Location Hydraulic Report

US 98/SR 35/SR 700
From CR 54 to
US 301/SR 39
Project Development & Environment (PD&E) Study

Florida Department of Transportation
District 7

Work Program Item Segment No. 443368-2
ETDM Project No. 14374
Pasco County, Florida

October 2021

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

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Florida Department of Transportation

District Seven

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October 2021

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District 7 is conducting a Project Development and Environment (PD&E) study along US Highway 98 (US 98) / State Road (SR) 35 / SR 700 from CR 54 to US 301 / SR 39, in Pasco County. The study will focus on widening this section of US 98 from a 2-lane undivided facility to a 4-lane divided facility and includes the realignment of US 98 between CR 35A to US 301. The realignment allows US 98 to align with the Clinton Avenue (New SR 52) intersection at US 301 and was the results of a separate Alternatives Corridor Evaluation (ACE) study (WPI Segment No. 443368-1). The study will also evaluate issues related to traffic operations, access management, safety, and include pedestrian and bicycle accommodations.

The PD&E study objectives include: determine proposed typical sections and develop preliminary conceptual design plans for proposed improvements, while minimizing impacts to the environment; consider agency and public comments; and ensure project compliance with all applicable federal and state laws. A Type 2 Categorical Exclusion is being prepared as part of this study. The proposed improvements will include construction of stormwater management facility (SMF) and floodplain compensation (FPC) sites. The PD&E study satisfies all applicable requirements, including the National Environmental Policy Act (NEPA), to qualify for federal-aid funding of subsequent development phases (design, right of way acquisition, and construction).

This Location Hydraulic Report was prepared to evaluate risks associated with the implementation of this project, impacts on natural and beneficial floodplain values, the discouragement of incompatible floodplain development, and measures to minimize floodplain impacts. This report was conducted in accordance with 23 CFR 650 Subpart A, Section 650.111. The protection of floodplains and floodways is required and the intent of the regulations are to avoid and minimize any encroachments within floodplains that may reduce available storage and/or increase water surface elevations by the proposed improvements.

The project is located within Federal Emergency Management Agency (FEMA) Insurance Rate Maps (FIRMs) 12101C0280F, 12101C0285F, 12101C0295F, and 12101C0315F in Pasco County, effective 9/26/2014. The project extends through areas of FEMA Flood Zone A and AE. Zone A has a 1% probablilty of flooding every year and no water elevations have been established. Zone AE has a 1% probability of flooding every year and a determined base flood elevation (BFE). The flood zones within the project area are associated with the Hillsborough River and the Green Swamp with elevations ranging from 82 to 84 feet NAVD. There are 31.82 acres of estimated impacts to the floodplain which result in approximately 120.07 ac-ft of volumetric impacts based on the flood elevation and the SHW values.

These impacts are transverse and unavoidable as the floodplain extends well outside of the corridor. Development within the 100-year floodplain has the potential for placing citizens and property at risk of flooding and producing changes in floodplain elevations. Improvements within floodplains increase the potential for flooding by limiting flood storage capacity. Development also reduces vegetated buffers that protect water quality and impacts important habitats for fish and wildlife.

Floodplain impacts are proposed to be mitigated for in offsite floodplain compensation sites on a cup-for-cup basis. The calculated sizes of the floodplain compensation areas were designed to be at least 5% larger than those of the impact areas to account for increases due to maintenance access and tying back into existing ground. **Table E-1** shows the summary of floodplain impacts and the compensation areas to be provided.

Table E-1 Summary of Floodplain Encroachment and Proposed Mitigation

Total Area of Impacts (Acres)	100-Year Volume of Impact (Ac-FT)	Area of FPC (Acres)	Volume of FPC (Ac-Ft)
31.82	120.07	39.95	130.92

The analysis in this report indicates that the recommended alternative is feasible from a hydraulic perspective. Existing drainage patterns will be maintained. Where unavoidable, floodplain impacts are proposed to be compensated with new floodplain compensation sites. No significant changes to the base flood elevation or mapped floodplains are anticipated. The drainage design will be consistent with FEMA, FDOT, and Southwest Florida Water Management District (SWFWMD) design guidelines.

There will be no significant or 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. It has been determined that this encroachment is not significant.

According to the PD&E Manual Figure 13-1, the improvements can be categorized as

Statement 4: PROJECTS ON EXISTING ALIGNMENT INVOLVING REPLACEMENT OF EXISTING DRAINAGE STRUCTURES WITH NO RECORD OF DRAINAGE PROBLEMS

The proposed structure will perform hydraulically in a manner equal to or greater than the existing structure, and backwater surface elevations are not expected to increase. Thus, 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 this encroachment is not significant.

It has been determined, through consultation with local, state, and federal water resources and floodplain management agencies that there is no regulatory floodway involvement on the project and that the project will not support base floodplain development that is incompatible with existing floodplain management program.

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SECTION 1 INTRODUCTION

1.1 PD&E STUDY PURPOSE

The objective of the PD&E study is to assist the FDOT's Office of Environmental Management (OEM) in reaching a decision on the type, location, and conceptual design of the proposed improvements for the widening of US Highway 98 (US 98), including stormwater management facility (SMF) and floodplain compensation (FPC) sites. This study documents 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 intersection enhancement alternatives.

The PD&E study satisfies all applicable requirements, including the National Environmental Policy Act (NEPA), to qualify for federal-aid funding of subsequent development phases (design, right of way acquisition, and construction). This project was screened through the FDOT's Efficient Transportation Decision Making (ETDM) process as ETDM Project No. 14374. The ETDM Programming Screen Summary Report was published on August 16, 2021, containing comments from the Environmental Technical Advisory Team (ETAT) on the project's effects on various natural, physical, and social resources. A Type 2 Categorical Exclusion will be prepared as part of this PD&E study.

The project is located in Sections 11, 12, 13, and 14, Township 25S, and Range 21E; and Sections 18, 19, 20, 27, 28, 29, 34 and 35, Township 25S, and Range 22E; Pasco County, Florida. See **Figure 1-1** for Project Location Map.

1.2 PROJECT PURPOSE AND NEED

Purpose

The purpose of this project is to evaluate the realignment of US 301 at US 98 and Clinton Avenue to enhance safety and provide system linkage/regional connectivity.

Need

A realignment of US 98 to Clinton Avenue intersection is needed to eliminate the existing closely spaced intersections of US 301 at US 98 and US 301 at Clinton Avenue, to reduce crashes, and to enhance safety. Construction of the realignment of SR 52 from east of McKendree Road to east of US 301 began in 2019 and will serve as an additional east/west route in the regional transportation network. When completed, this improvement will increase traffic at the US 301 at US 98 and US 301 at Clinton Avenue intersections, exacerbating the current intersection safety concerns. Also, plans are currently underway for the widening of US 98 from north of West Socrum Loop Road to South of CR 54 (Financial Management No.: 436673-1-22-01). This project will address capacity needs for the final segment of US 98 connecting to US 301 (which is a designated regional freight mobility corridor) as well as operational improvements to the intersection of US 98 and US 301 ultimately resulting in enhanced transportation network connectivity.

System Linkage

US 98 is a regional corridor which provides a connecting link between Polk and Pasco Counties and, within the area, provides a connection to the cities of Lakeland and Bartow to the south.

US 98 is the longest road in Florida and spans from Pensacola to Palm Beach primarily traveling along the Gulf Coast. Plans are currently underway for the widening of US 98 from north of West Socrum Loop Road to South of CR 54 (Financial Management No.: 436673-1-22-01). This project will provide additional capacity for the final segment of US 98 connecting to US 301 (which is a designated regional freight mobility corridor) as well as operational improvements to the intersection of US 98 and US 301 ultimately resulting in enhanced transportation network connectivity. Currently, this segment of US 98 experiences truck volumes in excess of 23% of annual average daily traffic (AADT) which illustrates this facility's importance to the overall freight network within the State of Florida.

Also, the SR 52/Clinton Avenue extension from I-75 to West of Fort King Road (Financial Management No.: 435142-1) is currently under construction. This extension will provide direct linkage to I-75 from this project.

Safety

The closely spaced intersections of US 301 at US 98 and US 301 at Clinton Avenue have crash rates that exceed the statewide average. Between 2014 and 2018, the intersection of US 301 at US 98 experienced a total of 63 crashes. The predominant crash types were angle crashes (58%) followed by rear end crashes (29%). This intersection exhibited a crash rate (0.816 crashes per million entering vehicles) that was consistently higher than the statewide average (0.270) for a similar type of intersection resulting in a crash ratio of 3.022 (crash rate divided by statewide average crash rate).

Between 2014 and 2018, the intersection of US 301 and Clinton Avenue experienced a total of 65 crashes. The predominant crash types were rear end crashes (55%) followed by angle crashes (25%). This intersection exhibited a crash rate (1.259) that was consistently higher than the statewide average (0.526) for a similar type of intersection resulting in a crash ratio of 2.394. A realignment of US 98 to Clinton Avenue to eliminate high traffic volumes at one of the two closely spaced intersections has the potential to reduce crashes and enhance safety.

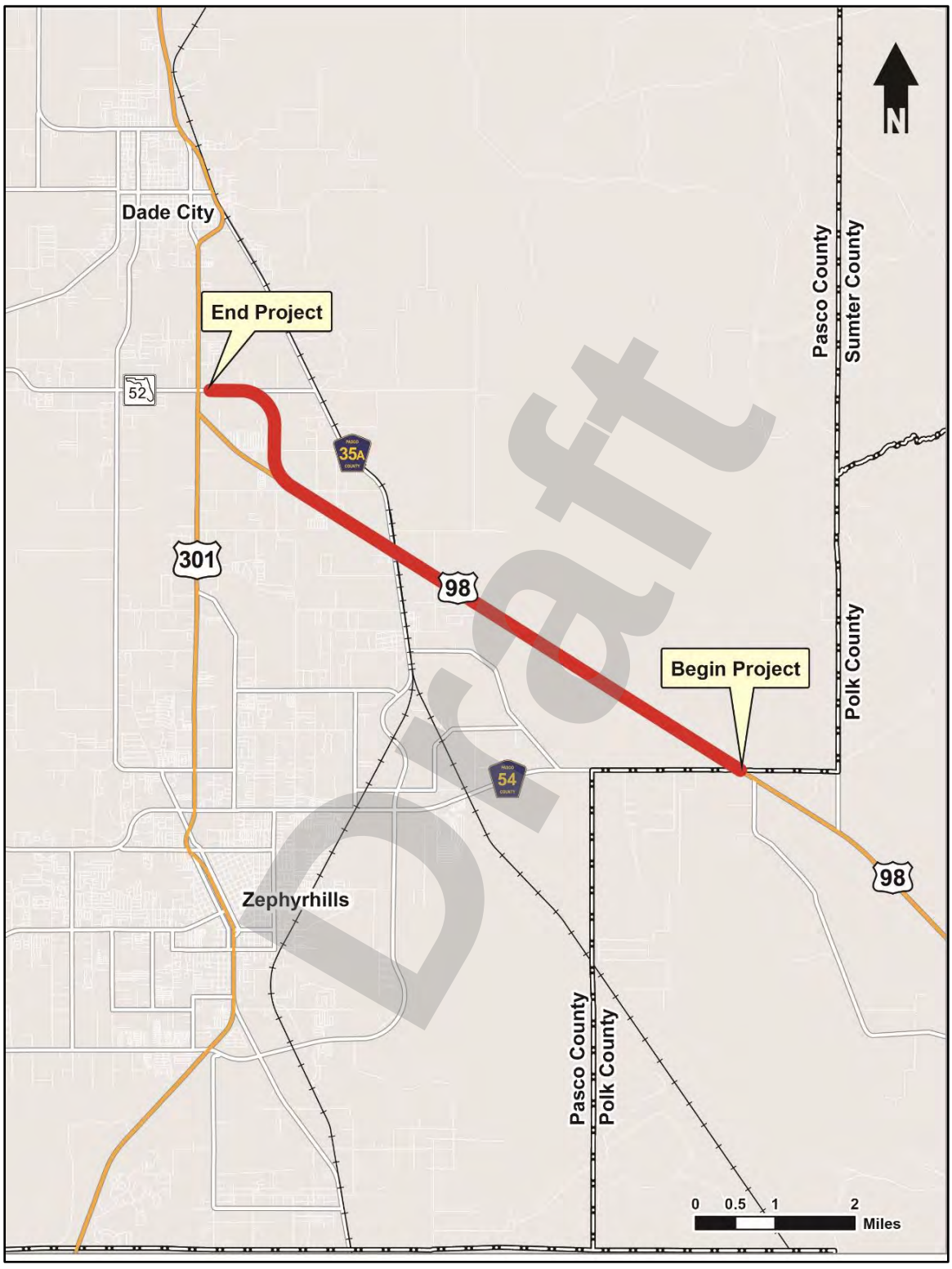

Figure 1-1 Project Location Map

1.3 EXISTING FACILITY AND PROPOSED IMPROVEMENTS

1.3.1 Existing Facility

The existing US 98 from the Polk County Line / CR 54 to US 301 is a 2-lane roadway. The roadway is functionally classified by FDOT as an Urban Principal Arterial – Other. In Pasco County, the 2-lane undivided facility has 12-foot travel lanes and 4-foot paved shoulders. The existing right of way (ROW) along the project corridor is 160 feet wide. There are two (2) existing bridges in the project limits. The first carries US 98 over the Hillsborough River Bridge and the second carries US 98 over Old Lakeland Highway and the CSX railway. There are no sidewalks, multi-use trails, bike lanes or other similar multi-modal facilities within the project corridor.

1.3.2 Proposed Improvements

The proposed improvements will widen US 98 to a 4-lane divided facility from CR 54 to north of Townsend Road and realign US 98 from north of Townsend Road to US 301. The realignment allows US 98 to align with the Clinton Avenue (New SR 52) intersection at US 301 and was the results of a separate Alternatives Corridor Evaluation (ACE) study (WPI Segment No. 443368-1).

The widened 4-lane divided facility will consist of 11 to 12-foot travel lanes with a varying 22 to 40-foot median. Where the roadway is widened, the roadway consists of a rural typical section and will fit within the existing 160-foot wide ROW. In the realignment section, the roadway consists of a suburban typical section within a proposed 245-foot wide ROW and include a 6-foot sidewalk on the east side of the road and a 12-foot trail on the west side of the road. Where the new US 98 connects to Clinton Avenue and extends to US 301, the roadway consists of an urban typical section within a 140-foot wide ROW and includes a 6-foot sidewalk on the east side of the road and a 12-foot trail on the west side of the road that will connect to the existing trail on US 301.

1.4 REPORT PURPOSE

The purpose of this Location Hydraulic Report is to document the risks associated with the implementation of this project, impacts on natural and beneficial floodplain values, the discouragement of incompatible floodplain development, and measures to minimize floodplain impacts. This Location Hydraulic Report was conducted in accordance with 23 CFR 650 Subpart A, Section 650.111. The protection of floodplains and floodways is required and the intent of the regulations are to avoid and minimize any encroachments within floodplains that may reduce available storage and/or increase water surface elevations by the proposed improvements.

SECTION 2 EXISTING DRAINAGE PATTERNS

The topography of the project area is relatively flat, with a majority of the project draining towards the Hillsborough River and Withlacoochee River. Elevations range from a high of approximately 108.00-feet to a low of 74.50-feet based on the LiDAR contours. The runoff ultimately outfalls to Florida waterbody identification numbers WBID 1443A (Hillsborough River Waterbody), WBID 1329F (Withlacoochee Waterbody), WBID 1403B (Clear Lake Outlet Waterbody) and WBID 1445 (Port Lonesome Waterbody). The FDEP statewide comprehensive verified list of impaired waters has been reviewed, and it has been identified that WBID 1443A (Hillsborough River Waterbody) is impaired for dissolved oxygen. WBID 1329F (Withlacoochee Waterbody), WBID 1403B (Clear Lake Outlet Waterbody) and WBID 1445 (Port Lonesome Ditches Waterbody) are not impaired. Net improvements will not be required for this project due to none of the receiving waterbodies being impaired for nutrients. Project drainage basins within the Hillsborough River and Withlacoochee River waterbodies outfall directly to Special Outstanding Florida Waters (OFWs). Project drainage basins within the Clear Lake Outlet waterbody do not outfall directly to Outstanding Florida Waters (OFWs).

Runoff is typically divided from the roadway crown and conveyed by roadside ditches and side drains to project low points. The existing drainage boundaries will be mostly maintained in the future condition.

The project has been subdivided into 10 basins. Refer to **Table 2-1** for a summary of the existing basins. Basins 800 and 900 are closed basins. Refer to **Appendix A** for the Pre Development Drainage Maps.

Table 2-1 Summary of Existing Drainage Basins

Basin	Begin Station	End Station
Basin 100	929+50	934+33
Basin 200	934+33	1018+42
Basin 300	1018+42	1184+00
Basin 400	1184+00	1203+78
Basin 500	1203+78	1224+53
Basin 600	1224+53	1250+64
Basin 700	1250+64	1286+23
Basin 800	1286+23	1313+45
Basin 900	1313+45	1381+33
Basin 1000	1381+33	1393+74

SECTION 3 FLOODPLAIN

3.1 FLOOD INSURANCE RATE MAPS (FIRMS)

The project is located within Federal Emergency Management Agency (FEMA) Insurance Rate Maps (FIRMs) 12101C0280F, 12101C0285F, 12101C0295F, and 12101C0315F in Pasco County, effective 9/26/2014. Refer to **Figure 3-1** for a summary of the firms and **Appendix B** for the full FIRM panels.

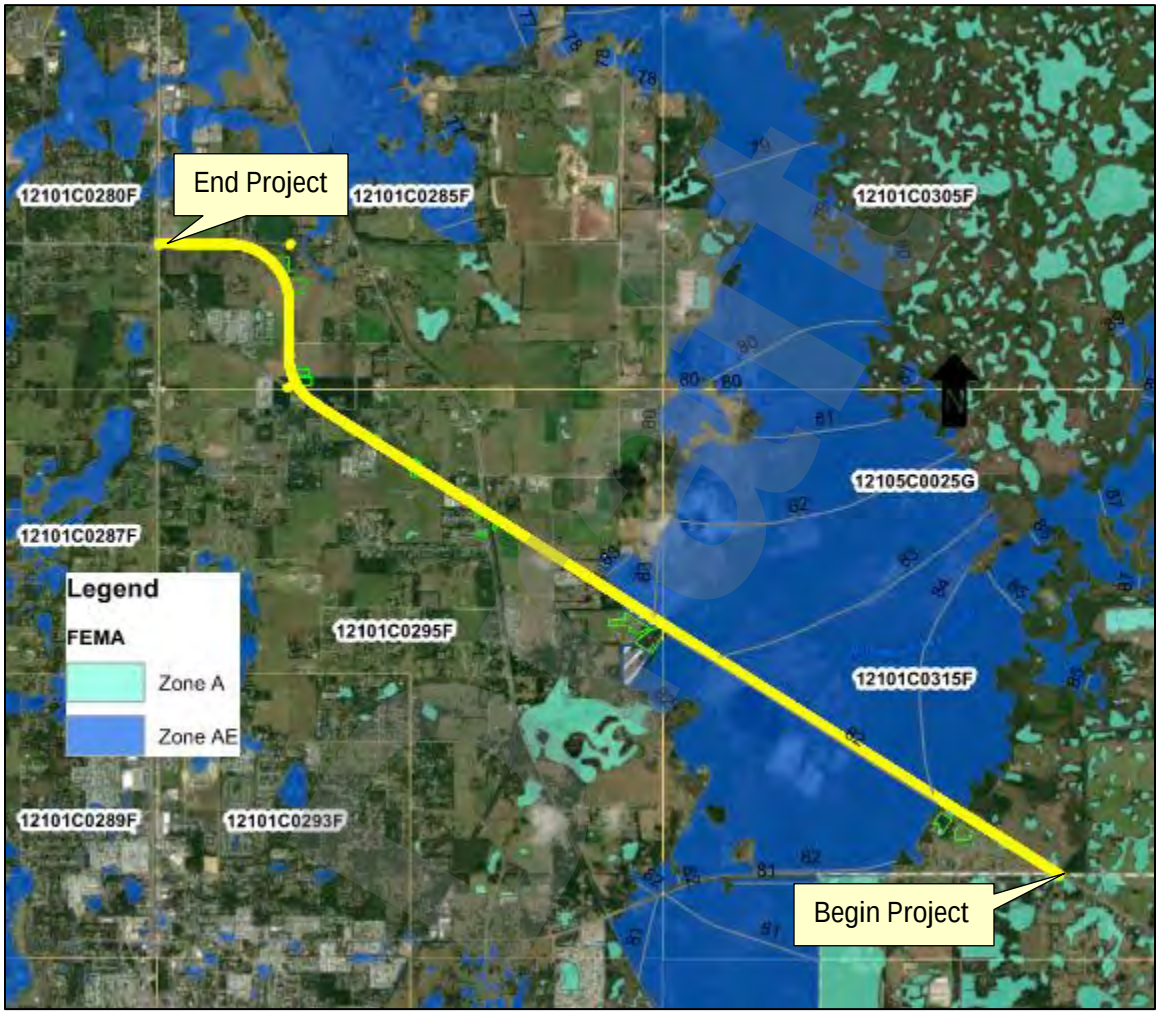

Figure 3-1 FEMA FIRMs Within Project Limits

3.2 ENCROACHMENTS

The project extends through areas of FEMA Flood Zone A and AE. Zone A has a 1% probablilty of flooding every year and no water elevations have been established. Zone AE has a 1% probability of flooding every year and a determined base flood elevation (BFE). The flood zones within the project area are associated with the Hillsborough River and the Green Swamp with elevations ranging from 82 to 84 feet NAVD. The areas on the south side of US 98 are noted with a BFE of 82. The north side of US 98 BFE ranges between 83 and 84 feet. Since both sides of the roadway are hydraulically

connected by the existing bridge over the Hilsborough River, an elevation of 84 feet has been used for impact and compensation calculations. This was confirmed during a pre-application meeting with the SWFWMD held on July 29, 2021.

Geotechnical Exploration Data Reports (for Roadway and Structures) were prepared by Test Lab, Inc. and are included in this report in **Appendix D**. For calculating floodplain impact and compensation, the SHWT used for Basin 200 and Basin 300 in the Green Swamp is approximated to be 80.00, which is based on the elevations of Borings B-25 to B-74 range from 79.9 to 82.9 and the adjacent 100-year floodplain elevation of 84.00. For calculating floodplain impact and compensation for a low area in Basin 300 in the Green Swamp the SHWT was approximated to be 78.00, which is based on (the elevations of Borings B-75 to B-83 range from 75.6 to 81.8. and the adjacent 100-year floodplain elevation of 84.00). The impacts are summarized in **Table 3-1**. Refer to **Appendix C** for the Floodplain Impact Maps.

Table 3-1 Summary of Floodplain Impacts

Basin	Side	Floodplain Impact (FPI) Area	Flood Zone	BFE (Ft.-NAVD-88)	SHW (Ft.-NAVD-88)	Total Area of Impacts (Acres)	100-Year Volume of Impact (Ac-FT)
200	South	FPI-B200-SOUTH-01	A, AE	84.00	80.00	0.46	0.80
		FPI-B200-SOUTH-02					
		FPI-B200-SOUTH-03	A	84.00	80.00	6.10	0.62
		FPI-B200-SOUTH-04	A	84.00	80.00	6.16	14.24
200	North	FPI-B200-NORTH-01	AE	84.00	80.00	2.80	8.07
300	South	FPI-B300-SOUTH-01	AE	84.00	78.00	4.96	27.13
		FPI-B300-SOUTH-02					
		FPI-B300-SOUTH-03	A	84.00	80.00	8.81	60.62
300	North	FPI-B300-NORTH-01	AE	84.00	80.00	2.53	8.59
		FPI-B300-NORTH-02					
		FPI-B300-NORTH-03					
					Totals	31.82	120.07

These impacts are transverse and unavoidable as the floodplain extends well outside of the corridor. Development within the 100-year floodplain has the potential for placing citizens and property at risk of flooding and producing changes in floodplain elevations. Improvements within floodplains increase the potential for flooding by limiting flood storage capacity. Development also reduces vegetated buffers that protect water quality and impacts important habitats for fish and wildlife.

3.2.1 FPI-B200-SOUTH-01

FPI-B200-SOUTH-01 is located left of the centerline (CL) between Sta. 983+66 and 987+53 in Basin 200. The floodplain associated with this encroachment is classified as Zone A and is assumed to have

a base flood elevation of 84.0 feet. The 100-year elevation for this floodplain is based on the adjacent Zone AE Floodplain which has a 100-year elevation of 84.0. The encroachment area is within a wetland that is approximately 31 feet left of the CL to the right-of-way line.

3.2.2 FPI-B200-SOUTH-02

FPI-B200-SOUTH-02 is located left of the CL between Sta. 1017+17 and 1017+65 in Basin 200. The floodplain associated with this encroachment is classified as Zone AE and its base flood elevation was estimated using topographic contours to be 84.0 feet. The encroachment area is within a wetland that is approximately 17 feet left of the CL at the Hillsborough Bridge.

3.2.3 FPI-B200-SOUTH-03

FPI-B200-SOUTH-03 is located left of the CL between Sta. 973+55 to Sta. 978+51 in Basin 200. SMF 200-2 has a portion identified in a FEMA floodplain and is adjacent to the FEMA floodplain classified as Zone AE and has a determined base flood elevation of 84.0 feet. This floodplain impact has been identified only if SMF-200-2 is selected, as the existing grades in the area of SMF-200-2 are 83.00 to 86.00. The encroachment area extends in the location of SMF 200-2.

3.2.4 FPI-B200-SOUTH-04

FPI-B200-SOUTH-04 is located left of the CL between Sta. 982+65 to Sta. 987+50 in Basin 200. SMF 200-1 has a portion identified in a FEMA floodplain and is adjacent to the FEMA floodplain classified as Zone AE and has a determined base flood elevation of 84.0 feet. This floodplain impact has been identified only if SMF 200-1 is selected, as the existing grades in the area of SMF 200-1 are 81.00 to 85.00. The encroachment area extends in the location of SMF 200-1.

3.2.5 FPI-B200-NORTH-01

FPI-B200-NORTH-01 is located right of the CL between Sta. 986+71 and 1017+65 in Basin 200. The floodplain associated with this encroachment is classified as Zone AE and has a determined base flood elevation of 84.0 feet. The encroachment area is within a wetland that are approximately 41 feet right of the CL to the right-of-way line.

3.2.6 FPI-B300-SOUTH-01

FPI-B300-SOUTH-01 is located left of the CL between Sta. 1019+35 and 1088+12 in Basin 300. The floodplain associated with this encroachment is classified as Zone AE and has a determined base flood elevation of 84.0 feet. The encroachment area is within a wetland that are approximately 25 feet left of the CL to the right-of-way line.

3.2.7 FPI-B300-SOUTH-02

FPI-B300-SOUTH-02 is located left of the CL between Sta. 1092+90 and 1117+54 in Basin 300. The floodplain associated with this encroachment is classified as Zone AE and has a determined base flood

elevation of 84.0 feet. The encroachment area extends along the left side of the road, set about 14 feet right of the CL to the right-of-way line.

3.2.8 FPI-B300-SOUTH-03

FPI-B300-SOUTH-03 is located left of the CL between Sta. 1119+27 and 1125+89 in Basin 300. This area is not identified as a FEMA floodplain but is adjacent to the FEMA floodplain classified as Zone AE and has a determined base flood elevation of 84.0 feet. This floodplain impact has been identified only if SMF-300-1 is selected, as the existing grades in the area of SMF-300-1 are 78.00 to 79.00. The encroachment area extends in the location of SMF 300-1.

3.2.9 FPI-B300-NORTH-01

FPI-B300-NORTH-01 is located left of the CL between Sta. 1019+35 and 1027+63 in Basin 300. The floodplain associated with this encroachment is classified as Zone AE and has a determined base flood elevation of 84.0 feet. The encroachment area extends along the right side of the road, set about 23 feet right of the CL to the right-of-way line.

3.2.10 FPI-B300-NORTH-02

FPI-B300-NORTH-02 is located right of the CL between Sta. 1041+98 and 1055+27 in Basin 300. The floodplain associated with this encroachment is classified as Zone AE and has a determined base flood elevation of 84.0 feet. The encroachment area extends along the right side of the road, set about 67 feet right of the CL to the right-of-way line.

3.2.11 FPI-B300-NORTH-03

FPI-B300-NORTH-03 is located right of the CL between Sta. 1117+58 and 1144+79 in Basin 300. The floodplain associated with this encroachment is classified as Zone AE and has a determined base flood elevation of 84.0 feet. The encroachment area extends along the right side of the road, set about 30 feet right of the CL to the right-of-way line.

SECTION 4 CROSS DRAINS

There are 9 cross drains and two bridges identified within the project limits. The cross drains are summarized in **Table 4-1** and the bridges are summarized in **Table 4-2.** CD-01 and CD-03 are old cattle crossings and will be removed as they do not provide stormwater conveyance. The remaining cross drains will require extension or replacement. The proposed size and length will be determined during the design phase of the project. Refer to **Appendix E** for the straight line diagrams.

Table 4-1 Summary of Cross Drains

Cross Drain	Station	Size	Type	Alignment	Note
CD-01	963+10	10’ x 8’	Box	US 98	To be removed
CD-02	1111+04	(2) 36”	Pipe	US 98	
CD-03	1130+00	10’ x 8’	Box	US 98	To be removed
CD-04	1139+03	36”	Pipe	US 98	
CD-05	1236+01	36”	Pipe	US 98	
CD-06	1296+23	30”	Pipe	US 98	
CD-07	1360+28	30”	Pipe	Clinton Ave	
CD-08	1390+29	36”	Pipe	Clinton Ave	
CD-09	1393+22	36”	Pipe	Clinton Ave	

Table 4-2 Summary of Existing Bridges

Structure Number	Bridge Number	Station	Alignment	Description
BR-01	BR #0024	1018+44	US 98	200.6’ Bridge over the Hillsborough River
BR-02	BR #0025	1203+78	US 98	364.3’ Bridge Over CSX Railroad and Old Lakeland Hwy.

SECTION 5 PROPOSED DRAINAGE PATTERNS

The stormwater runoff from the project limits will be collected and conveyed in roadside ditches or closed drainage systems to the proposed wet or dry detention ponds. The ponds will discharge at or near the same cross drains that carry the roadway runoff in the existing condition basins. The basins in the proposed condition will closely match the basins identified in the existing condition. The water quality treatment and water quantity attenuation will be achieved through the construction of wet or dry detention ponds, which will require the acquisition of additional right-of-way. The preferred pond sites are identified in **Table 5-1**. Refer to **Appendix A** for the proposed drainage maps.

Table 5-1 Summary of Recommended Ponds

Basin	Pond Name	Minimum Pond Site Area	
		Required (Acre)	Provided (Acre)
200	SMF 200-1	8.37	14.48
300	SMF 300-1	12.41	13.06
400	SMF 400-1	1.09	1.50
500	SMF 500-1	1.01	1.61
600	SMF 600-1	2.46	2.97
700	SMF 700-1	2.01	2.53
800	SMF 800-1	4.49	5.47
900	SMF 900-1	7.03	10.65
	Total	38.87	52.27

5.1 FLOODPLAIN COMPENSATION

Floodplain impacts have been calculated for encroachments to the 100-year floodplain within the project R/W and the alternative SMF sites. Floodplain impacts are proposed to be mitigated for in offsite floodplain compensation sites on a cup-for-cup basis. From the available data, approximate Floodplain Impact (FPI) Areas have been calculated (see **Table 3-1**). Within the project limits twelve (12) FPI segments have been identified as potential impacts to the 100-year floodplain (Zone A and AE), (see **Appendix C Floodplain Impact Maps**). Areas for floodplain compensation are identified in **Appendix A Post-development Drainage Maps**. The calculated sizes of the floodplain compensation areas were designed to be at least 5% larger than those of the impact areas to account for increases due to maintenance access and tying back into existing ground.

Areas are measured using the shapes shown in **Appendix C**. The depth of impact has been calculated from the difference between the floodplain elevation and existing ground elevation, with the seasonal high-water table elevation as the lower limit. The Zone AE floodplain elevations were taken directly from the FIRM. The Zone A floodplain elevations were estimated based on the approximate contours from LiDAR from the (SWFWMD). See **Table 5-2** for the floodplain area and volume.

Table 5-2 Summary of Floodplain Compensation Areas

Basin	Side	Floodplain Compensation (FPC) Areas	Flood Zone	BFE (Ft.-NAVD-88)	SHW (Ft.-NAVD-88)	Area of FPC (Acres)	Volume of FPC (Ac-Ft)
300	South	FPC-300-SOUTH-01*	A, AE	84.00	78.00	34.63	111.30
300	South	FPC-300-SOUTH-02	A, AE	84.00	78.00	20.47	47.45
300	North	FPC-300-NORTH-01*	AE	84.00	80.00	5.59	19.62
300	North	FPC-300-NORTH-02	AE	84.00	80.00	5.84	19.73
					Total	66.53	198.10

*Highlighted values depict recommended floodplain compensation sites

5.1.1 FPC-300-South-01 Alternative

FPC 300-SOUTH-01 is located left of the CL between Sta. 1118+86 to Sta. 1130+44 in Basin 300. This is the recommended floodplain compensation site. The compensation area is adjacent to the Green Swamp and the proposed pond SMF 300-1. The compensation area is on Parcel # 29-25-22-0000-00100-0010. A partial take of the parcel will be required for the floodplain compensation. The proposed FPC area is a vacant site with a combination of open space and woods. A residential driveway adjacent to the FPC will be maintained in the post-development conditions. The ground elevations range from 79-feet to 96-feet, and the SHW elevation was estimated to be 78.0-feet. The existing soils within the FPC consist mostly of Type A soils. Floodplain impacts to Basins 200 and 300 south of US 98 will be compensated in FPC 300-SOUTH-01. FPC 300-SOUTH-01 considers impacts from SMF 300-1 as the floodplain compensation and proposed pond are within this parcel.

5.1.2 FPC-300-South-02 Alternative

FPC 300-SOUTH-02 is located left of the CL between Sta. 1123+37 to Sta. 1138+29 in Basin 300. This is an alternate floodplain compensation site. The compensation area is one parcel away from the Green Swamp. The compensation area is adjacent to proposed pond SMF 300-2. The compensation area is on Parcels # 29-25-22-0000-00100-0020 and # 29-25-22-0000-01200-0021. Multiple partial parcel takes will be required for the floodplain compensation. The proposed FPC area is a vacant site with a combination of open space and woods. A residential driveway adjacent to the FPC will be maintained in the post-development conditions. The ground elevations range from 77-feet to 83-feet, and the SHW elevation was estimated to be 78.0-feet. The existing soils within the FPC consist mostly of Type A and A/D soils. Floodplain impacts to Basins 200 and 300 south of US 98 will be compensated in FPC 300-SOUTH-02.

5.1.3 FPC-300-North-01 Alternative

FPC 300-NORTH-01 is located right of the CL between Sta. 1151+52 to Sta. 1161+41 in Basin 300. This is the recommended floodplain compensation site. The compensation area is adjacent to the

floodplain. The compensation area is on Parcel # 20-25-22-0000-01600-0000. A partial take of the parcel will be required for the floodplain compensation. The proposed FPC area is a consists of a residential home site, open space and woods. The ground elevations range from 80-feet to 90-feet, and the SHW elevation was estimated to be 80.0-feet. The existing soils within the FPC consist mostly of Type A soils. Floodplain impacts to Basins 200 and 300 north of US 98 will be compensated in FPC 300-NORTH-01.

5.1.4 FPC-300-North-02 Alternative

FPC 300-NORTH-02 is located right of the CL between Sta. 1151+47 to Sta. 1160+09 in Basin 300. This is an alternate floodplain compensation site. The compensation area is adjacent to the floodplain. The compensation area is on Parcel # 20-25-22-0000-01400-0000. A partial take of the parcel will be required for the floodplain compensation. The proposed FPC area is a consists of a residential home site, open space and woods. The ground elevations range from 80-feet to 87-feet, and the SHW elevation was estimated to be 80.0-feet. The existing soils within the FPC consist mostly of Type A soils. Floodplain impacts to Basins 200 and 300 north of US 98 will be compensated in FPC 300-NORTH-02.

SECTION 6 RISK EVALUATION AND PROJECT CLASSIFICATION

6.1.1 RISK EVALUATION

There is no significant change in flood "risk" associated with this project. The encroachments will not have a significant potential for interruption or termination of transportation facilities needed for emergency vehicles or used as an evacuation route. In addition, no significant adverse impacts on natural and beneficial floodplain values are anticipated and no significant impacts to highway users are expected. The project traverses the Green Swamp and therefore, there will be no changes in flood risk to any residents or property loss associated with the proposed improvements.

6.1.2 PROJECT CLASSIFICATION

The proposed impacts to the floodplain could not be avoided as the existing corridor passes through the Green Swamp. The proposed impacts to the floodplain will be mitigated on a cup-for-cup basis. There are no rises to the flood stages anticipated with the proposed alternative and the proposed improvements will maintain the existing drainage patterns.

Minimal encroachments on a floodplain occur when there is floodplain involvement, but the impacts on human life, transportation facilities, and natural and beneficial floodplain values are not significant and can be resolved with minimal efforts. Normally, these minimal efforts to address the impacts will consist of applying the Department's drainage design standards and following the Water Management District's procedures to achieve results that will not increase or significantly change the flood elevations and/or limits.

There will be no significant or 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. It has been determined that this encroachment is not significant.

According to the PD&E Manual Figure 13-1, the improvements can be categorized as

Statement 4: PROJECTS ON EXISTING ALIGNMENT INVOLVING REPLACEMENT OF EXISTING DRAINAGE STRUCTURES WITH NO RECORD OF DRAINAGE PROBLEMS

The proposed structure will perform hydraulically in a manner equal to or greater than the existing structure, and backwater surface elevations are not expected to increase. Thus, 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 this encroachment is not significant.

It has been determined, through consultation with local, state, and federal water resources and floodplain management agencies that there is no regulatory floodway involvement on the project and that the project will not support base floodplain development that is incompatible with existing floodplain management program.

SECTION 7 RECOMMENDATIONS AND CONCLUSIONS

The analysis in this report indicates that the recommended alternative is feasible from a hydraulic perspective. Existing drainage patterns will be maintained. Where unavoidable, floodplain impacts are proposed to be compensated with new floodplain compensation sites. No significant changes to the base flood elevation or mapped floodplains are anticipated. The drainage design will be consistent with FEMA, FDOT, and SWFWMD design guidelines.

Table 7-1 Summary of Floodplain Encroachment and Proposed Mitigation

Total Area of Impacts (Acres)	100-Year Volume of Impact (Ac-FT)	Area of FPC (Acres)	Volume of FPC (Ac-Ft)
31.82	120.07	39.95	130.92

APPENDICES

Appendix A Drainage Maps

Appendix B FEMA FIRM Maps

Appendix C Floodplain Impact Maps

Appendix D Geotechnical Report

Appendix E Straight Line Diagram

Appendix F SWFWMD Pre-Application Minutes

APPENDIX A

Drainage Maps

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GREGG B HAMM, P.E.
P.E. LICENSE NUMBER 69760
ARCADIS U.S., INC.
3109 WEST DR. MARTIN LUTHER KING JR. BLVD.
TAMPA, FL 33607
T: 813 903 3100
CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

PRE-DEVELOPMENT DRAINAGE MAP

SHEET NO.
1

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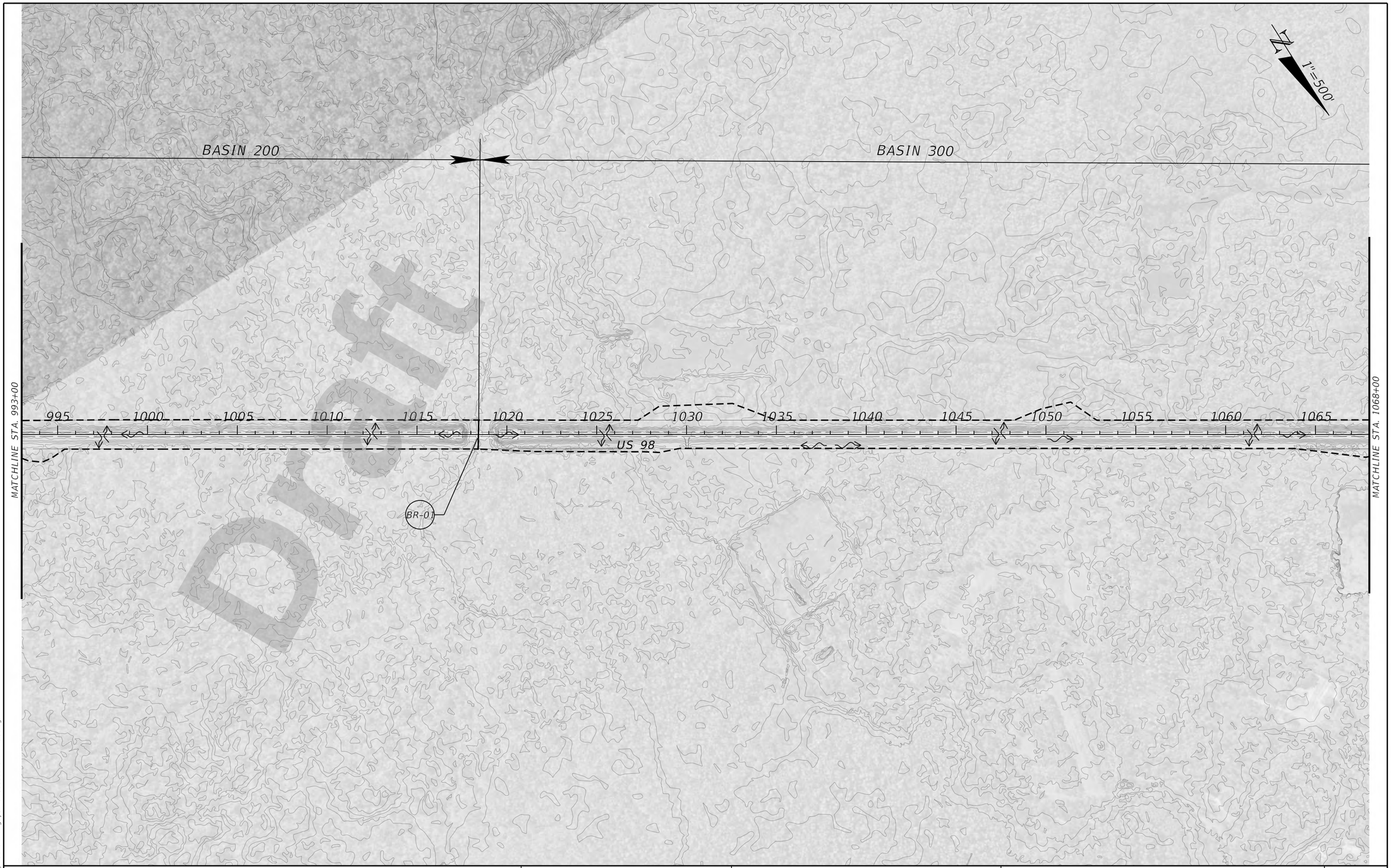

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

PRE-DEVELOPMENT DRAINAGE MAP

SHEET NO. 2

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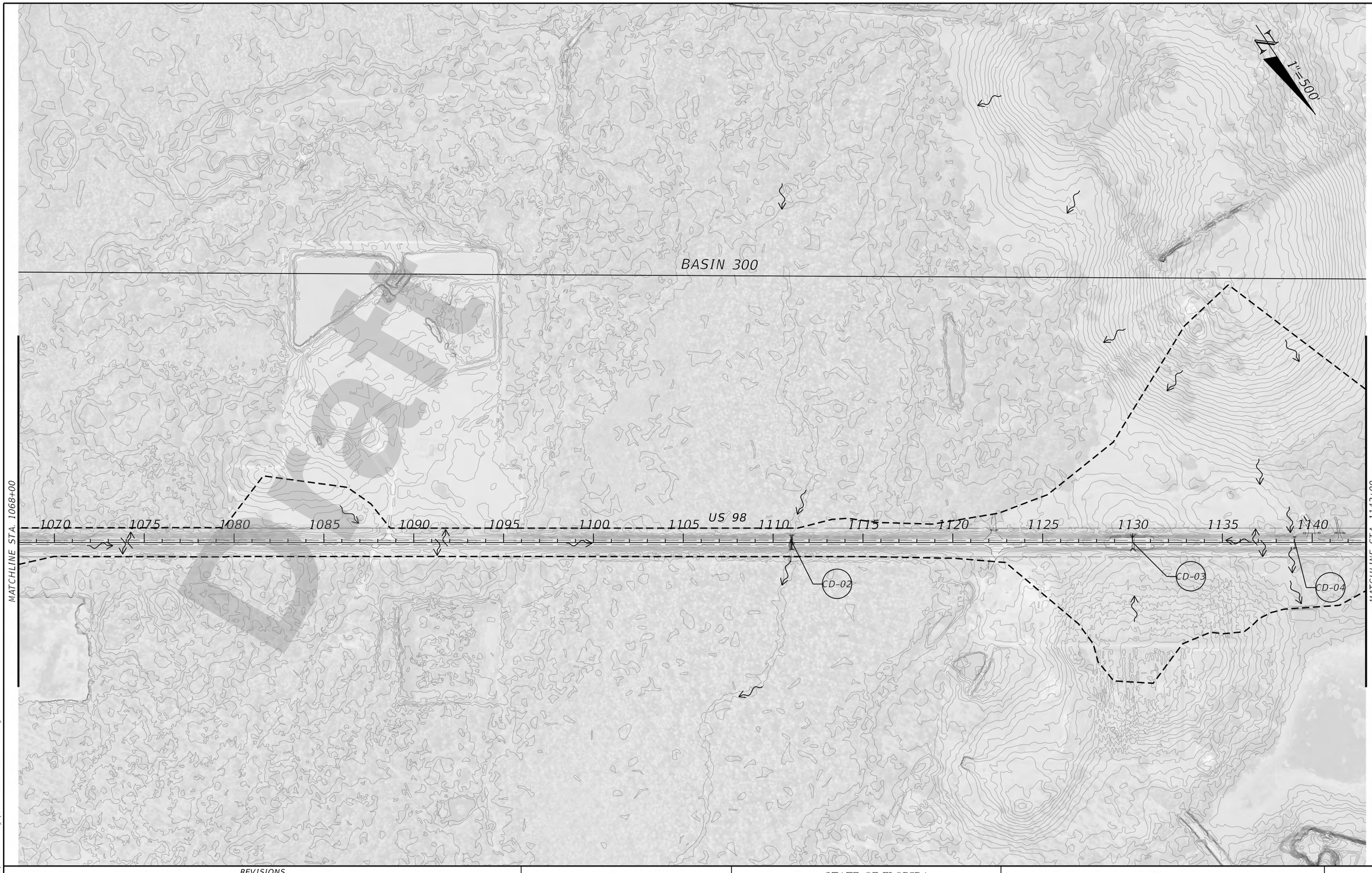

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

PRE-DEVELOPMENT DRAINAGE MAP

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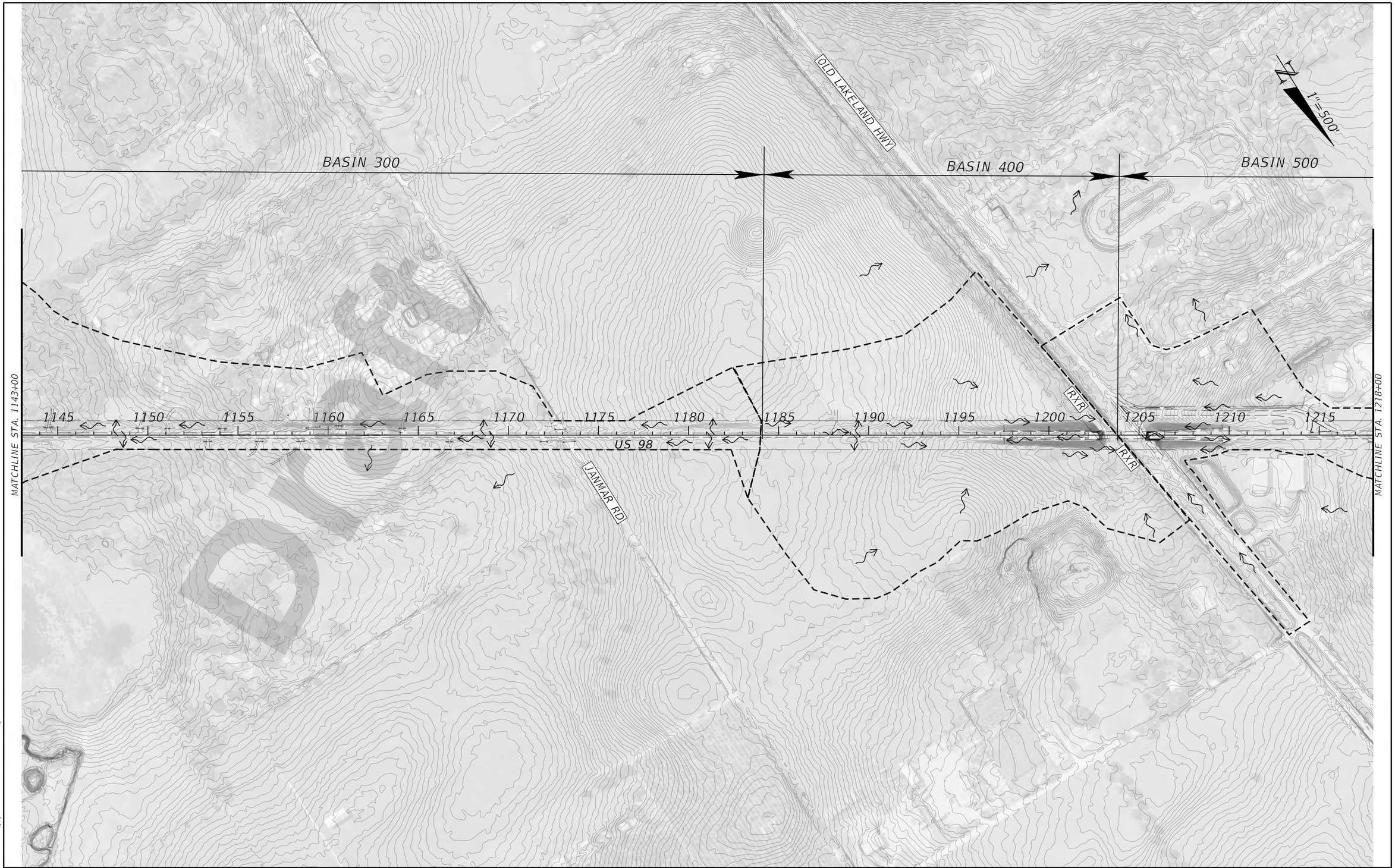

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

PRE-DEVELOPMENT DRAINAGE MAP

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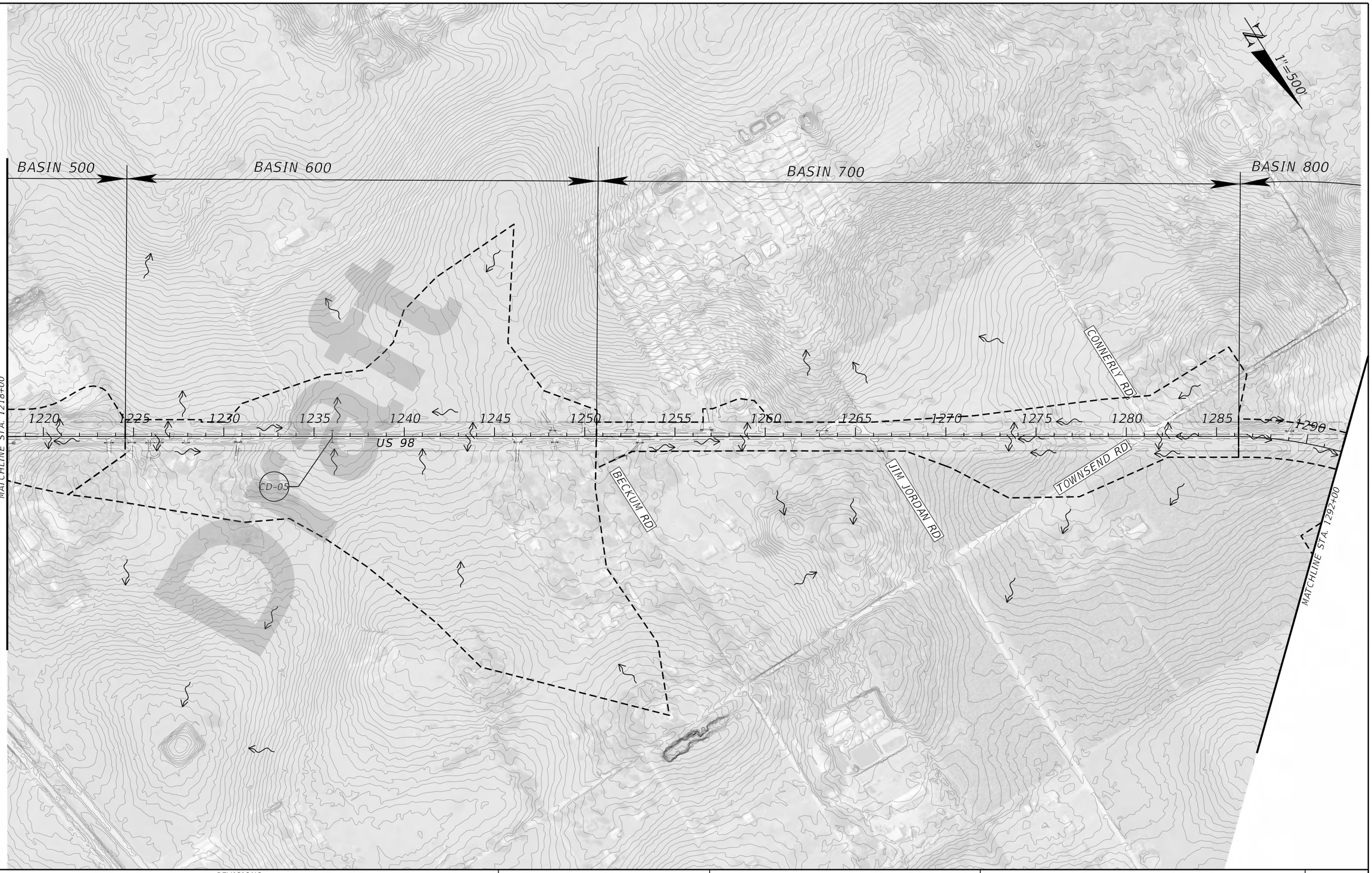

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

PRE-DEVELOPMENT DRAINAGE MAP

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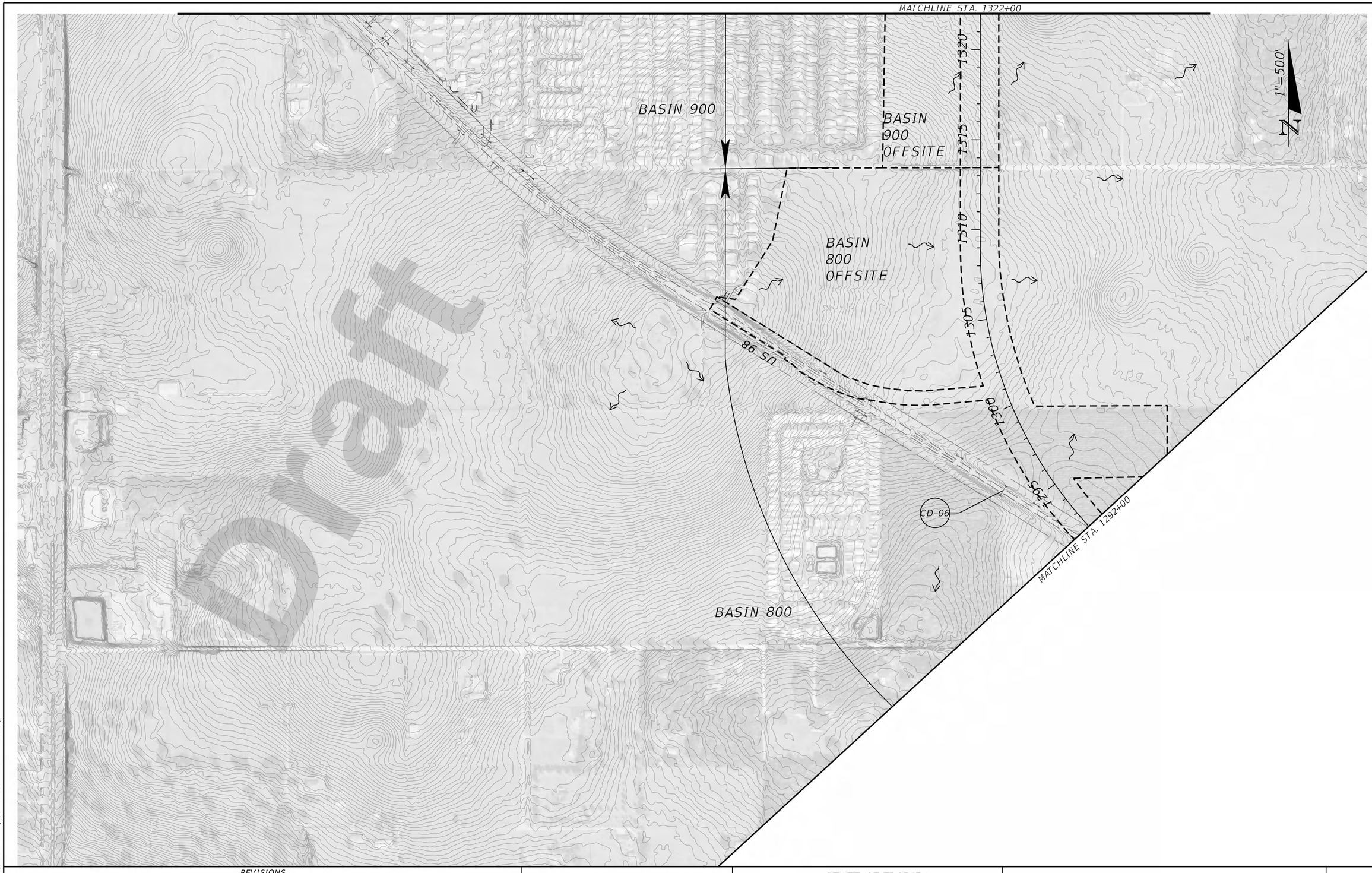

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

PRE-DEVELOPMENT DRAINAGE MAP

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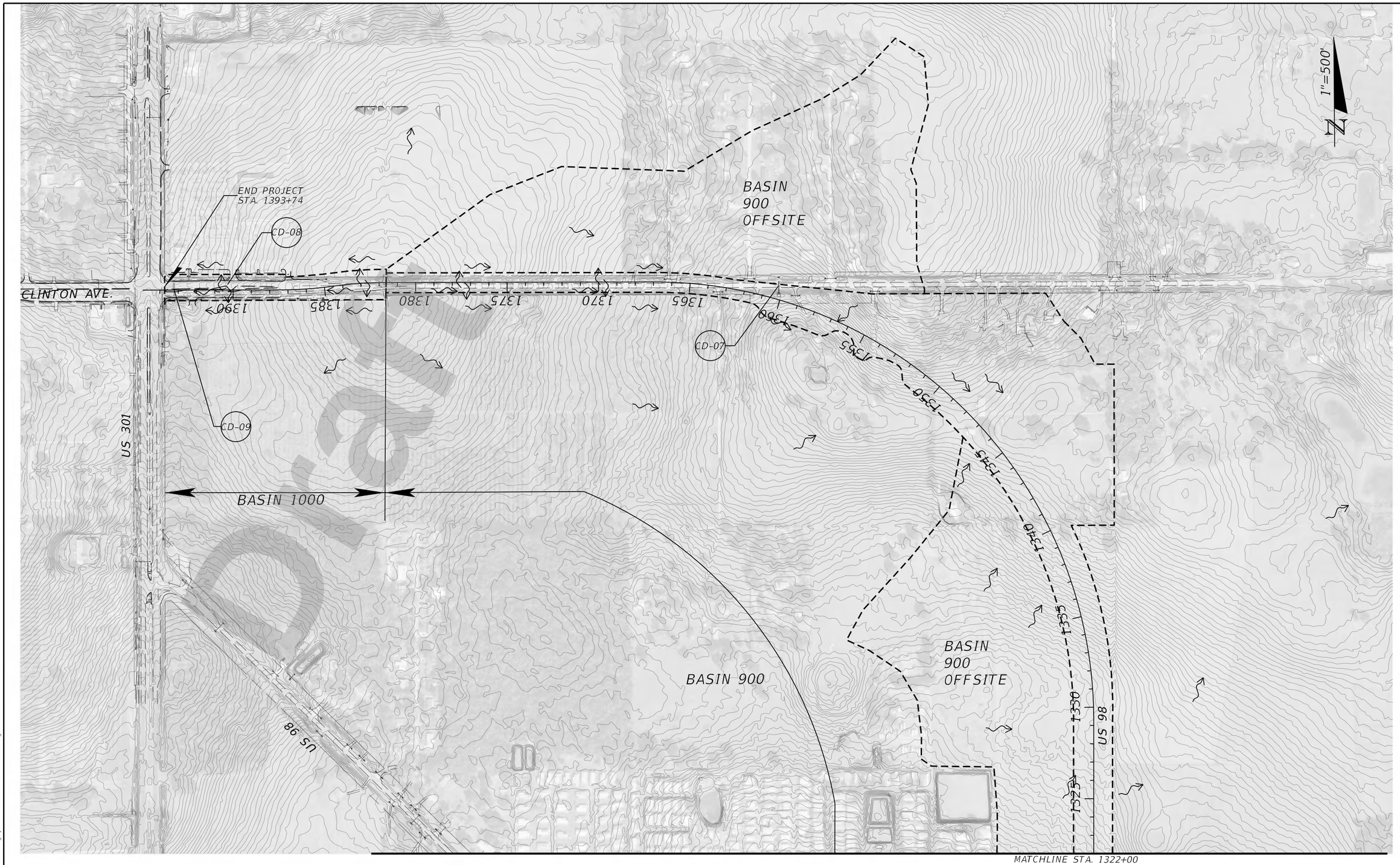

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

PRE-DEVELOPMENT DRAINAGE MAP

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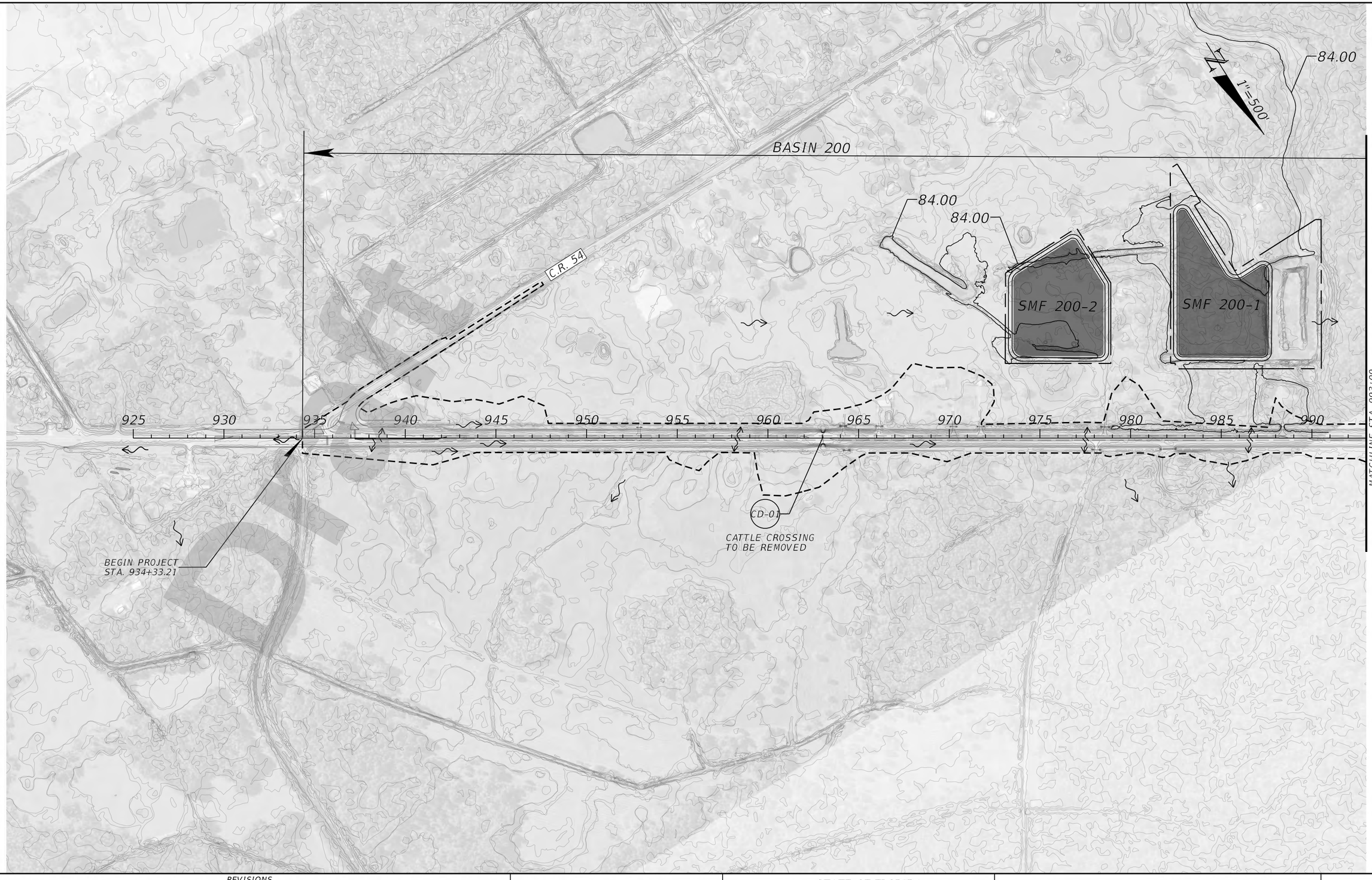

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

POST-DEVELOPMENT DRAINAGE MAP

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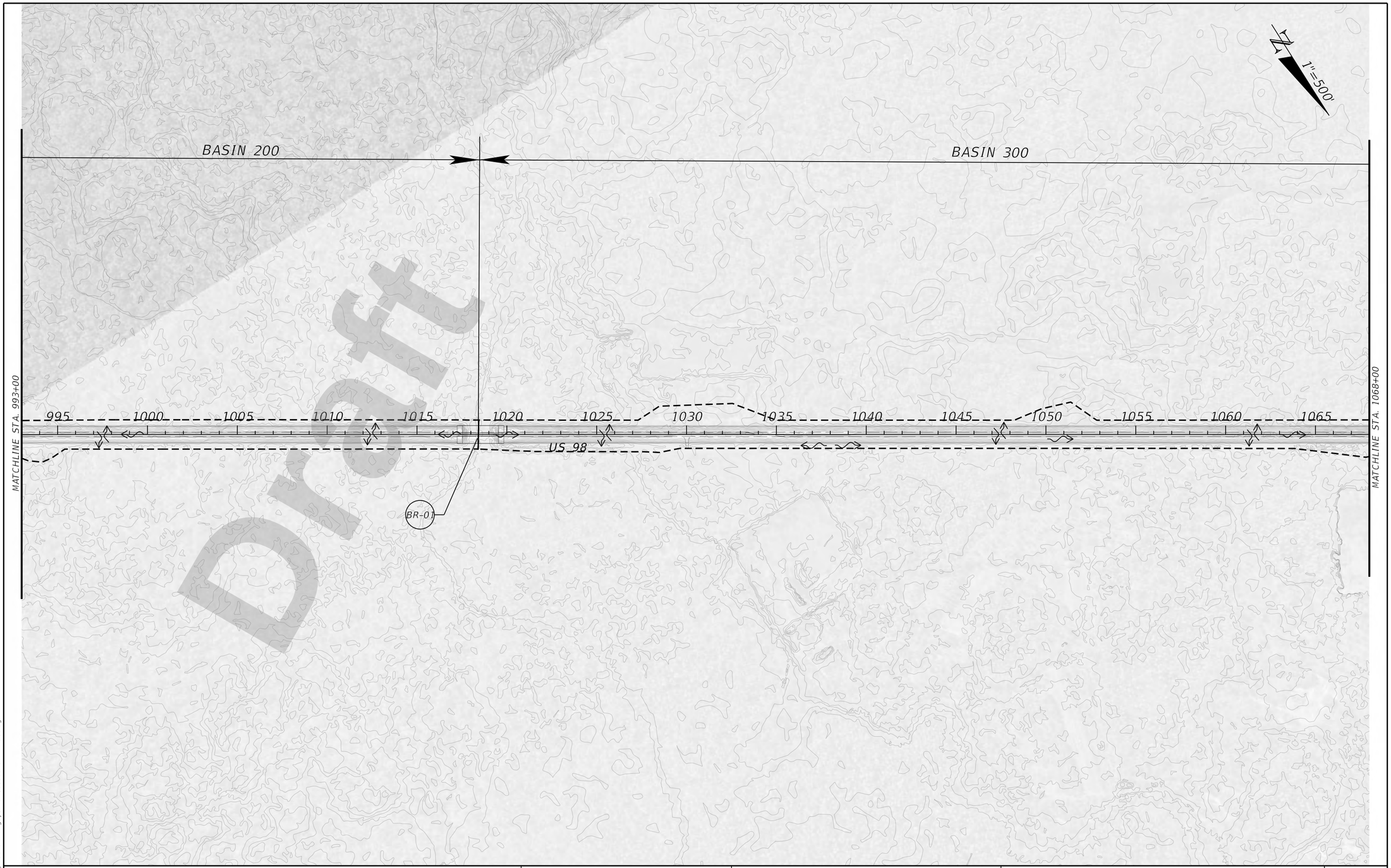

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CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

POST-DEVELOPMENT DRAINAGE MAP

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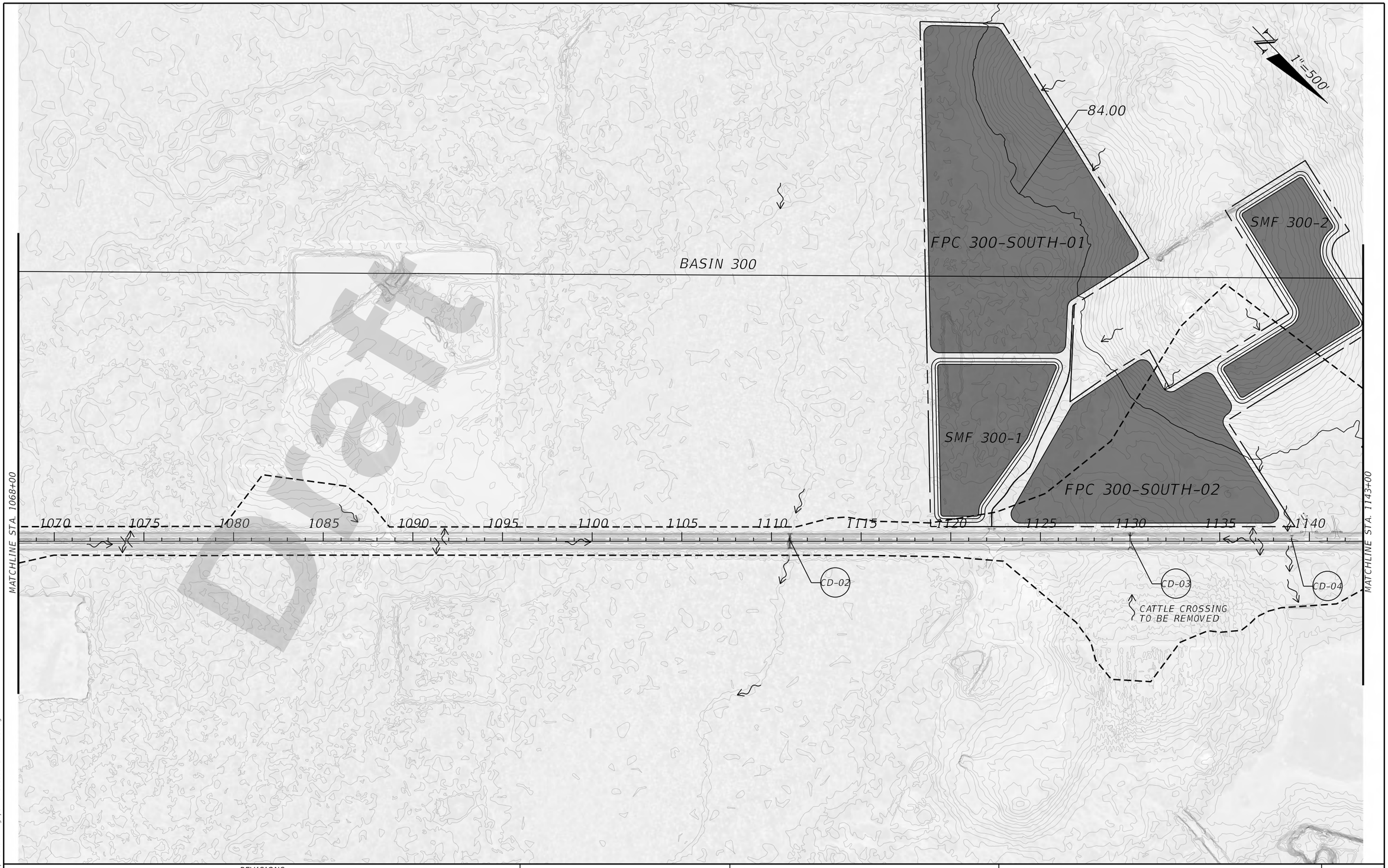

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

POST-DEVELOPMENT DRAINAGE MAP

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OLD LAKELAND HWY

N

1"=500'

BASIN 300

BASIN 400

BASIN 500

SMF 500-2

SMF 500-1

SMF 400-2

SMF 400-1

RXR

RXR

84.00

1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215

MATCHLINE STA. 1143+00

MATCHLINE STA. 1218+00

JANMAR RD

FPC 300-NORTH-01

FPC 300-NORTH-02

REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

POST-DEVELOPMENT DRAINAGE MAP

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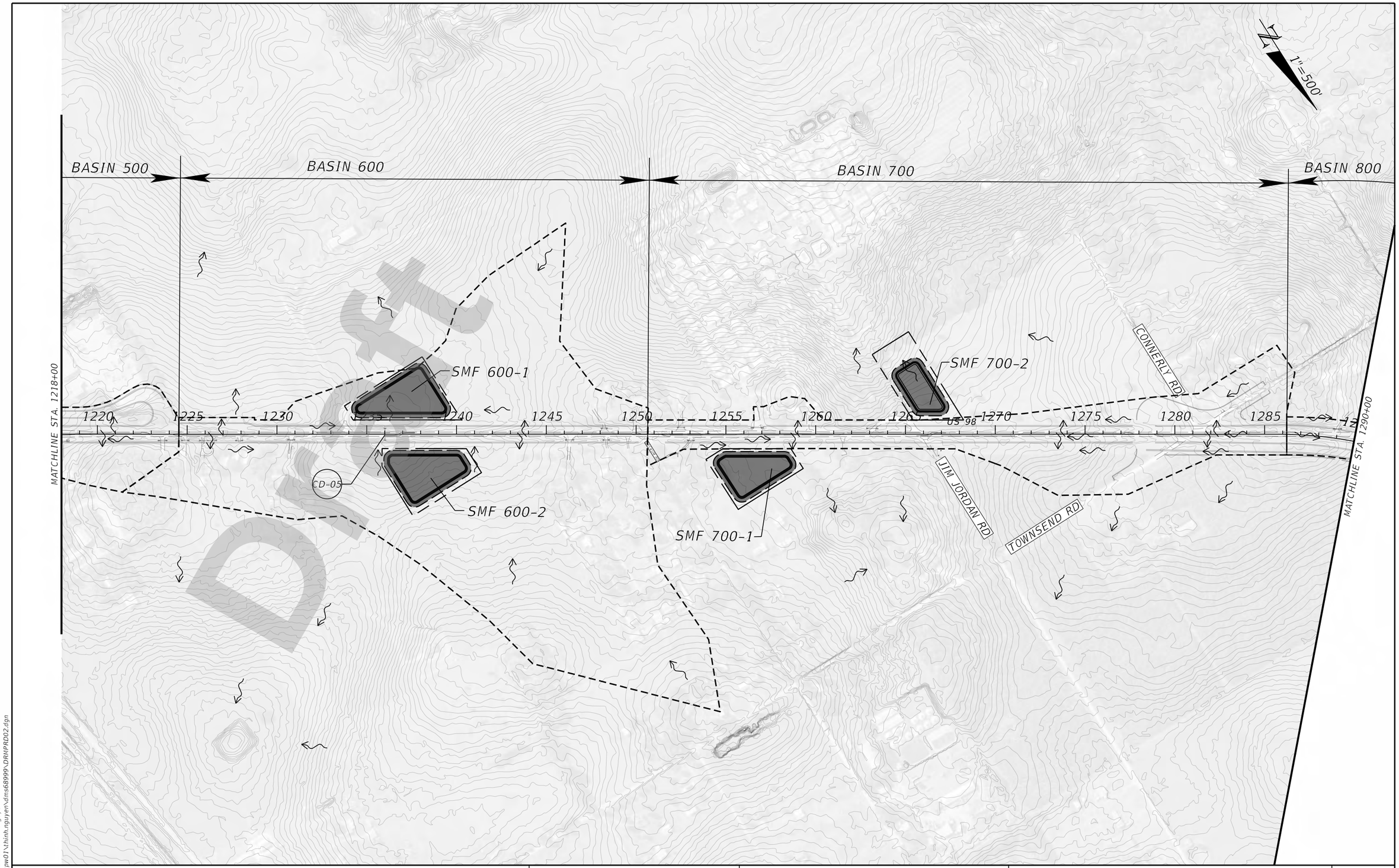

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GREGG B HAMM, P.E.
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CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

POST-DEVELOPMENT DRAINAGE MAP

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MATCHLINE STA. 1322+00

BASIN 900

BASIN 900 OFFSITE

BASIN 800 OFFSITE

BASIN 800

1320

1315

1310

1305

1300

1295

1290

1"=500'

US 98

SMF 800-1

SMF 800-2

CD-06

MATCHLINE STA. 1290+00

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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ARCADIS U.S., INC.
3109 WEST DR. MARTIN LUTHER KING JR. BLVD.
TAMPA, FL 33607
T: 813 903 3100
CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 6

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GREGG B HAMM, P.E.
P.E. LICENSE NUMBER 69760
ARCADIS U.S., INC.
3109 WEST DR. MARTIN LUTHER KING JR. BLVD.
TAMPA, FL 33607
T: 813 903 3100
CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 7

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APPENDIX B

FEMA FIRM Maps

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole foot elevations. BFEs in detailed watersheds are rounded to tenth-foot elevations, see Watershed Table below. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

Base map information shown on this FIRM was provided in digital format by the Southwest Florida Water Management District. The original orthophotographic base imagery was provided in color with a one-foot pixel resolution at a scale of 1" = 1' from photography flown January 2009.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include Letters of Map Change, a *Flood Insurance Study* report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/. A FIRMETTE (full scale section of a FIRM) is also available at this website.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

DATUM INFORMATION

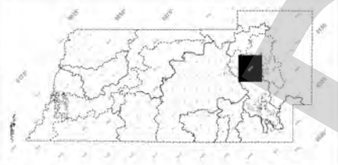
The **projection** used in the preparation of this map was State Plane Florida West. The **horizontal datum** was HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane Zone used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not reflect the accuracy of this FIRM.

Base Flood Elevation (BFEs) on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

Example Datum Offset Calculation
using datum offset table below
NAVD88 = NGVD29 + (datum offset value)

To obtain current elevation, description, and/or location information for **benchmarks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.



Watershed Boundary
Coastal Construction Control Line
Developed by the Department of Environmental Protection to safeguard coastal property from damage during storm events

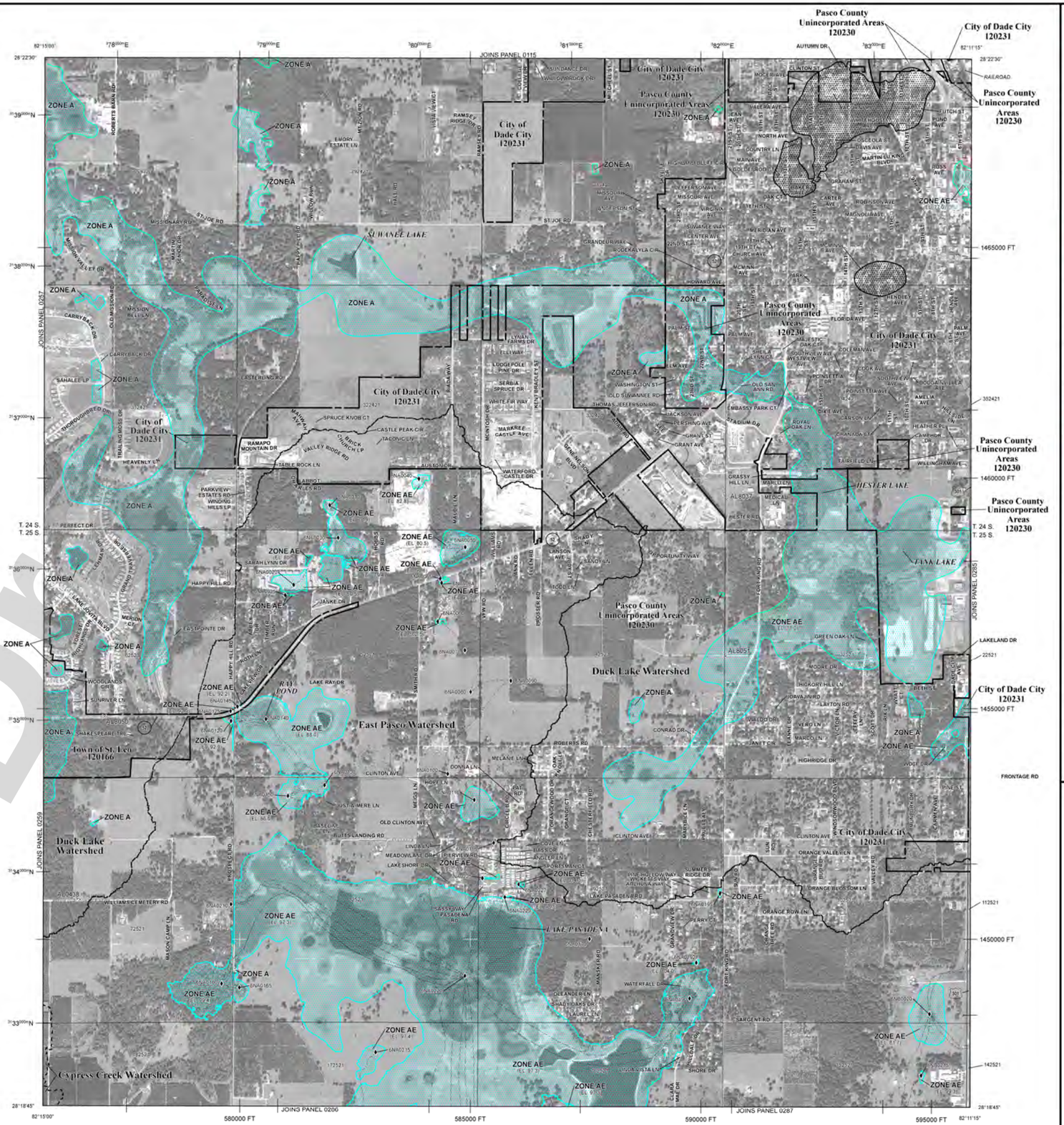
Watershed Table

Watershed	Datum Offset (ft)	Study Type	1 Day 100yr	Total Rainfall Volume (in) Multi-Day Rainfall Used[2]	Date of Model
1. Bear Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
2. Blanton Lake	-0.84	Effective Transfer	11.0	NO	09/30/92
3. Cypress Creek	-0.84	Detailed	12.4	YES	04/27/10
4. Double Hammock Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
5. Duck Lake	-0.84	Effective Transfer	11.0	NO	09/30/92
6. East Pasco	-0.84	Detailed	12.0	YES	02/23/10
7. East Pinellas Anclote	-0.84	Detailed	12.0	NO	04/26/11
8. Hammock Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
9. Lower Coastal	-0.84	Effective Transfer[1]	12.1	NO	09/30/92
10. New River	-0.84	Effective Transfer	11.1	NO	09/30/92
11. North Lakes	-0.84	Effective Transfer	N/A	NO	09/30/92
12. Pithlachascotee	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
13. Trout Creek	-0.84	Detailed	12.4	YES	06/29/10
14. Upper Hillsborough	-0.84	Effective Transfer	11.0	NO	05/01/79
15. Upper Pithlachascotee	-0.84	Effective Transfer	12.0	NO	09/30/92
16. Upper Withlacoochee	-0.84	Effective Transfer	10.9	NO	05/01/79
17. West Pinellas Anclote	-0.84	Effective Transfer	12.0	NO	09/30/92

[1]Redelineation performed for coastal flood zones
[2]Multi-Day event used only in specific sub-basins, refer to the FIS report.

[3]Zone X (shaded) 0.2% annual chance floodplain is delineated only in watersheds where the Study Type is Redelineation or Coastal. The 0.2% annual chance floodplain is not delineated in watersheds where the Study Type is Detailed. Refer to the Watershed Table for Study Type.

This digital Flood Insurance Rate Map (FIRM) was produced through a cooperative partnership between the Southwest Florida Water Management District (SWFWMD), Pasco County, Federal Emergency Management Agency (FEMA), and the associated communities within Pasco County.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X[3]	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot, and areas protected by levees from 1% annual chance flood. [3]See additional note in Watershed Table on left collar.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513 (EL 987)	Base Flood Elevation line and value; elevation in feet*
	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A A	Cross section line
23 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4775000mE	1000-meter Universal Transverse Mercator grid ticks, zone 17
6000000 FT	5000-foot grid values: Florida State Plane coordinate system, West Zone (FIPSZONE = 0902), Transverse Mercator projection
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile
222218	Section - Township - Range
7NX1000	Junction - Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).
	Hydraulic Connectivity - Flow pathway between junctions.

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 26, 2014
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0280F

FIRM

FLOOD INSURANCE RATE MAP
PASCO COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 280 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DADE CITY, CITY OF	120231	0280	F
PASCO COUNTY	120230	0280	F
ST. LEO, TOWN OF	120166	0280	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12101C0280F

EFFECTIVE DATE
SEPTEMBER 26, 2014

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole foot elevations. BFEs in detailed watersheds are rounded to tenth-foot elevations, see Watershed Table below. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

Base map information shown on this FIRM was provided in digital format by the Southwest Florida Water Management District. The original orthophotographic base imagery was provided in color with a one-foot pixel resolution at a scale of 1" = 1' from photography flown January 2009.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include Letters of Map Change, a *Flood Insurance Study* report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/. A FIRMETTE (full scale section of a FIRM) is also available at this website.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

DATUM INFORMATION

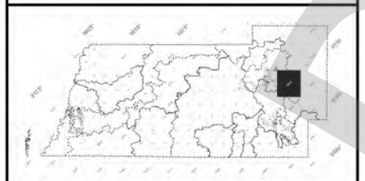
The **projection** used in the preparation of this map was State Plane Florida West. The **horizontal datum** was HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane Zone used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not reflect the accuracy of this FIRM.

Base Flood Elevation (BFEs) on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

Example Datum Offset Calculation
using datum offset table below
NAVD88 = NGVD29 + (datum offset value)

To obtain current elevation, description, and/or location information for **benchmarks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.



* PANEL NOT PRINTED

Watershed Boundary

Coastal Construction Control Line
Designated by the Department of Environmental Protection to safeguard coastal property from damage during storm events.

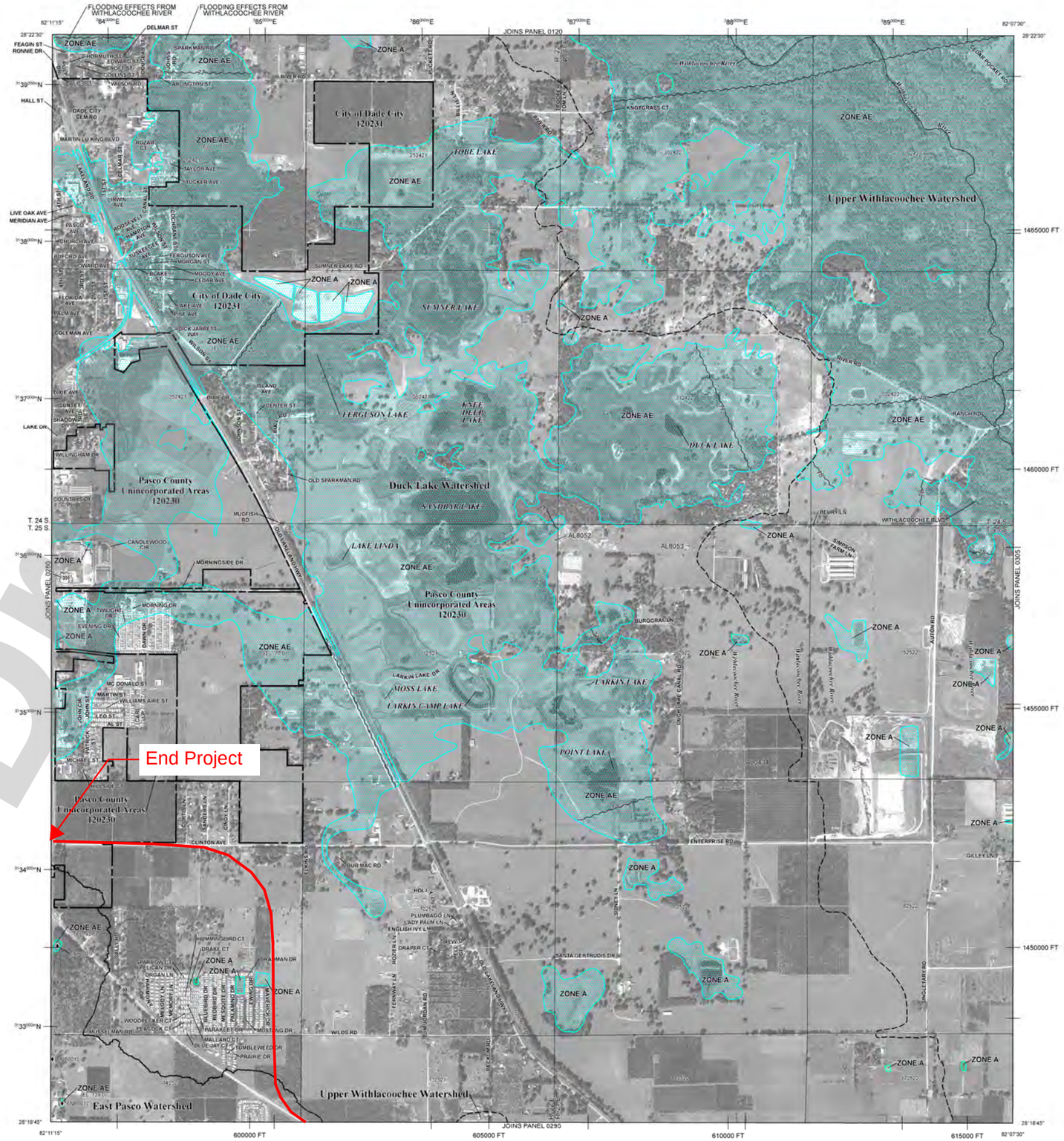
Watershed Table

Watershed	Datum Offset (ft)	Study Type	1 Day 100yr	Total Rainfall Volume (in) Multi-Day Rainfall Used[2]	Date of Model
1. Bear Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
2. Blanton Lake	-0.84	Effective Transfer	11.0	NO	09/30/92
3. Cypress Creek	-0.84	Detailed	12.4	YES	04/27/10
4. Double Hammock Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
5. Duck Lake	-0.84	Effective Transfer	11.0	NO	09/30/92
6. East Pasco	-0.84	Detailed	12.0	YES	02/23/10
7. East Pinellas Anclote	-0.84	Detailed	12.0	NO	04/26/11
8. Hammock Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
9. Lower Coastal	-0.84	Effective Transfer[1]	12.1	NO	09/30/92
10. New River	-0.84	Effective Transfer	11.1	NO	09/30/92
11. North Lakes	-0.84	Effective Transfer	N/A	NO	09/30/92
12. Pithlachascotee	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
13. Trout Creek	-0.84	Detailed	12.4	YES	06/29/10
14. Upper Hillsborough	-0.84	Effective Transfer	11.0	NO	05/01/79
15. Upper Pithlachascotee	-0.84	Effective Transfer	12.0	NO	09/30/92
16. Upper Withlacoochee	-0.84	Effective Transfer	10.9	NO	05/01/79
17. West Pinellas Anclote	-0.84	Effective Transfer	12.0	NO	09/30/92

[1]Redelineation performed for coastal flood zones
[2]Multi-Day event used only in specific sub-basins, refer to the FIS report.

[3]Zone X (shaded) 0.2% annual chance floodplain is delineated only in watersheds where the Study Type is Redelineation or Coastal. The 0.2% annual chance floodplain is not delineated in watersheds where the Study Type is Detailed. Refer to the Watershed Table for Study Type.

This digital Flood Insurance Rate Map (FIRM) was produced through a cooperative partnership between the Southwest Florida Water Management District (SWFWMD), Pasco County, Federal Emergency Management Agency (FEMA), and the associated communities within Pasco County.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X[3]** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot; and areas protected by levees from 1% annual chance flood. *See additional note in Watershed Table on left collar.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A–A Cross section line
- 23–23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4675000mE 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6000000 FT 5000-foot grid values: Florida State Plane coordinate system, West Zone (FIPSZONE = 0902), Transverse Mercator projection
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile
- 222218 Section - Township - Range
- 7NX1000 Junction - Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).
- Hydraulic Connectivity - Flow pathway between junctions

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 26, 2014
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0285F

FIRM
FLOOD INSURANCE RATE MAP
PASCO COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 285 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DADE CITY, CITY OF	120231	0285	F
PASCO COUNTY	120230	0285	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12101C0285F
EFFECTIVE DATE
SEPTEMBER 26, 2014

Federal Emergency Management Agency

NOTES TO USERS

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Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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DATUM INFORMATION

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National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

Example Datum Offset Calculation
using datum offset table below
NAVD88 = NGVD29 + (datum offset value)

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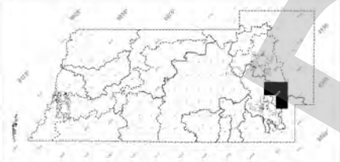

Watershed Boundary

Coastal Construction Control Line
Developed by the Department of Environmental Protection to safeguard coastal property from damage during storm events.

Watershed Table

Watershed	Datum Offset (ft)	Study Type	1 Day 100yr	Total Rainfall Volume (in) Multi-Day Rainfall Used[3]	Date of Model
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3. Cypress Creek	-0.84	Detailed	12.4	YES	04/27/10
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10. New River	-0.84	Effective Transfer	11.1	NO	09/30/92
11. North Lakes	-0.84	Effective Transfer	N/A	NO	09/30/92
12. Pithlachascotee	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
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16. Upper Withlacoochee	-0.84	Effective Transfer	10.9	NO	05/01/79
17. West Pinellas Anclote	-0.84	Effective Transfer	12.0	NO	09/30/92

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[2]Zone X (shaded) 0.2% annual chance floodplain is delineated only in watersheds where the Study Type is Redelineation or Coastal. The 0.2% annual chance floodplain is not delineated in watersheds where the Study Type is Detailed. Refer to the Watershed Table for Study Type.

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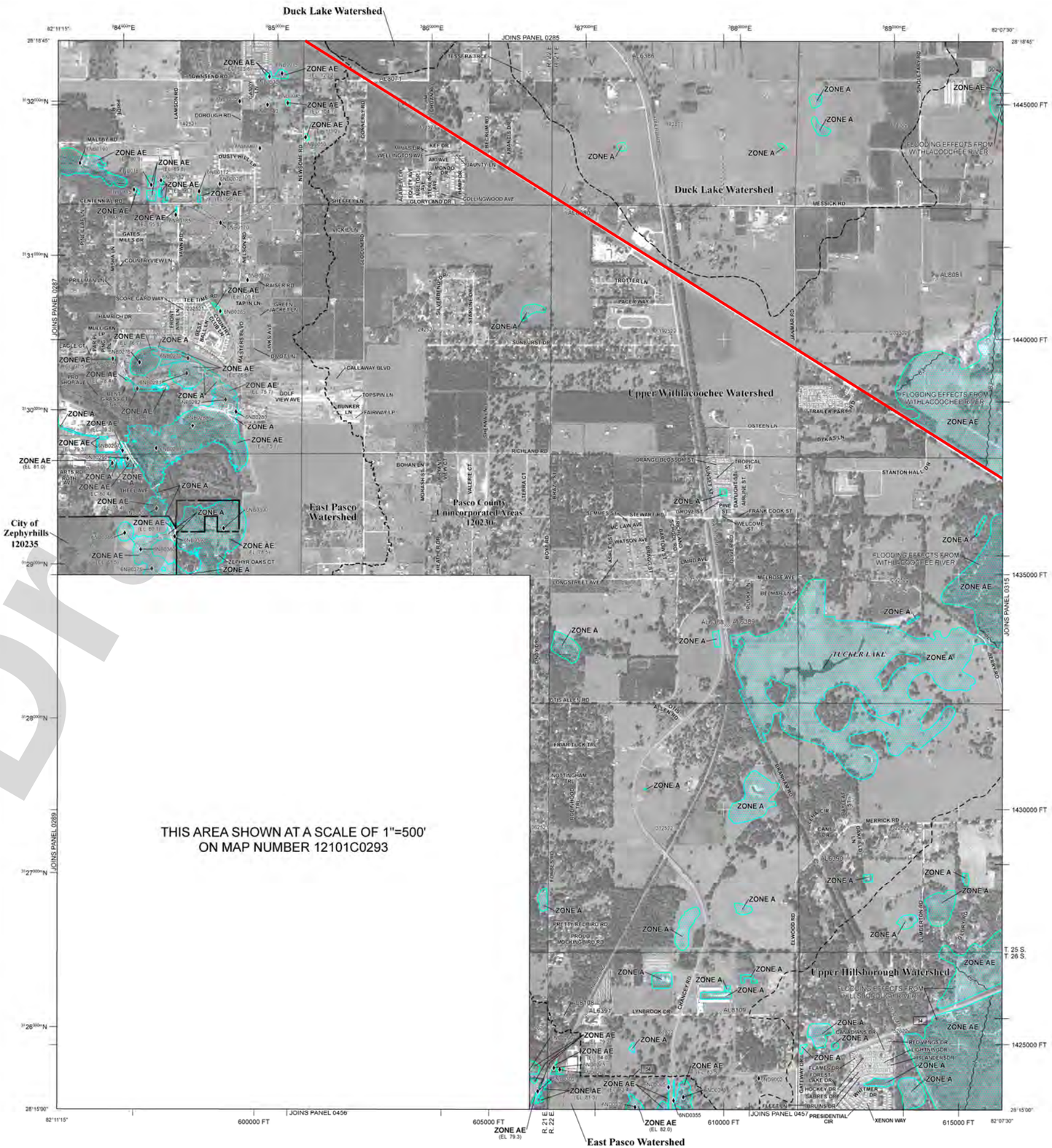

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X[2]** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot; and areas protected by levees from 1% annual chance flood. *See additional note in Watershed Table on left collar.*

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4275000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6000000 FT — 5000-foot grid values: Florida State Plane coordinate system, West Zone (FIPSZONE = 0902), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile
- 222218 — Section - Township - Range
- 7NX1000 — Junction - Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).
- Hydraulic Connectivity - Flow pathway between junctions

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 26, 2014
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0295F

FIRM

FLOOD INSURANCE RATE MAP
PASCO COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 295 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PASCO COUNTY	120230	0295	F
ZEPHYRHILLS, CITY OF	120235	0295	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12101C0295F
EFFECTIVE DATE
SEPTEMBER 26, 2014

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole foot elevations. BFEs in detailed watersheds are rounded to tenth-foot elevations, see Watershed Table below. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

Base map information shown on this FIRM was provided in digital format by the Southwest Florida Water Management District. The original orthophotographic base imagery was provided in color with a one-foot pixel resolution at a scale of 1" = 1' from photography flown January 2009.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include Letters of Map Change, a *Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/. A FIRMETTE (full scale section of a FIRM) is also available at this website.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

DATUM INFORMATION

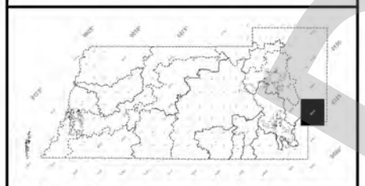
The **projection** used in the preparation of this map was State Plane Florida West. The **horizontal datum** was HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane Zone used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not reflect the accuracy of this FIRM.

Base Flood Elevation (BFEs) on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

Example Datum Offset Calculation
using datum offset table below
NAVD88 = NGVD29 + (datum offset value)

To obtain current elevation, description, and/or location information for **benchmarks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.



* PANEL NOT PRINTED

Watershed Boundary

Coastal Construction Control Line
Developed by the Department of Environmental Protection to safeguard coastal property from damage during storm events.

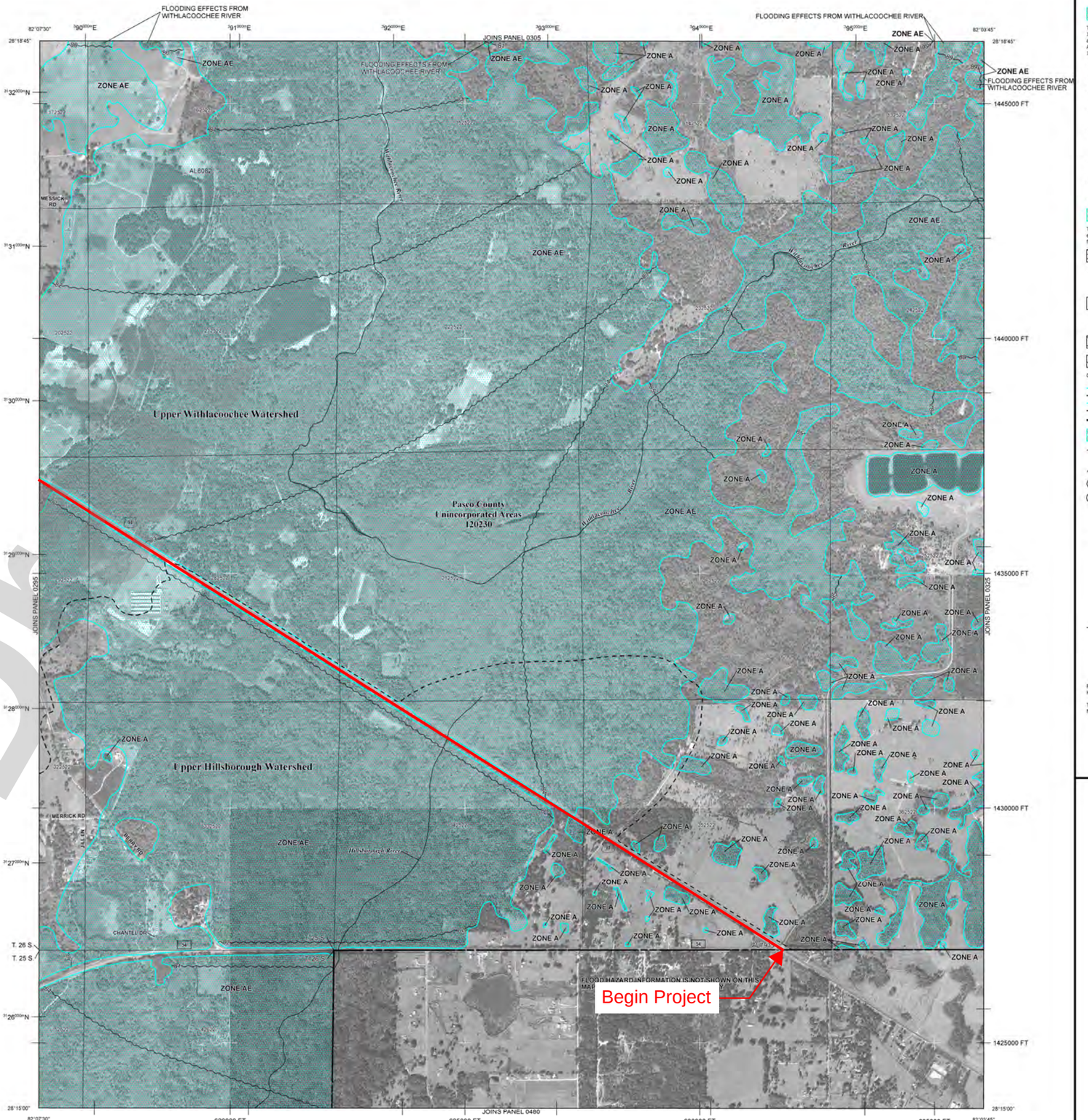
Watershed Table

Watershed	Datum Offset (ft)	Study Type	Total Rainfall Volume (in) 1 Day 100yr	Multi-Day Rainfall Used[3]	Date of Model
1. Bear Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
2. Blanton Lake	-0.84	Effective Transfer	11.0	NO	09/30/92
3. Cypress Creek	-0.84	Detailed	12.4	YES	04/27/10
4. Double Hammock Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
5. Duck Lake	-0.84	Effective Transfer	11.0	NO	09/30/92
6. East Pasco	-0.84	Detailed	12.0	YES	02/23/10
7. East Pinellas Anclote	-0.84	Detailed	12.0	NO	04/26/11
8. Hammock Creek	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
9. Lower Coastal	-0.84	Effective Transfer[1]	12.1	NO	09/30/92
10. New River	-0.84	Effective Transfer	11.1	NO	09/30/92
11. North Lakes	-0.84	Effective Transfer	N/A	NO	09/30/92
12. Pithlachascotee	-0.84	Effective Transfer[1]	12.0	NO	09/30/92
13. Trout Creek	-0.84	Detailed	12.4	YES	06/29/10
14. Upper Hillsborough	-0.84	Effective Transfer	11.0	NO	05/01/79
15. Upper Pithlachascotee	-0.84	Effective Transfer	12.0	NO	09/30/92
16. Upper Withlacoochee	-0.84	Effective Transfer	10.9	NO	05/01/79
17. West Pinellas Anclote	-0.84	Effective Transfer	12.0	NO	09/30/92

[1]Redelineation performed for coastal flood zones
[2]Multi-Day event used only in specific sub-basins, refer to the FIS report.

[3]Zone X (shaded) 0.2% annual chance floodplain is delineated only in watersheds where the Study Type is Redelineation or Coastal. The 0.2% annual chance floodplain is not delineated in watersheds where the Study Type is Detailed. Refer to the Watershed Table for Study Type.

This digital Flood Insurance Rate Map (FIRM) was produced through a cooperative partnership between the Southwest Florida Water Management District (SWFWMD), Pasco County, Federal Emergency Management Agency (FEMA), and the associated communities within Pasco County.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X[1]	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot; and areas protected by levees from 1% annual chance flood. [1]See additional note in Watershed Table on left collar.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A A	Cross section line
23 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE	1000-meter Universal Transverse Mercator grid ticks, zone 17
6000000 FT	5000-foot grid values: Florida State Plane coordinate system, West Zone (FIPSZONE = 0902), Transverse Mercator projection
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile
222218	Section - Township - Range
7NX1000	Junction - Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).
	Hydraulic Connectivity - Flow pathway between junctions.

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 26, 2014
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0315F

FIRM
FLOOD INSURANCE RATE MAP
PASCO COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 315 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PASCO COUNTY	120230	0315	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12101C0315F
EFFECTIVE DATE
SEPTEMBER 26, 2014

Federal Emergency Management Agency

APPENDIX C

Floodplain Impact Maps

BASIN 200

FPI-B200-SOUTH-03
ZONE A
BFE 84.00
6.10 AC.

FPI-B200-SOUTH-04
ZONE A
BFE 84.00
6.16 AC.

FPI-B200-SOUTH-01
ZONE A
BFE 84.00
0.43 AC.

84.00

84.00

84.00

N

1"=500'

C.R. 54

925 930 935 940 945 950 955 960 965 970 975 980 985 990

84

US 98

BEGIN PROJECT
STA. 934+33.21

MATCHLINE STA. 993+00

LEGEND

EXIST. 100-YR FLOODPLAIN

FLOODPLAIN IMPACT

EXIST. R/W

LIDAR CONTOUR

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GREGG B HAMM, P.E.
P.E. LICENSE NUMBER 69760
ARCADIS U.S., INC.
3109 WEST DR. MARTIN LUTHER KING JR. BLVD.
TAMPA, FL 33607
T: 813 903 3100
CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

FLOODPLAIN IMPACT MAP

SHEET NO. 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GREGG B HAMM, P.E.
P.E. LICENSE NUMBER 69760
ARCADIS U.S., INC.
3109 WEST DR. MARTIN LUTHER KING JR. BLVD.
TAMPA, FL 33607
T: 813 903 3100
CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

FLOODPLAIN IMPACT MAP

SHEET NO. 2

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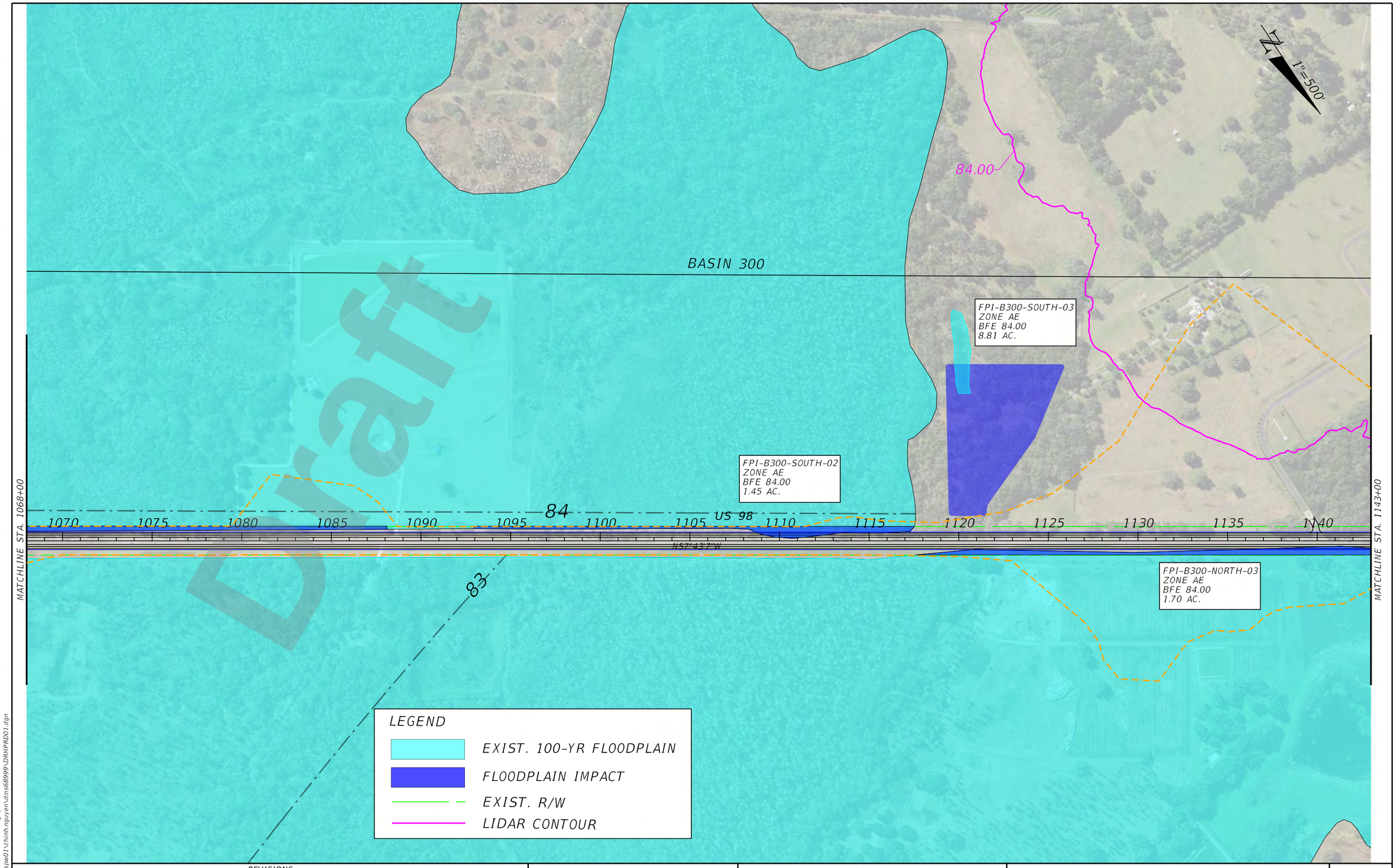

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GREGG B HAMM, P.E.
P.E. LICENSE NUMBER 69760
ARCADIS U.S., INC.
3109 WEST DR. MARTIN LUTHER KING JR. BLVD.
TAMPA, FL 33607
T: 813 903 3100
CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

FLOODPLAIN IMPACT MAP

SHEET NO. 3

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BASIN 300

OLD LAKELAND HWY

1"=500'

84.00

MATCHLINE STA. 1143+00

1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215

US 98

RXR

RXR

JANMAR RD

LEGEND

EXIST. 100-YR FLOODPLAIN

FLOODPLAIN IMPACT

EXIST. R/W

LIDAR CONTOUR

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GREGG B HAMM, P.E.
P.E. LICENSE NUMBER 69760
ARCADIS U.S., INC.
3109 WEST DR. MARTIN LUTHER KING JR. BLVD.
TAMPA, FL 33607
T: 813 903 3100
CERTIFICATE OF AUTHORIZATION NO.: 7917

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3 443368-4

FLOODPLAIN IMPACT MAP

SHEET NO. 4

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APPENDIX D

Geotechnical Report

GEOTECHNICAL EXPLORATION DATA REPORT - ROADWAY

US 98 FROM POLK COUNTY LINE TO US 301

FPN NO. 443368-3

TEST LAB PROJECT NO. GE-20-5131

Prepared for:

FLORIDA DEPARTMENT OF TRANSPORTATION
FDOT DISTRICT 1/7 MATERIALS OFFICE
P.O. BOX 1249, 2730 STATE ROAD 60 WEST

Prepared by:

TEST LAB INC.
GEOTECHNICAL & MATERIALS
ENGINEERING, TESTING & INSPECTION

P.O. Box 15732
Tampa, Florida 33684
Florida Certificate of Authorization No. 1450

TEST LAB INC.
GEOTECHNICAL & MATERIALS
ENGINEERING, TESTING & INSPECTION

July 15, 2021

Florida Department of Transportation
FDOT District 1/7 Materials Office
P.O. Box 1249, 2730 State Road 60 West

Attention: Ms. Teresa (Terry) Puckett, P.E.

Subject: **Geotechnical Exploration Data Report - Roadway**
Contract No. C-9S21 – Task 44
US 98 from Polk County Line to US 301
Pasco County, Florida
FPN No. 443368-3
Test Lab Project No. GE-20-5131

Dear Ms. Puckett:

Test Lab, Inc. (Test Lab) has completed a Geotechnical Exploration Data Report for the above referenced project. This report presents the findings of our field exploration and laboratory testing program.

Test Lab appreciates the opportunity of providing our services to the Florida Department of Transportation (FDOT) on this project. If there are any questions concerning this exploration, or if we may be of any further assistance, please do not hesitate to contact us.

Respectfully submitted,
Test Lab, Inc.
4112 West Osborne Avenue, Tampa, Florida 33614
Florida Certificate of Authorization No. 1450

Connie Johnson-Gearhart

Igor Kratser
2021.07.16
10:51:09 -04'00'

Connie Johnson-Gearhart, P.E.
Geotechnical Engineer
Florida License No. 69013

Igor (Igon) Kratser, P.E.
Senior Geotechnical Engineer
Florida License No. 73129

This item has been digitally signed and sealed by Igor (Igon) Kratser, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Copies Submitted: (1) PDF

TABLE OF CONTENTS

PROJECT INFORMATION

Project Description

This report focuses on a subsurface exploration along the referenced alignment of US 98. The subsurface information obtained to date is provided herein.

General Site Conditions

The existing roadway section of US 98 along the referenced alignment consists of a two-lane road that is supported by a slightly raised embankment with right turn lanes, left turn lanes and crossovers. There are two (2) bridge crossings along the alignment, one at the Hillsborough River and one over Old Lakeland Highway. The stormwater conveyance system within the project alignment consists of linear swales and culvert crossings adjacent to the existing roadway. A portion of the project corridor extends through undeveloped private parcels and along Clinton Avenue. Land use adjacent to the alignment is generally considered rural with occasional residential development.

PURPOSE AND SCOPE OF SERVICES

The geotechnical exploration presented herein was performed to obtain subsurface information at the above referenced site. The following services were provided in order to achieve the preceding objective:

i. Reviewed readily available published topographic and soils information. This information included Florida Quadrangle maps published by the United States Geological Survey (USGS), the “Soil Survey of Pasco County, Florida” and “Soil Survey of Polk County”, both published by the United States Department of Agriculture (USDA) Natural Resource Conservation Services (NRCS), and the “Potentiometric Surface of the Upper Floridan Aquifer in the Southwest Florida Water Management District – September 2015” map produced by Southwest Florida Water Management District.

ii. Completed a program of subsurface exploration consisting of one hundred eighty-three (183) hand and power auger borings advanced to depths of 6 to 11½ feet. Estimated Seasonal High Groundwater Table (SHGWT) at the boring locations.

iii. Collected bulk samples at 18 locations along the project alignment. Transported the bulk samples to the State Materials Office in Gainesville for Resilient Modulus (M_r) testing.

iv. Visually classified the recovered soil samples in the laboratory. Performed laboratory tests on selected representative samples to develop the soil legend for the project using the American Association of State Highway and Transportation Officials (AASHTO) Soil Classification System.

v. Prepared this Geotechnical Exploration Data Report for the project.

REVIEW OF AVAILABLE DATA

Regional Geology

Pasco County is in the central or mid-peninsular physiographic zone of the Florida Peninsula. The county is characterized by discontinuous highlands in the form of ridges separated by broad valleys. The ridges are above the static level of the water in the aquifer but the broad valleys are below it. Broad shallow lakes are common on the valley floors, and smaller deep lakes are on the ridges. Based on physiography, the county can be divided into five areas: the Coastal Swamps, the Gulf Coastal Lowlands, the Brooksville Ridge, the Tsala Apopka Plain and the Western Valley.

The county is underlain by several thousand feet of sedimentary rock, principally various limestone formations. A very gently sloping, very flat limestone terrain extends inland from the Gulf of Mexico. This is the Coastal Swamps area. It extends the length of the county and ranges up to about 2 miles in width. As one goes inland from the coast, the terrain changes very gradually from shallow marine water to salt marshes to fresh water swamps. Much of the area is shallow to limestone and because there are no barrier formations, sands did not accumulate and beaches did not form. In some areas, the limestone has dissolved and pockets of organic materials have accumulated. As a result, some places have a mixture of organic and mineral soils.

The soils of the Coastal Swamps area are very poorly drained, and the marsh areas are subject to daily flooding by normal tides. The vegetation ranges from salt-tolerant grasses in the marshes to stands of mixed hardwoods on more elevated areas. Elevation ranges from sea level to about 10 feet above sea level. Some urban development has taken place in the area. In some places limestone is mined.

The Gulf Coastal Lowlands lie between the Coastal Swamps and the Brooksville Ridge and the Western Valley. In the northern part of the county they conjoin the Brooksville Ridge, and in the southern part they conjoin the Western Valley area at Zephyrhills Gap. The elevation ranges between about 10 and 50 feet above sea level. The area consists mainly of pine and saw palmetto flatwoods and has numerous small ponds and broad grassy sloughs. The soils are predominantly nearly level, wet and sandy. Some areas have deep, well drained and excessively drained sands which are relict sand dunes. Much of the urban development in the county has occurred on the better drained parts of the lowlands. Much of the wetter acreage is used as pastureland.

The Brooksville Ridge extends south from Hernando County to about the area of Zephyrhills. It extends about from Florida Highway 581 on the west to U.S. Highway 301 on the east. Considerable local relief has developed along the ridge as a result of the numerous sinkholes. The elevation varies from about 70 to 300 feet over short distances Clay Hill, 6 miles northwest of Dade City, reaches an altitude of 301 feet, while Lake Dowling, a sinkhole lake 0.7 mile away, is at an altitude of only 75 feet. There is little surface drainage. Most of the surface is covered by a few feet of sand. Near the western side of the ridge are thicker deposits of sand that may be old stabilized dunes. Natural vegetation on the deep sands is mainly turkey oak and scattered longleaf pine. Other areas consist of poorly drained to well drained, sandy to clayey soils that support pine and hardwoods. Much of the Brooksville Ridge has been cleared and is used for cultivated crops and pasture.

The Tsala Apopka Plain extends south from Hernando County east of U.S. Highway 301 to about 3 miles north of Dade City. It is about 6 miles wide and ranges in elevation from about 75 to 85 feet above sea level. The area consists mostly of pine and saw palmetto flatwoods. Numerous ponds, depressions and broad grassy sloughs are present. The soils are mainly nearly level and wet and generally have a loamy subsoil. Most of this area remains in natural vegetation and is used primarily as woodland and wildlife habitat.

The Western Valley extends the length of the county on its eastern side. The Western Valley turns west at the termination of the Brooksville Ridge and unites with the Gulf Coastal Lowlands at Zephyrhills Gap. It contains the valleys of the Withlacoochee and Hillsboro Rivers and consists mainly of poorly drained sandy soils. The vegetation is mainly longleaf pine and saw palmetto.

Most of the soils in the Western Valley have loamy subsoil ranging from acid to alkaline over short distances. Outcroppings of limestone are common in some parts. Scattered throughout the Western Valley area are small to large, slightly depressional areas of sandy soils that support mixed swamp hardwoods and cypress. Much of the area remains in natural vegetation but some areas have been cleared and planted to improve pasture and cultivated crops.

The drainage of the area has been studied. Much of the water falling on the county is returned to the atmosphere by evaporation and transpiration. The remainder enters the ground. Ultimately, all of this ground water flows into the Gulf of Mexico. It drains from the area through the underlying limestone and via a few surface streams. Streams are present only where materials of slow permeability overlie the limestone or the water level in the limestone is near the ground surface. The Pthlachascotee and Anclote Rivers drain the area west of U.S. Highway 41 and south of Florida Highway 52. The southeastern and south-central parts of the county are drained by tributaries of the Hillsborough River. The Withlacoochee River drains the eastern part of the county.

Some areas of the county have sinkhole drainage patterns. Bear Creek, for example, drains into Bear Sink and, when Bear Sink is full, into a second sinkhole. In periods when both of these sinks cannot drain the full water flow, the excess flows westward, via a poorly developed channel, across U.S. Highway 19 to the Gulf of Mexico. Several lakes east of Port Richey are drained by Rocky Sink.

Some parts of the county are drained by closed depressions. These are common in the drainage area of streams. These closed depressions, which drain internally, generally provide adequate subsurface drainage during periods of normal rainfall. During very wet periods, however, the closed depressional drains may receive more water than they can release into the underlying limestone formation. Then, the closed depressions become flowing springs.

Groundwater drainage emerges as spring flow at or near the coast. Spring flow increases during wet periods, but there is a lag period in relation to the periods of rainfall inland. The water from the springs has a bicarbonate level of about 100 to 200 parts per million. The chloride content of the inland springs is low, and that of springs near the coast is much greater.

USGS Quadrangle Maps

Based on a review of the Florida Quadrangle Maps, it appears that the natural ground surface elevations within the project corridor range from approximately +80 feet to +155 feet North American Vertical Datum of 1988 (NAVD88) as illustrated on the **USGS Vicinity Map (Sheet 1)** in **Appendix A**. The existing ground surface elevations have been slightly altered due to road grading and embankment, however, based on the survey information for the project the current ground elevations are generally near or within the range provided on the Quadrangle Maps.

USDA/NRCS Soil Survey

Based on a review of the Pasco County Soil Survey and Polk County Soil Survey, published by the USDA/NRCS, it appears that there are thirteen (13) soil-mapping units and one (1) soil-mapping unit, respectively, noted within the project alignment. A reproduction of the **USDA Vicinity Map (Sheet 1)** is illustrated in **Appendix A** and the soil mapping units are summarized in **Appendix B**.

It should be noted that information contained in the USDA/NRCS Soil Survey may not be reflective of actual soil and groundwater conditions, particularly if recent development in the project vicinity has modified soil conditions or surface/subsurface drainage.

Potentiometric Surface Maps

Based on a review of the "Potentiometric Surface of the Upper Floridan Aquifer" (published in 2015) produced by Southwest Florida Water Management District, the potentiometric surface elevation of the upper Floridan Aquifer in the project alignment appears to be approximately +70 feet to +90 feet, NGVD29. Artesian conditions were not encountered at the time of our field activities.

SUBSURFACE EXPLORATION

Boring Location Plan

Prior to commencing our subsurface exploration, a boring location plan was prepared based on team needs, accessible areas and our engineering judgment. The borings were located in the field using hand-held Global Positioning System (GPS) equipment. The borings were generally performed at the proposed boring locations.

Utility clearances were coordinated by Test Lab and updated as required prior to performing the soil borings in order to reduce the potential for damage to utilities during our subsurface explorations. The subsurface explorations were performed in general compliance with the applicable FDOT Roadway and Traffic Design Standard Indices.

Borings

Test Lab performed one hundred eighty-three (183) hand and power auger borings along the project corridor. The borings were performed to evaluate the shallow subsurface soil conditions and measure the ground water table level. In areas where shallow groundwater table was present and required boring depth could not be achieved by hand auger method due to "cave-in" of borehole were extended utilizing power auger. The hand auger borings were performed by manually twisting and advancing a bucket auger into

the ground, typically in 4 to 6 inch increments. Representative samples were collected and returned to our laboratory to be evaluated and classified by a geotechnical engineer. The power auger borings were performed by advancing a rotating flight auger slowly into the ground in a “corkscrew” fashion, so as not to mix the soils. The flight auger was then retrieved and a representative samples were collected and returned to our laboratory for review and classification by a geotechnical engineer. The soil profiles of the borings performed are shown on the **Soil Profiles (Sheets 16 - 24)** in **Appendix A**.

The latitude, longitude and elevation of each boring were provided by the project surveyor. The roadway boring locations are shown on the **Boring Location Plan (Sheets 3 - 15)** in **Appendix A**.

LABORATORY TESTING

Representative soil samples collected from the borings were classified and stratified in general accordance with the American Association of State Highway and Transportation Officials (AASHTO) Soil Classification System. The classification was based on visual observations, using the results of laboratory testing as confirmation. These tests included grain-size analyses, Atterberg Limits, natural moisture content, organic content and environmental corrosion series.

Test Designation

The following list summarizes the laboratory tests performed and respective test methods utilized.

i. Grain-Size Analyses - The grain-size analyses were conducted in general accordance with the AASHTO test designation T-088 (ASTM test designation D-422).

ii. Atterberg Limits - The liquid limit and the plastic limit tests ("Atterberg Limits") were conducted in general accordance with the AASHTO test designations T-089 and T-090, respectively (ASTM test designation D-4318).

iii. Natural Moisture Content - The moisture content tests were conducted in general accordance with the AASHTO test designation T-265 (ASTM test designation D-2216).

iv. Organic Content – The organic content tests were conducted in general accordance with the ASSHTO test designation T-267 (ASTM test designation D-2974).

v. Environmental Corrosion Series – The environmental corrosion tests were conducted in general accordance with the FDOT test designations FM 5-550, FM 5-551, FM 5-552 and FM 5-553.

A summary of the laboratory test results for each soil stratum is presented on the **Roadway Soils Survey (Sheet 2)** in **Appendix A**. This sheet includes ranges of laboratory test results for different soil strata. A detailed summary of the laboratory test results is presented in **Appendix C**.

In addition, eighteen (18) bulk samples were collected along the referenced alignment. The samples were delivered to the State Materials Office for Resilient Modulus testing. The Resilient Modulus testing results are shown in **Appendix C** of this Report.

RESULTS OF SUBSURFACE EXPLORATION

General Soil Conditions

The near surface soils along the project corridor have been grouped into seven (7) strata, based on borings and laboratory testing. Each stratum exhibits a range of engineering properties related to suitability for roadway construction as outlined by FDOT Standard Index 120-0010. The **Roadway Soils Survey (Sheet 2)** in **Appendix A** shows the general range of engineering properties measured in the laboratory for the various soil strata encountered during our exploration.

The detailed results of the soil borings performed within the project corridor are presented in **Appendix A** in the form of soil profiles, along with the profile legend and other pertinent information such as measured groundwater levels. Soil stratification is based on an examination of the recovered soil samples, the laboratory testing, and interpretation of field boring logs by a geotechnical engineer. The stratification lines represent the approximate boundaries between soil types of significantly different engineering properties. The actual transition may be gradual. In some cases, small variations in properties not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The profiles represent the conditions at the boring locations only and variations may occur among and between the borings.

In general, the soil strata encountered in the soil borings performed along the project corridor are summarized in the following table:

Stratum Number	Typical Soil Description	AASHTO Classification
1	Light Gray to Very Dark Gray to Dark Yellowish-Brown to Very Pale Brown to Black SAND to SAND with SILT with occasional to some limerock or rock fragments	A-3/A-2-4
2	Light Gray to Very Dark Gray to Dark Yellowish-Brown to Very Pale Brown to Black SAND to SAND with SILT	A-3/A-2-4
3	Brownish-Yellow and Light Gray Mosaic to Light Brownish-Gray to Dark Gray to Yellowish-Brown to Brown Silty SAND	A-2-4
4	Brownish-Yellow and Light Gray Mosaic to Light Brownish-Gray to Dark Gray to Yellowish-Brown to Brown CLAY to Silty-Clayey SAND	A-7-6/A-6/A-4
5	Very Dark Brown to Black Muck	A-8
6	Very Dark Brown to Black SAND to Silty SAND with Organics to Trace Organics	A-3/A-2-4

Stratum Number	Typical Soil Description	AASHTO Classification
7	Weathered LIMESTONE	*

**AASHTO does not provide classification designation for Weathered Limestone.*

Some of the borings contained rootlets, clayey lenses or clay, decayed wood fragments and/or vegetative matter and cemented sand and/or limestone fragments. Where discernable amounts of these materials were encountered, the soil profiles are amended with an A, B, C, and D subscript, respectively.

Groundwater

The groundwater, when encountered, was measured in the borings at depths ranging from 1½ feet to 9½ feet below existing grade. Groundwater table depths at the time of the field exploration are presented graphically on the **Soil Profiles (Sheets 16 – 24)** in **Appendix A**. The groundwater table was mostly not encountered in borings B-78 through B-183 and was noted with a GNE on the **Soil Profiles (Sheets 16 – 24)** and **Seasonal High Groundwater Estimates Summary Table** in **Appendix B**.

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences (i.e. existing water management canals, swales, drainage ditch, underdrains, and areas of covered soils, such as paved parking lots and sidewalks).

Seasonal High Groundwater Estimates

The seasonal high groundwater table (SHGWT) us typically encountered during late summer following the rainy season. Several factors affect the seasonal high groundwater table including the amount of rainfall; the drainage characteristics of the soils; the land surface elevation; relief points such as lakes, river or swamps; and distance to relief points are some more important factors influencing the seasonal high groundwater table. The USDA soil survey provides the historical SHGWT based on the soil type. The reported SHGWT ranges from the natural ground surface to greater than 6 feet below natural ground, based on the soil type. However, portions of the alignment have been previously developed; therefore the USDA data may not reflect the current site conditions.

The estimated seasonal high groundwater table levels along the alignment ranged from 1 foot to greater than 6 feet below the existing ground surface. The estimated SHGWT could not be determined due to the in-situ disturbed soil conditions in borings B-35, B-36, B-47, B-72, B-73 and B-74. In boring B-63 the seasonal high groundwater table was determined considering the perched condition above clayey soil.

The SHGWT summary are presented adjacent to the soil profile on the **Soil Profile Sheets** in **Appendix A** and in a **Seasonal High Groundwater Estimates Summary Table** in **Appendix B**.

Resilient Modulus Testing

Bulk soil samples were retrieved for Resilient Modulus, M_r, testing at 18 locations along the project alignment. These samples were delivered in coordination with the FDOT to the State Materials Office in Gainesville. The results of these test are provided in **Appendix C** of this report along with FDOT's recommendations on the design M_r value.

LIMITATIONS

Our professional services have been performed in accordance with generally accepted geotechnical engineering principles and practices at the time of this report. This company is not responsible for the conclusions, opinions or recommendations made by others based on these data.

The scope of the exploration was intended to evaluate general soil conditions within the project corridor. This report presents the geotechnical conditions based on the data obtained from the soil borings performed at the locations indicated in this report and does not reflect any variations which may occur among these borings. If any variations become evident during the course of design and/or construction, a re-evaluation of the conditions contained in this report is the responsibility of the design team.

The data presented in this report is for informational purposes only. Project specific geotechnical evaluations should be completed by the design team for design and construction of this project. It should be noted that the design team will be responsible for interpretation of the data presented in this report.

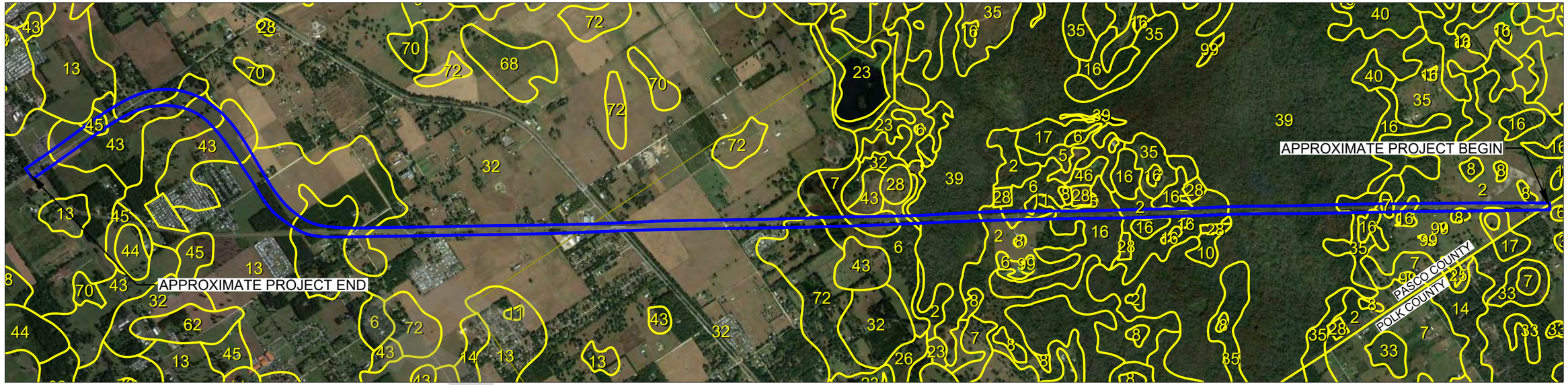
The scope of services, included herein, did not include any environmental assessment for the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater, air, on the site, below and around the site. Any statements in this report or on the boring logs regarding odors, colors, unusual or suspicious items and conditions are strictly for the information of our client.

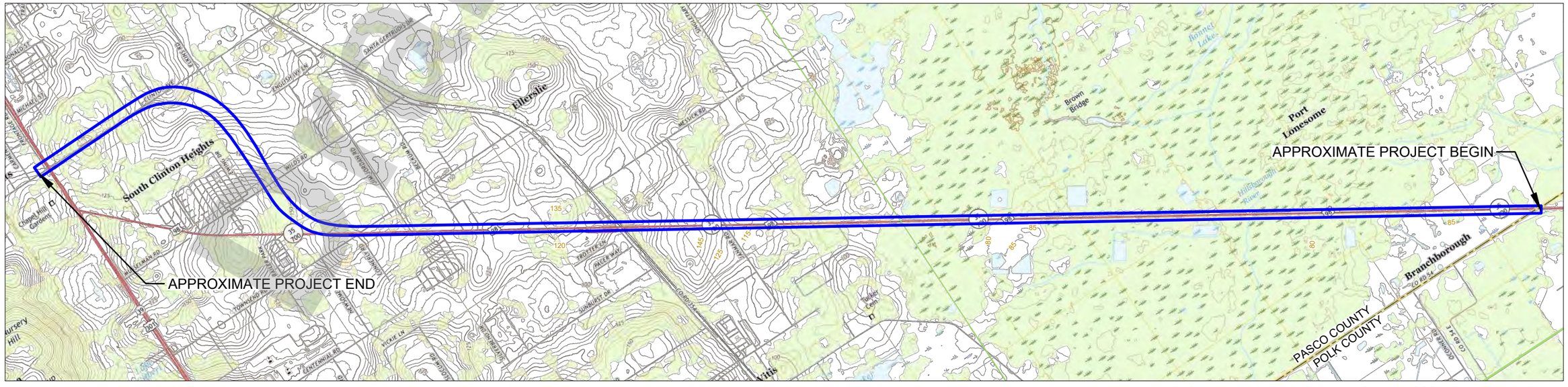
APPENDIX A

USDA & USGS Vicinity Map (Sheet 1)
Roadway Soils Survey (Sheet 2)
Boring Location Plan (Sheets 3 - 15)
Soil Profiles (Sheets 16 - 24)

USDA NRCS SOIL MAP & USGS QUADRANGLE MAP

Reference: USDA Soil Survey of Pasco & Polk County, Florida





Reference: United States Geological Survey (USGS) - Pasco County, Florida

N

0 3,000'

APPROXIMATE SCALE

LEGEND

- Soil Map Unit Lines
- Approximate Project Limits
- x 78 — North American Vertical Datum of 1988 (NAVD) Spot Elevation
- 80 — NAVD Elevation Contour
- 2 — Pomona Fine Sand
- 5 — Myakka-Myakka, Wet, Fine Sands, 0 to 2 Percent Slopes
- 6 — Tavares Sand, 0 to 5 Percent Slopes
- 7 — Sparr Fine Sand, 0 to 5 Percent Slopes
- 7 — Pomona Fine Sand (Polk County)
- 8 — Sellers Mucky Loamy Fine Sand
- 13 — Candler Fine Sand, 0 to 5 Percent Slopes
- 16 — Zephyr Muck
- 32 — Lake Fine Sand, 0 to 5 Percent Slopes
- 35 — EauGallie Fine Sand
- 39 — Chobee Soils, Frequently Flooded
- 43 — Arredondo Fine Sand, 0 to 5 Percent Slopes
- 45 — Kendrick Fine Sand, 0 to 5 Percent Slopes
- 72 — Orlando Fine Sand, 0 to 5 Percent Slopes

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Certificate of Authorization No. 1450

Engineer of Record:

Igor (Igon) Kratser, P.E.
License #73129

US 98 From Polk County Line to US 301
Pasco County, Florida
FPID No.: 443368-3

USDA NRCS Soil Map & USGS Quadrangle Map

Project #: GE-20-5131	Sheet: 1
Date: November 2020	
Scale: As Shown	

DATE OF SURVEY: AUGUST TO SEPTEMBER 2020
SURVEY MADE BY: TEST LAB, INC.
SUBMITTED BY: IGOR (IGON) KRATSER, P.E.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
MATERIALS AND RESEARCH

DISTRICT: 7
ROAD NO.: US 98
COUNTY : PASCO

PROJECT NAME: US 98 FROM POLK COUNTY LINE TO US 301

CROSS SECTION SOIL SURVEY FOR THE DESIGN OF ROADS

SURVEY BEGINS STA. : N/A SURVEY ENDS STA. : N/A

	ORGANIC CONTENT		MOISTURE CONTENT		SIEVE ANALYSIS RESULTS PERCENT PASS (%)						ATTERBERG LIMITS (%)					CORROSION TEST RESULTS				
STRATUM NO.	NO. OF TESTS	% ORGANIC	NO. OF TESTS	MOISTURE CONTENT	NO. OF TESTS	10 MESH	40 MESH	60 MESH	100 MESH	200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTIC INDEX	AASHTO GROUP	DESCRIPTION	NO. OF TESTS	RESISTIVITY ohm-cm	CHLORIDE ppm	SULFATES ppm	pH
1.	-	-	1	13	3	88 - 99	85 - 97	67 - 78	35 - 36	9 - 11	-	-	-	A-3/ A-2-4	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT WITH OCCASIONAL TO SOME LIMEROCK OR ROCK FRAGMENTS	1	12,000	50	≤ 2	7.4
2.	-	-	-	-	11	92 - 100	86 - 99	71 - 86	32 - 50	4 - 11	-	-	-	A-3/ A-2-4	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT	4	17,000 - 32,000	48 - 59	≤ 2 - 6	7.8 - 8.2
3.	-	-	7	13 - 44	8	99 - 100	91 - 99	55 - 88	33 - 57	19 - 28	7	NP - 23	NP - 9	A-2-4	BROWNISH-YELLOW AND LIGHT GRAY MOSAIC TO LIGHT BROWNISH-GRAY TO DARK GRAY TO YELLOWISH-BROWN TO BROWN SILTY SAND	1	7,200	52	≤ 2	8.0
4.	-	-	7	15 - 21	7	98 - 100	92 - 98	80 - 86	49 - 63	35 - 44	7	20 - 43	6 - 23	A-7-6/A-6/ A-4	BROWNISH-YELLOW AND LIGHT GRAY MOSAIC TO LIGHT BROWNISH-GRAY TO DARK GRAY TO YELLOWISH-BROWN TO BROWN CLAY TO SILTY-CLAYEY SAND	-	-	-	-	-
5.	1	16	1	43	1	100	97	83	46	23	-	-	-	A-8	VERY DARK BROWN TO BLACK MUCK	-	-	-	-	-
6.	7	2 - 5	7	12 - 32	7	99 - 100	92-98	74 - 84	36 - 47	9 - 31	-	-	-	A-3/ A-2-4	VERY DARK BROWN TO BLACK SAND TO SILTY SAND WITH ORGANICS TO TRACE ORGANICS	-	-	-	-	-
7.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	WEATHERED LIMESTONE	-	-	-	-	-

NOTES:

1. STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH BORING LOCATION. SUBSURFACE VARIATIONS BETWEEN BORINGS SHOULD BE ANTICIPATED.
2. THE MATERIAL FROM STRATUM 1 (A-3/A-2-4) APPEARS SATISFACTORY FOR USE IN THE EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-001.
2. THE MATERIAL FROM STRATUM 2 (A-3/A-2-4) APPEARS SATISFACTORY FOR USE IN THE EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH STANDARD PLANS, INDEX 120-001.
3. THE MATERIAL FROM STRATUM 3 (A-2-4) APPEARS SATISFACTORY FOR USE IN EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH INDEX 120-001. HOWEVER, THIS MATERIAL IS LIKELY TO RETAIN EXCESS MOISTURE AND MAY BE DIFFICULT TO DRY AND COMPACT. IT SHOULD BE USED IN THE EMBANKMENT ABOVE THE WATER LEVEL EXISTING AT TIME OF CONSTRUCTION.

EMBANKMENT AND SUBGRADE MATERIAL

THE SYMBOL "-" REPRESENTS AN UNMEASURED PARAMETER
GNE GROUNDWATER TABLE NOT ENCOUNTERED
▽ GROUNDWATER LEVEL AT TIME OF DRILLING
▼ ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT)
▼+ ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) GREATER THAN DESIGNATED DEPTH
▼P ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) WITH PERCHED CONDITIONS
A - WITH ROOTLETS
B - WITH CLAY LENSES OR CLAY
C - WITH DECAYED WOOD FRAGMENTS AND/OR VEGETATIVE MATTER
D - WITH CEMENTED SAND AND/OR LIMESTONE FRAGMENTS

4. THE MATERIAL FROM STRATUM 4 (A-7-6/A-6/A-2-6/A-4) IS PLASTIC MATERIAL AND SHALL BE REMOVED IN ACCORDANCE WITH INDEX 120-002 AND UTILIZED IN ACCORDANCE WITH INDEX 120-001.
5. THE MATERIAL FROM STRATUM 5 (A-8) IS ORGANIC MATERIAL AND SHALL BE REMOVED IN ACCORDANCE WITH INDEX 120-002.
6 THE MATERIAL FROM STRATUM 6 (A-3/A-2-4) APPEARS SATISFACTORY FOR USE IN THE EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH INDEX 120-001. HOWEVER, THIS MATERIAL MAY NOT BE USED IN THE SUBGRADE PORTION OF THE ROADBED DUE TO ITS ORGANIC CONTENT.
7. THE MATERIAL FROM STRATUM 7 (WEATHERED LIMESTONE) IS ROCK-LIKE AND IS LOCATED IN SOME AREAS WITHIN THE PROJECT VICINITY. FOUNDATION, UTILITY, AND STORMWATER POND EXCAVATIONS IN THOSE AREAS MAY BE DIFFICULT. IN ADDITION, THE MATERIAL FROM STRATUM 7 MAY BE POROUS AND DIFFICULT TO DEWATER.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

ROADWAY SOILS SURVEY

SHEET NO. 2

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US 98	PASCO	443368-3

TEST LOCATION PLAN (1)

SHEET NO. 3

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TEST LOCATION PLAN (2)

SHEET NO. 4

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TEST LOCATION PLAN (3)

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

TEST LOCATION PLAN (4)

SHEET NO. 6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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TEST LOCATION PLAN (5)

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

TEST LOCATION PLAN (6)

SHEET NO. 8

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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TEST LOCATION PLAN (7)

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

TEST LOCATION PLAN (8)

SHEET NO. 10

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IGOR (IGON) KRATSER, P.E.
P.E. NO.: 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

TEST LOCATION PLAN (9)

SHEET NO. 11

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
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TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

TEST LOCATION PLAN (10)

SHEET NO. 12

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
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TEST LAB, INC.
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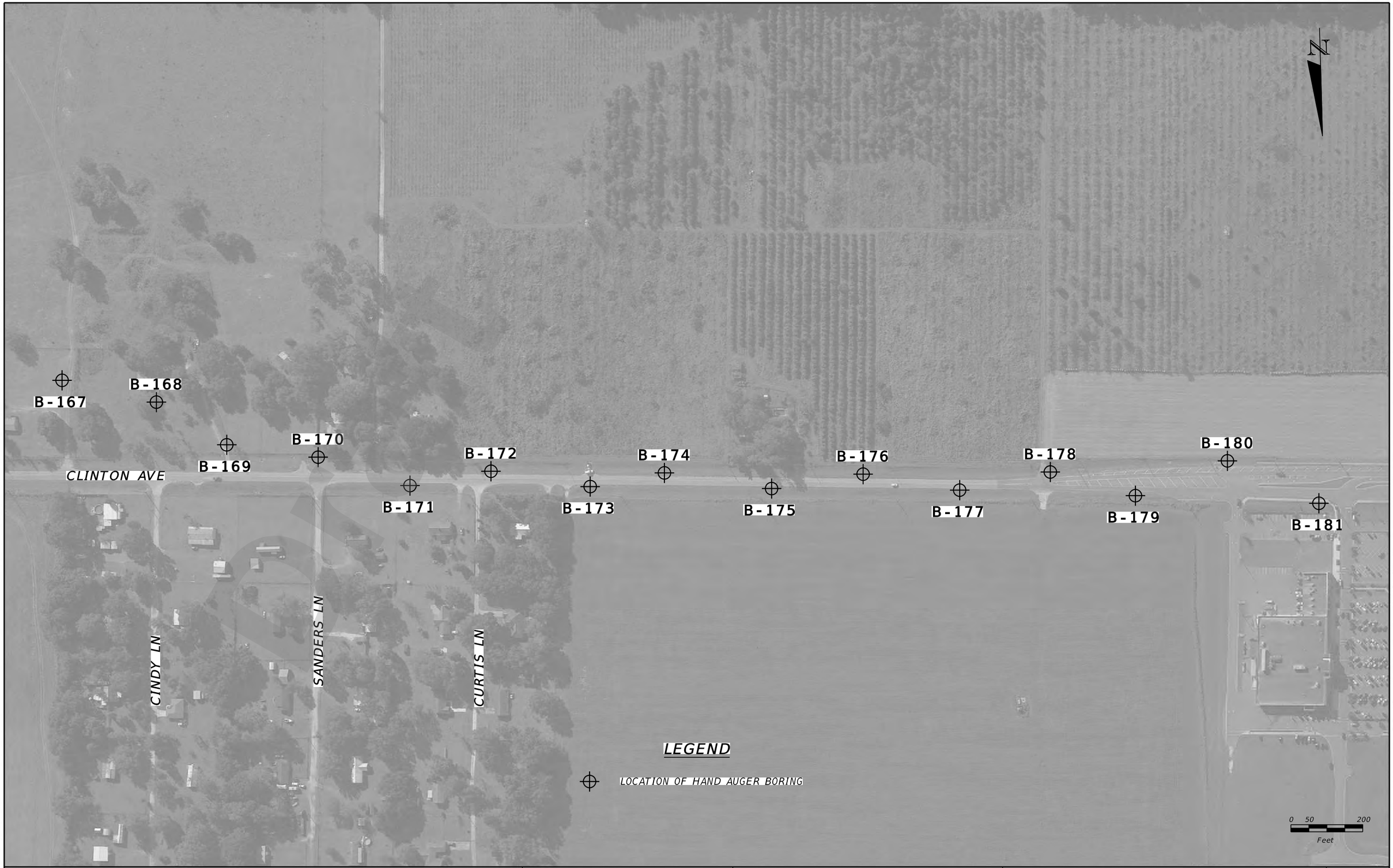
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

TEST LOCATION PLAN (11)

SHEET NO. 13



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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

TEST LOCATION PLAN (12)

SHEET NO. 14

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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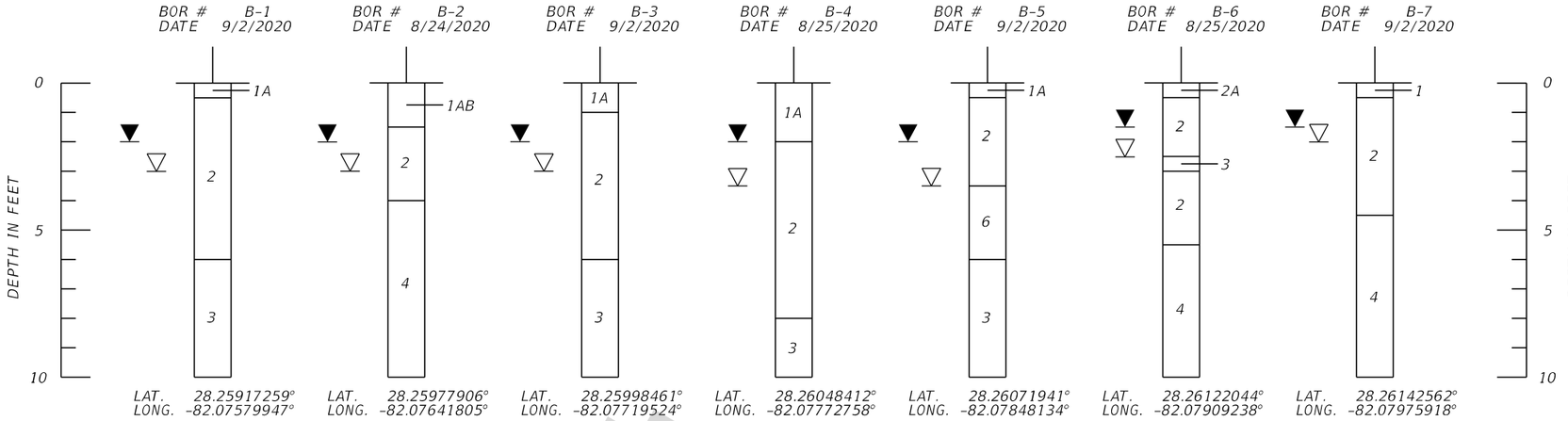
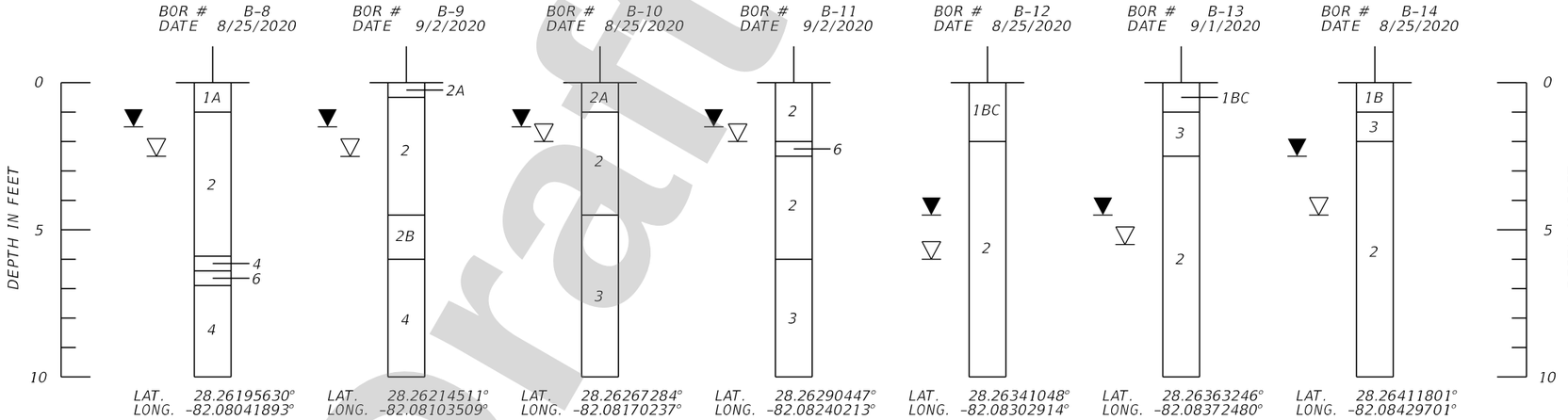
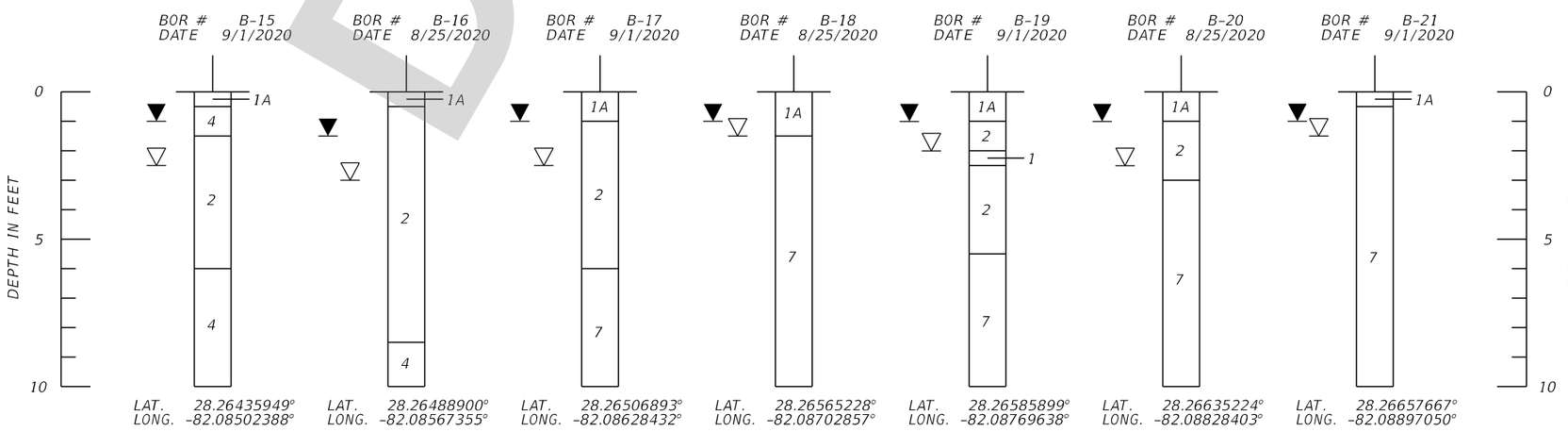
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

TEST LOCATION PLAN (13)

SHEET NO. 15







LEGEND

1	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT WITH OCCASIONAL TO SOME LIMEROCK OR ROCK FRAGMENTS (A-3/A-2-4)
2	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT (A-3/A-2-4)
3	BROWNISH-YELLOW AND LIGHT GRAY MOSAIC TO LIGHT BROWNISH-GRAY TO DARK GRAY TO YELLOWISH-BROWN TO BROWN SILTY SAND (A-2-4)
4	BROWNISH-YELLOW AND LIGHT GRAY MOSAIC TO LIGHT BROWNISH-GRAY TO DARK GRAY TO YELLOWISH-BROWN TO BROWN CLAY TO SILTY-CLAYEY SAND (A-7-6/A-6/A-4)
5	VERY DARK BROWN TO BLACK MUCK (A-8)
6	VERY DARK BROWN TO BLACK SAND TO SILTY SAND WITH ORGANICS TO TRACE ORGANICS (A-3/A-2-4)
7	WEATHERED LIMESTONE
A	WITH ROOTLETS
B	WITH CLAY LENSES OR CLAY
C	WITH DECAYED WOOD FRAGMENTS AND/OR VEGETATIVE MATTER
D	WITH CEMENTED SAND AND/OR LIMESTONE FRAGMENTS
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
GNE	GROUNDWATER TABLE NOT ENCOUNTERED
▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT)
▼P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) WITH PERCHED CONDITIONS

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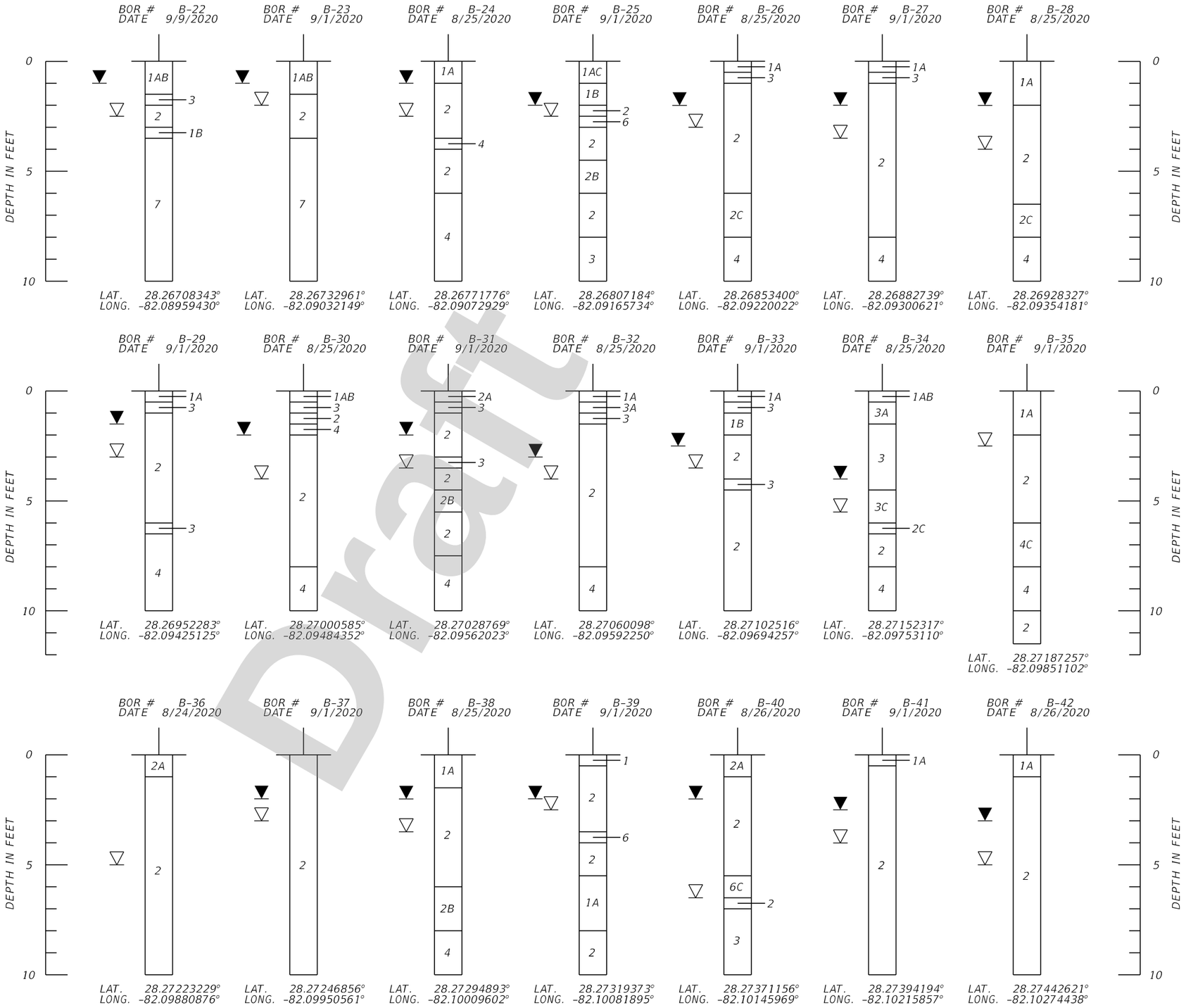
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

SOIL PROFILES (1)

SHEET NO. 16



LEGEND

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▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT)
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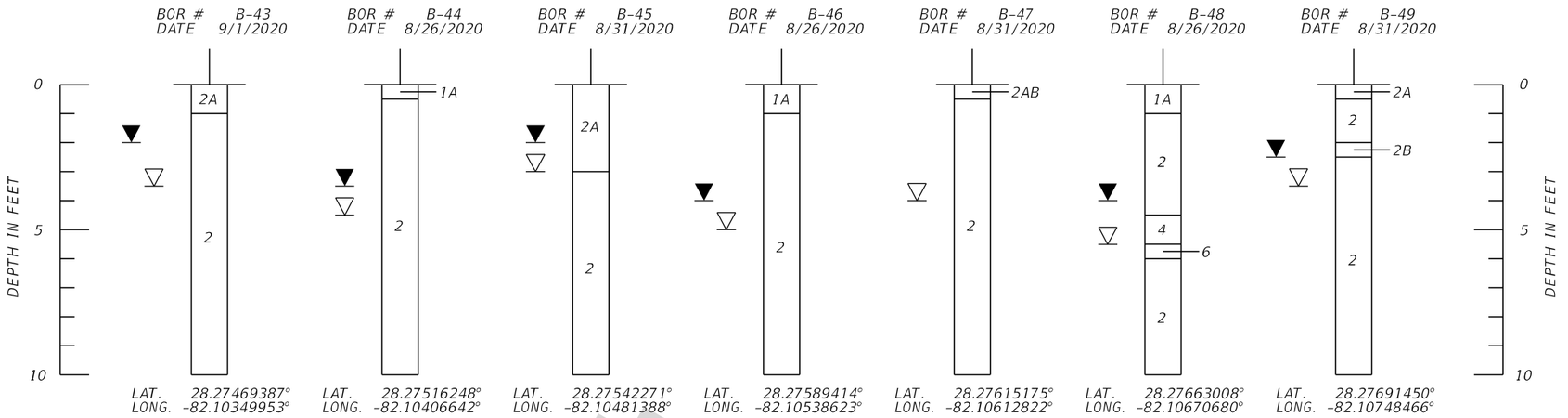
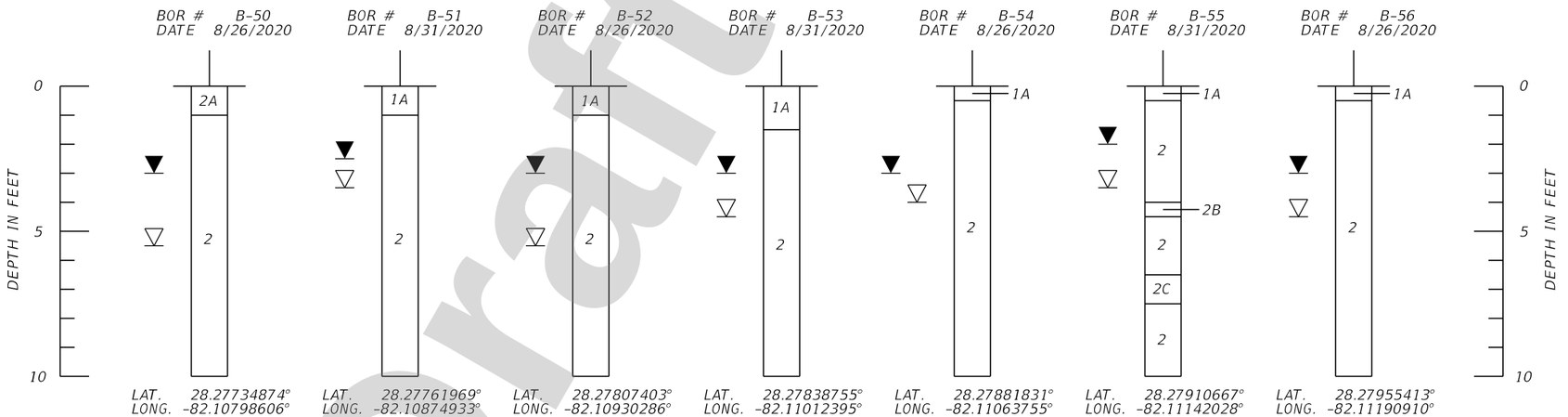
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

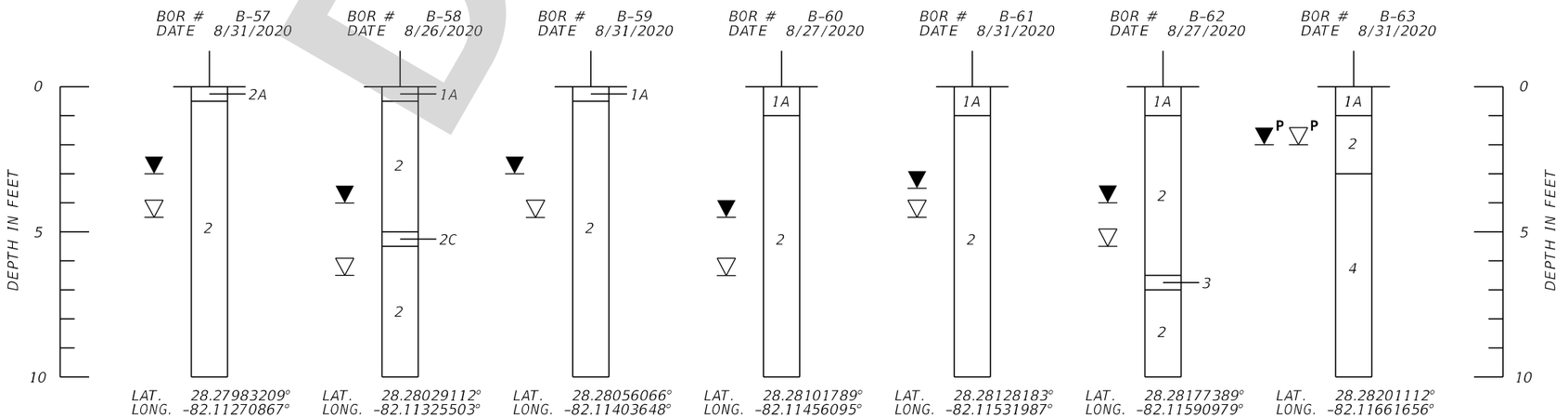
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

SOIL PROFILES (2)

SHEET NO. 17







LEGEND

1	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT WITH OCCASIONAL TO SOME LIMEROCK OR ROCK FRAGMENTS (A-3/A-2-4)
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A	WITH ROOTLETS
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D	WITH CEMENTED SAND AND/OR LIMESTONE FRAGMENTS
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
GNE	GROUNDWATER TABLE NOT ENCOUNTERED
▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT)
▼P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) WITH PERCHED CONDITIONS

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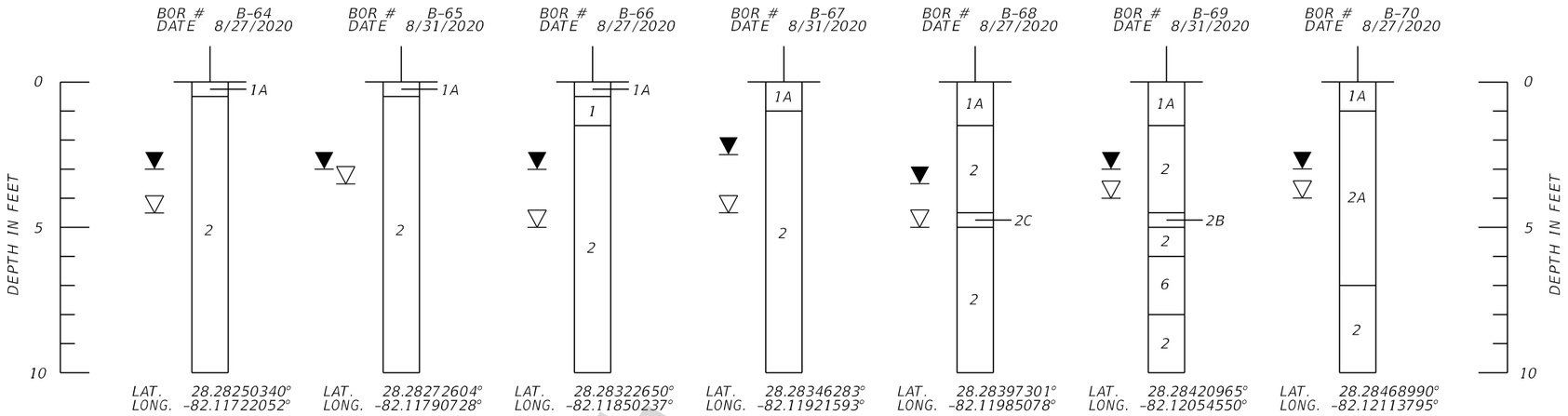
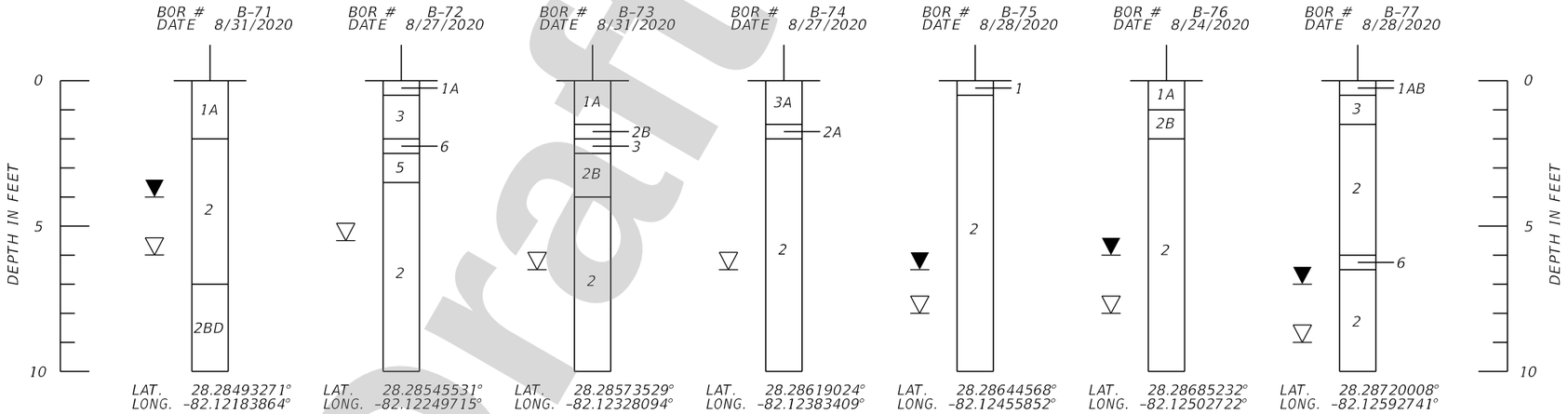
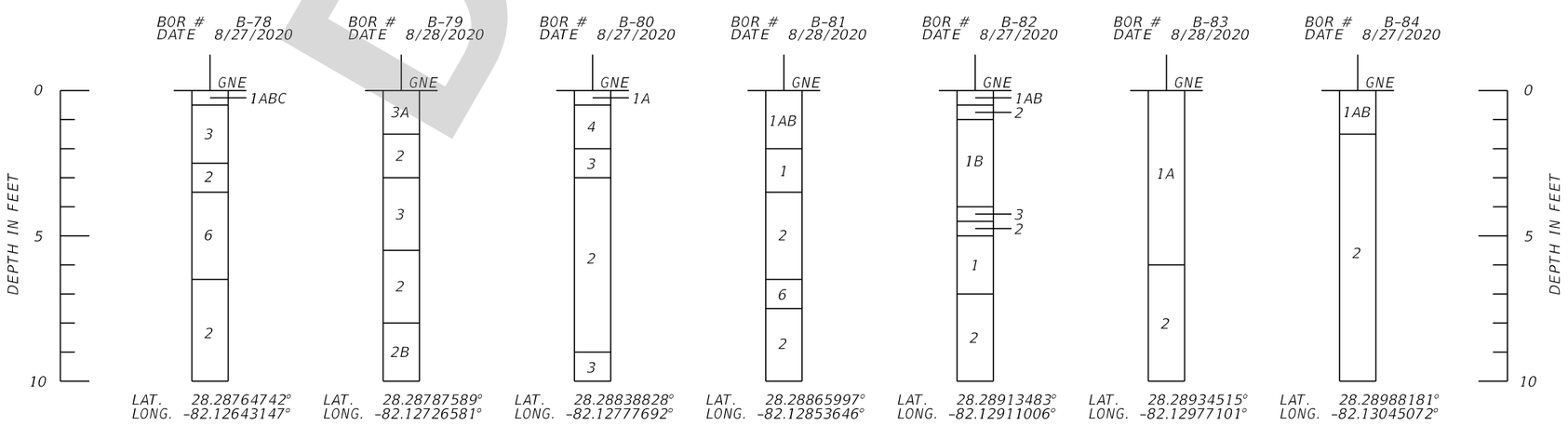
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

SOIL PROFILES (3)

SHEET NO. 18







LEGEND

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▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT)
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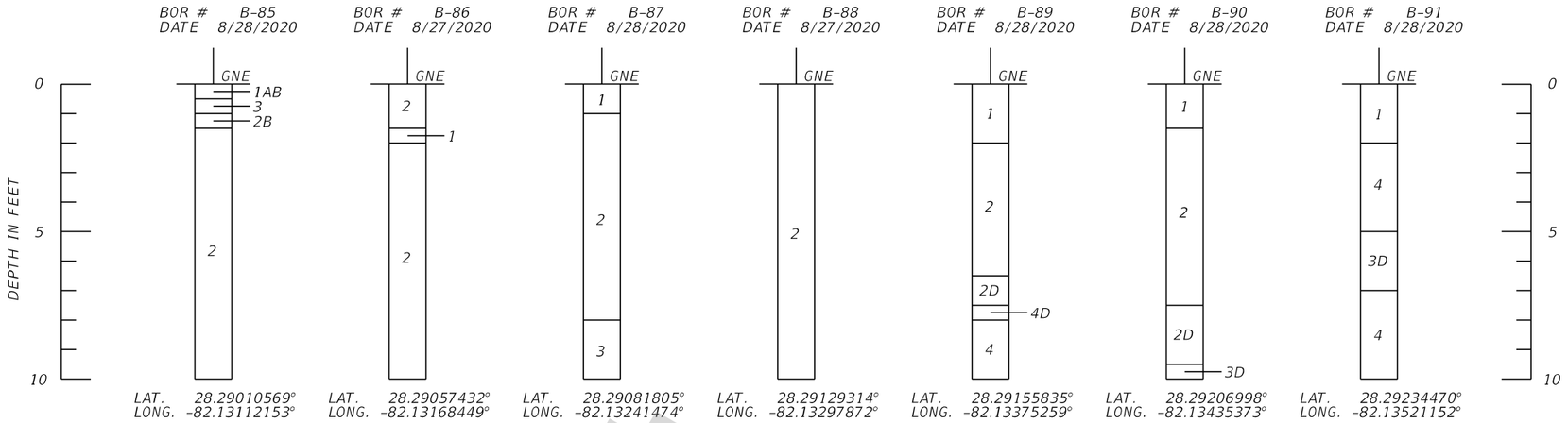
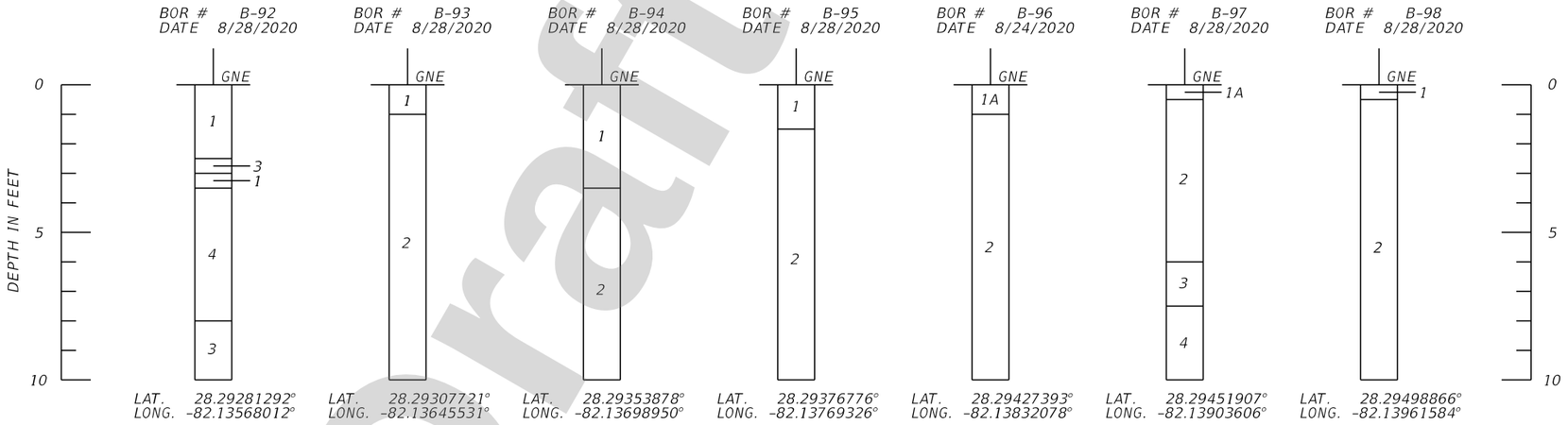
DEPARTMENT OF TRANSPORTATION

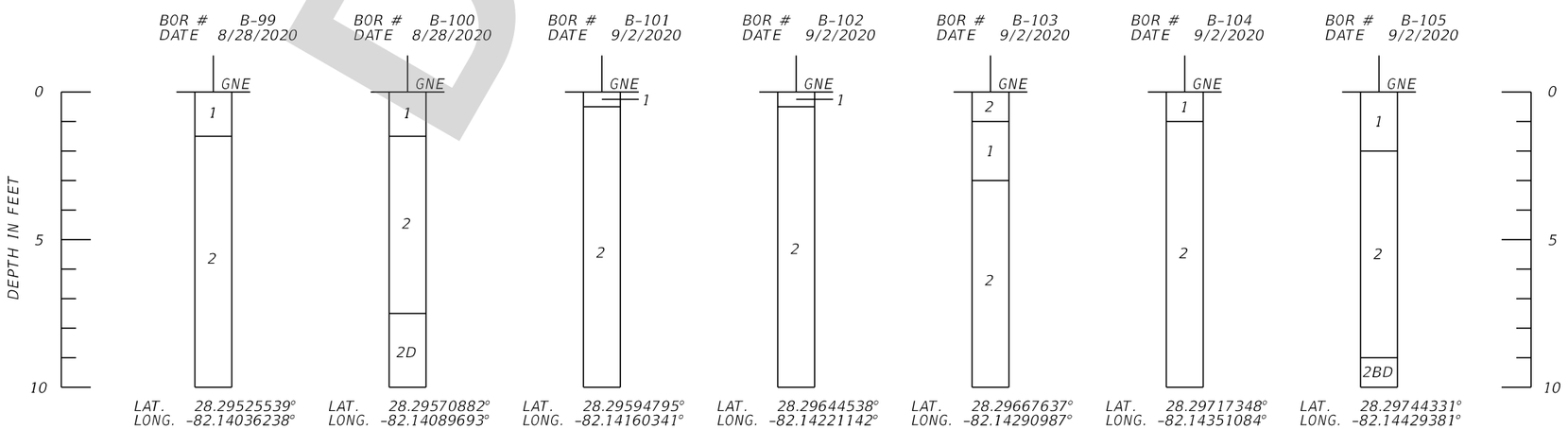
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

SOIL PROFILES (4)

SHEET NO. 19







LEGEND

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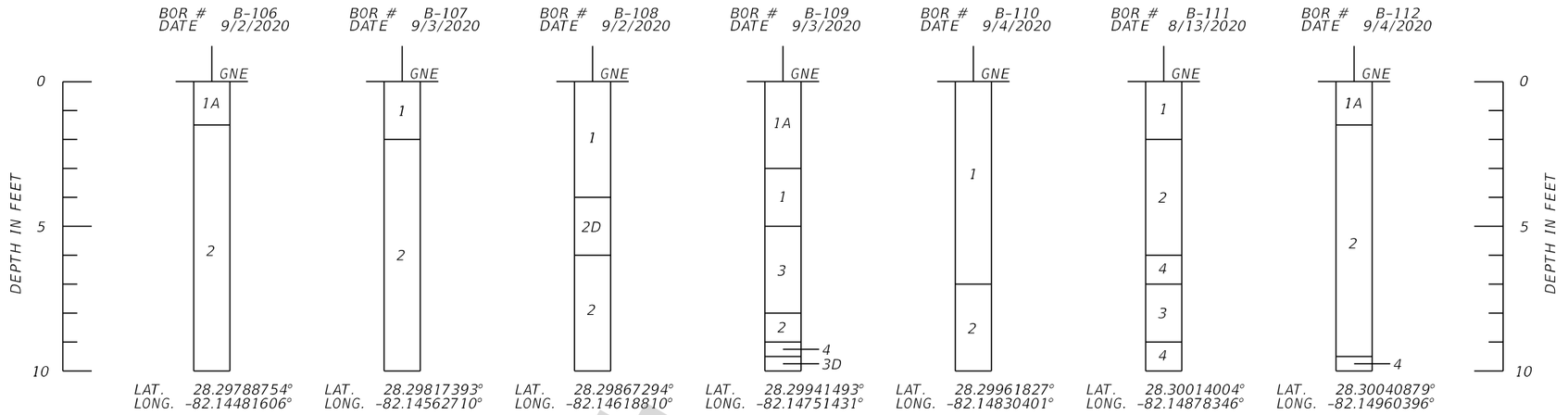
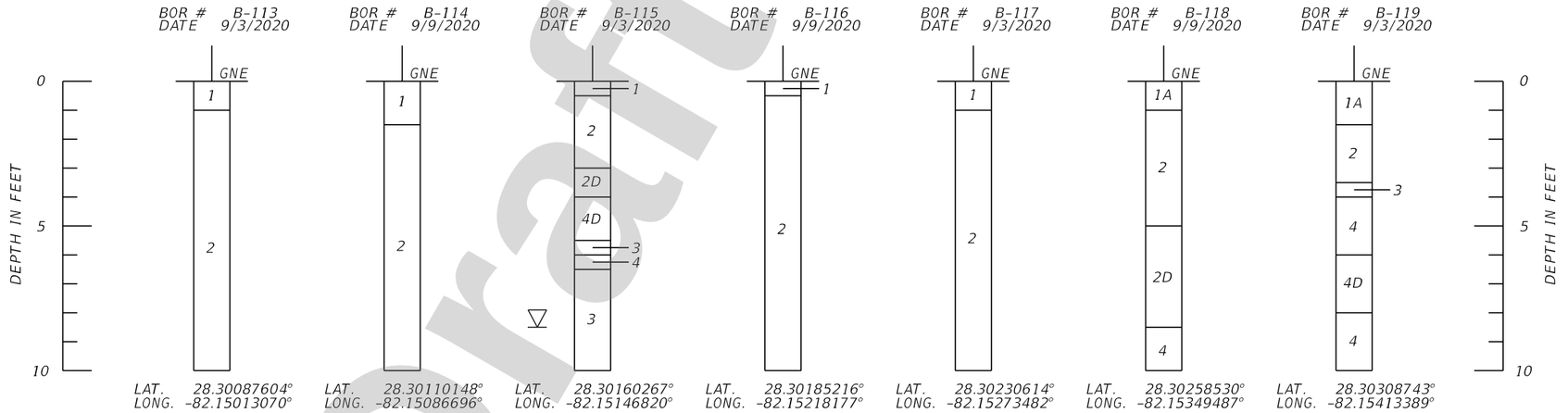
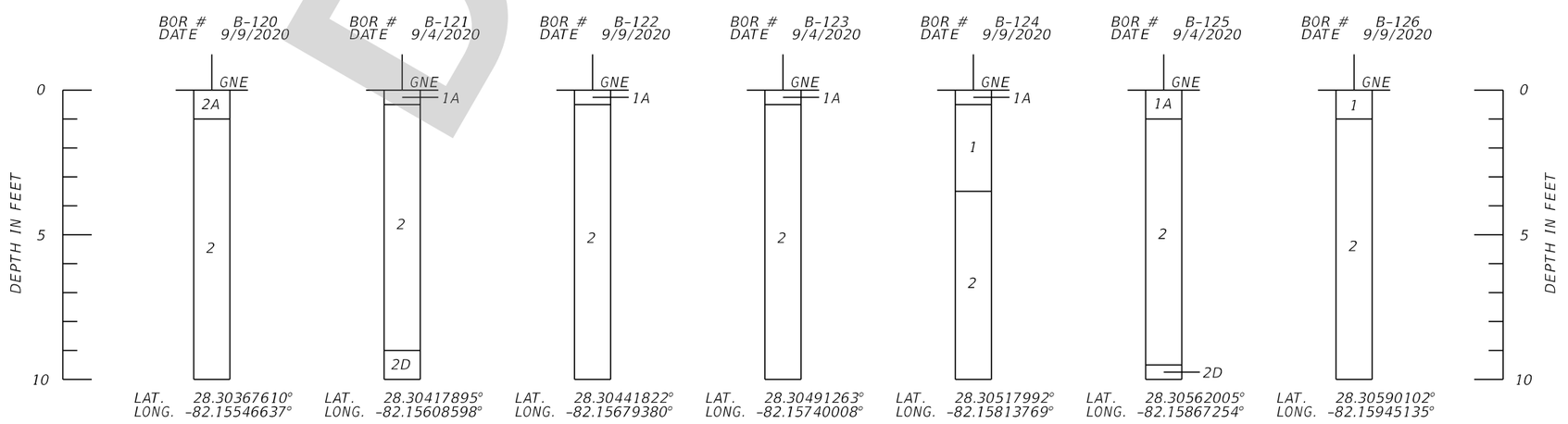
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

SOIL PROFILES (5)

SHEET NO. 20







LEGEND

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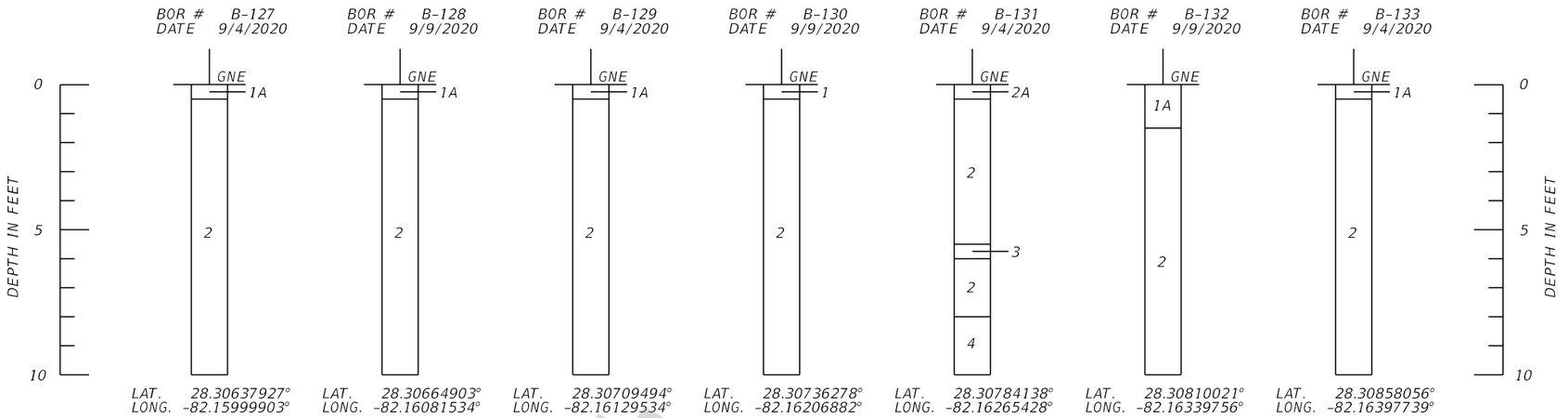
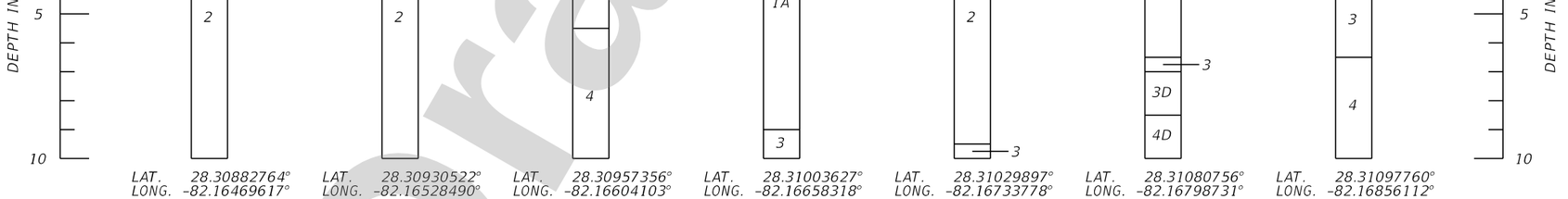
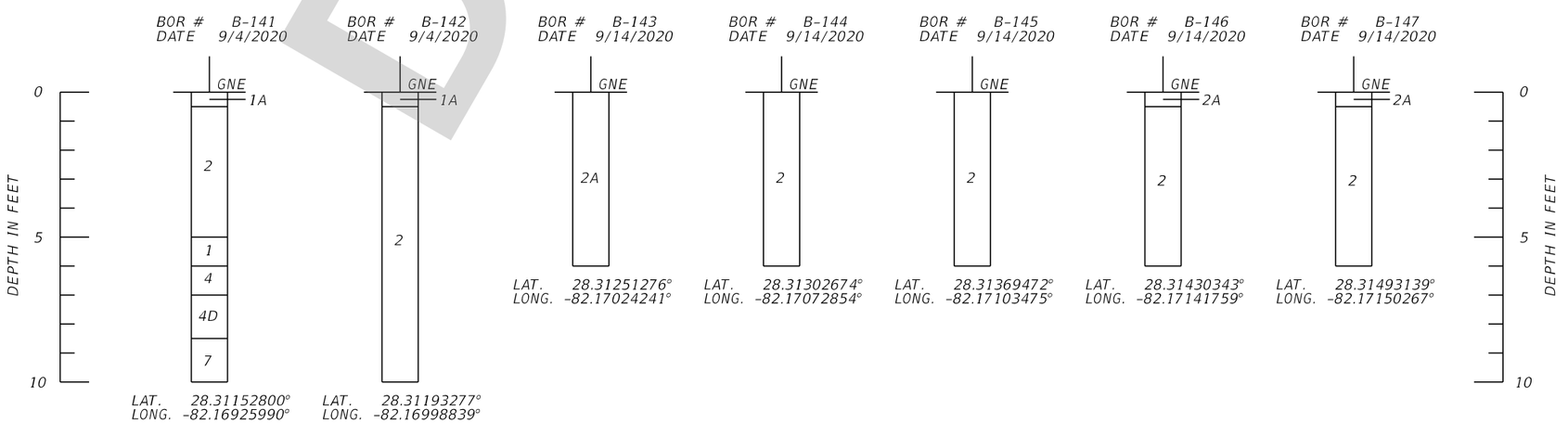
US 98	PASCO	443368-3

SOIL PROFILES (6)

SHEET NO. 21







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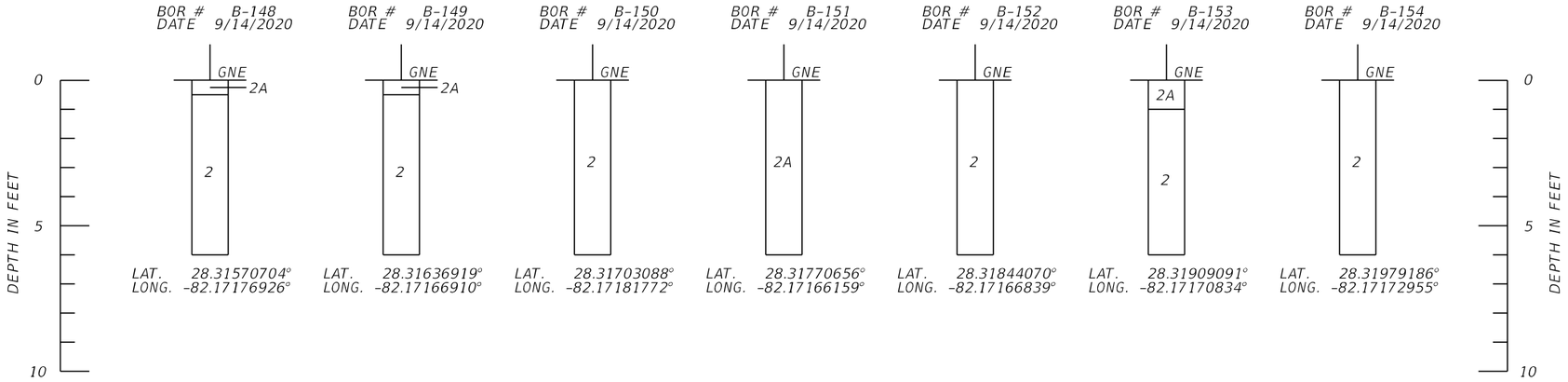
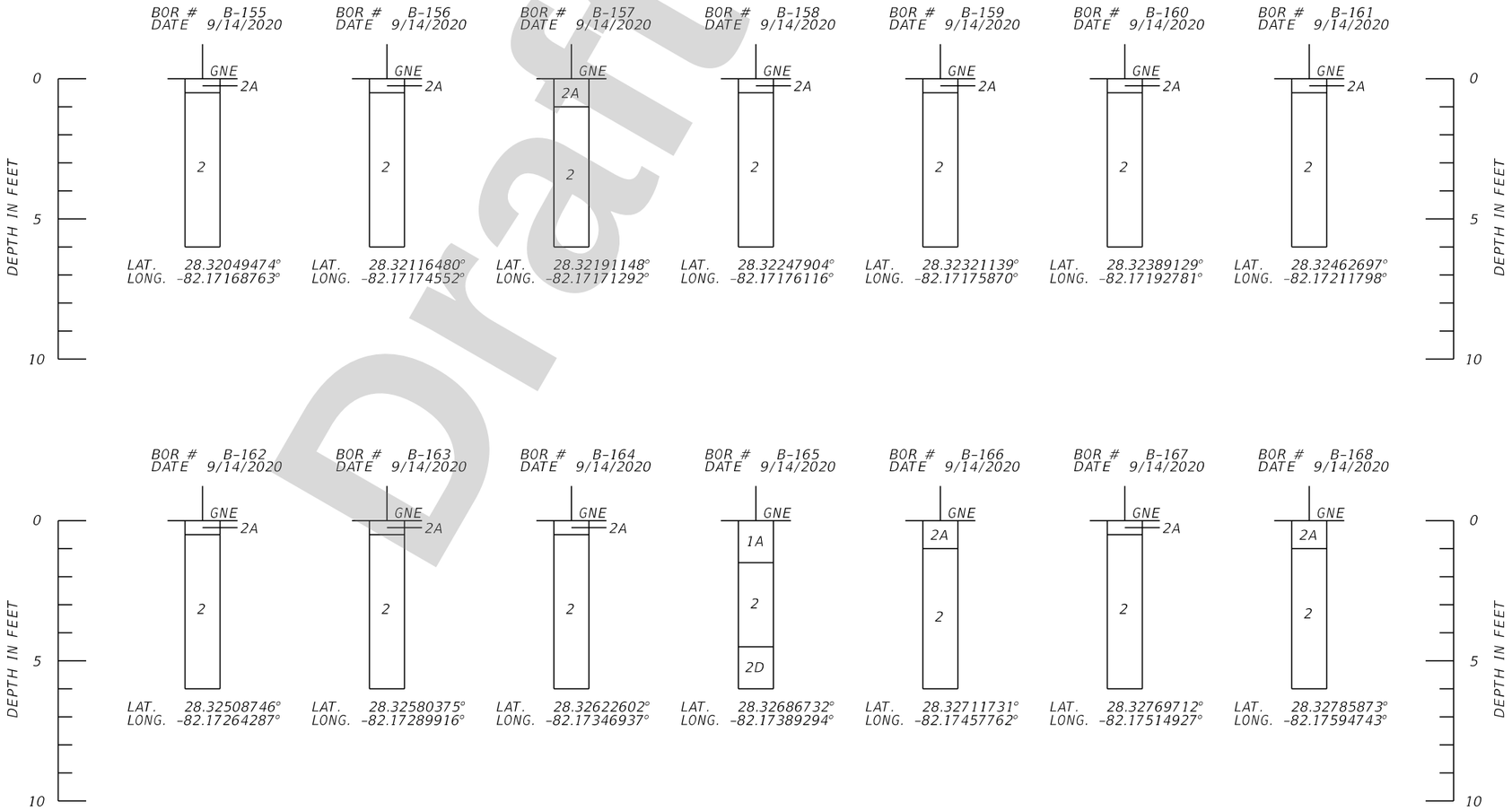
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

SOIL PROFILES (7)

SHEET NO. 22





LEGEND

1	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT WITH OCCASIONAL TO SOME LIMEROCK OR ROCK FRAGMENTS (A-3/A-2-4)
2	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT (A-3/A-2-4)
3	BROWNISH-YELLOW AND LIGHT GRAY MOSAIC TO LIGHT BROWNISH-GRAY TO DARK GRAY TO YELLOWISH-BROWN TO BROWN SILTY SAND (A-2-4)
4	BROWNISH-YELLOW AND LIGHT GRAY MOSAIC TO LIGHT BROWNISH-GRAY TO DARK GRAY TO YELLOWISH-BROWN TO BROWN CLAY TO SILTY-CLAYEY SAND (A-7-6/A-6/A-4)
5	VERY DARK BROWN TO BLACK MUCK (A-8)
6	VERY DARK BROWN TO BLACK SAND TO SILTY SAND WITH ORGANICS TO TRACE ORGANICS (A-3/A-2-4)
7	WEATHERED LIMESTONE
A	WITH ROOTLETS
B	WITH CLAY LENSES OR CLAY
C	WITH DECAYED WOOD FRAGMENTS AND/OR VEGETATIVE MATTER
D	WITH CEMENTED SAND AND/OR LIMESTONE FRAGMENTS
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
GNE	GROUNDWATER TABLE NOT ENCOUNTERED
▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT)
▼P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) WITH PERCHED CONDITIONS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

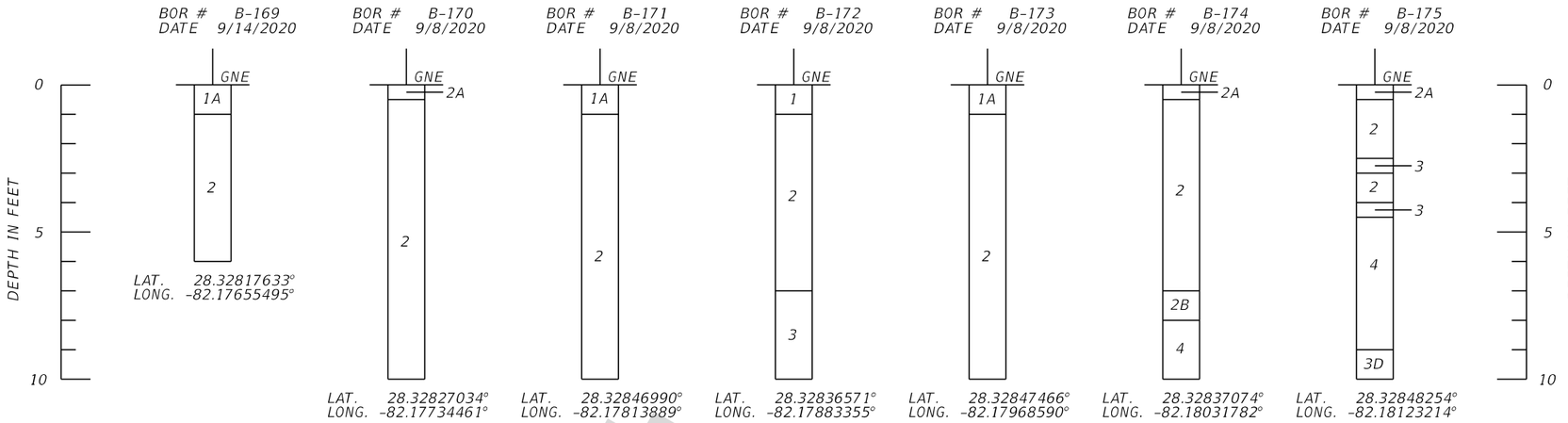
IGOR (IGON) KRATSER, P.E.
P.E. NO.: 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

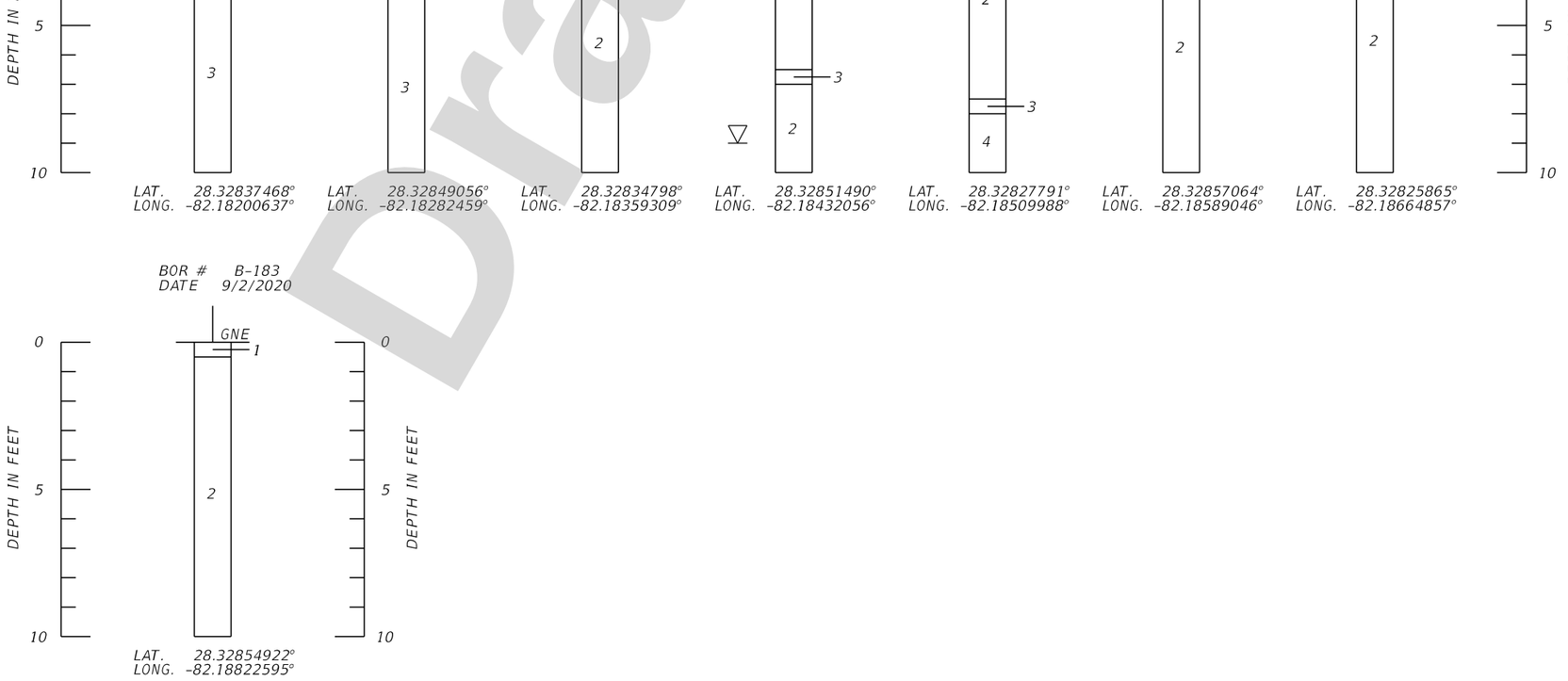
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

SOIL PROFILES (8)

SHEET NO. 23





LEGEND

1	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT WITH OCCASIONAL TO SOME LIMEROCK OR ROCK FRAGMENTS (A-3/A-2-4)
2	LIGHT GRAY TO VERY DARK GRAY TO DARK YELLOWISH-BROWN TO VERY PALE BROWN TO BLACK SAND TO SAND WITH SILT (A-3/A-2-4)
3	BROWNISH-YELLOW AND LIGHT GRAY MOSAIC TO LIGHT BROWNISH-GRAY TO DARK GRAY TO YELLOWISH-BROWN TO BROWN SILTY SAND (A-2-4)
4	BROWNISH-YELLOW AND LIGHT GRAY MOSAIC TO LIGHT BROWNISH-GRAY TO DARK GRAY TO YELLOWISH-BROWN TO BROWN CLAY TO SILTY-CLAYEY SAND (A-7-6/A-6/A-4)
5	VERY DARK BROWN TO BLACK MUCK (A-8)
6	VERY DARK BROWN TO BLACK SAND TO SILTY SAND WITH ORGANICS TO TRACE ORGANICS (A-3/A-2-4)
7	WEATHERED LIMESTONE
A	WITH ROOTLETS
B	WITH CLAY LENSES OR CLAY
C	WITH DECAYED WOOD FRAGMENTS AND/OR VEGETATIVE MATTER
D	WITH CEMENTED SAND AND/OR LIMESTONE FRAGMENTS
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
GNE	GROUNDWATER TABLE NOT ENCOUNTERED
▽	GROUNDWATER TABLE AT TIME OF DRILLING
▼	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT)
▼P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) WITH PERCHED CONDITIONS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. NO.: 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

SOIL PROFILES (9)

SHEET NO. 24

APPENDIX B

Summary of USDA Soil Survey-Polk County
Summary of USDA Soil Survey-Pasco County
Summary of Seasonal High Groundwater Table Estimates

SUMMARY OF USDA SOIL SURVEY
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPN: 443368-3
TEST LAB PROJECT NO: 20-5131

USDA Soil Name	Depth (in)	Soil Classification		Permeability (in/hr)	pH	Seasonal High Water Table	
		USCS	AASHTO			Depth (feet)	Months
(2) Pomona fine sand							
Pomona, non-hydric	0-6	SP, SP-SM	A-2-4, A-3	5.95 - 19.98	3.5-5.5	0.5-1.5	Jul-Sep
	6-22						
	22-36	SM, SP-SM		0.57 - 1.98			
	36-52	SP, SP-SM		5.95 - 19.98			
	52-60	SC, SC-SM, SM	A-2-4, A-4, A-6	0.20 - 0.57			
	60-80	SM, SP-SM	A-2-4, A-3	5.95 - 19.98			
Pomona, hydric	0-6	SP, SP-SM	A-2-4, A-3	5.95 - 19.98	3.5-5.5	0.0-0.5	Feb-Oct
	6-22						
	22-36	SM, SP-SM		0.57 - 1.98			
	36-52	SP, SP-SM		5.95 - 19.98			
	52-60	SC, SC-SM, SM	A-2-4, A-4, A-6	0.20 - 0.57			
	60-80	SM, SP-SM	A-2-4, A-3	5.95 - 19.98			
(5) Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes							
Myakka	0-6	SM, SP-SM	A-3, A-2-4	5.95 - 19.98	3.5-6.5	0.5-1.5	Jun-Nov
	6-20						
	20-36			0.57 - 5.95			
	36-80			5.95 - 19.98			
Myakka, wet	0-6	SM, SP-SM	A-3, A-2-4	5.95 - 19.98	3.5-6.5	0.3-1.5	Jul-Oct
	6-20						
	20-36			0.57 - 5.95			
	36-80			5.95 - 19.98			
(6) Tavares sand, 0 to 5 percent slopes							
Tavares	0-7	SM, SP-SM	A-2-4, A-3	6.00 - 50.03	3.5-6.0	3.5-6.0	Jun-Dec
	7-80	SP-SM, SM					
(7) Sparr fine sand, 0 to 5 percent slopes							
Sparr	0-6	SM, SP-SM	A-2-4, A-3	5.95 - 19.98	4.5-6.5	1.5-3.5	Jul-Oct
	6-43	SP-SM					
	43-48	SC, SC-SM, SM	A-2	0.57 - 1.98	4.5-6.0		
	48-59	SC, SC-SM	A-2, A-4, A-6				
	59-80	SC, SC-SM, SM					
(8) Sellers mucky loamy fine sand							
Sellers	0-9	SM, SP-SM	A-2-4, A-3	5.95 - 19.98	6.5-5.5	0.0	Jun-Sep
	9-24						
	24-80						
(13) Candler fine sand, 0 to 5 percent slopes							
Candler	0-5	SM, SP, SP-SM	A-2-4, A-3	5.95 - 50.03	4.5-6.0	—	—
	5-74						
	74-80	SP-SM, SM, SP, SC-SM		5.95 - 19.98			

SUMMARY OF USDA SOIL SURVEY
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPN: 443368-3
TEST LAB PROJECT NO: 20-5131

USDA Soil Name	Depth (in)	Soil Classification		Permeability (in/hr)	pH	Seasonal High Water Table	
		USCS	AASHTO			Depth (feet)	Months
(16) Zephyr muck							
Zephyr	0-13	PT	A-8	5.95 - 19.98	3.5-5.5	0.0	Jun-Nov
	13-31	SP-SM, SM	A-2-4, A-3				
	31-61	SC-SM, SM	A-2-4, A-6	0.06 - 0.20			
	61-80	SM, SC-SM	A-2-4	0.57 - 5.95			
(32) Lake fine sand, 0 to 5 percent slopes							
Lake	0-9	SP-SM	A-2-4, A-3	6.00 - 50.03	4.5-5.5	—	Jan-Dec
	9-80						
(35) EauGallie fine sand							
Eaugallie, non-hydric	0-7	SP, SP-SM	A-3	5.95 - 19.98	4.5-6.5	0.5-1.5	Jun-Sep
	7-22						
	22-30	SM, SP-SM	A-2-4, A-3	0.57 - 5.95	5.1-6.5		
	30-51	SP, SP-SM		5.95 - 19.98	5.6-7.8		
	51-80	SC, SC-SM, SM	A-2-4, A-6	0.57 - 5.95			
Eaugallie, hydric	0-5	SP, SP-SM	A-2-4, A-3	5.95 - 19.98	3.5-5.0	0.0-0.5	Jun-Sep
	5-13						
	13-25	SM, SP-SM		0.57 - 5.95			
	25-80	SP, SP-SM	A-3	5.95 - 19.98	4.5-5.5		
(39) Chobee soils, frequently flooded							
Chobee	0-11	SM, SP-SM	A-2-4	1.98 - 5.95	6.1-7.3	0.0-0.5	Jan-Feb, Jun-Dec
	11-56	SC	A-2-6, A-2-7, A-6, A-7	0.00 - 0.20	7.4-9.0		
	56-80	SC, SC-SM, SM, SP-SM	A-2-4, A-2-6, A-6, A-7	0.20 - 5.95			
(43) Arredondo fine sand, 0 to 5 percent slopes							
Arredondo	0-8	SM, SP-SM	A-3, A-2-4	5.95 - 19.98	4.5-6.0	—	Jan-Dec
	8-62						
	62-69	SC-SM, SC	A-2-4, A-2-6	1.98 - 5.95			
	69-80	SC	A-6, A-7-6, A-2-4	0.57 - 5.95			
(45) Kendrick fine sand, 0 to 5 percent slopes							
Kendrick	0-7	SM, SP-SM	A-2-4, A-3	6.00 - 20.00	4.5-6.0	—	Jan-Dec
	7-28						
	28-73	SC	A-2-4, A-6, A-2-6	0.60 - 6.00			
	73-80		A-6, A-2-6, A-2-4	0.60 - 2.00			
(72) Orlando fine sand, 0 to 5 percent slopes							
Orlando	0-20	SP-SM, SM	A-2-4, A-3	5.95 - 19.98	5.1-6.0	—	Jan-Dec
	20-80	SP-SM, SM, SC-SM					

SUMMARY OF USDA NRCS SOIL SURVEY - POLK COUNTY
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPN: 443368-3
TEST LAB PROJECT NO: 20-5131

USDA Soil Name	Depth (in)	Soil Classification		Permeability (in/hr)	pH	Seasonal High Water Table	
		USCS	AASHTO			Depth (feet)	Months
(7) Pomona fine sand							
Pomona, non-hydric	0-6	SP, SP-SM	A-2-4, A-3	5.95 - 19.98	3.5-5.5	0.5-1.5	Jun-Oct
	6-21						
	21-26	SM, SP-SM		0.57 - 5.95			
	26-48	SP, SP-SM		1.98 - 19.98	3.5-6.0		
	48-73	SM, SC-SM, SC	A-2, A-4, A-6	0.20 - 1.98	3.5-5.5		
	73-80	SM, SP-SM	A-2-4, A-3	0.57 - 5.95			
Pomona, hydric	0-6	SP, SP-SM	A-2-4, A-3	5.95 - 19.98	3.5-5.5	0.0-1.0	Jun-Oct
	6-21						
	21-26	SM, SP-SM		0.57 - 5.95			
	26-48	SP, SP-SM		1.98 - 19.98	3.5-6.0		
	48-73	SM, SC-SM, SC	A-2, A-4, A-6	0.20 - 1.98	3.5-5.5		
	73-80	SM, SP-SM	A-2-4, A-3	0.57 - 5.95			

SUMMARY OF SEASONAL HIGH GROUNDWATER TABLE ESTIMATES
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPID NO.: 443368-3
TEST LAB PROJECT NO: 20-5131

Boring Name	Boring Location[1]		Boring Depth	Date Recorded	Ground Elevation[2]	Measured Groundwater Table		USDA Soil Survey		Estimated SHGWT[5]	
	Latitude	Longitude	(feet)		(feet, NAVD)	Depth[3] (feet)	Elevation feet, NAVD	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet , NAVD)
B-1	28.259173	-82.075799	10.0	9/2/2020	89.8	3.0	86.8	7	0.0-1.0	2.0	87.8
B-2	28.259779	-82.076418	10.0	8/24/2020	89.9	3.0	86.9	2	0.5-1.5	2.0	87.9
B-3	28.259985	-82.077195	10.0	9/2/2020	89.3	3.0	86.3	2	0.5-1.5	2.0	87.3
B-4	28.260484	-82.077728	10.0	8/25/2020	89.1	3.5	85.6	2	0.5-1.5	2.0	87.1
B-5	28.260719	-82.078481	10.0	9/2/2020	88.7	3.5	85.2	2	0.5-1.5	2.0	86.7
B-6	28.261220	-82.079092	10.0	8/25/2020	88.4	2.5	85.9	2	0.5-1.5	1.5	86.9
B-7	28.261426	-82.079759	10.0	9/2/2020	88.4	2.0	86.4	2	0.5-1.5	1.5	86.9
B-8	28.261956	-82.080419	10.0	8/25/2020	88.1	2.5	85.6	2	0.5-1.5	1.5	86.6
B-9	28.262145	-82.081035	10.0	9/2/2020	88.0	2.5	85.5	2	0.5-1.5	1.5	86.5
B-10	28.262673	-82.081702	10.0	8/25/2020	88.2	2.0	86.2	2	0.5-1.5	1.5	86.7
B-11	28.262904	-82.082402	10.0	9/2/2020	88.7	2.0	86.7	2	0.5-1.5	1.5	87.2
B-12	28.263410	-82.083029	10.0	8/25/2020	91.4	6.0	85.4	2	0.5-1.5	4.5	86.9
B-13	28.263632	-82.083725	10.0	9/1/2020	91.4	5.5	85.9	2	0.5-1.5	4.5	86.9
B-14	28.264118	-82.084297	10.0	8/25/2020	89.3	4.5	84.8	2	0.5-1.5	2.5	86.8
B-15	28.264359	-82.085024	10.0	9/1/2020	86.8	2.5	84.3	2	0.5-1.5	1.0	85.8
B-16	28.264889	-82.085674	10.0	8/25/2020	86.8	3.0	83.8	2	0.5-1.5	1.5	85.3
B-17	28.265069	-82.086284	10.0	9/1/2020	86.2	2.5	83.7	16	0.0	1.0	85.2
B-18	28.265652	-82.087029	10.0	8/25/2020	86.5	1.5	85.0	2	0.5-1.5	1.0	85.5
B-19	28.265859	-82.087696	10.0	9/1/2020	86.4	2.0	84.4	7	1.5-3.5	1.0	85.4
B-20	28.266352	-82.088284	10.0	8/25/2020	86.1	2.5	83.6	7	1.5-3.5	1.0	85.1
B-21	28.266577	-82.088971	10.0	9/1/2020	85.5	1.5	84.0	16	0.0	1.0	84.5
B-22	28.267083	-82.089594	10.0	9/9/2020	85.5	2.5	83.0	35	0.0-0.5	1.5	84.0
B-23	28.267330	-82.090321	10.0	9/1/2020	85.0	2.0	83.0	35	0.0-0.5	1.0	84.0
B-24	28.267718	-82.090729	10.0	8/25/2020	84.8	2.5	82.3	35	0.0-0.5	1.0	83.8
B-25	28.268072	-82.091657	10.0	9/1/2020	84.8	2.5	82.3	39	0.0-0.5	2.0	82.8
B-26	28.268534	-82.092200	10.0	8/25/2020	84.9	3.0	81.9	39	0.0-0.5	2.0	82.9
B-27	28.268827	-82.093006	10.0	9/1/2020	84.6	3.5	81.1	39	0.0-0.5	2.0	82.6
B-28	28.269283	-82.093542	10.0	8/25/2020	84.6	4.0	80.6	39	0.0-0.5	2.0	82.6
B-29	28.269523	-82.094251	10.0	9/1/2020	84.3	3.0	81.3	39	0.0-0.5	1.5	82.8
B-30	28.270006	-82.094844	10.0	8/25/2020	84.8	4.0	80.8	39	0.0-0.5	2.0	82.8
B-31	28.270288	-82.095620	10.0	9/1/2020	84.0	3.5	80.5	39	0.0-0.5	2.0	82.0
B-32	28.270601	-82.095923	10.0	8/25/2020	85.1	4.0	81.1	39	0.0-0.5	3.0	82.1
B-33	28.271025	-82.096943	10.0	9/1/2020	84.4	3.5	80.9	39	0.0-0.5	2.5	81.9
B-34	28.271523	-82.097531	10.0	8/25/2020	85.9	5.5	80.4	39	0.0-0.5	4.0	81.9
B-35	28.271873	-82.098511	10.0	9/1/2020	85.0	2.5	82.5	39	0.0-0.5	ND	ND
B-36	28.272232	-82.098809	10.0	8/24/2020	84.2	5.0	79.2	39	0.0-0.5	ND	ND
B-37	28.272469	-82.099506	10.0	9/1/2020	84.5	3.0	81.5	39	0.0-0.5	2.0	82.5
B-38	28.272949	-82.100096	10.0	8/25/2020	84.2	3.5	80.7	2	0.5-1.5	2.0	82.2
B-39	28.273194	-82.100819	10.0	9/1/2020	84.1	2.5	81.6	2	0.5-1.5	2.0	82.1
B-40	28.273712	-82.101460	10.0	8/26/2020	83.7	6.5	77.2	2	0.5-1.5	2.0	81.7
B-41	28.273942	-82.102159	10.0	9/1/2020	84.0	4.0	80.0	2	0.5-1.5	2.5	81.5
B-42	28.274426	-82.102744	10.0	8/26/2020	84.5	5.0	79.5	2	0.5-1.5	3.0	81.5
B-43	28.274694	-82.103500	10.0	9/1/2020	84.6	3.5	81.1	2	0.5-1.5	2.0	82.6
B-44	28.275162	-82.104066	10.0	8/26/2020	84.1	4.5	79.6	2	0.5-1.5	3.5	80.6
B-45	28.275423	-82.104814	10.0	8/31/2020	84.1	3.0	81.1	2	0.5-1.5	2.0	82.1
B-46	28.275894	-82.105386	10.0	8/26/2020	84.6	5.0	79.6	2	0.5-1.5	4.0	80.6
B-47	28.276152	-82.106128	10.0	8/31/2020	84.1	4.0	80.1	2	0.5-1.5	ND	ND
B-48	28.276630	-82.106707	10.0	8/26/2020	84.7	5.5	79.2	2	0.5-1.5	4.0	80.7
B-49	28.276915	-82.107485	10.0	8/31/2020	84.1	3.5	80.6	2	0.5-1.5	2.5	81.6
B-50	28.277349	-82.107986	10.0	8/26/2020	84.4	5.5	78.9	2	0.5-1.5	3.0	81.4
B-51	28.277620	-82.108749	10.0	8/31/2020	84.3	3.5	80.8	16	0.0	2.5	81.8

SUMMARY OF SEASONAL HIGH GROUNDWATER TABLE ESTIMATES
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPID NO.: 443368-3
TEST LAB PROJECT NO: 20-5131

Boring Name	Boring Location[1]		Boring Depth	Date Recorded	Ground Elevation[2]	Measured Groundwater Table		USDA Soil Survey		Estimated SHGWT[5]	
	Latitude	Longitude	(feet)		(feet, NAVD)	Depth[3] (feet)	Elevation feet, NAVD	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet , NAVD)
B-52	28.278074	-82.109303	10.0	8/26/2020	84.7	5.5	79.2	16	0.0	3.0	81.7
B-53	28.278388	-82.110124	10.0	8/31/2020	84.4	4.5	79.9	16	0.0	3.0	81.4
B-54	28.278818	-82.110638	10.0	8/26/2020	84.8	4.0	80.8	16	0.0	3.0	81.8
B-55	28.279107	-82.111420	10.0	8/31/2020	83.8	3.5	80.3	16	0.0	2.0	81.8
B-56	28.279554	-82.111909	10.0	8/26/2020	83.5	4.5	79.0	16	0.0	3.0	80.5
B-57	28.279832	-82.112709	10.0	8/31/2020	84.1	4.5	79.6	16	0.0	3.0	81.1
B-58	28.280291	-82.113255	10.0	8/26/2020	84.1	6.5	77.6	16	0.0	4.0	80.1
B-59	28.280561	-82.114036	10.0	8/31/2020	83.5	4.5	79.0	2	0.5-1.5	3.0	80.5
B-60	28.281018	-82.114561	10.0	8/27/2020	84.9	6.5	78.4	6	3.5-6.0	4.5	80.4
B-61	28.281282	-82.115320	10.0	8/31/2020	84.4	4.5	79.9	2	0.5-1.5	3.5	80.9
B-62	28.281774	-82.115910	10.0	8/27/2020	84.5	5.5	79.0	6	3.5-6.0	4.0	80.5
B-63	28.282011	-82.116617	10.0	8/31/2020	84.8	2.0P	82.8P	6	3.5-6.0	2.0P	82.8P
B-64	28.282503	-82.117221	10.0	8/27/2020	84.4	4.5	79.9	6	3.5-6.0	3.0	81.4
B-65	28.282726	-82.117907	10.0	8/31/2020	84.0	3.5	80.5	2	0.5-1.5	3.0	81.0
B-66	28.283227	-82.118502	10.0	8/27/2020	83.7	5.0	78.7	2	0.5-1.5	3.0	80.7
B-67	28.283463	-82.119216	10.0	8/31/2020	82.8	4.5	78.3	39	0.0-0.5	2.5	80.3
B-68	28.283973	-82.119851	10.0	8/27/2020	83.6	5.0	78.6	39	0.0-0.5	3.5	80.1
B-69	28.284210	-82.120546	10.0	8/31/2020	83.6	4.0	79.6	39	0.0-0.5	3.0	80.6
B-70	28.284690	-82.121138	10.0	8/27/2020	83.1	4.0	79.1	39	0.0-0.5	3.0	80.1
B-71	28.284933	-82.121839	10.0	8/31/2020	83.9	6.0	77.9	39	0.0-0.5	4.0	79.9
B-72	28.285455	-82.122497	10.0	8/27/2020	81.9	5.5	76.4	39	0.0-0.5	ND	ND
B-73	28.285735	-82.123281	10.0	8/31/2020	84.0	6.5	77.5	39	0.0-0.5	ND	ND
B-74	28.286190	-82.123834	10.0	8/24/2020	83.7	6.5	77.2	39	0.0-0.5	ND	ND
B-75	28.286446	-82.124559	10.0	8/28/2020	84.4	8.0	76.4	6	3.5-6.0	6.5	77.9
B-76	28.286852	-82.125027	10.0	8/24/2020	84.4	8.0	76.4	6	3.5-6.0	6.0	78.4
B-77	28.287200	-82.125927	10.0	8/28/2020	84.9	9.0	75.9	7	1.5-3.5	7.0	77.9
B-78	28.287647	-82.126431	10.0	8/27/2020	86.2	GNE	<76.2	7	1.5-3.5	>6.0	<80.2
B-79	28.287876	-82.127266	10.0	8/28/2020	81.6	GNE	<71.6	7	1.5-3.5	>6.0	<75.6
B-80	28.288388	-82.127777	10.0	8/27/2020	87.8	GNE	<77.8	7	1.5-3.5	>6.0	<81.8
B-81	28.288660	-82.128536	10.0	8/28/2020	85.7	GNE	<75.7	7	1.5-3.5	>6.0	<79.7
B-82	28.289135	-82.129110	10.0	8/27/2020	84.1	GNE	<74.1	7	1.5-3.5	>6.0	<78.1
B-83	28.289345	-82.129771	10.0	8/28/2020	84.0	GNE	<74.0	6	3.5-6.0	>6.0	<78.0
B-84	28.289882	-82.130451	10.0	8/27/2020	84.2	GNE	<74.2	6	3.5-6.0	>6.0	<78.2
B-85	28.290106	-82.131122	10.0	8/28/2020	84.4	GNE	<74.4	72	>6.0	>6.0	<78.4
B-86	28.290574	-82.131684	10.0	8/27/2020	84.6	GNE	<74.6	72	>6.0	>6.0	<78.6
B-87	28.290818	-82.132415	10.0	8/28/2020	87.4	GNE	<77.4	72	>6.0	>6.0	<81.4
B-88	28.291293	-82.132979	10.0	8/27/2020	91.5	GNE	<81.5	72	>6.0	>6.0	<85.5
B-89	28.291558	-82.133753	10.0	8/28/2020	97.1	GNE	<87.1	72	>6.0	>6.0	<91.1
B-90	28.292070	-82.134354	10.0	8/28/2020	102.0	GNE	<92.0	32	>6.0	>6.0	<96.0
B-91	28.292345	-82.135212	10.0	8/28/2020	107.2	GNE	<97.2	32	>6.0	>6.0	<101.2
B-92	28.292813	-82.135680	10.0	8/28/2020	109.9	GNE	<99.9	32	>6.0	>6.0	<103.9
B-93	28.293077	-82.136455	10.0	8/28/2020	111.3	GNE	<101.3	32	>6.0	>6.0	<105.3
B-94	28.293539	-82.136990	10.0	8/28/2020	109.5	GNE	<99.5	32	>6.0	>6.0	<103.5
B-95	28.293768	-82.137693	10.0	8/28/2020	111.8	GNE	<101.8	32	>6.0	>6.0	<105.8
B-96	28.294274	-82.138321	10.0	8/24/2020	117.7	GNE	<107.7	32	>6.0	>6.0	<111.7
B-97	28.294519	-82.139036	10.0	8/28/2020	124.8	GNE	<114.8	32	>6.0	>6.0	<118.8
B-98	28.294989	-82.139616	10.0	8/28/2020	131.6	GNE	<121.6	32	>6.0	>6.0	<125.6
B-99	28.295255	-82.140362	10.0	8/28/2020	136.9	GNE	<126.9	32	>6.0	>6.0	<130.9
B-100	28.295709	-82.140897	10.0	8/28/2020	139.4	GNE	<129.4	32	>6.0	>6.0	<133.4
B-101	28.295948	-82.141603	10.0	9/2/2020	139.9	GNE	<129.9	32	>6.0	>6.0	<133.9
B-102	28.296445	-82.142211	10.0	9/2/2020	138.2	GNE	<128.2	32	>6.0	>6.0	<132.2

SUMMARY OF SEASONAL HIGH GROUNDWATER TABLE ESTIMATES
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPID NO.: 443368-3
TEST LAB PROJECT NO: 20-5131

Boring Name	Boring Location[1]		Boring Depth	Date Recorded	Ground Elevation[2]	Measured Groundwater Table		USDA Soil Survey		Estimated SHGWT[5]	
	Latitude	Longitude	(feet)		(feet, NAVD)	Depth[3] (feet)	Elevation feet, NAVD	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet , NAVD)
B-103	28.296676	-82.142910	10.0	9/2/2020	134.4	GNE	<124.4	32	>6.0	>6.0	<128.4
B-104	28.297173	-82.143511	10.0	9/2/2020	127.0	GNE	<117.0	32	>6.0	>6.0	<121.0
B-105	28.297443	-82.144294	10.0	9/2/2020	118.9	9.5	109.4	32	>6.0	>6.0	<112.9
B-106	28.297888	-82.144816	10.0	9/2/2020	116.9	GNE	<106.9	32	>6.0	>6.0	<110.9
B-107	28.298174	-82.145627	10.0	9/3/2020	120.6	GNE	<110.6	32	>6.0	>6.0	<114.6
B-108	28.298673	-82.146188	10.0	9/2/2020	125.7	GNE	<115.7	32	>6.0	>6.0	<119.7
B-109	28.299415	-82.147514	10.0	9/3/2020	126.5	GNE	<116.5	32	>6.0	>6.0	<120.5
B-110	28.299618	-82.148304	10.0	9/4/2020	123.9	GNE	<113.9	32	>6.0	>6.0	<117.9
B-111	28.300140	-82.148783	10.0	9/3/2020	121.5	GNE	<111.5	32	>6.0	>6.0	<115.5
B-112	28.300409	-82.149604	10.0	9/4/2020	121.6	GNE	<111.6	32	>6.0	>6.0	<115.6
B-113	28.300876	-82.150131	10.0	9/3/2020	123.7	GNE	<113.7	32	>6.0	>6.0	<117.7
B-114	28.301101	-82.150867	10.0	9/9/2020	127.9	GNE	<117.9	32	>6.0	>6.0	<121.9
B-115	28.301603	-82.151468	10.0	9/3/2020	131.4	8.5	122.9	32	>6.0	>6.0	<125.4
B-116	28.301852	-82.152182	10.0	9/9/2020	130.4	GNE	<120.4	32	>6.0	>6.0	<124.4
B-117	28.302306	-82.152735	10.0	9/3/2020	128.5	GNE	<118.5	32	>6.0	>6.0	<122.5
B-118	28.302585	-82.153495	10.0	9/9/2020	126.1	GNE	<116.1	32	>6.0	>6.0	<120.1
B-119	28.303087	-82.154134	10.0	9/3/2020	122.4	GNE	<112.4	32	>6.0	>6.0	<116.4
B-120	28.303676	-82.155466	10.0	9/9/2020	118.5	GNE	<108.5	32	>6.0	>6.0	<112.5
B-121	28.304179	-82.156086	10.0	9/4/2020	119.4	GNE	<109.4	32	>6.0	>6.0	<113.4
B-122	28.304418	-82.156794	10.0	9/9/2020	121.0	GNE	<111.0	32	>6.0	>6.0	<115.0
B-123	28.304913	-82.157400	10.0	9/4/2020	125.5	GNE	<115.5	32	>6.0	>6.0	<119.5
B-124	28.305180	-82.158138	10.0	9/9/2020	129.5	GNE	<119.5	32	>6.0	>6.0	<123.5
B-125	28.305620	-82.158673	10.0	9/4/2020	131.6	GNE	<121.6	32	>6.0	>6.0	<125.6
B-126	28.305901	-82.159451	10.0	9/9/2020	131.8	GNE	<121.8	32	>6.0	>6.0	<125.8
B-127	28.306379	-82.159999	10.0	9/4/2020	129.8	GNE	<119.8	32	>6.0	>6.0	<123.8
B-128	28.306649	-82.160815	10.0	9/9/2020	128.5	GNE	<118.5	32	>6.0	>6.0	<122.5
B-129	28.307095	-82.161295	10.0	9/4/2020	128.3	GNE	<118.3	32	>6.0	>6.0	<122.3
B-130	28.307363	-82.162069	10.0	9/9/2020	128.6	GNE	<118.6	32	>6.0	>6.0	<122.6
B-131	28.307841	-82.162654	10.0	9/4/2020	129.3	GNE	<119.3	32	>6.0	>6.0	<123.3
B-132	28.308100	-82.163398	10.0	9/9/2020	131.5	GNE	<121.5	32	>6.0	>6.0	<125.5
B-133	28.308581	-82.163977	10.0	9/4/2020	133.4	GNE	<123.4	32	>6.0	>6.0	<127.4
B-134	28.308828	-82.164696	10.0	9/8/2020	135.8	GNE	<125.8	32	>6.0	>6.0	<129.8
B-135	28.309305	-82.165285	10.0	9/4/2020	139.3	GNE	<129.3	32	>6.0	>6.0	<133.3
B-136	28.309574	-82.166041	10.0	9/8/2020	143.7	GNE	<133.7	13	>6.0	>6.0	<137.7
B-137	28.310036	-82.166583	10.0	9/4/2020	147.8	GNE	<137.8	13	>6.0	>6.0	<141.8
B-138	28.310299	-82.167338	10.0	9/8/2020	152.0	GNE	<142.0	13	>6.0	>6.0	<146.0
B-139	28.310808	-82.167987	10.0	9/4/2020	153.3	GNE	<143.3	32	>6.0	>6.0	<147.3
B-140	28.310978	-82.168561	10.0	9/8/2020	152.9	GNE	<142.9	32	>6.0	>6.0	<146.9
B-141	28.311528	-82.169260	10.0	9/4/2020	150.1	GNE	<140.1	32	>6.0	>6.0	<144.1
B-142	28.311933	-82.169988	10.0	9/4/2020	144.7	GNE	<134.7	32	>6.0	>6.0	<138.7
B-143	28.312513	-82.170242	6.0	9/14/2020	141.1	GNE	<135.1	32	>6.0	>6.0	<135.1
B-144	28.313027	-82.170729	6.0	9/14/2020	137.7	GNE	<131.7	32	>6.0	>6.0	<131.7
B-145	28.313695	-82.171035	6.0	9/14/2020	142.2	GNE	<136.2	13	>6.0	>6.0	<136.2
B-146	28.314303	-82.171418	6.0	9/17/2020	148.8	GNE	<142.8	13	>6.0	>6.0	<142.8
B-147	28.314931	-82.171503	6.0	9/17/2020	152.0	GNE	<146.0	13	>6.0	>6.0	<146.0
B-148	28.315707	-82.171769	6.0	9/17/2020	153.3	GNE	<147.3	13	>6.0	>6.0	<147.3
B-149	28.316369	-82.171669	6.0	9/17/2020	152.9	GNE	<146.9	13	>6.0	>6.0	<146.9
B-150	28.317031	-82.171818	6.0	9/17/2020	151.4	GNE	<145.4	13	>6.0	>6.0	<145.4
B-151	28.317707	-82.171662	6.0	9/14/2020	150.6	GNE	<144.6	13	>6.0	>6.0	<144.6
B-152	28.318441	-82.171668	6.0	9/14/2020	145.5	GNE	<139.5	13	>6.0	>6.0	<139.5
B-153	28.319090	-82.171710	6.0	9/14/2020	137.8	GNE	<131.8	13	>6.0	>6.0	<131.8

SUMMARY OF SEASONAL HIGH GROUNDWATER TABLE ESTIMATES
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPID NO.: 443368-3
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Boring Name	Boring Location[1]		Boring Depth	Date Recorded	Ground Elevation[2]	Measured Groundwater Table		USDA Soil Survey		Estimated SHGWT[5]	
	Latitude	Longitude	(feet)		(feet, NAVD)	Depth[3] (feet)	Elevation feet, NAVD	Map Symbol	Estimated SHGWT[4] Depth (feet)	Depth[3] (feet)	Elevation (feet , NAVD)
B-154	28.319792	-82.171732	6.0	9/14/2020	130.8	GNE	<124.8	43	>6.0	>6.0	<124.8
B-155	28.320495	-82.171688	6.0	9/14/2020	125.5	GNE	<119.5	43	>6.0	>6.0	<119.5
B-156	28.321165	-82.171746	6.0	9/14/2020	121.1	GNE	<115.1	43	>6.0	>6.0	<115.1
B-157	28.321911	-82.171713	6.0	9/14/2020	119.7	GNE	<113.7	43	>6.0	>6.0	<113.7
B-158	28.322479	-82.171761	6.0	9/14/2020	119.8	GNE	<113.8	43	>6.0	>6.0	<113.8
B-159	28.323211	-82.171759	6.0	9/14/2020	110.5	GNE	<104.5	43	>6.0	>6.0	<104.5
B-160	28.323891	-82.171928	6.0	9/14/2020	100.3	GNE	<94.3	13	>6.0	>6.0	<94.3
B-161	28.32462697	-82.17211798	6.0	9/14/2020	91.8	GNE	<85.8	13	>6.0	>6.0	<85.8
B-162	28.325087	-82.172643	6.0	9/14/2020	91.1	GNE	<85.1	13	>6.0	>6.0	<85.1
B-163	28.325804	-82.172899	6.0	9/14/2020	84.4	GNE	<78.4	13	>6.0	>6.0	<78.4
B-164	28.326226	-82.173469	6.0	9/14/2020	84.7	GNE	<78.7	43	>6.0	>6.0	<78.7
B-165	28.326867	-82.173893	6.0	9/14/2020	91.3	GNE	<85.3	43	>6.0	>6.0	<85.3
B-166	28.327117	-82.174578	6.0	9/14/2020	96.4	GNE	<90.4	43	>6.0	>6.0	<90.4
B-167	28.327697	-82.175149	6.0	9/14/2020	103.1	GNE	<97.1	32	>6.0	>6.0	<97.1
B-168	28.327859	-82.175947	6.0	9/14/2020	91.1	GNE	<85.1	32	>6.0	>6.0	<85.1
B-169	28.32817633	-82.17655495	6.0	9/14/2020	93.1	GNE	<87.1	32	>6.0	>6.0	<87.1
B-170	28.328270	-82.177345	10.0	9/8/2020	95.2	GNE	<85.2	32	>6.0	>6.0	<89.2
B-171	28.328470	-82.178139	10.0	9/8/2020	105.1	GNE	<95.1	32	>6.0	>6.0	<99.1
B-172	28.328366	-82.178834	10.0	9/8/2020	110.2	GNE	<90.2	32	>6.0	>6.0	<104.2
B-173	28.328475	-82.179686	10.0	9/8/2020	117.0	GNE	<107.0	43	>6.0	>6.0	<111.0
B-174	28.328371	-82.180318	10.0	9/8/2020	124.4	GNE	<114.4	45	>6.0	>6.0	<118.4
B-175	28.328483	-82.181232	10.0	9/8/2020	135.0	GNE	<125.0	45	>6.0	>6.0	<129.0
B-176	28.328375	-82.182006	10.0	9/3/2020	142.1	GNE	<132.1	43	>6.0	>6.0	<136.1
B-177	28.328491	-82.182825	10.0	9/8/2020	146.7	GNE	<136.7	43	>6.0	>6.0	<140.7
B-178	28.328348	-82.183593	10.0	9/3/2020	148.7	GNE	<138.7	43	>6.0	>6.0	<142.7
B-179	28.328515	-82.184321	10.0	9/8/2020	146.4	9.0	137.4	43	>6.0	>6.0	<140.4
B-180	28.328278	-82.185100	10.0	9/3/2020	142.2	GNE	<132.2	43	>6.0	>6.0	<136.2
B-181	28.328571	-82.185890	10.0	9/2/2020	135.0	GNE	<125.0	43	>6.0	>6.0	<129.0
B-182	28.328259	-82.186649	10.0	9/4/2020	126.9	GNE	<116.9	32	>6.0	>6.0	<120.9
B-183	28.328549	-82.188226	10.0	9/2/2020	127.7	GNE	<117.7	32	>6.0	>6.0	<121.7

(1) Boring latitude & longitude provided by the project surveyor

(2) Boring elevation provided by the project surveyor using the NAVD 1988 Datum

(3) Depth below existing grades at time of field exploration

(4) Seasonal high groundwater table depth presented in the Soil Surveys of Polk & Pasco County, Florida published by the USDA/NRCS

(5) Seasonal high groundwater table depth estimated based on soil stratigraphy, measured groundwater levels from the borings, the Soil Surveys of Polk & Pasco County published information and past experience with similar soil conditions

(6) GNE = Groundwater Not Encountered within the depth of the boring performed

(7) ND = SHGWT could not be determined due to disturbed soil conditions

(8) P= Indictes perched groundwater table condition above clayey soil

APPENDIX C

Summary of Corrosion Test Results
Summary of Laboratory Test Results
Summary of Resilient Modulus Testing Results

SUMMARY OF CORROSION TEST RESULTS
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPN NO: 443368-3
TEST LAB PROJECT NO: 20-5131

Sample Location Location		Boring Number/ Sample Type	Sample Depth (ft)	pH (FM 5-550)	Resistivity (ohm-cm) (FM 5-551)	Chlorides (ppm) (FM 5-552)	Sulfates (ppm) (FM 5-553)	Environmental Classification	
Lat:	Long:							Steel	Concrete
28.263548	-82.083456	Surface Water Sample (farm crossing)	N/A	6.5	13,000	41	≤ 2.0	Slightly Aggressive	Slightly Aggressive
28.263784	-82.083609	Soil Sample (farm crossing)	0-1.5	7.4	12,000	50	≤ 2.0	Slightly Aggressive	Slightly Aggressive
28.28787589	-82.12726581	Soil Sample (farm crossing)	0-1.5	8.0	7,200	52	≤ 2.0	Slightly Aggressive	Slightly Aggressive
28.25998461	-82.07719524	Soil Sample B-3	2.5-4.5	8.2	17,000	59	≤ 2.0	Slightly Aggressive	Slightly Aggressive
28.26928327	-82.09354181	Soil Sample B-28	1.5-5	7.8	32,000	53	≤ 2.0	Slightly Aggressive	Slightly Aggressive
28.27761969	-82.10874933	Soil Sample B-51	0.5-4	7.8	23,000	48	≤ 2.0	Slightly Aggressive	Slightly Aggressive
28.28988181	-82.13045072	Soil Sample B-84	2.5-6.5	7.8	26,000	50	6	Slightly Aggressive	Slightly Aggressive

SUMMARY OF LABORATORY TEST RESULTS
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPN: 443368-3
TEST LAB PROJECT NO: 20-5131

Boring Number	Sample Depth (ft)*	Stratum Number	AASHTO Symbol	Seive Analysis					Atterberg Limits			Organic Content (%)	Natural Moisture Content (%)
				#10	#40	#60	#100	#200	Liquid Limit	Plastic Limit	Plasticity Index		
B-1	0.0-0.5	1	A-2-4	94.3	86.9	67.0	35.8	11.1	--	--	--	--	--
B-35	0.5-1.0	1	A-3	88.1	85.0	69.2	35.0	9.5	--	--	--	--	12.7
B-110	3.0-3.5	1	A-3	99.3	96.7	77.7	35.9	9.1	--	--	--	--	--
B-15	1.5-2.0	2	A-3	100.0	97.0	77.9	42.4	9.8	--	--	--	--	--
B-29	5.5-6.0	2	A-2-4	99.9	97.5	81.9	49.6	11.1	--	--	--	--	--
B-42	3.0-3.5	2	A-3	100.0	97.5	80.3	47.5	8.4	--	--	--	--	--
B-60	1.0-1.5	2	A-3	100.0	97.4	78.7	37.8	7.2	--	--	--	--	--
B-96	2.0-2.5	2	A-3	100.0	98.9	84.3	39.8	5.4	--	--	--	--	--
B-122	4.0-4.5	2	A-3	100.0	97.6	73.5	32.3	6.6	--	--	--	--	--
B-135	5.0-5.5	2	A-3	100.0	86.4	80.4	36.0	5.8	--	--	--	--	--
B-148	5.5-6.0	2	A-3	100.0	98.7	81.4	36.8	3.9	--	--	--	--	--
B-161	1.0-1.5	2	A-3	100.0	98.3	74.1	32.5	4.1	--	--	--	--	--
B-173	7.0-7.5	2	A-2-4	99.2	98.9	85.7	44.7	10.8	--	--	--	--	--
B-183	0.5-1.0	2	A-3	91.9	86.9	70.7	36.8	9.1	--	--	--	--	--
B-6	2.5-3.0	3	A-2-4	100.0	97.7	79.6	50.4	27.9	23	15	8	--	20.7
B-10	4.5-5.0	3	A-2-4	100.0	97.3	82.1	54.4	27.5	23	14	9	--	20.4
B-14	1.0-1.5	3	A-2-4	99.6	90.8	55.1	33.1	20.2	20	14	6	--	12.5
B-31	3.0-3.5	3	A-2-4	100.0	96.9	69.7	36.9	19.4	NP	NP	NP	--	18.1
B-62	6.5-7.0	3	A-2-4	100.0	97.2	80.4	45.1	22.1	--	--	--	--	--
B-72	1.0-1.5	3	A-2-4	99.9	97.8	83.0	45.0	22.0	NP	NP	NP	--	44.2
B-97	7.0-7.5	3	A-2-4	99.2	98.5	87.7	56.7	26.9	23	16	7	--	18.9
B-175	4.0-4.5	3	A-2-4	99.9	99.4	87.9	53.2	28.4	20	14	6	--	17.2
B-2	4.0-4.5	4	A-7-6	100.0	98.0	85.1	63.0	38.9	43	20	23	--	21.4
B-63	3.0-3.5	4	A-6	99.9	98.4	86.4	59.0	38.9	35	17	18	--	21.3
B-80	0.5-1.0	4	A-6	98.7	92.9	80.3	58.4	43.6	38	21	17	--	20.1
B-91	2.0-2.5	4	A-4	99.5	97.9	86.3	60.6	37.9	20	14	6	--	14.9
B-92	5.0-5.5	4	A-4	99.8	97.0	85.5	59.3	35.4	22	15	7	--	15.1
B-119	8.0-8.5	4	A-6	99.8	96.7	80.2	48.9	36.3	37	22	15	--	19.9
B-141	6.0-6.5	4	A-6	97.5	91.6	82.3	59.3	39.2	28	16	12	--	19.7
B-72	2.5-3.0	5	A-8	99.8	97.3	82.6	46.4	23.2	--	--	--	15.8	42.5
B-5	3.5-4.0	6	A-3	100.0	96.9	73.9	37.6	8.5	--	--	--	2.1	20.3
B-8	6.5-7.0	6	A-2-4	100.0	97.3	78.7	36.3	10.1	--	--	--	3.6	12.4
B-11	2.0-2.5	6	A-2-4	100.0	97.5	79.2	44.8	13.3	--	--	--	5.2	29.5
B-25	3.0-3.5	6	A-2-4	100.0	97.9	83.9	46.4	13.0	--	--	--	4.2	31.9
B-39	3.5-4.0	6	A-2-4	99.7	97.0	79.4	46.6	11.8	--	--	--	4.6	28.5
B-69	6.0-8.0	6	A-2-4	99.9	97.1	78.0	38.7	11.0				5.2	16.9
B-72	2.0-2.5	6	A-2-4	98.7	92.3	77.4	43.3	30.9	--	--	--	4.3	16.0

Florida Department of Transportation

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

KEVIN J. THIBAULT
SECRETARY

MEMORANDUM

DATE: October 20, 2020

TO: Teresa Puckett, District Geotechnical Materials Engineer

FROM: David Horhota, State Geotechnical Materials Engineer

SUBJECT: Embankment Resilient Modulus Pavement Design
District 7, Pasco County
FPN 443368-3: US-98/SR-700 from S of Polk County Line to SR-35/39/700 (US-301/98)

Eighteen (18), 2-bag samples were received by the State Materials Office (SMO) for determination of an embankment (roadbed) resilient modulus for pavement design. After visual observation of the eighteen samples, it was determined that the material from each 2-bag sample looked visually similar and the material from each of the bags were combined to form one sample from each location. After combining materials from the bags, samples from each location were obtained for classification tests (Atterberg limits, particle size analysis, and organic content), Proctor density, and resilient modulus. The classification test results are reported in Tables 1 and 2. Information provided for this project by Testlab, Inc. indicated all samples were collected from between 1.0 and 2.0 feet in depth.

Table 1. Summary of Gradation Results

Sample ID	Passing 3/4" (%)	Passing 1/2" (%)	Passing 3/8" (%)	Passing No. 4 (%)	Passing No. 10 (%)	Passing No. 40 (%)	Passing No. 60 (%)	Passing No. 100 (%)	Passing No. 200 (%)
MR-1	100.0	100.0	99.5	98.7	94.4	88.7	73.5	43.6	17.9
MR-2	100.0	99.6	99.6	99.1	98.2	94.2	78.3	40.7	10.4
MR-3	100.0	99.3	97.9	96.3	91.8	87.4	73.7	42.5	13.0
MR-4	100.0	100.0	99.7	98.1	95.0	91.3	78.1	42.5	10.4
MR-5	100.0	100.0	99.9	99.5	99.1	95.3	78.8	41.5	10.5
MR-6	100.0	100.0	99.9	99.0	97.3	94.6	80.4	44.0	9.5
MR-7	100.0	100.0	100.0	99.7	99.1	95.5	78.7	37.0	9.8
MR-8	100.0	100.0	99.7	98.8	95.1	90.1	76.0	45.4	22.7
MR-9	100.0	99.1	98.7	98.3	97.7	94.5	78.5	37.9	11.4
MR-10	100.0	100.0	100.0	99.9	99.7	97.6	82.3	38.8	7.5
MR-11	100.0	99.8	99.7	99.2	97.0	92.4	73.1	31.1	8.9

MR-12	100.0	100.0	100.0	99.5	98.8	96.3	80.6	40.2	10.3
MR-13	100.0	100.0	99.9	99.6	98.5	96.1	81.5	15.5	10.5
MR-14	100.0	100.0	99.6	95.2	88.6	84.0	71.1	38.0	12.1
MR-15	100.0	100.0	100.0	100.0	99.9	98.5	81.4	37.2	4.3
MR-16	100.0	100.0	100.0	100.0	99.9	98.5	82.3	37.2	4.3
MR-17	100.0	100.0	100.0	99.8	99.7	97.8	81.3	37.2	6.0
MR-18	100.0	98.8	97.8	95.8	90.9	85.9	74.2	41.6	17.3

Table 2. Summary of Classification Results

Sample ID	Sample Location	Soil Class.	Organic Content (%)	LL/PI
MR-1	28.259427, -82.075694	A-2-4	0.6	N.P.
MR-2	28.263090, -82.082744	A-3	1.2	N.P.
MR-3	28.267035, -82.089513	A-2-4	2.1	N.P.
MR-4	28.270770, -82.096473	A-3	0.9	N.P.
MR-5	28.274723, -82.103304	A-2-4	2.3	N.P.
MR-6	28.278475, -82.110276	A-3	1.0	N.P.
MR-7	28.282436, -82.117138	A-3	1.3	N.P.
MR-8	28.286179, -82.124111	A-2-4	2.7	N.P.
MR-9	28.290166, -82.130975	A-2-4	2.2	N.P.
MR-10	28.293951, -82.138017	A-3	2.0	N.P.
MR-11	28.297931, -82.144886	A-3	1.3	N.P.
MR-12	28.301732, -82.151960	A-3	1.9	N.P.
MR-13	28.305679, -82.158765	A-3	1.9	N.P.
MR-14	28.309405, -82.165722	A-2-4	2.6	N.P.
MR-15	28.314343, -82.171289	A-3	0.6	N.P.
MR-16	28.321555, -82.171736	A-3	0.8	N.P.
MR-17	28.327696, -82.175182	A-3	1.2	N.P.
MR-18	28.328375, -82.138805	A-2-4	1.2	N.P.

In addition to the classification testing, the following test program was conducted:

(1) Standard Proctor, AASHTO T 99
(2) Resilient Modulus (M_R), AASHTO T 307.

A summary of laboratory test results is included in Table 3. The resilient modulus values listed in this table were obtained using the relationship developed from each individual test (resilient modulus versus bulk stress - with bulk stress, Θ, defined as $\Theta = \sigma_1 + \sigma_2 + \sigma_3$), and using a bulk stress of 11 psi, which is the recommendation from Dr. Ping's research work in modeling the embankment in-situ stresses for Florida pavement conditions. The resilient modulus samples were compacted to within 1 pound per cubic foot (pcf) of the maximum density and 0.5 percent of the optimum moisture content as determined by AASHTO T99.

Table 3. Summary of T-99 and M_R Test Results

Sample ID	Passing No. 200 (%)	Standard Proctor Density (pcf)	Optimum Moisture Content (%)	Resilient Modulus @ Θ=11psi (psi)
MR-1	18	121.0	9.9	15,127
MR-2	10	114.1	11.3	13,247
MR-3	13	114.6	11.7	13,756
MR-4	10	115.8	11.3	13,388
MR-5	11	112.8	11.5	12,400
MR-6	9	114.8	10.3	13,930
MR-7	10	112.8	11.5	14,064
MR-8	23	119.6	11.9	13,681
MR-9	11	113.0	11.9	12,238
MR-10	7	111.5	12.4	11,689
MR-11	9	114.0	11.2	14,140
MR-12	10	114.2	11.1	14,395
MR-13	10	112.6	11.6	12,607
MR-14	12	114.2	11.4	12,382
MR-15	4	106.7	12.9	15,001
MR-16	4	106.9	13.2	12,813
MR-17	6	111.3	12.2	13,143
MR-18	17	119.0	10.2	15,789

To obtain a design embankment resilient modulus, a 90 percent method was used as outlined in both the Flexible Pavement Design Manual and Soils and Foundations Handbook. The resilient modulus values were ranked in ascending order and the percentage of values which were greater than or equal to the individual value were determined. The results of this analysis are recorded in Table 4 and the corresponding graph of these results is included as Figure 1.

Table 4. Ranked M_R Test Results for 90 Percent Method

Rank	Sample ID	% ≥	M_R (psi)
1	MR-10	100	11,689
2	MR-9	94	12,238
3	MR-14	89	12,382
4	MR-5	83	12,400
5	MR-13	78	12,607
6	MR-16	72	12,813
7	MR-17	67	13,143
8	MR-2	61	13,247

9	MR-4	56	13,388
10	MR-8	50	13,681
11	MR-3	44	13,756
12	MR-6	39	13,930
13	MR-7	33	14,064
14	MR-11	28	14,140
15	MR-12	22	14,395
16	MR-15	17	15,001
17	MR-1	11	15,127
18	MR-18	6	15,789

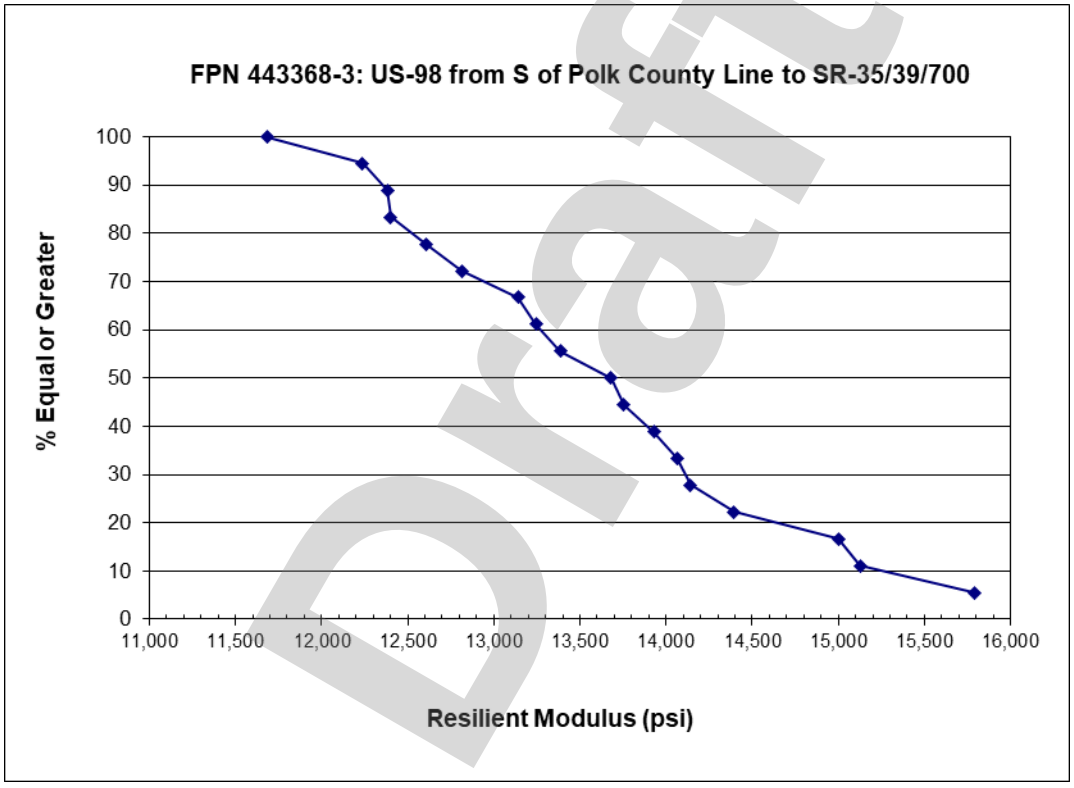

Figure 1. Ranked M_R Test Results for 90% Method

Based on the results shown in Table 4 and Figure 1, the resilient modulus corresponding to a 90th percentile is **12,400 psi**, which would represent the design embankment M_R value.

GEOTECHNICAL EXPLORATION DATA REPORT - STRUCTURES
US 98 FROM POLK COUNTY LINE TO US 301

FPID NO. 443368-3

TEST LAB PROJECT NO. GE-20-5131

Prepared for:

FLORIDA DEPARTMENT OF TRANSPORTATION
FDOT DISTRICT 1/7 MATERIALS OFFICE
P.O. BOX 1249, 2730 STATE ROAD 60 WEST

Prepared by:

TEST LAB INC.
GEOTECHNICAL & MATERIALS
ENGINEERING, TESTING & INSPECTION

P.O. Box 15732
Tampa, Florida 33684
Florida Certificate of Authorization No. 1450

TEST LAB INC.
GEOTECHNICAL & MATERIALS
ENGINEERING, TESTING & INSPECTION

July 15, 2021

Florida Department of Transportation
FDOT District 1/7 Materials Office
P.O. Box 1249, 2730 State Road 60 West

Attention: Ms. Teresa (Terry) Puckett, P.E.

Subject: **Geotechnical Exploration Data Report - Structures**
Contract No. C-9S21 – Task 44
US 98 from Polk County Line to US 301
US 98 over Hillsborough River
US 98 over Old Lakeland Highway
Pasco County, Florida
FPN No. 443368-3
Test Lab Project No. GE-20-5131

Dear Ms. Puckett:

Test Lab, Inc. (Test Lab) has performed a geotechnical exploration at US 98 over the Hillsborough River crossing and US 98 over Old Lakeland Highway crossing.

Test Lab appreciates the opportunity of providing our services to the Florida Department of Transportation (FDOT) on this project. If there are any questions concerning this exploration, or if we may be of any further assistance, please do not hesitate to contact us.

Respectfully submitted,
Test Lab, Inc.
4112 West Osborne Avenue, Tampa, Florida 33614
Florida Certificate of Authorization No. 1450

IGOR KRATSER
LICENSE
No 73129
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Connie Johnson-Gearhart

Igor Kratser
2021.07.16
10:51:40 -04'00'

Connie Johnson-Gearhart, P.E.
Geotechnical Engineer
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Igor (Igon) Kratser, P.E.
Senior Geotechnical Engineer
Florida License No. 73129

This item has been digitally signed and sealed by Igor (Igon) Kratser, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Copies Submitted: (1) PDF

TABLE OF CONTENTS

PROJECT INFORMATION

Project Description

This report focuses specifically on US 98 bridge crossings over Hillsborough River and Old Lakeland Highway, Bridge Nos. 140024 and 140025, respectively. The subsurface information obtained to date is provided herein.

General Site Conditions

The existing roadway section of US 98 along the referenced alignment consists of a rural, two-lane road supported by an embankment. The stormwater conveyance system within the project corridor consists of linear swales adjacent to the existing roadway. Land use generally consists of heavily wooded parcels, undeveloped grass covered parcels with isolated stands of trees and sporadic light residential and commercial development.

PURPOSE AND SCOPE OF SERVICES

The geotechnical exploration presented herein was performed to obtain subsurface information at the above referenced site. The following services were provided in order to achieve the preceding objective:

i. Reviewed readily available published topographic and soils information. This information included Florida Quadrangle maps published by the United States Geological Survey (USGS) and the "Soil Survey of Pasco County, Florida" published by the United States Department of Agriculture (USDA) Natural Resource Conservation Services (NRCS), and the "Potentiometric Surface of the Upper Floridan Aquifer in the Southwest Florida Water Management District – September 2015" map produced by Southwest Florida Water Management District.

ii. Completed a program of subsurface exploration consisting of five (5) Standard Penetration Test (SPT) borings advanced to depths of 65 to 155 feet.

iii. Visually classified the recovered soil samples in the laboratory. Performed laboratory tests on selected representative samples to develop the soil legend for the project using the Unified Soil Classification System (USCS).

iv. Prepared this Geotechnical Exploration Data Report for the project.

REVIEW OF AVAILABLE DATA

Regional Geology

Based on a review of the publications titled "A Geological Overview of Florida" prepared by the State of Florida Department of Natural Resources, 1992 and the Based on a review of the publication titled "A Geological Overview of Florida" prepared by the State of Florida Department of Natural Resources, 1992, and the USDA Soil Survey, the general project area lies within the area called the Brooksville Ridge, described as follows:

The Brooksville Ridge occupies most of Hernando County. It extends easterly form about U.S. Highway 19 to U.S. Highway 301. The Brooksville Ridge can be divided into two parts. The rolling, deep, sandy ridges on the western and eastern edges are dominated by deep, sandy soils with numerous depressions and sinks. Elevations range from about 75 to 100 feet in the western part and from about 50 to 100 feet in the eastern part. The central part of the Brooksville Ridge ranges in elevation from about 100 to more than 200 feet. These rolling areas consist of poorly drained to well drained, sandy to clayey soils.

Undifferentiated Pleistocene sand and clays exist from the surface to approximately 10 feet below grade. These soils are underlain by soils of the Miocene age Hawthorne Group that typically occur between 10 and 45 feet below grade. These soils are mostly clay with sand seams. Soils in this group frequently comprise the confining unit of the Floridan aquifer. Below this group is the Ocala Limestone formation of the Eocene period which extends to 1,000 feet or more below surface.USDA Soil Survey, the general project area lies within the areas of Brooksville Ridge and portions of Western Valley. These geomorphologic features are described as follows:

The Brooksville Ridge occupies most of the east portion of Pasco County. It extends from about U.S. Highway 41 to U.S. Highway 301. The Brooksville Ridge can be divided into two parts. The rolling, deep, sandy ridges on the western and eastern edges are dominated by deep, sandy soils with numerous depressions and sinks. Elevations range from about 75 to 100 feet in western part and from about 50 to 100 feet in the eastern part. The central part of the Brooksville Ridge ranges in elevation from about 100 to 200 feet. These rolling areas consist of poorly drained to well drained, sandy to clayey soils.

The Western Valley occupies several counties including the northeast portion of Hillsborough County, eastern Pasco County, northwest Polk County and Sumter County. The Western Valley includes the valley of the Withlacoochee River and the valley of the Hillsborough River. Elevations generally range from 50 to 100 feet.

Published information from the Florida Department of Environmental Protection shows the bridge over Hillsborough River as located within the geologic unit of Suwannee Limestone (Ts) and the bridge over Old Lakeland Highway as located within the geologic unit of Hawthorn Group, Undifferentiated (Th).

Suwannee Limestone consists of a white to cream, poorly to well indurated, fossiliferous, vuggy to moldic limestone. The dolomitized parts of the Suwannee Limestone are gray, tan, light brown to moderate brown, moderately to well indurated, finely to coarsely crystalline, dolostone with limited occurrences of fossiliferous beds. Silicified limestone is common in Suwannee Limestone. Fossils present in the Suwanee Limestone include mollusks, foraminifers, coals and echinoids.

The Hawthorn Group, Undifferentiated sediments are light olive gray and blue gray in unweathered sections to reddish brown in deeply weathered sections, poorly to moderately consolidated, clayey sands to silty clays and relatively pure clays. These sediments are part of the intermediate confining unit/aquifer system and provide an effective aquitard for the Florida Aquifer System, except where perforated by karst features.

USDA/NRCS Soil Survey

Based on a review of the Pasco County Soil Survey published by the USDA/NRCS, the soils present below the Hillsborough River Crossing consist of Chobee soils, frequently flooded (Unit 39) and the soil present below the crossing over Old Lakeland Highway consists of Lake fine sand, 0 to 5 percent slopes (Unit 32). A reproduction of the **USDA Vicinity Map (Sheets 1 & 2)** is illustrated in **Appendix A** and the soil mapping units are summarized in **Appendix B**.

Chobee soils has a landform of depressions on flood plains on marine terraces. The parent material is loamy alluvium. The soil profile generally consists of fine sandy loam (SM, SP-SM) to a depth of 11 inches followed by sandy clay loam (SC) to 56 inches and loamy sand, fine sand, sandy clay loam (SC, SC-SM, SM, SP-SM) to 80 inches. The natural drainage class is very poorly drained and water movement in the most restrictive layer is moderately low to low throughout. The seasonal high groundwater table is reported to range from 0 to ½ feet below natural grade.

Lake fine sand has a landform of ridges on marine terraces, hills on marine terraces. Lake has a parent material of eolian deposits or sandy marine deposits. The soil profile consists of fine sand (SP-SM) to a depth of 80 inches. The natural drainage class of excessively drained and water movement in the most restrictive layer is high to very high. The seasonal high groundwater table is greater than 6 feet below natural grade.

USGS Quadrangle Map

Based on a review of the Florida Quadrangle Map for Branchborough, Florida, and As-Built Roadway plans from 1993, it appears that the natural ground surface elevation around the banks of US 98 over Hillsborough River Crossing ranges from +75 to +85 feet North American Vertical Datum of 1988 (NAVD88) as illustrated on the **USGS Vicinity Map (Sheet 1)** in **Appendix A.** Based on a review of the Florida Quadrangle Map for Dade City, Florida, it appears that the natural ground surface elevation around the US 98 over Old Lakeland Highway Crossing ranges from +95 to +105 feet NAVD88 as illustrated on the **USGS Vicinity Map (Sheet 2)** in **Appendix A**. The existing ground surface elevations have been slightly altered due to road grading and embankment; however, based on survey information for the project, the current ground elevations are generally near or within the range provided on the Quadrangle Maps.

Existing Geotechnical Information

The geotechnical information from previous explorations consisting of Report of Core Borings sheets for bridge structures 140024 and 140025 has been provided by the Department and included in **Appendix D**.

Potentiometric Surface Maps

Based on a review of the "Potentiometric Surface of the Upper Floridan Aquifer" (published in September 2015) produced by Southwest Florida Water Management District, the potentiometric surface elevation of the upper Floridan Aquifer at the US 98 bridge over Hillsborough River is +80 to +90 feet, NGVD29 and at the US 98 bridge over Old Lakeland Highway, the potentiometric surface elevation is +70 to +80 feet, NGVD29. Artesian conditions were not encountered at the time of our field activities.

SUBSURFACE EXPLORATION

Bridge Borings

The subsurface conditions at the US 98 over Hillsborough River Crossing and US 98 over Old Lakeland Highway Crossing were explored utilizing Standard Penetration Test (SPT) borings advanced to approximately 65 to 155 feet below existing grade. The borings performed were located in the field by representatives of Test Lab using handheld Global Positioning System (GPS) devices and measuring distances from existing site features. The boring locations are illustrated on the **Report of Core Borings (Sheets 3 – 5)** in **Appendix A**.

The SPT borings were performed with the use of a drill rig using Bentonite Mud drilling procedures. The soil sampling was performed in general accordance with American Society for Testing and Materials (ASTM) test designation D-1586 titled “Penetration Test and Split-Barrel Sampling of Soils”. The upper 6 feet of the borings were hand augered to verify utility clearance. SPT N-values were then taken continuously to a depth of 10 feet and at intervals of 2.5 feet thereafter. Representative portions of these soil samples were sealed in glass jars, labeled and transferred to our Tampa laboratory for classification and analysis.

LABORATORY TESTING

Representative soil samples collected from the borings performed within the project corridor were classified and stratified in general accordance with the Unified Soil Classification System (USCS). The classification was based on visual observations, using the results of laboratory testing as confirmation. These tests included grain-size analyses, Atterberg Limits, natural moisture content and environmental corrosion series.

Test Designation

The following list summarizes the laboratory tests performed and respective test methods utilized.

i. Grain-Size Analysis – The grain-size analyses were conducted in general accordance with American Society for Testing and Materials (ASTM) test designation D-422.

ii. Atterberg Limits - The liquid limit and the plastic limit tests ("Atterberg Limits") were conducted in general accordance with ASTM test designation D-4318.

iii. Natural Moisture Content - The moisture content tests were conducted in general accordance with ASTM test designation D-2216.

iv. Environmental Corrosion Series – The environmental corrosion tests were conducted in general accordance with the FDOT test designations FM 5-550, FM 5-551, FM 5-552 and FM 5-553.

The laboratory test results are presented on the **Report of Core Borings (Sheets 3 – 5)** in **Appendix A**. A detailed summary of the Environmental Corrosion Series test results is presented in **Appendix C**.

RESULTS OF SUBSURFACE EXPLORATION

General Soil Conditions

The subsurface conditions encountered are shown on the **Report of Core Borings** (**Sheets 3 – 5)** in **Appendix A.** The boring results are presented in the form of soil profiles, along with the profile legend and other pertinent information such as measured groundwater levels and laboratory test results. The soil stratification is based on a visual examination of the recovered soil samples, the laboratory testing, and interpretation of field boring logs by a geotechnical engineer. The soil types shown represent observations made at the boring locations and may not reflect variations among the borings and beyond the depths explored. The stratification lines represent the approximate boundaries between soil types of significantly different engineering properties. The actual transition may be gradual.

The following table presents a generalized subsurface soil profile as encountered in the SPT borings performed in the vicinity of the existing bridge structures.

Typical Soil Description	USCS Classification
Very Dark Brown to Pale Brown to Gray to Light Gray SAND to SAND with SILT	SP/SP-SM
Pale Brown to Brown to Gray to Dark Gray Silty SAND to Silty Clayey SAND to Clayey SAND	SM/SC-SM/SC
Weathered Limestone	*

*The USCS does not include a classification for limestone.

Groundwater

The groundwater was encountered at depths of 2½ and 7 feet below existing ground surface at the Hillsborough River Crossing. The groundwater level was not encountered at the Old Lakeland Highway Crossing and is noted as GNE on the **Report of Core Borings (Sheets 3 – 5)**. The groundwater level is presented on the **Report of Core Borings (Sheets 3 – 5)** in **Appendix A.**

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences (i.e. existing water management canals, swales, drainage ditch, underdrains and areas of covered soils, such as paved parking lots and sidewalks).

LIMITATIONS

Our professional services have been performed in accordance with generally accepted geotechnical engineering principles and practices at the time of this report. This company is not responsible for the conclusions, opinions or recommendations made by others based on these data.

The scope of the exploration was intended to evaluate soil conditions within the influence of the proposed improvements. This report presents the geotechnical conditions based on the data obtained from the soil borings performed at the locations indicated in this report and does not reflect any variations which may occur among these borings. If any variations become evident during the course of design and/or construction, a re-evaluation of the conditions contained in this report is the responsibility of the design team.

The data presented in this report is for informational purposes only. Project specific geotechnical evaluations should be completed by the design team for design and construction of this project. It should be noted that the design team will be responsible for interpretation of the data presented in this report.

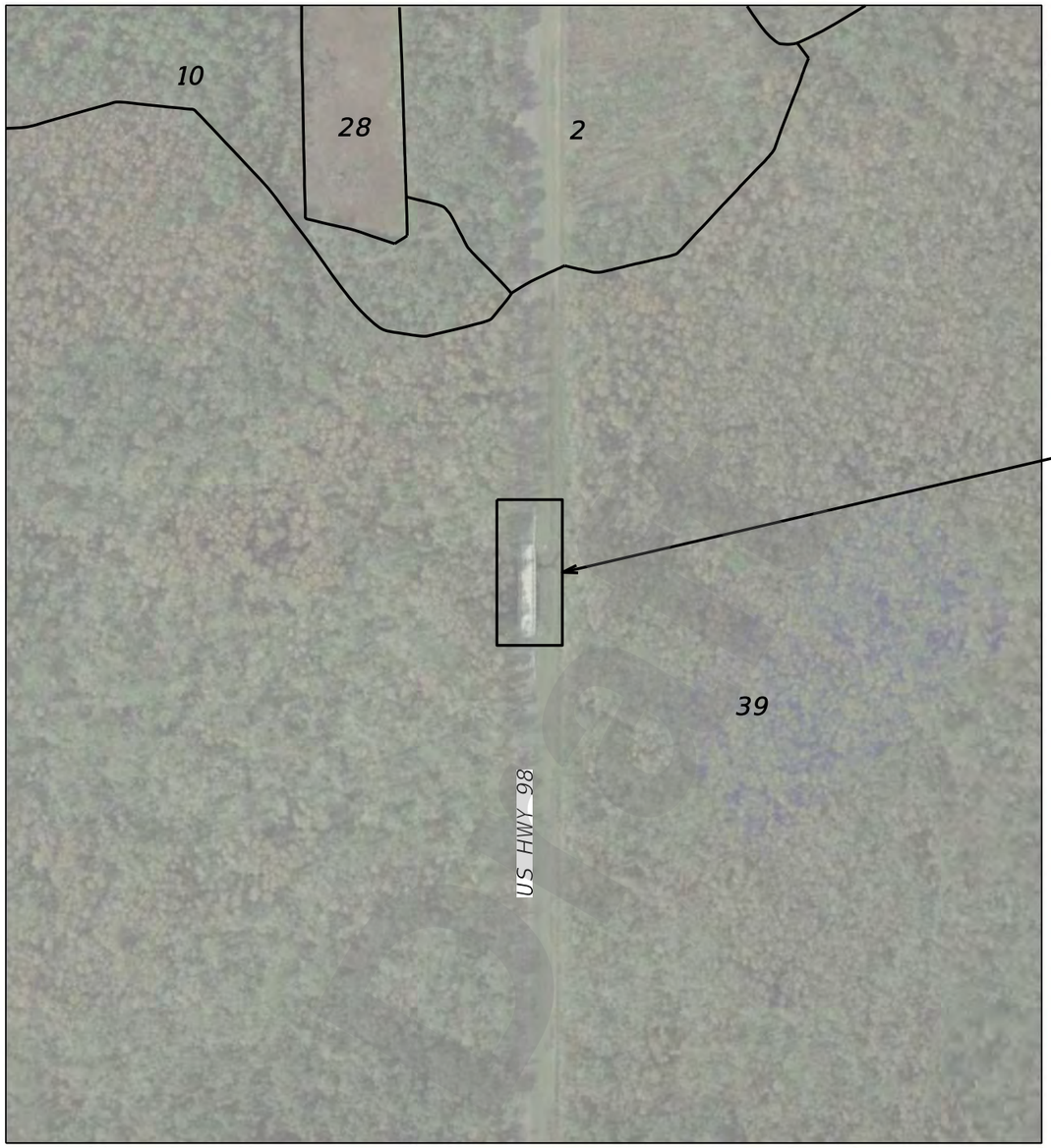
The scope of services, included herein, did not include any environmental assessment for the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater, air, on the site, below and around the site. Any statements in this report or on the boring logs regarding odors, colors, unusual or suspicious items and conditions are strictly for the information of our client.

APPENDIX A

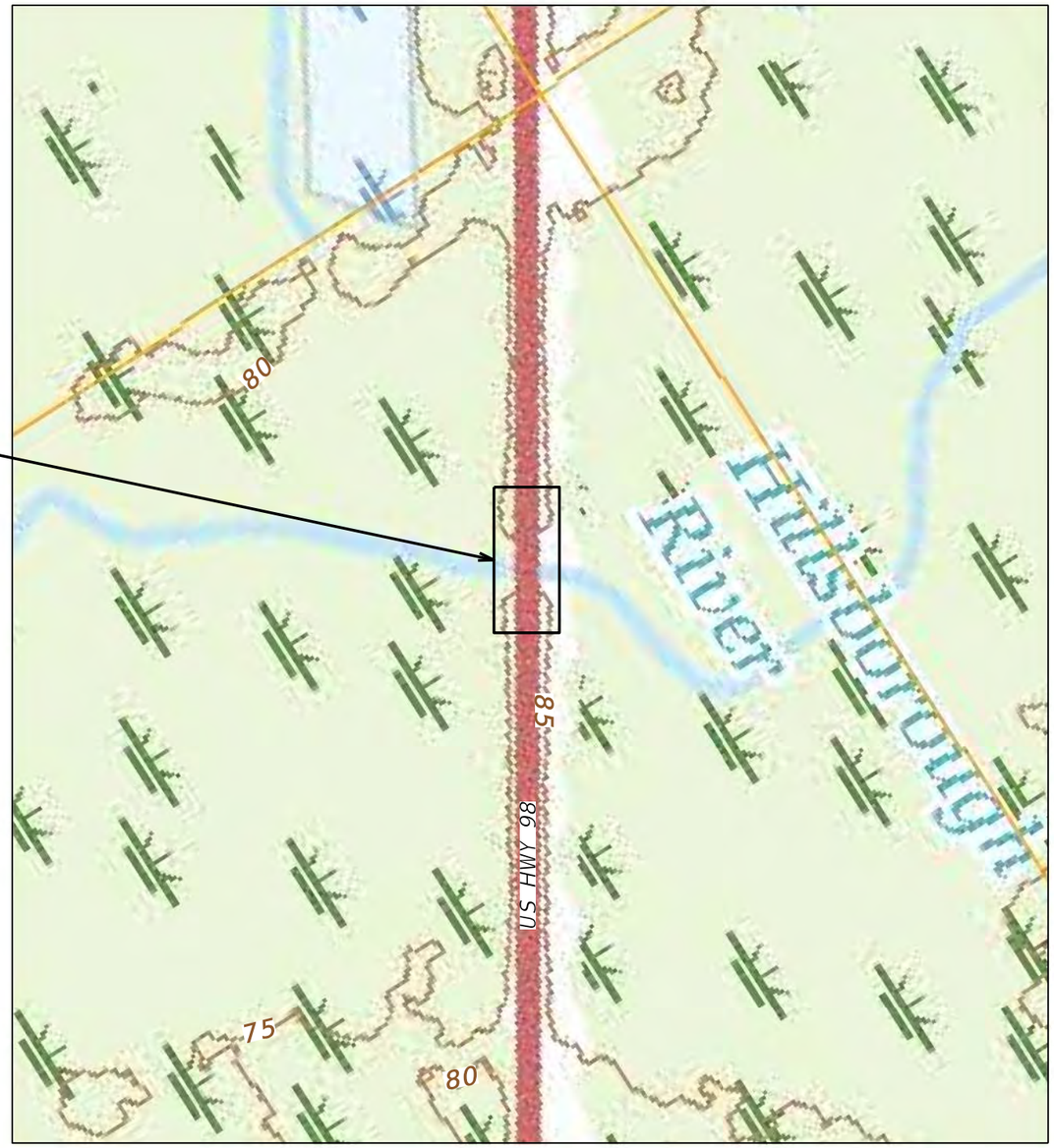
USDA & USGS Vicinity Map – US 98 over Hillsborough River (Sheet 1)

USDA & USGS Vicinity Map – US 98 over Old Lakeland Highway (Sheet 2)

Report of Core Borings (Sheets 3 - 5)



APPROXIMATE BRIDGE LOCATION



REFERENCE: USDA/NRCS SOIL SURVEY OF PASCO COUNTY, FLORIDA

REFERENCE: "BRANCHBOROUGH, FLORIDA" USGS QUADRANGLE MAP

0 100 400
Feet

US 98 OVER HILLSBOROUGH RIVER

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. NO.: 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

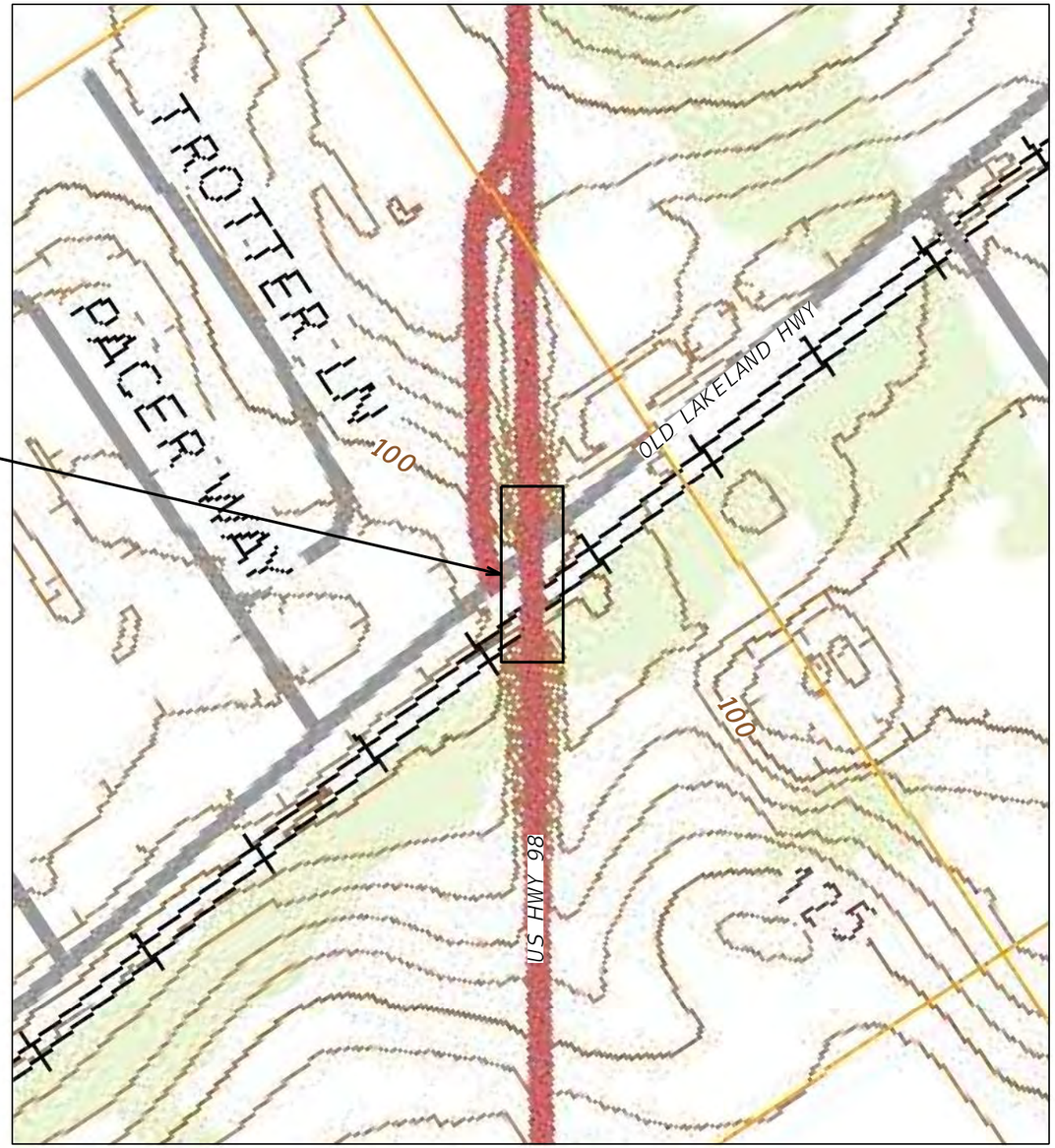
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

USDA & USGS VICINITY MAPS (1)

SHEET NO. 1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

APPROXIMATE BRIDGE LOCATION



REFERENCE: USDA/NRCS SOIL SURVEY OF PASCO COUNTY, FLORIDA

REFERENCE: "DADE CITY, FLORIDA" USGS QUADRANGLE MAP

0 100 400
Feet

US 98 OVER OLD LAKELAND HIGHWAY

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. NO.: 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

USDA & USGS VICINITY MAPS (2)

SHEET NO. 2

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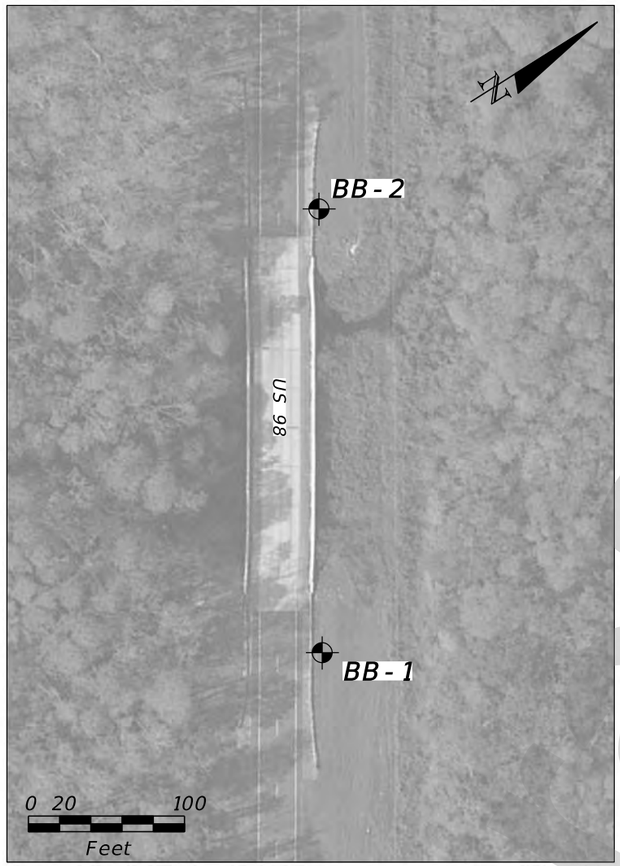
BORING LOCATION PLAN



ENVIRONMENTAL CLASSIFICATION:

SUBSTRUCTURE	CONCRETE: MODERATELY AGGRESSIVE
SUBSTRUCTURE	STEEL: MODERATELY AGGRESSIVE
SUPERSTRUCTURE	SLIGHTLY AGGRESSIVE

WATER TEST RESULTS:

RESISTIVITY	7,100 OHM-CM
CHLORIDES	20 PPM
SULFATES	≤ 2 PPM
pH	6.8

SOIL TEST RESULTS:

RESISTIVITY	1,600 OHM-CM
CHLORIDES	44 PPM
SULFATES	48 PPM
pH	6.3

AUTOMATIC HAMMER

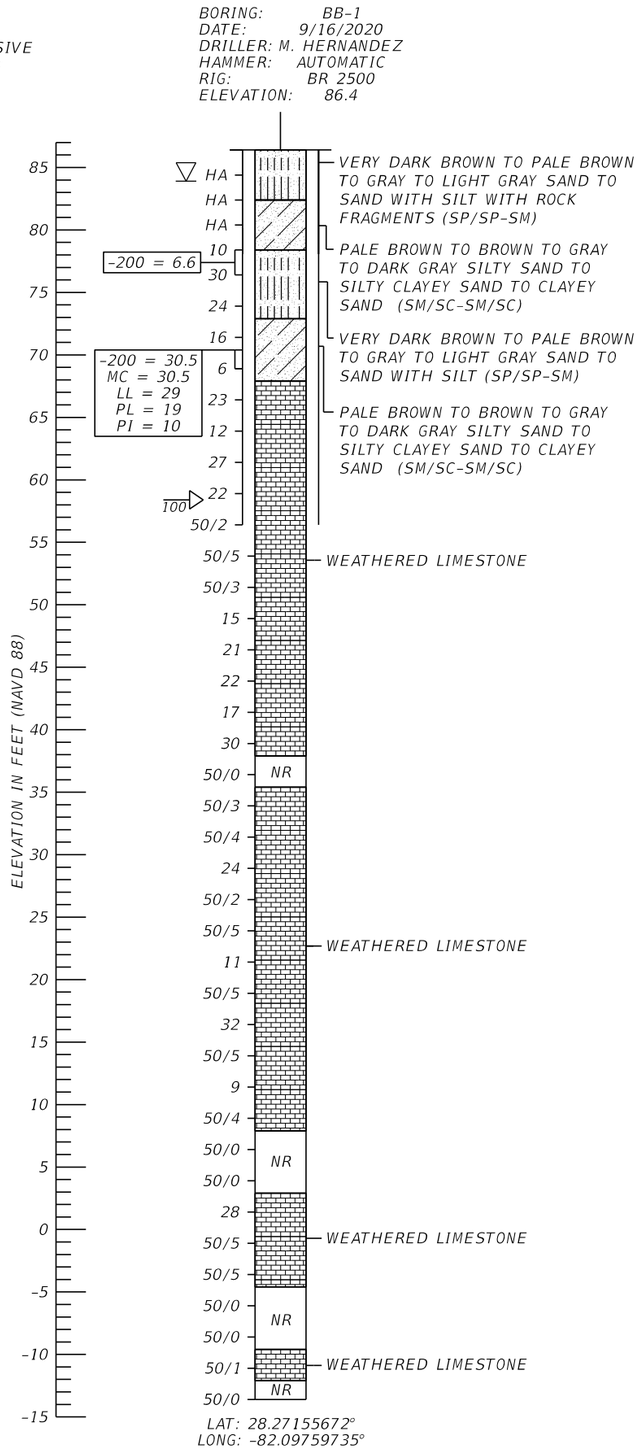
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 3
LOOSE	3 to 8
MEDIUM DENSE	8 to 24
DENSE	24 to 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	**SPT N-VALUE (BLOWS/FT.)**
VERY SOFT	LESS THAN 1
SOFT	1 to 3
FIRM	3 to 6
STIFF	6 to 12
VERY STIFF	12 to 24
HARD	GREATER THAN 24

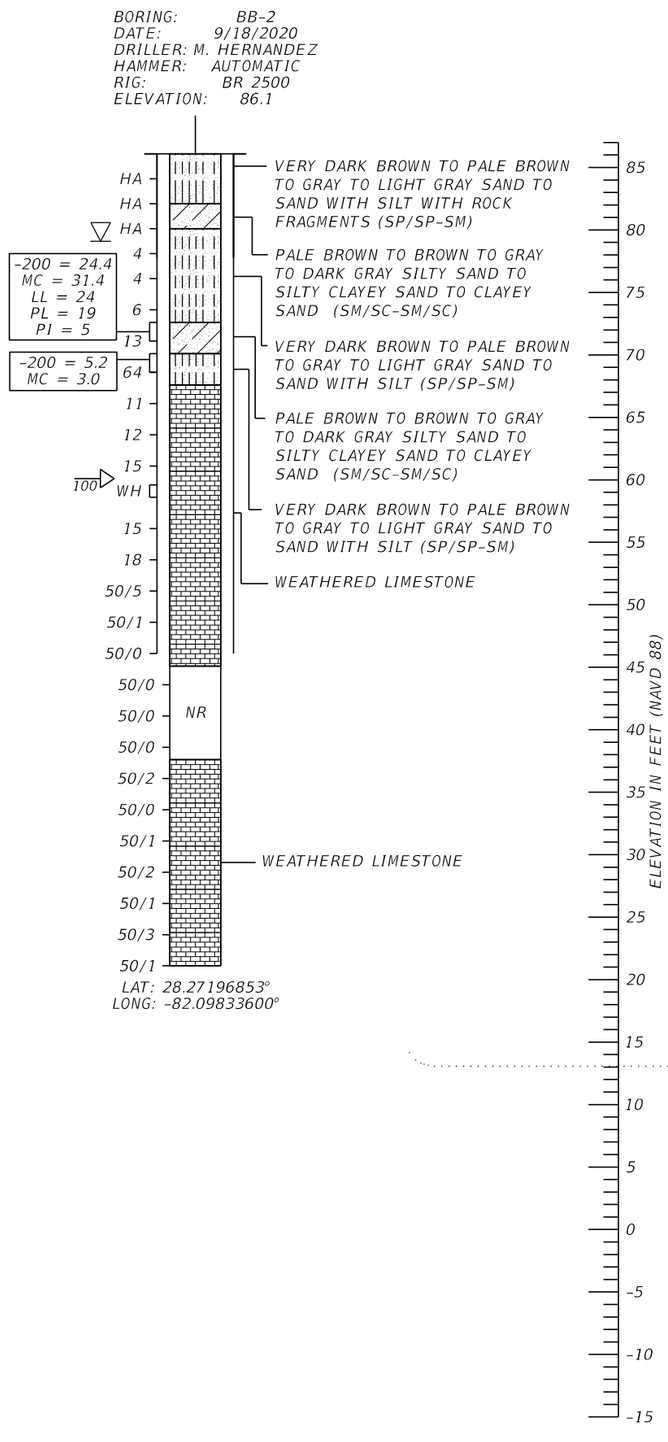
NOTES:

1. BORING ELEVATION AND GPS COORDINATES WERE PROVIDED BY SURVEYORS.
2. BASED ON REVIEW OF THE POTENTIOMETRIC SURFACE MAPS, THE POTENTIOMETRIC ELEVATION OF THE UPPER FLORIDAN AQUIFER IS REPORTED AT APPROXIMATELY +80 TO +90 NGVD 29.

LEGEND

- VERY DARK BROWN TO PALE BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (SP/SP-SM)
- PALE BROWN TO BROWN TO GRAY TO DARK GRAY SILTY SAND TO SILTY CLAYEY SAND TO CLAYEY SAND (SM/SC-SM/SC)
- WEATHERED LIMESTONE
- SP — UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2488) SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
- NR — NO RECOVERY OF SAMPLE
- WR — FELL UNDER WEIGHT OF ROD WITH DRILL BIT
- WH — FELL UNDER WEIGHT OF HAMMER
- ELEV. 9.8 — GROUND SURFACE ELEVATION (NAVD 88) AT TEST LOCATION
- NAVD 88 — NORTH AMERICAN VERTICAL DATUM OF 1988
- GNA — GROUNDWATER TABLE NOT APPARENT DUE TO USE OF DRILLING FLUID
- ▽ — GROUNDWATER LEVEL AT TIME OF DRILLING
- -200 — FINES PASSING THE #200 STANDARD SIEVE (%)
- MC — MOISTURE CONTENT (%)
- LL — LIQUID LIMIT (%)
- PL — PLASTIC LIMIT (%)
- PI — PLASTICITY INDEX (%)
- NP — NON-PLASTIC
- || — 3" STEEL CASING (USED TO STABILIZE BORE HOLE FOR SAMPLING
- 100▷ — LOSS OF CIRCULATION OF DRILLING FLUID (%)
- ⊕ — APPROXIMATE STANDARD PENETRATION TEST BORING LOCATION





US 98 OVER HILLSBOROUGH RIVER

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. NO.: 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

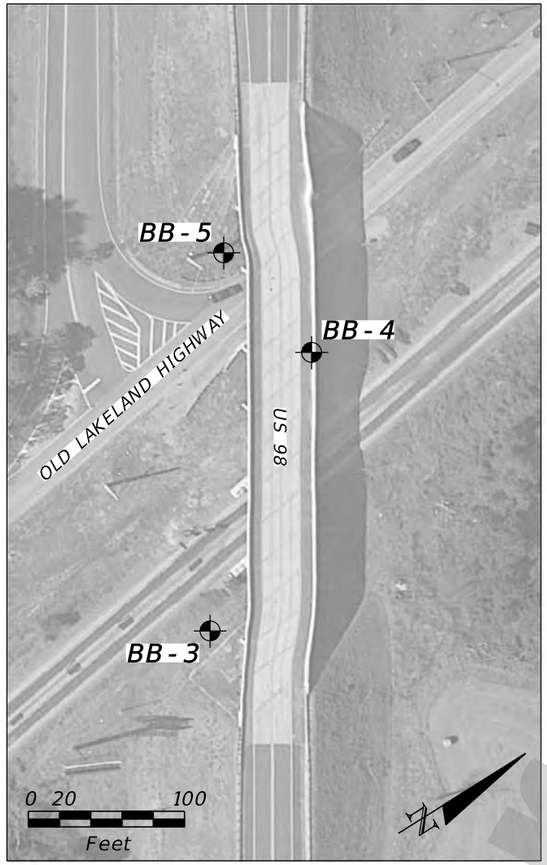
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

REPORT OF CORE BORINGS (1)

SHEET NO. 3

BORING LOCATION PLAN



ENVIRONMENTAL CLASSIFICATION:

SUBSTRUCTURE	CONCRETE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE	STEEL: SLIGHTLY AGGRESSIVE
SUPERSTRUCTURE	SLIGHTLY AGGRESSIVE

SOIL COMPOSITE TEST RESULTS:

RESISTIVITY	7,600 OHM-CM
CHLORIDES	51 PPM
SULFATES	≤ 2 PPM
pH	7.8

AUTOMATIC HAMMER

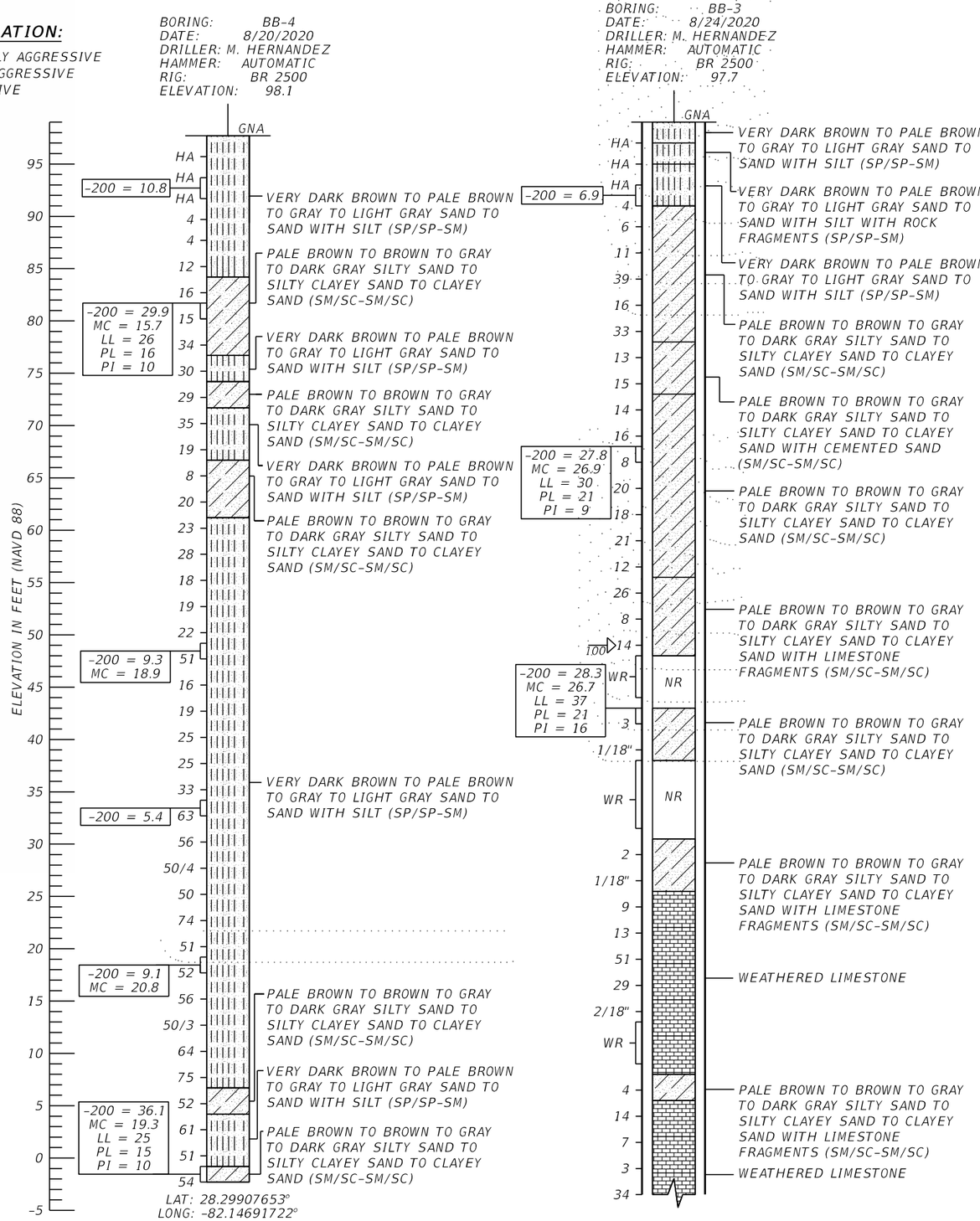
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 3
LOOSE	3 to 8
MEDIUM DENSE	8 to 24
DENSE	24 to 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	**SPT N-VALUE (BLOWS/FT.)**
VERY SOFT	LESS THAN 1
SOFT	1 to 3
FIRM	3 to 6
STIFF	6 to 12
VERY STIFF	12 to 24
HARD	GREATER THAN 24

NOTES:

1. BORING ELEVATION AND GPS COORDINATES WERE PROVIDED BY SURVEYORS.
2. BASED ON REVIEW OF THE POTENTIOMETRIC SURFACE MAPS, THE POTENTIOMETRIC ELEVATION OF THE UPPER FLORIDAN AQUIFER IS REPORTED AT APPROXIMATELY +70 TO +80 NGVD 29.

LEGEND

- VERY DARK BROWN TO PALE BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (SP/SP-SM)
- PALE BROWN TO BROWN TO GRAY TO DARK GRAY SILTY SAND TO SILTY CLAYEY SAND TO CLAYEY SAND (SM/SC-SM/SC)
- WEATHERED LIMESTONE
- SP — UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2488) SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
- NR — NO RECOVERY OF SAMPLE
- WR — FELL UNDER WEIGHT OF ROD WITH DRILL BIT
- WH — FELL UNDER WEIGHT OF HAMMER
- ELEV. 9.8 — GROUND SURFACE ELEVATION (NAVD 88) AT TEST LOCATION
- NAVD 88 — NORTH AMERICAN VERTICAL DATUM OF 1988
- GNA — GROUNDWATER TABLE NOT APPARENT DUE TO USE OF DRILLING FLUID
- GROUNDWATER LEVEL AT TIME OF DRILLING
- -200 — FINES PASSING THE #200 STANDARD SIEVE (%)
- MC — MOISTURE CONTENT (%)
- LL — LIQUID LIMIT (%)
- PL — PLASTIC LIMIT (%)
- PI — PLASTICITY INDEX (%)
- NP — NON-PLASTIC
- 3" STEEL CASING (USED TO STABILIZE BORE HOLE FOR SAMPLING)
- 100 — LOSS OF CIRCULATION OF DRILLING FLUID (%)
- APPROXIMATE STANDARD PENETRATION TEST BORING LOCATION



US 98 OVER OLD LAKELAND HIGHWAY

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. NO.: 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

REPORT OF CORE BORINGS (2)

SHEET NO. 4

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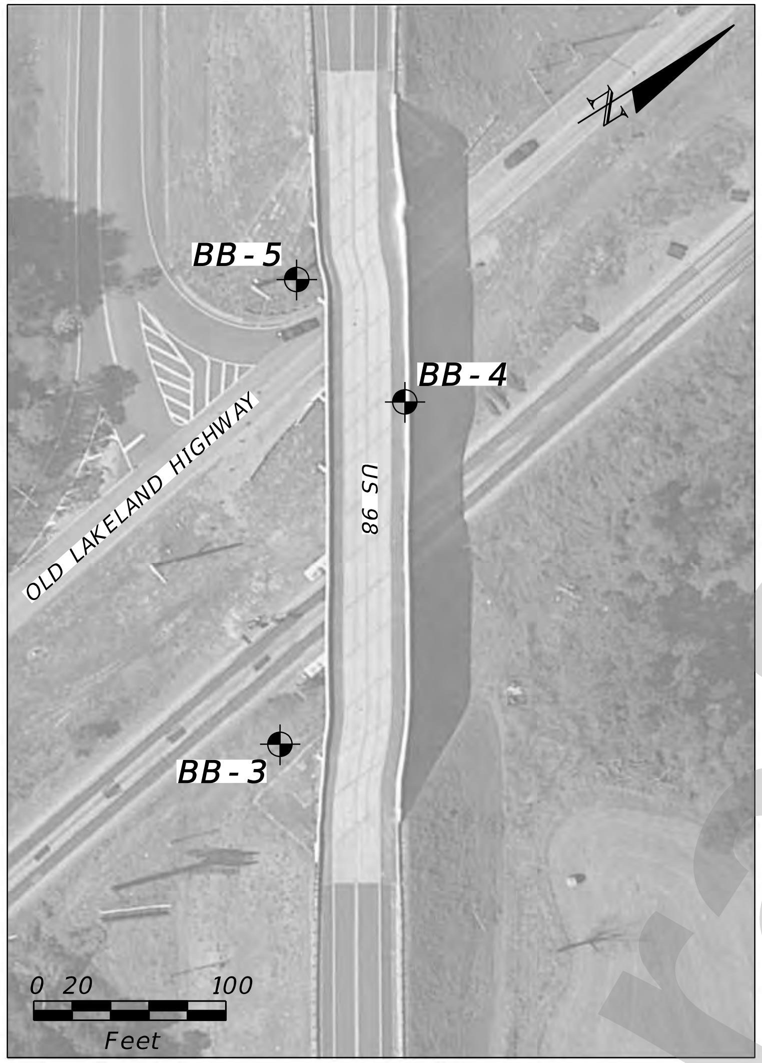
BORING LOCATION PLAN



ENVIRONMENTAL CLASSIFICATION:

SUBSTRUCTURE CONCRETE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE STEEL: SLIGHTLY AGGRESSIVE
SUPERSTRUCTURE SLIGHTLY AGGRESSIVE

SOIL COMPOSITE TEST RESULTS:

RESISTIVITY 7,600 OHM-CM
CHLORIDES 51 PPM
SULFATES ≤ 2 PPM
pH 7.8

AUTOMATIC HAMMER	
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	LESS THAN 3 3 to 8 8 to 24 24 to 40 GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)
VERY SOFT SOFT FIRM STIFF VERY STIFF HARD	LESS THAN 1 1 to 3 3 to 6 6 to 12 12 to 24 GREATER THAN 24

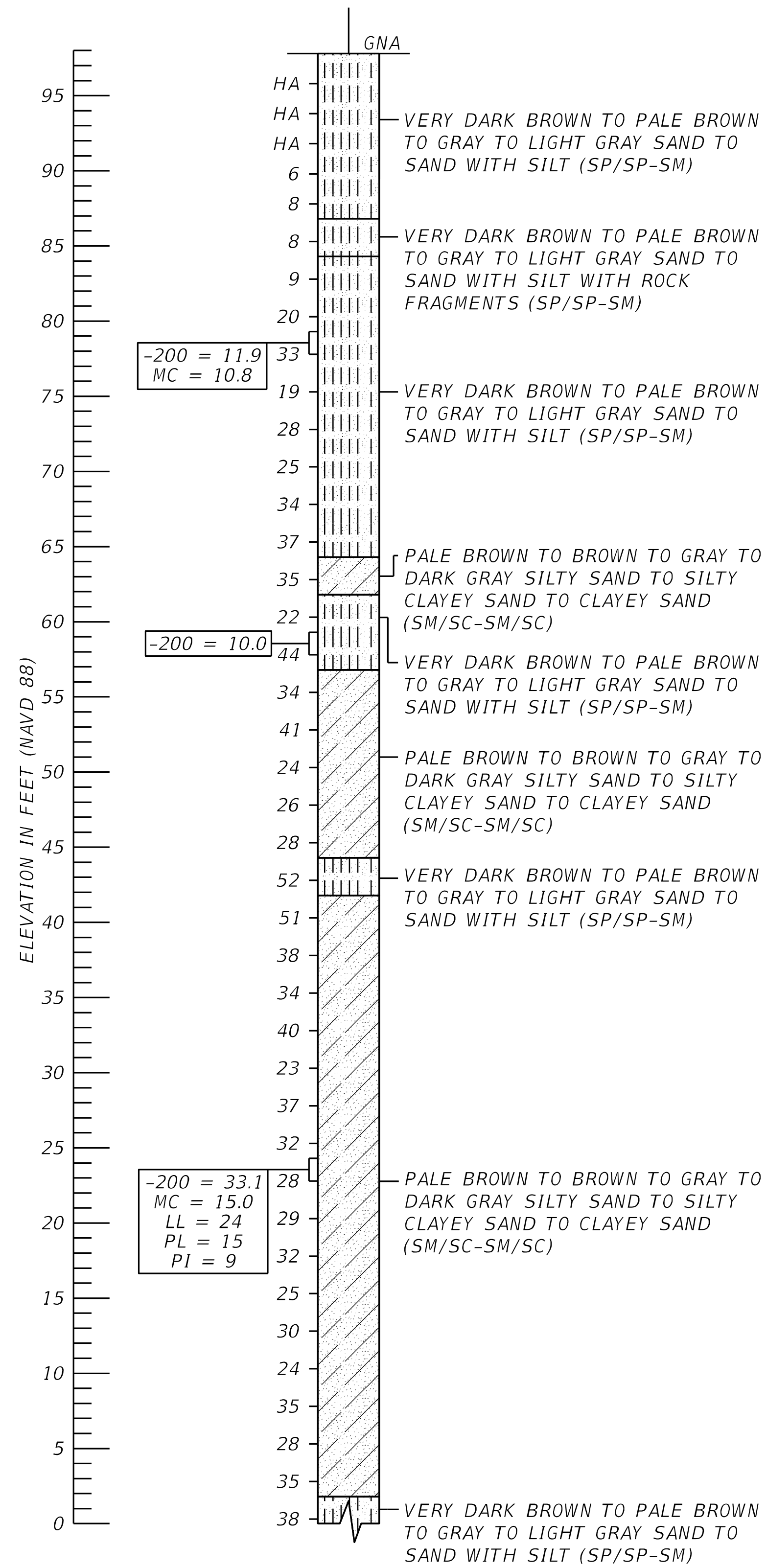
NOTES:

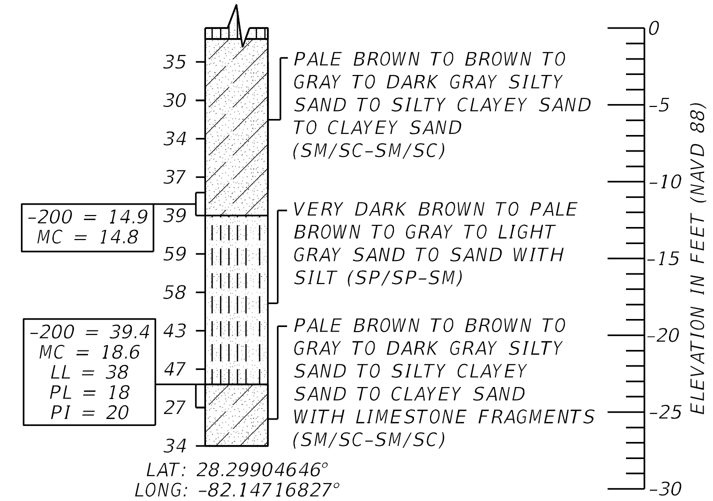
1. BORING ELEVATION AND GPS COORDINATES WERE PROVIDED BY SURVEYORS.
2. BASED ON REVIEW OF THE POTENTIOMETRIC SURFACE MAPS, THE POTENTIOMETRIC ELEVATION OF THE UPPER FLORIDAN AQUIFER IS REPORTED AT APPROXIMATELY +70 TO +80 NGVD 29.

LEGEND

(symbol)	VERY DARK BROWN TO PALE BROWN TO GRAY TO LIGHT GRAY SAND TO SAND WITH SILT (SP/SP-SM)
(symbol)	PALE BROWN TO BROWN TO GRAY TO DARK GRAY SILTY SAND TO SILTY CLAYEY SAND TO CLAYEY SAND (SM/SC-SM/SC)
(symbol)	WEATHERED LIMESTONE
SP	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2488) SYMBOL AS DETERMINED BY VISUAL REVIEW AND/OR LABORATORY TESTING
NR	NO RECOVERY OF SAMPLE
WR	FELL UNDER WEIGHT OF ROD WITH DRILL BIT
WH	FELL UNDER WEIGHT OF HAMMER
ELEV. 9.8	GROUND SURFACE ELEVATION (NAVD 88) AT TEST LOCATION
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
GNA	GROUNDWATER TABLE NOT APPARENT DUE TO USE OF DRILLING FLUID
▽	GROUNDWATER LEVEL AT TIME OF DRILLING
-200	FINES PASSING THE #200 STANDARD SIEVE (%)
MC	MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PL	PLASTIC LIMIT (%)
PI	PLASTICITY INDEX (%)
NP	NON-PLASTIC
			3" STEEL CASING (USED TO STABILIZE BORE HOLE FOR SAMPLING
100 ▷	LOSS OF CIRCULATION OF DRILLING FLUID (%)
⊕	APPROXIMATE STANDARD PENETRATION TEST BORING LOCATION

BORING: BB-5
DATE: 8/27/2020
DRILLER: M. HERNANDEZ
HAMMER: AUTOMATIC
RIG: BR 2500
ELEVATION: 97.8





LAT: 28.29904646°
LONG: -82.14716827°

US 98 OVER OLD LAKELAND HIGHWAY

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

IGOR (IGON) KRATSER, P.E.
P.E. NO.: 73129
TEST LAB, INC.
4112 WEST OSBORNE AVENUE
TAMPA, FL 33614

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 98	PASCO	443368-3

REPORT OF CORE BORINGS (3)

SHEET NO. 5

APPENDIX B

Summary of USDA Soil Survey

SUMMARY OF USDA SOIL SURVEY
US 98 FROM POLK COUNTY LINE TO US 301
PASCO COUNTY, FLORIDA
FPN:443368-3
TEST LAB PROJECT NO: 20-5131

USDA Soil Name	Depth (in)	Soil Classification		Permeability (in/hr)	pH	Seasonal High Water Table	
		USCS	AASHTO			Depth (feet)	Months
(32) Lake fine sand, 0 to 5 percent slopes							
Lake	0-9	SP-SM	A-2-4, A-3	6.00 - 50.03	4.5-5.5	>6.0	-
	9-80						
(39) Chobee soils, frequently flooded							
Chobee	0-11	SM, SP-SM	A-2-4	1.98 - 5.95	6.1-7.3	0.0-0.5	Jun-Feb
	11-56	SC	A-2-6, A-2-7, A-6, A-7	0.00 - 0.20	7.4-9.0		
	56-80	SC, SC-SM, SM, SP-SM	A-2-4, A-2-6, A-6, A-7	0.20 - 5.95			

APPENDIX C

Summary of Corrosion Test Results

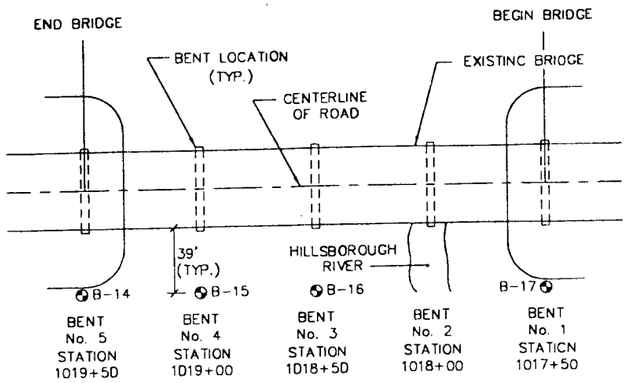
SUMMARY OF CORROSION TEST RESULTS
US 98 FROM POLK CL TO US 301
PASCO COUNTY, FLORIDA
FPN NO: 443368-3
TEST LAB PROJECT NO: 20-5131

Boring Number / Location	Sample Type	Depth (ft)	pH (FM 5-550)	Resistivity (ohm-cm) (FM 5-551)	Chlorides (ppm) (FM 5-552)	Sulfates (ppm) (FM 5-553)	Environmental Classification	
							Steel	Concrete
(Hills. River)	Water	N/A	6.8	7,100	20	≤ 2	Moderately Aggressive	Slightly Aggressive
BB-1 & BB-2 (Hills. River)	Soil Composite	4.0-6.0	6.3	1,600	44	48	Moderately Aggressive	Moderately Aggressive
BB-3, BB-4 & B-5 (Lakeland Hwy.)	Soil Composite	0.0-8.0	7.8	7,600	51	≤ 2	Slightly Aggressive	Slightly Aggressive

APPENDIX D

Report of Core Borings - Provided by the Department

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
				B-3

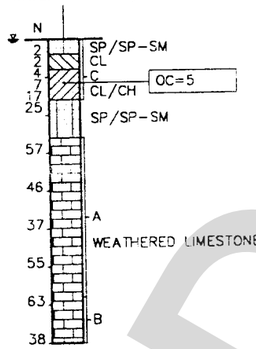


BRIDGE OVER HILLSBOROUGH RIVER

SCALE: N.T.S.

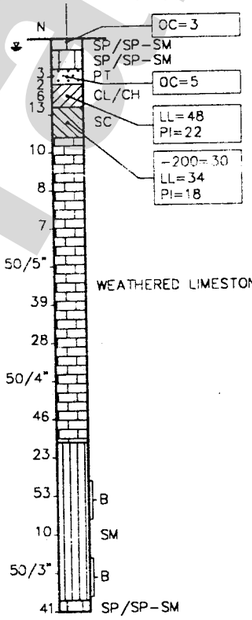
LOCATION	
TOWNSHIP:	25 S
RANGE:	22 E
SECTION:	34

BORING NO. B-14
STATION NO. 1019+50
OFFSET: 55' LT.
ELEVATION 77.5'
DATE: 03/23/93



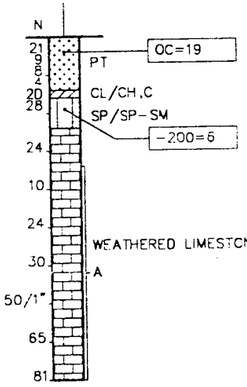
BORING TERMINATED @ 40'
NO CASING

BORING NO. B-15
STATION NO. 1019+00
OFFSET: 55' LT.
ELEVATION 77.5'
DATE: 03/18/93



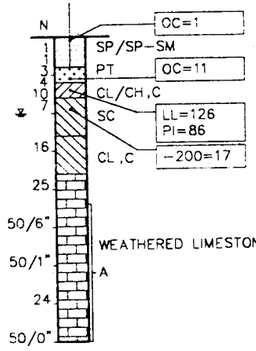
BORING TERMINATED @ 75'
NO CASING

BORING NO. B-16
STATION NO. 1018+50
OFFSET: 55' LT.
ELEVATION 77.5'
DATE: 03/18/93

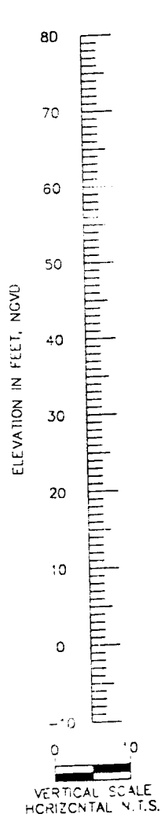


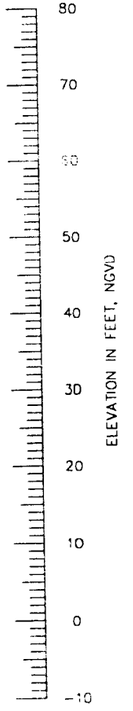
BORING TERMINATED @ 45'
NO CASING

BORING NO. B-17
STATION NO. 1017+50
OFFSET: 55' LT.
ELEVATION 77.5'
DATE: 03/24/93



BORING TERMINATED @ 40'
NO CASING





LEGEND

- (SP/SP-SM), SLIGHTLY SILTY FINE SAND
- (SP/SP-SM), FINE SAND TO SLIGHTLY SILTY FINE SAND
- (SP), SLIGHTLY CLAYEY FINE SAND
- (CL/CH), SLIGHTLY SANDY CLAY TO CLAY
- (SC), CLAYEY FINE SAND
- (CL), SANDY CLAY
- (SM), CALCAREOUS SILT
- LIMESTONE AND WEATHERED LIMESTONE
- (PT), ORGANIC FINE SAND
- (SM), SANDY SILT TO SLIGHTLY SANDY SILT
- A WITH ROCK FRAGMENTS
- B WITH CEMENTATION
- C WITH TRACE ORGANICS

NOTES:

- WATER TABLE
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12" PENETRATION. (UNLESS OTHERWISE NOTED.)
- APPROXIMATE SPT BORING LOCATION,

TYPE RIG = CME 550

ENVIRONMENTAL CLASSIFICATION

SUBSTRUCTURE: MODERATELY AGGRESSIVE, INLAND
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE, INLAND

WATER

RESISTIVITY:	2,882-4,386 OHMS-CM
CHLORIDES:	16.9-19.8 PPM
SULFATES:	6.8-7.1 PPM
pH:	6.72-6.86

GRANULAR MATERIALS- RELATIVE DENSITY	SPT (BLOWS/FT.)
VERY LOOSE	LESS THAN 4
LOOSE	4-10
MEDIUM OR COMPACT	10-30
DENSE	30-50
VERY DENSE	GREATER THAN 50

SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT.)
VERY SOFT	LESS THAN 2
SOFT	2-4
FIRM	4-8
STIFF	8-15
VERY STIFF	15-30
HARD	GREATER THAN 30

REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY			DRAWN BY	RAJ	10/93
CHECKED BY			CHECKED BY	SS	10/93

SUPERVISED BY: KERMIT SCHMIDT, P.E.

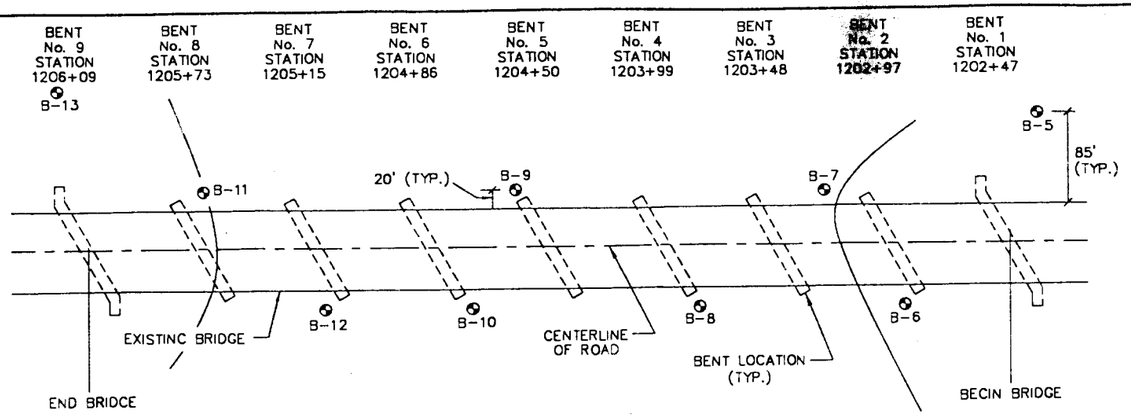
Professional Service Industries, Inc. Jammal & Associates Division

ROAD NO.	COUNTY	PROJECT NO.
S.R. 35	PASCO	14070-1513

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY:
DATE:

SHEET TITLE: REPORT OF CORE BORINGS
PROJECT NAME: U.S. 98 (S.R. 35)
DRAWING NO.
INDEX NO.
PSI J & A PROJECT No. 775-35039
SHEET B-3

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
				C-2A



BRIDGE OVER CSX RAILROAD

SCALE: N.T.S.

LOCATION	
TOWNSHIP:	25 S
RANGE:	22 E
SECTION:	19

LEGEND

- (SP/SP-SM), SLICHTLY SILTY FINE SAND
- (SP/SP-SM), FINE SAND TO SLIGHTLY SILTY FINE SAND
- (SP), SLIGHTLY CLAYEY FINE SAND
- (CL/CH), SLICHTLY SANDY CLAY TO CLAY
- (SC), CLAYEY FINE SAND
- (CL), SANDY CLAY
- (SM), CALCAREOUS SILT
- LIMESTONE AND WEATHERED LIMESTONE
- (PT), ORCANIC FINE SAND
- (SM), SANDY SILT TO SLIGHTLY SANDY SILT
- A WITH ROCK FRAGMENTS
- B WITH CEMENTATION
- C WITH TRACE ORCANICS

NOTES:

- WATER TABLE
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12" PENETRATION. (UNLESS OTHERWISE NOTED.)
- APPROXIMATE SPT BORING LOCATION.
- WR FELL UNOER WEIGHT OF ROD
- WH FELL UNDER WEICHT OF ROO ANO HAMMER

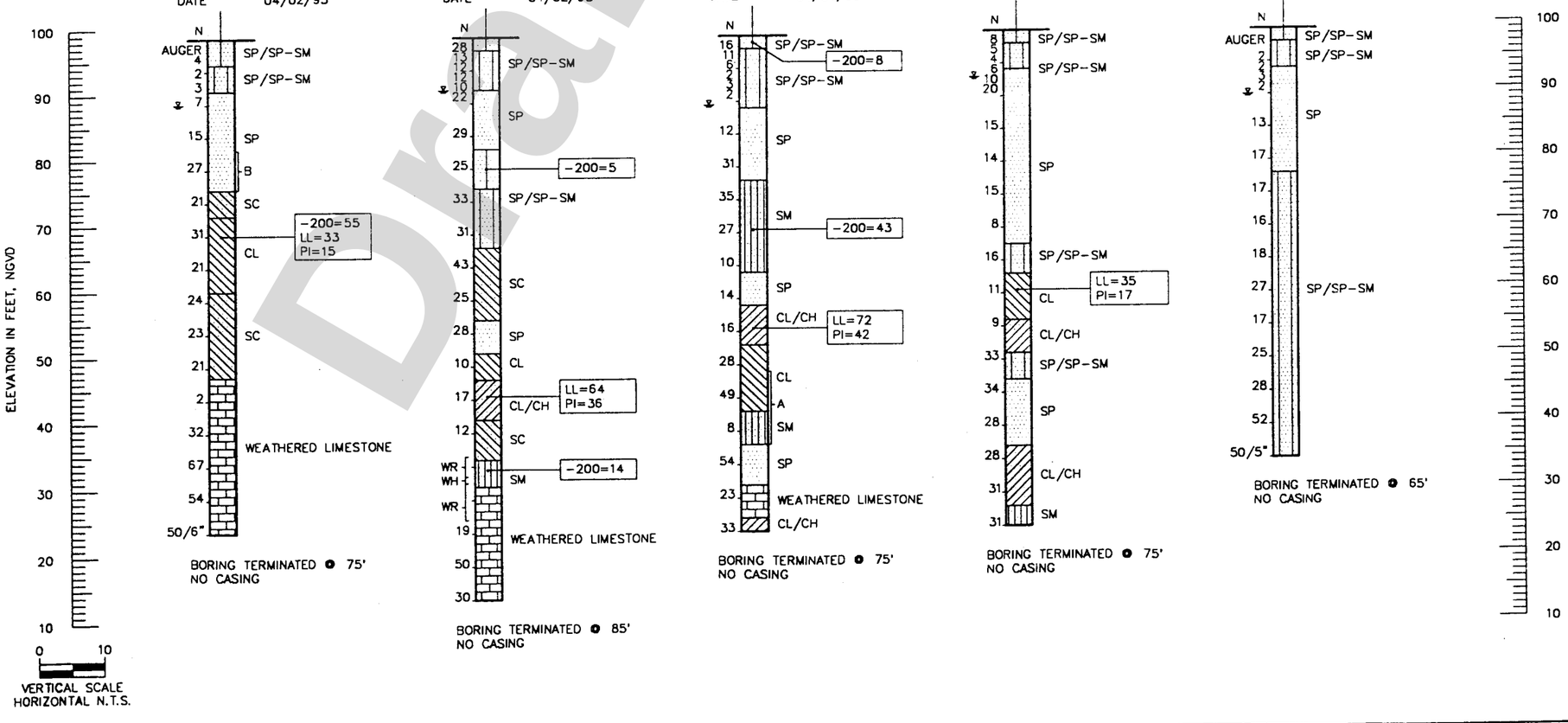
TYPE RIG = CME 550

ENVIRONMENTAL CLASSIFICATION

SUBSTRUCTURE: MODERATELY AGGRESSIVE, INLAND
SUPERSTRUCTURE: SLIGHTLY ACGRESSIVE, INLAND

WATER

RESISTIVITY: N/A
CHLORIDES: N/A
SULFATES: N/A
pH: N/A



GRANULAR MATERIALS- RELATIVE DENSITY	SPT (BLOWS/FT.)
VERY LOOSE	LESS THAN 4
LOOSE	4-10
MEDIUM OR COMPACT	10-30
DENSE	30-50
VERY DENSE	CREATER THAN 50

SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT.)
VERY SOFT	LESS THAN 2
SOFT	2-4
FIRM	4-8
STIFF	8-15
VERY STIFF	15-30
HARD	CREATER THAN 30

REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE
DESIGNED BY		
DRAWN BY	RAJ	10/93
CHECKED BY		
CHECKED BY	SS	10/93

SUPERVISED BY: KERMIT SCHMIOT, P.E.

Professional Service Industries, Inc. Jarrod & Associates Division

ROAD NO.	COUNTY	PROJECT NO.
S.R. 35	PASCO	14070-1513

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY:

DATE:

SHEET TITLE: REPORT OF CORE BORINGS

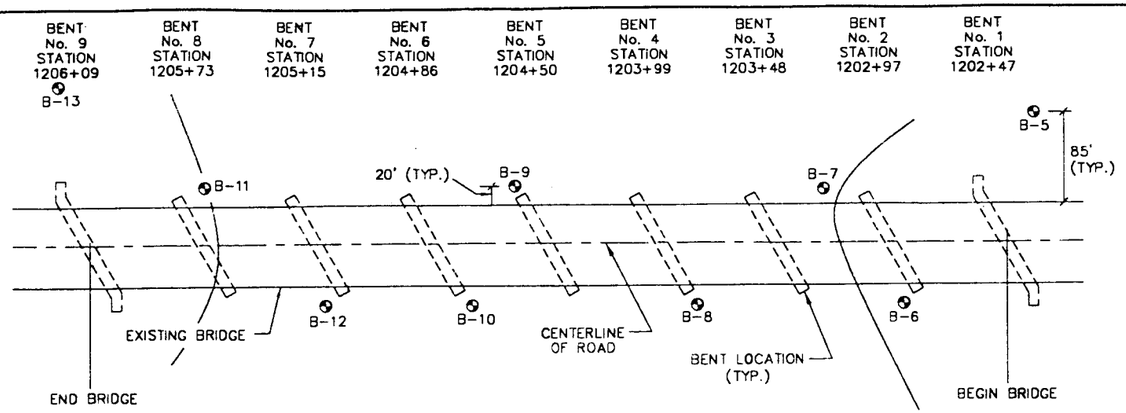
DRAWING NO.

PROJECT NAME: U.S. 98 (S.R. 35)

INDEX NO.

PSI J & A PROJECT No. 775-35039
SHEET C-2A

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
				C-2B



BRIDGE OVER CSX RAILROAD

SCALE: N.T.S.

LOCATION	
TOWNSHIP:	25 S
RANGE:	22 E
SECTION:	19

BORING NO. B-10
STATION NO. 1204+68
OFFSET: 36' LT.
ELEVATION 98.5'
DATE: 04/9/93

	N	
AUGER		SP/SP-SM
∇	3	
	3	
	3	
	4	
	11	SP/SP-SM
	41	
	19	SP
	17	
	7	SP/SP-SM
	27	
	35	SC
	12	SP
	9	
	16	CL/CH
	10	SC
	21	
	23	CL/CH

BORING TERMINATED @ 75'
NO CASING
100% LOSS OF CIRCULATION @ 68.5'

BORING NO. B-11
STATION NO. 1205+76
OFFSET: 36' RT.
ELEVATION 98.5'
DATE: 04/8/93

	N	
AUGER		SP/SP-SM
	2	
∇	4	
	4	
	1	
	16	
	40	
	25	
	50	SP/SP-SM
	58	
	22	
	50	
	34	
	56	
	50/6"	
	50/6"	

BORING TERMINATED @ 65'
NO CASING

BORING NO. B-12
STATION NO. 1205+23
OFFSET: 36' LT.
ELEVATION 98.5
DATE: 04/8/93

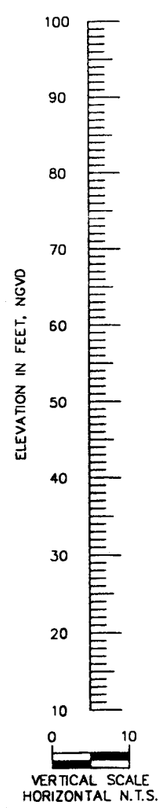
	N	
AUGER		SP/SP-SM
	3	
	4	
	4	
∇	3	
	19	
	18	
	26	SP/SP-SM
	24	
	30	
	28	
	22	
	37	SP
	52	
	51	

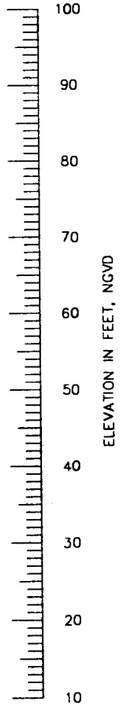
BORING TERMINATED @ 60'
NO CASING

BORING NO. B-13
STATION NO. 1206+23
OFFSET: 101' RT.
ELEVATION 98.5'
DATE: 04/8/93

	N	
AUGER		SP/SP-SM
	4	
	4	
	4	
∇	4	
	18	
	27	
	41	SP/SP-SM
	54	
	61	
	42	
	88	
	82	

BORING TERMINATED @ 50'
NO CASING





LEGEND

- (SP/SP-SM), SLIGHTLY SILTY FINE SAND
- (SP/SP-SM), FINE SAND TO SLIGHTLY SILTY FINE SAND
- (SP), SLIGHTLY CLAYEY FINE SAND
- (CL/CH), SLIGHTLY SANDY CLAY TO CLAY
- (SC), CLAYEY FINE SAND
- (CL), SANDY CLAY
- (SM), CALCAREOUS SILT
- LIMESTONE AND WEATHERED LIMESTONE
- (PT), ORGANIC FINE SAND
- (SM), SANDY SILT TO SLIGHTLY SANDY SILT
- A WITH ROCK FRAGMENTS
- B WITH CEMENTATION
- C WITH TRACE ORGANICS

NOTES:

- ∇ WATER TABLE
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12" PENETRATION. (UNLESS OTHERWISE NOTED.)
- @ APPROXIMATE SPT BORING LOCATION.

TYPE RIG = CME 550

ENVIRONMENTAL CLASSIFICATION

SUBSTRUCTURE: MODERATELY AGGRESSIVE, INLAND
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE, INLAND

WATER

RESISTIVITY: N/A
CHLORIDES: N/A
SULFATES: N/A
pH: N/A

GRANULAR MATERIALS– RELATIVE DENSITY	SPT (BLOWS/FT.)
VERY LOOSE	LESS THAN 4
LOOSE	4–10
MEDIUM OR COMPACT	10–30
DENSE	30–50
VERY DENSE	GREATER THAN 50

SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT.)
VERY SOFT	LESS THAN 2
SOFT	2–4
FIRM	4–8
STIFF	8–15
VERY STIFF	15–30
HARD	GREATER THAN 30

REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY			DRAWN BY	RAJ	10/93
CHECKED BY			CHECKED BY	SS	10/93

SUPERVISED BY: KERMIT SCHMIDT, P.E.

Professional Service Industries, Inc. Jammal & Associates Division

ROAD NO.	COUNTY	PROJECT NO.
S.R. 35	PASCO	14070-1513

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY:
DATE:

SHEET TITLE: REPORT OF CORE BORINGS
PROJECT NAME: U.S. 98 (S.R. 35)
DRAWING NO.
INDEX NO.

PSI*J & A PROJECT No. 775-35039
SHEET C-2B

APPENDIX E

Straight Line Diagrams

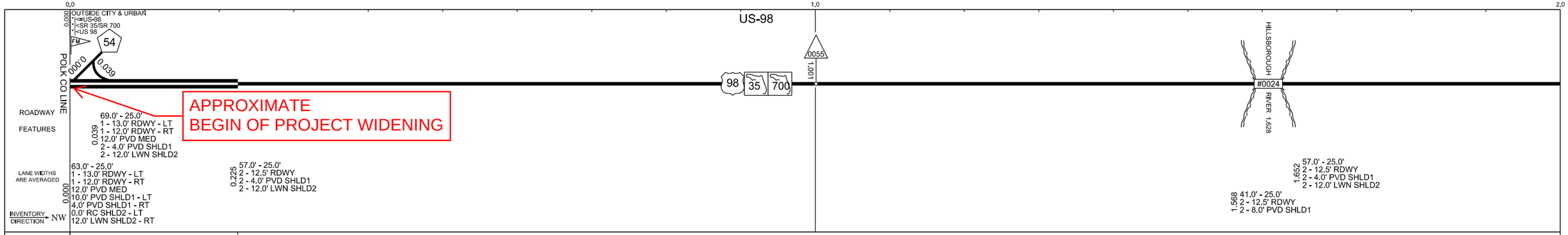
	5 YR INV	SLD REV
DATE	12/18/2019	03/29/2019
BY	FTE / IM-BK	FTE / KA

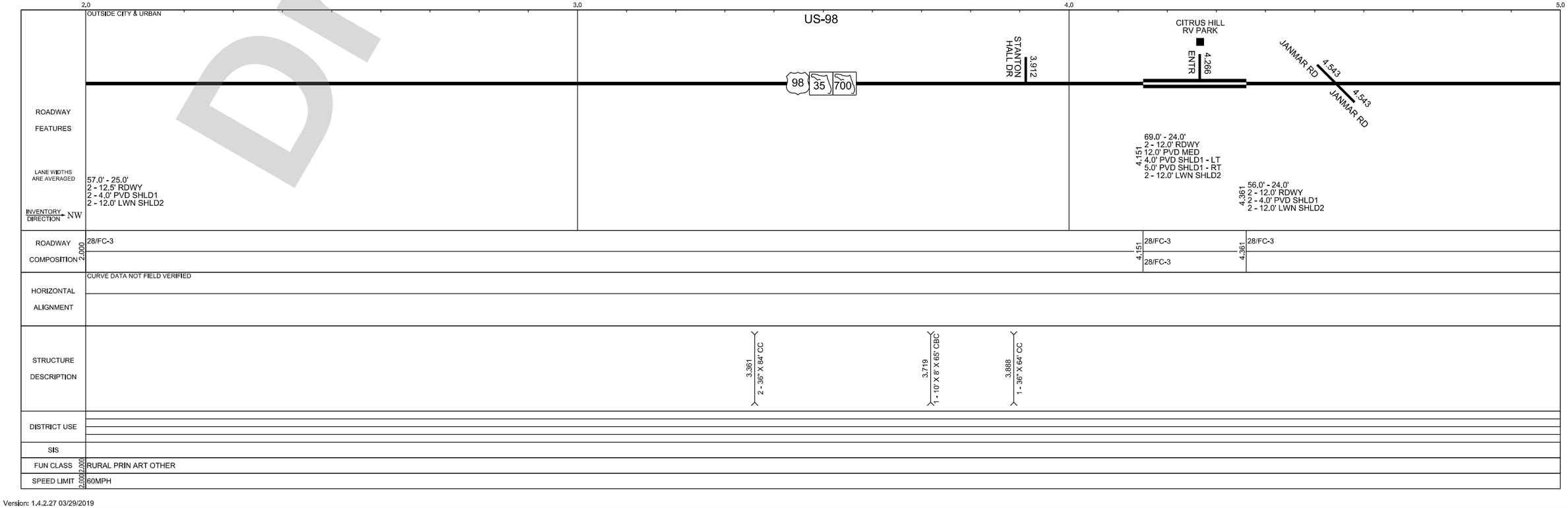
BMP	EMP	INV	SLD REV
7.250	7.250		03/30/2021
INTERSECTION			FTE/KA
CORRECTION			

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02	US 98	SR 700/SR 35	PASCO	07	14 070 000	1 OF 2





Version: 1.4.2.27 03/29/2019

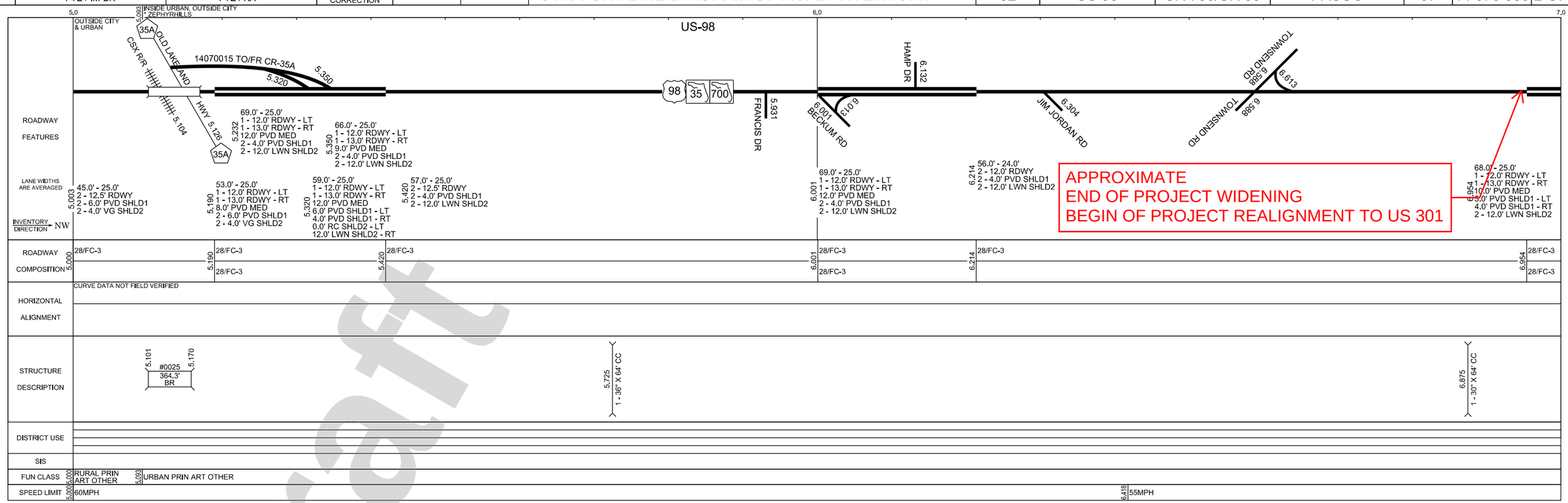
5 YR INV	SLD REV
DATE 12/18/2019	03/29/2019
BY FTE / IM-BK	FTE / KA

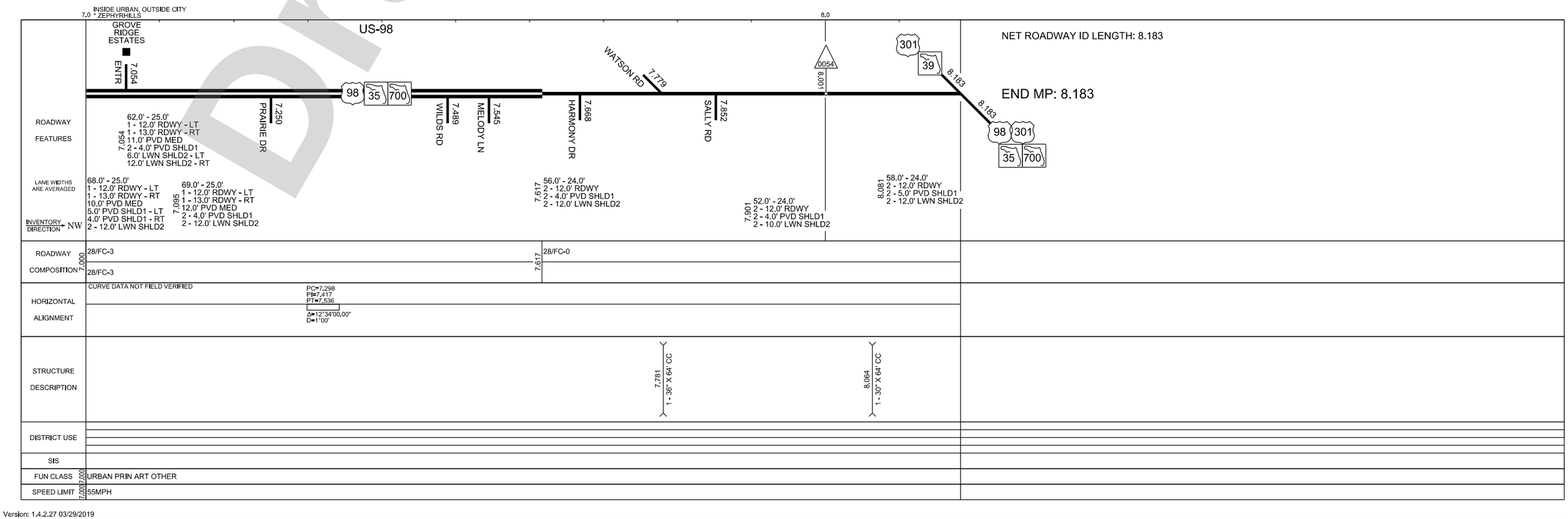
BMP	EMP	INV	SLD REV
7.250	7.250		03/30/2021
INTERSECTION			FTE/KA
CORRECTION			

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02	US 98	SR 700/SR 35	PASCO	07	14 070 000	2 OF 2





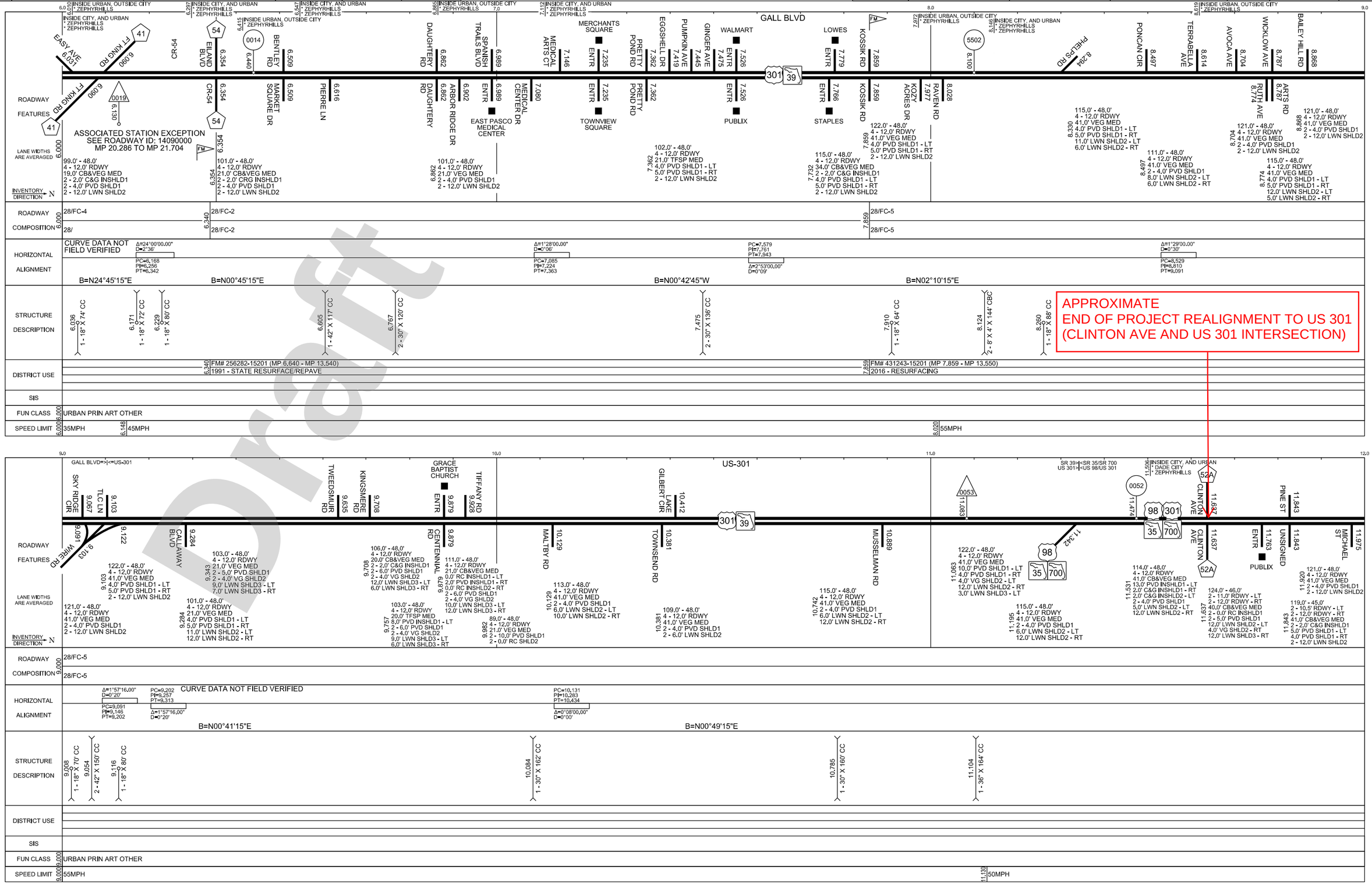
Version: 1.4.2.27 03/29/2019

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	05/09/2016	06/28/2016	14.601	15.705	03/18/2021	04/08/2021
BY	FTE / JR-IM	FTE / KA	CONST ACCEPT - RESURFACING		FTE / IM-KA	FTE / KA

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
12	US 301/US 98	SR 41/SR 39/SR 35/SR 700	PASCO	07	14 050 000	2 OF 7



Version: 1.4.2.24 06/24/2016

APPENDIX F

SWFWMD Pre-Application Minutes

THIS FORM IS INTENDED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING BY PROVIDING A PARTIAL "PROMPT LIST" OF DISCUSSION SUBJECTS. IT IS NOT A LIST OF REQUIREMENTS FOR SUBMITTAL BY THE APPLICANT.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES

FILE NUMBER:

PA 407789

Date:	07/29/2020		
Time:	10:00		
Project Name:	FDOT US 98 widening from SR 54 to SR 50		
District Engineer:	Scott VanOrsdale		
District ES:	Lauren Greenawalt		
Attendees:	Nate Johnson, Tech Wells, Christian Gyle, Walter Nemecek, Tony Celani, Craig Fox, Ashley Henzel, Todd Laine, Tori Kuba, Abdul Waris,		
County:	Pasco	**Sec/Twp/Rge:**	Multiple S/T/R
Total Land Acreage:	N/A	**Project Acreage:**	acres

Prior On-Site/Off-Site Permit Activity:

- Numerous ERP Permits located within or adjacent to the roadway, all impacted ERPs will need to be modified.

Project Overview:

- FDOT US 98 widening from SR 54 to SR 50 from 2 lanes to 4 lanes. Project will be submitted in segments; it is highly recommended that follow up pre-app meetings are held when more specific design concepts can be provided.
- High overview discussion for the widening on US 98 from SR 54 to SR 50.
- Discussed if there were any CFI or SWIM projects that roadway project can be party to. Contact Pasco County and the other local municipalities for information related to any upcoming or ongoing projects. For projects related to municipalities you can contact our Government Affairs Regional Manager Frank Gargano etx. 4759. For possible SWIM projects contact Will VanGelder ext. 2206.
- Unknown if there are any point source areas within the US 98 limits between SR 54 and SR 50.
- Floodplain limits should be determined utilizing best available information. In areas where a watershed study is not available, it may be required to establish the 100-year floodplain limits.
- Storage modeling or cup or cup compensation are both viable options for floodplain compensation. Impacts to a flood way may require modeling in addition to cup for cup compensation.
- Talked about impaired waterbodies in OFWs: The treatment required for an impaired waterbody that is also classified as an OFW will be the required net improvement treatment volumes depending on the treatment type(s) selected. However, this volume must not be less than the presumptive treatment volume plus 50% to meet the OFW Criteria.
- OFW treatment is required for all direct discharges into an OFW.
- Existing land uses for the net improvement analysis will be the historic land uses. Regional net improvement solutions can be considered to compensate for the lack of direct or inline solutions.
- Adding nutrient removal systems to existing drainage system is a viable option, as long as the existing systems are not adversely impacted.
- To consider the pre-development condition/ land use as agriculture pasture, the property would need to be in continuous use as an agriculture pasture for a long period of time. Typically, we consider a historic use as something that has been in operation for many years. I recent land use change of a short period of time, for example two years, would not be sufficient to consider the land use as agriculture.
- Discussed getting a land use change for removing cattle or agriculture practices off existing historical pastures. This may be possible using the BMPTrains and legal instruments to prohibit the land use from agriculture proposes. The post-development land use for properties effected by this change would be the appropriate undeveloped condition. Applicant must have legal control of the property.
- Discussed A/D soil classification; this soil can be classified as Group A when well drained, otherwise this soil type will be classified as group D.
- Also discussed if grass swales would be counted as DCIA. Per Section 4.5, A.H.V.II, grass swales would not be included in the DICA area. Only the new impervious area plus existing impervious area that directly connected would be used to determine the treatment volume.

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Drawdown Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)

- Provide the limits of jurisdictional wetlands and surface waters. Roadside ditches or other water conveyances, including permitted and constructed water conveyance features, can be claimed as surface waters per Chapter 62-340 F.A.C. if they do not meet the definition of a swale as stated under Rule 403.803 (14) F.S.
- Provide appropriate mitigation using UMAM for impacts, if applicable.
- If the wetland mitigation is appropriate and the applicant is proposing to utilize mitigation bank credit as wetland mitigation, the following applies: Provide letter or credit availability or, if applicable, a letter of reservation from the wetland mitigation bank. The wetland mitigation bank service area and current ledgers can be found out the following link: https://www.swfwmd.state.fl.us/business/epermitting/environmental-resource-permit, Goto "ERP Mitigation Bank Wetland Credit Ledgers"
- Demonstrate elimination and reduction of wetland impacts.
- Maintain minimum 15 foot, average 25 foot wetland conservation area setback or address secondary impacts.
- Determine SHWL's at pond locations, wetlands, and OSWs.
- Determine normal pool elevations of wetlands.
- Determine 'pop-off' locations and elevations of wetlands.
- As of October 1, 2017, the District will no longer send a copy of an application that does not qualify for a State Programmatic General Permit (SPGP) to the U.S. Army Corps of Engineers. If a project does not qualify for a SPGP, you will need to apply separately to the Corps using the appropriate federal application form for activities under federal jurisdiction. Please see the Corps' Jacksonville District Regulatory Division Sourcebook for more information about federal permitting. Please call your local Corps office if you have questions about federal permitting. Link: http://www.saj.usace.army.mil/Missions/Regulatory/Source-Book/

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- Existing roadway/intersections – US 98 from SR 54 to SR 50
- Watersheds – project will involve several watershed studies. Contact the watershed group for more information related to the watershed studies.
- WBIDs need to be independently verified by the consultant – Please review the following link to determine the impaired waterbodies, TMDLs or BMAPs associated with the project. Water Quality Assessments, TMDLs, and BMAPs
- Portions of the project will be discharging to impaired waters.
- Portions of the project may discharge to closed basins, applicant to determine.
- OFW – Withlacoochee River System
- Document/justify SHWE's at pond locations, wetlands, and OSWs.
- Determine normal pool elevations of wetlands.
- Determine 'pop-off' locations and elevations of wetlands.
- Provide documentation to support tailwater conditions for quality and quantity design
- Proposed control structures in wetlands should be consistent with existing 'pop-off' elevations of wetlands; demonstrate no adverse impacts to wetland hydroperiod for up to 2.33yr mean annual storm.
- Minimum flows and levels of receiving waters shall not be disrupted.
- Contamination issues need to be resolved with the FDEP. Check FDEP MapDirect layer for possible contamination points within/adjacent to the project area. FDEP MapDirect Link
  For known contamination within the site or within 500' beyond the proposed stormwater management system:
  - after the application is submitted, please contact FDEP staff listed below and provide them with the ERP Application ID # along with a mounding analysis (groundwater elevation versus distance) of the proposed stormwater management system that shows the proposed groundwater mound will not adversely impact the contaminated area. FDEP will review the plans submitted to the District and mounding analysis to determine any adverse impacts. Provide documentation from FDEP that the proposed construction will not result in adverse impacts. This is required prior to the ERP Application being deemed complete.
  - If a SWMS is to be constructed within a contamination zone area, a groundwater sample collected from the first aquifer water bearing zone (i.e. zone of saturation or first zone that the water table is encountered) will most likely be required.
  For known offsite contamination between 500' and 1500' beyond the site:

- FDEP may also require a mounding analysis (groundwater elevation versus distance) for the proposed stormwater systems. SWFWMD will issue the permit when contamination sites are located outside the 500 ft radius prior to concurrence from DEP, however, it is the Permittee's responsibility to resolve contaminated site assessment concerns with the FDEP prior to beginning any construction activities. A permit condition will be used to reiterate this. You are advised to contact DEP as soon as possible, preferably during permit application period.

FDEP Contacts:

- For projects located within Citrus, Hernando, Pasco, Hillsborough, Pinellas, Manatee, Polk and Hardee Counties: Yanisa Angulo yanisa.angulo@floridadep.gov

- District owned lands adjacent to project area. Contact Steven Blaschka ext. 4459, if a work license or easement is required on District. You may also want to contact land management, Manger for that section is Chris Reed, ext 4466 or Carmen Sanders, ext 4477.
- Stormwater retention and detention systems are classified as moderate sanitary hazards with respect to public and private drinking water wells. Stormwater treatment facilities shall not be constructed within 100 feet of an existing public water supply well and shall not be constructed within 75 feet of an existing private drinking water well. Subsection 4.2, A.H.V.II.
- Any wells on site should be identified and their future use/abandonment must be designated.
- District data collection site may be impacted by proposed construction. Contact data.maps@watermatters.org to coordinate relocation of District data collection site.

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- Demonstrate that post development peak discharges from proposed project area will not cause an adverse impact for a 25-year, 24-hour storm event.
- For projects or portions of projects that discharge to a closed basin, limit the post-development 100-year discharge volume to the pre-development 100-year, 24-hour volume.
- Demonstrate that site will not impede the conveyance of contributing off-site flows.
- Demonstrate that the project will not increase flood stages up- or down-stream of the project area(s).
- Provide equivalent compensating storage for all 100-year, 24-hour riverine floodplain impacts if applicable. Providing cup-for-cup storage in dedicated areas of excavation is the preferred method of compensation~~.~~ if no impacts to flood conveyance are proposed and storage impacts and compensation occur within the same basin. In this case, tabulations should be provided at 0.5-foot increments to demonstrate encroachment and compensation occur at the same levels. Otherwise, storage modeling will be required to demonstrate no increase in flood stages will occur on off-site properties, using the mean annual, 10-year, 25-year, and 100-year storm events for the pre- and post-development conditions.
- Please be aware that if there is credible historical evidence of past flooding or the physical capacity of the downstream conveyance or receiving waters indicates that the conditions for issuance will not be met without consideration of storm events of different frequency or duration, applicants shall be required to provide additional analyses using storm events of different duration or frequency than the 25-year 24-hour storm event, or to adjust the volume, rate or timing of discharges. [Section 3.0 Applicant's Handbook Volume II]

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- If the project discharges to an impaired water body, must provide a net environmental improvement.
- Applicant must demonstrate a net improvement for the parameters of concern by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use.
- Also, replace treatment function of existing ditches to be filled.
- Presumptive Water Quality Treatment for Alterations to Existing Public Roadway Projects:
  -Refer to Section 4.5 A.H.V.II for Alterations to Existing Public Roadway Projects.
  -Refer to Sections 4.8, 4.8.1 and 4.8.2 A.H.V.II for Compensating Stormwater Treatment, Overtreatment, and Offsite Compensation.
  -All co-mingled existing & new impervious that is proposed to be connected to a treatment pond will require treatment for an area equal to the co-mingled existing & new impervious (times ½" for dry treatment or 1" for wet treatment). This applies whether or not equivalent treatment concepts are used.
  -However, if equivalent treatment concepts are used it is possible to strategically locate the pond(s) so that the minimum treatment requirement may be for an area equivalent to the new impervious area only. That is, co-mingled existing & new impervious that is not connected to a treatment pond may bypass treatment (as per Section 4.5(2), A.H.V.II); if the 'total impervious area' that is connected to the treatment pond(s) is at

least equivalent to the area of new impervious only. The 'total impervious area' that is connected to the pond(s) may be composed of co-mingled existing & new impervious.
-Offsite impervious not required to be treated; but may be useful to be treated when using equivalent treatment concepts.
-Existing treatment capacity displaced by any road project will require additional compensating volume. Refer to Subsection 4.5(c), A.H.V.II.

- Will acknowledge compensatory treatment to offset pollutant loads associated with portions of the project area that cannot be physically treated.
- Provide additional 50% treatment for any direct discharges to OFW. Refer to ERP Applicant's Handbook Vol. II Subsection 4.1(f).
- Please be advised that although use of isolated wetlands for ERP treatment purposes is permittable as per Section 4.1(a)(3), A.H.V.II, use of isolated wetlands for treatment purposes may not necessarily meet US Army Corps criteria.

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)

- The project may be located within state owned sovereign submerged lands (SSSL). Be advised that a title determination will be required from FDEP to verify the presence and/or location of SSSL.
- If use of SSSL is proposed, authorization will be required. Refer to Chapter 18-21, F.A.C. and Chapter 18-20, F.A.C. for guidance on projects that impact SSSL and Aquatic Preserves.
- Include discussion on the potential type of SSSL authorization that may be required. Refer to Chapter 18-21.005, F.A.C.
- Coordination with the Tampa Port Authority for projects located in Hillsborough County is recommended.

Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)

- The permit must be issued to entity that owns or controls the property.
- Provide evidence of ownership or control by deed, easement, contract for purchase, etc. Evidence of ownership or control must include a legal description. A Property Appraiser summary of the legal description is NOT acceptable.

Application Type and Fee Required:

- SWERP Individual Permit – Sections A, C, and E of the ERP Application. Roadway improvements will likely be submitted in segments. Some common fees for large roadway projects listed below.
- < 100 acres of project area and < 10 acre of wetland or surface water impacts - $2,798.25 Online Submittal
- < 640 acres of project area and < 50 acre of wetland or surface water impacts - $3,105.75
- Consult the fee schedule for different thresholds.

Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)

- An application for an individual permit to construct or alter a dam, impoundment, reservoir, or appurtenant work, requires that a notice of receipt of the application must be published in a newspaper within the affected area. Provide documentation that such noticing has been accomplished. Note that the published notices of receipt for an ERP can be in accordance with the language provided in Rule 40D-1.603(10), F.A.C.

- Provide a copy of the legal description (of all applicable parcels within the project area) in one of the following forms:
  a. Deed with complete Legal Description attachment.
  b. Plat.
  c. Boundary survey of the property(ies) with a sketch.

- The plans and drainage report submitted electronically must include the appropriate information required under Rules 61G15-23.005 and 61G15-23.004 (Digital), F.A.C. The following text is required by the Florida Board of Professional Engineers (FBPE) to meet this requirement when a digitally created seal is not used and must appear where the signature would normally appear:

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DIGITAL: *[NAME] State of Florida, Professional Engineer, License No. [NUMBER]; This item has been digitally signed and sealed by [NAME] on the date indicated here; Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.*

- Provide soil erosion and sediment control measures for use during construction. Refer to ERP Applicant's Handbook Vol. 1 Part IV Erosion and Sediment Control.
- Demonstrate that excavation of any stormwater ponds does not breach an aquitard (see Subsection 2.1.1, A.H.V.II) such that it would allow for lesser quality water to pass, either way, between the two systems. In those geographical areas of the District where there is not an aquitard present, the depth of the pond(s) shall not be excavated to within two (2) feet of the underlying limestone which is part of a drinking water aquifer. [Refer to Subsection 5.4.1(b), A.H.V.II]
- If lowering of SHWE is proposed, then burden is on Applicant to demonstrate no adverse onsite or offsite impacts as per Subsection 3.6, A.H.V.II. Groundwater drawdown 'radius of influence' computations may be required to demonstrate no adverse onsite or offsite impacts. Please note that new roadside swales or deepening of existing roadside swales may result in lowering of SHWE. Proposed ponds with control elevation less than SHWE may result in adverse lowering of onsite or offsite groundwater.

THIS FORM IS INTENDED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING BY PROVIDING A PARTIAL "PROMPT LIST" OF DISCUSSION SUBJECTS. IT IS NOT A LIST OF REQUIREMENTS FOR SUBMITTAL BY THE APPLICANT.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES

FILE NUMBER:

PA 407957

Date:	10/1/2020
Time:	10:00
Project Name:	FDOT US 98 widening from SR 54 to SR 50
District Engineer:	Monte Ritter
District ES:	Kim Dymond
Attendees:	Nate Johnson Nathan.Johnson@arcadis.com , Tech Wells, Walter Nemecek, Christian Gyle, Tony Celani
County:	Pasco/Hernando
Total Land Acreage:	
Sec/Twp/Rge:	11,13,14/25/21; 18-20,27-29,34,35/25/22 26,27,35/24/21; 11-14,22,23,26/23/21
Project Acreage:	acres

Prior On-Site/Off-Site Permit Activity:

- Previous Pre App 407789; Numerous ERP's within the project corridor.

Project Overview:

- Proposed road widening from two to four lanes along US 98 and 301 between CR 54 at the Pasco/Polk county line and SR 50 in Hernando County. Project will be completed in four segments: (1) US 98 from CR 54 to US 301, (2) The US 301 Dade City Bypass, (3) US 301 from US 98 to the Withlacoochee River, (4) US 301 from the Withlacoochee River to SR 50.
- Meeting focused on a high-level discussion of regional facilities for treatment and floodplain compensation. Regional treatment facilities may be feasible if treatment facility is placed upstream of project and is connected to the same waterbody which receives untreated runoff. BMPTRAINS will be used to show treatment removal efficiencies of regional systems will be equal to, or greater than presumptive criteria. Wetlands and wet ponds will not be included as part of the catchment areas in the BMPTRAINS analyses.

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Drawdown Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)

- Not discussed.

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- Watersheds – New River/Upper Hillsborough, East Pasco, Duck Lake, Dade City, Eastern Hernando. 100-year floodplain onsite per watershed studies. Contact Jessica Hendrix at Ext 4217 if copies of the watershed studies are needed. Section 3.4 of the ERP AHVII requires that flood elevation need to be determined from the most accurate information available.
- WBIDs – 1445, 1443A, 1329F, 1403B, 1424A, 1399, 1396, 1390. WBID 1443A is currently listed as impaired for Dissolved Oxygen. WBIDs need to be independently verified by the consultant
- Portions of project discharge to closed or volume sensitive basins
- OFW – Hillsborough River and Withlacoochee River System.
- Document/justify SHWE's at pond locations, wetlands, and OSWs.
- Provide documentation to support tailwater conditions for quality and quantity design. Can use data from watershed studies.
- Contamination issues need to be resolved with the FDEP. Check FDEP MapDirect layer for possible contamination points within/adjacent to the project area. FDEP Map Direct
  For known contamination within the site or within 500' beyond the proposed stormwater management system:
  - After the application is submitted, please contact FDEP staff listed below and provide them with the ERP Application ID # along with a mounding analysis (groundwater elevation versus distance) of the proposed stormwater management system that shows the proposed groundwater mound will not adversely impact the contaminated area. FDEP will review the plans submitted to the District and mounding analysis to

determine any adverse impacts. Provide documentation from FDEP that the proposed construction will not result in adverse impacts. This is required prior to the ERP Application being deemed complete.
- If a SWMS is to be constructed within a contamination zone area, a groundwater sample collected from the first aquifer water bearing zone (i.e. zone of saturation or first zone that the water table is encountered) will most likely be required.
For known offsite contamination between 1500' and 500' beyond the site: - FDEP may also require a mounding analysis (groundwater elevation versus distance) for the proposed stormwater systems. SWFWMD will issue the permit when contamination sites are located outside the 500 ft radius prior to concurrence from DEP, however, it is the Permittee's responsibility to resolve contaminated site assessment concerns with the FDEP prior to beginning any construction activities. A permit condition will be used to reiterate this. You are advised to contact DEP as soon as possible, preferably during permit application period.
- FDEP Contacts:
- For projects located within Citrus, Hernando, Pasco, Hillsborough, Pinellas, Manatee, Polk and Hardee Counties: Yanisa Angulo Yanisa.angulo@floridadep.gov

- Any wells on site should be identified and their future use/abandonment must be designated.
- Stormwater retention and detention systems are classified as moderate sanitary hazards with respect to public and private drinking water wells. Stormwater treatment facilities shall not be constructed within 100 feet of an existing public water supply well and shall not be constructed within 75 feet of an existing private drinking water well. Subsection 4.2, A.H.V.II.
- District data collection sites (Site ID's 17716, 17717, 17718, and 17719) at southern end of project between SR 54 and Stanton Hall Drive may be impacted by proposed construction. Contact the District's Data Steward at Data.Maps@watermatters.org under the subject line "PRIORITY ERP Data Evaluation" to coordinate protection or relocation of the data collection sites.

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- Demonstrate that post development peak discharges from proposed project area will not cause an adverse impact for a 25-year, 24-hour storm event.
- For projects or portions of projects that discharge to a closed or volume sensitive basin, limit the post-development 100-year, 24-hour discharge volume to the pre-development 100-year, 24-hour volume.
- Demonstrate that site will not impede the conveyance of contributing off-site flows.
- Demonstrate that the project will not increase flood stages up- or down-stream of the project area(s).
- Provide equivalent compensating storage for all 100-year, 24-hour floodplain impacts if applicable. Providing cup-for-cup storage in dedicated areas of excavation is the preferred method of compensation, if no impacts to flood conveyance are proposed and storage impacts and compensation occur within the same basin. In this case, tabulations should be provided at 0.5-foot increments to demonstrate encroachment and compensation occur at the same levels. Otherwise, storage modeling will be required to demonstrate no increase in flood stages will occur on off-site properties, using the mean annual, 10-year, 25-year, and 100-year storm events for the pre- and post-development conditions.

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- Presumptive Water Quality Treatment for Alterations to Existing Public Roadway Projects:
-Refer to Section 4.5 A.H.V.II for Alterations to Existing Public Roadway Projects.
-Refer to Sections 4.8, 4.8.1 and 4.8.2 A.H.V.II for Compensating Stormwater Treatment, Overtreatment, and Offsite Compensation.
-All co-mingled existing & new impervious that is proposed to be connected to a treatment pond will require treatment for an area equal to the co-mingled existing & new impervious (times ½" for dry treatment or 1" for wet treatment). This applies whether or not equivalent treatment concepts are used.
-However, if equivalent treatment concepts are used it is possible to strategically locate the pond(s) so that the minimum treatment requirement may be for an area equivalent to the new impervious area only. That is, co-mingled existing & new impervious that is not connected to a treatment pond may bypass treatment (as per Section 4.5(2), A.H.V.II); if the 'total impervious area' that is connected to the treatment pond(s) is at least equivalent to the area of new impervious only. The 'total impervious area' that is connected to the pond(s) may be composed of co-mingled existing & new impervious.
-Offsite impervious not required to be treated; but may be useful to be treated when using equivalent treatment concepts.
-Existing treatment capacity displaced by any road project will require additional compensating volume. Refer to Subsection 4.5(c), A.H.V.II.

-Regional treatment systems can be used if they are strategically placed and benefit the same waters which receive untreated runoff from the project.

- Net improvement
  -Refer to rule 62-330.301(2), F.A.C.
  -Please verify accuracy of WBID boundaries and status of impairment.
  -The application must demonstrate a net improvement for nutrients for discharges into WBID 1443A. Applicant may demonstrate a net improvement for the parameters of concern by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use. Refer to ERP Applicant's Handbook Vol. II Subsection 4.1(g).
  -Effluent filtration is known to be ineffective for treating nutrient related impairments, unless special nutrient adsorption media provided. However, please note special nutrient adsorption media has extremely low conductivity values compared to typical sand type effluent filtration filter media. Note: if treatment volume required for net improvement is less than the treatment volume required for 'presumptive' treatment, then use of effluent filtration is ok.

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)

- The project may be located within state owned sovereign submerged lands (SSSL). Be advised that a title determination will be required from FDEP to verify the presence and/or location of SSSL.
- If use of SSSL is proposed, authorization will be required. Refer to Chapter 18-21, F.A.C. and Chapter 18-20, F.A.C. for guidance on projects that impact SSSL and Aquatic Preserves.
- Include discussion on the potential type of SSSL authorization that may be required. Refer to Chapter 18-21.005, F.A.C.

Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)

- The permit must be issued to entity that owns or controls the property. FDOT will be the permittee.
- Provide evidence of ownership or control by deed, easement, contract for purchase, etc.

Application Type and Fee Required:

- SWERP Individual – Sections A, C, and E of the ERP Application. Fee will be dependent upon project size and amount of wetland or surface water impacts.
- Consult the fee schedule for different thresholds.

Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)

- An application for an individual permit to construct or alter a dam, impoundment, reservoir, or appurtenant work, requires that a notice of receipt of the application must be published in a newspaper within the affected area. Provide documentation that such noticing has been accomplished. Note that the published notices of receipt for an ERP can be in accordance with the language provided in Rule 40D-1.603(10), F.A.C.

- The plans and drainage report submitted electronically must include the appropriate information required under Rules 61G15-23.005 and 61G15-23.004 (Digital), F.A.C. The following text is required by the Florida Board of Professional Engineers (FBPE) to meet this requirement when a digitally created seal is not used and must appear where the signature would normally appear:

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- Provide soil erosion and sediment control measures for use during construction. Refer to ERP Applicant's Handbook Vol. 1 Part IV Erosion and Sediment Control.
- Demonstrate that excavation of any stormwater ponds does not breach an aquitard (see Subsection 2.1.1, A.H.V.II) such that it would allow for lesser quality water to pass, either way, between the two systems. In those geographical areas of the District where there is not an aquitard present, the depth of the pond(s) shall

not be excavated to within two (2) feet of the underlying limestone which is part of a drinking water aquifer. [Refer to Subsection 5.4.1(b), A.H.V.II]

- If lowering of SHWE is proposed, then burden is on Applicant to demonstrate no adverse onsite or offsite impacts as per Subsection 3.6, A.H.V.II. Groundwater drawdown 'radius of influence' computations may be required to demonstrate no adverse onsite or offsite impacts. Please note that new roadside swales or deepening of existing roadside swales may result in lowering of SHWE. Proposed ponds with control elevation less than SHWE may result in adverse lowering of onsite or offsite groundwater.

THIS FORM IS INTENDED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING BY PROVIDING A PARTIAL "PROMPT LIST" OF DISCUSSION SUBJECTS. IT IS NOT A LIST OF REQUIREMENTS FOR SUBMITTAL BY THE APPLICANT.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES

FILE NUMBER:

PA 408716

Date:	07/29/2021		
Time:	11:00 am		
Project Name:	FDOT US 98 Widening from SR 54 to US 301		
District Engineer:	Beth Geurink		
District ES:	Al Gagne		
Attendees:	Abdul Waris, Tony Celani, Gregg Hamm, Tech Wells		
County:	Pasco County	**Sec/Twp/Rge:**	11-14,18-20,27-29,34-35/25/21; 2/26/22
Total Land Acreage:		**Project Acreage:**	Not quantified

Prior On-Site/Off-Site Permit Activity:

- Within corridor - none; adjacent - numerous

Project Overview:

- Proposed widening along US 98 from the intersection of US 98 and SR 54 to the intersection of US 301 and Clinton Ave

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Drawdown Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)

- Environmental issues were not discussed.
- Please note, the Florida Department of Environmental Protection (FDEP) has assumed the Federal dredge and fill permitting program under section 404 of the Federal Clean Water Act within certain waters. State 404 Program streamlining intentions direct Agency staff to coordinate joint site visits for overall consistency between the two State programs. As such, District staff and the FDEP will need to conduct a joint site visit for evaluation of the wetland/surface water systems proposed for impact. District staff will coordinate with FDEP staff on determining dates/times of joint Agency availability. Upon determination of joint availability, staff will provide the applicant's representative with site visit scheduling options.

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- Upper Hillsborough River/New River Watersheds
- WBIDs need to be independently verified by the consultant - WBIDs discussed in previous PreApp 407957 10/2/2020; PreApp 407789 7/29/2020
- Possibly discharging to impaired waters. See FDEP Map Direct_NAS_BMAP
- May discharge to closed or volume sensitive basins for some segments
- Bridge widening over OFWs (Hillsborough River and Withlacoochee River system)
- Provide documentation to support tailwater conditions for quality and quantity design
- Contamination issues may need to be resolved with the FDEP. Refer to earlier Pre App meeting – not discussed again. Check FDEP MapDirect layer for possible contamination points within/adjacent to the project area. FDEP MapDirect Link
  FDEP Contacts:
  - For projects located within Citrus, Hernando, Pasco, Hillsborough, Pinellas, Manatee, Polk and Hardee Counties: Yanisa Angulo yanisa.angulo@floridadep.gov
- District data collection site near proposed bridge widening location SID 17717 Withlacoochee-Hillsborough Overflow (USGS gage 02311000) may be impacted by proposed construction. Contact data.maps@watermatters.org to coordinate relocation/protection of District/USGS data collection site.

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- Discussion focused on appropriate interpretation of floodplain elevation data with respect to encroachment/compensation calculations at the Hillsborough River crossing, where a 2-foot drop in FEMA elevation occurs across the bridge (elevation 84 to 82). Simplest and adequately conservative approach would be to use the upstream flood elevation to derive encroachment and compensation quantities within the right-of-way on either side of the roadway in this area.

- Alternatively, a site-specific model for flood stage could be developed using available regression equations for flow determination based on contributing area and/or informed by gage data.
- Demonstrate that the project will not increase flood stages up- or down-stream of the project area(s).
- Watershed Model information may be available for download using the following link: https://watermatters.sharefile.com/d-s8c9019e00fd243908654e733a6b2016c but it appears that the regional model is using set boundary conditions at this location.
- Provide equivalent compensating storage for all 100-year, 24-hour riverine floodplain impacts if applicable. Providing cup-for-cup storage in dedicated areas of excavation is the preferred method of compensation~~.~~ if no impacts to flood conveyance are proposed and storage impacts and compensation occur within the same basin. In this case, tabulations should be provided at 0.5-foot increments to demonstrate encroachment and compensation occur at the same levels. Otherwise, storage modeling will be required to demonstrate no increase in flood stages will occur on off-site properties, using the mean annual, 10-year, 25-year, and 100-year storm events for the pre- and post-development conditions.

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- Provide water quality treatment for directly-connected impervious areas, consistent with the Applicant's Handbook Vol. II for alterations to existing public roadway projects (Section 4.5).
- In addition, if the project discharges to an impaired water body, must provide a net environmental improvement.
- Applicant must demonstrate a net improvement for the parameters of concern by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use.
- Refer to Sections 4.8, 4.8.1 and 4.8.2 A.H.V.II for Compensating Stormwater Treatment, Overtreatment, and Offsite Compensation.
- Will acknowledge compensatory treatment to offset pollutant loads associated with portions of the project area that cannot be physically treated.
- Provide additional 50% treatment (over presumptive) for any direct discharges to OFW. Refer to ERP Applicant's Handbook Vol. II Subsection 4.1(f). Where OFW and Net Improvement both apply, provide the greater volume of the two.
  -Effluent filtration is known to be ineffective for treating nutrient related impairments, unless special nutrient adsorption media provided. However, please note special nutrient adsorption media has extremely low conductivity values compared to typical sand type effluent filtration filter media. Note: if treatment volume required for net improvement is less than the treatment volume required for 'presumptive' treatment, then use of effluent filtration is ok.

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)

- Not discussed.

Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)

- The permit must be issued to entity that owns or controls the property.

Application Type and Fee Required:

- SWERP – Sections A, C, and E of the ERP Application.
- Consult the fee schedule for different thresholds.

Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)

- An application for an individual permit to construct or alter a dam, impoundment, reservoir, or appurtenant work, requires that a notice of receipt of the application must be published in a newspaper within the affected area. Provide documentation that such noticing has been accomplished. Note that the published notices of receipt for an ERP can be in accordance with the language provided in Rule 40D-1.603(10), F.A.C.

- Provide a copy of the legal description (of all applicable parcels within the project area) in one of the following forms:
  a. Deed with complete Legal Description attachment.
  b. Plat.

c. Boundary survey of the property(ies) with a sketch.

- The plans and drainage report submitted electronically must include the appropriate information required under Rules 61G15-23.005 and 61G15-23.004 (Digital), F.A.C. The following text is required by the Florida Board of Professional Engineers (FBPE) to meet this requirement when a digitally created seal is not used and must appear where the signature would normally appear:

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- Provide soil erosion and sediment control measures for use during construction. Refer to ERP Applicant's Handbook Vol. 1 Part IV Erosion and Sediment Control. FDOT projects may submit the full plan during the construction phase by special permit condition. Recommend basic erosion control measures on the submitted plans with the application.
- Demonstrate that excavation of any stormwater ponds does not breach an aquitard (see Subsection 2.1.1, A.H.V.II) such that it would allow for lesser quality water to pass, either way, between the two systems. In those geographical areas of the District where there is not an aquitard present, the depth of the pond(s) shall not be excavated to within two (2) feet of the underlying limestone which is part of a drinking water aquifer. [Refer to Subsection 5.4.1(b), A.H.V.II]
- If lowering of SHWE is proposed, then burden is on Applicant to demonstrate no adverse onsite or offsite impacts as per Subsection 3.6, A.H.V.II. Groundwater drawdown 'radius of influence' computations may be required to demonstrate no adverse onsite or offsite impacts. Please note that new roadside swales or deepening of existing roadside swales may result in lowering of SHWE. Proposed ponds with control elevation less than SHWE may result in adverse lowering of onsite or offsite groundwater.
- On December 17, 2020, the Environmental Protection Agency (EPA) formally transferred permitting authority under CWA Section 404 from the U.S. Army Corps of Engineers (Corps) to the State of Florida for a broad range of water resources within the State. The primary State 404 Program rules are adopted by the Florida Department of Environmental Protection (FDEP) as Chapter 62-331 of the Florida Administrative Code (F.A.C.). While the State 404 Program is a separate permitting program from the Environmental Resource Permitting program (ERP) under Chapter 62-330, F.A.C., and agency action for State 404 Program verifications, notices, or permits shall be taken independently from ERP agency action, the FDEP and the Southwest Florida Water Management District (SWFWMD) will be participating in a Joint application Process. Upon submittal of an ERP application that proposes dredge/fill activities in wetlands or surface waters within state assumed waters, the SWFWMD will forward a copy of your application to the FDEP for activities under State 404 jurisdiction. The applicant may choose to have the State 404 Program and ERP agency actions issued concurrently to help ensure consistency and reduce the need for project modifications that may occur when the agency actions are issued at different times. Additional information on the FDEP's 404 delegation can be found at: https://floridadep.gov/water/submerged-lands-environmental-resources-coordination/content/state-404-program

  Additionally, for those projects located in areas where the Corps retains jurisdiction, the applicant is advised that the District will not send a copy of an application that does not qualify for a State Programmatic General Permit (SPGP) to the U.S. Army Corps of Engineers. If a project does not qualify for a SPGP, you will need to apply separately to the Corps using the appropriate federal application form for activities under federal jurisdiction. Please see the Corps' Jacksonville District Regulatory Division Sourcebook for more information about federal permitting. Please call your local Corps office if you have questions about federal permitting. Link: http://www.saj.usace.army.mil/Missions/Regulatory/Source-Book/