



Project Development & Environment Study

I-75 (SR 93A)

From Moccasin Wallow Road (CR 6)
to South of US Highway 301 (SR 43)

Draft Pond Sizing Technical Memorandum

WPI Segment No.: 419235-2
Manatee & Hillsborough Counties

Prepared for the

**Florida Department of Transportation
District Seven**



April 2010

Manuel Santos, E.I.
FDOT Project Manager



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Prepared by:
American Consulting Engineers of Florida, LLC



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TABLE OF CONTENTS

DISCLAIMER	1
INTRODUCTION	1
POND SITE AREA REQUIREMENTS	2

APPENDICES

Appendix A: Conceptual Drainage Maps

LIST OF TABLES

<u>Table</u>	<u>Page</u>
Table 1: SMF Site Summary for Ultimate Condition.....	3
Table 2: FPC Site Summary for Ultimate Condition.....	4
Table 3: SMF Site Summary for the Recommended Alternative.....	5
Table 4: FPC Site Summary for the Recommended Alternative.....	6

DISCLAIMER

The information presented in this document is subject to change until the final Phase of the project. This Pond Sizing Memorandum is preliminary and used as an engineering tool to identify potential Stormwater Management Facilities (SMF) and Floodplain Compensation (FPC) site area requirements utilizing an alternatives methodology. The recommendations are generated using highly variable factors. The SMF and FPC sites are sized using preliminary information based upon many assumptions and judgments. The SMF and FPC sizes and limits of the basins are subject to change throughout the preliminary engineering and project design phases (1 thru final).

INTRODUCTION

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) Study to evaluate capacity improvements along approximately 25 miles of Interstate 75 (I-75) (State Road (SR) 93A) from Moccasin Wallow Road in Manatee County to south of US 301 (SR 43) in Hillsborough County, Florida. The design year for the improvements is 2035.

This PD&E Study is being conducted concurrently with the PD&E Study for the portion of I-75 that extends from south of US 301 (SR 43) to north of Fletcher Avenue (CR 582A) in Hillsborough County.

The objective of this PD&E study is to help the FDOT and the Federal Highway Administration (FHWA) reach a decision on the type, location, and conceptual design of the necessary improvements for I-75 to safely and efficiently accommodate future travel demand. This study will document the need for the improvements as well as the procedures utilized to develop and evaluate various improvements including elements such as proposed typical sections, preliminary horizontal alignments, and interchange enhancement alternatives. The social, physical, and natural environmental effects and costs of these improvements were identified. The alternatives were evaluated and compared based on a variety of parameters utilizing a matrix format. This process assisted in identifying the alternative that will best balance the benefits with the impacts (such as environmental effects and costs).

The PD&E Study satisfies all applicable requirements, including the National Environmental Policy Act, in order for this project to qualify for federal-aid funding of subsequent development phases (design, right of way acquisition, and construction).

POND SITE AREA REQUIREMENTS

This *Draft Pond Sizing Technical Memorandum* has been prepared as part of the PD&E Study to document stormwater treatment and attenuation requirements for the proposed improvements. This memo identifies approximate Stormwater Management Facility (SMF) site requirements per basin and approximate Floodplain Compensation (FPC) site requirements per encroachment. The SMFs were sized both for a conceptual ultimate condition typical section with a 324 foot impervious width and for the recommended alternative improvements identified by the PD&E study. This study analyzed pond site provisions that are hydraulically feasible and environmentally permissible based on the best available information. For this study, environmental impacts associated with ponds, including wetland impacts, cultural resources impacts, upland habitat and protected species was limited to consideration of GIS delineation of NWI wetlands for avoidance of wetlands and estimation of potential wetland impacts. Right-of-way cost estimation was limited to estimating acquisition cost at \$380,000 per acre as a conservative estimate, based on right-of-way estimates for segments of mainline acquisition provided by the District Right-of-Way Department. Section 4(f) involvement considerations consisted of evaluating if avoidance of public lands could be achieved in the conceptual placement of SMF and FPC sites. A more detailed pond siting evaluation will be conducted during the design phase of this project.

A treatment train system of dry retention and wet detention ponds are recommended for meeting stormwater management requirements for the proposed roadway widening. The wet detention ponds will provide water quality treatment benefits but will not be sufficient to meet future Total Maximum Daily Load (TMDL) requirements alone. Dry retention pretreatment areas will be required to supplement the wet detention ponds to meet the required nutrient removal efficiencies. The dry retention areas will be in series with the downstream wet ponds. The methodology followed is anticipated to address future impaired waters and Outstanding Florida Waters (OFW) criteria.

Approximate SMF and FPC area requirements are listed in **Tables 1 through 4**. Conceptual Drainage Maps are provided in **Appendix A**.

Table 1: SMF Site Summary for Ultimate Condition

Basin No.	Basin Limit		Outfall	Potential acreage required for the stormwater management of the basin (ac)	Right-of-way cost per basin
	From Sta.	To Sta.			
Manatee County					
1	75+00	110+50	75+00 LT	11.40	\$4,332,000.00
2	110+50	154+00	CD-7	6.05	\$2,299,000.00
3	154+00	192+00	160+00 RT	5.78	\$2,196,400.00
4	192+00	217+00	CD-11	8.38	\$3,184,400.00
5	217+00	239+75	CD-12	8.04	\$3,055,200.00
6	239+75	256+00	CD-13	5.64	\$2,143,200.00
Hillsborough County					
7	256+00	296+00	CD-16	6.36	\$2,416,800.00
8	296+00	324+50	CD-20	4.17	\$1,584,600.00
9	324+50	335+50	CD-21	3.37	\$1,280,600.00
10	335+50	373+50	CD-23	6.79	\$2,580,200.00
11	373+50	418+00	380+00 LT	7.42	\$2,819,600.00
12	418+00	464+00	435+50 RT	8.38	\$0.00
13	464+00	485+00	CD-26	4.09	\$1,554,200.00
14	485+00	512+75	CD-27	8.48	\$3,222,400.00
15	512+75	550+00	CD-27	6.67	\$2,534,600.00
16	550+00	585+00	585+00 LT	6.39	\$2,428,200.00
17	585+00	621+00	595+20 RT	13.85	\$0.00
18	621+00	635+00	614+80 RT	5.28	\$0.00
19	635+00	674+00	CD-33	6.30	\$2,394,000.00
20	674+00	701+00	CD-39	3.69	\$1,402,200.00
21	701+00	733+00	CD-42	5.92	\$2,249,600.00
22	733+00	777+00	CD-42	6.89	\$2,618,200.00
23	777+00	815+00	810+50 RT	7.13	\$2,709,400.00
24	815+00	882+00	855+40 RT	12.04	\$4,575,200.00
25	882+00	924+00	905+50 RT	12.13	\$0.00
26	924+00	978+50	CD-50	9.11	\$3,461,800.00
27	978+50	1029+50	985+50 RT	7.08	\$2,690,400.00
28	1029+50	1077+00	CD-52	8.47	\$3,218,600.00
29	1077+00	1110+00	CD-58	10.10	\$3,838,000.00
30	1110+00	1137+50	CD-59	6.93	\$2,633,400.00
31	1137+50	1159+50	1145+50 LT	9.42	\$0.00
32	1159+50	1184+00	CD-64	3.98	\$1,512,400.00
33	1184+00	1195+00	1185+20 RT	2.06	\$782,800.00
34	1195+00	1223+75	CD-65	4.21	\$1,599,800.00
35	1223+75	1250+50	CD-65	4.80	\$1,824,000.00
36	1250+50	1270+00	CD-67	3.08	\$1,170,400.00

Table 2: FPC Site Summary for Ultimate Condition

Encroachment No.	Encroachment Limit		Potential acreage required for compensation of floodplain storage for the encroachment (ac)	Right-of-way cost per basin
	From Sta.	To Sta.		
Manatee County				
F-1	235+00	301+00	14.51	\$5,513,800.00
Hillsborough County				
F-2	367+00	384+00	0.46	\$174,800.00
F-3	508+00	523+00	0.88	\$334,400.00
F-4	589+50	601+50	2.04	\$775,200.00
F-5	825+00	895+00	20.57	\$7,816,600.00
F-6	906+00	911+00	0.64	\$243,200.00
F-7	919+00	942+00	4.40	\$1,672,000.00
F-8	942+00	1006+00	2.49	\$946,200.00
F-9	1106+00	1117+50	5.06	\$1,922,800.00
F-10	1152+00	1175+00	1.54	\$585,200.00
F-11	1221+50	1226+00	2.05	\$779,000.00

Table 3: SMF Site Summary for the Recommended Alternative

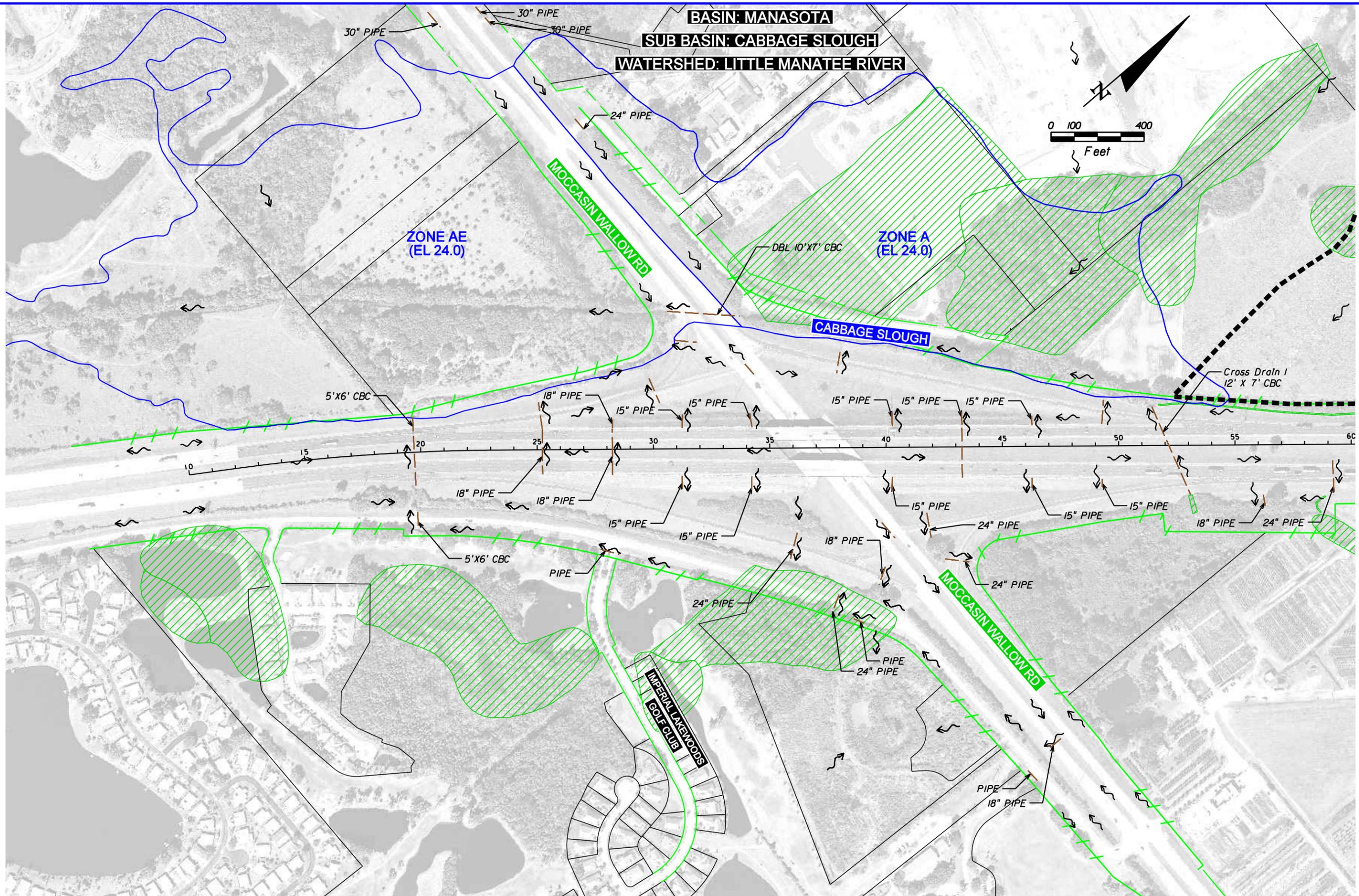
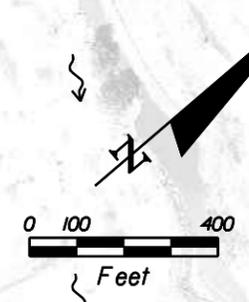
Basin No.	Basin Limit		Outfall	Potential acreage required for the stormwater management of the basin (ac)	Right-of-way cost per basin
	From Sta.	To Sta.			
Manatee County					
1	75+00	110+50	75+00 LT	3.98	\$1,512,400.00
2	110+50	154+00	CD-7	2.09	\$794,200.00
3	154+00	192+00	160+00 RT	1.99	\$756,200.00
4	192+00	217+00	CD-11	2.91	\$1,105,800.00
5	217+00	239+75	CD-12	2.78	\$1,056,400.00
6	239+75	256+00	CD-13	1.95	\$741,000.00
Hillsborough County					
7	256+00	296+00	CD-16	2.18	\$828,400.00
8	296+00	324+50	CD-20	1.44	\$547,200.00
9	324+50	335+50	CD-21	1.19	\$452,200.00
10	335+50	373+50	CD-23	2.37	\$900,600.00
11	373+50	418+00	380+00 LT	2.58	\$980,400.00
12	418+00	464+00	435+50 RT	2.90	\$0.00
13	464+00	485+00	CD-26	1.43	\$543,400.00
14	485+00	512+75	CD-27	2.98	\$1,132,400.00
15	512+75	550+00	CD-27	2.32	\$881,600.00
16	550+00	585+00	585+00 LT	2.23	\$847,400.00
17	585+00	621+00	595+20 RT	4.78	\$0.00
18	621+00	635+00	614+80 RT	1.82	\$0.00
19	635+00	674+00	CD-33	2.31	\$877,800.00
20	674+00	701+00	CD-39	1.28	\$486,400.00
21	701+00	733+00	CD-42	3.49	\$1,326,200.00
22	733+00	777+00	CD-42	2.36	\$896,800.00
23	777+00	815+00	810+50 RT	2.47	\$938,600.00
24	815+00	882+00	855+40 RT	4.19	\$1,592,200.00
25	882+00	924+00	905+50 RT	4.17	\$0.00
26	924+00	978+50	CD-50	3.22	\$1,223,600.00
27	978+50	1029+50	985+50 RT	2.45	\$931,000.00
28	1029+50	1077+00	CD-52	2.95	\$1,121,000.00
29	1077+00	1110+00	CD-58	3.55	\$1,349,000.00
30	1110+00	1137+50	CD-59	2.43	\$923,400.00
31	1137+50	1159+50	1145+50 LT	3.34	\$0.00
32	1159+50	1184+00	CD-64	1.64	\$623,200.00
33	1184+00	1195+00	1185+20 RT	0.86	\$326,800.00
34	1195+00	1223+75	CD-65	1.71	\$649,800.00
35	1223+75	1250+50	CD-65	2.00	\$760,000.00
36	1250+50	1270+00	CD-67	1.26	\$478,800.00

Table 4: FPC Site Summary for the Recommended Alternative

Encroachment No.	Encroachment Limit		Potential acreage required for compensation of floodplain storage for the encroachment (ac)	Right-of-way cost per basin
	From Sta.	To Sta.		
Manatee County				
F-1	235+00	301+00	7.52	\$2,857,600.00
Hillsborough County				
F-2	367+00	384+00	0.00	\$0.00
F-3	508+00	523+00	0.00	\$0.00
F-4	589+50	601+50	0.00	\$0.00
F-5	825+00	895+00	0.70	\$266,000.00
F-6	906+00	911+00	0.00	\$0.00
F-7	919+00	942+00	0.00	\$0.00
F-8	942+00	1006+00	0.00	\$0.00
F-9	1106+00	1117+50	0.00	\$0.00
F-10	1152+00	1175+00	0.00	\$0.00
F-11	1221+50	1226+00	0.00	\$0.00

APPENDIX A: Conceptual Drainage Maps

BASIN: MANASOTA
SUB BASIN: CABBAGE SLOUGH
WATERSHED: LITTLE MANATEE RIVER



LEGEND

- PUBLIC MANAGED LANDS
- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

DATE OF AERIAL : 2007

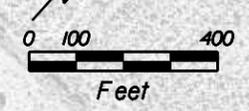
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DRAINAGE MAP

SHEET NO.

1

BASIN: MANASOTA
SUB BASIN: CABBAGE SLOUGH
WATERSHED: LITTLE MANATEE RIVER



BASIN-1
OUTFALL

Cross Drain 2
24" PIPE

Cross Drain 3
30" PIPE

Cross Drain 4
(2) 42" PIPE

Cross Drain 5
24" PIPE

Cross Drain 6
24" PIPE

STA 75+00
END PROJECT WPI SEGMENT NO. 201032-1
BEGIN PROJECT WPI SEGMENT NO. 419235-2

BASIN: MANASOTA
SUB BASIN: CABBAGE SLOUGH
WATERSHED: LITTLE MANATEE RIVER

BASIN 1
(32.97 AC)

BASIN 2
(34.88 AC)

LEGEND

- PUBLIC MANAGED LANDS
- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

DATE OF AERIAL : 2007

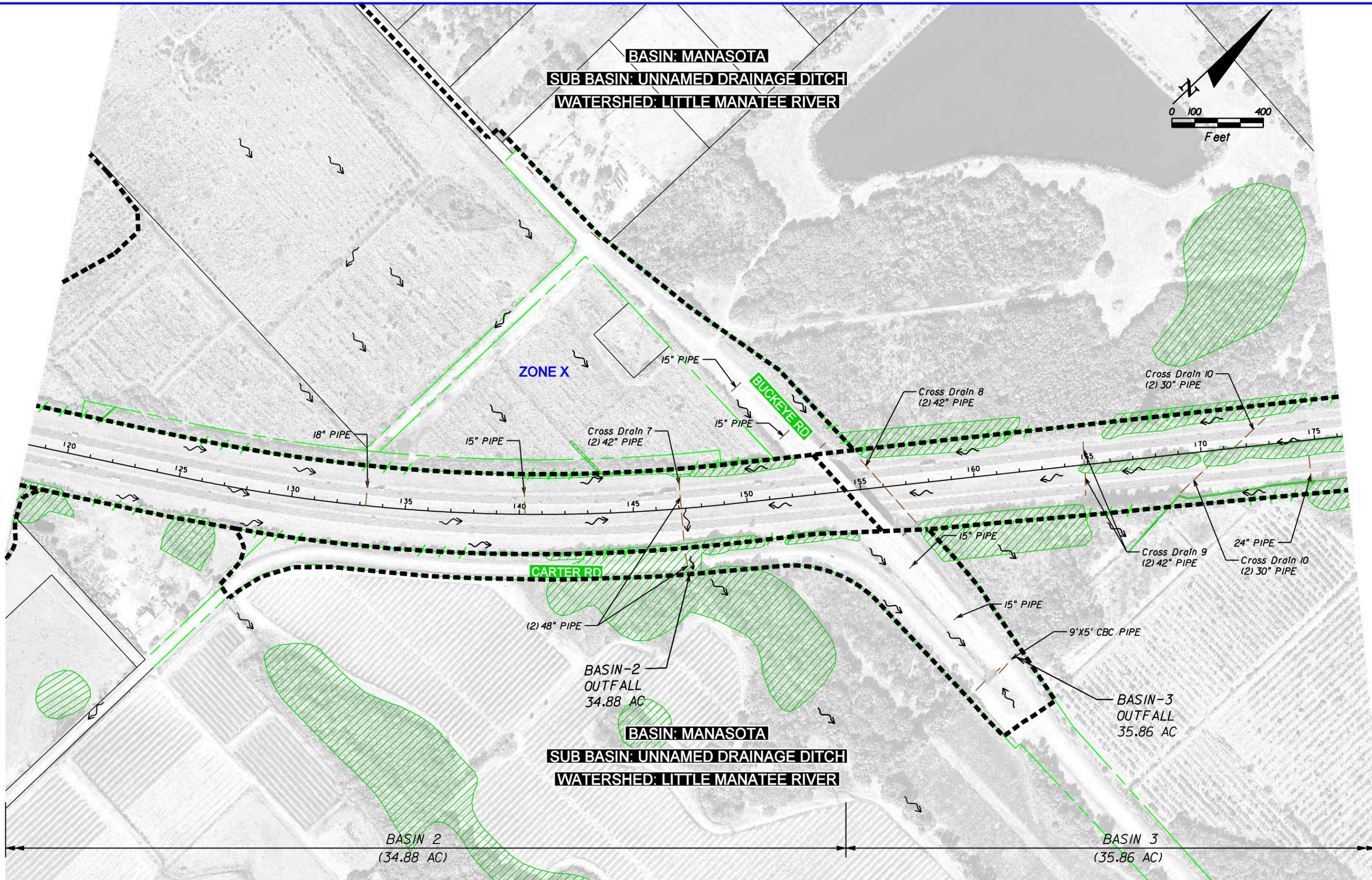
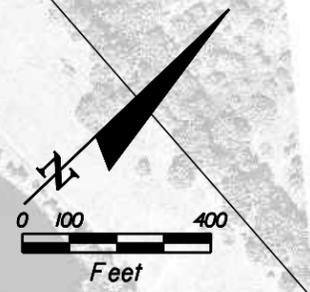
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DRAINAGE MAP

SHEET NO.

2

BASIN: MANASOTA
SUB BASIN: UNNAMED DRAINAGE DITCH
WATERSHED: LITTLE MANATEE RIVER



LEGEND

- PUBLIC MANAGED LANDS
- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
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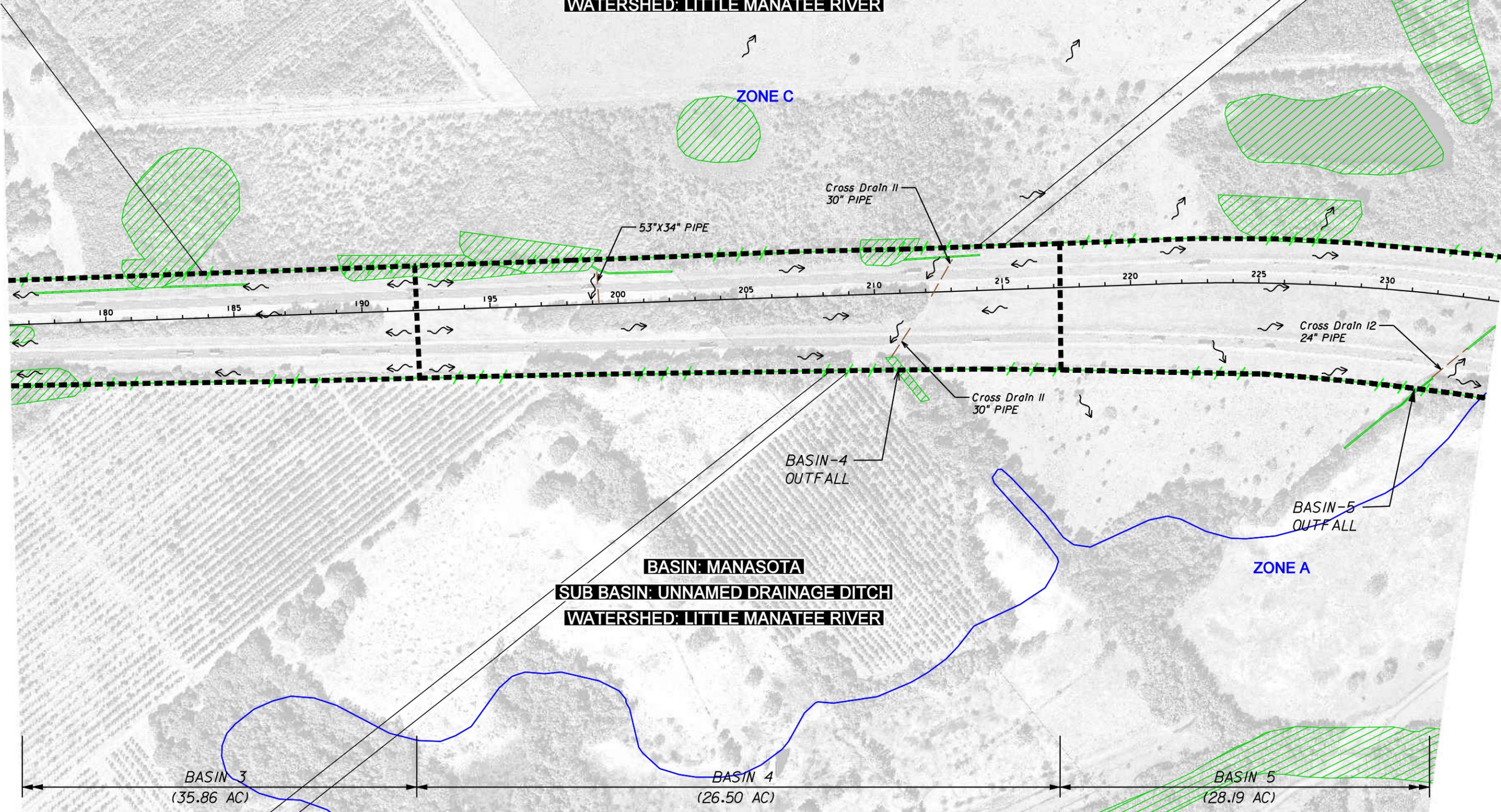
DRAINAGE MAP

SHEET NO.
 3

BASIN: MANASOTA
SUB BASIN: UNNAMED DRAINAGE DITCH
WATERSHED: LITTLE MANATEE RIVER



ZONE C



BASIN: MANASOTA
SUB BASIN: UNNAMED DRAINAGE DITCH
WATERSHED: LITTLE MANATEE RIVER

ZONE A

BASIN 3
(35.86 AC)

BASIN 4
(26.50 AC)

BASIN 5
(28.19 AC)

LEGEND

- PUBLIC MANAGED LANDS
- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

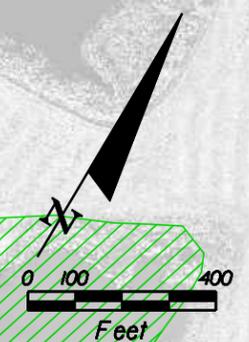
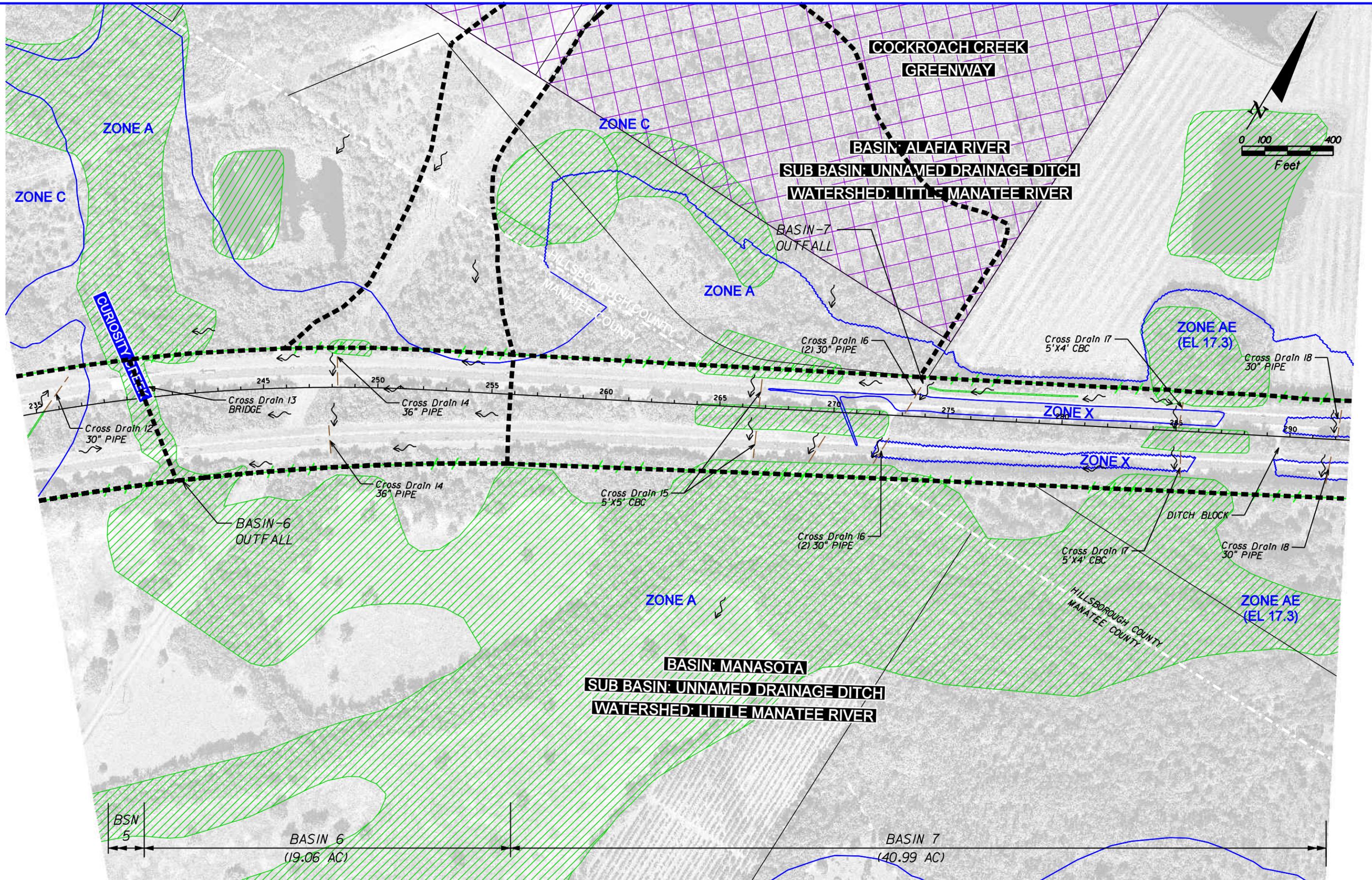
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DRAINAGE MAP

SHEET NO.

4



LEGEND

- PUBLIC MANAGED LANDS
- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

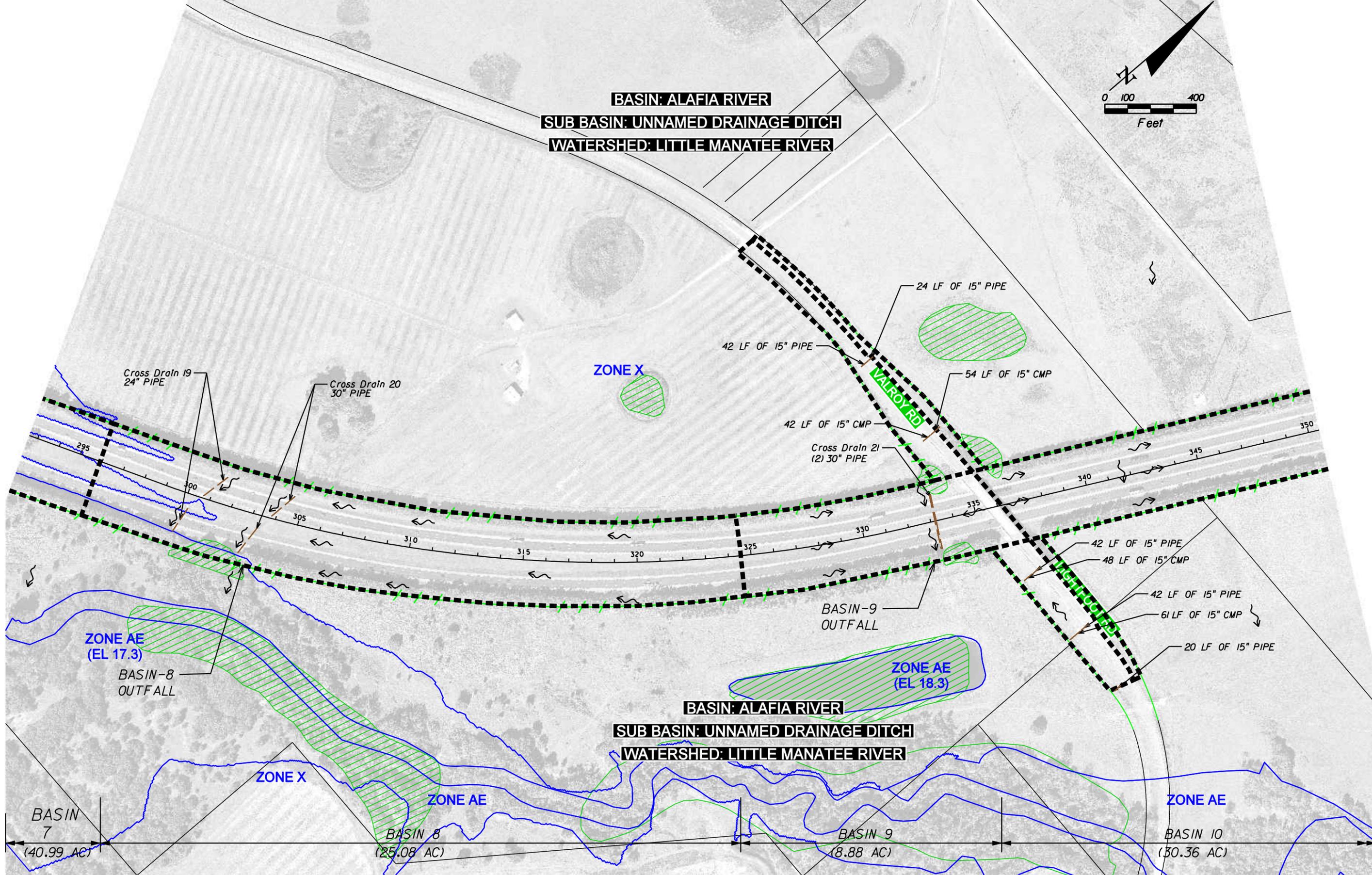
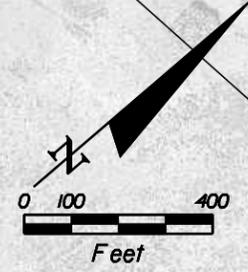
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DRAINAGE MAP

SHEET NO.
5

BASIN: ALAFIA RIVER
SUB BASIN: UNNAMED DRAINAGE DITCH
WATERSHED: LITTLE MANATEE RIVER



LEGEND

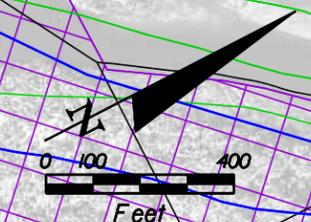
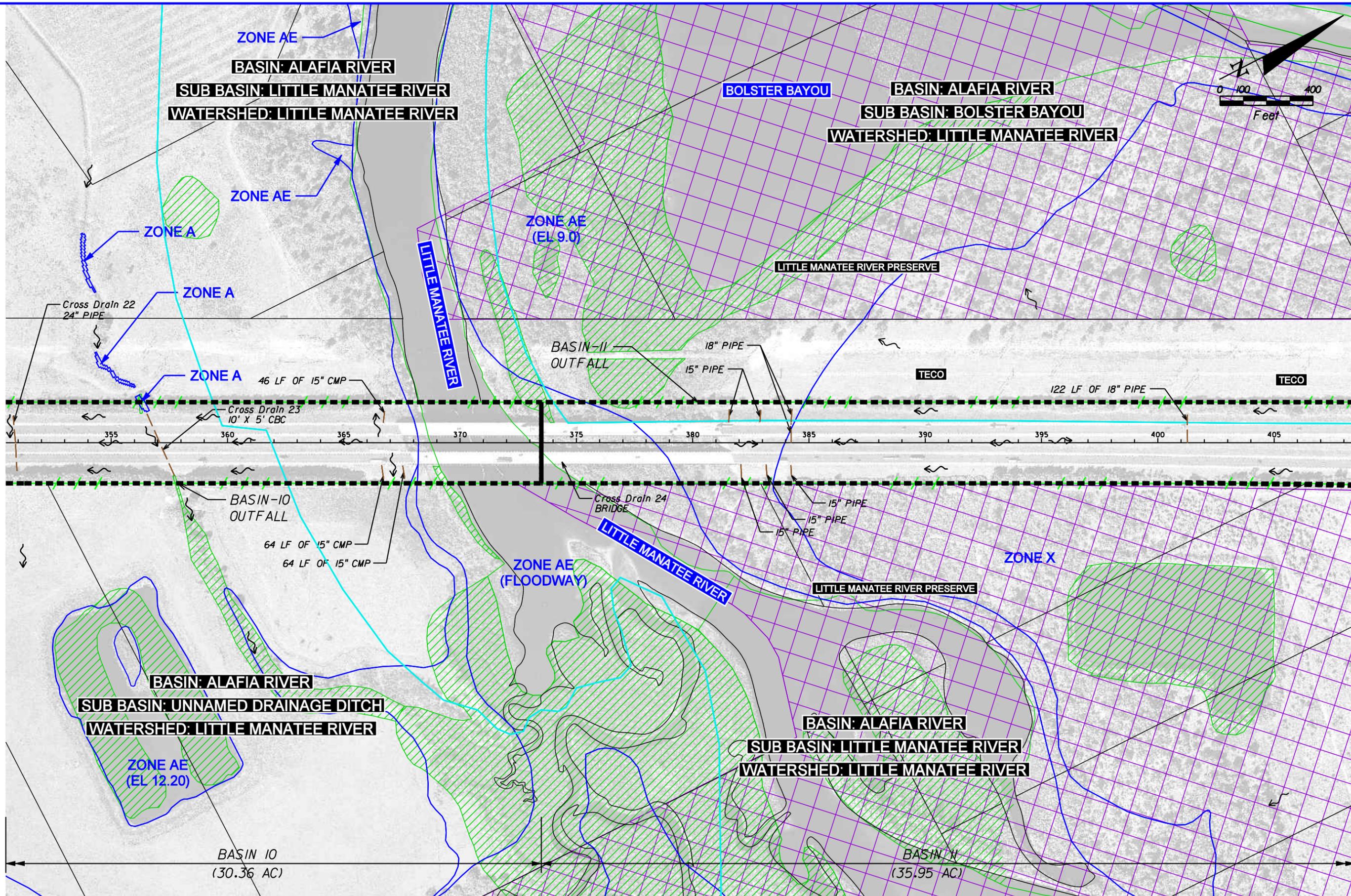
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- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

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DRAINAGE MAP

SHEET NO.
 6



LEGEND

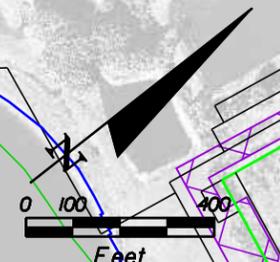
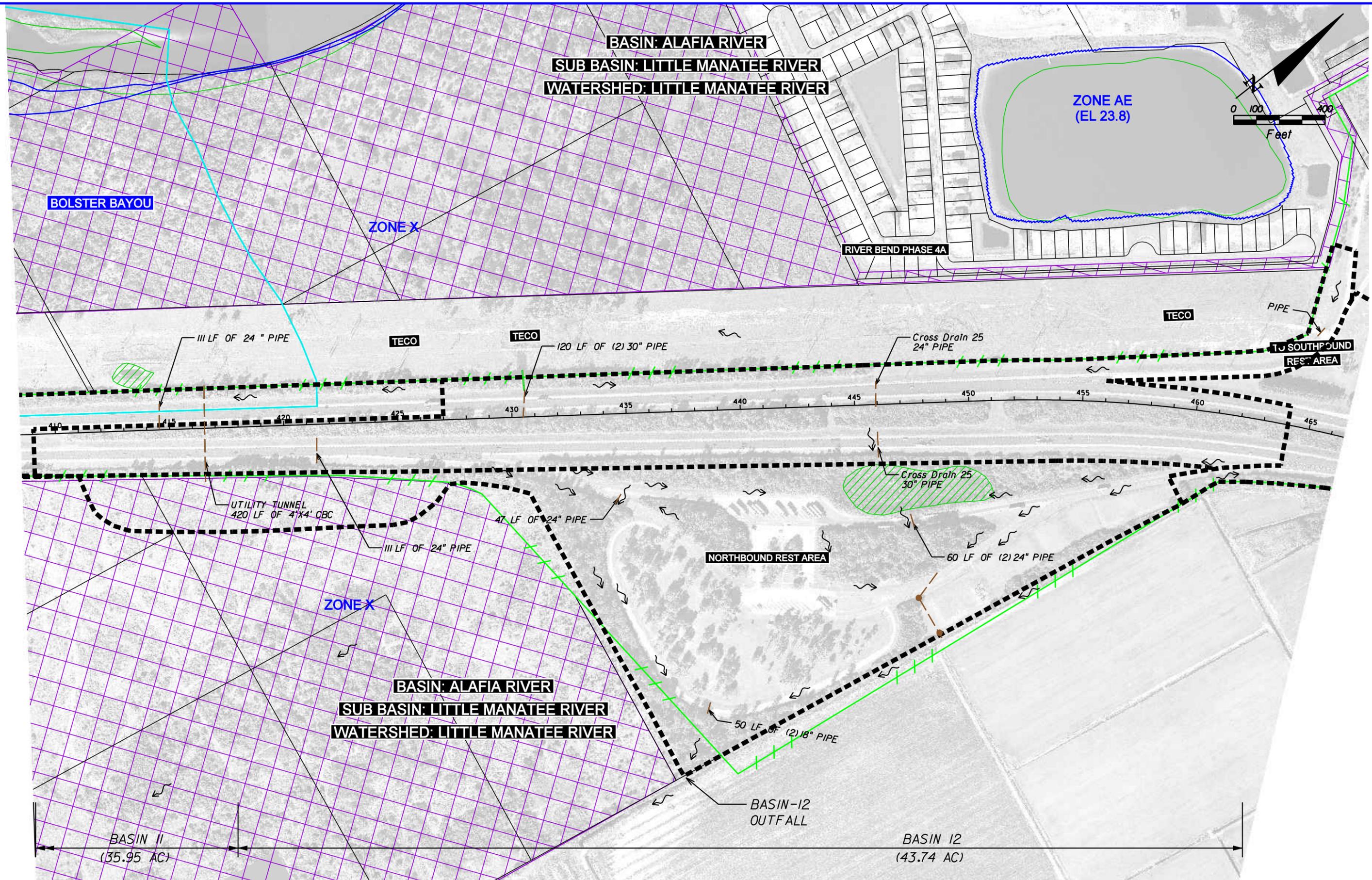
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DRAINAGE MAP

SHEET NO.
7



LEGEND

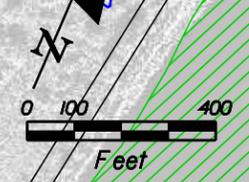
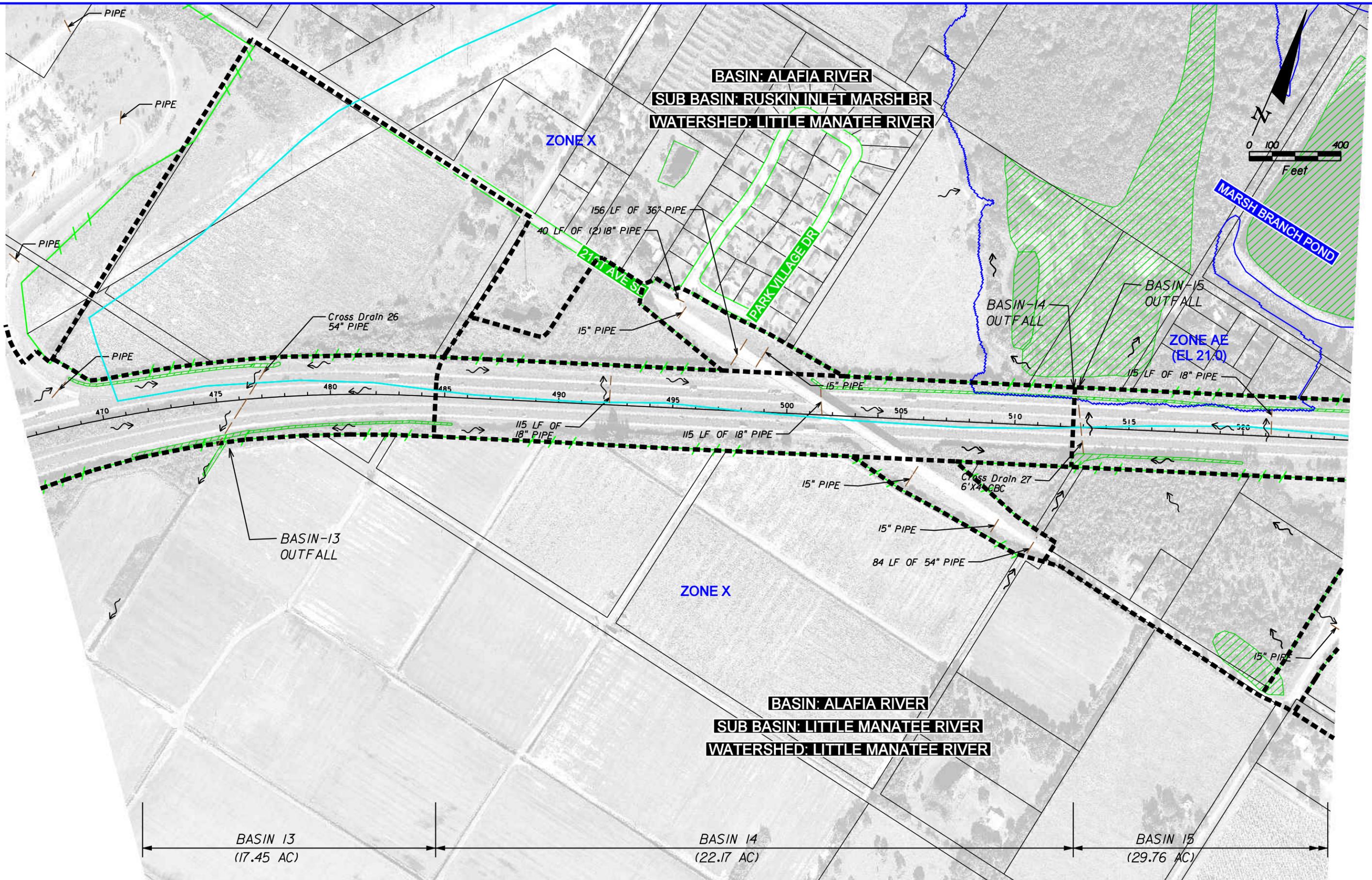
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DRAINAGE MAP

SHEET NO.
8



BASIN 13
(17.45 AC)

BASIN 14
(22.17 AC)

BASIN 15
(29.76 AC)

LEGEND

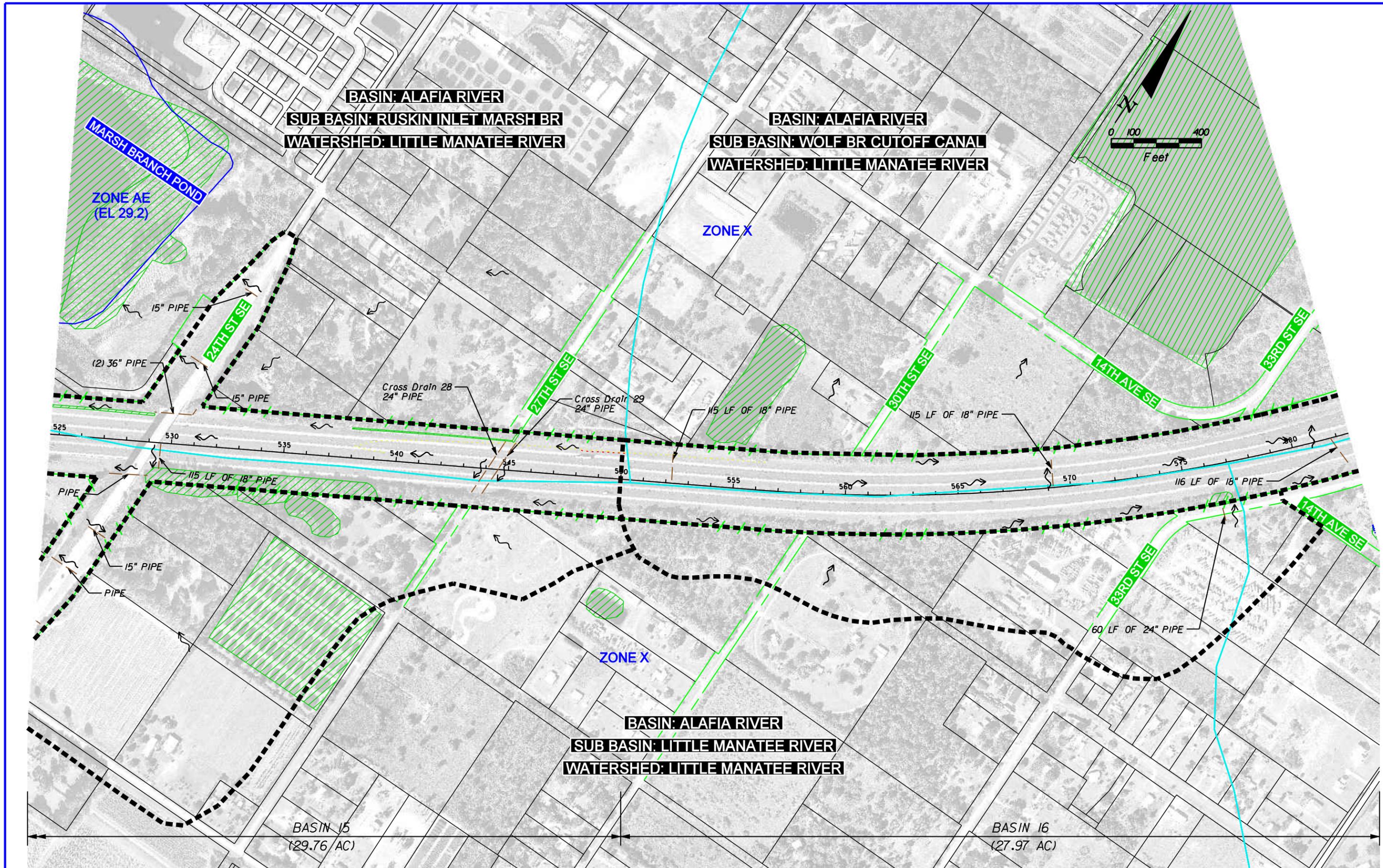
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DRAINAGE MAP

SHEET NO.
9



LEGEND

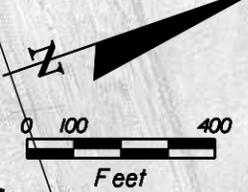
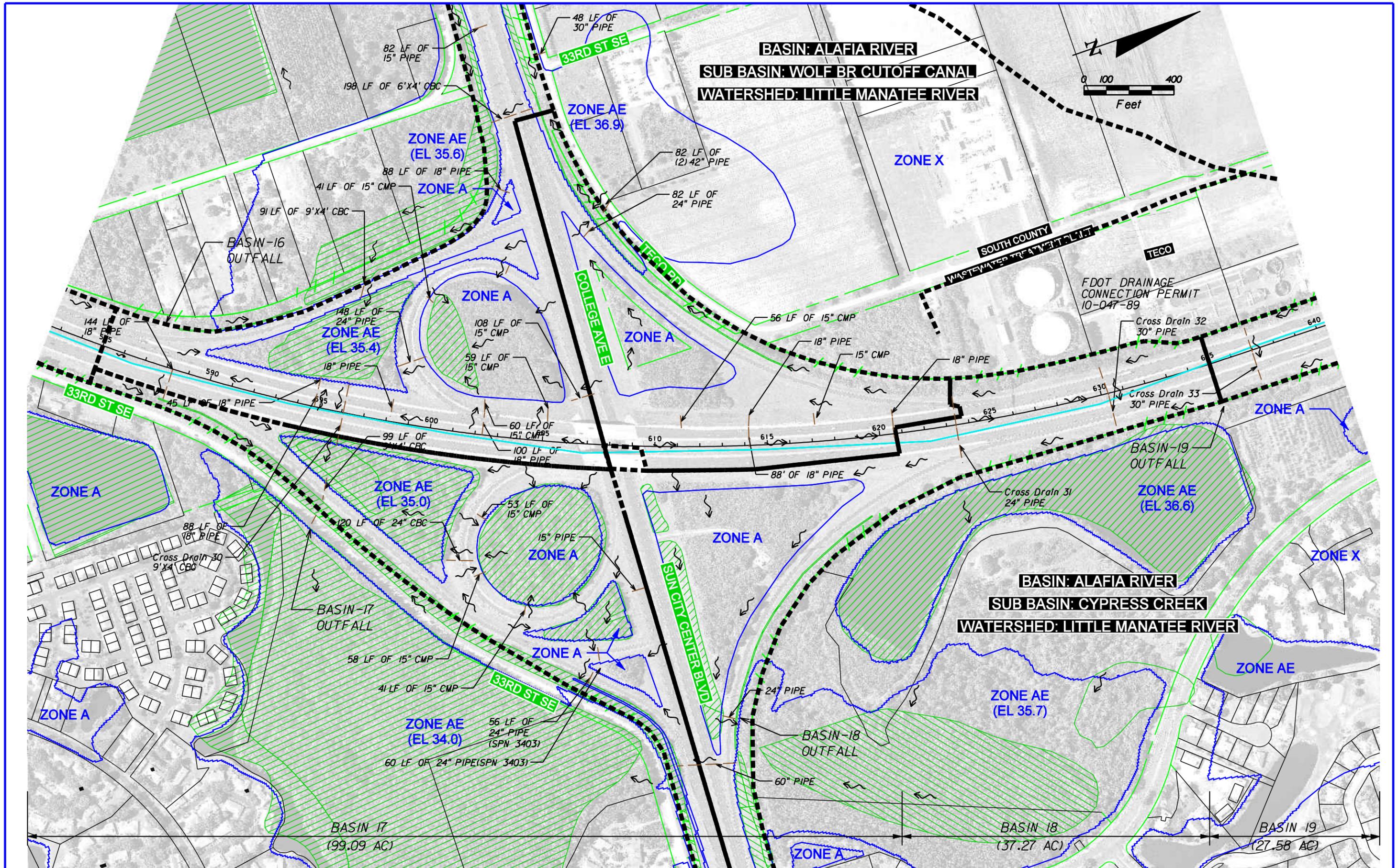
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 Certificate of Authorization No. 9302
 Jeffrey S. Novotny, P.E. No. 51083

DRAINAGE MAP

SHEET NO.
10



BASIN: ALAFIA RIVER
SUB BASIN: WOLF BR CUTOFF CANAL
WATERSHED: LITTLE MANATEE RIVER

SOUTH COUNTY
WASTEWATER TREATMENT PLANT
TECO
 FDOT DRAINAGE CONNECTION PERMIT 10-047-89

BASIN: ALAFIA RIVER
SUB BASIN: CYPRESS CREEK
WATERSHED: LITTLE MANATEE RIVER

LEGEND

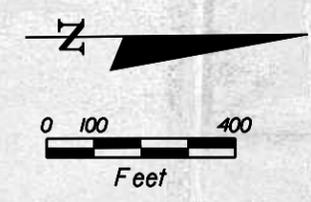
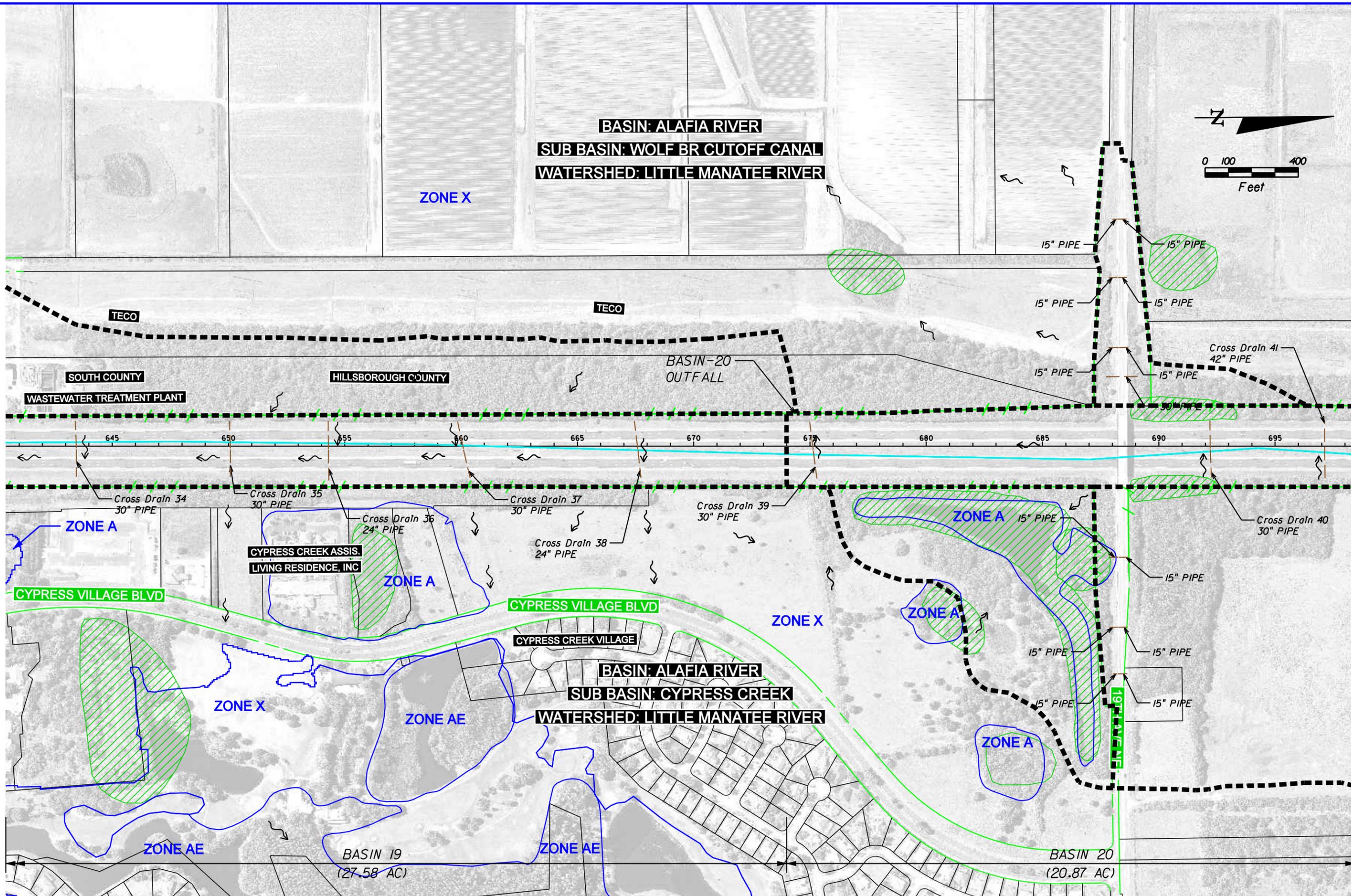
- PUBLIC MANAGED LANDS
- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

DATE OF AERIAL : 2007

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DRAINAGE MAP

SHEET NO.
 11



LEGEND

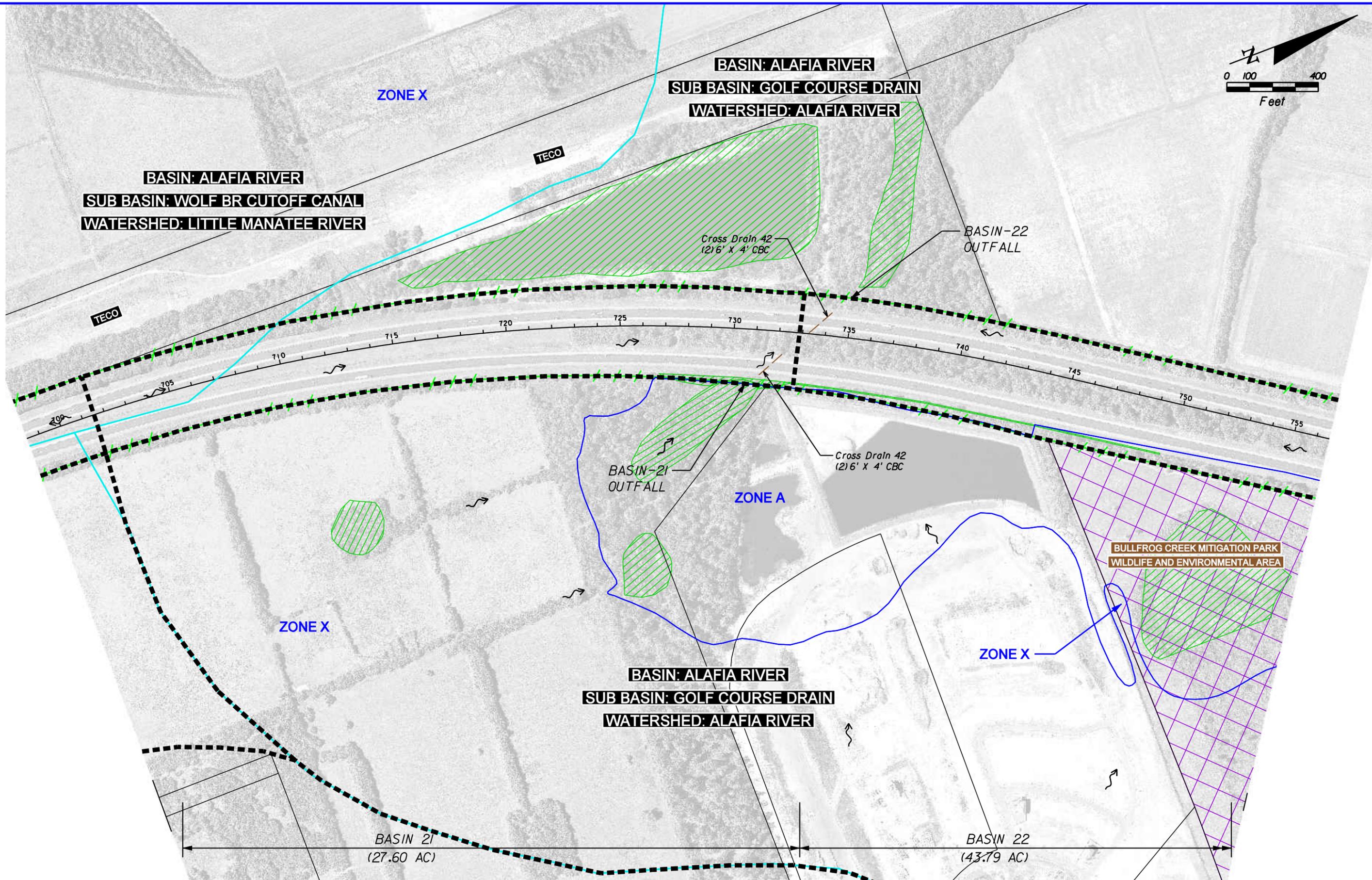
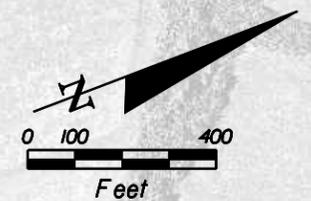
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DRAINAGE MAP

SHEET NO.
12



LEGEND

- PUBLIC MANAGED LANDS
- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

DATE OF AERIAL : 2007

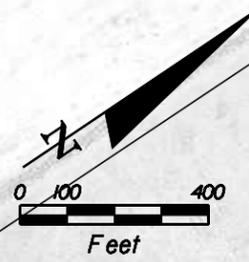
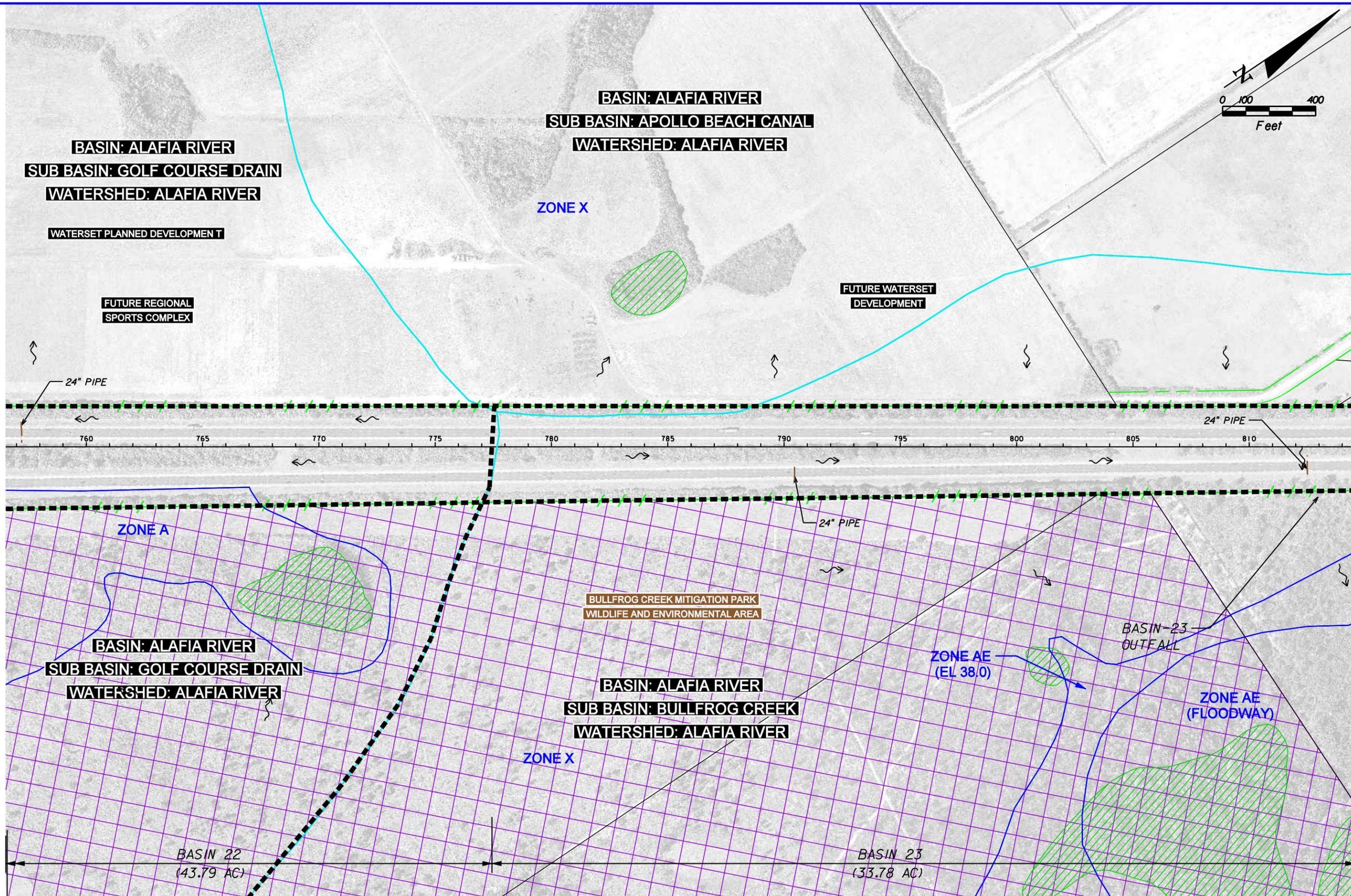
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DRAINAGE MAP

SHEET NO.
13

BASIN 21
(27.60 AC)

BASIN 22
(43.79 AC)



LEGEND

	PUBLIC MANAGED LANDS		EXISTING ROW
	FEMA 100 YEAR FLOODPLAIN		EXISTING LA ROW
	WETLAND BOUNDARY		PROPERTY LINES
	PROJECT BASIN BOUNDARY		SWFWMD REGIONAL SUB BASIN

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DRAINAGE MAP

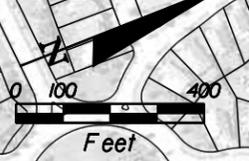
SHEET NO.
14

BASIN: ALAFIA RIVER
SUB BASIN: NEWMAN BRANCH
WATERSHED: ALAFIA RIVER

BASIN: ALAFIA RIVER
SUB BASIN: BULLFROG CREEK
WATERSHED: ALAFIA RIVER

BASIN: ALAFIA RIVER
SUB BASIN: BULLFROG CREEK
WATERSHED: ALAFIA RIVER

BASIN 24
 (54.14 AC)



ZONE X

ZONE AE
 (EL 39.8)

ZONE AE
 (EL 35.0)

ZONE AE
 (EL 37.0)

ZONE AE
 (EL 36.0)

ZONE AE
 (FLOODWAY)

COVINGTON GARDENS DR

BRIGHTON PARK DR

LAKE ST. CLAIR

LAKE ST. CLAIR

LAKE ST. CLAIR

CLAIR SHORE DR

CLAIR SHORE DR

FDOT DRAINAGE
 CONNECTION PERMIT
 99-D-796-0024

Cross Drain 43
 24" PIPE

18" PIPE

BASIN-24
 OUTFALL

Cross Drain 44
 9' X 6' CBC

LEGEND

- PUBLIC MANAGED LANDS
- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

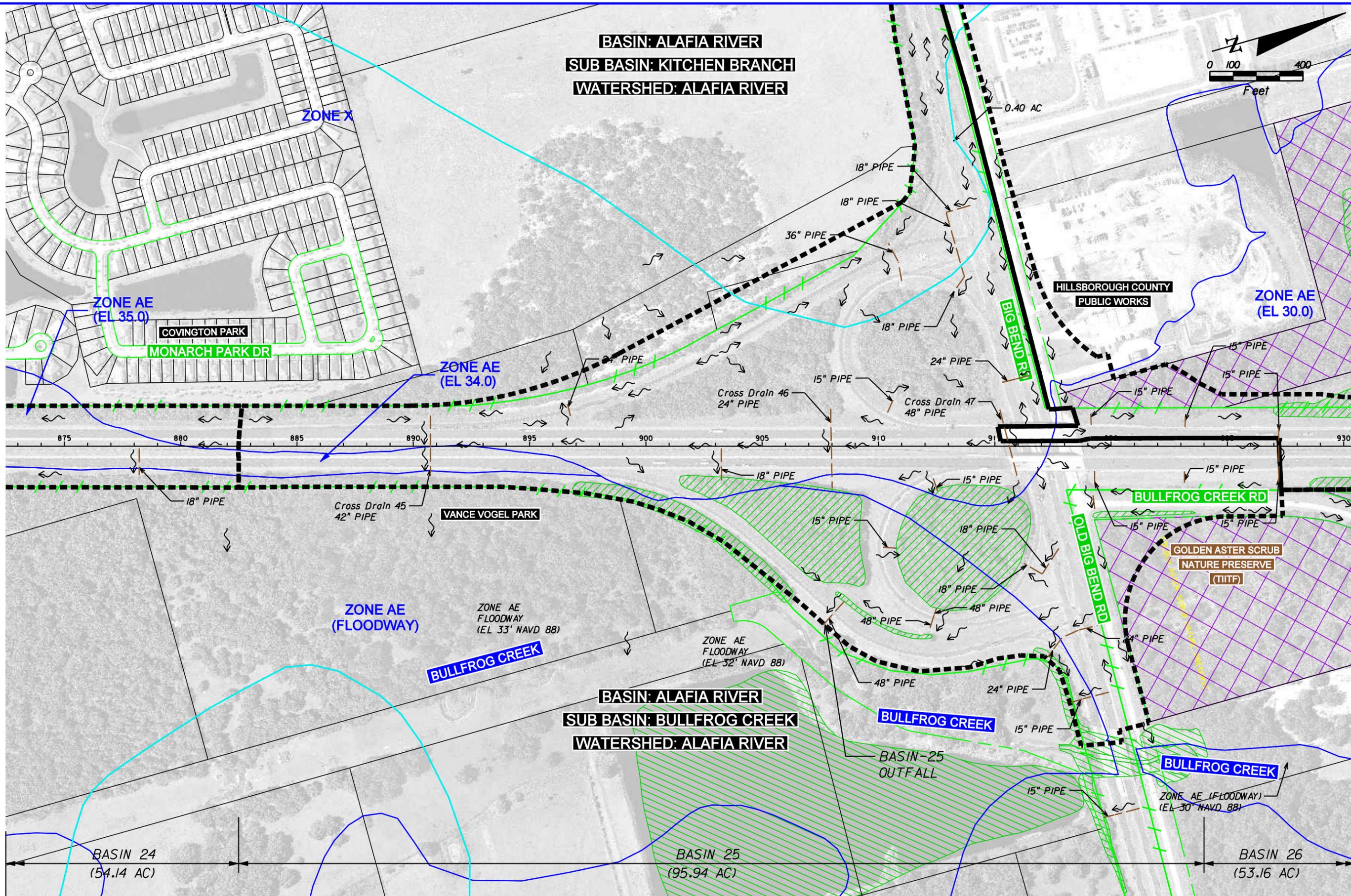
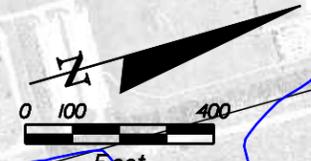
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DRAINAGE MAP

SHEET NO.
 15

BASIN: ALAFIA RIVER
SUB BASIN: KITCHEN BRANCH
WATERSHED: ALAFIA RIVER



LEGEND

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- FEMA 100 YEAR FLOODPLAIN
- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
- PROPERTY LINES
- SWFWMD REGIONAL SUB BASIN

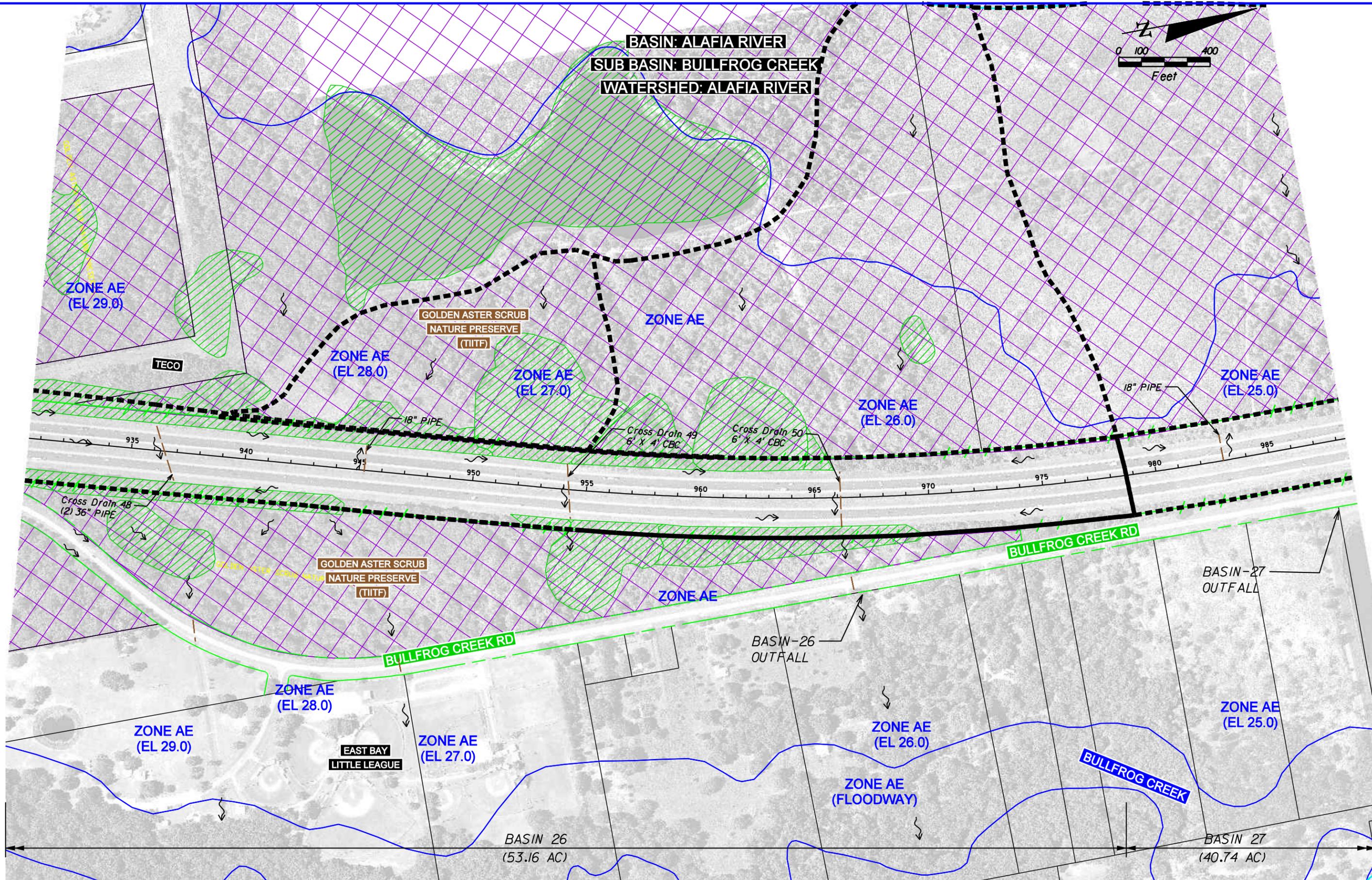
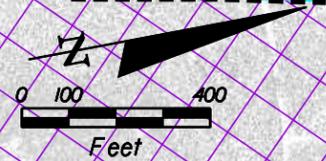
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DRAINAGE MAP

SHEET NO.
 16

BASIN: ALAFIA RIVER
SUB BASIN: BULLFROG CREEK
WATERSHED: ALAFIA RIVER



LEGEND

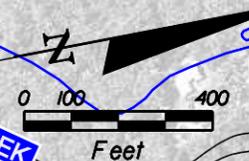
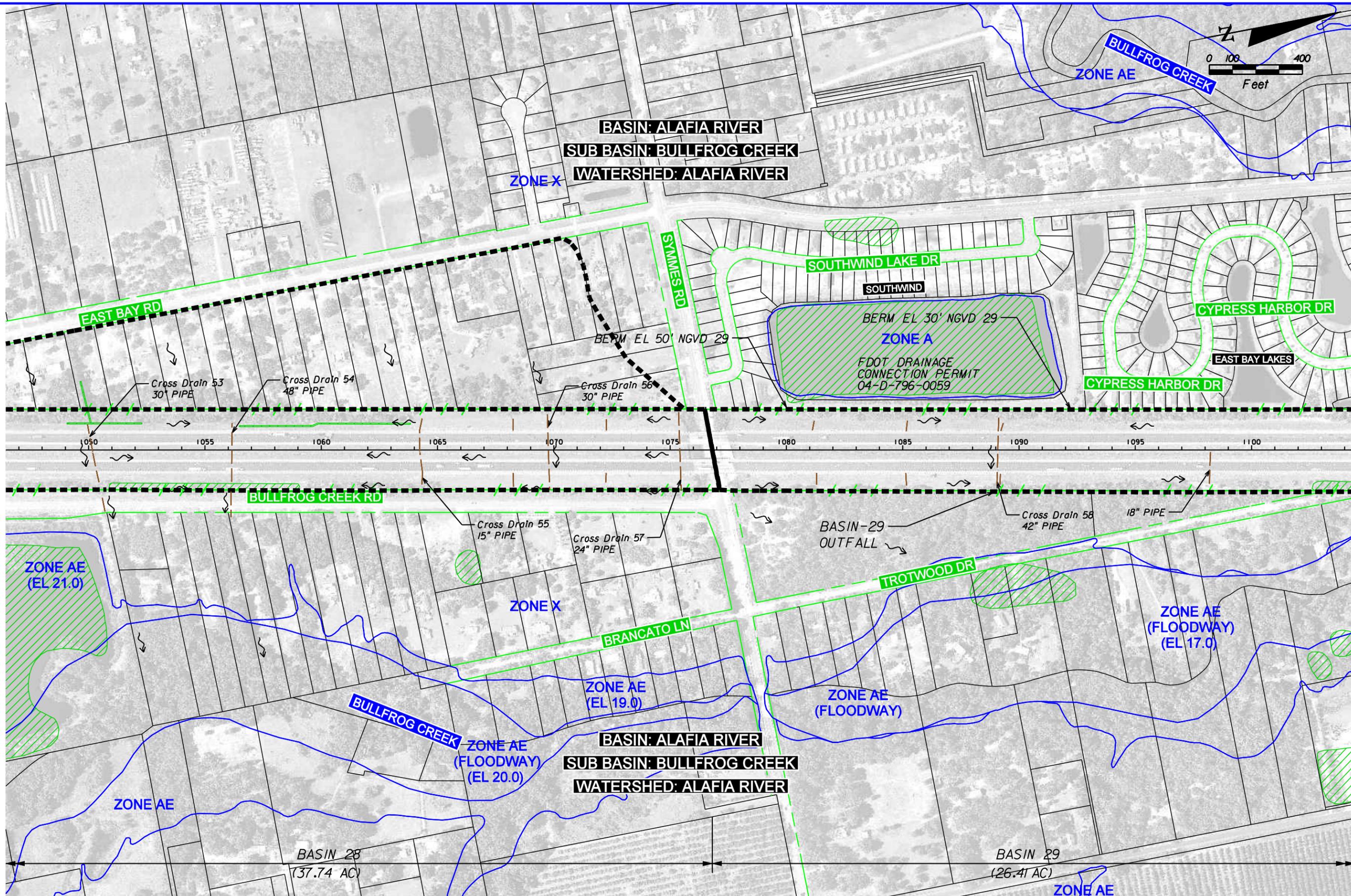
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DRAINAGE MAP

SHEET NO.
 17



LEGEND

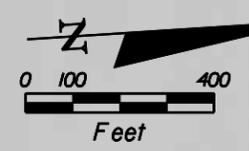
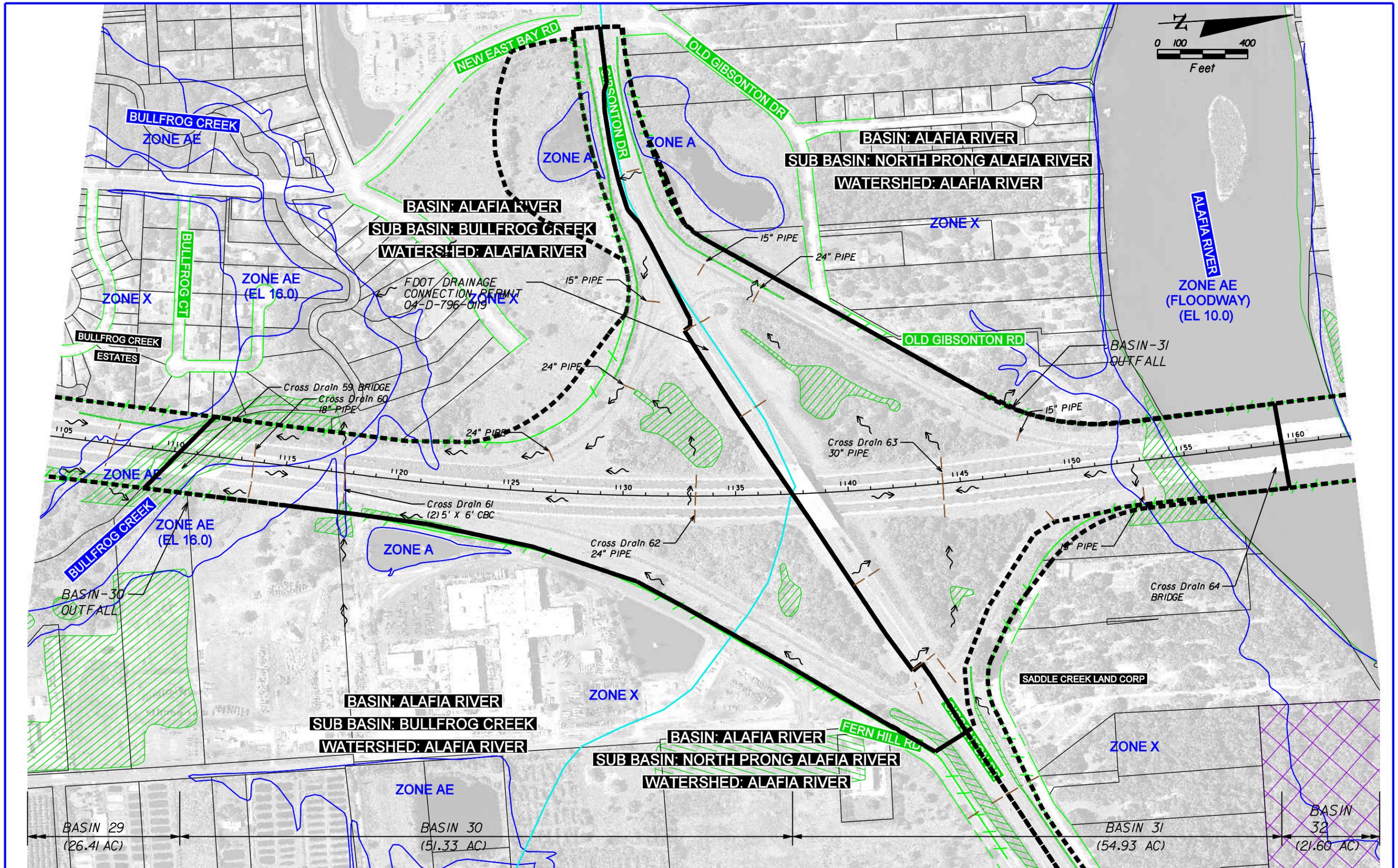
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DRAINAGE MAP

SHEET NO.
19



LEGEND

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- WETLAND BOUNDARY
- PROJECT BASIN BOUNDARY
- EXISTING ROW
- EXISTING LA ROW
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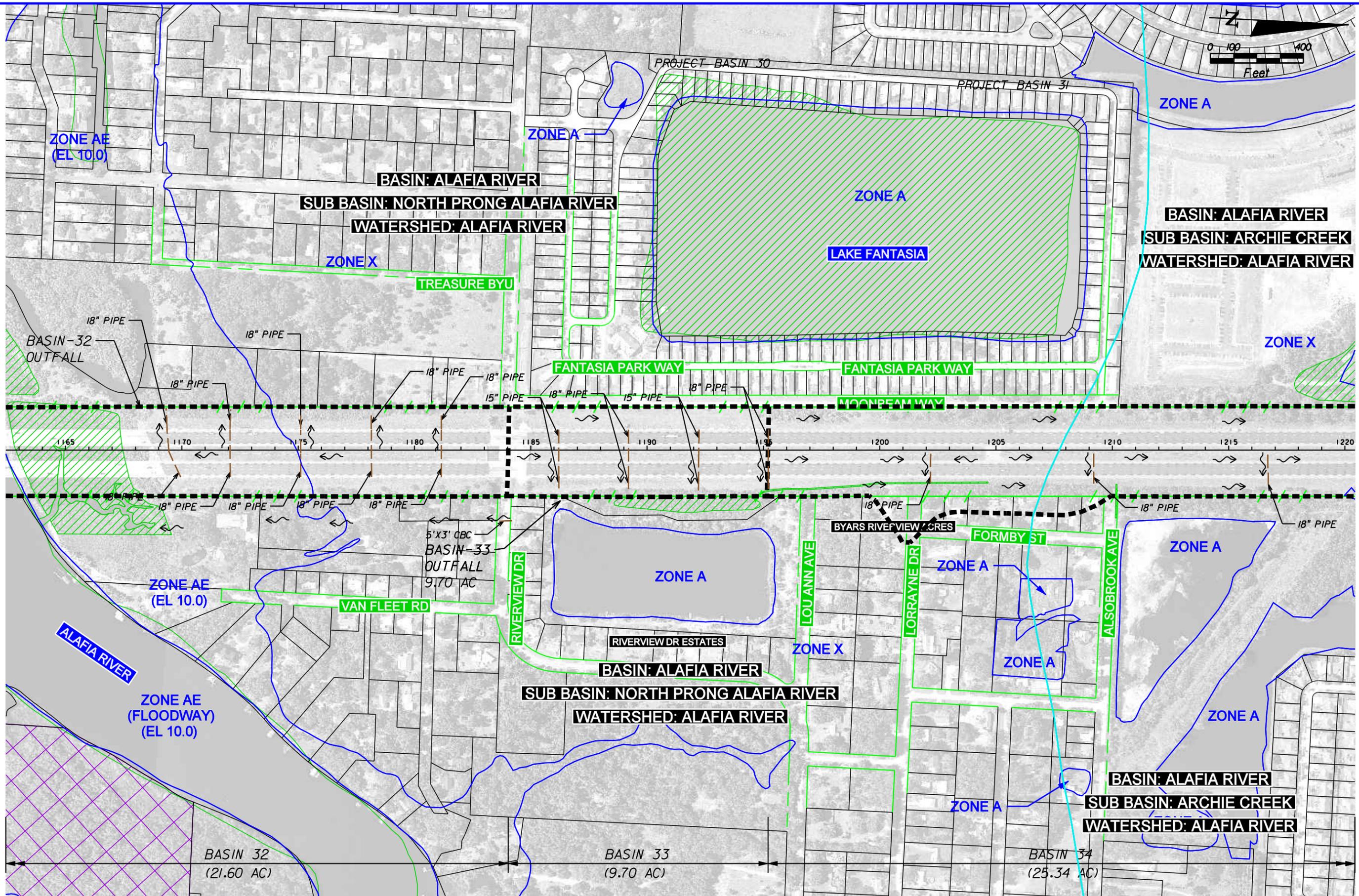
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DRAINAGE MAP

SHEET NO.
20

BASIN 29 (26.41 AC) BASIN 30 (51.33 AC) BASIN 31 (54.93 AC) BASIN 32 (21.60 AC)



LEGEND

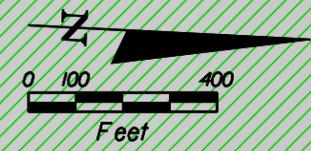
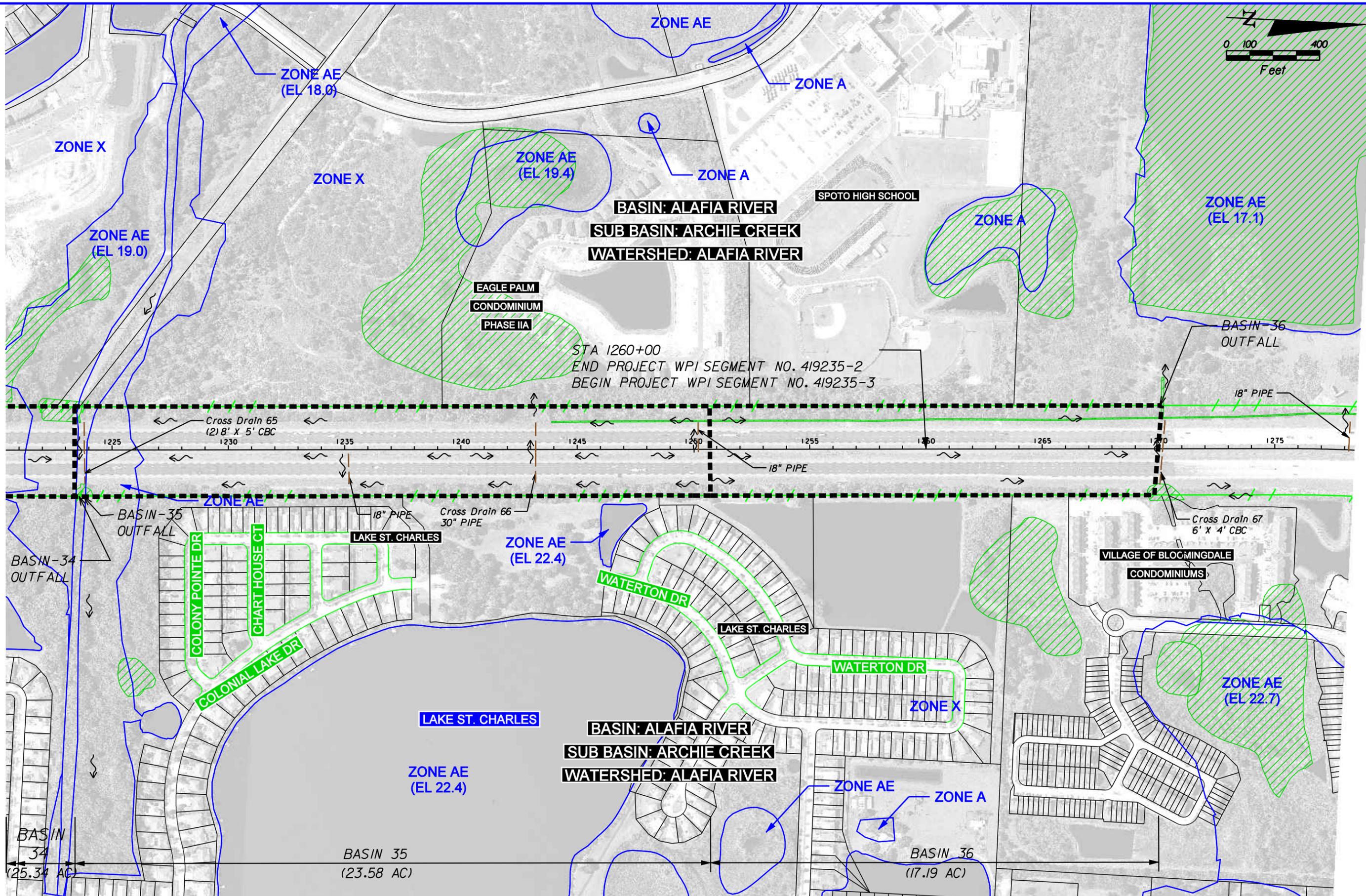
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DRAINAGE MAP

SHEET NO.
21



STA 1260+00
 END PROJECT WPI SEGMENT NO. 419235-2
 BEGIN PROJECT WPI SEGMENT NO. 419235-3

	PUBLIC MANAGED LANDS		EXISTING ROW
	FEMA 100 YEAR FLOODPLAIN		EXISTING LA ROW
	WETLAND BOUNDARY		PROPERTY LINES
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DRAINAGE MAP

SHEET NO.
 22