Cobb Road (CR 485) / US 98

WPI Segment Nos.: 257299 1 & 405017 1
FAP Nos.: 2891 007 P & 2891 008 P

LOCATION HYDRAULIC REPORT

April 2003

The Florida Department of Transportation (FDOT) is proposing improvements to CR 485 (Cobb Road) from SR 50 to US 98 and to US 98 from Cobb Road to the Suncoast Parkway in Hernando County, Florida. The distance of the project is approximately 11.5 miles. The project limits and segment identification are shown in **Exhibit 1**. The planned improvements consist of widening the existing two-lane rural roadways to a continuous four-lane divided highway. The proposed typical sections for the Recommended Alternative (urban, suburban, and rural) are shown in **Exhibits 2-4**, respectively. Cobb Road is intended to serve as a future evacuation route, while US 98 is currently a designated evacuation route.

This Location Hydraulic Report has been prepared to present the degree to which floodplains will be impacted for the Recommended Alternative. Executive Order 11988 "Floodplain Management", USDOT Order 5650.2 "Floodplain Management and Protection", and 23 CFR 650 mandate protection of floodplains and floodways. As outlined in Chapter 24 (rev. 4-22-98) of the FDOT *PD&E Manual*, these regulations are intended to "minimize highway encroachments within the 100-year base floodplain, where practicable, and to avoid supporting land use development which is incompatible with floodplains values". State (i.e. Southwest Florida Water Management District) and applicable local floodplain criteria will be met.

The Cobb Road and US 98 roadway improvement project will not directly or indirectly support incompatible floodplain development, or result in any floodplain encroachments that significantly affect the human environment, since the project is a component of the County's adopted comprehensive plan. Future land uses will be developed in accordance with the adopted comprehensive plan and its implemented Land Development Regulations, which, in compliance with the National Flood Insurance Program, prohibit development in the base floodplain. The proposed drainage improvements associated with the project are consistent with local floodplain development plans and will provide compensating storage equivalent to encroachments, as necessary, to preserve the natural and beneficial floodplain values. Since the proposed roadway will follow the same general alignment as the existing roadway, there will be no significant effect on the natural and beneficial floodplain values. The following items have been addressed to document the floodplain encroachments for the Recommended Alternative.

1. Existing Drainage System: The existing cross drains that are present along Cobb Road and US 98 within the project limits are shown in **Table 1**. This table reflects data from a survey conducted in the fall of 2001, as well as information from existing roadway plans data, straight line diagrams and field reviews. The centerline survey of Cobb Road begins with station 30 + 00 at SR 50. Station 30 +00 was assumed to be milepost 0.00 for purposes of this study. Cobb Road has 16 cross drains and US 98 has 19 cross drains within the limits of the study area. The project site was field reviewed on various dates in October 2001 and March 2002. **Exhibit 5** shows the approximate cross drain locations, as well as the primary drainage sub-basin boundaries.

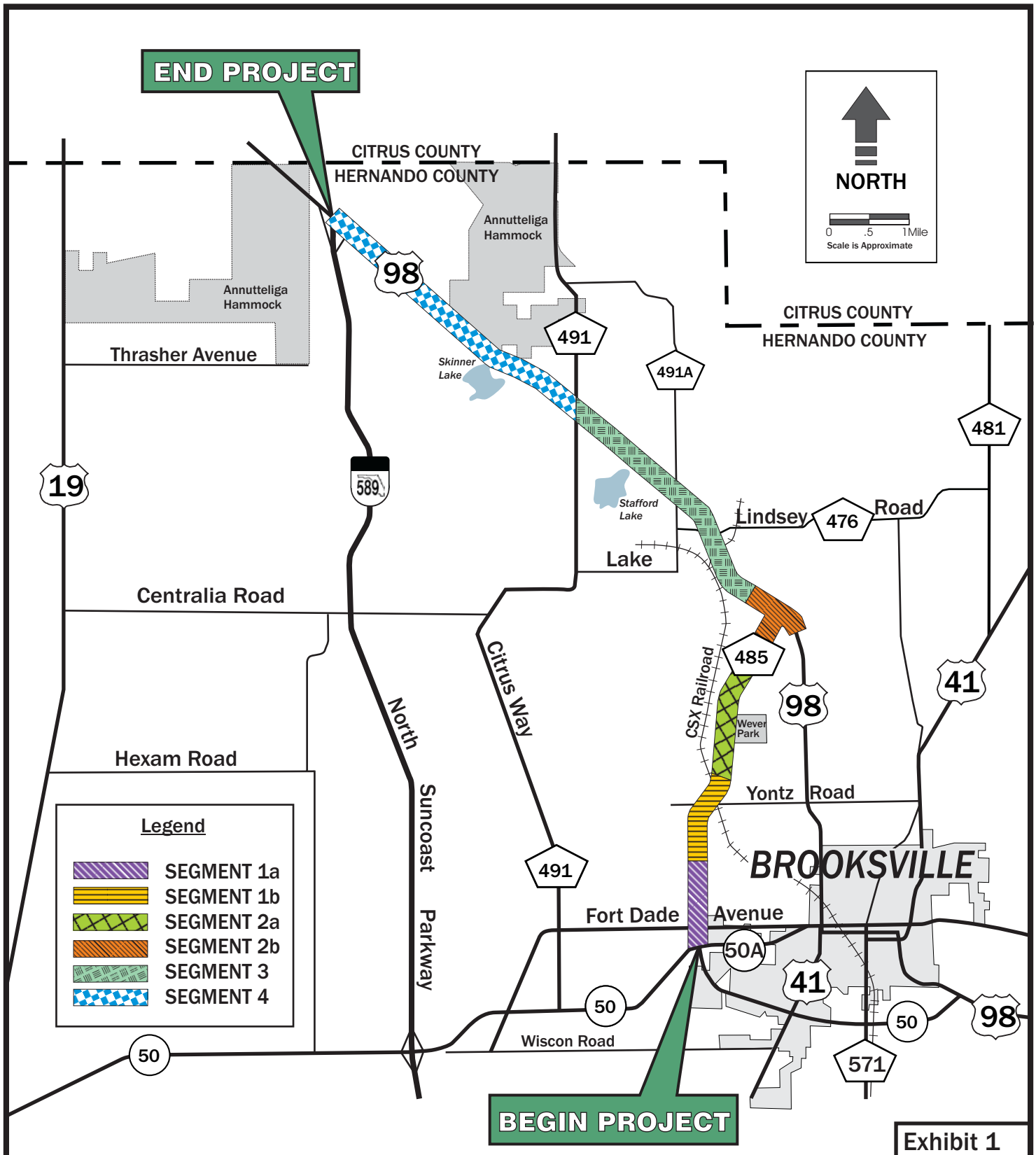


Exhibit 1

Project Location Map

Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1
FAP Nos: 2891 007 P & 2891 008 P

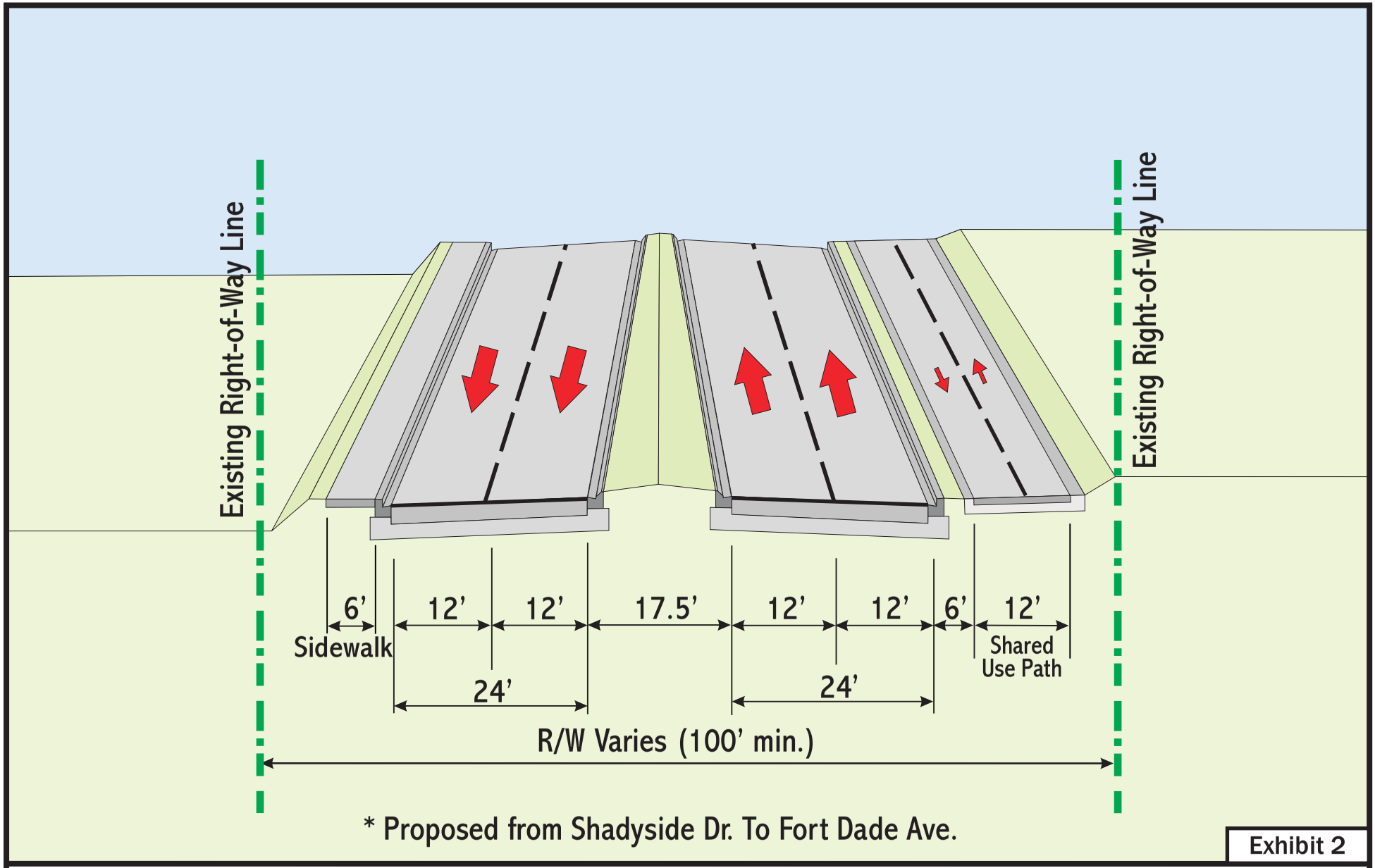


Exhibit 2

PROPOSED URBAN TYPICAL SECTION

(SEGMENT 1a)

Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1

FAP Nos: 2891 007 P & 2891 008 P

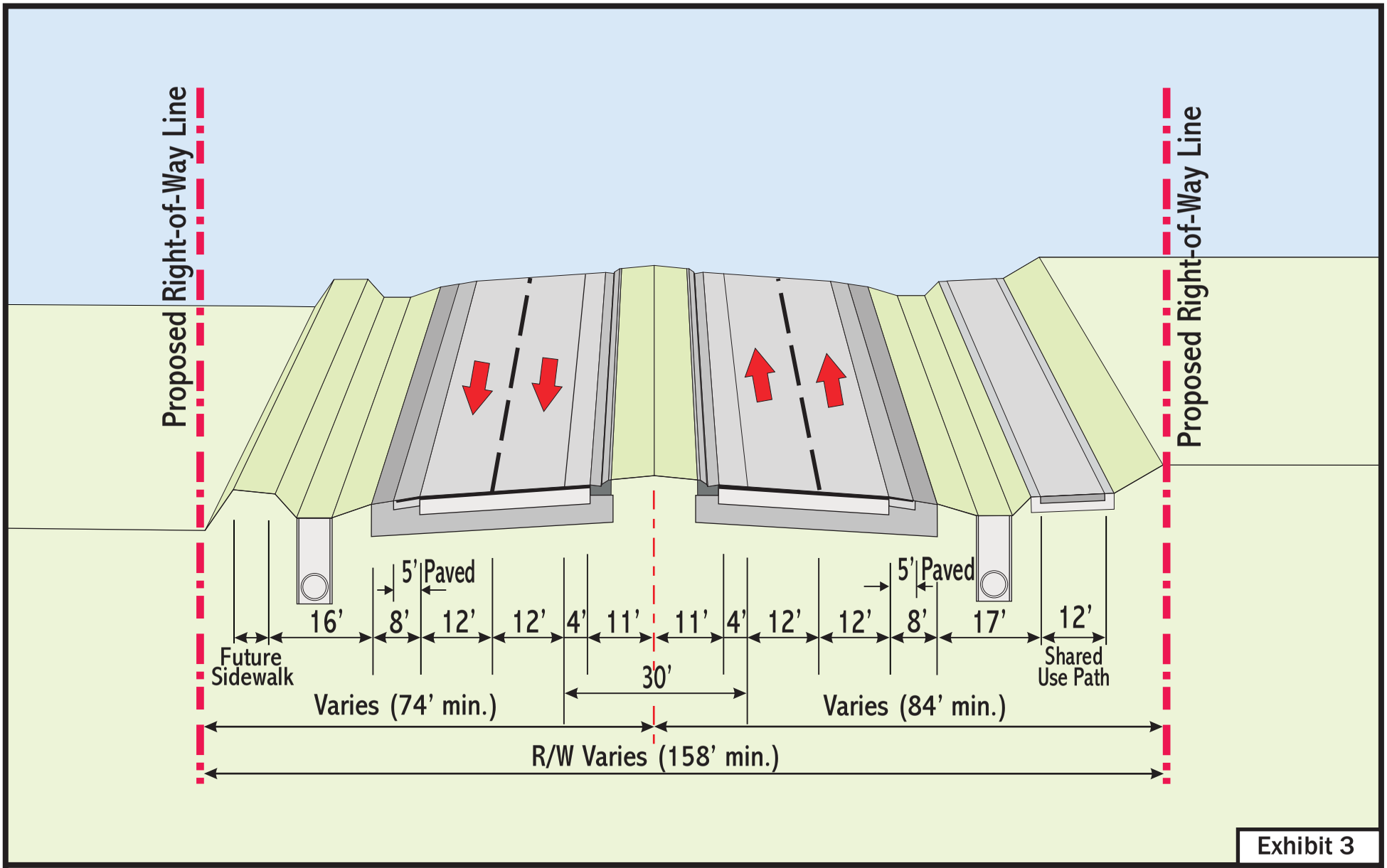


Exhibit 3

PROPOSED SUBURBAN TYPICAL SECTION

(SEGMENTS 1b and 2a)

Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1

FAP Nos: 2891 007 P & 2891 008 P

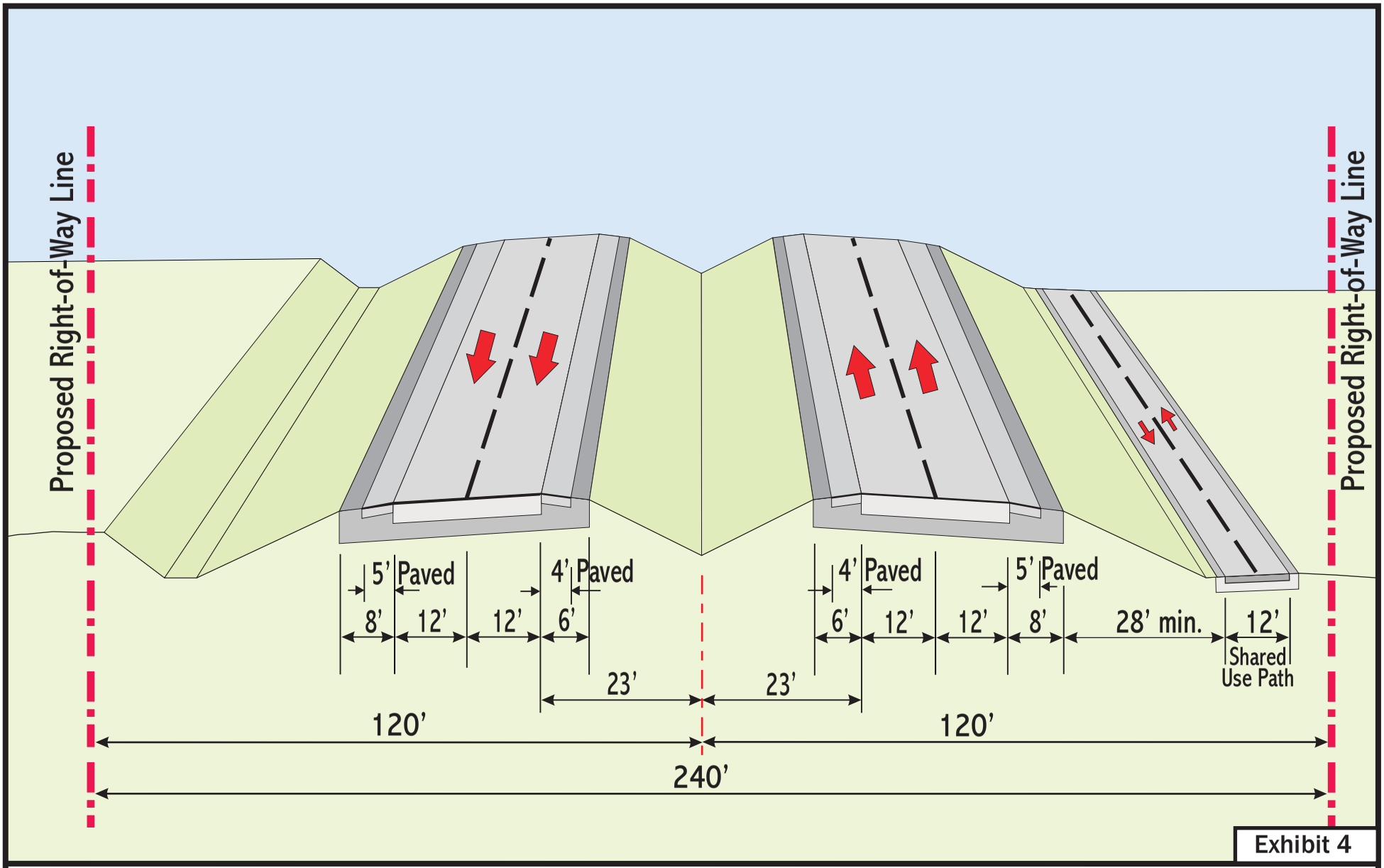


Exhibit 4

PROPOSED RURAL TYPICAL SECTION

(SEGMENTS 2a, 2b, 3 and 4)

Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1

FAP Nos: 2891 007 P & 2891 008 P

Table 1 Cobb Road and US 98 Existing Cross Drain Data

	Cross Drain Site Number	Location		Source[1] (Structure No.)	No. Pipes or Barrels	Size and Material	Length
		C/L Survey Station	Milepost				
Cobb Road	1	30 + 84.00	0.019	Survey, Field	2	10' X 8' CBC	343'
	2	44 + 19.83	0.314	Survey, Field	1	30" RCP	153'
	3	52 + 97.00	0.480	Survey	1	24" RCP	127'
	4	72 + 00.46	0.841	Survey, Field	1	36" RCP	97'
	5	121 + 47.40	1.781	Survey, Field	1	8' X 4' CBC	~200'
	6	125 + 85	1.861	Survey, A (S-2), Field	1	30" RCP	141'
	7	131 + 25	1.961	Survey, A (S-3)	2	36" CMP	137', 144'
	8	137 + 76	2.085	Survey, A (S-4), Field	3	48" CMP	116'
	9	165 + 00	2.601	Survey, A (S-5), Field	2	36" CMP	86'
	10	184 + 70	2.976	Survey, A (S-6), Field	1	30" CMP	94'
	11	198 + 60	3.239	Survey, A (S-7), Field	1	30" CMP	90'
	12	204 + 00	3.341	Survey, A (S-8), Field	1	24" CMP	72'
	13	229 + 00	3.814	Survey, A (S-9), Field	2	36" CMP	86'
	14	248 + 25	4.179	Survey, A (S-10), Field	2	36" CMP	111'
	15	260 + 58	4.412	Survey, A (S-11), Field	2	24" RCP	119'
	16	264 + 47	4.485	Survey, A (S-12), Field	2	36" RCP	173'
US 98	17	351 + 65.60	4.592	Survey, B (S-13), Field	4	48" RCP	93'
	18	358 + 93.40	4.730	Survey, C (S-1), Field	1	30" RCP	108'
	19	369 + 88.39	4.937	Survey, C (S-16), Field	1	24" RCP	65'
	20	396 + 23.23	5.436	Survey, B (S-19), Field	1	48" RCP	88'
	21	413 + 89.35	5.771	Survey, B (S-21), Field	2	42" RCP	121'
	22	433 + 99.50	6.152	Survey, B (S-22), Field	1	30" RCP	87'
	23	460 + 50.30	6.654	Survey, B (S-25), Field	1	48" RCP	143'
	24	465 + 11.00	6.741	Survey, SLD	1	30" RCP	97'
	25	473 + 39.43	6.898	Survey, SLD, Field	1	48" RCP	111'
	26	484 + 40.26	7.106	Survey, B (S-28), Field	1	24" RCP	86'
	27	518 + 85.57	7.759	Survey, B (S-30), Field	2	36" RCP	90'
	28	537 + 69.85	8.116	Survey, D (S-1)	1	24" RCP	100'
	29	547 + 54.05	8.302	Survey, E (S-2), Field	1	30" RCP	85'
	30	596 + 52.56	9.230	Survey, E (S-3), Field	1	42" RCP	90'
	31	623 + 51.78	9.741	Survey, E (S-4), Field	1	24" RCP	86'
	32	652 + 52.16	10.290	Survey, SLD, Field	1	24" RCP	93'
	33	674 + 44.31	10.706	Survey, E (S-6), Field	3	77" X 50" CMP	96'
	34	684 + 52.62	10.896	Survey, Field	1	15" RCP	95'
	35	690 + 45.04	11.009	Survey, E (S-7), Field	3	72" X 48" CMP/RCP	174'

(1) Sources:

(A) Construction Plans: CR 485 (SPN 08590-3606, FAP MARS-1599(1); Date Plans Approved - March 22, 1985)

(B) Construction Plans: US 98 (Resurfacing/Widening) SPN 08080-3902, FAP No. HES-289-1(4); Date Plans Approved - November 17, 1987

(C) Construction Plans: US 98 (Weigh Station) SPN 08080-3516; Date Plans Approved - February 7, 1992

(D) Construction Plans: US 98 (Resurfacing/Widening) SPN 08080-3517, FPI 254838-1-52-01; Date Plans Submited - October 15, 1999

(E) Construction Plans: US 98 (Resurfacing/Widening) SPN 08080-3511, FAP No. F-289-1(3); Date Work Complete - February 19, 1987

(2) Note: Cobb Road CL Survey STA 265+00 approximately equals US 98 CL Survey STA 343+70

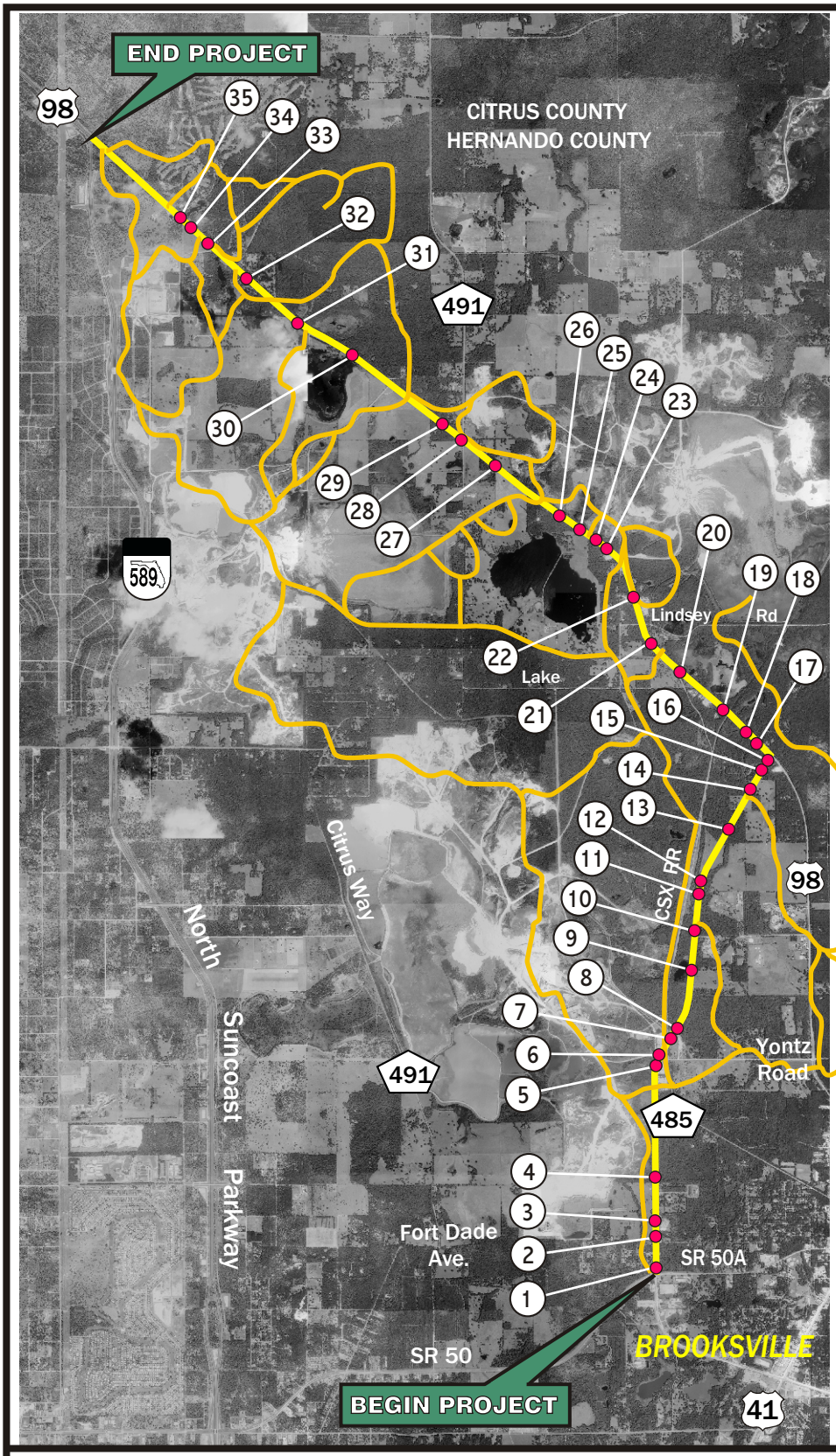
(3) Legend:

CBC = Concrete Box Culvert

RCP = Reinforced Concrete Pipe

CMP = Corrugated Metal Pipe

SLD - Straight Line Diagram



NORTH

Legend

- Drainage Basin Boundary
- Cross Drains
- 23 Cross Drain Site Number

Exhibit 5

Drainage Sub-Basin Boundaries with Cross Drains

Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1

FAP Nos: 2891 007 P & 2891 008 P

2. Existing Floodplain Involvement: **Exhibit 6** illustrates the limits of the 100-year base floodplain according to the Flood Insurance Rate Maps (FIRM) compiled by the Federal Emergency Management Agency (FEMA). A copy of each applicable FIRM is also included in **Appendix A**. There are no regulatory floodways within the limits of this project.

Within the limits of this project, the existing right-of-way encroaches upon two depressional areas identified as 100-year base floodplains (FP-1 and FP-2). FP-1 is located along Cobb Road and FP-2 is located along US 98. Each of these base floodplain areas is identified as Flood Zone 'A', an "area of 100-year flood; base flood elevations and flood hazard factors not determined". Base flood elevations for these existing floodplain areas were estimated by use of 2' aerial contour maps provided by the Southwest Florida Water Management District (SWFWMD). **Table 2** summarizes the areas of the 100-year base floodplain within the existing right-of-way and the estimated base flood elevations for each location.

Table 2 Summary of Existing Base Floodplain Areas and Estimated Elevations

Roadway Description	Floodplain Location Number	Flood Zone (FIRM)	Estimated 100-year Base Flood Elevation (1)	Floodplain Area (acres)	Existing No. Cross Drains	Existing Cross Drain Sizes
Cobb Road	FP-1	A	99'	0.07	1	24"
US 98	FP-2	A	59'	0.16	1	24"

(1) NGVD, 1929

3. History of Flooding: Per discussion with the FDOT Brooksville Maintenance Office, no flooding problems have been identified with any of the existing drainage structures on this project, nor has there been a known overtopping of the existing roadway within the project limits. A copy of the memorandum that summarizes this coordination is included in **Appendix B**.

4. Floodplain Involvement for the Recommended Alternative: A Recommended Alternative has been identified and is presented in the Preliminary Engineering Report. Portions of the improvements within the existing and proposed right-of-way for the Recommended Alternative will encroach upon the 100-year base floodplain areas FP-1 and FP-2. **Table 3** summarizes the areas of the 100-year base floodplain encroachments for the Recommended Alternative. These encroachments may be decreased (minimized) through adjustment to the typical section in the vicinity of the floodplain areas. In the area of FP-1, the proposed urban typical section fits within the existing right-of-way, which minimizes the floodplain impact as compared to other alternatives previously considered.

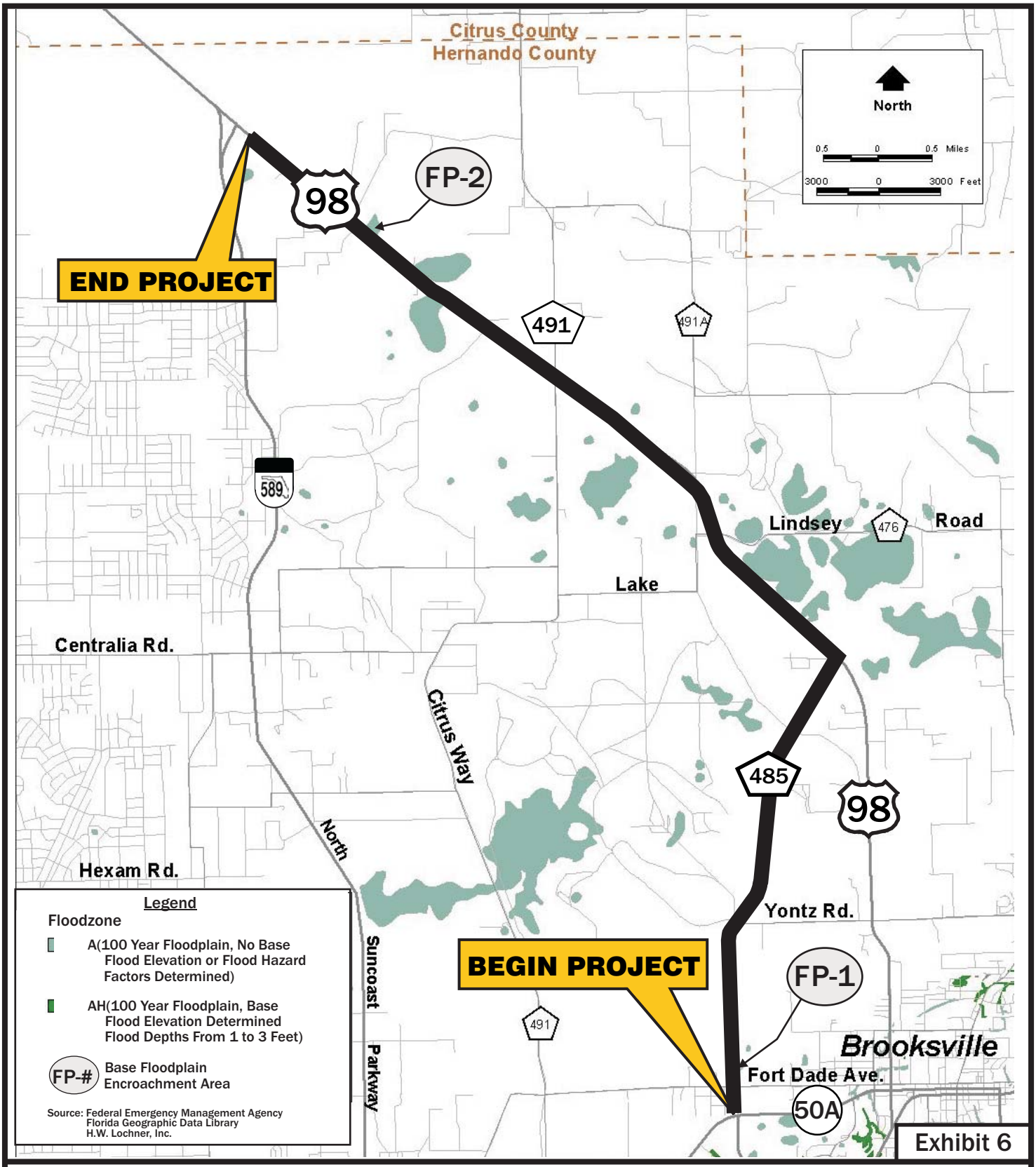


Exhibit 6

FEMA Floodplains

Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1

FAP Nos: 2891 007 P & 2891 008 P

Each of the floodplain encroachments will be minimal due to the proposed roadway alignment following the same general alignment as the existing roadway. The proposed cross-drain structures will perform hydraulically in a manner equal to or greater than the existing structure, and backwater surface elevations are not expected to increase. As a result, there will be no significant adverse impacts on natural and beneficial floodplain values. There will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that each encroachment is not significant.

Table 3 Summary of Floodplain Encroachments for the Recommended Alternative

Roadway Description	Recommended Alternative	Base Floodplain Encroachment Location Number	Encroachment Area (acres)	Flood Zone (FIRM)
Cobb Road Segment 1A	Urban	FP-1	0.07	A
Cobb Road Segment 1B	Suburban Left	n/a	0	n/a
Cobb Road Segment 2A	Suburban Left Transition to Rural Left	n/a	0	n/a
Cobb Road/US 98 Segment 2B	Rural Realign	n/a	0	n/a
US 98 Segment 3	Rural Left	n/a	0	n/a
US 98 Segment 4	Rural Left	FP-2	0.16	A

The SWFWMD Environmental Resource Permit (ERP) Information Manual (Section 4.4, 8/3/2000 version) states that no net encroachment into the floodplain, up to that encompassed by the 100-year event, which will adversely effect either conveyance, storage, water quality or adjacent lands will be allowed and required compensating storage shall be equivalently provided. Compliance with "Historic Basin Storage" (Section 4.7, ERP) and "Offsite Lands" (Section 4.8, ERP) criteria will also be necessary. Therefore, floodplain compensating storage will be provided as required by the SWFWMD and as a result, no significant changes in base flood elevations or limits will occur.

6. Longitudinal or Transverse Encroachments: The floodplain encroachments will only affect the fringe of the existing Zone 'A' areas associated with the applicable closed basin.

7. Stormwater Management: The drainage system for the planned Cobb Road and US 98 improvements will be designed in accordance with the standards contained in the FDOT Drainage Manual, including Chapter 14-86, and SWFWMD Rule criteria for open or closed basins, as applicable. Stormwater treatment and attenuation is anticipated to be accomplished through the use of detention/retention ponds and swales in accordance with SWFWMD/Florida Department of Environmental Protection (FDEP) Environmental Resource Permit (ERP) rules (Chapters 40D-1, 40D-4, 40D-40, 40D-41, and 40D-400, F.A.C.). The applicable type of stormwater management facility is generally dependent upon topographic constraints, seasonal high water table depth, and soil types and permeabilities encountered. The overall direction of the groundwater potentiometric surface is from southeast to northwest.

The planned roadway improvements may require extensions to cross drains and roadside ditches will be utilized along the proposed alignment for conveyance toward stormwater management facilities.

A sediment and erosion control plan will be prepared and implemented during construction of the roadway improvements. At a minimum, best management practices outlined in FDEP's Land Development Manual will be used. Examples of these include slope and outfall protection, such as hay bales and staked silt fences, and floating turbidity barriers. A National Pollutant Discharge Elimination System (NPDES) permit will be required, which will include preparation of a Stormwater Pollution Prevention Plan. These measures will also prohibit undue base floodplain encroachments.

APPENDIX A

APPROXIMATE SCALE

2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

HERNANDO COUNTY, FLORIDA
(UNINCORPORATED AREAS)

PANEL 175 OF 400

COMMUNITY-PANEL NUMBER
120110 0175 B

EFFECTIVE DATE:
APRIL 17, 1984

Federal Emergency Management Agency

KEY TO MAP

500-Year Flood Boundary	
100-Year Flood Boundary	
Zone Designations*	ZONE B / ZONE A / ZONE AE / ZONE B
100-Year Flood Boundary	
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

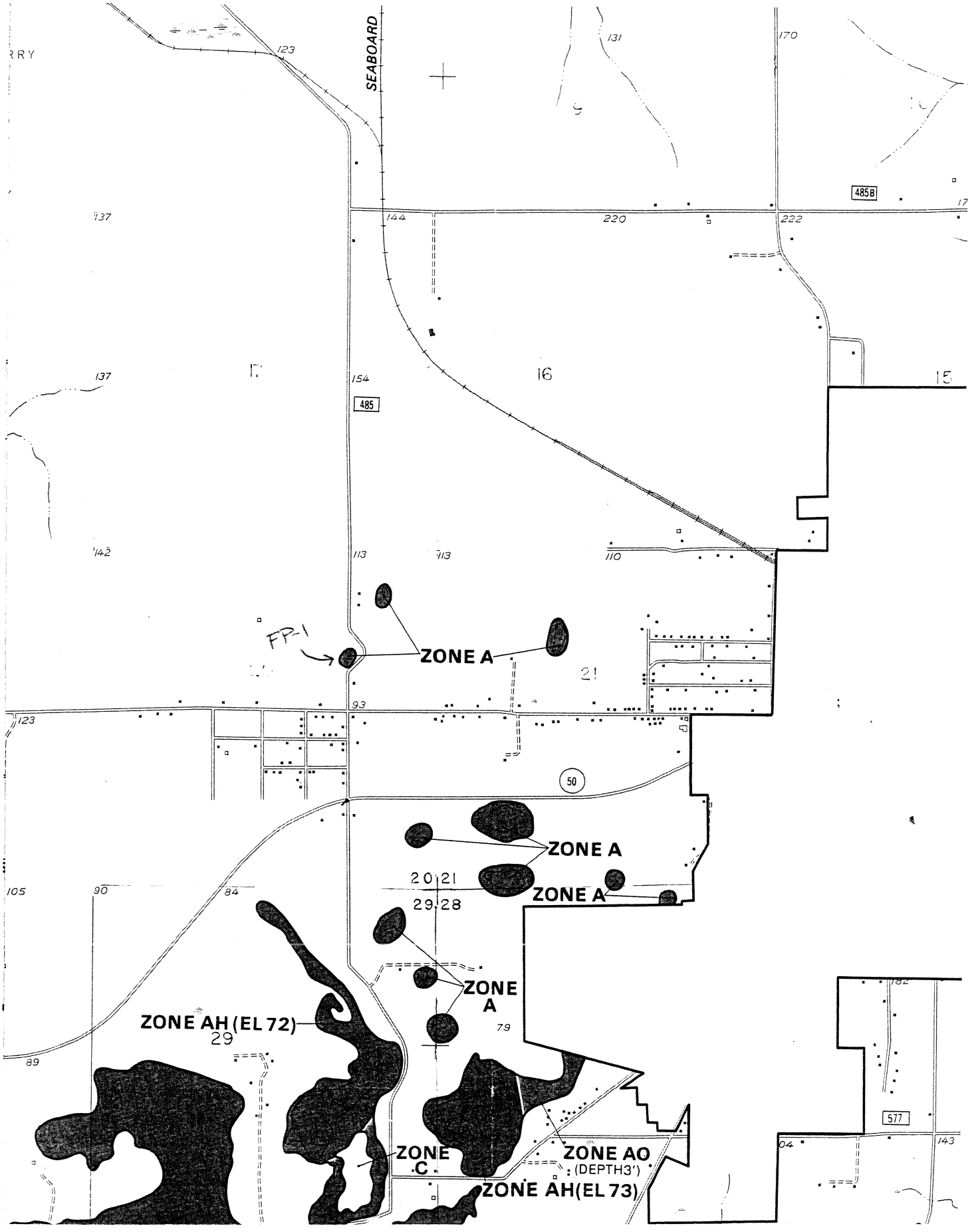
NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

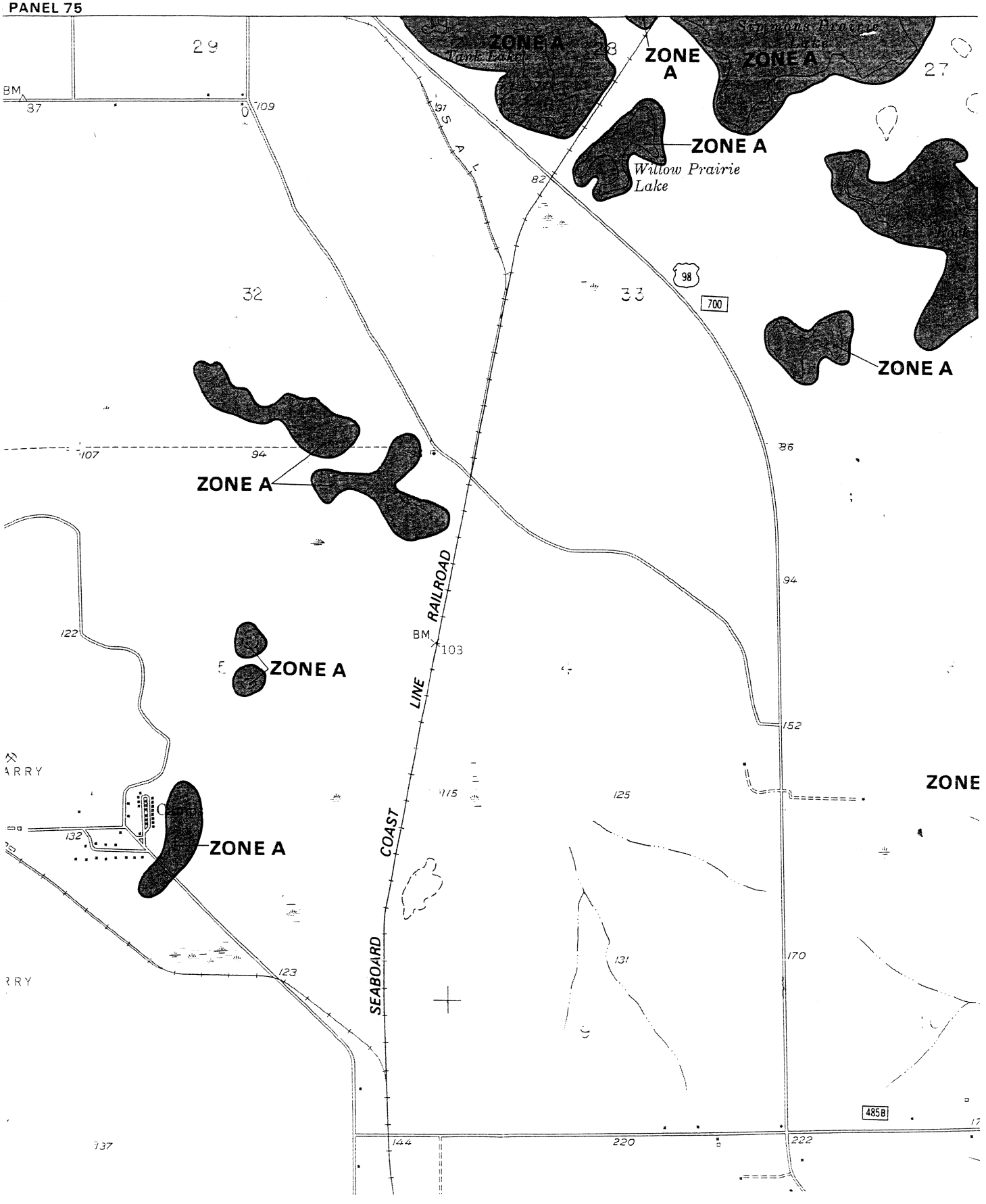
This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

Coastal Base Flood Elevations shown on this map include the effects of wave action.


SEABOARD
485B
485
50
577
FP-1
ZONE A
ZONE A
ZONE A
ZONE A
ZONE AH (EL 72)
ZONE C
ZONE AO
: (DEPTH 3')
ZONE AH (EL 73)
16
15
21
20 21
29 28
29

PANEL 75


ZONE A
Tank Lake
ZONE A
ZONE A
Simmons Prairie Lake
ZONE A
Willow Prairie Lake
ZONE A
ZONE A
ZONE A
ZONE A
ZONE
29
28
27
32
33
98
700
485B
SEABOARD COAST LINE RAILROAD
BM
87
109
107
94
82
86
122
103
132
123
115
125
131
152
170
137
144
220
222

APPROXIMATE SCALE

2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

HERNANDO COUNTY, FLORIDA

(UNINCORPORATED AREAS)

PANEL 75 OF 400

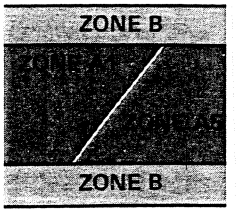
COMMUNITY-PANEL NUMBER
120110 0075 B

EFFECTIVE DATE:
APRIL 17, 1984

Federal Emergency Management Agency

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations*
100-Year Flood Boundary
500-Year Flood Boundary



Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — RM7×

Zone D Boundary

River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

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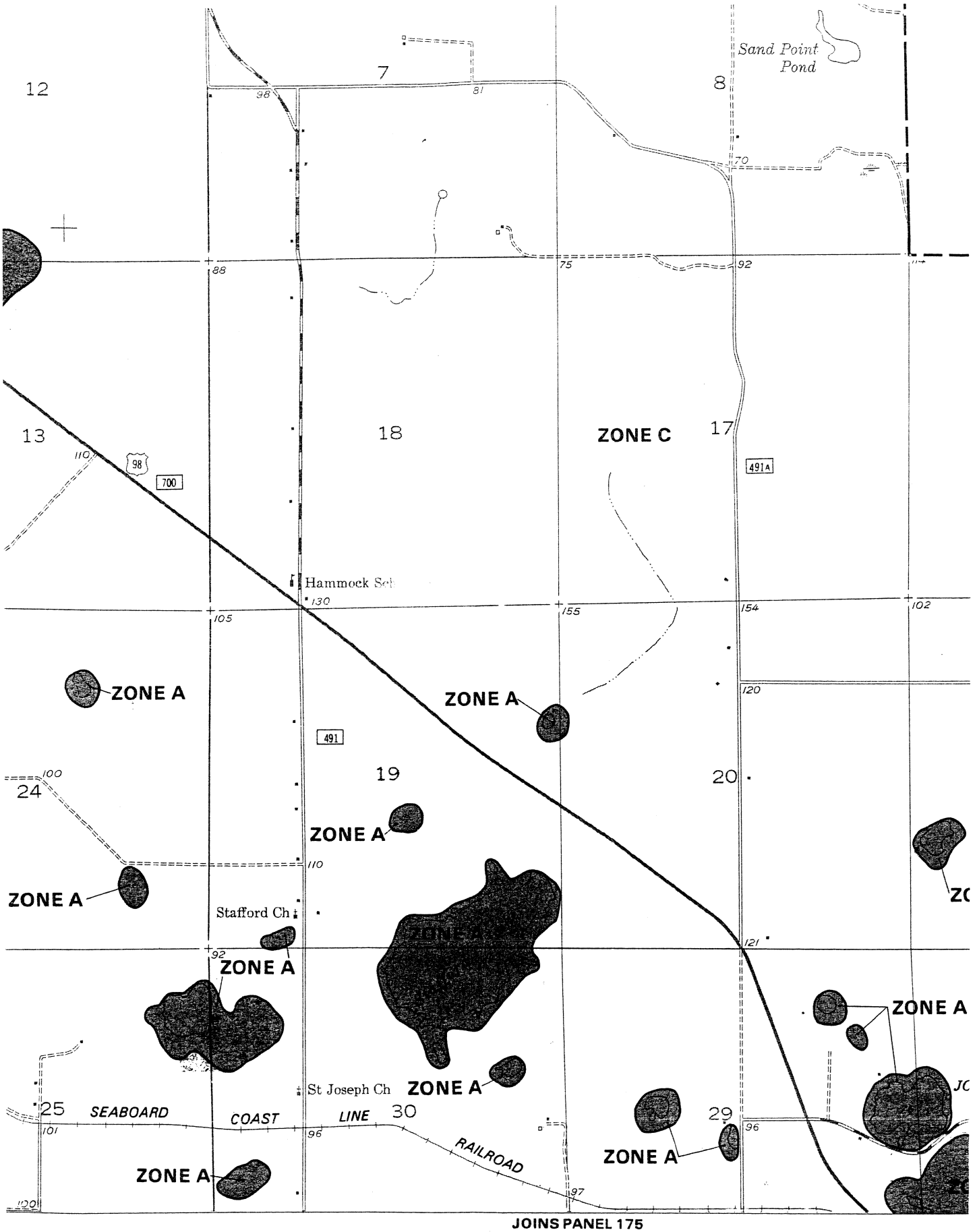
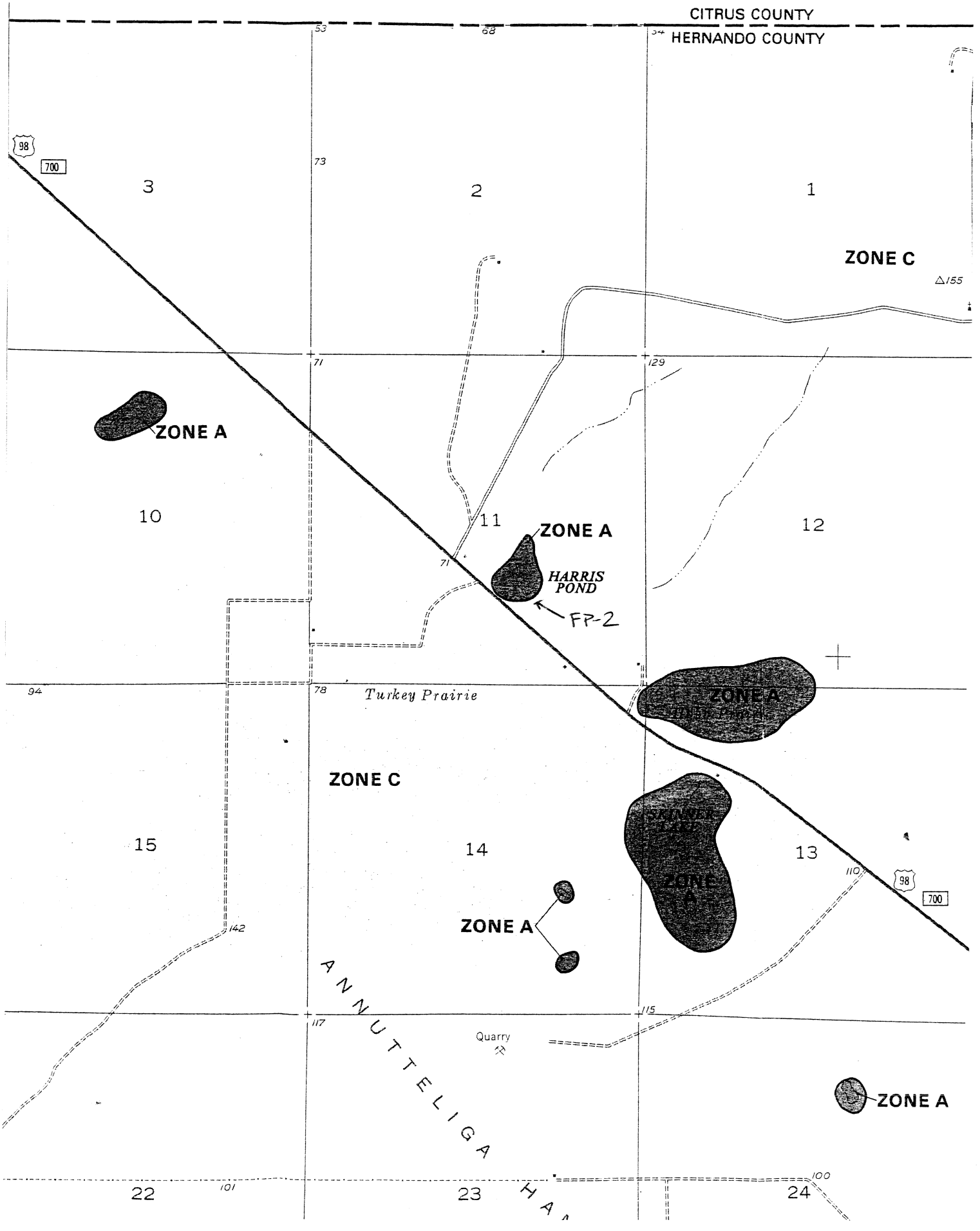


JOINS PANEL 175


CITRUS COUNTY
HERNANDO COUNTY
98
700
3
2
1
ZONE C
△155
ZONE A
10
11
12
ZONE A
HARRIS POND
FP-2
Turkey Prairie
ZONE A
ZONE C
15
14
13
SKINNER LAKE
ZONE A
ZONE A
98
700
ANNUTTELIGA
Quarry
ZONE A
22
23
24

APPENDIX B

LOCHNER

H. W. LOCHNER, INC., 13577 FEATHER SOUND DRIVE, SUITE 600, CLEARWATER, FLORIDA 33762 (727) 572-7111
FAX (727-571-3371

MEMORANDUM

TO: Cobb Rd./US 98 PD&E Study File

FROM: Rick Sowers

CC: Herschel Conner, Angie Patterson

DATE: April 3, 2002

SUBJECT: Summary of Telephone Conversation with Jerry Sanford ((352) 797-5700), FDOT, Brooksville Maintenance office

---

1. **Participants:** Rick Sowers (HWL) & Jerry Sanford (FDOT)

2. **Purpose:** On this date, I called to find out about known/historical drainage or flooding problems related to structures or conveyance systems along the existing roadway within the project limits of the Cobb Rd./US 98 PD&E Study, and in particular, any overtopping occurrences that have been reported or observed.

3. **Summary of Discussion:** I indicated that the purpose of this information would be for documentation necessary as part of the Location Hydraulics Report/PD&E Study process. Mr. Sanford indicated that in his 40 years of being familiar with the project area, he has never observed nor has knowledge or reports of Cobb Road/US 98 within the project limits being overtopped with stormwater runoff. However, he did make note of one concern regarding a portion of US 98, left side, in the area of Skinner Lake {near existing cross drain number 30 located at Centerline Survey Station 596+50}. Approximately ten years ago, as the result of a significant rainfall event, the water surface of Skinner Lake rose to a point equal in elevation to the grassed shoulder present at the time, approximately four inches below the edge of travel lane. This lake is the low area of a closed basin. A second observation was based on his discussion with a past District Drainage Engineer (FDOT, D-1) who indicated that the project's surrounding area (including Brooksville) is unique with clay layers being close to the surface. This allows lower than normal percolation into the surrounding soils, which in turn can produce higher than expected runoff rates through a forested land cover. There were no other historical drainage related problems along the existing roadway within the project limits.

[As an aside, I reviewed our survey information, which indicated that the existing cross drain was about ¾ full of standing water, at that time, and the water surface elevation of the lake was at about 73.0 feet (NGVD). From the contours, it looks like the edge of shoulder elevation is at about elevation 74.5 to 75.0. This seems to substantiate Mr. Sanford's observation. Also, confirmation of the time frame of his observation leads me to believe that the so-called "storm of the century", that occurred on March 13, 1993 was responsible for the amount of rain experienced in the area.]