total Basin

Impervious	.36	acres
Pervious	.70	acres
Total:	1.06	

Basin : 21

Total Basin

Impervious	.72	acres
Pervious	1.54	acres
Total:	2.26	

Basin : 22

Total Basin

Impervious	2.05	acres
Pervious	3.50	acres
Total:	5.55	

Basin : 23

Total Basin

Impervious	.28	acres
Pervious	.38	acres
Total:	.66	

Basin : 24

Total Basin

Impervious	.81	acres
Pervious	1.44	acres
Total:	2.25	

Basin : 25

Basin : 25

Total Basin

Impervious	.16	acres
Pervious	.25	acres
Total:	.41	

Basin : 26

Total Basin

Impervious	.16	acres
Pervious	.30	acres
Total:	.46	

Basin : 27

Total Basin

Impervious	.15	acres
Pervious	.27	acres
Total:	.42	

Basin : 28

Total Basin

Impervious	.84	acres
Pervious	1.66	acres
Total:	2.50	

Basin : 29

Total Basin

Impervious	1.09	acres
Pervious	1.18	acres
Total:	2.27	

Basin : 3

Total Basin

Impervious	2.21	acres
Pervious	6.69	acres
Total:	8.90	

Basin : 30

Basin : 30

Total Basin

Impervious	.37	acres
Pervious	.62	acres
Total:	.99	

Basin : 31

Total Basin

Impervious	.39	acres
Pervious	.64	acres
Total:	1.03	

Basin : 32

Total Basin

Impervious	3.96	acres
Pervious	6.60	acres
Total:	10.56	

WATER QUANTITY :**Discharge Rate :**

For the proposed drainage basins comprising the project area, the applicant's engineer submitted calculations demonstrating that the post-development discharge rates will be less than under existing conditions. Please refer to Exhibit 2.3 (Table V.4.2 from the Drainage Report for the subject project, dated June 26, 2014, as prepared by Transystems).

Road Design :

The minimum road elevation have been set at or above the 25 year 3 day storm elevation.

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NAVD 88)	WSWT Ctrl Elev (ft, NAVD 88)	Method Of Determination
1	7.95	24.2		Monitoring Data
2	6.36	24.2		Monitoring Data
3	8.90	24.1		Monitoring Data
4	7.12	24.1		Monitoring Data
5	9.48	24.07		Monitoring Data
6	7.59	24.07		Monitoring Data
7	8.17	23.8		Monitoring Data
8	1.46	23.8		Monitoring Data
9	3.54	23.62		Monitoring Data
10	8.21	23.25		Monitoring Data
11	5.17	23.23		Monitoring Data
12	4.70	23.07		Monitoring Data
13	4.70	23.07		Monitoring Data
14	7.67	22.83		Monitoring Data
15	4.73	23.09		Monitoring Data
16	15.15	22.93		Monitoring Data
17	2.77	23		Monitoring Data
18	3.70	22.82		Monitoring Data
19	2.14	22.7		Monitoring Data
20	1.06	22.95		Monitoring Data
21	2.26	22.95		Monitoring Data
22	5.55	22.8		Monitoring Data
23	.66	23		Monitoring Data
24	2.25	23		Monitoring Data
25	.41	23		Monitoring Data
26	.46	22.53		Monitoring Data
27	.42	22.2		Monitoring Data
28	2.50	22.2		Monitoring Data
29	2.27	22.2		Monitoring Data
30	.99	22.19		Monitoring Data
31	1.03	21.5		Monitoring Data
32	10.56	22.29		Monitoring Data

Receiving Body :

Basin	Str.#	Receiving Body
1	DS_1_1	Public Lands
1	DS_1_2	Public Lands
2	DS_2_1	Offsite Ditch
2	DS_2_2	Offsite Ditch
2	DS_2_3	Offsite Ditch

Receiving Body :

Basin	Str.#	Receiving Body
3	DS_3_1	Public Lands
3	DS_3_2	Public Lands
4	DS_4_1	Offsite Ditch
4	DS_4_2	Offsite Ditch
4	DS_4_3	Offsite Ditch
4	DS_4_4	Offsite Ditch
5	DS_5_1	Public Lands
5	DS_5_2	Public Lands
6	DS_6_1	Offsite Ditch
6	DS_6_2	Offsite Ditch
6	DS_6_3	Offsite Ditch
6	DS_6_4	Offsite Ditch
7	DS_7_1	Public Lands
7	DS_7_2	Public Lands
7	DS_7_3	Public Lands
7	DS_7_4	Public Lands
8	DS_8_1	Offsite Ditch
9	DS_9_1	Offsite Ditch
9	DS_9_2	Offsite Ditch
10	DS_10_1	Pine Glades
10	DS_10_2	Pine Glades
10	DS_10_3	Pine Glades
11	DS_11_1	Offsite Ditch
11	DS_11_2	Offsite Ditch
12	DS_12_1	Pine Glades
12	DS_12_2	Pine Glades
12	DS_12_3	Pine Glades
13	DS_13_1	Offsite Ditch
13	DS_13_2	Offsite Ditch
13	DS_13_3	Offsite Ditch
14	DS_14_1	Pine Glades
14	DS_14_2	Pine Glades
14	DS_14_3	Pine Glades
15	DS_15_1	Pine Glades
15	DS_15_2	Pine Glades
16	DS_16_1	Offsite Ditch
16	DS_16_2	Offsite Ditch
16	DS_16_3	Offsite Ditch
16	DS_16_4	Offsite Ditch
16	DS_16_5	Offsite Ditch
16	DS_16_6	Offsite Ditch
17	DS_17_1	Pine Glades
17	DS_17_2	Pine Glades
17	DS_17_3	Pine Glades
17	DS_17_4	Pine Glades
17	DS_17_5	Pine Glades
18	DS-18_1	Pine Glades
18	DS-18_2	Pine Glades
19	DS_19_1	Offsite Swale
20	DS_20_1	Offsite Ditch

Receiving Body :

Basin	Str.#	Receiving Body
21	DS_21_1	Offsite Ditch
22	DS-22_2	Offsite Ditch
22	DS_22_1	Offsite Ditch
23	DS_23_1	Offsite Ditch
24	DS_24_1	Offsite Ditch
25	DS_25_1	Offsite Ditch
26	DS-26_1	Offsite Ditch
27	DS_27_1	Offsite Ditch
28	DS_28_1	Offsite Ditch
29	DS_29_1	Offsite Ditch
29	DS_29_2	Offsite Ditch
29	DS_29_3	Offsite Ditch
30	DS_30_1	Offsite Ditch
31	DS_31_1	Offsite Ditch
32	DS_32_1	Offsite Ditch
32	DS_32_2	Offsite Ditch
32	DS_32_3	Offsite Ditch
32	DS_32_4	Offsite Ditch
32	DS_32_5	Offsite Ditch
32	DS_32_6	Offsite Ditch

Discharge Structures: Note: The units for all the elevation values of structures are (ft, NAVD 88)

Bleeders:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev.
1	DS_1_1	1	Circular Orifice				3"		24.2
10	DS_10_1	1	Circular Orifice				3"		23.25
11	DS_11_1	1	Circular Orifice				3"		23.23
12	DS_12_1	1	Circular Orifice				3"		23.07
13	DS_13_1	1	Circular Orifice				3"		23.07
14	DS_14_1	1	Circular Orifice				3"		22.83
15	DS_15_1	1	Circular Orifice				3"		23.09
16	DS_16_1	1	Circular Orifice				3"		22.93
17	DS_17_1	1	Circular Orifice				3"		23
18	DS-18_1	1	Circular Orifice				3"		22.82
19	DS_19_1	1	Circular Orifice				3"		22.7
2	DS_2_1	1	Circular Orifice				3"		24.2
20	DS_20_1	1	Circular Orifice				3"		22.95
21	DS_21_1	1	Circular Orifice				3"		22.95
22	DS_22_1	1	Circular Orifice				3"		22.8
23	DS_23_1	1	Circular Orifice				3"		23
24	DS_24_1	1	Circular Orifice				3"		23
25	DS_25_1	1	Circular Orifice				3"		23
26	DS-26_1	1	Circular Orifice				3"		22.53
27	DS_27_1	1	Circular Orifice				3"		22.2
28	DS_28_1	1	Circular Orifice				3"		22.2
29	DS_29_1	1	Circular Orifice				3"		22.2
3	DS_3_1	1	Circular Orifice				3"		24.1
30	DS_30_1	1	Circular Orifice				3"		22.19
31	DS_31_1	1	Circular Orifice				3"		21.5

Discharge Structures:**Bleeders:**

32	DS_32_1	1	Circular Orifice	3"	22.29
4	DS_4_1	1	Circular Orifice	3"	24.1
5	DS_5_1	1	Circular Orifice	3"	24.07
6	DS_6_1	1	Circular Orifice	3"	24.07
7	DS_7_1	1	Circular Orifice	3"	23.8
8	DS_8_1	1	Circular Orifice	3"	23.8
9	DS_9_1	1	Circular Orifice	3"	23.62

Inlets:

Basin	Str#	Count	Type	Width	Length	Dia.	Crest Elev.
1	DS_1_1	1	Fdot Mod D Drop Inlet	49"	37"		25.4
1	DS_1_2	1	Fdot Mod D Drop Inlet	49"	37"		25.4
10	DS_10_1	1	Fdot Mod D Drop Inlet	49"	37"		24.53
10	DS_10_2	1	Fdot Mod D Drop Inlet	49"	37"		24.53
10	DS_10_3	1	Fdot Mod D Drop Inlet	49"	37"		24.53
11	DS_11_1	1	Fdot Mod D Drop Inlet	49"	37"		24.68
11	DS_11_2	1	Fdot Mod D Drop Inlet	49"	37"		24.68
12	DS_12_1	1	Fdot Mod D Drop Inlet	49"	37"		24.55
12	DS_12_2	1	Fdot Mod D Drop Inlet	49"	37"		24.55
12	DS_12_3	1	Fdot Mod D Drop Inlet	49"	37"		24.55
13	DS_13_1	1	Fdot Mod D Drop Inlet	49"	37"		24.51
13	DS_13_2	1	Fdot Mod D Drop Inlet	49"	37"		24.51
13	DS_13_3	1	Fdot Mod D Drop Inlet	49"	37"		24.51
14	DS_14_1	1	Fdot Mod D Drop Inlet	49"	37"		24.31
14	DS_14_2	1	Fdot Mod D Drop Inlet	49"	37"		24.31
14	DS_14_3	1	Fdot Mod D Drop Inlet	49"	37"		24.31
15	DS_15_1	1	Fdot Mod D Drop Inlet	49"	37"		24.59
15	DS_15_2	1	Fdot Mod D Drop Inlet	49"	37"		24.59
16	DS_16_1	1	Fdot Mod D Drop Inlet	49"	37"		24.58
16	DS_16_2	1	Fdot Mod D Drop Inlet	49"	37"		24.58
16	DS_16_3	1	Fdot Mod D Drop Inlet	49"	37"		24.58
16	DS_16_4	1	Fdot Mod D Drop Inlet	49"	37"		24.58
16	DS_16_5	1	Fdot Mod D Drop Inlet	49"	37"		24.58
16	DS_16_6	1	Fdot Mod D Drop Inlet	49"	37"		24.58
17	DS_17_1	1	Fdot Mod D Drop Inlet	49"	37"		24.61
17	DS_17_2	1	Fdot Mod D Drop Inlet	49"	37"		24.61
17	DS_17_3	1	Fdot Mod D Drop Inlet	49"	37"		24.61
17	DS_17_4	1	Fdot Mod D Drop Inlet	49"	37"		24.61
17	DS_17_5	1	Fdot Mod D Drop Inlet	49"	37"		24.61
18	DS-18_1	1	Fdot Mod D Drop Inlet	49"	37"		24.31
18	DS-18_2	1	Fdot Mod D Drop Inlet	49"	37"		24.31
19	DS_19_1	1	Fdot Mod D Drop Inlet	49"	37"		24.17
2	DS_2_1	1	Fdot Mod D Drop Inlet	49"	37"		25.74
2	DS_2_2	1	Fdot Mod D Drop Inlet	49"	37"		25.74
2	DS_2_3	1	Fdot Mod D Drop Inlet	49"	37"		25.74
20	DS_20_1	1	Fdot Mod D Drop Inlet	40"	37"		24.39
21	DS_21_1	1	Fdot Mod D Drop Inlet	49"	37"		24.13
22	DS-22_2	1	Fdot Mod D Drop Inlet	49"	37"		24.25
22	DS_22_1	1	Fdot Mod D Drop Inlet	49"	37"		24.25

Discharge Structures:**Inlets:**

23	DS_23_1	1	Fdot Mod D Drop Inlet	49"	37"	24.3
24	DS_24_1	1	Fdot Mod D Drop Inlet	49"	37"	24.43
25	DS_25_1	1	Fdot Mod D Drop Inlet	49"	37"	24.43
26	DS_26_1	1	Fdot Mod D Drop Inlet	49"	37"	24.01
27	DS_27_1	1	Fdot Mod D Drop Inlet	49"	37"	23.73
28	DS_28_1	1	Fdot Mod D Drop Inlet	49"	37"	23.6
29	DS_29_1	1	Fdot Mod D Drop Inlet	49"	37"	23.96
29	DS_29_2	1	Fdot Mod D Drop Inlet	49"	37"	23.96
29	DS_29_3	1	Fdot Mod D Drop Inlet	49"	37"	23.96
3	DS_3_1	1	Fdot Mod D Drop Inlet	49"	37"	25.31
3	DS_3_2	1	Fdot Mod D Drop Inlet	49"	37"	25.31
30	DS_30_1	1	Fdot Mod D Drop Inlet	49"	37"	23.58
31	DS_31_1	1	Fdot Mod D Drop Inlet	49"	37"	22.88
32	DS_32_1	1	Fdot Mod D Drop Inlet	49"	37"	23.79
32	DS_32_2	1	Fdot Mod D Drop Inlet	49"	37"	23.79
32	DS_32_3	1	Fdot Mod D Drop Inlet	49"	37"	23.79
32	DS_32_4	1	Fdot Mod D Drop Inlet	49"	37"	23.79
32	DS_32_5	1	Fdot Mod D Drop Inlet	49"	37"	23.79
32	DS_32_6	1	Fdot Mod D Drop Inlet	49"	37"	23.79
4	DS_4_1	1	Fdot Mod D Drop Inlet	49"	37"	25.62
4	DS_4_2	1	Fdot Mod D Drop Inlet	49"	37"	25.62
4	DS_4_3	1	Fdot Mod D Drop Inlet	49"	37"	25.62
4	DS_4_4	1	Fdot Mod D Drop Inlet	49"	37"	25.62
5	DS_5_1	1	Fdot Mod D Drop Inlet	49"	37"	25.29
5	DS_5_2	1	Fdot Mod D Drop Inlet	49"	37"	25.29
6	DS_6_1	1	Fdot Mod D Drop Inlet	49"	37"	25.54
6	DS_6_2	1	Fdot Mod D Drop Inlet	49"	37"	25.54
6	DS_6_3	1	Fdot Mod D Drop Inlet	49"	37"	25.54
6	DS_6_4	1	Fdot Mod D Drop Inlet	49"	37"	25.54
7	DS_7_1	1	Fdot Mod D Drop Inlet	49"	37"	25.05
7	DS_7_2	1	Fdot Mod D Drop Inlet	49"	37"	25.05
7	DS_7_3	1	Fdot Mod D Drop Inlet	49"	37"	25.05
7	DS_7_4	1	Fdot Mod D Drop Inlet	49"	37"	25.05
8	DS_8_1	1	Fdot Mod D Drop Inlet	49"	37"	25.37
9	DS_9_1	1	Fdot Mod D Drop Inlet	49"	37"	25.18
9	DS_9_2	1	Fdot Mod D Drop Inlet	49"	37"	25.18

WATER QUALITY :

The proposed project is providing water quality treatment volume equivalent to the greater of one inch over the basin area or 2.5 inches times the proposed impervious area. The required water quality treatment volume for Basins 9 and 29 is 2.5 inches over the impervious area. The required water quality treatment volume for the remaining 30 drainage basins comprising the project area is one inch over the basin area.

The required water quality treatment is provided in roadside swales to be located on both sides of SR 710. The swale bottom elevations were placed one foot above the seasonal high water table elevations. The swales have been designed with outlet control structures, which will allow treated stormwater to discharge into the adjacent wetlands. Dry detention systems (swales) are designed to recover 50% of the required treatment volume within 24 hours through the inclusion of three-inch circular bleeders in the

outlet control structures. Endwalls with baffles are proposed at the points of discharge to dissipate energy and reduce the possibility of erosion. The outlet control structures have been located at the low-lying areas of the adjacent wetlands.

No adverse water quality impacts are anticipated as a result of the proposed project. Best management practices are identified on the plans to prevent sedimentation and discharges of turbid water outside of the project limits during construction.

Basin	Treatment Method		Vol Req.d (ac-ft)	Vol Prov'd
1	Treatment	Dry Detention	2.09 acres .5	.5
2	Treatment	Dry Detention	.37 acres .4	.4
3	Treatment	Dry Detention	2.21 acres .56	.56
4	Treatment	Dry Detention	.44 acres .45	.45
5	Treatment	Dry Detention	2.19 acres .59	.59
6	Treatment	Dry Detention	.56 acres .47	.47
7	Treatment	Dry Detention	1.46 acres .51	.51
8	Treatment	Dry Detention	.07 acres .09	.09
9	Treatment	Dry Detention	.22 acres .23	.23
10	Treatment	Dry Detention	1.18 acres .51	.51
11	Treatment	Dry Detention	.41 acres .32	.32
12	Treatment	Dry Detention	.4 acres .29	.29
13	Treatment	Dry Detention	.4 acres .29	.29
14	Treatment	Dry Detention	.48 acres .48	.48
15	Treatment	Dry Detention	.27 acres .3	.3
16	Treatment	Dry Detention	.77 acres .95	.95
17	Treatment	Dry Detention	.1 acres .17	.17
18	Treatment	Dry Detention	.22 acres .23	.23
19	Treatment	Dry Detention	.14 acres .13	.13
20	Treatment	Dry Detention	.08 acres .07	.07
21	Treatment	Dry Detention	.49 acres .14	.14
22	Treatment	Dry Detention	.44 acres .35	.35
23	Treatment	Dry Detention	.1 acres .04	.04
24	Treatment	Dry Detention	.17 acres .14	.14
25	Treatment	Dry Detention	.03 acres .03	.03
26	Treatment	Dry Detention	.03 acres .03	.03
27	Treatment	Dry Detention	.02 acres .03	.03
28	Treatment	Dry Detention	.22 acres .16	.16
29	Treatment	Dry Detention	.09 acres .17	.17
30	Treatment	Dry Detention	.09 acres .06	.06
31	Treatment	Dry Detention	.1 acres .06	.06
32	Treatment	Dry Detention	.72 acres .66	.66

WETLANDS:

Wetland Impacts:

Widening of SR 710 will result in 92.58 acres of direct wetland impacts and 50.69 acres of secondary impacts.

The wetlands that will be directly impacted are all located within the existing FDOT right of way. Northwest of Indiantown Road, the wetland impacts extend approximately 75 feet on the northeast side of SR 710 and 100 feet on the southwest side of SR 710. From Indiantown Road to the end of the project, wetlands extend approximately 100 to 110 feet northeast the existing road and 40 to 45 feet southwest of the existing road. Exhibit 3 indicates the extent of wetland impacts. Wetlands within the project area include marshes, wet prairies, hydric pine flatwoods, cypress and shrub communities. These wetlands vary in quality. Many of these wetlands are contiguous with offsite wetlands, many of which are preserved within Hungryland Wildlife and Environmental Area and Pine Glades Natural Area.

Generally, wetlands southwest of the existing roadway consist of marsh and scrub- shrub that was recently temporarily disturbed by FPL's project to construct a natural gas pipeline parallel to SR 710. These systems are located between the roadway and the CSX Railroad with little hydrologic connectivity to the southwest. They do provide forage habitat and wading birds and water storage functions.

The wetlands on the northeast side of SR 710 vary from shrubby, disturbed areas to high- functioning marshes, wet prairies and hydric pine flatwoods contiguous with natural areas managed by Palm Beach County. Immediately adjacent to the road, wetlands contain higher levels of exotic and nuisance species, road debris, and garbage, and some evidence of degraded water quality and fire suppression.

During the planning stages of this project, FDOT reduced wetland impacts by eliminating a paved, multi-use path that would have required the acquisition of additional lands (mostly wetland) for the path and/ or stormwater facilities; reducing the project to four lanes in each direction, rather than six lanes; and reducing the median width to 40 feet. This median width is narrower than the SR 710 median in the existing four lane section southeast of the project limits. Impacts are also reduced as a result of the License Agreement with Palm Beach County to allow FDOT to discharge stormwater (after the required water quality treatment is achieved) into the preserve lands, rather than having to acquire preserve lands to create stormwater ponds. These offsite wetlands currently receive flow from SR 710.

Additional reductions in the scope of the project to reduce wetland impacts would adversely affect public safety. Thus, this project meets the requirements of Section 10.2.1 of Applicant's Handbook Volume I.

The discharge structures from the project detention areas have been designed to reduce scour in the adjacent wetlands. Where velocities exceed two feet/second, riprap will be installed at the outfall.

Environmentally sensitive land and wetlands exist immediately adjacent to the project. Because the wetlands to be impacted are contiguous with additional wetlands outside of the right of way, construction methods must include containment of existing surface water in addition to implementation of best management practices for water quality protection. Sedimentation and discharge of turbid water must not occur within preserved lands. Additionally, to prevent encroachment during construction, the right of way limits shall be staked/ fenced/ marked to create a visible boundary. No equipment, material storage, vehicles, or dumping of debris shall occur outside of the project limits. See Exhibit 5 and the special conditions.

Mitigation Proposal:

To offset the wetland impacts, FDOT has purchased 48.09 herbaceous and 18.44 forested credits from Bluefield Ranch Mitigation Bank (Exhibit 4). This mitigation bank is located in St. Lucie and Martin Counties. It's service area does not cover the project area; however, pursuant to Section

373.4136(6)(d)(2), this linear project is eligible to use a mitigation bank, regardless of its service area, as long as the impacts are offset and the project does not result in an unacceptable cumulative impact.

The amount of mitigation required was determined by scoring the impact areas using the Wetland Rapid Assessment Procedure (WRAP), and multiplying the score by the acres of impact. The WRAP scores ranged from 0.2 to 0.82. Secondary impacts were calculated for the area 50 feet beyond the direct impacts on the northeast side of SR 710 and 25 feet beyond the direct impacts southwest side. The WRAP score sheets can be found in the ePermitting file. A summary of the scores is included as Exhibit 5.

Cumulative Impact Assessment:

Since the mitigation is not located within the same basin as the wetland impacts, a cumulative impact analysis was conducted of the freshwater wetlands within the Loxahatchee River Basin. This analysis can be found in the permit file.

The analysis identified freshwater wetlands in the Basin that were not protected by land use restrictions or dedicated as public preserve land, as "at risk". Wetlands preserved/protected accounted for 80% of all wetlands in the Basin. Based on the applicant's analysis, if all "at risk" wetlands within the Basin were impacted and all mitigation was conducted outside the Basin, a loss of 20 percent of wetland acreage in the Basin would occur. Actual losses are likely to be considerably less, however, due to the following considerations:

(1) Wetlands located within Martin County are subject to that County's wetland protection requirements, which do not allow for wetland impacts in most situations. Wetland impacts that do occur in Martin County are likely to be small and are most often offset through on-site, in-basin mitigation.

(2) The percentage of wetland impacts leaving the Basin for this project is 100%, due to the linear nature of the project. Unlike other projects, linear projects typically do not have land available for on-site mitigation. Future non-linear projects may have a combination of in-basin and out-of-basin mitigation, which would result in a lower percentage of wetland losses.

(3) All projects must demonstrate that the reduction and elimination rules (Section 10.2.1, Applicant's Handbook Volume I) are met. High-quality wetlands are likely to be preserved.

(4) Owners of the parcels with larger acreages of at-risk wetlands identified in the assessment have more opportunities for on-site, in-basin mitigation.

Considering these and other factors, the applicant's analysis estimates that potential losses to the Basin could be approximately 11%.

Based on the analysis provided, the District has determined that the potential for cumulative impacts to the Loxahatchee River Basin is low, and that the project will not result in unacceptable cumulative impacts. This conclusion is project-specific and does not necessarily apply to any other application.

Wetland Inventory :

CONSTRUCTION MOD -Direct Impacts

Site Id	Site Type	Pre-Development				Post-Development						
		Pre Fluc cs	AA Type	Acreage (Acres)	Current Wo Pres	With Project	Time Lag (Yrs)	Risk Factor	Pres. Adj. Factor	Post Fluc cs	Adj Delta	Functional Gain / Loss
619N	ON	643	Direct	.26							.000	.000
6219N	ON	621	Direct	4.17							.000	.000
621N	ON	621	Direct	1.27							.000	.000
6259N	ON	625	Direct	2.27							.000	.000
625N	ON	625	Direct	18.73							.000	.000
6319N	ON	631	Direct	4.20							.000	.000
6319S	ON	631	Direct	.89							.000	.000
631N	ON	631	Direct	5.65							.000	.000
631S	ON	631	Direct	7.76							.000	.000
640N	ON	643	Direct	.48							.000	.000
641N	ON	641	Direct	8.30							.000	.000
641S	ON	641	Direct	22.77							.000	.000
6437N	ON	643	Direct	8.47							.000	.000
643N	ON	643	Direct	7.36							.000	.000
Total:				92.58								.00

Wetland Inventory :

CONSTRUCTION MOD -Secondary impacts

Site Id	Site Type	Pre-Development				Post-Development						
		Pre Fluc cs	AA Type	Acreage (Acres)	Current Wo Pres	With Project	Time Lag (Yrs)	Risk Factor	Pres. Adj. Factor	Post Fluc cs	Adj Delta	Functional Gain / Loss
NPr	OFF	640	Secondary	7.68							.000	.000
NPub	OFF	640	Secondary	16.04							.000	.000
NPub	OFF	625	Secondary	7.04							.000	.000
Npr	OFF	625	Secondary	2.84							.000	.000
S	OFF	641	Secondary	17.09							.000	.000
Total:				50.69								.00

<u>Fluc cs Code</u>	<u>Description</u>
621	Cypress
625	Hydric Pine Flatwoods
631	Wetland Scrub
640	Vegetated Non-Forested Wetlands
641	Freshwater Marshes
643	Wet Prairies

MITBANK		BLUEFIELD RANCH	
Type Of Credits		Number Of Credits	
		Mitigation Bank Cr Used	
Fresh Water Forested		18.44	
Fresh Water Herbaceous		48.09	
Total:		66.53	

Wildlife Issues:

The project corridor was identified as potential nesting and foraging habitat for listed wetland- dependent wildlife. Specifically, the wood stork, Audubon's crested caracara, (both Federally- designated as threatened), sandhill cranes (state- designated as threatened) and other wading birds designated as State Species of Special Concern.

Repeated surveys of the project area for nesting birds, particularly listed species, were conducted by FDOT's consultants. No nests were observed within the project area. Foraging by sandhill cranes and other wading birds is regularly observed and foraging by the caracara is likely.

The FDOT has made commitments to re-survey the project corridor prior to construction and implement nest protection protocols during construction if nests are observed. The U.S. Fish and Wildlife Service has determined that the project may affect, but is not likely to adversely affect the wood stork and the caracara.

Additionally, the mitigation provided will offset impacts to foraging habitat for the wood stork, sandhill crane and other species that forage within the project area. Replacement detention swales will also provide foraging habitat for wading birds similar to that found on the southwest side of SR 710.

Species	Potential Occurrence	Use Types
Caracara	Known Range	Foraging Nesting
Sandhill Cranes	Observed	Foraging
Wood Stork	Preferred Habitat	Foraging

LEGAL ISSUES:

A License Agreement has been executed between Palm Beach County Board of County Commissioners and FDOT that allows for the discharge of water from the project to Palm Beach County preserve lands (see permit file).

CERTIFICATION, OPERATION, AND MAINTENANCE:

Pursuant to Chapter 62-330.310 Florida Administrative Code (F.A.C.), Individual Permits will not be converted from the construction phase to the operation phase until construction completion certification of the project is submitted to and accepted by the District. This includes compliance with all permit conditions, except for any long term maintenance and monitoring requirements. It is suggested that the permittee retain the services of an appropriate professional registered in the State of Florida for periodic observation of construction of the project.

For projects permitted with an operating entity that is different from the permittee, it should be noted that until the construction completion certification is accepted by the District and the permit is transferred to an

acceptable operating entity pursuant to Sections 12.1-12.3 of the Applicant's Handbook Volume I and Section 62-330.310, F.A.C., the permittee is liable for operation and maintenance in compliance with the terms and conditions of this permit.

In accordance with Section 373.416(2), F.S., unless revoked or abandoned, all stormwater management systems and works permitted under Part IV of Chapter 373, F.S., must be operated and maintained in perpetuity.

The efficiency of stormwater management systems, dams, impoundments, and most other project components will decrease over time without periodic maintenance. The operation and maintenance entity must perform periodic inspections to identify if there are any deficiencies in structural integrity, degradation due to insufficient maintenance, or improper operation of projects that may endanger public health, safety, or welfare, or the water resources. If deficiencies are found, the operation and maintenance entity will be responsible for correcting the deficiencies in a timely manner to prevent compromises to flood protection and water quality. See Section 12.4 of Applicant's Handbook Volume I for Minimum Operation and Maintenance Standards.

RELATED CONCERNS:**Water Use Permit Status:**

The applicant has indicated that irrigation is not needed for this project.

Dewatering will likely be required for construction of this project. At least two weeks prior to commencement of any dewatering, FDOT must submit a project- specific dewatering plan pursuant to FDOT's Master Dewatering Permit for Palm Beach County (Permit No. 50-09836-W) for review and approval. No dewatering shall commence prior to receiving written notification from District staff that the proposed dewatering activity is consistent with the approved master permit.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation.

CERP:

The proposed project is not located within or adjacent to a Comprehensive Everglades Restoration Project component.

Potable Water Supplier:

Potable water is not required for this project.

Waste Water System/Supplier:

Waste water service is not required for this project.

Right-Of-Way Permit Status:

A District Right-of-Way Permit is not required for this project.

DRI Status:

This project is not a DRI.

Historical/Archeological Resources:

The District has received correspondence from the Florida Department of State, Division of Historical Resources indicating that no significant archaeological or historical resources are recorded in the project area and the project is therefore unlikely to have an effect upon any such properties.

DEO/CZM Consistency Review:

The issuance of this permit constitutes a finding of consistency with the Florida Coastal Management Program.

Third Party Interest:

District staff met with Kristin Bennett, representing Loxahatchee Mitigation Bank, about the mitigation plan for this project. Ms. Bennett has been included in the distribution list for this permit.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF RECOMMENDATION TO EXECUTIVE DIRECTOR:

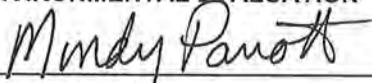
The Staff recommends that the following be issued :

Construction and operation of a project that includes a stormwater management system serving 149.93 acres of road development including 92.58 acres of wetland impacts with offsite mitigation known as SR 710 Martin/Palm Beach County Line to Pratt Whitney Entrance.

Based on the information provided, District rules have been adhered to.

Staff recommendation is for approval subject to the attached
General and Special Conditions.

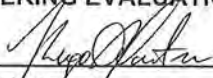
STAFF REVIEW:**NATURAL RESOURCE MANAGEMENT APPROVAL****ENVIRONMENTAL EVALUATION**


Melinda Parrott

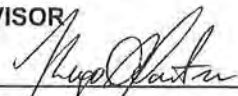
SUPERVISOR


Anita R. Bain

SURFACE WATER MANAGEMENT APPROVAL**ENGINEERING EVALUATION**


for Carolyn McCreedy

SUPERVISOR


Jesse-Marie, P.E. Hugo A. Carter, P.E.

ENVIRONMENTAL RESOURCE PERMITTING BUREAU CHIEF :


Anita R. Bain

DATE: 7/31/14

REGULATION DIVISION ASSISTANT DIRECTOR :


Anthony M. Waterhouse, P.E.

DATE: 7/31/14

GENERAL CONDITIONS

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C. Any deviations that are not so authorized shall subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S. (2012).
2. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with Rule 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.
3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the "State of Florida Erosion and Sediment Control Designer and Reviewer Manual" (Florida Department of Environmental Protection and Florida Department of Transportation June 2007), and the "Florida Stormwater Erosion and Sedimentation Control Inspector's Manual" (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.
4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice" indicating the expected start and completion dates. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.
5. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.
6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
 - a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex- "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit"[Form 62-330.310(3)]; or
 - b. For all other activities- "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
 - c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.
7. If the final operation and maintenance entity is a third party:
 - a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as- built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Applicant's Handbook Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
 - b. Within 30 days of submittal of the as- built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

GENERAL CONDITIONS

8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.
9. This permit does not:
 - a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
 - b. Convey to the permittee or create in the permittee any interest in real property;
 - c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
 - d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.
10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.
11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.
12. The permittee shall notify the Agency in writing:
 - a. Immediately if any previously submitted information is discovered to be inaccurate; and
 - b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.
13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.
14. If any prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, work involving subsurface disturbance in the immediate vicinity of such discoveries shall cease. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section, at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Such subsurface work shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and notification shall be provided in accordance with Section 872.05, F.S.
15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

GENERAL CONDITIONS

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.
17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.
18. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

SPECIAL CONDITIONS

1. The construction phase of this permit shall expire on August 4, 2019.
2. Operation of the stormwater management system shall be the responsibility of the permittee.
3. Discharge Facilities:

Basin: 1, Structure: DS_1_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.2' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.4' NAVD 88.

Receiving body : Public Lands
Control elev : 24.2 feet NAVD 88.

Basin: 1, Structure: DS_1_2

1-49" W X 37" L drop inlet with crest at elev. 25.4' NAVD 88.

Receiving body : Public Lands
Control elev : 24.2 feet NAVD 88.

Basin: 2, Structure: DS_2_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.2' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.74' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.2 feet NAVD 88.

Basin: 2, Structure: DS_2_2

1-49" W X 37" L drop inlet with crest at elev. 25.74' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.2 feet NAVD 88.

Basin: 2, Structure: DS_2_3

1-49" W X 37" L drop inlet with crest at elev. 25.74' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.2 feet NAVD 88.

Basin: 3, Structure: DS_3_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.1' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.31' NAVD 88.

Receiving body : Public Lands
Control elev : 24.1 feet NAVD 88.

SPECIAL CONDITIONS

Basin: 3, Structure: DS_3_2

1-49" W X 37" L drop inlet with crest at elev. 25.31' NAVD 88.

Receiving body : Public Lands
Control elev : 24.1 feet NAVD 88.

Basin: 4, Structure: DS_4_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.1' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.62' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.1 feet NAVD 88.

Basin: 4, Structure: DS_4_2

1-49" W X 37" L drop inlet with crest at elev. 25.62' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.1 feet NAVD 88.

Basin: 4, Structure: DS_4_3

1-49" W X 37" L drop inlet with crest at elev. 25.62' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.1 feet NAVD 88.

Basin: 4, Structure: DS_4_4

1-49" W X 37" L drop inlet with crest at elev. 25.62' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.1 feet NAVD 88.

Basin: 5, Structure: DS_5_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.07' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.29' NAVD 88.

Receiving body : Public Lands
Control elev : 24.07 feet NAVD 88.

Basin: 5, Structure: DS_5_2

1-49" W X 37" L drop inlet with crest at elev. 25.29' NAVD 88.

Receiving body : Public Lands
Control elev : 24.07 feet NAVD 88.

SPECIAL CONDITIONS

Basin: 6, Structure: DS_6_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 24.07' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.54' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.07 feet NAVD 88.

Basin: 6, Structure: DS_6_2

1-49" W X 37" L drop inlet with crest at elev. 25.54' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.07 feet NAVD 88.

Basin: 6, Structure: DS_6_3

1-49" W X 37" L drop inlet with crest at elev. 25.54' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.07 feet NAVD 88.

Basin: 6, Structure: DS_6_4

1-49" W X 37" L drop inlet with crest at elev. 25.54' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 24.07 feet NAVD 88.

Basin: 7, Structure: DS_7_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.8' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.05' NAVD 88.

Receiving body : Public Lands
Control elev : 23.8 feet NAVD 88.

Basin: 7, Structure: DS_7_2

1-49" W X 37" L drop inlet with crest at elev. 25.05' NAVD 88.

Receiving body : Public Lands
Control elev : 23.8 feet NAVD 88.

Basin: 7, Structure: DS_7_3

1-49" W X 37" L drop inlet with crest at elev. 25.05' NAVD 88.

Receiving body : Public Lands
Control elev : 23.8 feet NAVD 88.

SPECIAL CONDITIONS

Basin: 7, Structure: DS_7_4

1-49" W X 37" L drop inlet with crest at elev. 25.05' NAVD 88.

Receiving body : Public Lands
Control elev : 23.8 feet NAVD 88.

Basin: 8

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.8' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.37' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.8 feet NAVD 88.

Basin: 9, Structure: DS_9_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.62' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 25.18' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.62 feet NAVD 88.

Basin: 9, Structure: DS_9_2

1-49" W X 37" L drop inlet with crest at elev. 25.18' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.62 feet NAVD 88.

Basin: 10, Structure: DS_10_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.25' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.53' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.25 feet NAVD 88.

Basin: 10, Structure: DS_10_2

1-49" W X 37" L drop inlet with crest at elev. 24.53' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.25 feet NAVD 88.

Basin: 10, Structure: DS_10_3

1-49" W X 37" L drop inlet with crest at elev. 24.53' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.25 feet NAVD 88.

SPECIAL CONDITIONS

Basin: 11, Structure: DS_11_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.23' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.68' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.23 feet NAVD 88.

Basin: 11, Structure: DS_11_2

1-49" W X 37" L drop inlet with crest at elev. 24.68' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.23 feet NAVD 88.

Basin: 12, Structure: DS_12_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.07' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.55' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.07 feet NAVD 88.

Basin: 12, Structure: DS_12_2

1-49" W X 37" L drop inlet with crest at elev. 24.55' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.07 feet NAVD 88.

Basin: 12, Structure: DS_12_3

1-49" W X 37" L drop inlet with crest at elev. 24.55' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.07 feet NAVD 88.

Basin: 13, Structure: DS_13_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.07' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.51' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.07 feet NAVD 88.

Basin: 13, Structure: DS_13_2

1-49" W X 37" L drop inlet with crest at elev. 24.51' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.07 feet NAVD 88.

SPECIAL CONDITIONS

Basin: 13, Structure: DS_13_3

1-49" W X 37" L drop inlet with crest at elev. 24.51' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 23.07 feet NAVD 88.

Basin: 14, Structure: DS_14_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.83' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.83 feet NAVD 88.

Basin: 14, Structure: DS_14_2

1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.83 feet NAVD 88.

Basin: 14, Structure: DS_14_3

1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.83 feet NAVD 88.

Basin: 15, Structure: DS_15_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23.09' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.59' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.09 feet NAVD 88.

Basin: 15, Structure: DS_15_2

1-49" W X 37" L drop inlet with crest at elev. 24.59' NAVD 88.

Receiving body : Pine Glades
Control elev : 23.09 feet NAVD 88.

Basin: 16, Structure: DS_16_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.93' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

SPECIAL CONDITIONS

Basin: 16, Structure: DS_16_2

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_3

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_4

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_5

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 16, Structure: DS_16_6

1-49" W X 37" L drop inlet with crest at elev. 24.58' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.93 feet NAVD 88.

Basin: 17, Structure: DS_17_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 17, Structure: DS_17_2

1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 17, Structure: DS_17_3

SPECIAL CONDITIONS

1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 17, Structure: DS_17_4

1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 17, Structure: DS_17_5

1-49" W X 37" L drop inlet with crest at elev. 24.61' NAVD 88.

Receiving body : Pine Glades
Control elev : 23 feet NAVD 88.

Basin: 18, Structure: DS-18_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.82' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.82 feet NAVD 88.

Basin: 18, Structure: DS-18_2

1-49" W X 37" L drop inlet with crest at elev. 24.31' NAVD 88.

Receiving body : Pine Glades
Control elev : 22.82 feet NAVD 88.

Basin: 19

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.7' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 24.17' NAVD 88.

Receiving body : Offsite Swale
Control elev : 22.7 feet NAVD 88.

Basin: 20

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.95' NAVD 88.
1-40" W X 37" L drop inlet with crest at elev. 24.39' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.95 feet NAVD 88.

Basin: 21

SPECIAL CONDITIONS

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.95' NAVD 88.
 1-49" W X 37" L drop inlet with crest at elev. 24.13' NAVD 88.

Receiving body : Offsite Ditch
 Control elev : 22.95 feet NAVD 88.

Basin: 22, Structure: DS-22_2

1-49" W X 37" L drop inlet with crest at elev. 24.25' NAVD 88.

Receiving body : Offsite Ditch
 Control elev : 22.8 feet NAVD 88.

Basin: 22, Structure: DS_22_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.8' NAVD 88.
 1-49" W X 37" L drop inlet with crest at elev. 24.25' NAVD 88.

Receiving body : Offsite Ditch
 Control elev : 22.8 feet NAVD 88.

Basin: 23

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
 1-49" W X 37" L drop inlet with crest at elev. 24.3' NAVD 88.

Receiving body : Offsite Ditch
 Control elev : 23 feet NAVD 88.

Basin: 24

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
 1-49" W X 37" L drop inlet with crest at elev. 24.43' NAVD 88.

Receiving body : Offsite Ditch
 Control elev : 23 feet NAVD 88.

Basin: 25

1-3" dia. CIRCULAR ORIFICE with invert at elev. 23' NAVD 88.
 1-49" W X 37" L drop inlet with crest at elev. 24.43' NAVD 88.

Receiving body : Offsite Ditch
 Control elev : 23 feet NAVD 88.

Basin: 26

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.53' NAVD 88.
 1-49" W X 37" L drop inlet with crest at elev. 24.01' NAVD 88.

Receiving body : Offsite Ditch

SPECIAL CONDITIONS

Control elev : 22.53 feet NAVD 88.

Basin: 27

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.2' NAVD 88.

1-49" W X 37" L drop inlet with crest at elev. 23.73' NAVD 88.

Receiving body : Offsite Ditch

Control elev : 22.2 feet NAVD 88.

Basin: 28

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.2' NAVD 88.

1-49" W X 37" L drop inlet with crest at elev. 23.6' NAVD 88.

Receiving body : Offsite Ditch

Control elev : 22.2 feet NAVD 88.

Basin: 29, Structure: DS_29_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.2' NAVD 88.

1-49" W X 37" L drop inlet with crest at elev. 23.96' NAVD 88.

Receiving body : Offsite Ditch

Control elev : 22.2 feet NAVD 88.

Basin: 29, Structure: DS_29_2

1-49" W X 37" L drop inlet with crest at elev. 23.96' NAVD 88.

Receiving body : Offsite Ditch

Control elev : 22.2 feet NAVD 88.

Basin: 29, Structure: DS_29_3

1-49" W X 37" L drop inlet with crest at elev. 23.96' NAVD 88.

Receiving body : Offsite Ditch

Control elev : 22.2 feet NAVD 88.

Basin: 30

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.19' NAVD 88.

1-49" W X 37" L drop inlet with crest at elev. 23.58' NAVD 88.

Receiving body : Offsite Ditch

Control elev : 22.19 feet NAVD 88.

Basin: 31

1-3" dia. CIRCULAR ORIFICE with invert at elev. 21.5' NAVD 88.

SPECIAL CONDITIONS

1-49" W X 37" L drop inlet with crest at elev. 22.88' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 21.5 feet NAVD 88.

Basin: 32, Structure: DS_32_1

1-3" dia. CIRCULAR ORIFICE with invert at elev. 22.29' NAVD 88.
1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_2

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_3

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_4

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_5

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

Basin: 32, Structure: DS_32_6

1-49" W X 37" L drop inlet with crest at elev. 23.79' NAVD 88.

Receiving body : Offsite Ditch
Control elev : 22.29 feet NAVD 88.

4. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

SPECIAL CONDITIONS

5. Prior to the commencement of construction, the limits of construction adjacent to public lands, wetlands and/ or preservation areas shall be staked/roped/fenced to prevent encroachment into the protected areas. The permittee shall notify the District's Environmental Resource Compliance staff in writing upon completion of staking/roping/fencing and schedule an inspection of this work. The staking/roping/fencing shall be subject to District staff approval. The permittee shall modify the staking/roping/fencing if District staff determines that it is insufficient or is not in conformance with the intent of this permit. The staking/roping/fencing shall remain in place until all adjacent construction activities are complete.
6. The District reserves the right to require remedial measures to be taken by the permittee if monitoring or other information demonstrates that adverse impacts to onsite or offsite wetlands, upland conservation areas or buffers, or other surface waters have occurred due to project related activities.
7. Construction of the permitted activities shall be conducted in accordance with Exhibit No. 5.
8. Endangered species, threatened species and/or species of special concern have been observed onsite and/or the project contains suitable habitat for these species. It shall be the permittee's responsibility to coordinate with the Florida Fish and Wildlife Conservation Commission and/or the U.S. Fish and Wildlife Service for appropriate guidance, recommendations and/or necessary permits to avoid impacts to listed species.
9. A project- specific dewatering plan must be submitted a minimum of two weeks prior to any dewatering to be conducted under FDOT's Master Dewatering Water Use Permit. Dewatering effluent shall be contained on site. At no time shall dewatering effluent be discharged into adjacent wetlands or preserve areas.
10. Prior to the commencement of construction, the permittee shall conduct a pre-construction meeting with field representatives, contractors and District staff. The purpose of the meeting will be to discuss construction methods and sequencing, including type and location of turbidity and erosion controls to be implemented during construction, mobilization and staging of contractor equipment, phasing of construction, methods of vegetation clearing, construction dewatering if required, coordination with other entities on adjacent construction projects, wetland/buffer protection methods, and/or endangered species protection with the permittee and contractors. The permittee shall contact District Environmental Resource Compliance staff from the Martin/St. Lucie Regulatory Office at (863) 462-5260 ext 3613 to schedule the pre-construction meeting.
11. The following exhibits for the permit are incorporated by reference herein and are located in the permit file. In addition, these exhibits can be viewed on the District's ePermitting website under this application number.

Exhibit No. 2.1 Drainage Maps, Typical Sections, Roadway Plan and Profile

Exhibit No. 2.2 Drainage Details, Drainage Structures

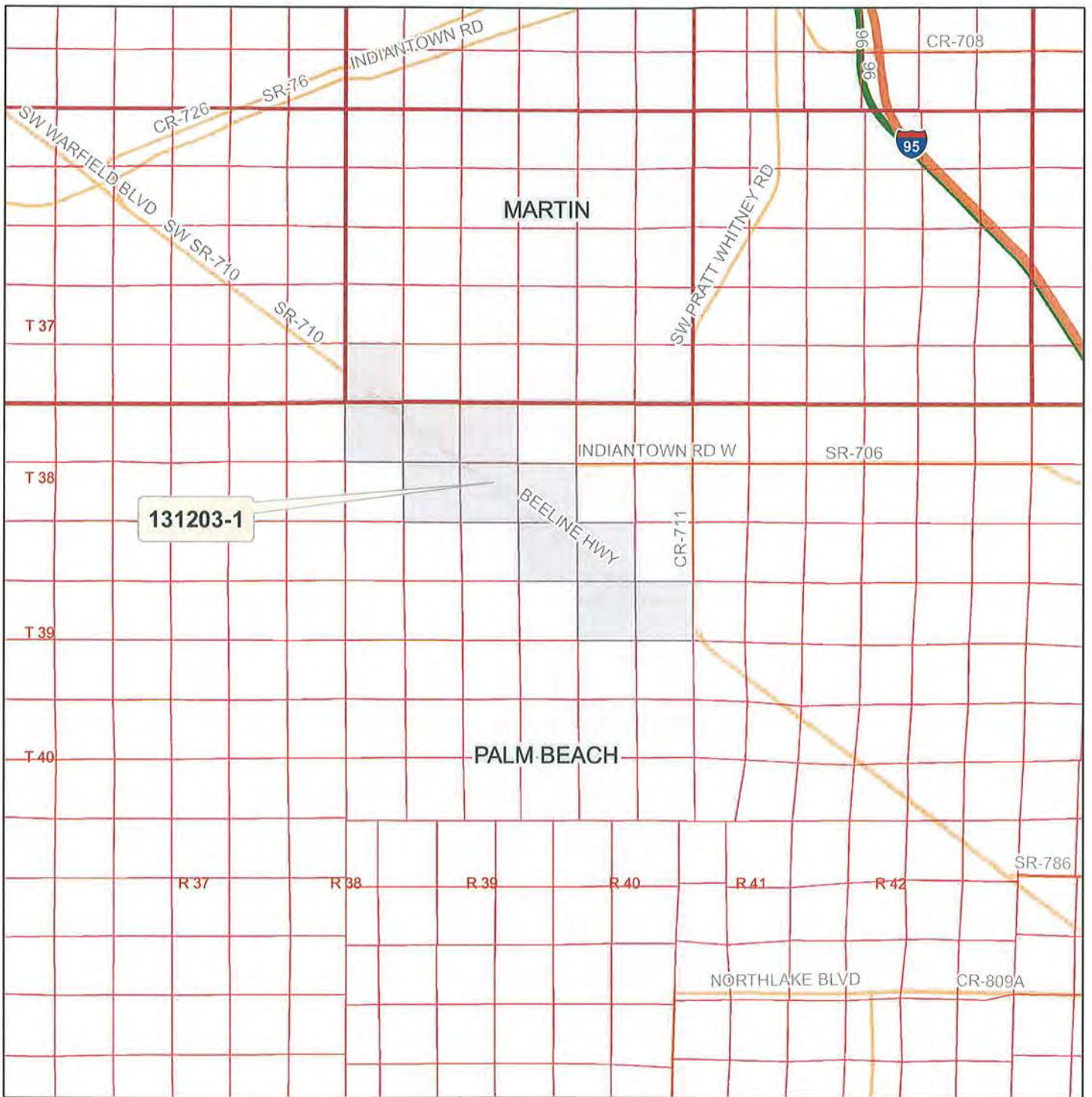
The drawings have been signed and sealed electronically by Elizabeth M. Bartell P.E., of TranSystems on June 30, 2014.

Table of Contents for Staff Report Exhibits

App. No. 131203-1

SR 710 Martin/PB County Line to Pratt Whitney Entrance

- 1.1 General Location Map
- 1.2 Detailed Location Map
- 2.1 Drainage Maps, Typical Sections, Roadway Plan and Profile
- 2.2 Drainage Details, Drainage Structures
- 2.3 Design Storm Discharge
- 3 ERP Permit Sketches
- 4 Mitigation Bank Credit
- 5 Environmental Construction



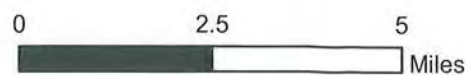
PALM BEACH COUNTY, FLORIDA

Application No: 131203-1

Permit No: 50-04716-P

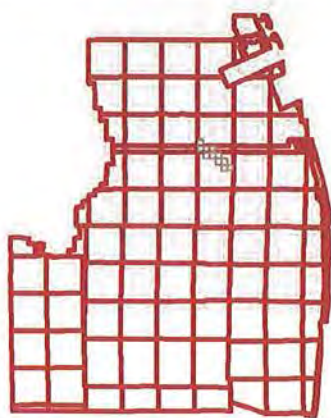
Sec 31-33 / Twp 40 / Rge 40

Project Name: S R 710 MARTIN/P B COUNTY LINE
TO PRATT WHITNEY ENTRANCE



Map Date: 2014-07-31

Exhibit Number: 1.1



PALM BEACH COUNTY, FLORIDA

Legend

 Application

Application No: 131203-1

Sec 31-33 / Twp 40 / Rge 40

Project Name: S R 710 MARTIN/P B COUNTY LINE
TO PRATT WHITNEY ENTRANCE

0 0.75 1.5
 Miles



Map Date: 2014-07-31

Permit No: 50-04716-P

Exhibit Number: 1.2

Staff Report Exhibits by Reference
(See Permit File)
App. No. 131203-1
SR 710 Martin/PB County Line to Pratt
Whitney Entrance

- 2.1 Drainage Maps, Typical Sections, Roadway Plan and Profile
- 2.2 Drainage Details, Drainage Structures

Table V.4.2. Existing and Proposed Discharge for 25-Year/72-Hour Storm Event

	Existing Conditions		Proposed Conditions	
	Peak Discharge Rate (cfs)	Discharge Volume (ac-ft)	Peak Discharge Rate (cfs)	Discharge Volume (ac-ft)
Pine Glades	278.04	81.5	187.80	79.0
Public Lands	199.69	50.7	134.39	54.9

STAFF REPORT DISTRIBUTION LIST

S R 710 MARTIN/P B COUNTY LINE TO PRATT WHITNEY ENTRANCE

Application No: 131203-1

Permit No: 50-04716-P

INTERNAL DISTRIBUTION

- X Carolyn McCreedy
- X Melinda Parrott
- X Anita R. Bain
- X Jesse Markle, P.E.
- X A. Bain
- X A. Waterhouse
- X ERC Engineering
- X ERC Environmental
- X ERC Martin/St. Lucie

EXTERNAL DISTRIBUTION

- X Permittee - Florida Department Of Transportation
- X Engr Consultant - Transystems
- X Env Consultant - Cyriacks Environmental Consulting Services Inc

GOVERNMENT AGENCIES

- X Ann Broadwell - FDOT District IV Environmental Administrator
- X Div of Recreation and Park - District 5 - Miranda Cunningham, FDEP
- X Div of Recreation and Park - District 5 - Miranda Cunningham, FDEP
- X Garrett Lips - USACE
- X Martin County - County Administrator
- X Martin County Board of County Commissioners
- X Martin County Engineering Dept. - Don G. Donaldson, P.E.
- X Palm Beach County - Environmental Res Management
- X Palm Beach County - Health Dept Environmental Health & Engineering
- X Palm Beach County - Water Utilities Operations Center
- X Palm Beach County School District of Palm Beach County
- X Palm Beach County Engineer

OTHER INTERESTED PARTIES

- X Alexandria Larson
- X Chuck Olson -Bluefield Ranch Mitigation Bank
- X Kristin Bennett -Tetra Tech, Inc.
- X Rosa Durando

SR 710
FROM MARTIN/PALM BEACH COUNTY LINE TO
PRATT & WHITNEY ENTRANCE
PALM BEACH COUNTY, FL
FPID: 432704-1-52-01/432706-1-52-01

DRAINAGE REPORT
SFWMD PERMIT SUBMITTAL

PREPARED FOR:
FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 4
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

PREPARED BY:
TRANSYSTEMS
2400 E COMMERCIAL BOULEVARD, SUITE 1000
FORT LAUDERDALE, FL 33308
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JUNE 26, 2014

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APPENDIX F: PROPOSED ICPR MODEL

APPENDIX G: CORRESPONDENCE

APPENDIX H: FDOT STANDARD INDEX NO. 261

I. INTRODUCTION

The Florida Department of Transportation (FDOT) is proposing to widen SR 710 (Beeline Highway) from a two-lane section to a four-lane divided rural roadway. The proposed limits of the project are from the Martin/Palm Beach County Line to the Pratt & Whitney entrance, approximately 5.7 miles. The proposed stormwater treatment and attenuation will be accommodated in roadside dry detention swales. The dry detention swales discharge to the adjacent wetlands north of SR 710. The total project area is 149.93 acres. Please refer to Figure 1 for the Location Map.

The existing surrounding land uses are conservation lands, industrial, and low density residential. The SR 710 alignment runs parallel to the CSX railroad that provides both freight and passenger service. The CSX railroad lines parallel SR 710 on the south side, but does not cross SR 710 within the project limits. Please refer to Figure 2 for the Land Use Maps.

This project was included in a Project Development and Environment (PD&E) Study completed for SR 710 from approximately one mile east of SR 76 (Kanner Highway) to SR 708 (Blue Heron Boulevard). The *Pond Siting & Conceptual Drainage Report* for the PD&E was submitted in May 2013. The PD&E documents have been used as a reference for the design of this project.

II. PROJECT LOCATION

This project is located in Palm Beach County and Martin County in the state of Florida. The majority of the project is located in Palm Beach County; however, at the west end of the project the vertical and horizontal transitions from the existing two-lane typical section to the proposed four-lane typical section are located within Martin County. The project is located in Township 40S, Range 40E, Sections 30, 31, 32 and 33 and Township 41S, Range 40E, Sections 3, 4, 5, 10, 11, 13 and 14.

III. PROJECT DESCRIPTION

The FDOT is proposing to widen SR 710 from the Martin/Palm Beach County Line to the Pratt & Whitney entrance from a two-lane roadway to a four-lane divided rural roadway. Shoulder widths will be increased from 8 feet to 12 feet. While a shared use path was included as an alternative during the PD&E process, it has been eliminated in the design phase to minimize wetland impacts. Stormwater treatment and attenuation will be provided in roadside treatment swales. The project also includes improvements to the intersection of SR 710 and Indiantown Road.

III. 1. Existing Typical Section

In the existing conditions, the mainline typical section of SR 710 generally consists of two 12-foot wide lanes undivided with eight-foot wide inside and outside shoulders (four feet paved). The roadway transitions to a four-lane divided facility just west of the Pratt & Whitney entrance, with a 46-foot wide median, 12-foot wide lanes, and four-foot outside paved shoulders and two-foot inside paved shoulders. The average existing right-of-way width from the beginning of the project to just east of Indiantown

Road is 225 feet. The average existing right-of-way width from Indiantown Road to the end of the project is 200 feet. Please refer to Figure 3 for the existing typical section.

III. 2. Proposed Typical Section

In the proposed condition, the SR 710 typical section generally consists of two 12-foot lanes in each direction with 12-foot outside shoulders (5 feet paved) and 8-foot inside shoulders (2 feet paved) and is divided by a 40-foot median. Roadside swales, with 1:6 front slopes and 1:3 back slopes, are provided along each side of the roadway to provide stormwater treatment. The treatment swales bottom widths have been maximized to provide the maximum amount of storage within the swales. A ditch with 1:6 side slopes is also proposed within the median.

The existing right-of-way will be maintained; no proposed right-of-way is anticipated for this project. Please refer to the Typical Section sheets in the Construction Plans and the Typical Section Package included in Appendix B.

IV. ROADWAY DRAINAGE

The stormwater system is comprised of overland sheet flow that flows to the proposed roadside treatment swales, which discharge to the adjacent wetlands. Since the purpose of the roadside swales is treatment, and not conveyance, they are not required to follow the minimum slope criteria for ditches. The treatment swales are dry detention systems that will treat and attenuate on-site runoff within the existing right-of-way and discharge to the adjacent wetlands.

IV. 1. Design Criteria

IV. 1. 1. FDOT Drainage Manual

- The design frequency for cross drains is 50 years.
- The minimum ditch elevation shall be 1 foot above the estimated seasonal high water table (SHWT) elevation for maintainability.
- A minimum time of concentration of 10 minutes shall be used.
- The physical slope of a pipe shall be that which will produce a velocity of at least 2.5 feet per second (fps) when the storm drain is flowing full. In areas of flat terrain where 2.5 fps is not feasible, an absolute minimum velocity of 2.0 fps for full flow shall be obtained.
- When the outlet velocity for the design storm exceeds 4 fps, the need for special channel lining and/or energy dissipation shall be considered for protection against undesirable scour.
- Minimum cover for pipe shall be provided in accordance with Appendix E of the FDOT Drainage Manual.

IV. 2. Existing Drainage System

In the existing conditions, stormwater runoff from the existing roadway flows over grassed shoulders into roadside swales located on both sides of SR 710. The existing roadway was constructed prior to stormwater management regulations; therefore, there are no permitted stormwater management facilities within the project limits in the existing condition.

IV. 3. Proposed Drainage System

Much like the existing condition, stormwater runoff in the proposed condition flows from the roadway into roadside swales located on both sides of SR 710. The swale bottom elevation was placed one foot above the seasonal high water table elevation. The swales have been designed with outlet control structures, which will allow treated stormwater to discharge into the adjacent wetlands. Endwalls with baffles are proposed at the points of discharge to dissipate energy and reduce the possibility of erosion. The outlet control structures have been located at the low-lying areas of the adjacent wetlands and have been coordinated with Palm Beach County. Please refer to the Construction Plans for the proposed drainage system.

V. STORMWATER MANAGEMENT PERMITTING

V. 1. Permitting Agencies with Stormwater Management Jurisdiction

- South Florida Water Management District (SFWMD) – An Individual Environmental Resource Permit will be obtained through SFWMD.
- US Army Corps of Engineers (USACE) – A Section 404 Wetland Permit will be obtained through the USACE.
- Northern Palm Beach County Improvement District – It was determined that a permit would not be required for this project. Please refer to Appendix G for Correspondence.

V. 2. Resource of Criteria

- SWERP FDEP Applicant's Handbook Volume I
- SFWMD Applicant's Handbook Volume II
- SFWMD Environmental Resource Permit Information Manual, Volume IV
- FDOT Stormwater Management Facility Drainage Handbook

V. 3. Water Quality

V. 3. 1. Criteria

- Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater.
- Dry detention volume shall be provided equal to 75 percent of the above amounts computed for wet detention.
- This project does not discharge to an OFW, so additional treatment is not required.

V. 3. 2. Results

The required treatment volume for this project is 9.41 acre-feet (ac-ft). The weir elevation for each swale has been set at the treatment volume depth. Please refer to Table V.3.2. for a summary of the required treatment volumes per subbasin and Appendix D for the treatment volume calculations.

Table V.3.2. Required Treatment Volumes

Basin	1" of Runoff over Project Area (ac-ft)	2.5" of Runoff over Impervious Area (ac-ft)	Required Treatment Volume (ac-ft)
1	0.50	0.35	0.50
2	0.40	0.28	0.40
3	0.56	0.35	0.56
4	0.45	0.35	0.45
5	0.59	0.41	0.59
6	0.47	0.39	0.47
7	0.51	0.44	0.51
8	0.09	0.07	0.09
9	0.22	0.23	0.23
10	0.51	0.40	0.51
11	0.32	0.28	0.32
12	0.29	0.24	0.29
13	0.29	0.23	0.29
14	0.48	0.37	0.48
15	0.30	0.24	0.30
16	0.95	0.76	0.95
17	0.17	0.16	0.17
18	0.23	0.19	0.23
19	0.13	0.12	0.13
20	0.07	0.06	0.07
21	0.14	0.11	0.14
22	0.35	0.32	0.35
23	0.04	0.04	0.04
24	0.14	0.13	0.14
25	0.03	0.03	0.03
26	0.03	0.03	0.03
27	0.03	0.02	0.03
28	0.16	0.13	0.16
29	0.14	0.17	0.17
30	0.06	0.06	0.06
31	0.06	0.06	0.06
32	0.66	0.62	0.66
Total	9.37	7.64	9.41

V. 4. Water Quantity

V. 4. 1. Criteria

- Off-site discharge rates are limited to rates not causing adverse impacts to existing off-site properties, and:

- Historic discharge rates, or
- Rates determined in previous District permit actions, or
- Rates specified in District criteria (see Appendix 2 of the SFWMD Basis of Review).
- The design storm is the 25-year, 3-day storm event.
- Dry detention systems shall recover 50% of the treatment volume within 24 hours.

V. 4. 2. Results

The project is divided into 2 major drainage basins. One basin of the project discharges to adjacent public lands, owned by Hungryland and SFWMD, north of SR 710. The other basin discharges to the Pine Glades Natural Areas/wetlands north of SR 710. The SFWMD contours were obtained to approximate capacity within the adjacent lands; however, only 5-foot contours were available. Since the 5-foot contours were not detailed enough to provide stage/area data for the adjacent lands, the area of the adjacent wetlands were estimated from aeriels and available contours.

The project was modeled using ICPR Version 3.10. Each swale was modeled individually and discharges to either Pine Glades, public lands, or the offsite-ditch between SR 710 and the CSX roadway. The off-site ditch between SR 710 and the railroad is connected to Pine Glades and public land via cross drains. The existing and proposed cross drains are included in the ICPR models.

Based on the existing ICPR model, the runoff from SR 710 causes a 0.01 foot rise in stage in Pine Glades and no rise in the adjacent public lands. Please refer to Appendix D for the ICPR Node Summary tables and Appendix E for the existing conditions ICPR model.

In the proposed condition, treated stormwater discharges to adjacent wetlands and Natural Areas via outlet control structures. All existing cross drains within the project area have been extended or replaced to maintain existing drainage patterns.

Based on the proposed ICPR model, the discharge from the proposed improvements along SR 710 within the project limits will create no adverse impacts on Pine Glades or public lands. The proposed runoff from SR 710 caused a 0.01 foot rise in stage in Pine Glades and no rise in the adjacent public lands, the same as in the existing conditions. Table V.4.2. summarizes the existing and proposed discharge volumes and rates. Please refer to Appendix D for the ICPR Node Summary tables and Appendix F for the proposed ICPR model.

Table V.4.2. Existing and Proposed Discharge for 25-Year/72-Hour Storm Event

	Existing Conditions		Proposed Conditions	
	Peak Discharge Rate (cfs)	Discharge Volume (ac-ft)	Peak Discharge Rate (cfs)	Discharge Volume (ac-ft)
Pine Glades	278.04	81.5	187.80	79.0
Public Lands	199.69	50.7	134.39	54.9

V. 5. Floodplain

There are no floodplains within the project limits.

V. 6. Dry Detention Treatment Swale Design

V. 6. 1. Criteria

- The side slopes of the swales shall conform to the roadway typical section, which is based on the recoverable terrain and clear zone requirements.
- The ditch bottoms shall be a minimum of one foot above the estimated seasonal high water table.

V. 6. 2. Results

- The side slopes of the dry detention treatment swales conform to the roadway typical section. The front slope of the treatment swales is 1:6 and the back slope is 1:3. The ditch bottom widths have been maximized within the right-of-way to provide the maximum amount of storage volume.
- The ditch bottoms have been designed a minimum of one foot above the estimated SHWT recommended by the geotechnical engineer in the Report of Groundwater Monitoring Wells dated April 7, 2014. Please refer to the Geotechnical Characteristics section of this report for further discussion of the estimated SHWT elevations within the project limits.

V. 7. Maintaining Agency

The FDOT will be the maintaining agency of the dry detention roadside treatment swales and outfall structures.

VI. STORMWATER MANAGEMENT SYSTEM DESIGN

VI. 1. Project Datum

The survey and plans for this project use the datum of NAVD 1988. To convert between NAVD 88 and NGVD 29, subtract 1.17 feet from the NGVD 29 elevation to get the NAVD 88 elevation.

VI. 2. Control Elevations

VI. 2. 1. Wet Season Groundwater Table Elevations

The original estimate of the SHWT is included in Exhibit A-4 in the geotechnical report. A monitoring well study of the corridor was completed subsequent to the original SHWT analysis. Please refer to the Geotechnical Characteristics section of this report, the *Report of Groundwater Monitoring Wells*, and the *Data Report of Roadway Soil Survey for SR 710 Reconstruction from Martin/Palm Beach County Line to Pratt & Whitney Entrance* prepared by Terracon for further explanation of the seasonal groundwater table elevations.

VI. 3. Drainage Basins

VI. 3. 1. Basin Divides

The project is divided into 2 major basins drainage basins. One basin of the project discharges to adjacent public lands north of SR 710. The other basin discharges to the Pine Glades Natural Areas/wetlands north of SR 710. These two major basins were split into 32 drainage subbasins for ease of modeling and reviewing. These basin divides are located at driveways or cross drains, where the roadside swale is divided. Please refer to the Basin Area Summary Table in Appendix D for the basin limits.

VI. 3. 2. Basin Areas

The total project area is 149.93 acres. The basins that discharge to the public lands account for 57.03 acres of the total project area. The basins that discharge to Pine Glades account for 92.90 acres of the total project area. Please refer to the Basin Area Summary Table in Appendix D for the basin areas for each individual basin.

VI. 3. 3. Basin Characteristics

Time of Concentration

The time of concentration is the time required for a drop of water to travel from the most hydrologically remote point in a basin to the collection point. Since this project consists of dry detention roadside treatment swales, the runoff will sheet flow to the proposed treatment swales, which is also the collection point. For this reason, the times of concentration for the basins were assumed to be the minimum, 10 minutes.

Curve Number

Based on the USDA NRCS Web Soil Survey, the soils within the project area are Type A/D, B/D, or C/D. Since the land adjacent to the roadway is open spaces in fair condition, a curve number of 84 was used for the pervious areas within the right-of-way.

Directly Connected Impervious Area (DCIA)

In the existing condition and proposed condition, the entire roadway is directly connected impervious area.

VI. 3. 4. Cross Drains

There are seven existing cross drains within the project limits in the existing condition. CD-1 is a 36" RCP and is located at Station 1270+89.46. CD-1 conveys runoff from the ditch between SR 710 and the CSX railroad to the public lands located along the north side of SR 710. CD-2 is a 42" RCP and is located at Station 1301+88.28. CD-2 conveys runoff from the ditch between SR 710 and the CSX railroad to the public lands located along the north side of SR 710. CD-3 is a 42" RCP and is located at Station 1334+92.11. CD-3 conveys runoff from the ditch between SR 710 and the CSX railroad to the public lands located along the north side of SR 710. CD-4 is a 36" RCP and is located at Station 1379+21.36. CD-4 conveys runoff from the ditch between SR 710 and the CSX railroad to Pine Glades located along the north side of SR 710. CD-5 is a 36" RCP and is located at Station 1399+69.55. CD-5 conveys runoff from the ditch between SR 710 and the CSX railroad to Pine Glades located along the north side of SR 710. CD-6 is a 36" RCP and is located at Station 1465+70.54. CD-6 conveys runoff from the ditch between SR 710 and the CSX railroad to Pine Glades located along the north side of SR 710. CD-7 is a 36" RCP and is located at Station 1545+71.69. CD-7 conveys runoff from the ditch between SR 710 and the CSX railroad to Pine Glades located along the north side of SR 710.

The cross drains are included in the existing and proposed ICPR models. All cross drains, except CD-7, will be replaced to accommodate the proposed roadway widening. Though the cross drains appear to be in suitable condition for extensions, extending the cross sections was not possible given the flowlines of the existing cross drains.

No modifications are proposed for CD-7 because it is located at the end of the project, where the roadway has already been widened and CD-7 has been sufficiently sized for the widened roadway. No additional roadway widening is proposed at Station 1545+71.69; therefore, no modifications will be proposed to CD-7.

VI. 3. 5. Control Structure Information

The dry detention treatment swales will discharge via outlet control structures consisting of a ditch bottom inlet with skimmer, a pipe, and an endwall with baffles for energy dissipation. The grate elevations have been set at the minimum weir elevation to provide the required treatment volume. The discharge locations have been located at low-lying areas along public lands owned by Palm Beach County. Palm Beach County has approved the weir locations proposed on the north side of SR 710. Please refer to Appendix G for documentation of Palm Beach County's approval of the weir locations.

Pine Glades abuts the north side of SR 710 from Indiantown Road to approximately Station 1453+00. All treatment swales located along the north side of SR 710 from Station 1453+00 to the end of the project discharge south via outfall structures, to the off-site ditch located between the CSX railroad and SR 710. Runoff in the off-site ditch is conveyed to Pine Glades via cross drains. These outfalls have been designed to avoid discharging to non-public lands.

VII. GEOTECHNICAL CHARACTERISTICS

VII. 1. Soils Information

The soil survey of Palm Beach County, Florida, published by the United States Department of Agriculture (USDA) was reviewed for soil information within the project vicinity. The soil survey shows that the following soils are located within the project area:

- Arrents Urban Land Complex
- Holopaw Fine Sand
- Oldsmar Sand
- Pineda Sand
- Pinellas Fine Sand
- Riviera Sand (Depressional)
- Wabasso Fine Sand

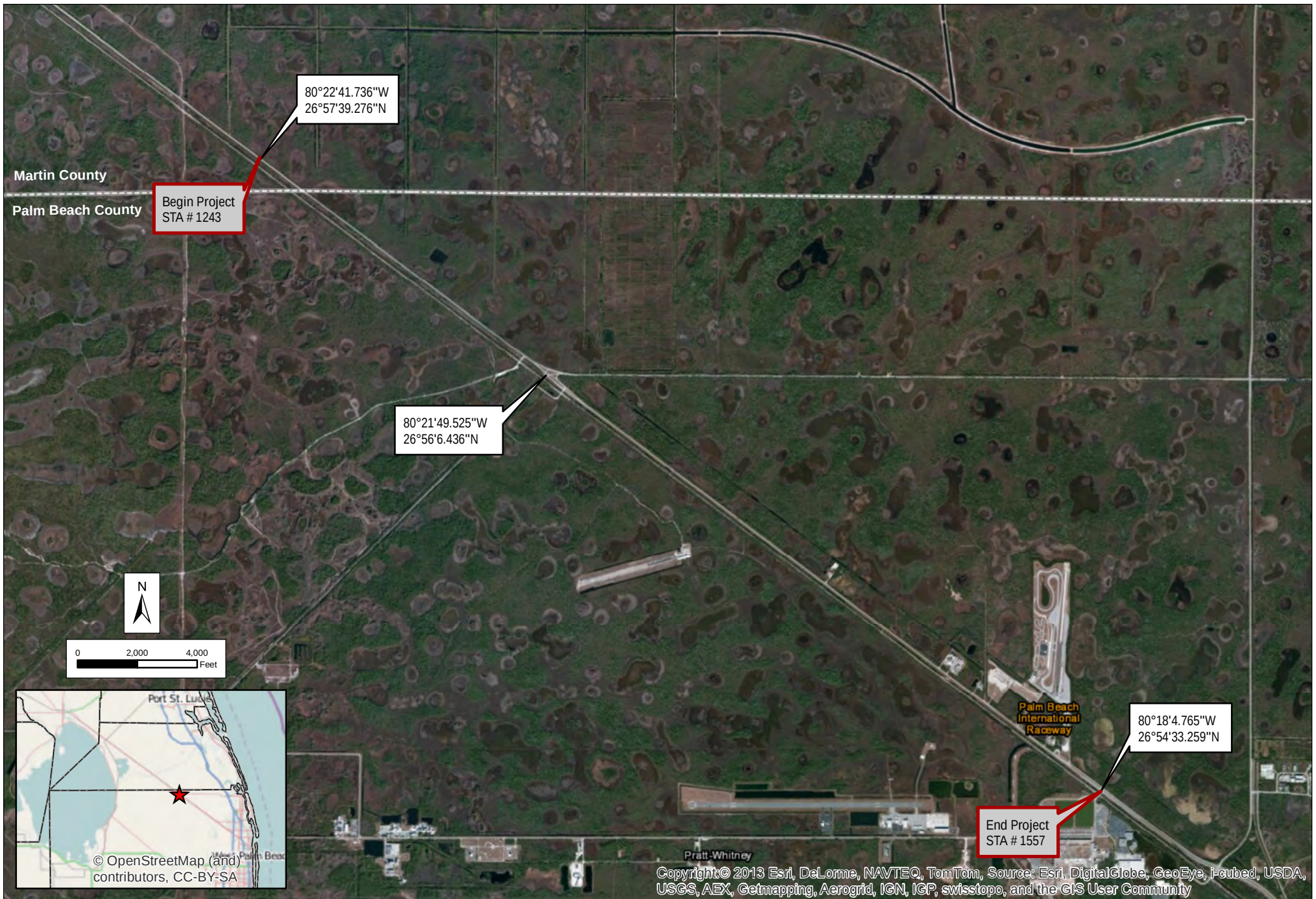
A geotechnical investigation was conducted by Nodarse, a Terracon Company, from May through August 2013. During the time of the investigation, high standing water was present throughout most of the project limits immediately off of the existing roadway embankment. Based on the measured groundwater depths and the approximate soil boring elevations, the groundwater elevation was found to range from elevation 20.0 to 24.6 feet (NAVD 88).

Nodarse estimated the seasonal high water table based on a review of average rainfall data for the region, the USDA Soil Survey of Palm Beach County, and USGS water level gauge data; site observations; and the actual ground water measurements made during the site investigation. The estimated SHWT is included at Exhibit A-4 in the geotechnical report. The estimated SHWT elevations were higher than expected. On April 2, 2013, CECOS, the environmental consultant for this project, performed a field survey. The estimated seasonal high water table elevations from the field survey conducted by CECOS were lower than those produced by Nodarse. In order to resolve these conflicting estimated SHWT elevations, temporary groundwater monitoring wells were installed to determine the SHWT elevation. The results of the monitoring well study were used to determine the SHWT elevations throughout the corridor to determine base clearance and swale bottom elevations.

Surficial muck was encountered within the upper 6 inches at many locations outside of the existing roadway embankment. The soils should be removed during clearing and grubbing, in accordance with Section 110 of the FDOT Standard Specifications. Due to the high water during the time of the geotechnical investigation, many low-lying densely vegetated areas along the project limits could not be investigated. It is recommended that additional geotechnical investigations should be performed by the Design-Build team to determine the complete extents of the muck soils.

Please refer to the *Report of Groundwater Monitoring Wells* (dated April 7, 2014) and the *Data Report of Roadway Soil Survey for SR 710 Reconstruction from Martin/Palm Beach County Line to Pratt & Whitney Entrance* (dated September 4, 2013), both prepared by Nodarse.

APPENDIX A: FIGURES



	State Road (SR) 710 (Beeline Highway) Design Build From West of Martin/Palm Beach County Line to West of Pratt Whitney Entrance Palm Beach & Martin Counties	FPID NOS: 432704-1-52-01 432706-1-52-01	Location Map	
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APPENDIX D: DESIGN CALCULATIONS

SR 710 Design-Build Package
From Martin/Palm Beach County Line to Pratt & Whitney Entrance
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Florida Department of Transportation, District 4

Basin Area Summary

Receiving Water	Basin	Begin Station	End Station	Side	Existing Conditions				Proposed Conditions			
					Impervious Area	Percent Impervious	Pervious Area	Total Area	Impervious Area	Percent Impervious	Pervious Area	Total Area
					(ac)	(%)	(ac)	(ac)	(ac)	(%)	(ac)	(ac)
Public Lands	1	1243+17	1270+88	LT	1.85	23.27	6.10	7.95	2.27	28.55	5.68	7.95
	2	1243+17	1270+88	RT	0.00	0.00	6.36	6.36	1.80	28.30	4.56	6.36
	3	1270+88	1301+88	LT	2.44	27.42	6.46	8.90	2.21	24.83	6.69	8.90
	4	1270+88	1301+88	RT	0.00	0.00	7.12	7.12	2.21	31.04	4.91	7.12
	5	1301+88	1334+92	LT	2.59	27.32	6.89	9.48	2.64	27.85	6.84	9.48
	6	1301+88	1334+92	RT	0.00	0.00	7.59	7.59	2.52	33.20	5.07	7.59
	7	1334+92	1350+66	LT	2.30	27.71	6.00	8.30	2.84	34.76	5.33	8.17
	8	1334+92	1341+30	RT	0.03	2.05	1.43	1.46	0.46	31.51	1.00	1.46
Pine Glades Natural Area	9	1341+30	1356+72	RT	0.91	25.71	2.63	3.54	1.48	41.81	2.06	3.54
	10	1350+66	1379+22	LT	0.61	7.55	7.47	8.08	2.58	31.43	5.63	8.21
	11	1356+72	1379+22	RT	2.15	41.59	3.02	5.17	1.77	34.24	3.40	5.17
	12	1379+22	1399+70	LT	0.00	0.00	4.70	4.70	1.52	32.34	3.18	4.70
	13	1379+22	1399+70	RT	1.62	34.47	3.08	4.70	1.46	31.06	3.24	4.70
	14	1399+70	1433+10	LT	0.00	0.00	7.67	7.67	2.38	31.03	5.29	7.67
	15	1433+10	1453+63	LT	0.00	0.00	4.73	4.73	1.51	31.92	3.22	4.73
	16	1399+70	1453+63	RT	5.13	33.86	10.02	15.15	4.87	32.15	10.28	15.15
	17	1453+63	1465+63	LT	0.00	0.00	2.77	2.77	1.02	36.82	1.75	2.77
	18	1465+63	1481+84	LT	0.01	0.27	3.69	3.70	1.22	32.97	2.48	3.70
	19	1481+84	1491+16	LT	0.04	1.87	2.10	2.14	0.77	35.98	1.37	2.14
	20	1491+16	1495+77	LT	0.09	8.49	0.97	1.06	0.36	33.96	0.70	1.06
	21	1453+63	1475+54	RT	0.77	34.07	1.49	2.26	0.72	31.86	1.54	2.26
	22	1475+54	1499+72	RT	1.98	35.68	3.57	5.55	2.05	36.94	3.50	5.55
	23	1495+77	1498+63	LT	0.03	4.55	0.63	0.66	0.28	42.42	0.38	0.66
	24	1498+63	1508+42	LT	0.03	1.33	2.22	2.25	0.81	36.00	1.44	2.25
	25	1508+42	1510+19	LT	0.03	7.32	0.38	0.41	0.16	39.02	0.25	0.41
	26	1510+19	1512+18	LT	0.00	0.00	0.46	0.46	0.16	34.78	0.30	0.46
	27	1512+18	1514+02	LT	0.02	4.76	0.40	0.42	0.15	35.71	0.27	0.42
	28	1514+02	1524+89	LT	0.05	2.00	2.45	2.50	0.84	33.60	1.66	2.50
	29	1524+89	1534+77	LT	0.07	3.08	2.20	2.27	1.09	48.02	1.18	2.27
	30	1534+77	1539+06	LT	0.12	12.12	0.87	0.99	0.37	37.37	0.62	0.99
	31	1539+06	1543+54	LT	0.28	27.18	0.75	1.03	0.39	37.86	0.64	1.03
	32	1499+72	1545+72	RT	4.50	42.61	6.06	10.56	3.96	37.50	6.60	10.56
	Total				27.65		122.28	149.93	48.87		101.06	149.93

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Swale Volume Calculations

The stage/area and volume calculations from the bottom of the swale to top of berm:

Swale	Stage	Area	Volume	Required Treatment Volume	Minimum Weir Elevation
	(ft)	(ac)	(ac-ft)	(ac-ft)	(ft)
1	25.20	2.09	0.00		
	26.50	2.83	3.20	0.50	25.40
2	25.20	0.37	0.00		
	26.20	1.11	0.74	0.40	25.74
3	25.10	2.21	0.00		
	26.60	3.17	4.04	0.56	25.31
4	25.10	0.44	0.00		
	26.10	1.28	0.86	0.45	25.62
5	25.07	2.19	0.00		
	26.57	3.20	4.04	0.59	25.29
6	25.07	0.56	0.00		
	26.07	1.44	1.00	0.47	25.54
7	24.80	1.46	0.00		
	26.30	2.59	3.04	0.51	25.05
8	24.80	0.07	0.00		
	25.80	0.25	0.16	0.09	25.37
9	24.62	0.22	0.00		
	25.62	0.61	0.42	0.23	25.18
10	24.25	1.18	0.00		
	25.25	2.46	1.82	0.51	24.53
11	24.23	0.41	0.00		
	25.73	1.02	1.07	0.32	24.68
12	24.07	0.40	0.00		
	25.57	0.83	0.92	0.29	24.55
13	24.07	0.40	0.00		
	25.07	0.95	0.68	0.29	24.51
14	23.83	0.48	0.00		
	25.33	1.53	1.51	0.48	24.31
15	24.09	0.27	0.00		
	25.59	0.91	0.89	0.30	24.59
16	23.95	0.77	0.00		
	25.45	2.23	2.25	0.95	24.58

Swale	Stage	Area	Volume	Required Treatment Volume	Minimum Weir Elevation
	(ft)	(ac)	(ac-ft)	(ac-ft)	(ft)
17	24.00	0.10	0.00		
	25.50	0.47	0.43	0.17	24.61
18	23.82	0.22	0.00		
	24.82	0.72	0.47	0.23	24.31
19	23.70	0.14	0.00		
	25.20	0.43	0.43	0.13	24.17
20	23.95	0.08	0.00		
	25.45	0.22	0.23	0.07	24.39
21	23.95	0.49	0.00		
	24.95	1.08	0.79	0.14	24.13
22	23.80	0.44	0.00		
	25.30	1.09	1.15	0.35	24.25
23	24.00	0.10	0.00		
	25.50	0.19	0.22	0.04	24.30
24	24.00	0.17	0.00		
	25.50	0.48	0.49	0.14	24.43
25	24.00	0.03	0.00		
	25.50	0.09	0.09	0.03	24.43
26	23.53	0.03	0.00		
	25.03	0.09	0.09	0.03	24.01
27	23.20	0.02	0.00		
	24.70	0.08	0.08	0.03	23.73
28	23.20	0.22	0.00		
	24.70	0.56	0.59	0.16	23.60
29	23.20	0.09	0.00		
	24.20	0.36	0.23	0.17	23.96
30	23.19	0.09	0.00		
	24.69	0.23	0.24	0.06	23.58
31	22.50	0.10	0.00		
	24.00	0.24	0.26	0.06	22.88
32	23.29	0.72	0.00		
	24.29	1.94	1.33	0.66	23.79
TOTAL			33.70	9.41	

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Orifice/Bleeder Calculations

The bleeder shall be designed based upon a maximum design discharge of one half inch of the detention volume in 24 hours.

Discharge (Q) through an orifice is given by:

$$Q = CA(2gh)^{1/2}$$

where: Q = rate of discharge (cfs)
A = orifice area (sf)
g = gravitational constant (32.2 ft/s²)
h = depth of water above the flow line (center) of the orifice (ft)
C = orifice coefficient (usually assumed as 0.6)

The average discharge rate (Q) required to drawdown half the treatment volume (TV) in a desired amount of time (t) is:

$$Q = \frac{TV}{2tCF}$$

where: TV = treatment volume (cf)
t = recovery time (hrs)
CF = conversion factor (3600 sec/hour)

The depth of water (h) should be set to the average depth above the flow line between the top of the treatment volume and the stage at which half the treatment volume has been released:

$$h = \frac{(h1+h2)}{2}$$

where: h1 = depth of water between the top of the treatment volume and the flow line of the orifice (ft)
h2 = depth of water between the stage when half the treatment volume has been released and the flow line of the orifice (ft)

The diameter of the orifice is calculated by:

$$D = (4A/\pi)^{1/2}$$

where: D = diameter of the orifice (ft)

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Orifice/Bleeder Calculations

Swale	Q	A	g	h	C	TV	t	CF	h ₁	h ₂	D _{calculated}	D _{calculated}	D _{used}	1/2 Inch of Detention Volume	24-Hour Discharge Volume
	(cfs)	(sf)	(ft/s ²)	(ft)		(ac-ft)	(hrs)	(sec/hr)	(ft)	(ft)	(ft)	(in)	(in)	(ac-ft)	(ac-ft)
1	0.125	0.07	32.2	0.15	0.6	0.50	24	3,600	0.20	0.10	0.29	3.50	3.0	0.33	0.4
2	0.100	0.03	32.2	0.40	0.6	0.40	24	3,600	0.54	0.27	0.20	2.45	3.0	0.27	0.4
3	0.140	0.07	32.2	0.16	0.6	0.56	24	3,600	0.21	0.10	0.31	3.68	3.0	0.37	0.4
4	0.112	0.04	32.2	0.39	0.6	0.45	24	3,600	0.52	0.26	0.22	2.62	3.0	0.30	0.4
5	0.149	0.08	32.2	0.16	0.6	0.59	24	3,600	0.22	0.11	0.31	3.74	3.0	0.40	0.4
6	0.120	0.04	32.2	0.36	0.6	0.47	24	3,600	0.47	0.24	0.23	2.76	3.0	0.32	0.4
7	0.129	0.06	32.2	0.19	0.6	0.51	24	3,600	0.25	0.13	0.28	3.36	3.0	0.34	0.4
8	0.023	0.01	32.2	0.43	0.6	0.09	24	3,600	0.57	0.29	0.10	1.16	3.0	0.06	0.4
9	0.058	0.02	32.2	0.42	0.6	0.23	24	3,600	0.56	0.28	0.15	1.85	3.0	0.15	0.4
10	0.129	0.06	32.2	0.21	0.6	0.51	24	3,600	0.28	0.14	0.27	3.27	3.0	0.34	0.4
11	0.081	0.03	32.2	0.34	0.6	0.32	24	3,600	0.45	0.23	0.19	2.31	3.0	0.22	0.4
12	0.074	0.03	32.2	0.36	0.6	0.29	24	3,600	0.48	0.24	0.18	2.17	3.0	0.20	0.4
13	0.074	0.03	32.2	0.33	0.6	0.29	24	3,600	0.44	0.22	0.19	2.22	3.0	0.20	0.4
14	0.121	0.04	32.2	0.36	0.6	0.48	24	3,600	0.48	0.24	0.23	2.77	3.0	0.32	0.4
15	0.075	0.03	32.2	0.38	0.6	0.30	24	3,600	0.50	0.25	0.18	2.15	3.0	0.20	0.4
16	0.239	0.07	32.2	0.47	0.6	0.95	24	3,600	0.63	0.32	0.30	3.63	3.0	0.63	0.5
17	0.044	0.01	32.2	0.46	0.6	0.17	24	3,600	0.61	0.30	0.13	1.57	3.0	0.12	0.4
18	0.058	0.02	32.2	0.37	0.6	0.23	24	3,600	0.49	0.25	0.16	1.91	3.0	0.15	0.4
19	0.034	0.01	32.2	0.35	0.6	0.13	24	3,600	0.47	0.23	0.12	1.47	3.0	0.09	0.4
20	0.017	0.01	32.2	0.33	0.6	0.07	24	3,600	0.44	0.22	0.09	1.05	3.0	0.04	0.4
21	0.036	0.02	32.2	0.13	0.6	0.14	24	3,600	0.18	0.09	0.16	1.92	3.0	0.09	0.4
22	0.087	0.03	32.2	0.34	0.6	0.35	24	3,600	0.45	0.23	0.20	2.39	3.0	0.23	0.4
23	0.011	0.00	32.2	0.23	0.6	0.04	24	3,600	0.30	0.15	0.08	0.94	3.0	0.03	0.4
24	0.035	0.01	32.2	0.32	0.6	0.14	24	3,600	0.43	0.22	0.13	1.54	3.0	0.09	0.4
25	0.006	0.00	32.2	0.32	0.6	0.03	24	3,600	0.43	0.21	0.05	0.66	3.0	0.02	0.4
26	0.007	0.00	32.2	0.36	0.6	0.03	24	3,600	0.48	0.24	0.06	0.68	3.0	0.02	0.4
27	0.007	0.00	32.2	0.39	0.6	0.03	24	3,600	0.52	0.26	0.05	0.63	3.0	0.02	0.4
28	0.039	0.01	32.2	0.30	0.6	0.16	24	3,600	0.40	0.20	0.14	1.65	3.0	0.10	0.4
29	0.043	0.01	32.2	0.57	0.6	0.17	24	3,600	0.76	0.38	0.12	1.47	3.0	0.11	0.4
30	0.016	0.01	32.2	0.29	0.6	0.06	24	3,600	0.39	0.19	0.09	1.05	3.0	0.04	0.4
31	0.016	0.01	32.2	0.28	0.6	0.06	24	3,600	0.38	0.19	0.09	1.08	3.0	0.04	0.4
32	0.166	0.06	32.2	0.37	0.6	0.66	24	3,600	0.50	0.25	0.27	3.22	3.0	0.44	0.5

Note: The minimum orifice diameter allowed by SPWMD is 3 inches. Systems which are limited by a discharge structure with an orifice no larger than the minimum dimensions shall be presumed to meet the discharge quantity criteria.

SR 710 Design-Build Package

From Martin/Palm Beach County Line to Pratt & Whitney Entrance

FPIDs: 432704-I-52-01/432706-I-52-01

Florida Department of Transportation, District 4

Summary of Existing Cross Drains

ID	Station	Size	Length	Offset LT	FL @ LT Offset	Offset RT	FL @ RT Offset
CD-1	1270+89.46	36"	51	-50.65	21.07	0.57	20.66
CD-2	1301+88.28	42"	55	-53.42	20.22	1.23	20.48
CD-3	1334+92.11	42"	58	-55.36	20.66	2.66	20.42
CD-4	1379+21.36	36"	59	15.04	20.19	73.57	20.8
CD-5	1399+69.55	36"	59	14.9	20.52	73.99	20.61
CD-6	1465+70.54	36"	67	10.33	20.59	77.31	20.5
CD-7	1545+71.69	36"	174	-77.66	18.82	96.57	18.54

SR 710 Design-Build Package

From Martin/Palm Beach County Line to Pratt & Whitney Entrance

FPIDs: 432704-I-52-01/432706-I-52-01

Florida Department of Transportation, District 4

Summary of Proposed Cross Drains

ID	Station	Size	Length	Offset LT	FL @ LT Offset	Offset RT	FL @ RT Offset
CD-1	1270+89.46	36"	153	-80.74	22.04	80.35	21.41
CD-2	1301+88.28	42"	152	-80.06	22.02	79.94	21.57
CD-3	1334+92.11	42"	180	-105.12	22.01	82.67	21.58
CD-4	1379+21.36	36"	157	-82.41	21.77	82.53	22.13
CD-5	1399+69.55	36"	159	-81.69	21.23	85.64	21.16
CD-6	1465+70.54	36"	161	-85.31	20.74	83.32	19.76

SR 710 Design-Build Package

From Martin/Palm Beach County Line to Pratt & Whitney Entrance

FPIDs: 432704-I-52-01/432706-I-52-01

Florida Department of Transportation, District 4

Existing ICPR Node Summary Table for the 25-Year/72-Hour Storm Event

Node	Max Stage	Warning Stage	Max Inflow	Max Outflow
	(ft)	(ft)	(cfs)	(cfs)
Offsite Ditch	23.21	25.00	884.60	67.72
Pine Glades	21.01	21.01	278.04	0.00
Public Lands	21.00	21.01	199.69	0.00

SR 710 Design-Build Package

From Martin/Palm Beach County Line to Pratt & Whitney Entrance

FPIDs: 432704-I-52-01/432706-I-52-01

Florida Department of Transportation, District 4

Existing ICPR Node Summary Table for the 100-Year/72-Hour Storm Event

Node	Max Stage	Warning Stage	Max Inflow	Max Outflow
	(ft)	(ft)	(cfs)	(cfs)
Offsite Ditch	23.67	25.00	1,099.82	103.79
Pine Glades	21.02	21.01	353.33	0.00
Public Lands	21.01	21.01	257.95	0.00

SR 710 Design-Build Package

From Martin/Palm Beach County Line to Pratt & Whitney Entrance

FPIDs: 432704-I-52-01/432706-I-52-01

Florida Department of Transportation, District 4

Proposed ICPR Node Summary Table for the 25-Year/72-Hour Storm Event

Node	Max Stage	Warning Stage	Max Inflow	Max Outflow
	(ft)	(ft)	(cfs)	(cfs)
Swale 1	25.89	26.50	44.52	28.96
Swale 2	26.12	26.20	35.61	33.10
Swale 3	25.88	26.60	49.77	26.36
Swale 4	25.97	26.10	39.91	37.56
Swale 5	25.94	26.57	53.07	24.26
Swale 6	25.90	26.07	42.58	39.76
Swale 7	25.42	26.30	45.86	39.33
Swale 8	25.67	25.80	8.19	7.81
Swale 9	25.52	25.62	19.93	18.76
Swale 10	24.99	25.25	46.03	33.22
Swale 11	25.28	25.73	29.02	20.37
Swale 12	24.87	25.57	26.36	25.29
Swale 13	24.87	25.07	26.35	22.61
Swale 14	24.75	25.33	42.99	39.01
Swale 15	25.01	25.59	26.52	24.87
Swale 16	25.04	25.45	84.96	73.67
Swale 17	24.77	25.50	15.56	15.36
Swale 18	24.66	24.82	20.76	19.38
Swale 19	24.72	25.20	12.02	9.21
Swale 20	24.64	25.45	5.95	5.77
Swale 21	24.48	24.95	12.67	9.86
Swale 22	24.82	25.30	31.18	22.96
Swale 23	24.48	25.50	3.72	3.59
Swale 24	24.87	25.50	12.64	10.35
Swale 25	24.55	25.50	2.31	2.28
Swale 26	24.15	25.03	2.58	2.54
Swale 27	23.86	24.70	2.36	2.33
Swale 28	24.23	24.70	14.03	8.57
Swale 29	24.16	24.20	12.81	12.47
Swale 30	23.81	24.69	5.56	5.37
Swale 31	23.44	24.00	5.79	4.71
Swale 32	24.14	24.29	59.34	55.55
Offsite Ditch	23.43	25.00	892.29	84.92
Pine Glades	21.01	21.01	187.80	0.00
Public Lands	21.01	21.01	134.39	0.00

SR 710 Design-Build Package

From Martin/Palm Beach County Line to Pratt & Whitney Entrance

FPIDs: 432704-I-52-01/432706-I-52-01

Florida Department of Transportation, District 4

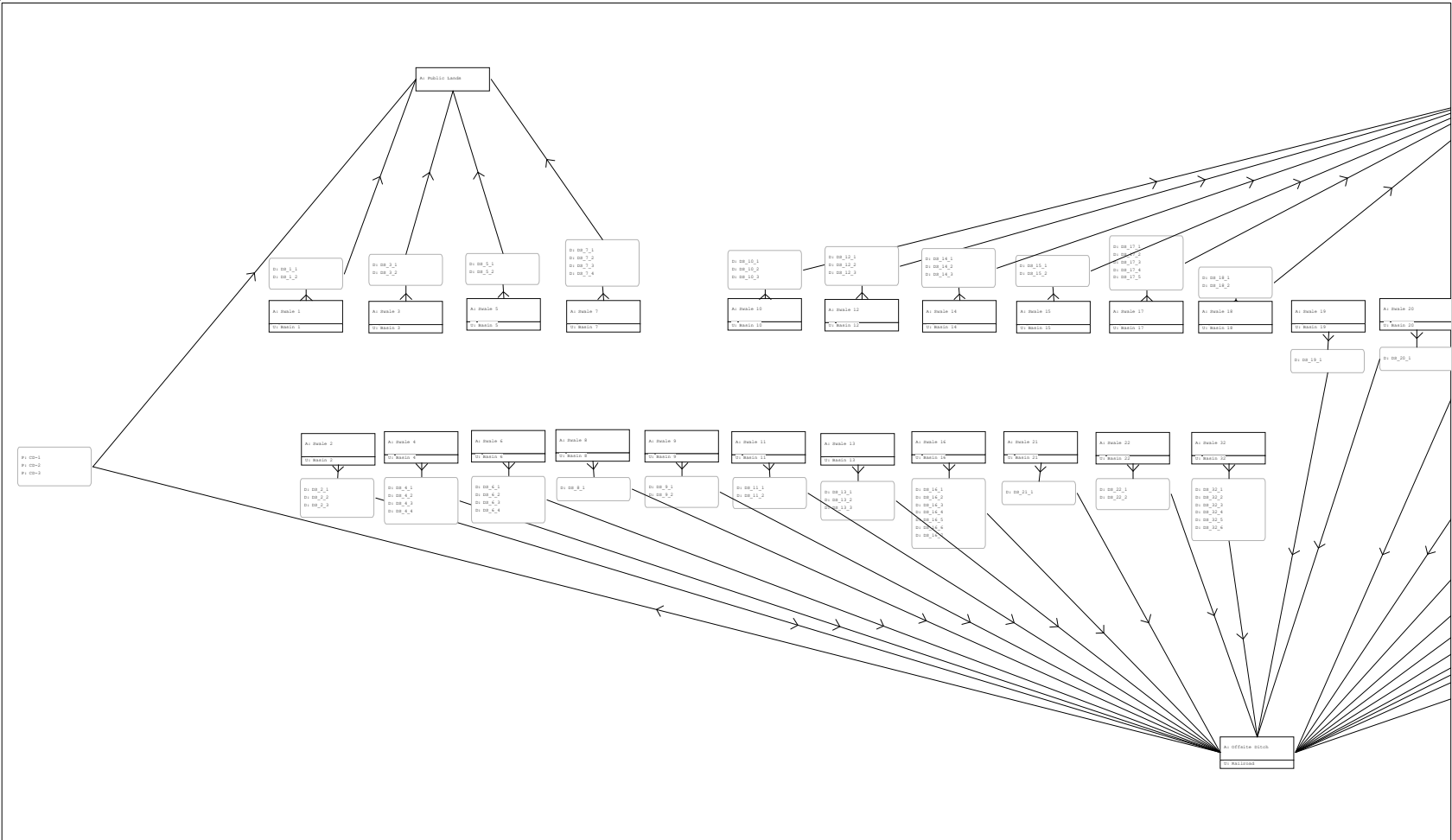
Proposed ICPR Node Summary Table for the 100-Year/72-Hour Storm Event

Node	Max Stage	Warning Stage	Max Inflow	Max Outflow
	(ft)	(ft)	(cfs)	(cfs)
Swale 1	26.03	26.50	55.26	30.58
Swale 2	26.19	26.20	44.20	41.22
Swale 3	26.06	26.60	61.80	27.61
Swale 4	26.02	26.10	49.52	46.75
Swale 5	26.15	26.57	65.88	25.73
Swale 6	25.97	26.07	52.82	47.50
Swale 7	25.52	26.30	56.88	44.57
Swale 8	25.72	25.80	10.16	9.70
Swale 9	25.58	25.62	24.69	23.32
Swale 10	25.13	25.25	57.11	35.39
Swale 11	25.51	25.73	35.99	22.24
Swale 12	24.92	25.57	32.70	31.46
Swale 13	25.01	25.07	32.69	25.47
Swale 14	24.91	25.33	53.34	42.08
Swale 15	25.10	25.59	32.91	28.82
Swale 16	25.25	25.45	105.40	80.92
Swale 17	24.80	25.50	19.30	19.06
Swale 18	24.72	24.82	25.75	24.11
Swale 19	24.93	25.20	14.90	9.65
Swale 20	24.68	25.45	7.38	7.27
Swale 21	24.56	24.95	15.72	11.17
Swale 22	25.05	25.30	38.66	24.71
Swale 23	24.51	25.50	4.60	4.47
Swale 24	25.13	25.50	15.67	10.07
Swale 25	24.58	25.50	2.86	2.82
Swale 26	24.17	25.03	3.20	3.16
Swale 27	23.88	24.70	2.92	2.89
Swale 28	24.57	24.70	17.40	8.00
Swale 29	24.19	24.20	15.86	15.47
Swale 30	23.91	24.69	6.90	6.00
Swale 31	23.89	24.00	7.18	3.98
Swale 32	24.22	24.29	73.57	64.13
Offsite Ditch	23.88	25.00	1075.79	121.68
Pine Glades	21.02	21.01	224.42	0.00
Public Lands	21.01	21.01	163.49	0.00

APPENDIX F: PROPOSED ICPR MODEL

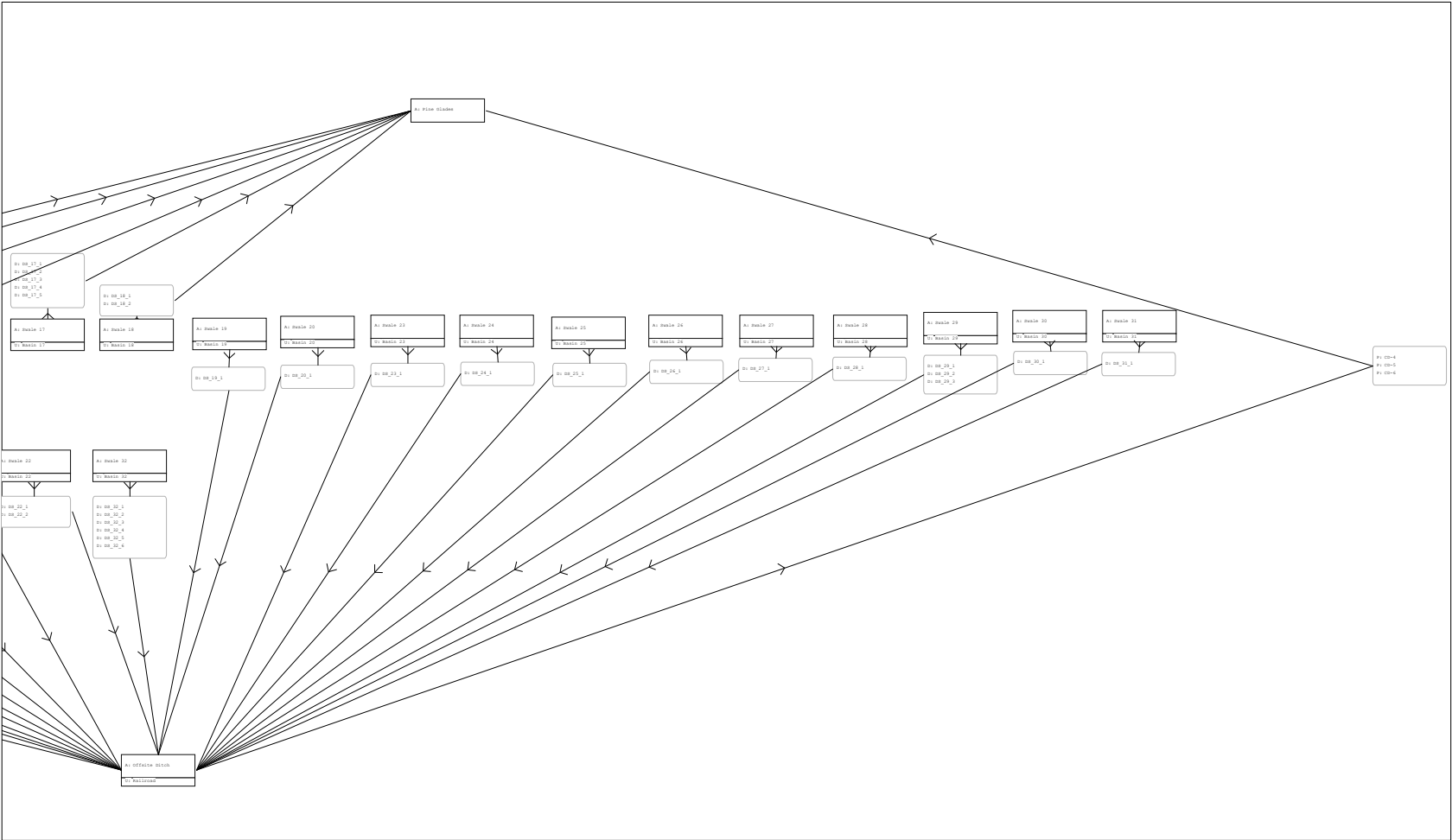
SR 710 from Martin/Palm Beach County Line to Pratt & Whitney Entrance
Proposed Nodal Diagram

- 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



SR 710 from Martin/Palm Beach County Line to Pratt & Whitney Entrance
Proposed Nodal Diagram

- Nodes
A Stage/Area
V Stage/Volume
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E Percolation
F Filter
X Exfil Trench



SR 710 from Martin/Palm Beach County Line to Pratt & Whitney Entrance
Proposed Node Min/Max Report

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	M Outfl c
Offsite Ditch	BASE	100YR72HR	61.55	23.88	25.00	0.0039	2369594	60.00	1075.79	61.55	121.
Pine Glades	BASE	100YR72HR	72.00	21.02	21.01	0.0000	289456856	60.10	224.42	0.00	0.
Public Lands	BASE	100YR72HR	72.00	21.01	21.01	0.0000	470448707	60.33	163.49	0.00	0.
Swale 1	BASE	100YR72HR	60.27	26.03	26.50	0.0020	111644	60.00	55.26	60.27	30.
Swale 10	BASE	100YR72HR	60.22	25.13	25.25	-0.0021	100452	60.00	57.11	60.22	35.
Swale 11	BASE	100YR72HR	60.22	25.51	25.73	-0.0035	40547	60.00	35.99	60.22	22.
Swale 12	BASE	100YR72HR	60.04	24.92	25.57	0.0019	28072	60.00	32.70	60.04	31.
Swale 13	BASE	100YR72HR	60.14	25.01	25.07	-0.0024	39878	60.00	32.69	60.14	25.
Swale 14	BASE	100YR72HR	60.14	24.91	25.33	-0.0030	53802	60.00	53.34	60.14	42.
Swale 15	BASE	100YR72HR	60.10	25.10	25.59	0.0023	30577	60.00	32.91	60.10	28.
Swale 16	BASE	100YR72HR	60.14	25.25	25.45	-0.0037	88648	60.00	105.40	60.14	80.
Swale 17	BASE	100YR72HR	60.01	24.80	25.50	0.0013	12935	60.00	19.30	60.01	19.
Swale 18	BASE	100YR72HR	60.06	24.72	24.82	0.0020	29133	60.00	25.75	60.06	24.
Swale 19	BASE	100YR72HR	60.23	24.93	25.20	-0.0029	16484	60.00	14.90	60.03	9.
Swale 2	BASE	100YR72HR	60.07	26.19	26.20	0.0021	47897	60.00	44.20	60.07	41.
Swale 20	BASE	100YR72HR	60.03	24.68	25.45	0.0028	6472	60.00	7.38	60.07	7.
Swale 21	BASE	100YR72HR	60.17	24.56	24.95	0.0016	37035	60.00	15.72	60.18	11.
Swale 22	BASE	100YR72HR	60.21	25.05	25.30	-0.0034	42709	60.00	38.66	60.21	24.
Swale 23	BASE	100YR72HR	60.03	24.51	25.50	0.0030	5676	60.00	4.60	60.03	4.
Swale 24	BASE	100YR72HR	60.22	25.13	25.50	-0.0029	17600	60.00	15.67	59.88	10.
Swale 25	BASE	100YR72HR	60.01	24.58	25.50	0.0043	2310	60.00	2.86	60.01	2.
Swale 26	BASE	100YR72HR	60.01	24.17	25.03	0.0045	2422	60.00	3.20	60.01	3.
Swale 27	BASE	100YR72HR	60.01	23.88	24.70	0.0050	2059	60.00	2.92	60.01	2.
Swale 28	BASE	100YR72HR	60.42	24.57	24.70	0.0037	23073	60.00	17.40	60.02	8.
Swale 29	BASE	100YR72HR	60.03	24.19	24.20	0.0017	15578	60.00	15.86	60.02	15.
Swale 3	BASE	100YR72HR	60.37	26.06	26.60	-0.0030	123005	60.00	61.80	60.37	27.
Swale 30	BASE	100YR72HR	60.14	23.91	24.69	0.0028	6853	60.00	6.90	59.94	6.
Swale 31	BASE	100YR72HR	61.55	23.89	24.00	0.0034	9998	60.00	7.18	59.82	3.
Swale 32	BASE	100YR72HR	60.11	24.22	24.29	0.0019	80676	60.00	73.57	60.01	64.
Swale 4	BASE	100YR72HR	60.06	26.02	26.10	0.0019	52836	60.00	49.52	60.06	46.
Swale 5	BASE	100YR72HR	60.46	26.15	26.57	-0.0029	126996	60.00	65.88	60.46	25.
Swale 6	BASE	100YR72HR	60.09	25.97	26.07	0.0020	58942	60.00	52.82	60.09	47.
Swale 7	BASE	100YR72HR	60.14	25.52	26.30	0.0019	87087	60.00	56.88	60.14	44.
Swale 8	BASE	100YR72HR	60.05	25.72	25.80	0.0026	10247	60.00	10.16	60.05	9.
Swale 9	BASE	100YR72HR	60.05	25.58	25.62	0.0020	25877	60.00	24.69	60.05	23.
Offsite Ditch	BASE	25YR72HR	61.80	23.43	25.00	0.0035	2202046	60.00	892.29	61.80	84.
Pine Glades	BASE	25YR72HR	72.00	21.01	21.01	0.0000	289456841	60.09	187.80	0.00	0.
Public Lands	BASE	25YR72HR	72.00	21.01	21.01	0.0000	470448659	60.21	134.39	0.00	0.
Swale 1	BASE	25YR72HR	60.20	25.89	26.50	0.0017	108238	60.00	44.52	60.20	28.
Swale 10	BASE	25YR72HR	60.16	24.99	25.25	-0.0017	92472	60.00	46.03	60.16	33.
Swale 11	BASE	25YR72HR	60.17	25.28	25.73	-0.0032	36478	60.00	29.02	60.17	20.
Swale 12	BASE	25YR72HR	60.04	24.87	25.57	0.0017	27431	60.00	26.36	60.04	25.
Swale 13	BASE	25YR72HR	60.11	24.87	25.07	-0.0020	36607	60.00	26.35	60.11	22.
Swale 14	BASE	25YR72HR	60.09	24.75	25.33	0.0019	49034	60.00	42.99	60.09	39.
Swale 15	BASE	25YR72HR	60.06	25.01	25.59	0.0019	28794	60.00	26.52	60.06	24.
Swale 16	BASE	25YR72HR	60.10	25.04	25.45	-0.0026	79630	60.00	84.96	60.10	73.

SR 710 from Martin/Palm Beach County Line to Pratt & Whitney Entrance
Proposed Node Min/Max Report

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	M Outfl c
Swale 17	BASE	25YR72HR	60.01	24.77	25.50	0.0012	12659	60.00	15.56	60.01	15.
Swale 18	BASE	25YR72HR	60.07	24.66	24.82	0.0016	27902	60.00	20.76	60.07	19.
Swale 19	BASE	25YR72HR	60.15	24.72	25.20	-0.0033	14715	60.00	12.02	60.24	9.
Swale 2	BASE	25YR72HR	60.07	26.12	26.20	0.0017	45913	60.00	35.61	60.07	33.
Swale 20	BASE	25YR72HR	60.03	24.64	25.45	0.0043	6274	60.00	5.95	60.03	5.
Swale 21	BASE	25YR72HR	60.14	24.48	24.95	0.0013	35090	60.00	12.67	60.14	9.
Swale 22	BASE	25YR72HR	60.16	24.82	25.30	-0.0030	38450	60.00	31.18	60.16	22.
Swale 23	BASE	25YR72HR	60.03	24.48	25.50	0.0031	5598	60.00	3.72	60.03	3.
Swale 24	BASE	25YR72HR	60.13	24.87	25.50	-0.0025	15269	60.00	12.64	60.03	10.
Swale 25	BASE	25YR72HR	60.01	24.55	25.50	-0.0042	2271	60.00	2.31	60.01	2.
Swale 26	BASE	25YR72HR	60.02	24.15	25.03	0.0044	2379	60.00	2.58	60.01	2.
Swale 27	BASE	25YR72HR	60.01	23.86	24.70	0.0050	2017	60.00	2.36	60.01	2.
Swale 28	BASE	25YR72HR	60.25	24.23	24.70	-0.0029	19744	60.00	14.03	59.88	8.
Swale 29	BASE	25YR72HR	60.03	24.16	24.20	0.0022	15202	60.00	12.81	60.03	12.
Swale 3	BASE	25YR72HR	60.29	25.88	26.60	-0.0020	118057	60.00	49.77	60.29	26.
Swale 30	BASE	25YR72HR	60.03	23.81	24.69	0.0049	6458	60.00	5.56	60.03	5.
Swale 31	BASE	25YR72HR	61.78	23.44	24.00	0.0035	8179	60.00	5.79	59.90	4.
Swale 32	BASE	25YR72HR	60.06	24.14	24.29	0.0016	76332	60.00	59.34	60.06	55.
Swale 4	BASE	25YR72HR	60.06	25.97	26.10	0.0016	50832	60.00	39.91	60.06	37.
Swale 5	BASE	25YR72HR	60.36	25.94	26.57	-0.0028	121057	60.00	53.07	60.36	24.
Swale 6	BASE	25YR72HR	60.07	25.90	26.07	0.0016	56179	60.00	42.58	60.07	39.
Swale 7	BASE	25YR72HR	60.11	25.42	26.30	0.0015	83917	60.00	45.86	60.11	39.
Swale 8	BASE	25YR72HR	60.05	25.67	25.80	0.0028	9862	60.00	8.19	60.05	7.
Swale 9	BASE	25YR72HR	60.06	25.52	25.62	0.0016	24940	60.00	19.93	60.06	18.

SR 710 from Martin/Palm Beach County Line to Pratt & Whitney Entrance
Proposed Link Min/Max Report

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CD-1	BASE	100YR72HR	61.52	16.48	0.046	61.55	23.88	61.52	22.65
CD-2	BASE	100YR72HR	61.55	18.41	0.051	61.55	23.88	61.55	22.88
CD-3	BASE	100YR72HR	61.55	17.69	0.049	61.55	23.88	61.55	22.86
CD-4	BASE	100YR72HR	61.55	9.93	0.027	61.55	23.88	61.55	23.13
CD-5	BASE	100YR72HR	61.55	21.70	0.047	61.55	23.88	61.55	22.66
CD-6	BASE	100YR72HR	61.54	37.47	-0.255	61.55	23.88	61.54	21.55
DS_10_1	BASE	100YR72HR	60.22	11.45	0.221	60.22	25.13	72.00	21.02
DS_10_2	BASE	100YR72HR	60.22	11.97	-0.087	60.22	25.13	72.00	21.02
DS_10_3	BASE	100YR72HR	60.22	11.97	-0.087	60.22	25.13	72.00	21.02
DS_11_1	BASE	100YR72HR	60.23	10.97	0.221	60.22	25.51	61.55	23.88
DS_11_2	BASE	100YR72HR	60.22	11.27	-0.124	60.22	25.51	61.55	23.88
DS_12_1	BASE	100YR72HR	60.04	10.59	0.221	60.04	24.92	72.00	21.02
DS_12_2	BASE	100YR72HR	60.04	10.44	0.062	60.04	24.92	72.00	21.02
DS_12_3	BASE	100YR72HR	60.04	10.44	0.062	60.04	24.92	72.00	21.02
DS_13_1	BASE	100YR72HR	60.15	8.45	0.218	60.14	25.01	61.55	23.88
DS_13_2	BASE	100YR72HR	60.14	9.24	-0.082	60.14	25.01	61.55	23.88
DS_13_3	BASE	100YR72HR	60.14	7.78	0.058	60.14	25.01	61.55	23.88
DS_14_1	BASE	100YR72HR	60.14	14.24	0.221	60.14	24.91	72.00	21.02
DS_14_2	BASE	100YR72HR	60.14	13.63	-0.126	60.14	24.91	72.00	21.02
DS_14_3	BASE	100YR72HR	60.14	14.21	-0.135	60.14	24.91	72.00	21.02
DS_15_1	BASE	100YR72HR	60.10	14.35	0.221	60.10	25.10	72.00	21.02
DS_15_2	BASE	100YR72HR	60.10	14.48	-0.098	60.10	25.10	72.00	21.02
DS_16_1	BASE	100YR72HR	60.15	10.65	0.223	60.14	25.25	61.55	23.88
DS_16_2	BASE	100YR72HR	60.14	11.45	-0.132	60.14	25.25	61.55	23.88
DS_16_3	BASE	100YR72HR	60.14	11.71	-0.139	60.14	25.25	61.55	23.88
DS_16_4	BASE	100YR72HR	60.14	12.12	-0.150	60.14	25.25	61.55	23.88
DS_16_5	BASE	100YR72HR	60.14	11.87	-0.145	60.14	25.25	61.55	23.88
DS_16_6	BASE	100YR72HR	60.14	11.77	-0.142	60.14	25.25	61.55	23.88
DS_16_7	BASE	100YR72HR	60.14	11.35	-0.128	60.14	25.25	61.55	23.88
DS_17_1	BASE	100YR72HR	60.01	4.06	0.221	60.01	24.80	72.00	21.02
DS_17_2	BASE	100YR72HR	60.01	3.75	0.026	60.01	24.80	72.00	21.02
DS_17_3	BASE	100YR72HR	60.01	3.75	0.026	60.01	24.80	72.00	21.02
DS_17_4	BASE	100YR72HR	60.01	3.75	0.026	60.01	24.80	72.00	21.02
DS_17_5	BASE	100YR72HR	60.01	3.75	0.026	60.01	24.80	72.00	21.02
DS_18_1	BASE	100YR72HR	60.06	12.17	0.221	60.06	24.72	72.00	21.02
DS_18_2	BASE	100YR72HR	60.06	11.94	0.067	60.06	24.72	72.00	21.02
DS_19_1	BASE	100YR72HR	60.03	9.65	0.221	60.23	24.93	61.55	23.88
DS_1_1	BASE	100YR72HR	60.27	15.96	0.221	60.27	26.03	72.00	21.01
DS_1_2	BASE	100YR72HR	60.27	14.61	0.085	60.27	26.03	72.00	21.01
DS_20_1	BASE	100YR72HR	60.07	7.27	0.221	60.03	24.68	61.55	23.88
DS_21_1	BASE	100YR72HR	60.18	11.17	0.221	60.17	24.56	61.55	23.88
DS_22_1	BASE	100YR72HR	60.22	12.58	0.221	60.21	25.05	61.55	23.88
DS_22_2	BASE	100YR72HR	60.21	12.13	-0.106	60.21	25.05	61.55	23.88
DS_23_1	BASE	100YR72HR	60.03	4.47	0.221	60.03	24.51	61.55	23.88
DS_24_1	BASE	100YR72HR	59.88	10.07	0.221	60.22	25.13	61.55	23.88
DS_25_1	BASE	100YR72HR	60.01	2.82	0.221	60.01	24.58	61.55	23.88

SR 710 from Martin/Palm Beach County Line to Pratt & Whitney Entrance
Proposed Link Min/Max Report

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DS_26_1	BASE	100YR72HR	60.01	3.16	0.221	60.01	24.17	61.55	23.88
DS_27_1	BASE	100YR72HR	60.01	2.89	0.221	60.01	23.88	61.55	23.88
DS_28_1	BASE	100YR72HR	60.02	8.00	0.221	60.42	24.57	61.55	23.88
DS_29_1	BASE	100YR72HR	60.02	5.27	0.221	60.03	24.19	61.55	23.88
DS_29_2	BASE	100YR72HR	60.03	5.10	0.031	60.03	24.19	61.55	23.88
DS_29_3	BASE	100YR72HR	60.03	5.10	0.031	60.03	24.19	61.55	23.88
DS_2_1	BASE	100YR72HR	60.07	13.90	0.221	60.07	26.19	61.55	23.88
DS_2_2	BASE	100YR72HR	60.07	13.66	0.075	60.07	26.19	61.55	23.88
DS_2_3	BASE	100YR72HR	60.07	13.66	0.075	60.07	26.19	61.55	23.88
DS_30_1	BASE	100YR72HR	59.94	6.00	0.221	60.14	23.91	61.55	23.88
DS_31_1	BASE	100YR72HR	59.82	3.98	0.206	61.55	23.89	61.55	23.88
DS_32_1	BASE	100YR72HR	60.12	9.60	0.221	60.11	24.22	61.55	23.88
DS_32_2	BASE	100YR72HR	60.01	10.94	0.065	60.11	24.22	61.55	23.88
DS_32_3	BASE	100YR72HR	60.01	10.94	0.065	60.11	24.22	61.55	23.88
DS_32_4	BASE	100YR72HR	60.01	10.94	0.065	60.11	24.22	61.55	23.88
DS_32_5	BASE	100YR72HR	60.01	10.94	0.065	60.11	24.22	61.55	23.88
DS_32_6	BASE	100YR72HR	60.01	10.94	0.065	60.11	24.22	61.55	23.88
DS_3_1	BASE	100YR72HR	60.37	14.93	0.221	60.37	26.06	72.00	21.01
DS_3_2	BASE	100YR72HR	60.37	12.68	-0.105	60.37	26.06	72.00	21.01
DS_4_1	BASE	100YR72HR	60.06	11.91	0.221	60.06	26.02	61.55	23.88
DS_4_2	BASE	100YR72HR	60.06	11.61	0.065	60.06	26.02	61.55	23.88
DS_4_3	BASE	100YR72HR	60.06	11.61	0.065	60.06	26.02	61.55	23.88
DS_4_4	BASE	100YR72HR	60.06	11.61	0.065	60.06	26.02	61.55	23.88
DS_5_1	BASE	100YR72HR	60.46	10.95	0.221	60.46	26.15	72.00	21.01
DS_5_2	BASE	100YR72HR	60.46	14.78	-0.120	60.46	26.15	72.00	21.01
DS_6_1	BASE	100YR72HR	60.09	13.00	0.221	60.09	25.97	61.55	23.88
DS_6_2	BASE	100YR72HR	60.09	10.87	0.068	60.09	25.97	61.55	23.88
DS_6_3	BASE	100YR72HR	60.09	11.81	0.068	60.09	25.97	61.55	23.88
DS_6_4	BASE	100YR72HR	60.09	11.81	0.068	60.09	25.97	61.55	23.88
DS_7_1	BASE	100YR72HR	60.14	13.20	0.221	60.14	25.52	72.00	21.01
DS_7_2	BASE	100YR72HR	60.14	10.95	-0.068	60.14	25.52	72.00	21.01
DS_7_3	BASE	100YR72HR	60.14	10.63	-0.065	60.14	25.52	72.00	21.01
DS_7_4	BASE	100YR72HR	60.14	9.79	0.064	60.14	25.52	72.00	21.01
DS_8_1	BASE	100YR72HR	60.05	9.70	0.221	60.05	25.72	61.55	23.88
DS_9_1	BASE	100YR72HR	60.05	11.76	0.221	60.05	25.58	61.55	23.88
DS_9_2	BASE	100YR72HR	60.05	11.57	0.066	60.05	25.58	61.55	23.88
CD-1	BASE	25YR72HR	61.76	10.20	0.033	61.80	23.43	61.76	22.37
CD-2	BASE	25YR72HR	61.75	11.61	0.037	61.80	23.43	61.75	22.62
CD-3	BASE	25YR72HR	61.80	11.29	0.035	61.80	23.43	61.80	22.60
CD-4	BASE	25YR72HR	61.80	5.72	0.019	61.80	23.43	61.80	22.88
CD-5	BASE	25YR72HR	61.80	15.88	0.035	61.80	23.43	61.80	22.43
CD-6	BASE	25YR72HR	61.74	30.22	-0.255	61.80	23.43	61.74	21.32
DS_10_1	BASE	25YR72HR	60.16	10.84	0.221	60.16	24.99	72.00	21.01
DS_10_2	BASE	25YR72HR	60.16	11.19	-0.071	60.16	24.99	72.00	21.01
DS_10_3	BASE	25YR72HR	60.16	11.19	-0.071	60.16	24.99	72.00	21.01
DS_11_1	BASE	25YR72HR	60.17	9.99	0.221	60.17	25.28	61.80	23.43

SR 710 from Martin/Palm Beach County Line to Pratt & Whitney Entrance
Proposed Link Min/Max Report

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DS_11_2	BASE	25YR72HR	60.17	10.37	-0.121	60.17	25.28	61.80	23.43
DS_12_1	BASE	25YR72HR	60.04	8.58	0.221	60.04	24.87	72.00	21.01
DS_12_2	BASE	25YR72HR	60.04	8.36	0.044	60.04	24.87	72.00	21.01
DS_12_3	BASE	25YR72HR	60.04	8.36	0.044	60.04	24.87	72.00	21.01
DS_13_1	BASE	25YR72HR	60.10	7.54	0.218	60.11	24.87	61.80	23.43
DS_13_2	BASE	25YR72HR	60.11	8.24	-0.070	60.11	24.87	61.80	23.43
DS_13_3	BASE	25YR72HR	60.11	6.82	-0.053	60.11	24.87	61.80	23.43
DS_14_1	BASE	25YR72HR	60.09	13.25	0.221	60.09	24.75	72.00	21.01
DS_14_2	BASE	25YR72HR	60.09	12.62	0.067	60.09	24.75	72.00	21.01
DS_14_3	BASE	25YR72HR	60.09	13.13	0.067	60.09	24.75	72.00	21.01
DS_15_1	BASE	25YR72HR	60.06	12.54	0.221	60.06	25.01	72.00	21.01
DS_15_2	BASE	25YR72HR	60.06	12.33	0.063	60.06	25.01	72.00	21.01
DS_16_1	BASE	25YR72HR	60.10	9.60	0.223	60.10	25.04	61.80	23.43
DS_16_2	BASE	25YR72HR	60.10	10.42	-0.097	60.10	25.04	61.80	23.43
DS_16_3	BASE	25YR72HR	60.10	10.68	-0.104	60.10	25.04	61.80	23.43
DS_16_4	BASE	25YR72HR	60.10	11.08	-0.108	60.10	25.04	61.80	23.43
DS_16_5	BASE	25YR72HR	60.10	10.83	-0.105	60.10	25.04	61.80	23.43
DS_16_6	BASE	25YR72HR	60.10	10.74	-0.104	60.10	25.04	61.80	23.43
DS_16_7	BASE	25YR72HR	60.10	10.32	-0.095	60.10	25.04	61.80	23.43
DS_17_1	BASE	25YR72HR	60.01	3.32	0.221	60.01	24.77	72.00	21.01
DS_17_2	BASE	25YR72HR	60.01	3.01	0.023	60.01	24.77	72.00	21.01
DS_17_3	BASE	25YR72HR	60.01	3.01	0.023	60.01	24.77	72.00	21.01
DS_17_4	BASE	25YR72HR	60.01	3.01	0.023	60.01	24.77	72.00	21.01
DS_17_5	BASE	25YR72HR	60.01	3.01	0.023	60.01	24.77	72.00	21.01
DS_18_1	BASE	25YR72HR	60.07	9.84	0.221	60.07	24.66	72.00	21.01
DS_18_2	BASE	25YR72HR	60.07	9.54	0.049	60.07	24.66	72.00	21.01
DS_19_1	BASE	25YR72HR	60.24	9.21	0.221	60.15	24.72	61.80	23.43
DS_1_1	BASE	25YR72HR	60.20	15.10	0.221	60.20	25.89	72.00	21.01
DS_1_2	BASE	25YR72HR	60.20	13.86	0.066	60.20	25.89	72.00	21.01
DS_20_1	BASE	25YR72HR	60.03	5.77	0.221	60.03	24.64	61.80	23.43
DS_21_1	BASE	25YR72HR	60.14	9.86	0.221	60.14	24.48	61.80	23.43
DS_22_1	BASE	25YR72HR	60.16	11.70	0.221	60.16	24.82	61.80	23.43
DS_22_2	BASE	25YR72HR	60.16	11.26	-0.116	60.16	24.82	61.80	23.43
DS_23_1	BASE	25YR72HR	60.03	3.59	0.221	60.03	24.48	61.80	23.43
DS_24_1	BASE	25YR72HR	60.03	10.35	0.221	60.13	24.87	61.80	23.43
DS_25_1	BASE	25YR72HR	60.01	2.28	0.221	60.01	24.55	61.80	23.43
DS_26_1	BASE	25YR72HR	60.01	2.54	0.221	60.02	24.15	61.80	23.43
DS_27_1	BASE	25YR72HR	60.01	2.33	0.221	60.01	23.86	61.80	23.43
DS_28_1	BASE	25YR72HR	59.88	8.57	0.221	60.25	24.23	61.80	23.43
DS_29_1	BASE	25YR72HR	60.03	4.32	0.221	60.03	24.16	61.80	23.43
DS_29_2	BASE	25YR72HR	60.03	4.08	0.025	60.03	24.16	61.80	23.43
DS_29_3	BASE	25YR72HR	60.03	4.08	0.025	60.03	24.16	61.80	23.43
DS_2_1	BASE	25YR72HR	60.07	11.24	0.221	60.07	26.12	61.80	23.43
DS_2_2	BASE	25YR72HR	60.07	10.93	0.056	60.07	26.12	61.80	23.43
DS_2_3	BASE	25YR72HR	60.07	10.93	0.056	60.07	26.12	61.80	23.43
DS_30_1	BASE	25YR72HR	60.03	5.37	0.221	60.03	23.81	61.80	23.43

SR 710 from Martin/Palm Beach County Line to Pratt & Whitney Entrance
Proposed Link Min/Max Report

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DS_31_1	BASE	25YR72HR	59.90	4.71	0.206	61.78	23.44	61.80	23.43
DS_32_1	BASE	25YR72HR	60.07	8.84	0.221	60.06	24.14	61.80	23.43
DS_32_2	BASE	25YR72HR	60.06	9.34	0.047	60.06	24.14	61.80	23.43
DS_32_3	BASE	25YR72HR	60.06	9.34	0.047	60.06	24.14	61.80	23.43
DS_32_4	BASE	25YR72HR	60.06	9.34	0.047	60.06	24.14	61.80	23.43
DS_32_5	BASE	25YR72HR	60.06	9.34	0.047	60.06	24.14	61.80	23.43
DS_32_6	BASE	25YR72HR	60.06	9.34	0.047	60.06	24.14	61.80	23.43
DS_3_1	BASE	25YR72HR	60.29	14.36	0.221	60.29	25.88	72.00	21.01
DS_3_2	BASE	25YR72HR	60.29	12.00	-0.077	60.29	25.88	72.00	21.01
DS_4_1	BASE	25YR72HR	60.06	9.62	0.221	60.06	25.97	61.80	23.43
DS_4_2	BASE	25YR72HR	60.06	9.31	0.048	60.06	25.97	61.80	23.43
DS_4_3	BASE	25YR72HR	60.06	9.31	0.048	60.06	25.97	61.80	23.43
DS_4_4	BASE	25YR72HR	60.06	9.31	0.048	60.06	25.97	61.80	23.43
DS_5_1	BASE	25YR72HR	60.36	10.14	0.221	60.36	25.94	72.00	21.01
DS_5_2	BASE	25YR72HR	60.36	14.12	-0.113	60.36	25.94	72.00	21.01
DS_6_1	BASE	25YR72HR	60.07	10.14	0.221	60.07	25.90	61.80	23.43
DS_6_2	BASE	25YR72HR	60.07	9.87	0.050	60.07	25.90	61.80	23.43
DS_6_3	BASE	25YR72HR	60.07	9.87	0.050	60.07	25.90	61.80	23.43
DS_6_4	BASE	25YR72HR	60.07	9.87	0.050	60.07	25.90	61.80	23.43
DS_7_1	BASE	25YR72HR	60.11	10.53	0.221	60.11	25.42	72.00	21.01
DS_7_2	BASE	25YR72HR	60.11	10.03	-0.050	60.11	25.42	72.00	21.01
DS_7_3	BASE	25YR72HR	60.11	9.76	-0.050	60.11	25.42	72.00	21.01
DS_7_4	BASE	25YR72HR	60.11	9.01	-0.050	60.11	25.42	72.00	21.01
DS_8_1	BASE	25YR72HR	60.05	7.81	0.221	60.05	25.67	61.80	23.43
DS_9_1	BASE	25YR72HR	60.06	9.51	0.221	60.06	25.52	61.80	23.43
DS_9_2	BASE	25YR72HR	60.06	9.25	0.048	60.06	25.52	61.80	23.43

*INDIAN SUN GROVES
AGRICULTURAL AREA
(SFWMD PERMIT # 43-00347)*

LAST DATE FOR GOVERNING BOARD ACTION:
February 13, 1986

DRAFT
Subject to Governing
Board Approval

SURFACE WATER MANAGEMENT STAFF REVIEW SUMMARY

APPLICATION NO.: 12125-D

PROJECT NAME: Indian Sun Groves

LOCATION: Martin County, S9,10,11,14,15,16,23/T40S/R39E

APPLICANTS NAME AND ADDRESS: Metropolitan Life Insurance Company
P.O. Box 336
Indiantown, FL 33456

OWNER: Same

DEVELOPER: Same

ENGINEER: Lindahl, Browning, Ferrari, and Hellstrom, Inc.

REVIEWER RATING OF PROJECT DESIGN

1. Suitability of land for proposed use	<u>GOOD</u>	FAIR	POOR	NOT APPLICABLE
2. Water quantity impacts	<u>GOOD</u>	FAIR	POOR	NOT APPLICABLE
3. Water quality impacts	<u>GOOD</u>	FAIR	POOR	NOT APPLICABLE
4. Environmental impacts	GOOD	FAIR	POOR	<u>NOT SIGNIFICANT</u>
5. Water conservation	<u>GOOD</u>	FAIR	POOR	NOT APPLICABLE
6. Flood protection	GOOD	FAIR	POOR	<u>NOT APPLICABLE</u>
7. Relief from rainstorm inconvenience	GOOD	FAIR	POOR	<u>NOT APPLICABLE</u>
8. System maintainability	<u>GOOD</u>	FAIR	POOR	NOT APPLICABLE
9. Overall use of land with respect to water resource	<u>GOOD</u>	FAIR	POOR	NOT APPLICABLE
10. Water management system with respect to feasible alternatives	<u>GOOD</u>	FAIR	POOR	NOT APPLICABLE

FINAL - adopted by Governing Board

1-27-86

SURFACE WATER MANAGEMENT EVALUATION

APPLICATION NUMBER 12125-D DATE: December 12, 1985

PROJECT NAME: Indian Sun Groves

LOCATION: Martin COUNTY

SECTIONS 9, 10, 11, 14, 15, 16, 23, TOWNSHIP 40 SOUTH, RANGE 39 EAST

PROJECT AREA 1633.9 ACRES

DRAINAGE AREA 1603.9* ACRES

*Approximately 30 acres of wetlands will be excluded from the project.

FACILITIES:

1. EXISTING: This project was previously covered by Permit #43-00034-S/W, Thomas M. Chastain. A series of drainage ditches runs through the property to a canal that drains to the C-44 canal via the Corp of Engineers Spillway "G". The discharge from the site is controlled by a structure consisting of 1-60" CMP with a riser.

2. PROPOSED: A series of swales and lateral ditches will direct runoff to a collector ditch from which runoff will be pumped into a 70-acre wet detention area via 1-40 CFS pump activated at elevation 22.5' NGVD and shut off at elevation 22.0' NGVD and 1-120 CFS pump activated at elevation 23.0' NGVD and shut off at elevation 22.5' NGVD. Discharge from the detention area will be controlled by a structure consisting of an 8' diameter circular shaft spillway with a sloped top from elevation 27.5' NGVD to elevation 29.5' NGVD and 60 LF of 72" diameter RCP culvert. The detention area will have an emergency overflow structure consisting of a 6' 7" X 3' inlet with a grate at elevation 30.5' NGVD and a 54" diameter BCCMP culvert outfalling to the irrigation canal within the project. The inlet will also have a 30" X 30" orifice at elevation 19.0' NGVD and will be controlled by a slide gate to remain closed except when water is needed for irrigation.

DRAINAGE BASIN C-44 RECEIVING BODY C-44 Canal

RUN OFF FORMULA 0.3 CFS Per Acre ALLOWABLE DISCHARGE 490 CFS

REQUIRED DETENTION 125 AC-FT

DETENTION METHOD Wet detention

DETENTION PROVIDED 125 AC-FT

BASIN DESIGN FREQUENCY

25 YEAR, 72 HOUR STORM

FLOOD CONTOUR

30.0 FEET NGVD

DESIGN DISCHARGE

158 CFS

WATER QUALITY

A. ADVERSE IMPACTS EXPECTED: NO

B. BEST MANAGEMENT PRACTICES UTILIZED: Detention of the first inch of runoff.

ENVIRONMENTAL

A. SIGNIFICANT ADVERSE IMPACTS EXPECTED: NO

B. COMMENTS: A wetland in the southeast corner of the site is being preserved and excluded from the project and some wetland pockets within the site are being mitigated in the wet detention area.

LAND USE

The current land use is agricultural as is proposed in this application.

ADDITIONAL COMMENTS: None.

CONCLUSION AND RECOMMENDATION

Adverse impacts to the water quality and environment are not expected as a result of the construction and operation of the proposed system. The calculated peak discharge rate of 158 CFS during the 25-year 3-day storm should not result in any adverse impacts.

The staff recommends approval of this applicaiton for construction and operation.

APPLICABLE LAND AREA

	<u>Project</u>	<u>Phase Construction</u>
Total	<u>1633.9</u> acres;	<u>1633.9</u> acres
Water Management	<u>70</u> acres;	<u>70</u> acres
Impervious	<u>63</u> acres;	<u>63</u> acres

Location: Southeast corner of the intersection of SR 706 and SR 76.

City: N/A

County: Martin

Special District: N/A

SFWMD Basin: C-44

Operation Entity: Metropolitan Life Insurance Company

The Staff recommends that the following be issued:

- ☐ General Permit
- ☒ Construction and Operation Permit
- ☐ Construction Permit
- ☐ Operation Permit
- ☐ Letter of Conceptual Approval
- ☐ Right-of-Way Occupancy Permit

APPLICATION REVIEWER:

SUPERVISOR/CHECKER:

TECHNICAL: J. Gronborg

C. deRojas

WATER QUALITY: J. Gronborg

M. Cullum

ENVIRONMENTAL: W. Helffrich

C. Padera

APPROVED:

DIVISION DIRECTOR:

Charles W. Finkle

DEPARTMENT DIRECTOR:

Richard A. Rogers

Richard A. Rogers, P.E.
Resource Control Department

DATE: 1/27/86

Subject to the following 18 Special Conditions (for conceptual approvals only, these conditions as a minimum will apply to subsequent construction permitting).

DRAFT
Subject to Governing
Board Approval

SPECIAL CONDITIONS

1. DISCHARGE FACILITIES:

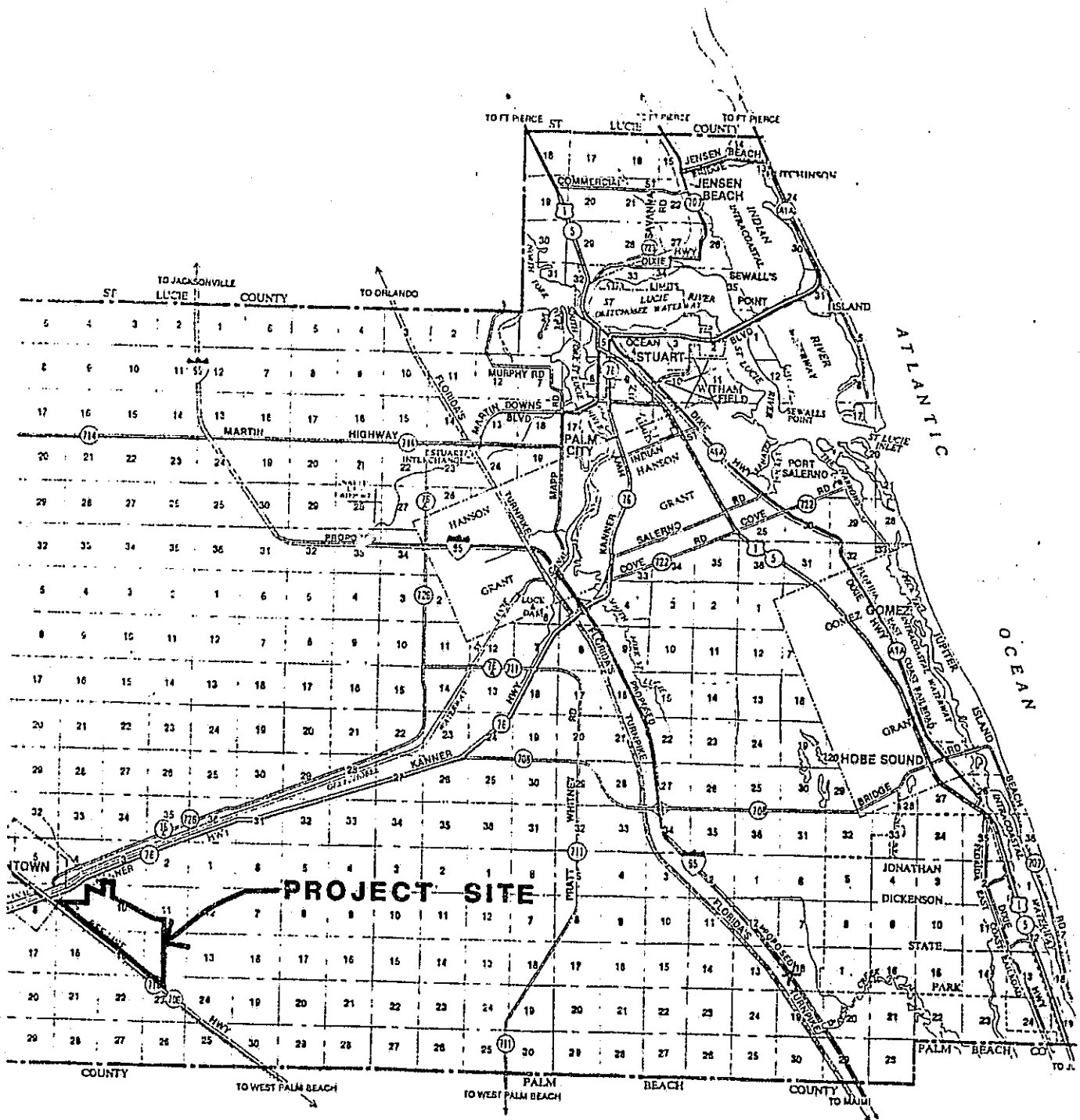
DESCRIPTION: AN 8' DIAMETER CIRCULAR SHAFT SPILLWAY WITH A SLOPED TOP FROM ELEVATION 27.5' NGVD TO ELEVATION 29.5' NGVD AND 60 LF OF 72" DIAMETER RCP CULVERT. EMERGENCY OVERFLOW WILL BE ACCOMPLISHED BY A 6' 7" x 3' INLET WITH A TOP AT ELEVATION 30.5' NGVD, A 30" X 30" ORIFICE WITH A SLIDE GATE AT ELEVATION 19.0' NGVD AND A 54" DIAMETER RCCMP CULVERT OUTFALLING TO THE INTERNAL IRRIGATION CANAL.

RECEIVING WATER: D-44 CANAL

CONTROL ELEVATION: 27. FEET NGVD.

2. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.
3. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.
4. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.
5. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF METROPOLITAN LIFE INSURANCE COMPANY
6. THE PERMITTEE SHALL PROSECUTE THE WORK AUTHORIZED SO AS TO MINIMIZE ANY ADVERSE IMPACT OF THE WORKS ON FISH, WILDLIFE, NATURAL ENVIRONMENTAL VALUES, AND WATER QUALITY. THE PERMITTEE SHALL INSTITUTE NECESSARY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING FULL COMPACTION OF ANY FILL MATERIAL PLACED AROUND NEWLY INSTALLED STRUCTURES, TO REDUCE EROSION, TURBIDITY, NUTRIENT LOADING AND SEDIMENTATION IN THE RECEIVING WATERS.
7. OFF-SITE DISCHARGES DURING CONSTRUCTION AND DEVELOPMENT SHALL BE MADE ONLY THROUGH THE FACILITIES AUTHORIZED BY THIS PERMIT. NO ROADWAY OR BUILDING CONSTRUCTION SHALL COMMENCE ON-SITE UNTIL COMPLETION OF THE PERMITTED DISCHARGE STRUCTURE AND DETENTION AREAS. WATER DISCHARGED FROM THE PROJECT SHALL BE THROUGH STRUCTURES HAVING A MECHANISM SUITABLE FOR REGULATING UPSTREAM WATER STAGES. STAGES MAY BE SUBJECT TO OPERATING SCHEDULES SATISFACTORY TO THE DISTRICT.
8. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, OPERATION, MAINTENANCE OR USE ANY FACILITY AUTHORIZED BY THE PERMIT.

9. THIS PERMIT IS ISSUED BASED ON THE APPLICANT'S SUBMITTED INFORMATION WHICH REASONABLY DEMONSTRATES THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS WILL NOT BE CAUSED BY THE COMPLETED PERMIT ACTIVITY. IT IS ALSO THE RESPONSIBILITY OF THE PERMITTEE TO INSURE THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS DO NOT OCCUR DURING CONSTRUCTION.
10. PRIOR TO DEWATERING, PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL. INFORMATION SHALL INCLUDE AS A MINIMUM: PUMP SIZES, LOCATIONS AND HOURS OF OPERATION FOR EACH PUMP. IF OFF-SITE DISCHARGE IS PROPOSED, OR OFF-SITE ADVERSE IMPACTS ARE EVIDENT, AN INDIVIDUAL WATER USE PERMIT MAY BE REQUIRED. THE PERMITTEE IS CAUTIONED THAT SEVERAL MONTHS MAY BE REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION.
11. SPECIAL CONDITIONS OF RULE 40E-4.301 (SURFACE WATER MANAGEMENT) ARE WAIVED UNLESS OTHERWISE PROVIDED HEREIN.
12. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.
13. LAND USE BY THE PERMITTED FACILITIES IS AGRICULTURAL. PROPOSED CONSTRUCTION OF RESIDENCES MAY REQUIRE MODIFICATION OF THIS PERMIT AND MUST BE REPORTED TO THE DISTRICT.
14. UPON COMPLETION OF CONSTRUCTION, ALL ABOVE GROUND DIKES, LEVEES AND BERMS BEHIND WHICH WATER IS TO BE CONTAINED SHALL BE INSPECTED FOR STRUCTURAL ADEQUACY, WITH REPORTS SUBMITTED TO THE DISTRICT. SUCH REPORTS SHALL INCLUDE PROPOSAL OF TECHNIQUE AND SCHEDULE FOR REPAIR OF ANY DEFICIENCIES NOTED, AND SHALL BE SIGNED AND SEALED BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER.
15. PERMITTEE SHALL SUBMIT SEMI-ANNUAL REPORTS TO THE DISTRICT, IN MAY AND DECEMBER OF EACH YEAR, OF APRIL AND NOVEMBER INSPECTIONS OF ALL ABOVE GROUND DIKES, LEVEES AND BERMS BEHIND WHICH WATER IS CONTAINED. SUCH REPORTS SHALL INCLUDE PROPOSAL OF TECHNIQUE AND SCHEDULE FOR REPAIR OF ANY DEFICIENCIES NOTED, AND SHALL BE SIGNED AND SEALED BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER.
16. THIS PERMIT DELETES 1633.9 ACRES FROM PERMIT 43-00034-S/W.
17. PRIOR TO CONSTRUCTION, LOCATION OF THE ROADWAY ADJACENT TO THE WETLAND IS TO BE STAKED IN THE FIELD BY THE ENGINEER, FOR DISTRICT STAFF REVIEW AND APPROVAL.
18. ALL DITCHES AND CANALS SHALL BE AT LEAST 200 FEET AWAY FROM ANY PRESERVED WETLANDS UNLESS IT CAN BE DEMONSTRATED TO DISTRICT STAFF THAT THEIR CONSTRUCTION AND OPERATION WILL NOT ADVERSELY AFFECT THE WETLAND.



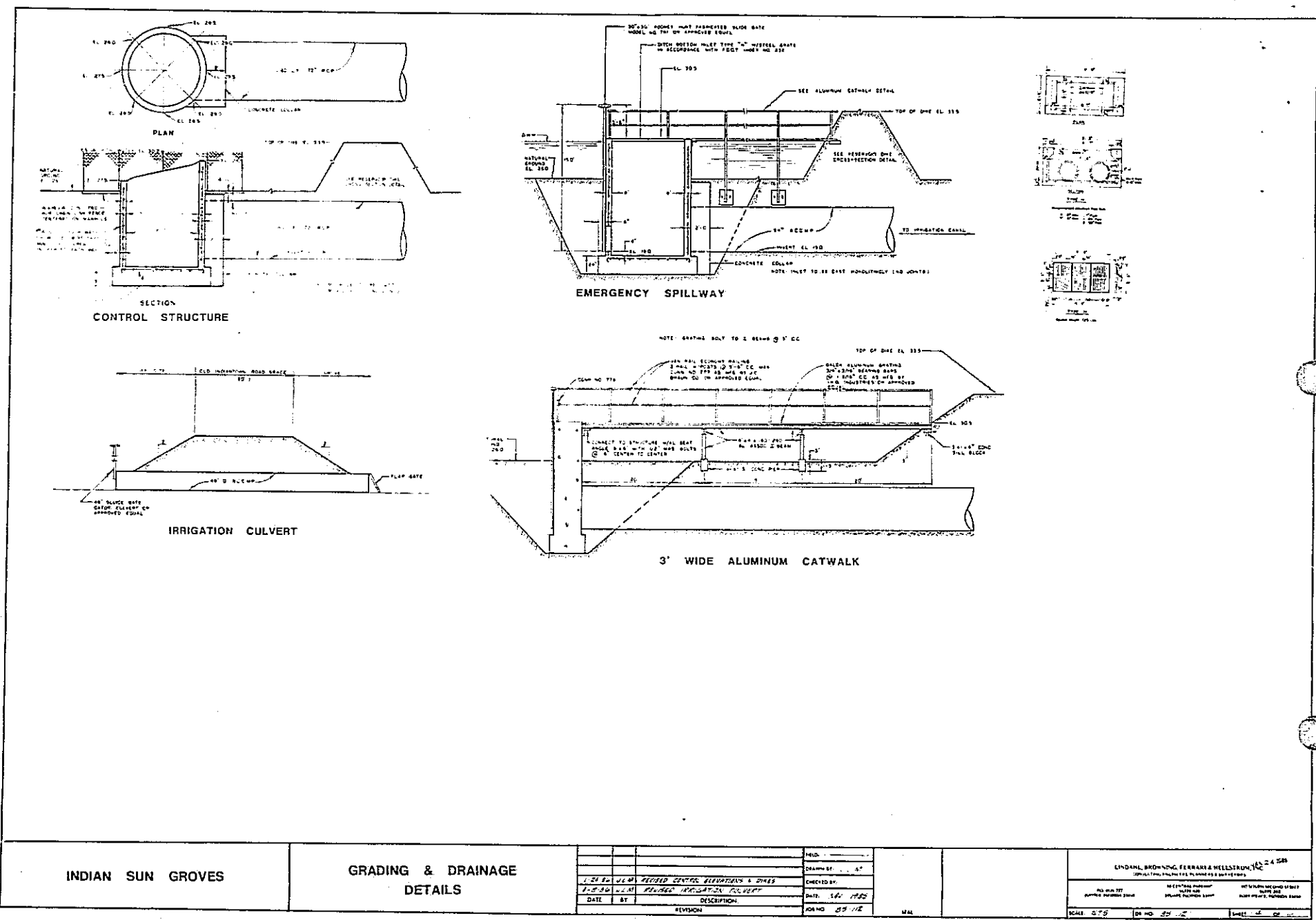
LOCATION MAP



EXHIBIT I

[illegible]

EXHIBIT 3



INDIAN SUN GROVES

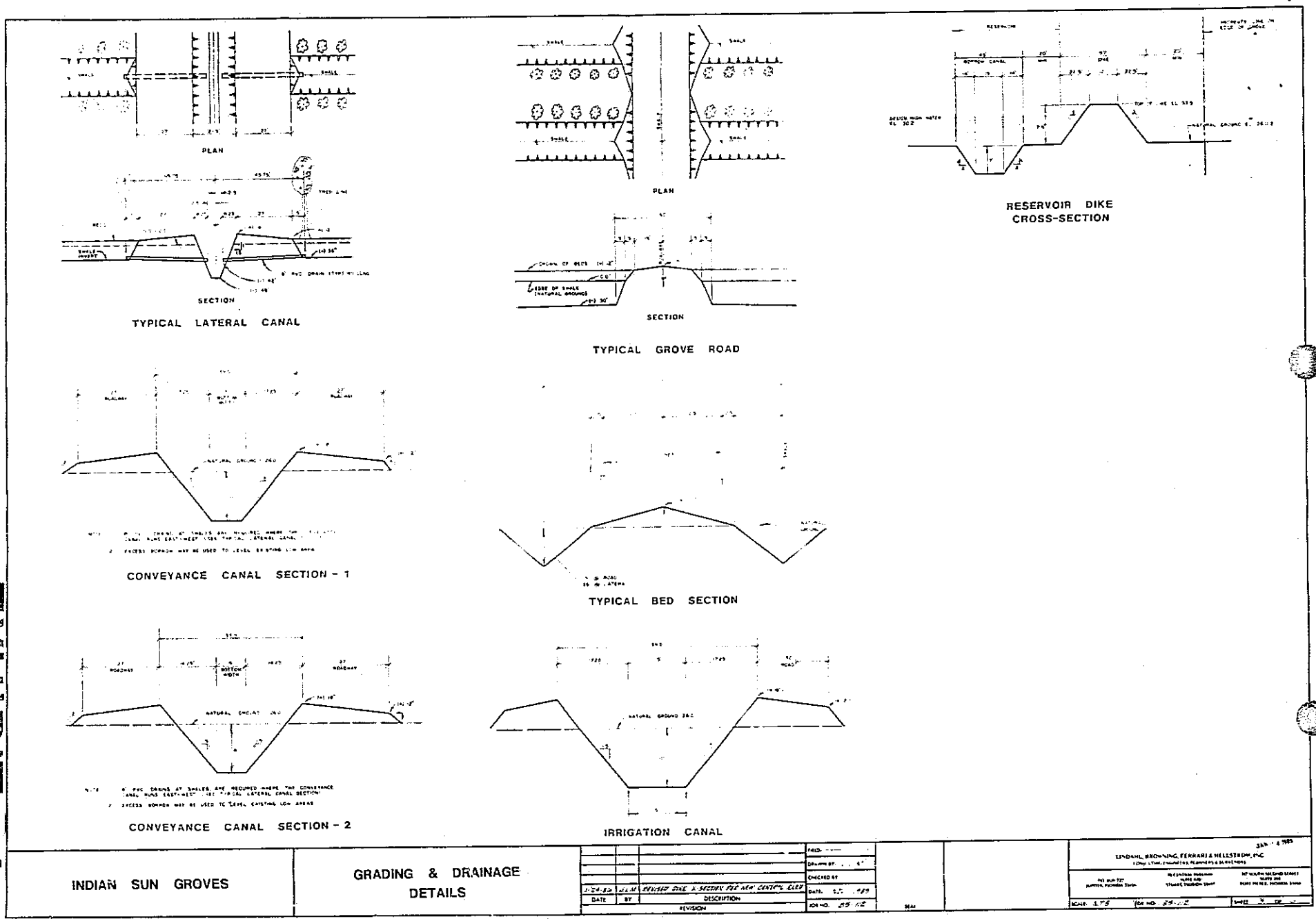
GRADING & DRAINAGE
DETAILS

DATE	BY	DESCRIPTION	REVISION
1-24-80	JLM	RECEIVED CIVIL ENGINEERING & DRAINAGE	
1-24-80	JLM	RECEIVED IRRIGATION CULVERT	
DATE	BY	DESCRIPTION	REVISION

FIELD	DATE	BY	DESCRIPTION
1-24-80	JLM	RECEIVED CIVIL ENGINEERING & DRAINAGE	
1-24-80	JLM	RECEIVED IRRIGATION CULVERT	

LINDA L. BROWN, FERRARI & WELLS, INC. 24 588	
CIVIL ENGINEER, FERRARI & WELLS, INC.	
PROJ. NO. 150827-4	NO. 150827-4
PLANNING & DESIGN	DESIGN & CONSTRUCTION
SCALE 1" = 10'	DATE 1-24-80

EXHIBIT 4



STAFF REPORT DISTRIBUTION LIST

PROJECT Indian Sun Groves APPLICATION NUMBER 12125-D

INTERNAL DISTRIBUTION

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Mr. Stanley W. Hole
Mr. Oscar Corbin

X Applicant Metropolitan Life
Insurance Company
X Applicant's Consultant:
Lindahl, Browning, Ferrari,
and Hellstrom, Inc.
Applicant's Agent:

X Engineer, County of
Martin

EXTERNAL DISTRIBUTION CONTINUED

Engineer, City of _____
Local Drainage District _____

BUILDING AND ZONING

Boca Raton
Boynton Beach
Royal Palm Beach
Tequesta
West Palm Beach

COUNTY

Broward -Dir. Water Mgmt Division
Collier -Agricultural Agent
Dade -DERM
Lee -Long Range Planning
-Mosquito Control
X Martin -Planning and Zoning
Palm Beach-Building Department
-Area Planning Board
-School Brd, Plant Planning
Polk -Water Resources Department

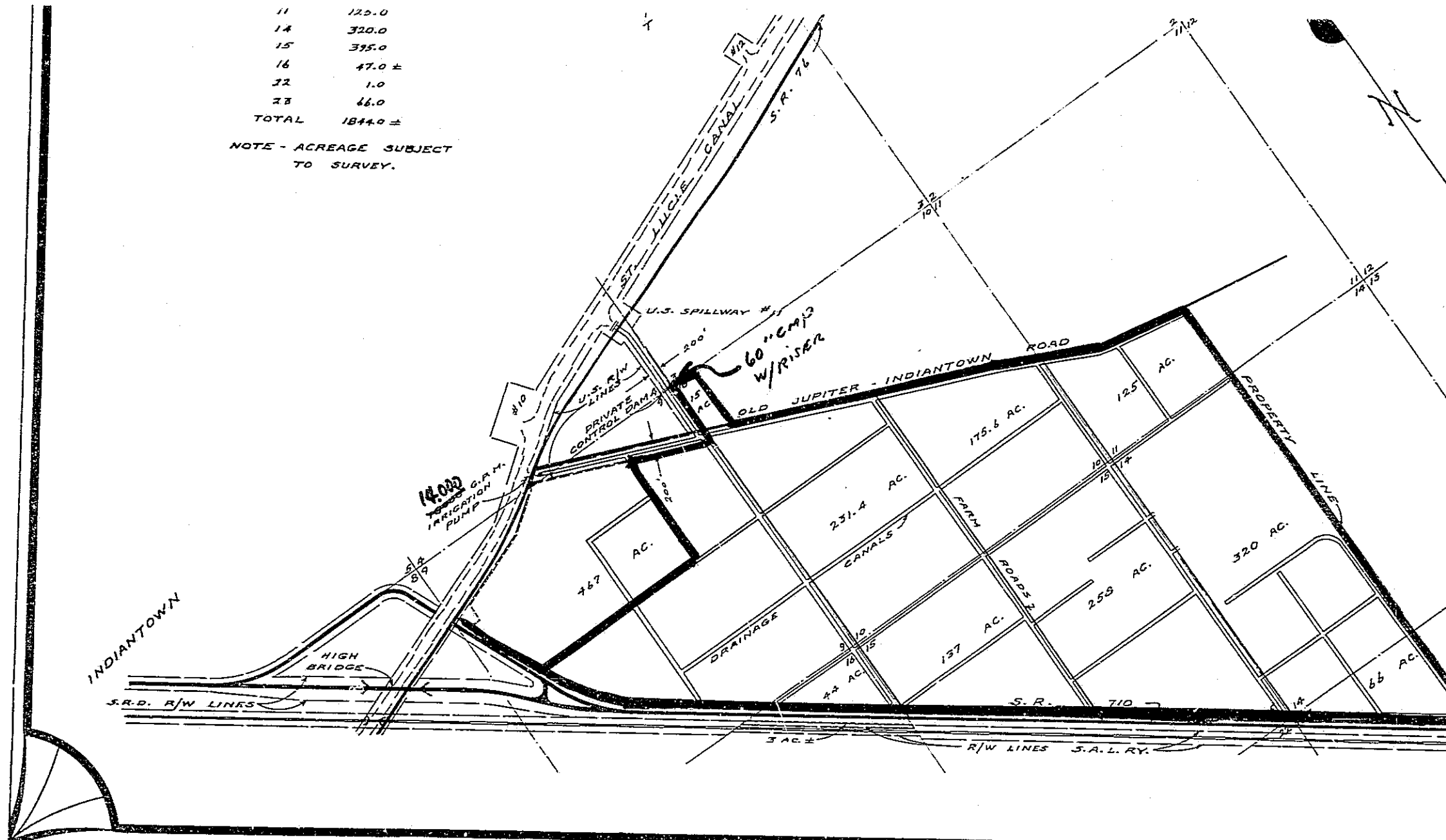
Fred Vidzes, Big Cypress Basin
Kissimmee River Coordinating Council

Other:

EXHIBIT 5

11	125.0
14	320.0
15	395.0
16	47.0 ±
32	1.0
23	66.0
TOTAL	1844.0 ±

NOTE - ACREAGE SUBJECT
TO SURVEY.



Objections or requests must be
received before 5:00 o'clock,
P.M. on the 11th day of August,
1976.

CENTRAL AND
SOUTHERN FLORIDA
FLOOD CONTROL

INDIAN SUN GROVES
SURFACE WATER MANAGEMENT REPORT
for
Metropolitan Life Insurance Company

November 1985

Prepared by:
LINDAHL, BROWNING, FERRARI & HELLSTROM, INC.
Engineers, Planners and Surveyors

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12. Description of Irrigation Culverts
13. Irrigation System and Crop Description

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- B. USGS 7.5 Minute Quadrangle, Indian Town/West Palm Beach 2 N.W.
- C. Soils Association Map
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- J. Contract for Purchase
- K. Aerial Photograph
- L. Construction Plans and Specifications
- M. South Florida Water Management District Memorandums

SURFACE WATER MANAGEMENT REPORT

for

Indian Sun Groves

I. INTRODUCTION

The purpose of this report is to provide the necessary technical information to obtain a Construction and Operation Permit and consumptive water use permit for the proposed 1635+ acre Citrus Grove. This parcel is located in western Martin County (Sections 9, 10, 11, 14, 15, 16 and 23/Township 40S/Range 39E).

The site lies between S.R. 710 and the Old Indian Town Road grade. It is also located just southeast of the St. Lucie Canal (C-44).

II. DESIGN CONSIDERATIONS

A. General

Presently the site is used for pasture and is operating under South Florida Water Management District permit 43-00034-S/W for both surface water management and consumptive use of water for 1800 acres. The adjacent grove owner and applicant has contracted with the present owner for purchase of a portion of the 1800 acres (1635 acres).

The proposed surface water management plan will provide a separate drainage system for the proposed 1635 acre site. Irrigation water will be from the St. Lucie Canal. This will be supplied by the pump station which is being utilized by Indian Sun Groves to the north and the existing Chastain Station to the northwest.

B. Land Use

The project is currently used for agriculture purposes. Most of the site is presently improved pasture.

The proposed land use will continue to be agriculture. The site will be converted to citrus. The present and proposed zoning is Agriculture.

C. Operation Entity

The applicant will operate and maintain the surface water management system. It is the applicant's intent to retain the ownership of the entire parcel.

D. Utilities

No development other than the grove operation is proposed, therefore, no potab. water or wastewater treatment facilities are required.

III. WATER MANAGEMENT INFORMATION

A. Surface Water Management Facilities

1. Drainage Facilities

Presently the site has an extensive internal agricultural ditch system. These ditches drain north through a 60"x42' ACCMP to the Corps of Engineers (COE) spillway "G" into the St. Lucie Canal.

2. Water Use Facilities

Irrigation water for the existing pasture is provided by surface water withdrawals from the St. Lucie Canal. Presently these withdrawals are being made via an existing 14,000 GPM pump located on the St. Lucie Canal approximately 3000 feet west of spillway "G". Please see Exhibit B for the location of the pump.

The applicant presently owns and operates the Grove immediately north of this site which is covered by SFWMD Permit No. 43-00025 S/W. Irrigation water for this grove is supplied by 1-18,000 GPM irrigation pump withdrawing from the St. Lucie Canal. This pump is on the south side of the St. Lucie Canal and approximately 150 feet west of the east Section line of Section 3, Township 40 South, Range 39 East. A north-south canal runs along the east Section line of Section 3, 10 and 15 which connect to this project.

B. Hydrologic Soil Data

The majority of the soil on the site are nearly level fine sand which are poorly drained. These soils are shown on the soils association map which is shown as Exhibit "C".

Most of these soils are in the Hydrologic Soil Group B/D. These soils have a very slow infiltration rate and thus a high runoff potential in their undeveloped state. This is due to a "hardpan" layer which is typically 2'-4' below the ground surface. The permeability of the soils above the hardpan is 6-20 inches per hour while the hardpans permeability is less than 0.2 inches per hour.

C. Topography

The site is generally flat with scattered shallow depressions. These depressions are very shallow (0.5' typical) and have been drained by past agricultural activities.

Topographic features of the area are shown on Exhibit "B". Generally the Old Indian Town Road Grade and S.R. 710 prohibit any exchange of surface waters except where culverts have been installed.

D. Contributing Off-Site Drainage Areas

Presently no areas off-site drain through this site. The areas west of the project presently drain west and north along the eastern Section line of Sections 2 and 11, Township 40 South, Range 39 East.

Although the South Florida Water Management District Memorandum (Exhibit M) indicates there are off-site contributing areas, field inspection, and review of aerial photographs and topography indicate there are no off-site drainage areas.

The areas south of S.R. 710 drains northwest along S.R. 710 and eventually to the St. Lucie Canal. There are some culverts under S.R. 710 but they are just strictly for equalization of the canals on the north and south sides of S.R. 710.

The outparcel in Section 9, which was originally included in the previous permit for this project. This area will also drain to spillway "G", but will enter the outfall canal downstream of this project.

E. Allowable Discharge

SFWMD does not have an established discharge criteria for the St. Lucie Canal. The SFWMD "Basis of Review" indicates the allowable discharge for the project is based upon amounts determined by previous District permit. This was determined to be the prorated capacity of the design discharge from COE spillway "G".

This spillway has a drainage area of 2880 acres and a design capacity of 865 cfs, or 0.3 cfs per acre. This yields an allowable discharge of 490 cfs for the 1635 acre project area. (See Exhibit M)

F. Environmental Considerations

There are numerous isolated shallow wetlands on-site. Generally these have been severely impacted by previous drainage activities.

On May 22, 1985, William M. Helfferich, Senior Environmental Analyst for the SFWMD inspected the site with Mr. Travis Murphy, President of Indian Sun Groves Management Company. Mr. Helfferich indicated that the only significant functional wetland on the site is in the southeast corner of the site in Section 14. He also recommended that the area be diked around on the west side only and be left to function as a part of the larger wetland system to the east.

IV. PROPOSED WATER MANAGEMENT PLAN

A. General

The proposed water management plan will consist of a grove and reservoir system. The internal grove drainage will generally consist of swales, lateral ditches and major conveyance canals. Excess stormwater from the grove will be pumped into the above ground diked reservoir for storage and treatment. Discharge from the reservoir will be by gravity to the existing outfall canal along the east line of Section 3 and 10 and eventually to the St. Lucie Canal via the COE spillway "G".

B. Soil Storage

A majority of the soils within the site are dual classification soils of the Hydrologic Soil Group B/D. In the developed condition these soils will exhibit characteristics of the B hydrologic group, due to the enhanced drainage facilities of the swales, lateral ditches and conveyance canals.

It is proposed that the controlled water elevation within the grove will be controlled 4.0' below the ground elevation. This will be at elevation 22.0' NGVD.

Table 2 depicts the available soil storage for the grove. Since excess water will be stored in the reservoir for irrigation, no soil storage was assumed.

C. Stage-Storage Volumes

A stage-storage tabulation for the grove and reservoir is provided in Table 3. This storage is based upon the proposed grading of the roads, lateral, swales, etc. within the grove.

D. Water Quality Detention Volumes

Required detention volume for the site is greatest of the following volumes:

1. First one inch of runoff.
2. Runoff from a 3-year frequency 1-hour duration storm.

The runoff from the 3-year 1-hour storm was computed using the rational formula. The required detention volumes for the site is provided in Table 4.

E. Flood Routing Response

The grove and reservoir system was hydrologically routed using the SCS mass-routing method as described in the SCS National Engineering Handbook, Section 4, Hydrology. The SFWMD rainfall distribution was utilized.

The design storms for the project are as follows:

- | | |
|-----------------------|---|
| A. Roadways: | 10-year 1-day event
$P_{24} = 6.0"$ |
| B. Conveyance System: | 25-year 3-day event
$P_{24} = 7.9"$ |
| C. Finished Floors: | 100-year 3-day event
$P_{24} = 9.3"$ |

The flood routings for the 10-year, 25-year and 100-year frequency storm events are provided in Tables 6, 7 and 8.

A summary of these flood routing results and proposed roadway and floor elevations is provided in Table 5.

The proposed roadways will only be farm roads (dirt). Also, no buildings are proposed at this time, but an elevation was determined in the event of any future construction.

F. Ecological Consequences

The proposed site plan has recognized that approximately 30 acres of viable wetland exist on the site. These wetlands are to be preserved and will remain contiguous with the larger wetland system east of the site. A berm will be constructed along the western boundary of the wetland (in the uplands). This berm should prevent any change to the hydroperiod of these wetlands as it now exists.

The additional 70 acre reservoir will provide an attractive wetland habitat for vegetation and wildlife. Although this system will not be subject to a typical regional hydroperiod since additional irrigation water will be stored in the reservoir during dry periods.

V. PROPOSED IRRIGATION SYSTEM

The irrigation system for the citrus grove will utilize a high efficiency spray-jet system to conserve water. The estimated Net Irrigation requirements for citrus is given in Table 9 for an 8 in 10 year drought. These values are as determined by IFAS/University of Florida.

The supplemented water will be supplied from the St. Lucie Canal by the two existing pump stations (see existing water use facilities) which are as follows:

- one? ? 1. 1-18,000 GPM pump
2. 2-14,000 GPM pump

No additional withdrawal facilities from the C-44 are proposed.

Internal irrigation stations will be constructed on the irrigation canal to supply pressurized water for the irrigation system. These facilities will be designed at a later date.

Irrigation Water Use Checklist

Applicants for the following water uses should utilize this checklist: livestock, nursery, recreational area, soil flooding, agricultural, freeze protection, golf course and landscape irrigation.

This checklist is for a typical project. For complex projects, large withdrawals, or withdrawals in sensitive areas, additional information may be requested. Only applicable information need be submitted.

A. General

1. Project Ownership; to be completed only if the project site is leased:
 - a. If the person listed as Owner in Application for a Permit (Form 0050) is the lessor, give name, address and phone.
 - b. If the person listed as Owner in Application for a Permit (Form 0050) is the lessee, give name, address and phone number of lessor.
 - c. If project site is leased, provide expiration date of the lease. (Permit will not be issued beyond the expiration date of the lease).
2. If the project site is located within a drainage district, provide the name of the district.
3. Briefly describe the purpose of the application.
4. If new pumps, culverts, or wells are needed for irrigation, describe the reason for construction and placement of each.
5. If the project is existing, an aerial photograph that shows the crop must be submitted with the application.
6. Indicate the source of water.
7. Indicate the date on which the use of water was initiated or is proposed and the duration of the use of water.

B. Location

1. Provide a location map.
2. Provide a site map. Indicate the property boundaries, irrigated area, wells, pumps, culverts, canals, ditches, roads, and other landmarks. Number wells, pumps and culverts to correspond with Tables A, B, and C. Show areas served by irrigation systems described in Table G.
3. Indicate Section, Township and Range of Project.

C. Facilities

1. Describe all existing and proposed wells by completing Table A for each well.
2. Describe all abandoned flowing wells by completing Table A for each well.
3. Describe all existing and proposed surface water irrigation pumps by completing Table B for each pump.
4. Describe all existing and proposed irrigation-withdrawal culverts by completing Table C for each culvert.
5. Describe existing legal rights to proposed well or wellfield site.

D. Crop type by Irrigation system

For each type of irrigation system (flood, drip, microjet, overhead, etc.) fill out a Table G. For example, if a grower has 150 acres of citrus on drip and 500 acres on Flood, two copies of Table G would be filled out, one for drip and another for flood irrigation. Three copies of Table G are attached. "Acres planted" is the irrigated acreage minus roads, ditches, canals, swales, etc.

E. Water Usage

1. If available, please provide any pumpage records of existing water usage and the time period of usage.
2. Indicate the amount of water that will be required on a monthly basis for each month (January through December) for irrigation of each crop in a dry year.
3. Indicate the total water needed to meet the irrigation demands of all crops.
4. Explain the basis for the crop requirements in "2" above.

F. Water Problems

Explain any water problems currently experienced within one mile of the project site as a consequence of withdrawals, such as drawdowns of adjacent water bodies, saline water intrusion, adverse impact on adjacent land use, water quality problems, within one mile of the wellfield.

G. Frost Protection

1. Describe methods of freeze protection and quantities desired.
2. Request a letter from the IFAS County Extension Agent evaluating the water quantity requested for freeze protection.

H. Water Conservation

1. Describe any water conservation techniques or methods of water use optimization (soil moisture meters, accounting methods, etc.) that are

currently being used or are proposed for use.

2. Describe any potential for reusing wastewater.
3. For golf course irrigation please provide the following information:
 - a. Explain the derivation of the quantity of water needed for irrigation.
 - b. Break down golf course acreage for the following areas:
 - rough
 - fairway approach
 - fairways
 - tees
 - greens
 - other
 - c. Will the rough areas be irrigated?
 - d. During which hours of the day will the course be irrigated?
 - e. Is the golf course associated with a residential development?

I. Impacts

1. Will the proposed water use affect domestic, irrigation, or other public water supply wells?
2. Will the proposed water use affect adjacent lake levels?
3. Will the proposed water use cause saltwater intrusion?
4. Will the proposed water use affect environmental features that have either a direct or indirect relationship to the water resources of the District (wetland habitat, natural water bodies, intermittent ponds, upland areas) and preferred habitats for rare, endangered or threatened species?
5. Will the proposed water use enhance the rate of formation of sinkholes?

In addition to responding to the above questions the Applicant must document any adverse impact on other users, pollution sources, saline water intrusion, adjacent water bodies, environmental features or land use that the proposed withdrawals may have.

J. Present and Proposed Zoning

Submit evidence of compatible zoning. Include the status under the DRI process if applicable. If the project is a DRI, then a copy of the final approved development order must be supplied. For a new use of water submit a letter from the appropriate local government indicating that the proposed land use is compatible with the local government comprehensive plan.

K. Adjacent uses of Water

Submit the names and complete addresses of adjacent owners that are withdrawing water from either groundwater or surface water and are within 300 feet of:

1. a proposed well or pump proposed by the applicant,
2. an existing but unused well or pump,
3. a well or pump not listed under facilities in the applicant's current permit, or
4. an existing well or pump currently in-service if an increase in pumpage is proposed for the existing well or pump.

L. Proposed Surface Water Management System

If the Applicant proposes a new surface water management system then an evaluation of the impact of the proposed withdrawal on the lake system and conversely, the impact of the control elevations of the surface water management system on the withdrawal and water availability at the project site must be submitted.

Note: Include four copies of all information and one completed copy of Application Form 0050.

Appendix A

Response to SFWMD checklist for Irrigation Water Use.

A. GENERAL

1. a.b.c. The applicant is a contract purchaser. Information is provided on the application form.
2. The site is not located within a local drainage district.
3. The purpose of the application is for drainage and irrigation of the proposed citrus grove.
4. No new pumps are proposed for irrigation. Additional culverts will be installed per plan for road crossings, etc. Also, an irrigation culvert with flap gate will be installed at the north property line and the irrigation canal.
5. The project is proposed.
6. Irrigation water will be from the St. Lucie Canal (C-44).
7. The proposed use will be perpetual.

B. LOCATION

1. A location map is provided as Exhibit A.
2. The construction plans are enclosed which shows the appropriate data.
3. Refer to Application form for Section, Township and Range.

C. FACILITIES

1. No wells are proposed.
2. There are no known flowing wells on the site.
3. The existing and proposed surface water irrigation pumps are shown in Table 11. Additional information is contained in SFWMD Permit No. 43-00025-S/W.

Appendix A (Cont.)

4. The proposed irrigation culvert is provided in Table 12. Also, the culvert is shown on the plans.

5. Not applicable.

D. CROP TYPE BY IRRIGATION SYSTEM

Please see Table 13.

E. WATER USAGE

1. No existing pumpage records are available.

2. Please see Table 10 for the reasonable need crop demands.

3. Table 10 indicates the total irrigation demand, as there is only one crop.

4. The crop requirements were based upon IFAS report 84-1, Citrus Water Use and Evapotranspiration (ET) Requirements for Florida Flatwoods Soils.

F. WATER PROBLEMS

There are no known problems currently being experienced within one mile of the site.

G. FROST PROTECTION

1. Freeze protection will be provided by spray-jet irrigation. It is estimated that the frost protection will require 7 MGD of water.

2. Not applicable.

H. WATER CONSERVATION

1. No water conservation techniques are proposed except that a highly efficient irrigation system (spray-jet) will be used.

2. There is no potential in the area for wastewater reuse.

3. Not applicable.

Appendix A (Cont.)

I. IMPACTS

1. The proposed use will not affect any wells.
2. There are no adjacent lakes. The levels of C-44 will not be affected by the proposed use.
3. The water use will not cause saltwater intrusion.
4. No adverse environmental impacts are expected as a result of the proposed water use.
5. No groundwater withdrawals are proposed.

J. PRESENT AND PROPOSED ZONING

The proposed and present zoning is agriculture. It is obvious that a citrus grove is a compatible use.

K. ADJACENT USES OF WATER

The adjacent grove is withdrawing water from C-44. This grove is owned by the applicant.

L. PROPOSED SURFACE WATER MANAGEMENT SYSTEM

An evaluation of the surface water management system is included in the Engineering report.

TABLE 1
PROPOSED LAND USE

	<u>Total (Acres)</u>	<u>Impervious (Acres)</u>
GROVE (total)	1535	63
Canals	63	63
Roads	60	0
Swales	706	0
Tree Beds	706	0
RESERVOIR	70	70
WETLANDS	<u>30</u>	<u>30</u>
TOTAL	1635	226

TABLE 2

DEVELOPED AVAILABLE SOIL STORAGE

<u>Basin</u>	<u>Depth to Water Table (ft)</u>	<u>Available Soil Storage (in)</u>	<u>Pervious Area Basin (%)</u>	<u>Equivalent* Soil Storage (in)</u>
Grove	3.5	6.6	96	6.3"
Reservoir	0	0	0	0

* From TR55 use CN = 70

$$S = \frac{1000}{CN} - 10 = \frac{1000}{70} - 10 = 4.3"$$

Company Name.....: Lindahl, Browning, Ferrari & Hellstrom, Inc.
 Execution Date.....: 11-22-1985

Computation Type.....: STAGE-STORAGE

Project Name.....: INDIAN SUN GROVES
 Engineer's Name.....: Marty Sanders

Name	ROADS	CANALS	BEDS	SWALES	
Area	60.00	63.00	706.00	706.00	
S.Elev	27.00	22.00	26.00	24.00	
E.Elev	0.00	0.00	27.00	26.00	
Stage Feet NGVD	Vert. Storage ac-ft	Vert. Storage ac-ft	Linear Storage ac-ft	Linear Storage ac-ft	Total Storage ac-ft
22.00	0.00	0.00	0.00	0.00	0.00
22.50	0.00	31.50	0.00	0.00	31.50
23.00	0.00	63.00	0.00	0.00	63.00
23.50	0.00	94.50	0.00	0.00	94.50
24.00	0.00	126.00	0.00	0.00	126.00
24.50	0.00	157.50	0.00	44.13	201.63
25.00	0.00	189.00	0.00	176.50	365.50
25.50	0.00	220.50	0.00	397.13	617.63
26.00	0.00	252.00	0.00	706.00	958.00

TABLE 3
 PAGE 1 OF 2

Company Name.....: Lindahl, Browning, Ferrari & Hellstrom, Inc.
Execution Date.....: 11-22-1985

Computation Type.....: STAGE-STORAGE

Project Name.....: INDIAN SUN RESERVIOR
Engineer's Name.....: MARTY S

Name RESERVOIR

Area 70.00
S.Elev 27.00
E.Elev 0.00

Stage Feet NGVD	Vert. Storage ac-ft	Total Storage ac-ft
27.00	0.00	0.00
27.50	35.00	35.00
28.00	70.00	70.00
28.50	105.00	105.00
29.00	140.00	140.00
29.50	175.00	175.00
30.00	210.00	210.00

TABLE 3
PAGE 2 OF 2

TABLE 4
DETENTION VOLUMES*

<u>Volume First Inch Runoff (AF)</u>	<u>Volumes 3-Year 1-Hour Runoff (AF)</u>	<u>Required Detention Volume (AF)</u>	<u>Minimum Weir Crest Elevation (ft. NGVD)</u>	<u>H Head (ft)</u>	<u>V-Notch** Angle Required (degrees)</u>	<u>V-Notch Angle Provided (degrees)</u>
125	91	125	28.8	1.8	164	162

* Based upon combined Grove and Reservoir Drainage Area of 1505 acres.

**V-Notch angle based upon formula: $\Theta = 2 \text{ ARCTAN } \frac{0.246 \text{ Vol}}{H^{2.5}}$

TABLE 5
FLOOD ROUTING RESULTS

<u>Basin</u>	<u>Control Elevation (ft. NGVD)</u>	<u>10-Year 24-Hour Stage (ft. NGVD)</u>	<u>25-Year 72-Hour Stage (ft. NGVD)</u>	<u>100-Year 72-Hour Stage (ft. NGVD)</u>	<u>Minimum Road Elevation (ft. NGVD)</u>	<u>Minimum Road Elevation (ft. NGVD)</u>
GROVE	22.0	24.5	25.4	25.7	26.0	28.5
RESERVOIR	27.0	29.5	29.5	29.7	N/A	N/A

City Name.....: Santa Barbara, California, Santa Barbara Irrigation, Inc.
 Execution Date.....: 11-21-1985

Program Name.....: Santa Barbara -- (08/18/85)

Project Name.....: INDIAN SUN GROVES
 Engineer's Name.....: Marty Sanders
 Project Area.....: 1535 acres
 Ground Storage.....: 4.3 inches
 Termination Discharge.....: 10 cfs
 Time of Concentration.....: 1 hour
 Distribution Type.....: SFWD
 Return Frequency.....: 10 years
 Rainfall Duration.....: 1 -day
 24-hr Rainfall.....: 6 inches
 Reporting Sequence.....: Standardized
 Discharge Hydrograph.....: ISG10

Pump No.	Pump On Elevation (ft)	Pump Off Elevation (ft)	Pump Rate Discharge (cfs)
1	22.50	22.00	40.00
2	23.00	22.50	120.00

Storage Information.....	Component Name	Storage Type	Area (acres)	Start Elev (NGVD-ft)	Ending Elev (NGVD-ft)
Entry No. 1.....	ROADS	V	60	27	
Entry No. 2.....	CANALS	V	63	22	
Entry No. 3.....	BEDS	L	706	26	27
Entry No. 4.....	SWALES	L	706	24	26

Point No.	Stage (ft)	Storage (af)
1	22.00	0.00
2	22.50	31.50
3	23.00	63.00
4	23.50	94.50
5	24.00	126.00
6	24.50	201.63
7	25.00	365.50
8	25.50	617.63
9	26.00	958.00

- - - - - R E S E R V O I R - - - - -									
Time (hr)	Rain fall (in)	Accum. Runoff (in)	Basin Discharge (cfs)	Accum. Inflow (af)	Volume (af)	Outflow (af)	Instant Dischge (cfs)	Average Dischge (cfs)	Stage (ft)
0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00
4.00	0.27	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00
8.00	0.82	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00
10.00	1.28	0.04	19.2	1.1	1.1	0.0	0.0	0.0	22.01
11.00	1.61	0.11	54.7	4.3	4.3	0.0	0.0	0.0	22.06
11.50	1.91	0.21	99.6	7.9	7.9	0.0	0.0	0.0	22.11
11.75	2.35	0.67	274.7	13.6	13.6	0.0	0.0	0.0	22.17
12.00	3.94	1.28	634.0	26.7	26.7	0.0	0.0	0.0	22.32
12.50	4.37	1.58	846.0	61.4	60.6	0.6	40.0	30.0	22.82
13.00	4.60	1.74	791.4	94.9	90.0	5.0	160.0	130.0	23.30
14.00	4.91	1.96	621.7	151.5	133.3	18.2	160.0	160.0	24.01
16.00	5.28	2.24	365.7	227.7	183.1	44.6	160.0	160.0	24.35
20.00	5.71	2.57	161.6	302.7	205.1	97.5	160.0	160.0	24.51
24.00	6.00	2.80	98.1	341.9	191.5	150.4	160.0	160.0	24.43
30.00	6.00	2.80	5.2	357.2	127.4	229.8	160.0	160.0	24.01
36.00	6.00	2.80	0.5	358.0	48.9	309.1	160.0	160.0	22.78
42.00	6.00	2.80	0.0	358.0	14.2	343.8	40.0	67.5	22.23
46.50	6.00	2.80	0.0	358.0	-0.4	358.4	0.0	38.9	21.99

Maximum Stage - 24.51 feet
 Maximum Discharge - 160.00 cfs

TABLE 6
 PAGE 1 OF 2

Company Name..... Lindbergh, Browning, Ferrari & Hellstrom, Inc.
 Execution Date..... 11-21-1965

Program Name..... Santa Barbara -- (08/18/85)

Project Name..... INDIAN SUN RESERVOIR
 Engineer's Name..... MARTY B
 Project Area..... 70 acres
 Ground Storage..... .01 inches
 Termination Discharge..... 20 cfs
 Time of Concentration..... 1 hours
 Distribution Type..... SFWMD
 Return Frequency..... 10 years
 Rainfall Duration..... 1 -day
 24-hr Rainfall..... 6 inches
 Reporting Sequence..... Standardized
 Inflow Hydrograph..... ISG101 lagged by 0 hours

Bleeder Information.....	Invert-NGVD-Ft	Angle-Degrees	Width-Ft
V-notch.....	27	161.9	
Weir Information.....	Length-Ft	Elev-NGVD-Ft	Coefficient
	29.13	29	3.13
Culvert Information.....	Length-Ft	Diameter-Ft	N-Value
	60	6	.013
Storage Information.....	Component Name	Storage Type (acres)	Start Elev (NGVD-ft) Ending Elev (NGVD-ft)
Entry No. 1.....	RESERVOIR	V 70	27

Point No.	Stage (ft)	Storage (af)	Discharge (cfs)
1	27.00	0.00	0.00
2	27.50	35.00	2.77
3	28.00	70.00	15.70
4	28.50	105.00	43.25
5	29.00	140.00	88.79
6	29.50	175.00	158.01
7	30.00	210.00	254.28

- - - - - R E S E R V O I R - - - - -									
Time (hr)	Rain Accum. (in)	Runoff (in)	Discharge (cfs)	Inflow (af)	Volume (af)	Accum. (af)	Instant Discharge (cfs)	Average Discharge (cfs)	Stage (ft)
0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	27.00
4.00	0.27	0.26	5.1	1.0	1.0	0.0	0.1	0.0	27.01
8.00	0.82	0.81	11.2	3.7	3.6	0.1	0.3	0.2	27.05
10.00	1.28	1.27	18.0	5.9	5.7	0.1	0.4	0.4	27.08
11.00	1.61	1.60	20.7	7.4	7.2	0.2	0.6	0.5	27.10
11.50	1.91	1.90	28.0	8.3	8.2	0.2	0.6	0.6	27.11
11.75	2.93	2.91	59.2	9.2	9.0	0.2	0.7	0.7	27.12
12.00	3.94	3.92	108.7	11.0	10.7	0.2	0.8	0.7	27.14
12.50	4.37	4.36	109.5	17.0	16.7	0.3	1.2	1.0	27.22
13.00	4.60	4.59	81.5	26.3	26.0	0.3	1.9	1.5	27.33
14.00	4.91	4.90	44.0	44.6	44.0	0.6	5.3	3.0	27.60
16.00	5.28	5.27	17.2	75.5	73.1	2.4	16.7	11.0	28.02
20.00	5.71	5.70	7.8	111.7	117.4	14.7	57.2	36.0	28.85
24.00	6.00	5.99	5.1	186.5	146.5	40.0	98.2	77.9	29.07
30.00	6.00	5.99	0.0	266.3	166.2	100.1	137.3	121.2	29.35
36.00	6.00	5.99	0.0	345.7	173.4	172.3	151.5	145.5	29.45
42.00	6.00	5.99	0.0	379.1	143.2	235.9	94.3	128.3	29.04
48.00	6.00	5.99	0.0	393.6	119.0	274.6	61.5	77.9	28.70
54.00	6.00	5.99	0.0	393.6	56.1	297.5	56.2	46.3	28.37
60.00	6.00	5.99	0.0	393.6	81.2	312.4	24.5	30.0	28.16
63.25	6.00	5.99	0.0	393.6	75.3	318.3	19.8	22.1	28.08

Maximum Stage - 29.45 feet
 Maximum Discharge - 158.01 cfs

TABLE 6
 PAGE 2 OF 2

City Name.....: Santa Barbara, California, Santa Barbara Hydrograph, Inc.
 Execution Date.....: 11-21-1985

Program Name.....: Santa Barbara -- (08/18/85)

Project Name.....: INDIAN SUN GROVES
 Engineer's Name.....: Marty Sanders
 Project Area.....: 1535 acres
 Ground Storage.....: 4.5 inches
 Termination Discharge.....: 10 cfs
 Time of Concentration.....: 2 hours
 Distribution Type.....: SFWMH
 Return Frequency.....: 25 years
 Rainfall Duration.....: 3 -day
 24-hr Rainfall.....: 7.9 inches
 Reporting Sequence.....: Standardized
 Discharge Hydrograph.....: ISG25

Pump No.	Pump On Elevation (ft)	Pump Off Elevation (ft)	Pump Rate Discharge (cfs)
1	22.50	22.00	40.00
2	23.00	22.50	120.00

Storage Information.....	Component Name	Storage Type	Area (acres)	Start Elev (NGVD-ft)	Ending Elev (NGVD-ft)
Entry No. 1.....	ROADS	V	60	27	
Entry No. 2.....	CANALS	V	63	22	
Entry No. 3.....	BEDS	L	706	26	27
Entry No. 4.....	SWALES	L	706	24	26

Point No.	Stage (ft)	Storage (cfs)
1	22.00	0.00
2	22.50	31.50
3	23.00	63.00
4	23.50	94.50
5	24.00	126.00
6	24.50	201.63
7	25.00	365.50
8	25.50	617.63
9	26.00	958.00

- - - - - R E S E R V O I R - - - - -									
Time (hr)	Rain fall (in)	Accum. Runoff (in)	Basin Dischge (cfs)	Accum. Inflow (cfs)	Volume (af)	Accum. Outflow (cfs)	Instant Dischge (cfs)	Average Dischge (cfs)	Stage (ft)
0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00
4.00	0.19	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00
8.00	0.38	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00
12.00	0.58	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00
16.00	0.77	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00
20.00	0.96	0.00	1.2	0.1	0.1	0.0	0.0	0.0	22.00
24.00	1.15	0.02	6.3	1.3	1.3	0.0	0.0	0.0	22.00
28.00	1.43	0.07	18.3	5.6	5.6	0.0	0.0	0.0	22.02
32.00	1.71	0.14	28.2	13.4	13.4	0.0	0.0	0.0	22.09
36.00	1.99	0.24	38.5	24.2	24.2	0.0	0.0	0.0	22.21
40.00	2.28	0.35	43.6	37.6	32.6	5.0	40.0	16.3	22.38
44.00	2.56	0.48	49.7	53.1	34.9	18.2	40.0	40.0	22.51
48.00	2.84	0.62	55.0	70.5	39.1	31.4	40.0	40.0	22.55
52.00	3.19	0.82	77.4	91.8	47.2	44.6	40.0	40.0	22.61
56.00	3.52	1.27	177.1	132.7	64.9	67.8	160.0	73.8	22.74
58.00	4.52	1.68	268.4	169.6	75.4	94.2	160.0	160.0	23.00
59.00	4.96	2.00	351.9	195.6	88.2	107.4	160.0	160.0	23.15
59.50	5.36	2.30	458.9	213.3	99.3	114.0	160.0	160.0	23.34
59.75	6.69	3.35	843.4	230.8	113.4	117.4	160.0	160.0	23.50
60.00	8.02	4.47	1535.9	262.5	141.8	120.7	160.0	160.0	23.66
60.50	8.60	4.97	1817.1	338.3	211.1	127.3	160.0	160.0	24.00
61.00	8.90	5.23	1833.1	408.1	274.2	133.9	160.0	160.0	24.44
62.00	9.30	5.59	1218.1	521.1	374.0	147.1	160.0	160.0	24.67
64.00	9.79	5.03	663.2	664.6	491.1	173.6	160.0	160.0	24.99
68.00	10.36	6.54	262.0	793.5	567.1	226.4	160.0	160.0	25.24
72.00	10.74	6.88	151.0	855.3	576.0	279.3	160.0	160.0	25.39
80.00	10.74	6.88	2.9	879.7	494.5	385.1	160.0	160.0	25.41
88.00	10.74	6.88	0.1	880.1	389.2	490.9	160.0	160.0	25.26
96.00	10.74	6.88	0.0	880.1	283.4	596.7	160.0	160.0	25.05
104.00	10.74	6.88	0.0	880.1	177.6	702.5	160.0	160.0	24.75
112.00	10.74	6.88	0.0	880.1	71.9	808.3	160.0	160.0	24.34
120.00	10.74	6.88	0.0	880.1	13.2	866.9	40.0	86.9	23.14
124.00	10.74	6.88	0.0	880.1	-0.0	880.2	0.0	38.8	22.21

Maximum Stage = 25.42 feet
 Maximum Discharge = 160.00 cfs

TABLE 7
 PAGE 1 OF 2

.....: Lindahl, Browning, Ferrari & Holliston, Inc.
 Execution Date.....: 11-21-1985

Project Name.....: Santa Barbara -- (08/18/85)

Project Name.....: INDIAN SUN RESERVOIR
 Engineer's Name.....: MARTY S
 Project Area.....: 70 acres
 Ground Storage.....: .01 inches
 Termination Discharge.....: 20 cfs
 Time of Concentration.....: 1 hour
 Distribution Type.....: SFWD
 Return Frequency.....: 25 years
 Rainfall Duration.....: 3 -day
 24-hr Rainfall.....: 7.9 inches
 Reporting Sequence.....: Standardized
 Inflow Hydrograph.....: ISG25 lagged by 0 hours

Bleeder Information.....: Invert-NGVD-Ft Angle-Degrees Width-Ft
 V-notch.....: 27 161.9

Well Information.....: Length-Ft Elev. NGVD-Ft Coefficient
 25.13 29 3.13

Culvert Information.....: Length-Ft Diameter-Ft N-Value
 60 6 .013

Storage Information.....: Component Storage Area Start Elev Ending Elev
 Name Type (acres) (NGVD-ft) (NGVD-ft)
 Entry No. 1.....: RESERVOIR
 Point Stage Storage Discharge
 No. (ft) (af) (cfs)

Point No.	Stage (ft)	Storage (af)	Discharge (cfs)
1	27.00	0.00	0.00
2	27.50	45.00	2.77
3	28.00	70.00	15.70
4	28.50	105.00	43.25
5	29.00	140.00	88.79
6	29.50	175.00	158.01
7	30.00	210.00	234.28

- - - - - R E S E R V O I R - - - - -									
Time (hr)	Rain Fall (in)	Accum. Runoff (in)	Basin Discharge (cfs)	Accum. Inflow (af)	Volume (af)	Accum. Outflow (af)	Instant Discharge (cfs)	Average Discharge (cfs)	Stage (ft)
0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	27.00
4.00	0.19	0.18	3.3	0.7	0.7	0.0	0.1	0.0	27.01
8.00	0.38	0.57	3.4	1.9	1.8	0.0	0.1	0.1	27.03
12.00	0.58	0.96	3.4	3.0	2.9	0.1	0.2	0.2	27.04
16.00	0.77	0.76	3.4	4.1	3.9	0.2	0.3	0.3	27.06
20.00	0.96	0.95	3.4	5.2	4.9	0.3	0.4	0.3	27.07
24.00	1.15	1.14	3.4	6.3	5.9	0.4	0.5	0.4	27.08
28.00	1.43	1.42	4.9	7.8	7.2	0.6	0.6	0.5	27.10
32.00	1.71	1.70	4.9	9.5	8.6	0.8	0.7	0.6	27.12
36.00	1.99	1.98	4.9	11.1	10.0	1.1	0.8	0.7	27.14
40.00	2.28	2.26	4.9	18.1	16.7	1.4	1.3	0.9	27.23
44.00	2.56	2.54	4.9	33.0	31.0	2.0	2.4	1.9	27.44
48.00	2.84	2.82	4.9	47.8	44.6	3.0	6.1	3.9	27.63
52.00	3.19	3.18	6.9	62.9	56.9	6.1	10.7	8.4	27.81
56.00	3.92	3.91	14.8	90.8	80.2	10.6	22.3	13.7	28.12
59.00	4.52	4.51	21.1	120.2	104.3	15.9	41.2	31.9	28.46
59.00	4.90	4.89	27.3	135.3	115.0	19.8	54.5	47.4	28.62
59.50	5.36	5.34	30.8	143.3	121.1	22.2	61.6	58.0	28.70
59.75	5.69	5.68	36.0	147.7	124.3	29.5	65.4	63.5	28.74
60.00	6.07	6.01	143.1	153.3	128.4	24.9	70.1	67.7	28.79
60.50	6.60	6.58	144.2	161.2	138.2	28.0	82.3	76.1	28.93
61.00	6.90	6.89	167.5	178.0	146.4	31.7	95.7	88.6	29.05
62.00	9.30	9.29	177.9	197.9	157.3	40.0	118.4	108.0	29.21
64.00	9.79	9.78	22.6	230.2	167.9	62.3	140.3	130.9	29.37
68.00	10.36	10.34	10.3	287.5	175.8	111.7	156.1	149.6	29.49
72.00	10.74	10.72	6.8	342.9	178.5	164.4	161.9	159.4	29.53
80.00	10.74	10.72	0.0	449.3	178.0	271.4	160.9	161.7	29.52
88.00	10.74	10.72	0.0	555.1	177.7	377.5	160.2	160.5	29.51
96.00	10.74	10.72	0.0	660.9	177.6	483.3	160.0	160.1	29.51
104.00	10.74	10.72	0.0	766.7	177.6	589.1	160.0	160.0	29.51
112.00	10.74	10.72	0.0	872.5	177.6	694.9	160.0	160.0	29.51
120.00	10.74	10.72	0.0	929.9	143.6	786.3	95.1	138.2	29.05
132.00	10.74	10.72	0.0	942.7	95.4	847.3	35.7	61.6	28.36
141.00	10.74	10.72	0.0	942.7	75.3	867.4	19.9	27.0	28.08

Maximum Stage - 29.53 feet
 Maximum Discharge - 162.43 cfs

TABLE 7
 PAGE 2 OF 2

Company Name.....: Lindahl, Browning, Ferrari & Hellstrom, Inc.
 Execution Date.....: 11-21-1985

Program Name.....: Santa Barbara -- (08/18/85)

Project Name.....: INDIAN SUN GROVES
 Engineer's Name.....: Marty Sanders
 Project Area.....: 1535 acres
 Ground Storage.....: 4.3 inches
 Termination Discharge.....: 10 cfs
 Time of Concentration.....: 2 hours
 Distribution Type.....: SFWDH
 Return Frequency.....: 100 years
 Rainfall Duration.....: 3 -day
 24-hr Rainfall.....: 9.3 inches
 Reporting Sequence.....: Standardized
 Discharge Hydrograph.....: 1SG1003

Pump No.	Pump On Elevation (ft)	Pump Off Elevation (ft)	Pump Rate Discharge (cfs)
1	22.50	22.00	40.00
2	23.00	22.50	120.00

Storage Information.....	Component Name	Storage Type	Area (acres)	Start Elev (NGVD-ft)	Ending Elev (NGVD-ft)
Entry No. 1.....	ROADS	V	60	27	
Entry No. 2.....	CANALS	V	63	22	
Entry No. 3.....	BEDS	L	706	26	27
Entry No. 4.....	SWALES	L	706	24	26

Point No.	Stage (ft)	Storage (af)
1	22.00	0.00
2	22.50	31.50
3	23.00	63.00
4	23.50	94.50
5	24.00	126.00
6	24.50	201.63
7	25.00	365.50
8	25.50	617.63
9	26.00	958.00

Time (hr)	Rain Fall (in)	Accum. Runoff (in)	Basin Discharge (cfs)	Accum. Inflow (af)	RESERVOIR					Stage (ft)
					Volume (af)	Accum. Outflow (af)	Instant Discharge (cfs)	Average Discharge (cfs)		
0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00	
4.00	0.21	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00	
8.00	0.45	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00	
12.00	0.68	0.00	0.0	0.0	0.0	0.0	0.0	0.0	22.00	
16.00	0.91	0.00	0.2	0.0	0.0	0.0	0.0	0.0	22.00	
20.00	1.13	0.02	6.2	1.0	1.0	0.0	0.0	0.0	22.00	
24.00	1.36	0.05	13.5	4.3	4.3	0.0	0.0	0.0	22.01	
28.00	1.69	0.13	30.6	12.0	12.0	0.0	0.0	0.0	22.07	
32.00	2.02	0.25	42.8	24.3	24.3	0.0	0.0	0.0	22.19	
36.00	2.35	0.38	52.6	40.2	34.4	5.8	40.0	18.8	22.38	
40.00	2.68	0.54	60.7	59.1	40.1	19.0	40.0	40.0	22.54	
44.00	3.01	0.72	67.6	80.4	48.1	32.2	40.0	40.0	22.63	
48.00	3.34	0.91	73.5	103.8	58.3	45.5	40.0	40.0	22.75	
52.00	3.76	1.17	101.9	102.1	53.6	78.5	160.0	103.8	22.91	
56.00	4.61	1.75	226.3	185.2	53.8	131.4	160.0	160.0	22.82	
58.00	5.32	2.27	342.0	232.5	74.6	157.9	160.0	160.0	23.13	
59.00	5.84	2.67	445.2	265.5	94.4	171.1	160.0	160.0	23.43	
59.50	6.31	3.04	577.8	287.8	110.1	177.7	160.0	160.0	23.65	
59.75	7.87	4.35	1002.6	309.5	128.5	181.0	160.0	160.0	23.87	
60.00	9.44	5.72	1402.0	348.3	164.5	184.3	160.0	160.0	24.12	
60.50	10.12	6.32	2238.8	442.3	251.4	190.9	160.0	160.0	24.58	
61.00	10.47	6.64	2008.0	528.1	330.6	197.5	160.0	160.0	24.83	
62.00	10.95	7.07	1493.5	666.9	456.1	210.7	160.0	160.0	25.15	
64.00	11.52	7.60	809.5	842.4	605.3	237.2	160.0	160.0	25.46	
68.00	12.19	8.22	317.3	994.2	709.1	290.1	160.0	160.0	25.63	
72.00	12.64	8.63	1073.4	1073.4	730.9	347.0	160.0	160.0	25.66	
80.00	12.64	8.63	0.0	1103.7	549.2	534.5	160.0	160.0	25.36	
96.00	12.64	8.63	0.0	1103.8	443.4	660.3	160.0	160.0	25.15	
104.00	12.64	8.63	0.0	1103.8	337.6	766.1	160.0	160.0	24.91	
112.00	12.64	8.63	0.0	1103.8	231.8	871.9	160.0	160.0	24.59	
120.00	12.64	8.63	0.0	1103.8	126.1	977.7	160.0	160.0	24.00	
132.00	12.64	8.63	0.0	1103.8	14.5	1089.3	40.0	111.3	22.23	
136.50	12.64	8.63	0.0	1103.8	-0.4	1104.1	0.0	38.9	21.99	

Maximum Stage = 25.66 feet
 Maximum Discharge = 160.00 cfs

TABLE 8
 PAGE 1 OF 2

Company Name.....: Lindahl, Browning, Ferrari & Hollstrom, Inc.
 Execution Date.....: 11-21-1985

Program Name.....: Santa Barbara -- (08/18/85)

Project Name.....: INDIAN SUN RESERVOIR
 Engineer's Name.....: HARTY S
 Project Area.....: 70 acres
 Ground Storage.....: .01 inches
 Termination Discharge.....: 20 cfs
 Time of Concentration.....: 1 hour
 Distribution Type.....: SFWM
 Return Frequency.....: 100 years
 Rainfall Duration.....: 3 -day
 24-hr Rainfall.....: 9.3 inches
 Reporting Sequence.....: Standardized
 Inflow Hydrograph.....: ISG100 lagged by 0 hours

Bleeder Information.....: Invert-NGVD-Ft Angle-Degrees Width-Ft
 V-notch.....: 27 161.9
 Weir Information.....: Length-Ft Elev. NGVD-ft Coefficient
 25.13 29 3.13
 Culvert Information.....: Length-Ft Diameter-Ft N-Value
 60 6 .013
 Storage Information.....: Component Storage Area Start Elev Ending Elev
 Name Type (acres) (NGVD-ft) (NGVD-ft)
 Entry No. 1.....: RESERVOIR
 Point Stage Storage Discharge
 No. (ft) (af) (cfs)
 1 27.00 0.00 0.00
 2 27.50 35.00 2.77
 3 28.00 70.00 15.70
 4 28.50 105.00 43.25
 5 29.00 140.00 88.79
 6 29.50 175.00 158.01
 7 30.00 210.00 234.28

- - - - - R E S E R V O I R - - - - -

Time (hr)	Rain Accum. (in)	Basin Runoff (in)	Basin Discharge (cfs)	Accum. Inflow (af)	Volume (af)	Accum. Instant Outflow (af)	Average Discharge (cfs)	Stage (ft)
0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	27.00
1.00	0.23	0.21	3.9	0.9	0.9	0.0	0.1	27.01
2.00	0.45	0.44	4.0	2.2	2.2	0.0	0.2	27.03
3.00	0.67	0.67	4.0	3.5	3.4	0.1	0.3	27.05
4.00	0.91	0.89	4.0	4.8	4.6	0.2	0.4	27.07
5.00	1.13	1.12	4.0	6.2	5.8	0.4	0.5	27.08
6.00	1.36	1.35	4.0	7.5	7.0	0.5	0.5	27.10
7.00	1.59	1.58	5.8	9.2	8.5	0.7	0.6	27.12
8.00	2.02	2.01	5.8	11.2	10.2	1.0	0.8	27.14
9.00	2.35	2.34	5.8	19.3	18.0	1.3	1.0	27.25
10.00	2.68	2.67	5.8	34.4	32.5	1.9	2.0	27.46
11.00	3.01	3.00	5.8	49.6	46.2	3.4	4.3	27.65
12.00	3.34	3.33	5.8	64.7	58.4	6.4	9.0	27.83
13.00	3.76	3.75	8.1	101.3	89.4	11.8	16.5	28.25
14.00	4.61	4.60	17.4	158.3	129.9	28.3	50.0	28.83
15.00	5.32	5.31	24.8	188.1	145.9	42.3	84.2	29.06
16.00	5.88	5.83	32.2	203.6	152.8	50.8	103.5	29.15
17.00	6.31	6.29	43.3	211.8	156.3	55.5	116.9	29.20
18.00	7.87	7.86	90.2	216.5	158.5	58.0	118.8	29.23
19.00	9.44	9.43	168.4	222.5	161.9	60.5	126.3	29.27
20.00	10.17	10.11	169.7	236.5	170.4	66.1	142.1	29.38
21.00	10.47	10.46	128.3	249.2	177.0	72.2	155.9	29.48
22.00	10.95	10.93	88.2	270.2	184.3	85.9	173.1	29.60
23.00	11.52	11.51	26.7	303.6	188.1	115.5	182.2	29.66
24.00	12.19	12.18	12.1	361.7	186.3	175.4	178.7	29.64
25.00	12.64	12.63	8.0	417.5	183.9	233.6	173.7	29.60
26.00	12.64	12.63	0.0	524.1	179.3	344.8	163.8	29.54
27.00	12.64	12.63	0.0	629.9	178.0	451.9	160.9	29.52
28.00	12.64	12.63	0.0	735.9	177.7	558.0	160.2	29.51
29.00	12.64	12.63	0.0	841.4	177.6	663.8	160.0	29.51
30.00	12.64	12.63	0.0	947.2	177.6	769.6	160.0	29.51
31.00	12.64	12.63	0.0	1053.0	177.6	875.4	160.0	29.51
32.00	12.64	12.63	0.0	1163.3	143.6	1019.7	95.1	29.05
33.00	12.64	12.63	0.0	1177.8	96.2	1081.6	36.3	28.37
34.00	12.64	12.63	0.0	1177.8	75.3	1102.5	19.9	28.08

Maximum Stage = 29.66 feet
 Maximum Discharge = 162.49 cfs

TABLE 8
 PAGE 2 OF 2

Elevation Date.....: 11-11-1985

Computation Type.....: STAGE-DISCHARGE

Project Name.....: INDIAN SUN RESERVIOR

Engineer's Name.....: MARTY S

Bleeder Type

V-notch

Notch Angle-Deg = 161.9

Bleeder Invert-Ft = 27

Weir Information

Weir Length-Ft = 25.13

Weir Elevation-Ft = 29

Coefficient = 3.13

Culvert Information

Culvert Length-Ft = 60

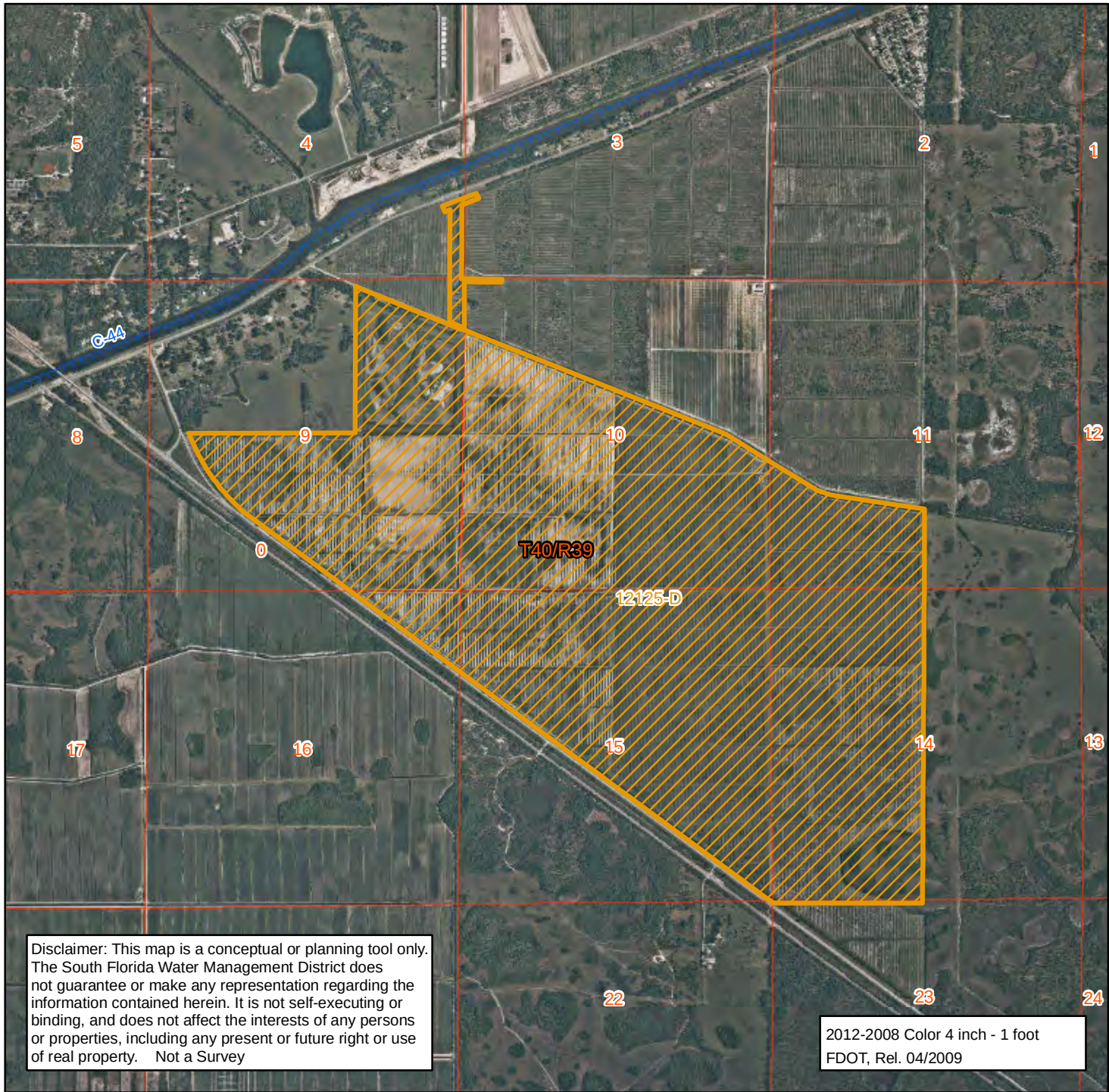
Culvert Dia.-Ft = 6

N-value = .013

Tailwater Elev.-Ft = 23

Stage Elev. (ft)	Head (ft)	Weir Flow (cfs)	Bleeder Flow (cfs)	Culvert Flow (cfs)	Structure Flow (cfs)
27.00	0.00	0.00	0.00	350.97	0.00
27.50	0.50	0.00	2.77	372.26	2.77
28.00	1.00	0.00	15.70	392.39	15.70
28.50	1.50	0.00	43.25	411.55	43.25
29.00	2.00	0.00	88.79	429.85	88.79
29.50	2.50	27.81	130.20	447.40	158.01
30.00	3.00	78.66	155.62	464.29	234.28

TABLE 9



Sections Township/Range Major Road Centerlines Canals		Application		
Martin County, FL	Sec/Twp/Rge 15/40/39	Date 01/28/2014	Latitude (DMS): 27° 0m 6s N Longitude (DMS): 80° 25m 30s W	State Plane Coordinates X: 843399.81 Y: 970198.17
Application Number: 12125-D			 South Florida Water Management District Regulation Division Regulatory Support Bureau - GIS Section 3301 Gun Club Road West Palm Beach, Florida 33406 Phone: (561) 682-6582	

Scale 1 = 29000

Miles

APPENDIX F
ENVIRONMENTAL
FEATURES
IDENTIFICATION
MEMORANDUM



Florida Department of Transportation

RICK SCOTT
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

ANANTH PRASAD, P.E.
SECRETARY

MEMORANDUM

DATE: November 19, 2014

TO: Thuc Le, P.E. Design Project Manager

FROM: George Burke, Environmental Scientist, PL&EM Support
David Bogardus, Environmental Specialist

COPIES: Ann Broadwell, District Environmental Administrator
Central File, Reading File

ENVIRONMENTAL FEATURES IDENTIFICATION MEMORANDUM

Project Name: SR-710/Beeline Hwy
Project FM Number: 432705-1-52-01
Federal Aid Project Number: 1301-041-P
Limits: from East of SR-76 to the Palm Beach/Martin County Line
County: Martin

The proposed project on SR-710/Beeline Highway consists of the reconstruction of the existing two (2) lane roadway to widen into four (4) lanes to create a divided rural roadway, and the associated stormwater management improvements. The project is to be constructed within the existing right of way (ROW). The stormwater treatment requirements will be met within roadside swales. Attenuation of the discharge will be accommodated within adjacent wetlands. No offsite ponds are included and no ROW acquisition is required. The project is Federally funded.

The SR-710 corridor is part of Florida's Strategic Intermodal System (SIS). A Project Development and Environmental (PD&E) Study was completed for the project under Financial Management numbers 419348.2 and 419348.1. The Class of Action (COA) was determined to be an Environmental Assessment (EA) – Finding of No Significant Impact (FONSI). Location Design Concept Acceptance (LDCA) was issued on January 6, 2014.

The above referenced project was reviewed for environmental features identification. The purpose of this evaluation is to identify environmental features of potential concern for consideration during design phase. The project was evaluated based on a field review of the project area and a review of desktop resources including:

- Geographic Information Systems (GIS) review of contamination; historic and archaeological sites; recreation and Section 4(f); wetlands; and, wildlife and habitat using the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST).
- Review of aerials using Florida Department of Transportation (FDOT) GIS and ETDM EST.
- Review of the PD&E Study for the project under Financial Management number 419348.2 and 419348.1

Socio-Cultural Resources

The project, referred to as the SR 710/Beeline Hwy project, traverses an undeveloped rural area dominated by natural wetlands and agriculture. There are no emergency services or community services within this segment (432705.1) (see attached Communities and Community Facilities Map; Map of Public Lands; and, Table of Public Lands). However, there are three publicly owned conservation and recreation lands within the project vicinity: the SFWMD/Hungryland parcels, JW Corbett Wildlife Management Area, and John C. and Mariana Jones/Hungryland Wildlife and Environmental Area. For this reason, the potential for urban sprawl along the project is limited.

The publicly owned lands are being managed for preservation of habitat and species, and for public use of passive resource based recreational uses, scientific research, and environmental educational activities. In addition, the state owned lands are also used for recreational and educational purposes including hunting, fishing, horseback riding, bicycle riding, primitive camping, boating, canoeing and kayaking. Implementation of the entire SR 710/Beeline Hwy project will provide a multi-use trail (10-foot, paved) along 22 miles of rural corridor and paired five-foot sidewalks and 6.5-foot shoulders along three miles of urban corridor, thereby improving connectivity and recreational use. Avoidance and minimization measures were implemented during the PD&E Study and must be continued during the design process to minimize impacts to Section 4(f) resources.

A socio-cultural effects (SCE) evaluation was prepared for this project during the PD&E study. No right-of-way (ROW) acquisition, residential relocations or business relocations are required for this project segment. The demographic character and the social framework of the populations along the SR 710 project corridor are not anticipated to be affected. Currently, the potential for urban sprawl along the corridor is limited due to the amount of publically owned lands present along the corridor.

A Cultural Resources Assessment Survey (CRAS) was prepared during PD&E, which determined the project area had a low archaeological site potential. Six historic-aged resources were identified along the entire SR 710 project corridor during PD&E, which include: one railroad (CSX), one road, two bridges, one canal, and one cemetery (see attached Map of Cultural Resources). The railroad and the roadway are the only resources within this segment (432705.1) of the corridor. FHWA in consultation with the State Historic Preservation Office (SHPO) determined that no National Register properties would be impacted by the project. However, SHPO stated that subsurface testing of all final pond locations should be conducted. FDOT has committed to conduct sub-surface testing of all selected pond locations during final

design and coordinate with SHPO on the results of the testing. Please coordinate testing of the pond locations with Planning and Environmental Management Office (PL&EM) as early in the design-build process as possible to allow for the necessary scheduling and coordination with SHPO.

Natural Resources

There is no designated critical habitat within the project limits; however, the project corridor traverses an area dominated by wetlands and habitat conservation areas, which support many listed species and other wildlife. The ETDM EST indicates the project is within the Consultation Areas for caracara (*Polyborus plancus*), red cockaded woodpecker (*Picoides borealis*), scrub jay (*Aphelocoma coerulescens*), and snail kite (*Rostrhamus sociabilis*). The project is also within the core foraging area for the wood stork (*Mycteria americana*). An eagle nest search utilizing the Florida Fish and Wildlife Conservation Commission's eagle nest locator did not identify any nests within the vicinity of the project corridor. The closest nest is approximately 1.5 miles southwest of the intersection of Northlake Boulevard and SR 710.

There are no existing wildlife crossings within this project segment. However, there is one existing crossing southeast of the project at Loxahatchee Slough. A limited wildlife crossing study was conducted to determine whether additional wildlife crossings were required along SR 710/Beeline Highway. Based on the results of the study, no additional wildlife crossings are currently recommended. However, FDOT committed to an at grade multi-use crossing at approximate Station 1230+00, as well as continued coordination with the Florida Fish and Wildlife Conservation Commission (FFWCC) and the U.S. Fish and Wildlife Service (USFWS) throughout the design process and to reevaluate incorporating new wildlife crossings should additional information indicating the need arise. The inclusion of fencing along natural areas must be considered during design to deter animal crossings and improve safety for wildlife and vehicles.

The project corridor is adjacent to significant stretches of publicly owned conservation lands that support recreationally important wildlife and other listed species. Additional lanes result in a considerable amount of upland and wetland habitat loss for many species, and a possible reduction in habitat connectivity for some species due to the increased laneage. Avoidance and minimization measures must be implemented during the design process. Please coordinate with PL&EM as early in the design phase as feasible to initiate agency coordination and mitigation planning. General Notes will be required in the plans to prevent any impacts to listed species and/or habitat during project construction.

Physical Resources

The project corridor is in an area dominated by undeveloped lands and natural areas. ROW acquisition is not required. An Air Study and a Noise Study were completed for this capacity improvement project in accordance with the PD&E manual. The project is not anticipated to adversely impact air quality or noise levels.

A total of 35 potentially contaminated sites were identified along the SR 710 project corridor, three of which are within the vicinity this project segment. A table showing the name, address, and contaminant of concern for each site and a map showing site locations are attached to this

Memo. PL&EM staff will identify if testing is needed at any of these sites during the constructability phase. Please keep PL&EM updated on all scope changes that will involve subsurface work (drainage, mast arms, etc.) as early in the design process as possible, to allow time for Level II testing, if warranted.

The following are Federal Aid Category National Environmental Policy Act (NEPA) Compliance Checklist Items

Local Traffic Patterns

Maintenance of Traffic (MOT) and Sequence of Construction must be planned and scheduled so as to minimize traffic delays throughout the project. Signs must be used as appropriate to provide notice of lane closures and other pertinent information to the traveling public. The local news media must also be notified in advance of lane closings and other construction-related activities, which could excessively inconvenience the community so that motorists, residents, and business persons can plan travel routes in advance. Traffic delays must be controlled to the extent possible where many construction operations are in progress at the same time. The contractor is required to maintain at least one lane of traffic in each direction at all times, and to comply with the Best Management Practices of FDOT. Also, present traffic movements must be maintained at all times. No locations will require temporary roads or bridges.

Property Access and Right of Way Acquisition

No ROW acquisition is required for this project segment; therefore, no adverse impacts to property access are expected as a result of this proposed project. Please add the following staging and stockpiling general notes to the plans:

“No materials should be staged within or adjacent to the John C. and Mariana Jones Hungryland Wildlife and Environmental Area (WEA) property; J.W. Corbett Wildlife Management Area (WMA) property; wetlands; water bodies; or, other environmentally sensitive areas.”

Planned Community Growth/Land Use Patterns

The land use within the project area is dominated by publicly owned lands and undeveloped wetland areas. Direct impacts to existing land uses from project implementation include impacts to natural lands, including publicly held conservation and recreation lands.

Community Cohesiveness

The project is not anticipated to increase, decrease or displace any population, or to disproportionately affect any minority populations or special populations. No negative impacts to any communities are anticipated. No negative impacts to any communities are anticipated. No change in social values is anticipated. The proposed increase in capacity is anticipated to benefit emergency response times and is anticipated to save energy by reducing congestion. These should result in a positive effect on quality of life for both local residents and users of the roadway. The demographic character and the social framework of the populations along the SR 710 project corridor are not anticipated to be affected. No change is anticipated with a wider roadway.

Air Quality and Noise

The project was reviewed for air quality impacts consistent with the guidance provided by the FHWA. The project is located in an area which is designated as attainment for all of the National Ambient Air Quality Standards (NAAQS) under the criteria provided in the Clean Air Act. Therefore, the Clean Air Act conformity requirements do not apply to the project.

The noise analysis for this project was conducted (during the PD&E study) in accordance with the Code of Federal Regulations (CFR), Title 23, Part 772, and the U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Traffic Noise: Analysis and Abatement Guidance* (FHWA, 2011). The project was further conducted in accordance with the procedures established in Chapter 17 of the FDOT PD&E Manual (05-24-11). The FHWA Traffic Noise Model (TNM) Version 2.5 (FHWA, 1998) was used to predict existing year 2011 noise levels and noise levels for the Design Year 2040 build and no build conditions. Based on the findings in the PD&E, no noise impact is predicted for noise sensitive receptors at this common noise environment (CNE) under the Design Year 2040 'Build' condition.

Wetlands/Water Quality:

Based on the field review, review of the FDOT ETDM EST and the Wetland Evaluation Report (WER) from the PD&E study, there are extensive wetlands and environmentally sensitive areas adjacent to the majority of the proposed project corridor (**See Figure 1**). A WER was prepared as part of the PD&E Study. The WER documented that the landscape is dominated by multiple wetland habitat types, as well as uplands and mesic habitats. A mix of intermediate to long hydroperiod marshes as well as shorter hydroperiod prairies and flatwoods exist. Substantial impacts will occur due to the widening from two-lanes to four lanes and the extensive undeveloped natural lands.

Avoidance and minimization measures must be implemented during the design process. All unavoidable impacts must be permitted and mitigated. Please coordinate with Drainage for permitting and PL&EM for mitigation as soon as possible. Mitigation will be addressed at an agency-approved mitigation bank.

In order to ensure that adverse and/or excessive impacts to the water quality and wetlands within the vicinity of the project corridor will not occur, the FDOT made the following commitments during PD&E, which must be adhered to during the design-build phase:

- The proposed project is located within the designated boundaries of the Biscayne Aquifer. The FDOT will commit to the following measures:
 - Debris will be properly contained and removed from the site.
 - As applicable, contractors will follow all county flood plain management's plans and public notification processes.
 - During construction, all Federal, State and local government permits, ordinances, planning designs, construction codes, operation and maintenance requirements, and engineering will be adhered to.
 - State and County environmental offices will be contacted, as applicable, to address proper drainage and stormwater designs.

- The FDOT commits to implement conservation measures, such as Best Management Practices (BMPs) for water quality and erosion control, in the project design and during project construction. A Stormwater Pollution Prevention Plan (SWPPP) for containment/treatment of surface and stormwater runoff from impervious surfaces will be prepared.
- The proposed storm-water facility design will include, at a minimum, the water quantity requirements for water quality impacts, as required by the South Florida Water Management District (SFWMD) and requirements of local water control districts.
- Stormwater treatment and management plans will be coordinated with SFWMD. Disturbed soil surfaces will be re-vegetated and stabilized when practical to minimize temporary construction impacts and to prevent erosion.
- Compensation for unavoidable wetland impacts will be mitigated in coordination with USACE, SFWMD, USFWS, and FFWCC.
- The contractor(s), prior to commencement of any work or mobilization, will be required to prepare a plan identifying all staging, storage and office areas, for all construction phases/work zones (as per FDOT specifications). This plan must be coordinated with and approved by the FDOT PL&EM and the District Construction Office prior to initiating construction. The contractor will be required to depict the ROW and construction limits with fences and flagged as necessary to clearly minimize the potential for impact outside the project limits.
- The FDOT shall require the contractor(s) to avoid sensitive areas (i.e., all wetland and riverine areas, and stream crossings) that cannot be used as staging areas. This condition will be included in the drawing plans and construction specifications. The SFWMD (ERP) and the United States Army Corps of Engineers (USACE) Section 404 Permit will be included in the contract documents. Permit conditions must be followed.
- The FDOT commits to remove exotic vegetation from the ROW and to maintain the ROW free of exotic vegetation.
- To mitigate for the unavoidable impacts to wetlands, the FDOT will provide appropriate mitigation for loss of wetland habitat. A detailed mitigation plan should be developed. Compensation for unavoidable wetland impacts will be provided in accordance with USACE and SFWMD permits.
- Environmentally sensitive lands should be clearly delineated in the final design plans, including areas where no encroachment is allowed. Signs should be posted to keep all activities within the construction limits and prior to the commencement of construction, wetland areas should be marked and the contractor(s) should not be allowed to work within those areas that are not permitted by the USACE and/or SFWMD permits. The contractor will likely not be permitted to stage within any publically owned land outside the ROW.
- BMPs must be implemented during construction following FDOT's *Standard Specifications for Road and Bridge Construction*.
- Existing hydrologic connections between wetland and surface water should be maintained and/or improved (e.g., via culverts under SR-710 or new culvert under the Northlake Interchange access road).
- The FDOT should fully restore wetland areas that are to be temporarily impacted by construction activities to a condition, which is at least as good as that which existed prior to the project.

- Dewatering should not occur adjacent to wetlands unless measures are implemented to avoid impacts (i.e., drawdown) to these sensitive areas.

All activities associated with construction must be in compliance with the current National Pollutant Discharge Elimination System (NPDES) requirements. Any work outside the ROW must be coordinated with the PL&EM Office. Adding the notes below to the construction plans will help to minimize impacts to water quality and wetlands:

“There are wetlands located adjacent to the project corridor. Swales, drainage areas and wetlands must be avoided and are not to be used for stockpiling.”

“No dewatering shall be performed adjacent to wetlands unless measures are implemented to avoid impact (i.e. draw-down) to these sensitive areas and approved by the Engineer.”

Please refer to the May 2013 WER (Update: September 2013) for further details regarding wetlands.

Floodplain Encroachment

There is no history of flooding or roadway overtopping for this segment of SR-710. The proposed roadway widening alternatives would improve emergency services and evacuation route capabilities. Also, the lowest point of the existing roadway is elevated approximately two feet above the 100-year floodplain elevation of 18.00 feet NGVD in this area. The proposed roadway elevations shall meet or exceed the existing roadway elevations; therefore, no negative impacts are anticipated as a result of this proposed project.

Threatened/Endangered Species Wildlife and Critical Habitats

An Endangered Species Biological Assessment (ESBA) Report was prepared as part of the PD&E Study. The proposed project will cause direct impacts to the terrestrial flora and fauna as the proposed corridor improvements include the widening of a two lane roadway into a four lane roadway. According to the ESBA Report, the proposed project may affect, but is not likely to adversely affect six federally listed species:

- Wood stork (*M. americana*)
- Audubon’s crested caracara (*P. plancus audubonii*)
- Everglades snail kite (*R. sociabilis plumbeus*)
- Red-cockaded woodpecker (*P. boreales*)
- American alligator (*A. mississippiensis*)
- Eastern indigo snake (*D. corais couperi*)

Likewise, the proposed project may affect, but is not likely to adversely affect fourteen (14) State listed species, primarily wading birds, as well as the gopher tortoise, gopher frog, black bear and small mammals. The determination of may affect, not likely to adversely affect, is a result of the project’s anticipated impacts to wetlands and upland habitats, including dry prairie, pine flatwoods, surface waters (i.e. waterways), freshwater marsh, hydric pine flatwood, wetland scrub, wet prairie and cypress/pine/cabbage palm habitats. Avoidance and minimization

measures must be implemented during design to keep such impacts to a minimum. Any unavoidable impacts will require mitigation. Please coordinate with PL&EM as early as possible regarding any required mitigation.

In order to ensure that adverse impacts to the protected species within the vicinity of the project corridor will not occur, the FDOT will abide by the following commitments (made during the PD&E study):

- The FDOT commits to design and coordinate an at grade multi-use crossing in the vicinity of Station 1230+00. An 8' x 8' culvert (minimum size) with fencing along both side of the right of way will be constructed. This multiuse crossing has been coordinated with USFWS. During design, additional coordination with USFWS, FFWCC, CSX, Pal Mar Water Control District and any other adjacent property owners regarding this crossing will occur.
- The FDOT commits to maintaining the existing wildlife crossing at the Loxahatchee Slough Bridge as well as maintaining existing hydrologic connectivity via culverts under the existing and proposed roadway.
- The two other waterway crossings along the corridor, C-18 West Canal and C-18 East Canal, were evaluated to determine the feasibility of accommodating wildlife crossings. The project, as proposed, does not include roadway widening at either of these locations and no retrofitting of these structures are proposed as part of this project. The USFWS agreed retrofitting was not necessary as part of this project. However, the FDOT commits to coordinating with USFWS and other pertinent agencies on adding wildlife crossing features on future projects that include these structures.
- The FDOT will require the construction contractor abide by Article 7-1.4 of the Standard Specifications, Compliance with the Federal Endangered Species Act.
- The FDOT will provide the contractor with maps/plans identifying the locations of all environmentally sensitive lands. The contractor will be required to submit a Staging / Stockpiling Plan to FDOT and the permit agencies prior to initiation of construction activities. This plan will identify their proposed locations for staging, stock piling of material, etc. The contractor will be directed to minimize impacts to adjacent natural areas by keeping construction activity within the permitted footprint and by not allowing construction activities to occur in adjacent natural lands. During the bidding process, the contractor will be encouraged to develop their means and methods to further minimize impact to adjacent natural lands.
- The FDOT commits to avoid clearing impacts beyond the work area needed. DOT standard protocols for roadway construction will be followed. Contractors will be informed of wetlands and other natural areas that should be avoided.
- The "Habitat Management Guidelines for the Wood Stork in the Southeast Region" (USFWS, 1990) will be followed and implemented as applicable.
- To minimize adverse effects to the wood stork, the FDOT will 1) continue to evaluate measures to avoid and minimize impact to suitable foraging habitat; and 2) Suitable foraging habitat (SFH) compensation will occur in accordance with the CWA section 404(b)(1) guidelines and will not be contrary to the Habitat Management Guidelines (HMG); habitat compensation is within the appropriate Core Foraging Habitat (CFA) or within the service area of a Service-approved mitigation bank; and habitat compensation

replaces foraging value, consisting of wetland enhancement or restoration matching the hydroperiod percentage of the wetlands affected, and provides foraging value similar to, or higher than, that of impacted wetlands. The wetland mitigation plan prepared for this project provides appropriate compensation for wood stork foraging habitat.

- FDOT will follow Recommended Management Practices and Survey Protocols for Audubon's Crested Caracara (*Caracara cheriway audubonii*) and the USFWS Species Conservation Guidelines – Audubon's Crested Caracara (Draft April 20, 2004).

Please ensure the following general note(s) are included in the plans to minimize potential impacts to wildlife and habitat during construction:

“The Contractor is notified to review the current Standard and Supplemental Specifications for Unexpected Interactions with Certain Protected Species during Work Activities.”

“The corridor is within the core foraging area for wood storks, a federally protected species. The wet swales and/or wetlands adjacent to the roadway provide suitable foraging habitat for the wood stork and must not be impacted by construction activities.”

Please refer to the July 2013 ESBA Report (Update: September 2013) for further details regarding endangered and threatened species and habitat.

Essential Fish Habitat

During the PD&E Study, coordination was conducted with the National Marine Fisheries Service (NMFS). NMFS expressed concern that the wetlands in the project area are the headwaters for the Loxahatchee River and impacts to these wetlands may impact federally managed fishery resources downstream of the project. Additionally, NMFS was concerned that the project may affect fish and invertebrate species identified as Aquatic Resources of National Importance (ARNI) in accordance with the Water Resources Development Act of 1986 (33 USC 2201 et seq; PL 99-602), including blue crab, shrimp, snappers, red drum, and bluefish. However, further coordination with NMFS confirmed that the project is not anticipated to directly impact EFH because the FDOT has committed to the implementation of conservation measures, such as BMPs for water quality and erosion control, in the project design and during project construction. A SWPPP for containment/treatment of surface and stormwater runoff from impervious surfaces will be prepared and included in the construction plans.

Coastal Barrier Resources

The project is not located within a Coastal Barrier Resource Area (CBRA).

Community Services

The project is located in an undeveloped, rural area of Martin County consisting of mainly undisturbed natural areas and farmland. There are no community resources located along the proposed project corridor and the project will not change or result in any loss of connectivity or creation of new barriers to community cohesion. The proposed increase in capacity is anticipated to benefit emergency response times and is anticipated to save energy by reducing congestion. These should result in a positive effect on quality of life for both local residents and users of the

roadway. Implementation of a TCP will minimize the potential temporary impacts to community services.

Section 4(f) of the US Department of Transportation Act

Twelve properties were identified along the entire SR 710 corridor as potential parks, public lands/natural areas, conservation lands and trails, three of which are within or adjacent to this project segment (432705.1): the SFWMD/Hungryland parcels, JW Corbett Wildlife Management Area, and John C. and Mariana Jones/Hungryland Wildlife and Environmental Area. Please see the attached table for a description of these properties and the attached Figure for their locations.

A Section 4(f) Determination of Applicability (DOA) Report was prepared during the PD&E study and FHWA determined that there are three Section 4(f) resources located within the SR 710 project area (entire corridor): Pine Glades Natural Area, JW Corbett Wildlife Management Area and John C. and Mariana Jones/Hungryland Wildlife and Environmental Area. FHWA also determined the SFWMD/Hungryland parcels may be Section 4(f) Resources. Both the SFWMD/Hungryland parcels are located immediately adjacent to the north side of the SR 710 ROW within this project segment (432705.1).

The FDOT completed an assessment of the project's potential impacts on the identified resources and it was determined that no direct use of Section 4(f) properties are anticipated. In addition, it was determined that proximity impacts will not impair the activities, features, or attributes of these properties. The FDOT coordinated with Florida Fish and Wildlife Conservation Commission (FWC) in regard to the modified access to JW Corbett. In addition, the FDOT coordinated with Palm Beach County Environmental Resources Management (ERM) in regard to offsite stormwater discharge to their properties (i.e., Pine Glades and some of the Hungryland Parcels). ERM has concurred with the drainage design and outfall locations. Any change to these locations could require preparation of a Section 4(f) document if temporary construction easements or maintenance easements are required.

Avoidance and minimization measures must be implemented during design to minimize impacts to Section 4(f) resources. In addition, the construction contractor will be prohibited from staging or stockpiling equipment in any of these Section 4(f) properties.

In order to ensure that adverse impacts are avoided, the FDOT will abide by the following commitment (made during the PD&E study) which should be added as a note on the construction plans:

- The contractor will be required to depict the ROW and construction limits with fences and flagged as necessary to clearly minimize the possibility of any impact outside the project limits. Signs will be posted to keep all the activities within the construction limits and prior to the commencement of construction, Section 4(f) properties will be marked and the contractor(s) will not be allowed to work or stage within those areas.

Section 106 of the Historic Preservation Act

A Cultural Resource Assessment Survey (CRAS) was conducted in accordance with the procedures contained in 36 CFR Part 800 and including background research and a field survey

coordinated with the SHPO, was performed for this proposed project area during the PD&E study. Results indicate that this project's Area of Potential Effect (APE) has a low archaeological site potential, which the pedestrian survey confirmed. The historic resources survey resulted in the identification of six historic resources within the APE of the SR-710 corridor; however only two of which, the Seaboard Air Line/CSX Railroad (ID: 8MT1514) and Davis and Jenkins Tramline (ID: 8MT1349) are within this project segment (432705.1).

The Seaboard Air Line (CSX) Railroad is considered eligible for listing in the NRHP as a linear historic resource. The entire Davis and Jenkins Tramline was not evaluated; however, the small portion within the project APE was determined to be ineligible for NRHP. The FHWA in consultation with the SHPO determined that the project did not constitute an adverse effect on the CSX or Davis and Jenkins Tramline property. Based on the fact that no additional archaeological or historical sites or properties are expected to be encountered during subsequent project development for the roadway component of the project, the FHWA has determined that no other National Register properties would be impacted. SHPO stated that subsurface testing of all final pond locations should be conducted.

In order to ensure that adverse impacts are avoided, the FDOT will abide by the following commitment (made during the PD&E study) which should be added as a note on the construction plans:

- The FDOT has committed to conduct sub-surface archaeological testing of all selected pond locations during final design and coordinate with the SHPO on the results of the testing.

For further details, please refer to the October 2012 CRAS regarding historical and archaeological sites.

Contamination

Three potentially contaminated facilities, including petroleum users and storage tanks were identified within the project corridor (**See Figure and Chart below**). No high risk sites are located in the project area. Given the proposed project scope, which includes widening of an existing roadway and stormwater management system improvements, the possibility exists that contamination may be encountered during construction. PL&EM staff will identify if testing is needed at any of these sites during the constructability phase. Please advise PL&EM of any potential scope changes that will involve subsurface work (drainage, mast arms, etc.) as early in the design as possible, to allow time for Level II testing, if warranted.

In the event that construction operations encounter or expose any abnormal condition that may indicate the presence of a hazardous or toxic waste, the contractor is required to follow the current edition of the FDOT Standard Specifications for Road and Bridge Construction (Section 8-4.9, Hazardous or Toxic Waste).

The following commitments related to contamination have been made by the FDOT (during the PD&E study) and will be adhered to during the final design and construction phases (See Section 4.3.9 and Contamination Screening Evaluation Report (CSER), updated September 2013):

- FDOT commits to conducting a Level II Contamination Impact Assessment and an Impact to Construction Assessment for each project design segment during the design phase.
- Further assessments of the High and Medium risk sites will occur. Additional file review and possible soil and ground water testing is recommended during the design phase to determine the status of sites.
- The reevaluation of some of the Low risk sites are recommended during the design phase, particularly if subsurface work is required for construction (i.e., dewatering, foundations, French drains).
- If construction activities are to occur in an area with contamination concerns, a site assessment will be performed to the degree necessary prior to final design approval to determine levels of contamination and evaluate clean-up options and associated costs. Excavation and/or dewatering for installation of underground structures or utilities in the vicinity of contaminated sites could potentially encounter or exacerbate contamination conditions. Investigations should not be limited to areas of roadway expansion but should also include the drainage areas located adjacent to the roadway. No dewatering should occur near the high and/or medium risk contamination sites. However, if dewatering cannot be avoided then measures to avoid exacerbation of an existing groundwater plume should be employed (i.e., installing a well point system with a recharge trench).
- No dewatering should occur in the vicinity of Dyer Park and/or the US Veterans Administration Medical Center. Coordination with the FDEP is recommended during final design. However, if dewatering cannot be avoided then measures to avoid exacerbation of an existing plume should be employed (i.e., installing a well point system with a recharge trench).
- Resolution of problems regarding contamination will be coordinated with the appropriate regulatory agencies, and action will be taken as applicable. Further coordination with the regulatory agencies, possible field surveys involving monitoring wells, soil borings, and other site-specific methods can identify potential contamination issues so that avoidance, minimization, and remediation measures can be taken.
- Procedures specifying the contractor's responsibilities in regard to encountering petroleum-contaminated soil and/or groundwater are set forth in FDOT's Standard Specifications for Road and Bridge Construction. If construction activities will be impacted, general notes addressing the contamination will be included in the plans as determined by the District Contamination Impact Coordinator.
- The FDOT Standard Specifications for Road and Bridge Construction will be used to address short-term air pollution impacts during construction due to emissions from diesel powered construction equipment.
- A Spill Prevention Plan will be prepared prior to initiation of construction activities.

Please refer to the May 2013 CSER (Update: September 2013) for further details regarding contamination.

Public Hearing

Public involvement occurred during the PD&E process and was outlined in the EA. Please inform PL&EM of any design or project changes that have resulted from these or subsequent

meetings with residents, community leaders, public officials or the media for this particular project segment along the SR-710 corridor.

An Alternatives Public Workshop was held on September 20, 2012 to present to the public the proposed alternative designs for the SR-710 Mainline and the Northlake Interchanges, as well as drainage design and pond locations. Other information available included environmental issues, access management and project schedule. Thirty-seven people attended the workshop and 22 written comments were received.

A Public Hearing was held on Wednesday, August 7, 2013, which provided interested persons an opportunity to express their views concerning the location, conceptual design, and social, economic, and environmental effects of the proposed improvements. Comments received ultimately helped guide the selection of the Preferred Alternative.

Controversy

According to the comments provided by the Environmental Technical Advisory Team (ETAT) during the ETDM screening of the SR-710 corridor project (for the PD&E study), specific areas of controversy or concern, as denoted by “substantial” risk ratings, include: Floodplains, Water Quality and Secondary and Cumulative Effects (Environmental Protection Agency [EPA]); Section 4(f) Potential Sites and Special Designations (FHWA); Wetlands (U.S. Army Corps of Engineers [USACE]); Wetlands and Recreational Areas (Florida Department of Environmental Protection [FDEP]; and, Secondary and Cumulative Impacts (Florida Fish and Wildlife Conservation Commission [FFWCC]).

A Public Involvement Program was developed and is being carried out as an integral part of the SR-710 corridor project for the PD&E limits. The purpose of the program is to establish and maintain communication with the public and agencies concerned with the project and its potential impacts. To ensure open communication with agency and public input, FDOT provided an early (advance) notification package to the State and Federal agencies and other interested parties defining the project and, in cursory terms, describing anticipated issues and impacts. In addition, in order to expedite the project development processes, eliminate unnecessary work, and provide a substantial issue identification/problem solving effort, FDOT conducted an extensive interagency coordination and consultation effort, and public participation process.

Permits

This project will require permitting with the SFWMD and the USACE as well as an NPDES permit. Additionally, endangered species coordination is required with the USFWS and potentially with NMFS.

Project Location map

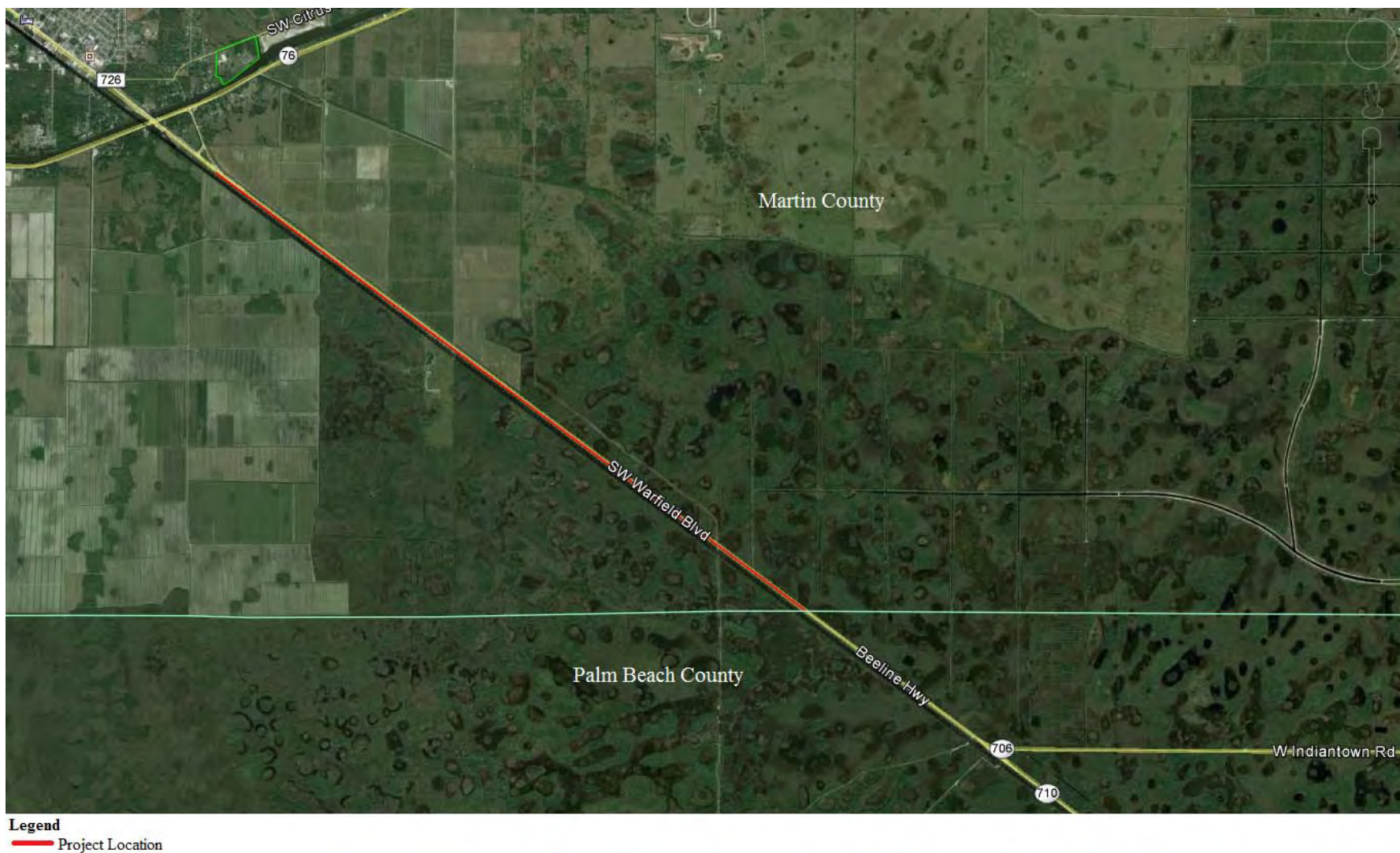
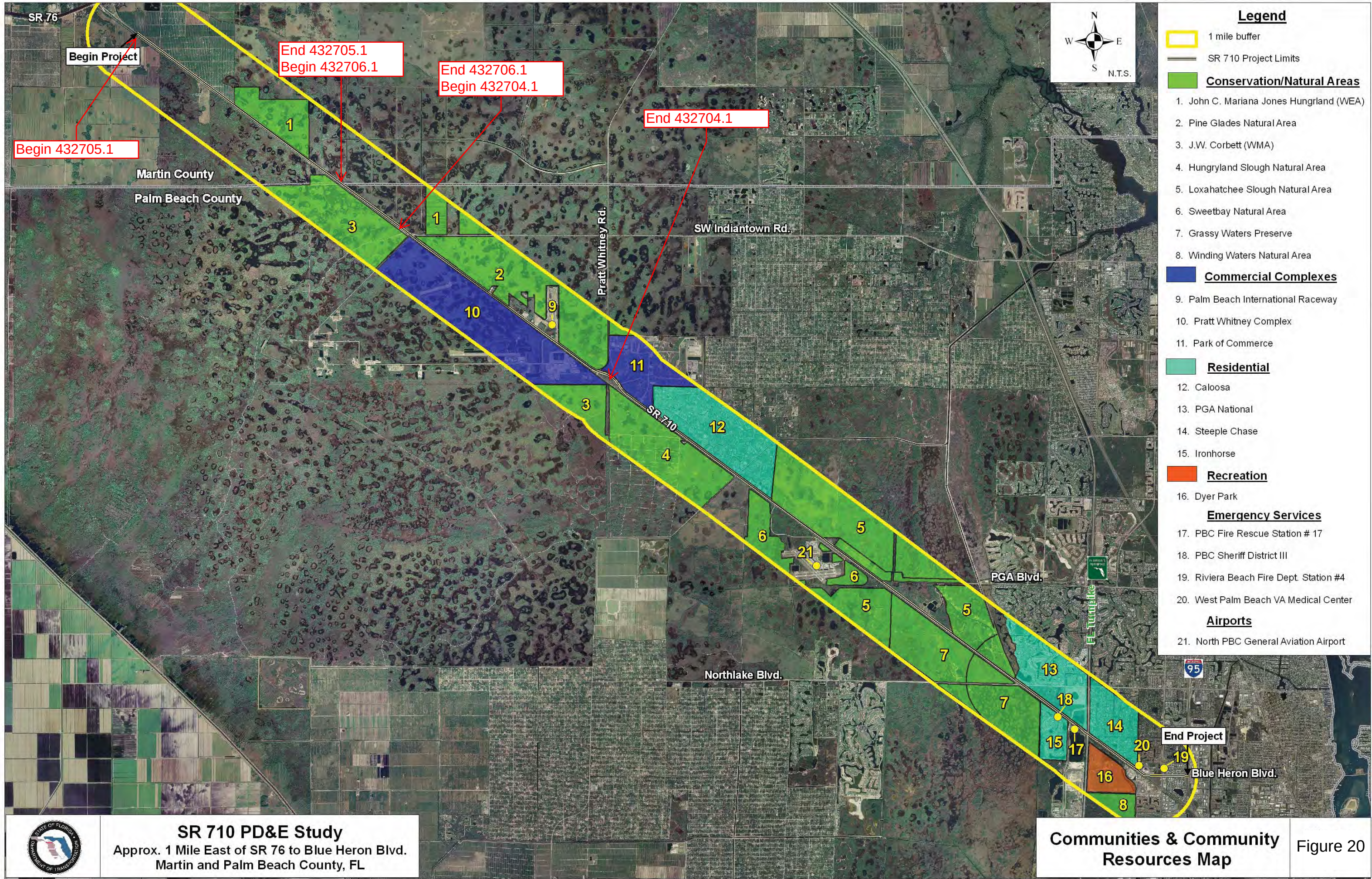
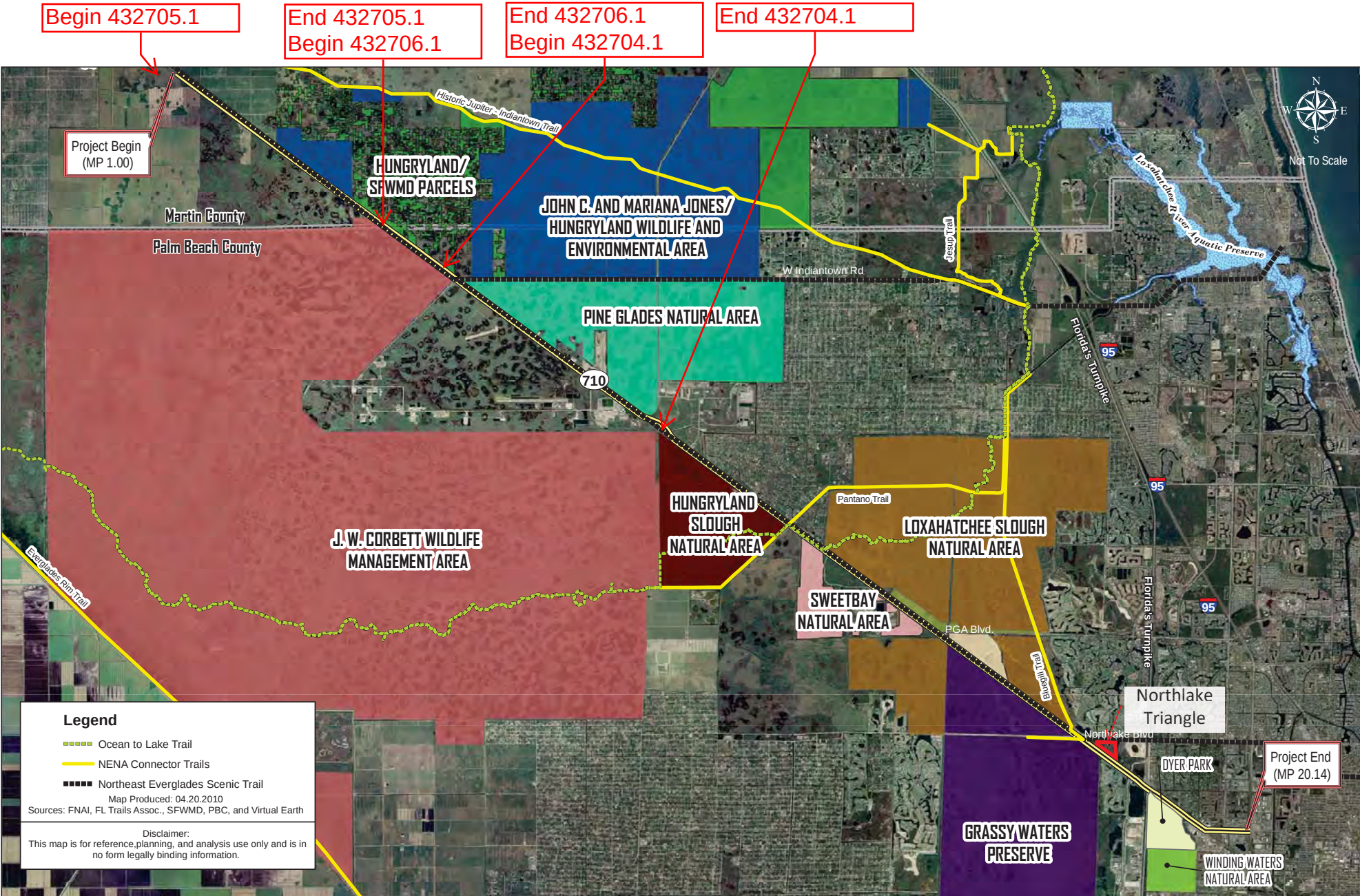


Figure 1. The map shows the location of the proposed project corridor, FM 432705-1 on SR-710/Beeline Highway in Martin County, FL.

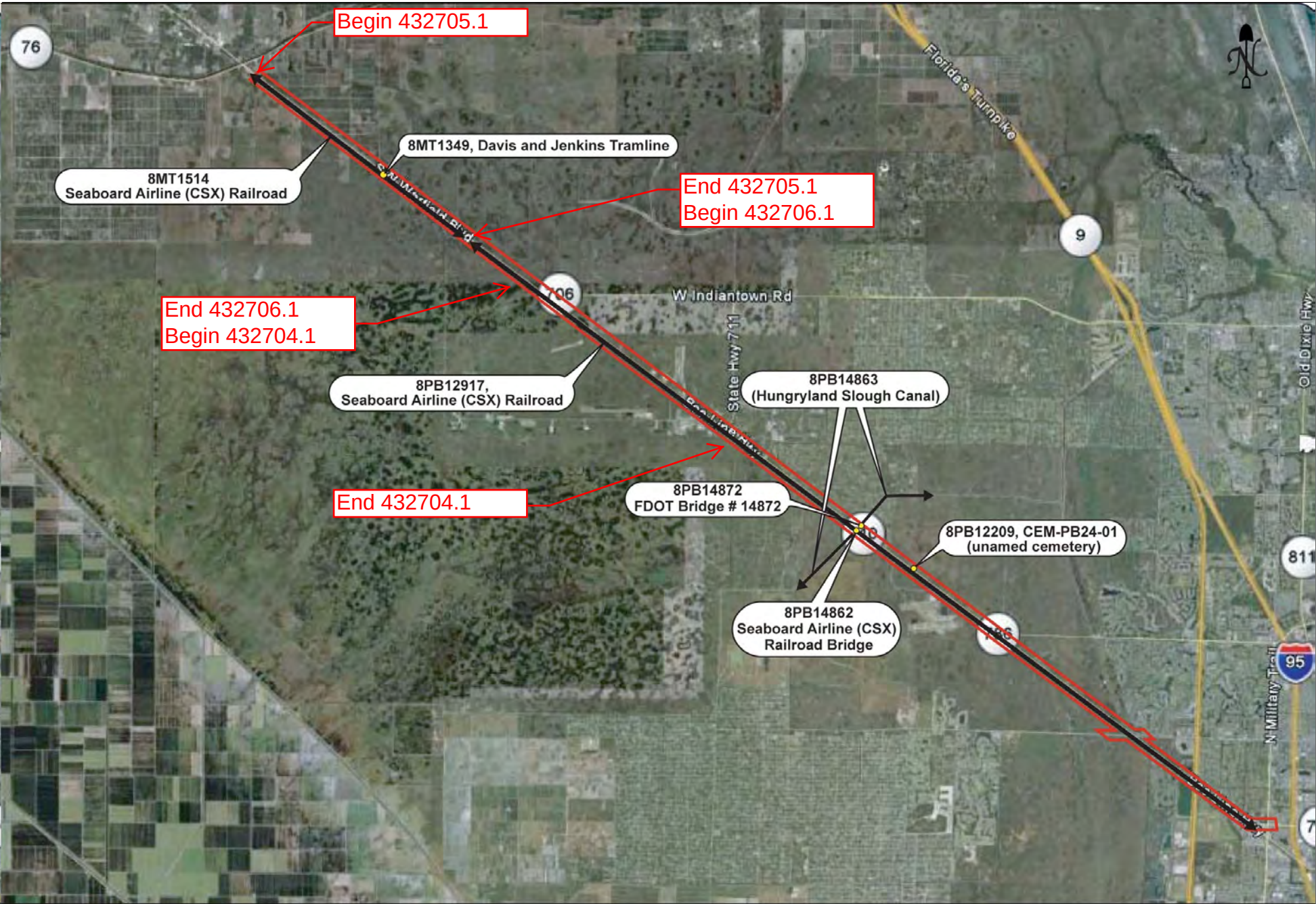




	SR710 PD&E Study Approx. 1 Mile East of SR 76 to Blue Heron Blvd. Martin & Palm Beach County, FL	FDIP NOS: 419348-1-22-01 419348-2-22-01	Trails and Public Lands	Figure 5
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Table 8 - Public Lands Adjacent to Corridor

Site ID	Name of Public Land	Size	Ownership	Function	Section 4(f) Category	FHWA 4(f) Determination	Build Alternative Impacts	Avoidance Alternative
A	Northeast Everglades Natural Area (NENA) Not in segment	152 miles of Trails	Multiple agencies and other owners	Recreation	Recreation	No	Potential modification of NENA connector trail (between Grassy Waters and Bluegill Trail) required at Northlake Interchange. To be finalized in design.	N/A
B	Pine Glades Natural Area 432704.1 & 432706.1	6,413 acres	Palm Beach County Environmental Resources Management (PBC ERM)	Preservation of Habitat	Wildlife Refuge	Yes	- Alt. B requires a 6.8 ac. take (approx.). - Alts. B & B1 - Treated stormwater will be discharged to property in accordance with State water quality standards.	- Alt. B1 PBC ERM has indicated that they would accept treated water to improve hydrology of area.
C	Loxahatchee Slough Natural Area Not in segment	12,836 acres	PBC ERM	Preservation of Habitat	Wildlife Refuge	Yes	- Alt. C requires a 5.5 ac take (approx.)	- No-Build - Trail routing through PBC ERM lands
D	Hungryland Slough Natural Area 432704.1 & 432706.1	2,945 acres	PBC ERM	Preservation of Habitat	Wildlife Refuge	Yes	None	N/A
E	Sweetbay Natural Area Not in segment	925 acres	PBC ERM	Preservation of Habitat	Wildlife Refuge	Yes	None	N/A
F	Winding Waters Natural Area Not in segment	550 acres	PBC ERM	Preservation of Habitat	Wildlife Refuge	Yes	None	N/A
G	J.W. Corbett WMA 432704.1, 432705.1 & 432706.1	60,348 acres	Florida Fish & Wildlife Conservation Commission (FFWCC)	Multi-Use: recreation & preservation of habitat	Recreation	Yes	- Alt A – requires intersection modification which will only allow right-turns leaving facility (i.e., no westbound movement). Access to and from property will still be provided.	- No-Build - Due to the proximity of the entrance to the Indiantown intersection no other Build alternative is available.
H	John C. & Mariana Jones/Hungryland WEA 432704.1, 432705.1 & 432706.1	12,415 acres	FFWCC	Multi-Use: recreation & preservation of habitat	Recreation	Yes	None	N/A
I	Grassy Waters Preserve Not in segment	12,800 acres	City of West Palm Beach	Multi-use: water catchment & recreation	Recreation	Yes	- Alt. 1 will require a 0.26 ac take. - Alt. 2c will require a 0.19 ac take.	Alternatives 1, 2a, 2b and 3.
J	Dyer Park Not in segment	560 acres	Palm Beach County Parks	Recreation	Recreation	Yes	None	N/A
K	Hungryland/SFWMD Parcels 432705.1 & 432706.1	Unknown, parcels under acquisition	SFWMD/Palm Beach Co. /Martin Co.	TBD	TBD	TBD	Treated stormwater will be discharged to property in accordance with State water quality standards.	N/A, SFWMD has indicated that discharge of treated water is acceptable.



SR 710 PD&E Study
Approx. 1 Mile East of SR 76 to Blue Heron Blvd.
Martin & Palm Beach County, FL

FPID NOS:
419348-1-22-01
419348-2-22-01

Cultural Resources

Figure 23

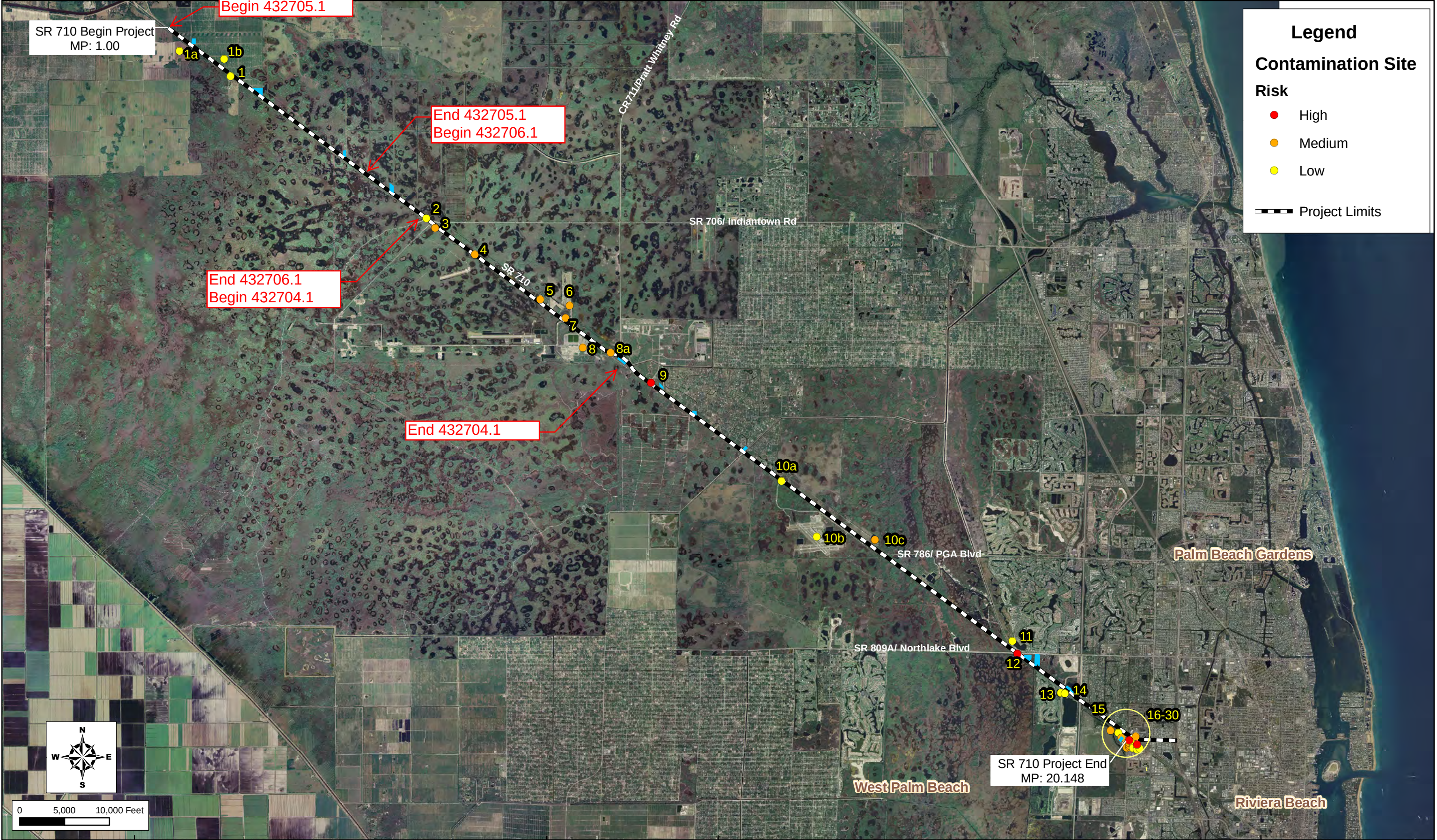


Table 21 - Potential Contamination Sites								
Site #	Facility Name	Address	Facility ID(s)	Contamination Source(s)	Concern	Existing Contamination (known)	Distance and Direction	
1	MCI Worldcom-Indiantown	432705.1	SE of St. Lucie Canal along SR 710, Indiantown, FL 33456	9100927	Petroleum Tanks (2 USTs)	Petroleum	No	~200 feet south of the SR 710
1a	R & B Ranch LLC	432705.1	South side of SR710, Martin Co., FL	Not registered as FDEP contamination site	Fertilizer, Herbicides, Pesticides, Fumigants	Fumigants	No	South of CSX Right-of-Way
1b	Riverland and Indian Sun, L.C	432705.1	Old Jupiter Rd, Martin Co., FL	Not registered as FDEP contamination site	Fertilizer, Herbicides, Pesticides, Fumigants	Fertilizers	No	Adjacent to north side of SR 710
2	Southeast Milk Diesel Spill	432704.1 & 432706.1	SR 710 and W Indiantown Road, Jupiter, FL 33478	9803221	Petroleum Tanks (Spill)	Petroleum	Yes	Adjacent to north side of SR 710
3	Amtrak Accident Spill	432704.1	SR 710 & SR 706 N Side of Tracks, Jupiter, FL 33478	9806872	Petroleum Tanks (Spill)	Petroleum	Yes	~100 feet south of SR 710
4	Lamariana Transport Hydraulic spill	432704.1	Corner of SR 710, one mile SE of Indiantown Road, Jupiter, FL 33478	9805239	Petroleum Tanks (Spill)	Petroleum	No	North side of SR 710
5	Tri-Gas, Inc	432704.1	18000 Beeline Highway, Jupiter, FL 33478	8623140, FLD 030777205, 33478-TRGSN-18000	Petroleum Tanks (7 USTs, 1 AST), EPA RCRA, EPA TRI	Petroleum	No	~180 feet north of SR 710
6	Palm Beach County International Raceway (Formerly Moroso Motorsports Park)	432704.1	17047 Beeline Highway, Jupiter, FL 33478	8944647	Petroleum Tanks (3 USTs-removed, 1 AST)	Petroleum	Yes	~ 1,320 feet north of SR 710
7	Manny's Food Mart (a.k.a. Texaco Speedway Station)	432704.1	117107 Beeline Highway, Jupiter, FL 33478	8623281	Petroleum Tanks (8 USTs-removed)	Petroleum	No	~ 100 feet Northeast of SR 710
8	Pratt & Whitney Property Complex	432704.1	17900 Beeline Highway, Jupiter, FL 33478	FLD001447952, 33478-NTDTC-17900	EPA RCRA, EPA TRI, Solid Waste	Petroleum, Heavy Metals, PCBs, Solvents	Yes	South side of SR 710, W of Pratt Whitney Road
8a	Richard Trucking Company Inc.	432704.1	SR 710 , South of Pratt Whitney Rd., West Palm Beach, FL	9812076	Petroleum Tanks (Spill)	Petroleum	Yes	On SR 710, South of Pratt Whitney Rd.
9	Mobil- Beeline/Shell Brothers & Beeline Tire	Not in segment	14680 Park of Commerce Blvd, Jupiter, FL 33478	8841778	Petroleum Tanks (5 USTs)	Petroleum	Yes	Adjacent to SR 710 at Park of Commerce Boulevard
10a	CSX Transportation Train Spill	Not in segment	CSX Tracks near the Delta Station, West Palm Beach, FL 33401	9102114	Petroleum Tanks (Spill)	Petroleum	No	~ 120 feet south of SR 710
10b	PB County General Aviation Airport	Not in segment	11600 Aviation Blvd, Palm Beach Gardens, FL 33418	9401967	Petroleum Tanks (2 ASTs)	Petroleum	No	~ 650 feet south of SR 710
10c	PB Acquisition DA 100-019	Not in segment	Palm Beach Gardens Blvd and SR 710, Palm Beach Gardens, FL 33418	COM 287160	AST, pasture and agriculture	Historical & current agricultural land use	No	~ 650 feet North East of SR 710
11	Northern Palm Beach County Water Control- PGA National	Not in segment	South Pump Station, Coventry Ln, Palm Beach Gardens, FL 33418	8630533	Petroleum Tanks (1 UST-removed)	Petroleum	No	~ 700 feet north of SR 710
12	IPA Trucking & Equipment Accident	Not in segment	Intersection of Northlake Boulevard and SR 710, West Palm Beach, FL	9808358	Petroleum Tanks (Spill)	Petroleum	Yes	Adjacent to SR 710
13	Northern Palm Beach Co.Water Control- Jog Road	Not in segment	8811 Jog Road, Unit #24, West Palm Beach, FL	9200139	Petroleum Tanks (1 UST-removed, 1 AST)	Petroleum	No	~ 580 feet South of SR 710
14	Palm Beach County North Substation	Not in segment	8200 N Jog Road, West Palm Beach, FL 33412	9601238	Petroleum Tanks (3 USTs)	Petroleum	No	~ 400 feet South of SR 710
15	Dyer Blvd Landfill (Dyer Park)	Not in segment	7301 Haverhill Road, West Palm Beach, FL 33412 SE of SR 710 & Haverhill Road Intersection	65682	Solid Waste (Class I & III Landfill)	Fecal Coliform, VOAs, Heavy Metals	Yes	South of SR 710
16	Bradco Supply Co.	Not in segment	7392 Haverhill Road, Riviera Beach, FL 33407	8945052	Petroleum Tanks (1 UST-removed)	Petroleum	No	~ 200 feet south of SR 710
17	City of Riviera Beach (Haverhill Business Park)	Not in segment	7241 Haverhill Road, Riviera Beach, FL 33407	65767	Solid Waste (Class II Landfill)	Solid Waste Leachate	Yes	~ 300 feet south of SR 710
18	Aquifer Maintenance & Performance Systems (AMPS), Inc. (formerly Poma Corp)	Not in segment	7146 Haverhill Road, Riviera Beach, FL 33407	293696, FLD980803720	Hazardous Waste, EPA RCRA	Hazardous Waste	Highly unlikely	~ 1,000 feet South of SR 710
19	Fla-Mex Mexican Tile (Formerly Ceramic Tile & Marble)	Not in segment	7030 Haverhill Road, Riviera Beach, FL 33407	8735723	Petroleum Tanks (1 UST-removed)	Petroleum	Highly unlikely	~ 1,200 feet southwest of SR 710
20	Atlantic Auto Discount	Not in segment	6000 Dyer Blvd. Riviera Beach, FL 33407	9804863	Petroleum Tanks (1 AST)	Petroleum	Yes	~ 830 feet southwest of SR 710
21	Bradford Septic Tank Co.	Not in segment	7117 North 49th Terrace, Riviera Beach, FL 33407	9300788	Petroleum Tanks (1 AST-removed)	Petroleum	No	~ 650 feet southwest of SR 710
22	Harmsco Inc.	Not in segment	7169 49th Terrace N, Riviera Beach, FL 33407	FLD004145850	EPA RCRA	Hazardous Waste	No	~ 750 feet southwest of SR 710
23	CSX Transportation	Not in segment	4960 Beeline Highway, Palm Beach Gardens, FL 33407	357615, FL0000040691	Petroleum Tank (Spill), EPA RCRA	Hazardous Waste	No	Adjacent to the south side of SR 710
24	Petrolane Gas / Amerigas	Not in segment	7171 Interpace Road, Riviera Beach, FL 33407	FLD984245415	EPA RCRA	None	No	~ 300 feet south side of SR 710
25	Coastal (Formerly Paver Systems / Production Products)	Not in segment	7137 & 7167 Interpace Road, Riviera Beach, FL 33407	9103291, 8516968,	Petroleum Tanks (1 UST -removed & 2 ASTs - removed), EPA TRI	Petroleum, Concrete Chemicals	No	~ 1,000 feet south of SR 710
26	Central Concrete Supermix Inc. (Formerly Continental FL Materials, Inc.)	Not in segment	7130 Interpace Road, Riviera Beach, FL 33407	9600550	Petroleum Tanks (1 AST)	Petroleum	No	~ 650 feet South of SR 710
27	Waste Management (WM) Delta Recycling Riviera Beach	Not in segment	7095 Barbour Road, Riviera Beach, FL 33407	67360	Solid Waste (Material Recovery) Oil drums, diesel fuel, coolants, etc.	Petroleum	No	~ 1,056 feet from Blue Heron Blvd, ~150 feet south of SR 710
28	US Veterans Administration Medical Center	Not in segment	7305 North Military Trail, Riviera Beach, FL 33418	FDEP 9400946, COM_121287	Petroleum Tanks (5ASTs, 4 USTs), Pre-existing Pesticide Contamination	Petroleum, Arsenic	Yes	Adjacent to SR 710
29	Three Brothers Recycling (Vacant)	Not in segment	49th Terrace North, Riviera Beach, FL 33407	Not registered as FDEP contamination site	Unknown materials off -oaded at railroad siding	Unknown	Unknown	~250 feet south of SR 710
30	7166 Interpace Road LLC	Not in segment	7166 Interpace Road, Riveira Beach, FL 33407	Not registered as FDEP contamination site	Petroleum Tanks, 55 gallon drums, junk yard; potential hazardous waste	Petroleum; potential hazardous waste	Unknown	~225 feet south of SR 710
Abbreviations/Acronyms: AST: Aboveground Storage Tank; EPA: Environmental Protection Agency; FDEP: Florida Department of Environmental Protection; RCRA: Resource Conservation and Recovery Act; UST: Underground Storage Tank.								

Table 10 - Mitigation Matrix											
Mitigation Option	Activity	Description	Owner/ Operator	Permit No. / Application No.	Habitat Type	Potential Acreage / Credits Available	Direct Impact Functional Loss*	Indirect Impact Functional Loss*	Estimated Cost Per Acre/ Credit	Contact	Comments
Bluefield Ranch Mitigation Bank	Mitigation Bank- credits available for purchase	The Bank has been awarded 1,240.32 State of Florida mitigation banking credits. It has also been awarded 1,522.34 Federal Banking credits. The credits are a combination of forested and herbaceous credits.	BRMD/ SFWMD	State Mitigation Banking Permit #56-00002-M, Federal Banking Permit #200002935	Herbaceous and Forested	1240.32	TBD	TBD	TBD	Dr. Chuck Olson (BRMB) (772)708-1776 Mindy Parrott (SFWMD) mparrott@sfwmd.gov	Use of Bluefield Ranch Mitigation Bank (linear project rule).
CERP Partnering Projects	Partnering and Funding - CERP projects	Effort to include partnership with ACOE and SFWMD with support funding.	ACOE, SFWMD	TBD	TBD	TBD	169.65	TBD	N/A	Beth Kacvinski (561) 682-6241	HB 599 may affect the ability to utilize this mitigation option.
Dupuis Natural Area	Mitigation Site - FDOT Regional Off-site Mitigation Area with acreage credits available	Nearly 22,000 acre management area. Serves as FDOT ROMA for wetland impacts. Located in Martin and Palm Beach Counties. (L-8 and C-44 Basins)	SFWMD	Agreement Between SFWMD and FDOT; ACOE Permit Pending	Herbaceous	571 acres**	105.49	TBD	TBD	Bert Trammel btrammel@sfwmd.gov	Uses ratios as functional assessment due to date area was permitted.
					Forested		64.16	TBD			
Everglades Mitigation Bank	Mitigation Bank - mitigation bank credits available for purchase in Miami-Dade County with a service area of Miami-Dade and Broward Counties, and portions of Palm Beach County	FP&L owned and operated 13,455 acres of wetlands being restored to natural condition. Area serves as corridor between Biscayne National Park and Everglades National Park in Miami-Dade County. Service area includes Palm Beach, Broward and Miami-Dade Counties.	FP&L	FDEP:193232-001	Herbaceous	52 credits	105.49	TBD	\$85,000 per credit	Joseph Scibaldi joseph_sicbaldi@fpl.com	Includes woodstork credit; snail kite suitable.
					Forested	29 credits	64.16	TBD	\$85,000 per credit		
Grassy Waters Preserve	Mitigation Site - mitigation site with acreage available for credit within Grassy Waters Preserve	City of West Palm Beach operated area. City has previously conducted wetland restoration for credit. Originally 1,100 acres of restoration needed within preserve located in West Palm Beach. (WPB Catchment Area Basin)	West Palm Beach	TBD	Restoration	680 acres	105.49	TBD	TBD	Pat Painter ppainter@wpb.org	Permitted individually per project, UMAMs completed on area available, snail kite viable per USFWS, Note- HB 599 may affect the ability to utilize this mitigation bank.
							64.16	TBD			
Hungryland	Mitigation Bank (Proposed) - proposed Lemon Grove Mitigation Bank to have credits available for purchase in Palm Beach County with a service area to be determined	Proposed 263 acre mitigation bank to be operated by FFWCC in addition to the Hungryland WEA in Palm Beach County. (Pal Mar Basin). SFWMD Permit status - No response	SFWMD	SFWMD App. No. 040830-22	Herbaceous	263 acres	105.49	TBD	TBD	Not Available	SFWMD Permit application status is listed as "No Response", State owned land with private mitigation rights.
Hungryland Parcels	Mitigation - acquiring lands adjacent to Hungryland WMA (involves small parcels with numerous land owners); evaluating potential enhancement activities	Property located in Palm Beach County and is adjacent to Hungryland WMA. Acquisition parcels are spread amongst SFWMD/Hungryland owned lands. (Pal Mar Basin)	SFWMD	N/A	N/A	TBD	169.65	TBD	TBD	SFWMD, PBC ERM, Martin County	Acquisition of parcel and potential enhancement would not provide do to the high quality of the sites.
Loxahatchee Mitigation Bank	Mitigation Bank - mitigation bank credits available for purchase in Palm Beach County with a service area of Broward and Palm Beach Counties, and portions of Martin County	Site within Loxahatchee National Wildlife Refuge / WCA 1 in Palm Beach County. 1,300 acre parcel buffering the Everglades from urbanized areas. Offered through private banker. Service area includes southern Martin, Palm Beach and Broward Counties.	SFWMD	ACOE: SAJ-1997-07816 FDEP: 140969-001	Herbaceous	30+ credits	105.49	TBD	\$100,000 per credit	Kristin Bennett kristin.bennett@tetratech.com	Includes woodstork credit; snail kite suitable; additional credits to be released.
					Forested	36+ credits	64.16	TBD	\$110,000 per credit		
Martin County Environmental Division	Mitigation through Multi-Site Restoration - potential restoration activities throughout county natural areas	Restoration of county owned and operated natural areas. Effort to include numerous sites throughout Martin County.	Martin County	TBD	Various	TBD	169.65	TBD	TBD	Not Available	Note- HB 599 may affect the ability to utilize this option.
Palm Beach County ERM Natural Areas	Mitigation through Multi-Site Restoration - potential restoration activities throughout county natural areas (e.g., Loxahatachee Slough)	Restoration of county owned and operated natural areas. Effort could include numerous sites throughout Palm Beach County. (Pine Glade information provided)	Palm Beach County	North- No. 50-08231-P, West- No. 50-08187-P	Various	N- 57.67 credits, W- 66.28 credits (functional units)	169.65	TBD	TBD	Benji Studt (561) 681-3885	Note- HB 599 may affect the ability to utilize this option.
Pal-Mar "Triangle Area"	Mitigation - acquiring the "Triangle Area" adjacent to J.W.Corbett WMA and evaluating enhancement activities	Property located in Martin County and shares border with Martin-Palm Beach County line. Approximately 1,600 acres. (C-44 Basin)	SFWMD, Martin County	N/A	N/A	TBD	169.65	TBD	TBD	Not Available	Note- HB 599 may affect the ability to utilize this option.
Raise PGA Blvd.	Elevating (culverts / bridge) a section of PGA Blvd to re-hydrate hundreds of acres of land to increase hydrology and wildlife habitat (UMAM, i.e., habitat lift)	In summary, this effort would include restoration of hydrology and water flow (i.e., bridge, culvert) through PGA Blvd. between SR710 and the C-18 Canal in Palm Beach County. (C-18 Basin)	FDOT	TBD	TBD	TBD	169.65	TBD	N/A	Not Applicable	Will require detailed evaluation &cost. PBC Rdwy Dept may not want to use highway \$\$. HB 599 may affect ability to use this option.
* Project requires both herbaceous and forested mitigation for direct impact functional loss. Functional loss is based on UMAM											
** Available acreage (571) previously funded by FDOT											

APPENDIX G
OPTIONAL PIPE
MATERIAL ANALYSIS

GENERAL NOTES

1.The Contractor may use any of the optional pipe materials tabulated for a given structure. Only the material options tabulated for a given structure can be used.

2.Adjustment to the bid quantities, prices and payment will not be allowed due to increase or decrease in structure size, shape, length, width, depth or accessory construction necessary to accommodate the use of an optional pipe material other than the “plotted” option; likewise there will be no added or reduced compensation for structure alterations required to relieve utility conflicts which arise from the use of an optional material other than the “plotted” option.

3.Adjustment to the bid quantities, prices and payment will not be allowed due to increased or decreased excavation, bedding, borrow, backfilling, compaction, special installation requirements or disposal of excess materials due to use of any of the pipe optional materials. Likewise, adjustment in the quantities, prices and payment will not be allowed due to differences in end treatment size or types, pipe length, alternate jointing and connecting materials, saddles, cradles, filter fabrics, shoring or similar features due to the use of an optional material other than the “plotted” option.

4.If adjustments are required due to plan errors or omissions or authorized field changes, the “plotted” material and not the material elected by the Contractor would be used to establish new pay quantities.

5.The Contractor shall notify the Department in writing as to which optional pipe materials he chooses to use at the preconstruction conference. Once identified the contractor may not change pipe material selected without approval of the Engineer.

6.Pipe shapes other than round (Elliptical/Arch) are summarized and paid for using equivalent round pipe diameter.

STRUCTURE	SIZE (Inches)	MATERIAL	PLOTTED	AS BUILT	REMARKS
ALL	18,24	RCP CLASS I	X		
		NRCP			
		SRAP, 16 GA.			
		SRASP, 16 GA.			
		HDPE CLASS II			
		POLYPROPYLENE			
		PVC, ASTM F-949			
ALL	30,36	RCP CLASS I	X		
		NRCP			
		SRAP, 16 GA.			
		SRASP, 16 GA.			
		HDPE CLASS II			
		POLYPROPYLENE			
		PVC, ASTM F-949			
		SRPE			
ALL	48	RCP CLASS I	X		
		SRAP, 12 GA.			
		SRASP, 14 GA.			
		HDPE CLASS II			
		POLYPROPYLENE			

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
----	----		

RS&H, INC.
3125 W COMMERCIAL BLVD, STE 130
FT. LAUDERDALE, FL 33309-3446
FL CERT. # EB0005620
DARREN G. DYER, P.E. # 73951

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
710	MARTIN	432705-1-52-01

OPTIONAL MATERIALS
TABULATION

SHEET NO.

27

Dyer, Darren

11/21/2015 7:23:54 PM

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NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

September 24, 2014

DCE MEMORANDUM NO. 19-14
(FHWA Approved: 9/24/2014)

TO: DISTRICT CONSTRUCTION ENGINEERS

FROM: David A. Sadler, P.E., Director, Office of Construction

COPIES: Tom Byron, Rudy Powell, Bob Burleson, Nick Finch, Chad Thompson, Rafiq Darji, Rick Renna

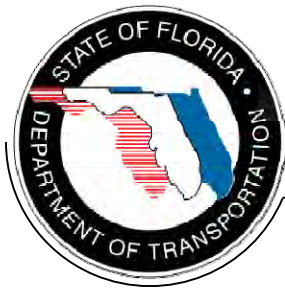
SUBJECT: USE OF STEEL REINFORCED POLYETHYLENE PIPE

Steel reinforced polyethylene (SRPE) pipe has passed the needed testing to be accepted for 100-year pipe applications. However, SRPE is being allowed only in slightly and moderately aggressive environments at this time.

Accordingly, SRPE pipe may be substituted, by the Contractor, for round, non-perforated Aluminized steel pipe (ASP), 30" through 60", anywhere that ASP pipe is allowed as cross drains or storm sewers in the plans, both on projects within the bidding process, and projects already let. SRPE may not be used as gutter drains due to its low n-value. Cost Savings Initiative Proposals will not be required where SRPE pipe is substituted for ASP on projects already under contract.

If you have any questions, please call Larry Ritchie at 850-414-4168.

DAS/hh



Florida Department of Transportation

Corrosion Research Laboratory

Culvert Service Life Estimator

Date Jan 21, 2015

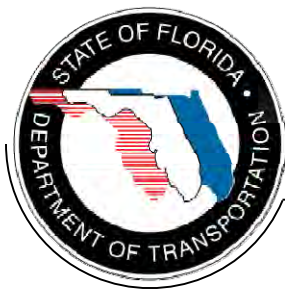
Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 972+00.58 (BL Survey)
 Boring Number/Location: EB-1
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7.2
Manning's n Value	0.012	Resistivity	8210
Diameter (inches)	18.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	224	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	108	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(HDPE)CANNOT be used		Fail		

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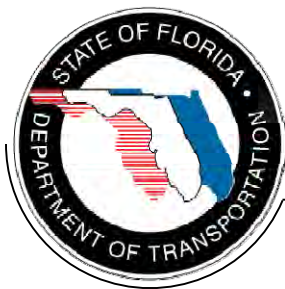
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1033+67.78 (BL Survey)
 Boring Number/Location: EB-42
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7
Manning's n Value	0.012	Resistivity	7870
Diameter (inches)	18.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	222	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	107	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	97	Fail		
(HDPE)CANNOT be used		Fail		

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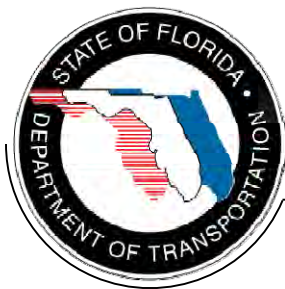
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1086+12.63 (BL Survey)
 Boring Number/Location: EB-78
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.8
Manning's n Value	0.012	Resistivity	7640
Diameter (inches)	18.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	221	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	126	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(HDPE)CANNOT be used		Fail		

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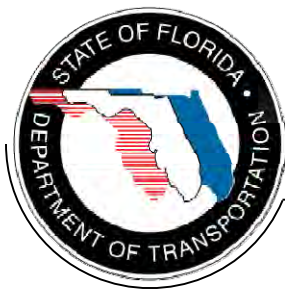
Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1142+22.65 (BL Survey)
 Boring Number/Location: EB-116
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7.1
Manning's n Value	0.012	Resistivity	8150
Diameter (inches)	18.00	Chlorides	14
		Sulfates	5

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	223	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	108	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(HDPE)CANNOT be used		Fail		

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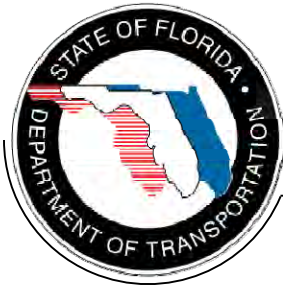
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1197+26.46 (BL Survey)
 Boring Number/Location: EB-154
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.4
Manning's n Value	0.012	Resistivity	8480
Diameter (inches)	18.00	Chlorides	12
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	225	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	113	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	78	Fail		
(HDPE)CANNOT be used		Fail		

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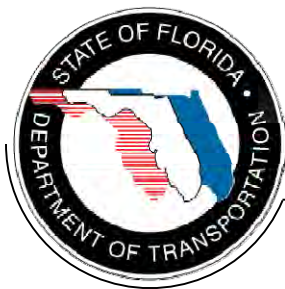
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1252+56.76 (BL Survey)
 Boring Number/Location: EB-192
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.7
Manning's n Value	0.012	Resistivity	8900
Diameter (inches)	18.00	Chlorides	10
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	227	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	125	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(HDPE)CANNOT be used		Fail		

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Date Jan 21, 2015

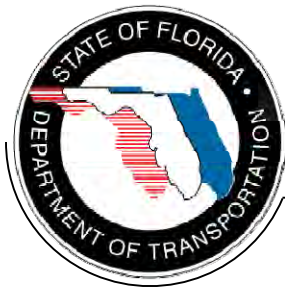
Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 972+00.58 (BL Survey)
 Boring Number/Location: EB-1
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7.2
Manning's n Value	0.012	Resistivity	8210
Diameter (inches)	24.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	224	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	108	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(HDPE)CANNOT be used		Fail		

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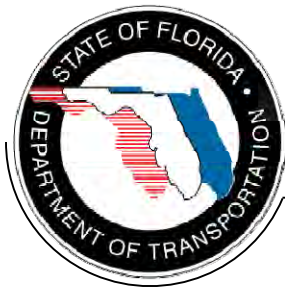
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1033+67.78 (BL Survey)
 Boring Number/Location: EB-42
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7
Manning's n Value	0.012	Resistivity	7870
Diameter (inches)	24.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	222	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	107	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	97	Fail		
(HDPE)CANNOT be used		Fail		

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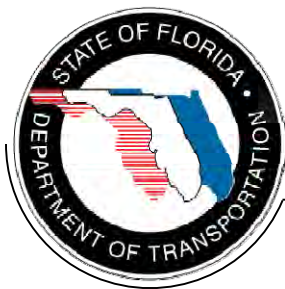
Date Jan 21, 2015

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 FM #: 432705-1-32-01
 Structure Station: 1086+12.63 (BL Survey)
 Boring Number/Location: EB-78
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.8
Manning's n Value	0.012	Resistivity	7640
Diameter (inches)	24.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	221	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	126	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(HDPE)CANNOT be used		Fail		

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Culvert Service Life Estimator

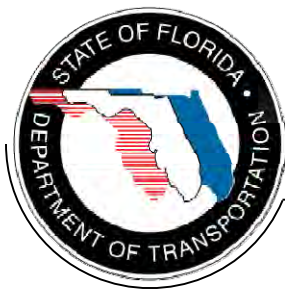
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1142+22.65 (BL Survey)
 Boring Number/Location: EB-116
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7.1
Manning's n Value	0.012	Resistivity	8150
Diameter (inches)	24.00	Chlorides	14
		Sulfates	5

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	223	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	108	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(HDPE)CANNOT be used		Fail		

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Florida Department of Transportation

Corrosion Research Laboratory

Culvert Service Life Estimator

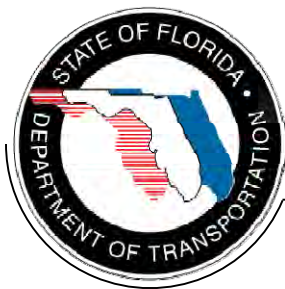
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1197+26.46 (BL Survey)
 Boring Number/Location: EB-154
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.4
Manning's n Value	0.012	Resistivity	8480
Diameter (inches)	24.00	Chlorides	12
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	225	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	113	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	78	Fail		
(HDPE)CANNOT be used		Fail		

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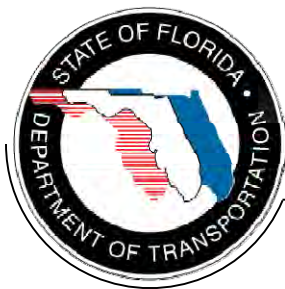
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1252+56.76 (BL Survey)
 Boring Number/Location: EB-192
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.7
Manning's n Value	0.012	Resistivity	8900
Diameter (inches)	24.00	Chlorides	10
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	227	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	125	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(HDPE)CANNOT be used		Fail		

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Culvert Service Life Estimator

Date Jan 21, 2015

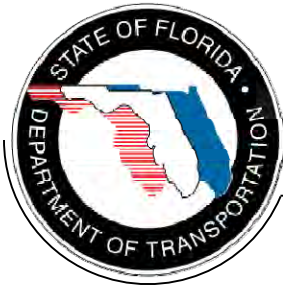
Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
FM #: 432705-1-32-01
Structure Station: 972+00.58 (BL Survey)
Boring Number/Location: EB-1
County: Martin
Designer: D. Dyer

Design Life (Years)	100	pH	7.2
Manning's n Value	0.012	Resistivity	8210
Diameter (inches)	30.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	224	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	108	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(HDPE)CANNOT be used		Fail		

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Date Jan 21, 2015

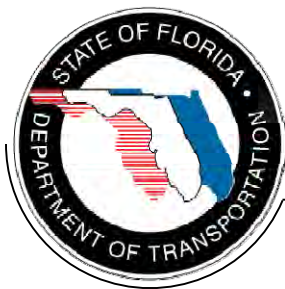
Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
FM #: 432705-1-32-01
Structure Station: 1033+67.78 (BL Survey)
Boring Number/Location: EB-42
County: Martin
Designer: D. Dyer

Design Life (Years)	100	pH	7
Manning's n Value	0.012	Resistivity	7870
Diameter (inches)	30.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	222	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	107	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	97	Fail		
(HDPE)CANNOT be used		Fail		

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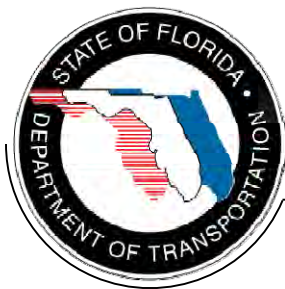
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1086+12.63 (BL Survey)
 Boring Number/Location: EB-78
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.8
Manning's n Value	0.012	Resistivity	7640
Diameter (inches)	30.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	221	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	126	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(HDPE)CANNOT be used		Fail		

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Culvert Service Life Estimator

Date Jan 21, 2015

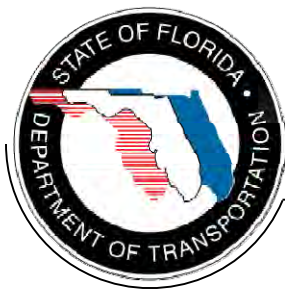
Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
FM #: 432705-1-32-01
Structure Station: 1142+22.65 (BL Survey)
Boring Number/Location: EB-116
County: Martin
Designer: D. Dyer

Design Life (Years)	100	pH	7.1
Manning's n Value	0.012	Resistivity	8150
Diameter (inches)	30.00	Chlorides	14
		Sulfates	5

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	223	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	108	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(HDPE)CANNOT be used		Fail		

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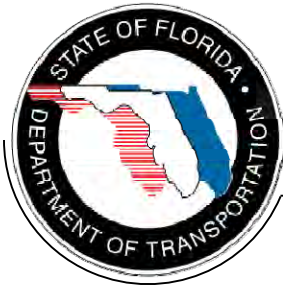
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1197+26.46 (BL Survey)
 Boring Number/Location: EB-154
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.4
Manning's n Value	0.012	Resistivity	8480
Diameter (inches)	30.00	Chlorides	12
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	225	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	113	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	78	Fail		
(HDPE)CANNOT be used		Fail		

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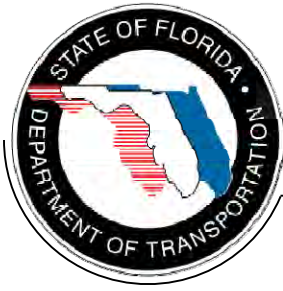
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
FM #: 432705-1-32-01
Structure Station: 1252+56.76 (BL Survey)
Boring Number/Location: EB-192
County: Martin
Designer: D. Dyer

Design Life (Years)	100	pH	6.7
Manning's n Value	0.012	Resistivity	8900
Diameter (inches)	30.00	Chlorides	10
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	227	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	125	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		1
(PP) Polypropylene	100+	Pass		2
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(HDPE)CANNOT be used		Fail		

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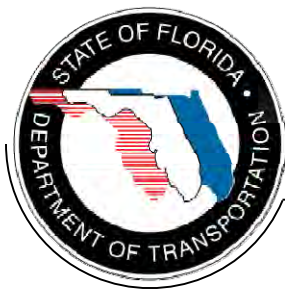
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 972+00.58 (BL Survey)
 Boring Number/Location: EB-1
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7.2
Manning's n Value	0.012	Resistivity	8210
Diameter (inches)	36.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	224	Pass		1
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	108	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(PP) Polypropylene	100+	Pass		3
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(HDPE)CANNOT be used		Fail		

- 1) Special Installation required. Refer to AASHTO Standard Specifications for Highway Bridges or ASTM B788-88 and manufacturer's recommendations.
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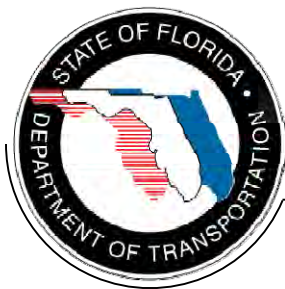
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1033+67.78 (BL Survey)
 Boring Number/Location: EB-42
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7
Manning's n Value	0.012	Resistivity	7870
Diameter (inches)	36.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	222	Pass		1
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	107	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(PP) Polypropylene	100+	Pass		3
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	97	Fail		
(HDPE)CANNOT be used		Fail		

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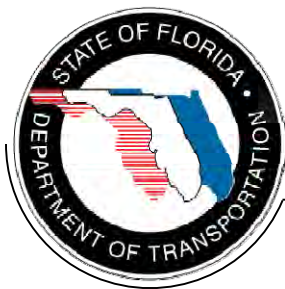
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1086+12.63 (BL Survey)
 Boring Number/Location: EB-78
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.8
Manning's n Value	0.012	Resistivity	7640
Diameter (inches)	36.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	221	Pass		1
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	126	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(PP) Polypropylene	100+	Pass		3
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(HDPE)CANNOT be used		Fail		

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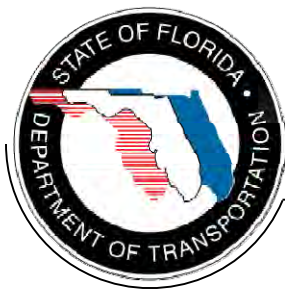
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1142+22.65 (BL Survey)
 Boring Number/Location: EB-116
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7.1
Manning's n Value	0.012	Resistivity	8150
Diameter (inches)	36.00	Chlorides	14
		Sulfates	5

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	223	Pass		1
(SRASP) Aluminized Steel - Spiral Rib, 16 GA.	108	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(PP) Polypropylene	100+	Pass		3
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(HDPE)CANNOT be used		Fail		

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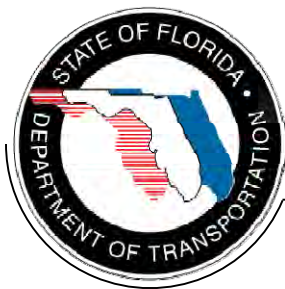
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1197+26.46 (BL Survey)
 Boring Number/Location: EB-154
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.4
Manning's n Value	0.012	Resistivity	8480
Diameter (inches)	36.00	Chlorides	12
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	225	Pass		1
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	113	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(PP) Polypropylene	100+	Pass		3
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	78	Fail		
(HDPE)CANNOT be used		Fail		

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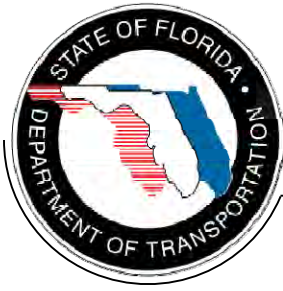
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1252+56.76 (BL Survey)
 Boring Number/Location: EB-192
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.7
Manning's n Value	0.012	Resistivity	8900
Diameter (inches)	36.00	Chlorides	10
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(NRCP) Non-Reinforced Concrete	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 16 GA.	227	Pass		1
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	125	Pass		
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(PP) Polypropylene	100+	Pass		3
(PVC) Polyvinyl Chloride, ASTM F-949	100+	Pass		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(HDPE)CANNOT be used		Fail		

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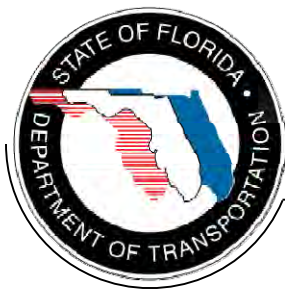
Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
FM #: 432705-1-32-01
Structure Station: 972+00.58 (BL Survey)
Boring Number/Location: EB-1
County: Martin
Designer: D. Dyer

Design Life (Years)	100	pH	7.2
Manning's n Value	0.012	Resistivity	8210
Diameter (inches)	48.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 12 GA.	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	140	Pass		
(PP) Polypropylene	100+	Pass		1
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(NRCP)UNAVAILABLE in this size	364	Fail		
(HDPE)CANNOT be used		Fail		
(PVC)UNAVAILABLE in this size		Fail		

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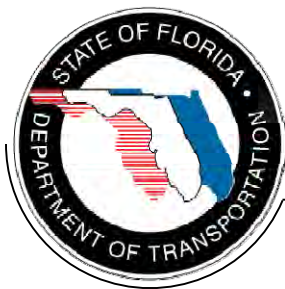
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1033+67.78 (BL Survey)
 Boring Number/Location: EB-42
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7
Manning's n Value	0.012	Resistivity	7870
Diameter (inches)	48.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 12 GA.	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	139	Pass		
(PP) Polypropylene	100+	Pass		1
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(NRCP)UNAVAILABLE in this size	364	Fail		
(CSP/SRSP)SRSP CANNOT be used	97	Fail		
(PVC)UNAVAILABLE in this size		Fail		
(HDPE)CANNOT be used		Fail		

1) HDPE and PP not allowed in the Florida Keys for 100 year service life. No restrictions for 50 year service life.
 2) HDPE and PP not allowed in the Florida Keys for 100 year service life. No restrictions for 50 year service life.



Florida Department of Transportation

Corrosion Research Laboratory

Culvert Service Life Estimator

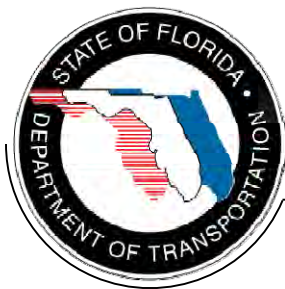
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1086+12.63 (BL Survey)
 Boring Number/Location: EB-78
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.8
Manning's n Value	0.012	Resistivity	7640
Diameter (inches)	48.00	Chlorides	13
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 12 GA.	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	126	Pass		
(PP) Polypropylene	100+	Pass		1
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(NRCP)UNAVAILABLE in this size	364	Fail		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(PVC)UNAVAILABLE in this size		Fail		
(HDPE)CANNOT be used		Fail		

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Florida Department of Transportation

Corrosion Research Laboratory

Culvert Service Life Estimator

Date Jan 21, 2015

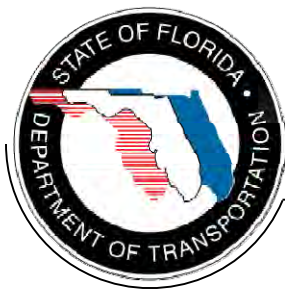
Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1142+22.65 (BL Survey)
 Boring Number/Location: EB-116
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	7.1
Manning's n Value	0.012	Resistivity	8150
Diameter (inches)	48.00	Chlorides	14
		Sulfates	5

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 12 GA.	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	140	Pass		
(PP) Polypropylene	100+	Pass		1
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(NRCP)UNAVAILABLE in this size	364	Fail		
(HDPE)CANNOT be used		Fail		
(PVC)UNAVAILABLE in this size		Fail		

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2) HDPE and PP not allowed in the Florida Keys for 100 year service life. No restrictions for 50 year service life.



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Culvert Service Life Estimator

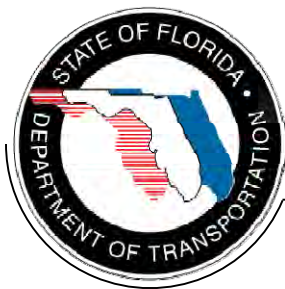
Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1197+26.46 (BL Survey)
 Boring Number/Location: EB-154
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.4
Manning's n Value	0.012	Resistivity	8480
Diameter (inches)	48.00	Chlorides	12
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 12 GA.	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	113	Pass		
(PP) Polypropylene	100+	Pass		1
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(NRCP)UNAVAILABLE in this size	364	Fail		
(CSP/SRSP)SRSP CANNOT be used	78	Fail		
(PVC)UNAVAILABLE in this size		Fail		
(HDPE)CANNOT be used		Fail		

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Florida Department of Transportation

Corrosion Research Laboratory

Culvert Service Life Estimator

Date Jan 21, 2015

Project Name: SR 710 (Warfield Blvd / Beeline Hwy)
 FM #: 432705-1-32-01
 Structure Station: 1252+56.76 (BL Survey)
 Boring Number/Location: EB-192
 County: Martin
 Designer: D. Dyer

Design Life (Years)	100	pH	6.7
Manning's n Value	0.012	Resistivity	8900
Diameter (inches)	48.00	Chlorides	10
		Sulfates	3

Type of Culvert	Service Life	Environment		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRAP) Aluminum - Spiral Rib, 12 GA.	360	Pass		
(RCP) Steel-Reinforced Concrete	360	Pass		
(SRASP) Aluminized Steel - Spiral Rib, 14 GA.	125	Pass		
(PP) Polypropylene	100+	Pass		1
(HDPE) High Density Polyethylene, Cl. II	100+	Pass		2
(NRCP)UNAVAILABLE in this size	364	Fail		
(CSP/SRSP)SRSP CANNOT be used	87	Fail		
(PVC)UNAVAILABLE in this size		Fail		
(HDPE)CANNOT be used		Fail		

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 2) HDPE and PP not allowed in the Florida Keys for 100 year service life. No restrictions for 50 year service life.

APPENDIX H
GEOTECHNICAL
DATA

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
MATERIALS AND RESEARCH

DATE OF SURVEY: 10/30/2014-12/03/2014
SURVEY MADE BY: ORACIO RICCOBONO, P.E.
SUBMITTED BY: GEOSOL, Inc.

FINANCIAL PROJECT ID : 432705-1-52-01
PROJECT NAME: SR 710 / WARFIELD BOULEVARD
FROM EAST OF SR 76/KANNER HIGHWAY TO MARTIN/PALM BEACH COUNTY LINE
CROSS SECTION SOIL SURVEY FOR THE DESIGN OF ROADS

DISTRICT: FOUR
ROAD NO.: 710
COUNTY: MARTIN

SURVEY BEGINS STA. : 972+00 SURVEY ENDS STA. : 1261+10 REFERENCE: SR 710 B/L SURVEY

ORGANIC CONTENT				SIEVE ANALYSIS RESULTS PERCENT PASS						ATTERBERG LIMITS (%)				DESCRIPTION	CORROSION TEST RESULTS				
STRATUM NO.	NO. OF TESTS	% ORGANIC	MOISTURE CONTENT	NO. OF TESTS	10 MESH	40 MESH	60 MESH	100 MESH	200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTIC INDEX	AASHTO GROUP		NO. OF TESTS	RESISTIVITY ohms cm	CHLORIDE ppm	SULFATES ppm	pH
1	4	5-12	20-61										A-8	Dark Brown Organic Silty Fine SAND with Grass (TOPSOIL)					
2	11	1-5	14-32	11	97-100	51-55	4-9	2-6	1-10				A-3	Brown Slightly Silty Fine to Medium SAND with Trace of Limerock Fragments (FILL)	6	7,640-8,900	10-14	3-5	6.4-7.2
3	61	0-4	12-42	61	88-100	52-91	8-72	2-37	0-10	N.P.	N.P.	N.P.	A-3	Brown to Dark Brown, Occasionally Organic Stained, Slightly Silty Fine to Medium SAND with Trace to Little Limestone Fragments					
4	21	2-4	7-29	21	93-100	50-95	15-32	13-23	11-21				A-2-4	Brown Slightly Silty to Silty Fine to Medium SAND					
5	5	5-10	35-44						3-13				A-8	Dark Brown Organic Silty Fine to Medium SAND					

EMBANKMENT AND SUBGRADE MATERIAL
STRATA BOUNDARIES ARE APPROXIMATE. MAKE FINAL CHECK AFTER GRADING.
☒ - WATER TABLE ENCOUNTERED

- Notes:
- 1) The material from Stratum 1 is topsoil (A-8) and considered to be unsuitable (muck). It shall be removed during clearing and grubbing in accordance with Section 110 of the FDOT Standard Specifications.
 - 2) The materials from Strata Numbers 2 and 3 (A-3) are considered to be select and should be utilized in accordance with FDOT Roadway and Traffic Design Standard Index Drawing 505.
 - 3) The materials from Stratum Number 4 (A-2-4) are considered to be select and should be utilized in accordance with FDOT Standard Index 505. Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the roadbed when approved by the District Materials Engineer.
 - 4) The material from Stratum Number 5 (A-8) is considered to be organic (muck). This material was encountered at ten (10) test boring locations (EB-36 through EB-39, and EB-46 through EB-51) at depths ranging from 0.2 to 4.0 feet below existing grades with an average thickness of about 3.6 feet. This material shall be completely removed in accordance with FDOT Roadway and Traffic Design Standard Index Drawing 500 and replaced with select fill in accordance with the FDOT Specifications for Road and Bridge Construction. The approximate limits for Stratum Number 5 removal are as follows:

A) Station 1023+50 to Station 1030+00 - Right
B) Station 1038+00 to Station 1046+00 - Right
 - 5) The soils survey for this project was performed by GEOSOL, Inc. as a subconsultant to C H Perez & Associates Consulting Engineers, Inc.

REVISIONS				ENGINEER OF RECORD: GEOSOL, INC. ORACIO RICCOBONO, P.E. P.E. LICENSE NO. 49324 5795-A NW 151ST STREET MIAMI LAKES, FL 33014 PHONE: (305) 828-4367 CERTIFICATE OF AUTHORIZATION 8530	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY SOILS SURVEY	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					710	MARTIN	432705-1-52-01		

SUMMARY OF WELL MONITORING

SR 710 Monitoring Wells
Martin County, Florida
FPID No. 432705-1-32-02
AMEC Project No. 6785132565.13

Well ID No.	Ground Elev. (ft)	Top of Casing Elev. (ft)	Measured Groundwater Levels (ft NAVD 88)																			
			8/22/14	8/29/14	9/5/14	9/12/14	9/19/14	9/26/14	10/3/14	10/10/14	10/17/14	10/24/14	10/31/14	11/7/14	11/14/14	11/21/14	11/28/14	12/5/14	12/12/14	12/19/14	12/26/14	1/2/15
MW-1	24.96	30.11	21.36	20.97	20.81	22.94	22.04	22.41	22.64	21.85	20.73	22.04	20.69	21.41	22.02	22.08	21.98	22.09	21.77	21.65	21.91	22.01
MW-2	25.45	30.54	20.96	20.64	20.45	21.94	21.32	21.64	21.80	21.45	20.35	21.44	20.31	21.36	22.37	22.67	22.53	22.64	22.39	22.18	22.26	22.48
MW-3	25.09	30.22	20.93	20.56	20.22	22.00	21.50	21.74	22.32	21.75	20.53	21.67	20.62	21.56	22.82	23.21	22.94	23.41	23.25	23.03	23.13	23.26
MW-4	24.78	29.60	21.83	21.44	21.11	22.11	22.00	21.37	22.25	22.20	21.10	22.43	21.36	22.00	22.70	22.75	22.50	22.77	22.46	22.34	22.59	22.62
MW-5	23.73	28.82	20.69	20.30	20.07	21.07	20.78	21.18	21.47	20.27	20.04	21.32	20.17	21.23	22.73	23.11	22.87	23.01	22.92	22.63	22.71	22.82
MW-6	24.75	29.65	21.85	21.41	21.15	22.39	22.04	22.46	22.40	22.09	21.64	22.70	21.65	22.15	22.75	22.84	22.67	22.73	22.55	22.37	22.50	22.56
MW-7	24.63	29.86	21.44	20.96	20.75	21.82	21.55	22.21	22.71	21.50	21.18	22.25	21.16	21.18	22.76	23.31	23.06	23.02	22.07	22.77	22.81	22.96
MW-8	26.05	31.10	22.08	21.81	21.71	22.74	22.36	22.80	23.10	21.86	21.52	22.74	21.58	21.60	23.39	23.57	23.38	23.54	23.37	23.15	23.24	23.42
MW-9	25.58	30.78	22.97	22.68	22.72	24.11	23.84	23.60	24.31	23.18	22.63	24.20	23.60	22.39	23.83	23.59	23.31	23.63	23.15	22.94	23.31	23.51
MW-10	26.17	31.13	23.63	23.33	23.35	23.84	23.78	23.58	24.36	23.36	23.15	24.08	23.87	22.93	23.83	23.77	23.64	23.71	23.55	23.46	23.50	23.54
MW-11	25.24	30.19	22.64	22.15	22.39	23.59	23.16	23.50	23.49	22.50	22.19	23.18	22.94	21.77	23.02	22.94	22.59	22.93	22.43	22.27	22.68	22.70
MW-12	26.00	30.70	23.51	23.10	23.30	23.87	23.74	24.22	24.21	24.02	23.06	24.00	23.80	23.60	23.78	23.73	23.54	23.69	23.42	23.28	23.43	23.48
MW-13	24.83	29.85	23.54	23.37	23.30	23.97	23.81	24.25	24.20	24.08	23.85	24.04	23.85	23.67	23.84	23.74	23.70	23.90	23.59	23.42	23.61	23.62
MW-14	26.31	31.61	23.67	23.61	23.33	24.03	23.91	24.21	24.28	24.13	24.00	24.12	23.96	23.81	23.84	23.81	23.70	23.85	23.58	23.46	23.52	23.60
MW-15	25.92	31.03	23.48	23.59	23.25	22.83	23.59	23.98	24.03	23.88	23.71	23.90	23.68	23.53	23.74	23.54	23.46	23.50	23.44	23.63	23.27	23.29

- Notes:
- Groundwater Elevations are referenced from Top of Casing Elevations, data provided by C.H. Perez & Associates Consulting Engineers, Inc. on 12/19/14
 - Monitoring Well MW-13 above ground section damaged in the period between 11/28/14 and 12/5/14. Levels for the period of 12/5/14 to 1/2/15 should be within 0.1 foot of the recorded values.

TABLE 3 - SUMMARY OF ENVIRONMENTAL CLASSIFICATION TEST RESULTS
SR 710/WARFIELD BOULEVARD ROADWAY IMPROVEMENTS
MARTIN COUNTY, FLORIDA
GEOSOL PROJECT No. 214151

Sample Location	"AS-DRILLED" TEST LOCATION (FEET)			Sample Type	Depth (ft)	pH	Resistivity (ohm-cm)	Chloride (ppm)	Sulfate (ppm)	FDOT ENVIRONMENTAL CLASSIFICATION	
	STATION	OFFSET	REFERENCE							Steel	Concrete
EB-1	972+00.58	59.80 RT	SR 710 B/L SURVEY	WATER	4.4	7.2	8,210	13	3	SA	SA
EB-42	1033+67.78	23.88 RT	SR 710 B/L SURVEY	WATER	1.1	7.0	7,870	13	3	SA	SA
EB-78	1086+12.63	23.05 RT	SR 710 B/L SURVEY	WATER	2.1	6.8	7,640	13	3	SA	SA
EB-116	1142+22.65	21.69 RT	SR 710 B/L SURVEY	WATER	1.0	7.1	8,150	14	5	SA	SA
EB-154	1197+26.46	21.39 RT	SR 710 B/L SURVEY	WATER	1.0	6.4	8,480	12	3	SA	SA
EB-192	1252+56.76	19.19 RT	SR 710 B/L SURVEY	WATER	1.0	6.7	8,900	10	3	SA	SA

NOTES: (1) The following FDOT laboratory test methods were utilized.

FM5-550: pH

FM5-552: Chlorides

FM5-551: Resistivity

FM5-553: Sulfates

(2) SA: SLIGHTLY AGGRESSIVE

(3) MA: MODERATELY AGGRESSIVE

(4) EA: EXTREMELY AGGRESSIVE

FDOT Criteria for Substructure Environmental Classification (FDOT *Structures Design Guidelines* 2014)

Classification	Environmental Condition	Units	Steel		Concrete	
			Water	Soil	Water	Soil
Extremely Aggressive (If any of these conditions exist)	pH		< 6.0		< 5.0	
	Cl	ppm	> 2000		> 2000	
	SO ₄	ppm	N.A.		> 1500	> 2000
	Resistivity	Ohm-cm	< 1000		< 500	
Slightly Aggressive (If all of these conditions exist)	pH		> 7.0		> 6.0	
	Cl	ppm	< 500		< 500	
	SO ₄	ppm	N.A.		< 150	< 1000
	Resistivity	Ohm-cm	> 5000		> 3000	
Moderately Aggressive	This classification must be used at all sites not meeting requirements for either slightly aggressive or extremely aggressive environments.					
pH = acidity (-log ₁₀ H ⁺ ; potential of Hydrogen), Cl = chloride content, SO ₄ = Sulfate content.						

*SR 710 – FDOT PD&E
POND SITING REPORT
GEOTECHNICAL STUDY EXCERPT*

Pond Siting & Conceptual Drainage Report



SR 710 (Beeline Highway)

Project Development and Environment (PD&E) Study

From Approximately One Mile East of SR 76 (Kanner Highway) to
SR 708 (Blue Heron Blvd.), in Martin and Palm Beach Counties

FM 419348-2-22-01, 419348-1-22-01

ETDM # 7151



Florida Department of Transportation
District Four
3400 West Commercial Boulevard
Ft. Lauderdale, Florida 33309-3421

May 2013

Appendix B – Geotechnical Data



Listed below are the preferred percolation test locations. The following pages show an aerial location of each percolation test.

The percolation tests need to be taken as far from the existing paved shoulder as possible, so the influence of the roadway fill material does not affect the test results.

Therefore:

The tests on the north side of SR710 should occur as close to the SR710 roadway right of way as possible.

The test on the south side of SR710 should occur between SR710 and the CSX railroad, as far from the paved shoulder as possible.

Percolation Test No.	Percolation Test Location	Side of Roadway
1	2.00 miles east of St. Lucie River	North
2	4.00 miles east of St. Lucie River	North
3	7.00 miles east of St. Lucie River	North
4	2.00 miles east of Indiantown Road	North
5	0.30 miles east of Pratt Whitney Road (between Pratt Whitney Rd & RR	South
6	0.20 miles east of Park Commerce Road	North
7	0.50 miles east of PGA Blvd	North
8	0.20 miles east of Jog Road	North
9	250 feet east of Haverhill Road	North
10	200 feet west of I-95	South
11	200 feet east of I-95	North

DOUBLE RING INFILTRATION TEST (ASTM D 3385)

Project #: 05-06-0002-101ALocation: PT-1

Tested by: Diego TigrerosBucket Dia.: 11.25 in.

Proj. Name: SR-710 Beeline HighwayTime: 2:00 PM

Weather: SUNNYOuter Ring Dia.: 24 in.

Date: 1/7/2009 14:00Water Temp:

Comments: Inner Ring Dia.: 12 in.

Time		Water Supply for Inner Ring				Inner Ring Infiltration Rate	Water Supply for Outer Ring				Outer Ring Infiltration Rate
Time	Time change	Initial Reading	Final Reading	Height change	Height/Time change		Initial Reading	Final Reading	Height change	Height/Time change	
(minutes)	(minutes)	(Inches)	(Inches)	(Inches)	(in./min)	(in/hr)	(Inches)	(Inches)	(Inches)	(in/min)	(in/hr)
2:00 PM			0.00					0.00			
2:15 PM	15		4.00	4.0	/15			13.00	13.0	/15	
2:30 PM	15		3.56	7.6	/30			11.44	24.4	/30	
2:45 PM	15		2.69	10.3	/45			10.00	34.4	/45	
3:00 PM	15		2.44	12.7	12.69/60	11.15		10.56	45.0	45.0/60	13.18
3:15 PM	15		2.44	15.1	/15			10.81	55.8	/15	
3:30 PM	15		2.44	17.6	/30			11.00	66.8	/30	
3:45 PM	15		2.06	19.6	/45			11.06	77.9	/45	
4:00 PM	15		2.19	21.8	9.1/60	8.02		9.81	87.7	42.7/60	12.51
4:15 PM	15		2.19	24.0	/15			9.31	97.0	/15	
4:30 PM	15		2.00	26.0	/30			9.25	106.3	/30	
4:45 PM	15		2.06	28.1	/45			9.19	115.4	/45	
5:00 PM	15		2.00	30.1	8.3/60	7.25		9.00	124.4	36.8/60	10.77
5:15 PM	15		2.00	32.1	/15			9.06	133.5	/15	
5:30 PM	15		1.94	34.0	/30			10.00	143.5	/30	
5:45 PM	15		2.00	36.0	/45			9.19	152.7	/45	
6:00 PM	15		2.00	38.0	7.9/60	6.98		9.06	161.8	37.3/60	10.93

NOTE: A CONSTANT HEAD WAS MAINTAINED IN EACH RING. WATER SUPPLY BUCKET HEIGHT CHANGE WAS USED TO CALCULATE INFILTRATION RATE.



SUMMARY OF SFWMD "USUAL OPEN-HOLE CONSTANT HEAD" TEST
S.R. 710
Palm Beach / Martin County, Florida
N&A PROJECT No. 05-06-0002-101A

Test No.	Borehole Diameter	Casing Diameter	Borehole Depth	Groundwater Depth	Depth to Water During Testing	H ₂	Saturated Hole Depth, DS	Average Flow Rate		Hydraulic Conductivity, K
	inches	inches	feet	feet	feet	feet	feet	(gpm)	(cfs)	(cfs/ft ² -ft. Head)
PT-1	8.50	6.0	10.0	4.6	0.0	4.6	5.4	2.08	4.63E-03	8.20E-05
PT-2	8.50	6.0	10.0	4.6	0.0	4.6	5.4	0.60	1.34E-03	2.36E-05
PT-3	8.50	6.0	10.0	3.5	0.0	3.5	6.5	0.56	1.25E-03	2.71E-05
PT-4	6.00	4.0	10.0	3.5	0.0	3.5	6.5	0.78	1.74E-03	5.69E-05
PT-5	6.00	4.0	10.0	2.0	0.0	2.0	8.0	0.03	5.57E-05	2.93E-06
PT-6	9.00	6.0	10.0	3.8	0.0	3.8	6.2	0.37	8.24E-04	1.68E-05
PT-7	9.00	6.0	10.0	3.7	0.0	3.7	6.3	0.39	8.69E-04	1.81E-05
PT-8	8.50	6.0	10.0	4.9	0.0	4.9	5.1	0.39	8.69E-04	1.47E-05
PT-9	8.50	6.0	10.0	4.8	0.0	4.8	5.2	1.55	3.45E-03	5.93E-05
PT-10	9.00	6.0	10.0	6.1	0.0	6.1	3.9	7.90	1.76E-02	2.60E-04
PT-11	6.00	4.0	10.0	5.0	0.0	5.0	5.0	5.32	1.19E-02	2.99E-04