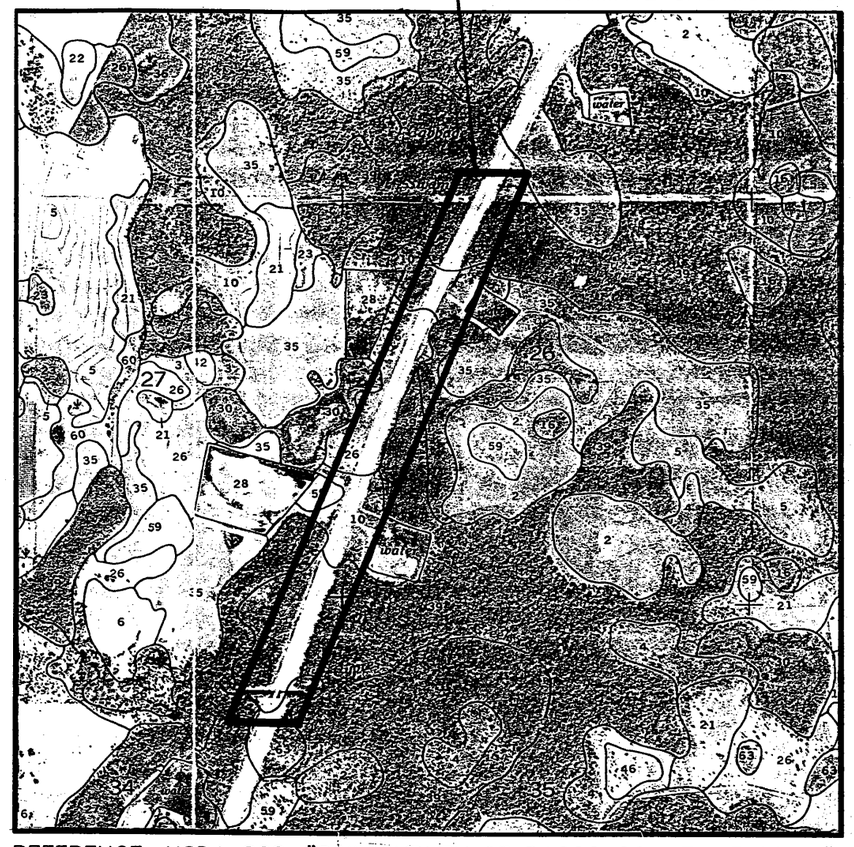
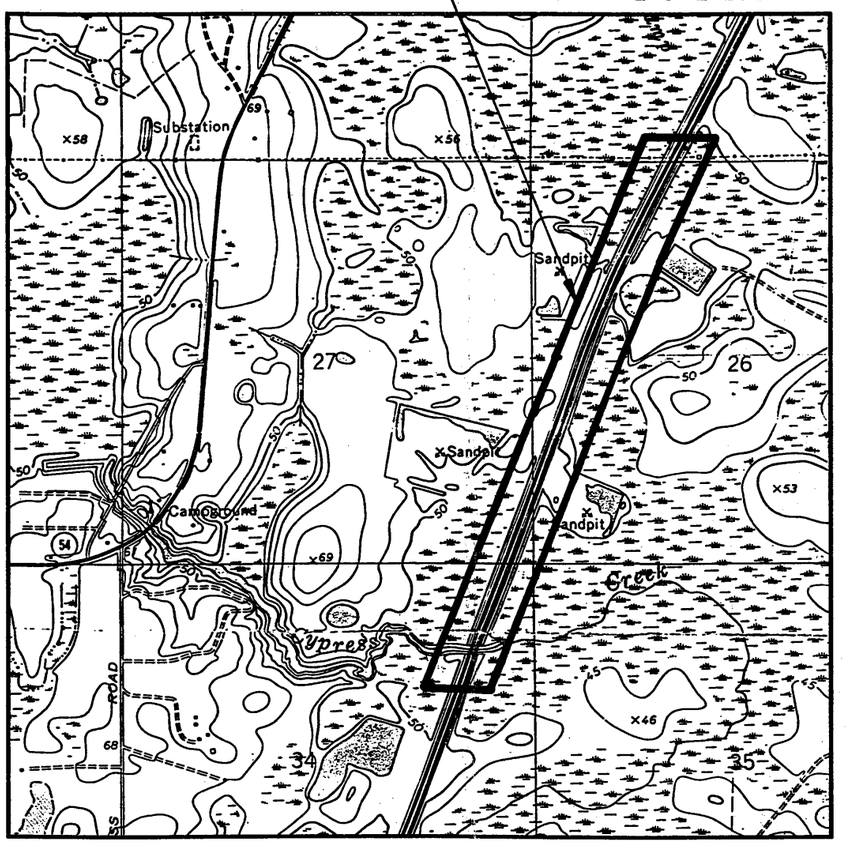
APPROXIMATE SITE LOCATION



REFERENCE: USDA SCS, "SOIL SURVEY OF PASCO COUNTY, FLORIDA"
TOWNSHIP: 26 SOUTH
RANGE: 19 EAST
SECTION: 23,26,27 AND 34
ISSUED: 1982
PHOTO: 1975
SCALE: 1 : 24,000

USDA VICINITY MAP

APPROXIMATE SITE LOCATION



REFERENCE: USGS "LUTZ, FLORIDA" QUADRANGLE MAP
TOWNSHIP: 26 SOUTH
RANGE: 19 EAST
SECTION: 23,26,27 AND 34
ISSUED: 1974
PHOTOREVISED: –
SCALE: 1 : 24,000

USGS VICINITY MAP

SEGMENT A

DRAWN	KM
CHECKED	SBJ
APPROVED	CLK
SCALE	NOTED

USDA & USGS VICINITY MAPS
PD&E STUDY I-75 (S.R. 93) FROM SOUTH OF S.R. 56 TO NORTH OF S.R. 52
PASCO COUNTY, FLORIDA

psi ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION

DATE	PROJ. NO.	SHEET
JULY 97	775-65241	SHEET 1

FINAL GEOTECHNICAL REPORT

Florida Department of Transportation

State Project Number: 14140-1423
Federal Project Number: NH-75-1(91)275
Work Program Number: 7147619
I-75 (S.R. 93) from South of S.R. 56 to North of S.R. 52

This project evaluates improvement alternatives for Interstate 75 (State Road 93) from south of State Road 56 to north of State Road 52 in Pasco County, Florida The approximate length of the project is 19.15 kilometers (11.902 miles).

OCTOBER 29, 1997

TABLE OF CONTENTS

I-75 (S.R. 93) PD&E Study
State Project No. 14140-1423
W.P.I. No. 7147619

1.0 INTRODUCTION

This study is to support the Project Development and Environment (PD&E) Study for I-75 (S.R. 93) from south of S.R. 56 to north of S.R. 52, approximately 19.3 kilometers (See Figure 1 in the Appendix of this report).

1.1 Purpose

The purpose of this geotechnical study is to support the PD&E study in accordance with the Florida Department of Transportation's (FDOT's) current Project Development and Environment Manual, the Pasco County Metropolitan Planning Organization Long Range Transportation Plan and the Pasco County Comprehensive Plan.

This report focuses on providing a summary of existing information and the results of a field reconnaissance to identify soil conditions along the project alignment. Using aerial photography, available county and Soil Conservation Service data, United States Geological Survey (USGS) quadrangle mapping, and previous projects within the study area, an inventory of the anticipated soil conditions along the roadway and/or at the structure sites are presented. Further, general recommendations for treatment of problem soil conditions are provided.

1.2 Project Description

This report is part of an on-going study to provide geotechnical services for the proposed roadway improvements associated with I-75 in Pasco County, Florida and is in general accordance with "Exhibit A" Scope of Services dated May 14, 1996. The proposed improvements for I-75 generally consist of widening the existing roadway from a four (4) to a six (6) lane highway.

The project has been divided into four (4) segments. The approximate baseline stations dividing each segment are as follows: Segment A from Station 193+55 to 217+19; Segment B from Station 217+19 to 273+18; Segment C from Station 273+18 to 321+72; and Segment D from Station 321+72 to 390+00 (See Figure 1 in the Appendix of this report).

The PD&E Study report presented herein is intended to be used to support the feasibility and design of the roadway improvements and bridge structures.

A separate report addresses the associated stormwater retention ponds.

2.0 SCOPE OF SERVICES

2.1 Project Approach

The services for this project consisted of providing preliminary geotechnical engineering services in general accordance with the project Scope of Consulting Engineering Services as defined in Exhibit "A" issued by the Florida Department of Transportation (FDOT). The services included performing a field reconnaissance and a review of published information that are related to the subsurface soil and groundwater conditions in the project area. The geotechnical study began with a review of available subsurface test data, such as the "Soil Survey of Pasco County, Florida" published by the USDA and the USGS topographic maps for the project vicinity. A field reconnaissance was conducted and conditions assessed with respect to general topographic site conditions.

The purpose of this study was to obtain preliminary information concerning the general subsurface conditions along the roadway alignment and within the general vicinity of the existing structures in order to catalog the general subsurface stratigraphy and provide preliminary geotechnical recommendations to guide in the design and construction of the project. The following services were provided in order to achieve the preceding objectives:

1. Conducted a general visual reconnaissance of the project alignment.

2. Reviewed readily available published geologic and topographic information. This published information was obtained from the "Lutz, Florida", "Wesley Chapel, Florida" and "San Antonio, Florida" Quadrangle Maps published by the USGS, the "Soil Survey of Pasco County, Florida" published by the USDA Soil

Conservation Service (SCS), aerial photographs provided by PBS&J, aerial photographs published by the Southwest Florida Water Management District (SWFMD), existing bridge structure plans, and previously prepared geotechnical reports.

3. Evaluated the feasibility of typical foundation alternatives for the widening of the bridge structures.

4. Prepared an engineering report summarizing our study for the design and construction of the proposed roadway.

3.0 GENERALIZED SITE AND SUBSURFACE SOIL CONDITIONS

3.1 Site Description

It appears that the project alignment was constructed predominantly as an elevated (fill) section. It is estimated that the fill depth may range from 0.0 to 6.0 meters above the natural ground surface. The pavement generally appears to be in good working condition with surficial pavement cracking appearing to be minimal. For detailed pavement evaluation, pavement corings will be necessary.

Segment A Roadway

The Segment A boundaries for this report include the I-75 corridor between baseline Station 193+55 (begin project, south of Cypress Creek) to baseline Station 217+19 (north of proposed S.R. 56 interchange). This segment consists of approximately 2.4 kilometers of four (4) lane divided highway. It is our understanding that the new S.R. 56 interchange is to be considered as an existing, "no build", interchange for this project.

A field reconnaissance was performed on July 18, 1997 by representatives of PSI. In general, the existing I-75 Segment A corridor travels in a north/south direction through undeveloped, heavily wooded, marshy areas of southern Pasco County.

Several sand pits are located along the western and eastern extents on Segment A, from the project beginning to Cypress Creek, generally appears to contain mucky soils on either sides of I-75.

Segment A Structures

Segment A along the I-75 corridor consists of two (2) existing bridge structures. The structures cross over Cypress Creek with one consisting of three (3) southbound travel lanes and the other consisting of four (4) northbound travel lanes. Each bridge is a 3-span structure with intermediate bents consisting of 455 mm square prestressed concrete (PSC) pilings. At the time of our visit, the creek bottom underneath and in the vicinity of the bridges was covered with some vegetation and a few small trees.

Within this segment one (1) box culvert structure was also observed across I-75 at a location south of the proposed S.R. 56 interchange.

Segment B Roadway

This segment is between baseline station 217+19 (north of proposed S.R. 56 interchange) and 273+18 (north of the existing S.R. 54 interchange). Based on our field reconnaissance, the segment travels through heavily wooded, marshy areas. The southern end of the segment is within Cabbage Swamp. The eastern and western extents of the segment consisted of some areas with water at or above the ground surface.

Segment B Structures

This segment of I-75 includes two (2) existing bridge structures. Both three (3) span structures cross over S.R. 54 and consist of the northbound and southbound travel lanes. The segment also includes three box culverts across I-75, one (1) located north of proposed S.R. 56 interchange, one (1) north of Topp of Tampa Airport, and one (1) north of S.R. 54.

Segment C Roadway

This segment is between baseline Station 273+18 (north of the existing S.R. 54 interchange) and Station 321+72 (north of Overpass Road). Based on our field reconnaissance, the segment travels through wooded, marshy areas. Specifically, the northern end of the segment appears to contain mucky soils on either sides of I-75. The eastern and western extents of the segment consist of areas with water at or above the ground surface.

Segment C Structures

This segment of I-75 includes one (1) existing bridge structure. The structure is aligned along Overpass Road and over I-75, with four (4) spans. The segment also includes four (4) box culverts across I-75 with two (2) located south and two (2) located north of the existing Overpass Road over I-75 bridge structure.

Segment D Roadway

This segment is between baseline Station 321+72 (north of Overpass Road) and Station 390+00 (north of abandoned railroad). Based on our field reconnaissance, the segment travels through wooded, marshy areas. The eastern and western extents of the segment consist of areas with water at or above the ground surface.

Segment D Structures

This segment of I-75 includes four (4) existing bridge structures. Two (2) bridge structures are aligned along I-75 and cross over S.R. 52, and two (2) structures cross over an abandoned railroad. The I-75 over S.R. 52 structures have four (4) spans, with the intermediate bents consisting of piers. The I-75 over the abandoned railroad have three (3) spans, with the intermediate bents consisting of 455 mm square PSC pilings. At the time of our site visit to the railroad bridge, the abandoned railroad and the ground surface near the railroad were covered with some vegetation and a few small trees. The segment also includes four (4) box culverts across I-75, located south of the existing I-75 over S.R. 52 bridge structures.

3.2 United States Geological Survey (USGS) Topographic Survey

Segment A

The site of the proposed development is located in Pasco County, Florida. Specifically, the proposed improvements are located within Sections 23, 26, 27, and 34, Township 26 South, Range 19 East in Pasco County (see Sheet 1 in the Appendix of this report).

The USGS topographic survey map entitled "Lutz, Florida", issued 1974, was reviewed for ground surface features along the proposed project improvements. Based on this review, the natural ground surface elevations are generally within the range of 15 to 18 meters National Geodetic Vertical Datum of 1929 (NGVD).

Segment B

This segment of I-75, is located in Sections 12, 13, 14 and 23, Township 26 South, Range 19 East and Section 7, Township 26 South, Range 20 East in Pasco County, Florida (see Sheet 3). The USGS maps entitled "Lutz, Florida" and "Wesley Chapel, Florida" were reviewed. Based on the review, the natural ground surface elevations are generally in the range of 15 to 26 meters NGVD.

Segment C

This segment of I-75 is located in Sections 5, 6 and 7, Township 26 South, Range 20 East and Sections 29, 31 and 32, Township 25 South, Range 20 East in Pasco County, Florida (see Sheet 5). The USGS maps entitled "Wesley Chapel, Florida" and " San Antonio, Florida" were reviewed. Based on the review, the natural ground surface elevations are generally in the range of 26 to 30 meters NGVD.

Segment D

This segment of I-75 is located in Sections 5, 8, 17, 20 and 29, Township 25 South, Range 20 East in Pasco County, Florida (see Sheet 7). The USGS map entitled "San Antonio, Florida" ground surface elevations are generally in the range of 27 to 30 meters NGVD.

3.3 Pasco County Regional Geology

Based on our review at the "Geohydrologic Reconnaissance of Pasco and Southern Hernando Counties, Florida", (dated 1964) published by the USGS in cooperation with the FGS, 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 hundred meters 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. This area extends the length of the County and ranges up to about three kilometers in width. Inland, the terrain changes very gradually from shallow marine water to salt marshes to fresh water swamps. Limestone is shallow in much of the area; 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 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 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 drainage of the area has also 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 groundwater 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

material of slow permeability overlie the limestone or the water level in the limestone is near the ground surface. The Pithlachascotee 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.

Based on "Hydrogeology of the Southwest Florida Water Management District", (dated March 1985), published by the Southwest Florida Water Management District (SWFWMD), some areas of the County appear to have sinkhole drainage patterns. Bear Creek, for example, reportedly, drains into Bear Sink and when Bear Sink is full it drains into a second sinkhole. In periods when both of these sinks cannot drain the full water flow, the excess appears to flow 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 areas of streams. These closed depressions, which drain internally, generally provide adequate subsurface drainage during periods of normal rainfall. During very wet periods, the closed depressional drains may receive more water than they can release into the underlying limestone formation, allowing the closed depressions to become flowing springs.

3.4 Pasco County Soil Survey

Segment A Roadway

The Soil Survey of Pasco County, Florida, published by the USDA SCS, has been reviewed for the project vicinity. The soil survey map for the project vicinity is illustrated on Sheet 1 in the Appendix of this report. This soil survey map indicates that there are seven (7) mapping units along the Segment A roadway alignment. The map soil units encountered are shown in Table 1 below. Mucky fine sand (map unit 63) is indicated by SCS for the project area from the project beginning to Cypress Creek (approximate Stations 193+55 to 196+00).

TABLE 1

USDA Map Soil Name and Symbol	Classification			Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Felda fine sand (4)	0.00 - 0.58	A-3	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jul-Mar	High	Moderate
	0.58 - 0.89	A-2-4, A-2-6	0.0004 - 0.0042					
	0.89 - 2.03	A-3, A-2-4	0.0042 - 0.0141					
Vero fine sand (10)	0.00 - 0.58	A-3, A-2-4	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jun-Oct	Moderate	High
	0.58 - 0.76	A-2-4	<0.0001					
	0.76 - 2.03	A-2-4, A-2-6, A-6, A-4	<0.0001					
Narcoossee fine sand (26)	0.00 - 0.08	A-3	0.0042 - 0.0141	0.6 - 1.1	Apparent	Jun-Nov	Moderate	High
	0.08 - 0.23	A-3	0.0042 - 0.0141					
	0.23 - 0.30	A-3, A-2-4	0.0014 -0.0042					
	0.30 - 1.91	A-3	0.0042 - 0.0141					
Anclote fine sand (27)	0.00 - 0.36	A-3, A-2-4	0.0042 - 0.0141	+0.6 - 0.3	Apparent	Jun-Mar	Moderate	Moderate
	0.36 - 2.03	A-3, A-2-4	0.0042 - 0.0141					
Chobee soils (39)	0.00 - 0.28	A-2-4	0.0014 - 0.0042	0.0 - 0.3	Apparent	Jun-Feb	Moderate	Low
	0.28 - 1.42	A-2-6, A-2-7	<0.0001					
	1.42 - 2.03	A-2-4, A-2-6, A-6, A-7	0.0001 - 0.0042					
Newnan fine sand (59)	0.00 - 0.56	A-3, A-2-4	0.0042 - 0.0141	0.5 - 0.8	Apparent	Aug-Feb	Low	High
	0.56 - 0.84	A-3, A-2-4	0.0014 - 0.0141					
	0.84 - 1.12	A-3, A-2-4	0.0042 - 0.0141					
	1.12 - 2.03	A-2-4, A-4, A-6	<0.0001 - 0.0004					
Delray mucky fine sand (63)	0.00 - 0.41	A-3, A-2-4	0.0042 - 0.0141	+0.6 - 0.3	Apparent	Jun-Dec	Moderate	Low
	0.41 - 1.22	A-3, A-2-4	0.0042 - 0.0141					
	1.22 - 2.03	A-2-4, A-2-6	0.0004 - 0.0042					

Segment A Structures

The Soil Survey of Pasco county indicates two (2) primary mapping units within the vicinity of the existing I-75 over Cypress Creek bridge structures. The map soil units encountered are shown in Table 2. Mucky fine sand (map unit 63) is indicated in the area of the bridge structures (approximate Stations 195+00 to 196+00).

TABLE 2

USDA Map Soil Name and Symbol	Classification			Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Chobee soils (39)	0.00 - 0.28	SP-SM, SM	0.0014 - 0.0042	0.0 - 0.3	Apparent	Jun-Feb	Moderate	Low
	0.28 - 1.42	SC	<0.0001					
	1.42 - 2.03	SP-SM, SM, SC, SM-SC	0.0001 - 0.0042					
Delray mucky fine sand (63)	0.00 - 0.41	SP-SM, SM, SM-SC	0.0042 - 0.0141	+0.6 - 0.3	Apparent	Jun-Dec	Moderate	Low
	0.41 - 1.22	SP-SM	0.0042 - 0.0141					
	1.22 - 2.03	SM, SM-SC, SC	0.0004 - 0.0042					

Segment B Roadway

The Soil Survey of Pasco County indicates seven (7) primary mapping units within the vicinity of the existing roadway (see Sheet 2). The map soil units encountered are shown in Table 3. Mucky fine sand (map unit 8) is located near Station 249+00 and between Stations 258+00 and 261+00.

TABLE 3

USDA Map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Pomona fine sand (2)	0.00 - 0.15	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jul-Sep	High	High
	0.15 - 0.56	A-3, A-2-4	SP, SP-SM, SM	0.0042 - 0.0141					
	0.56 - 0.91	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0014					
	0.91 - 1.32	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141					
	1.32 - 1.52	A-2-4, A-4, A-6	SC, SM-SC, SM	0.0001 - 0.0004					

TABLE 3

USDA Map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Pineda fine sand (3)	0.00 - 0.99	A-3	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jun-Nov	High	Low
	0.99 - 2.03	A-2-4, A-2-6	SC, SM-SC	>0.0001					
Sellers mucky loamy fine sand (8)	0.00 - 0.23	A-3, A-2-4	SP-SM, SM	0.0042 - 0.141	+0.6 - 0.0	Apparent	Jun-Mar	High	High
	0.23 - 0.61	A-3, A-2-4	SP-SM, SM	0.0042 - 0.141					
	0.61 - 2.03	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
Ona fine sand (9)	0.00 - 0.18	A-3	SP-SM, SP	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jun-Oct	High	High
	0.18 - 0.46	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0014					
	0.46 - 2.03	A-3	SP-SM, SP	0.0042 - 0.141					
Vero fine sand (10)	0.00 - 0.58	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jun-Oct	Moderate	High
	0.58 - 0.76	A-2-4	SM	<0.0001					
	0.76 - 2.03	A-2-4, A-2-6, A-6, A-4	SM, SM-SC, SC	<0.0001					
Eaugallie fine sand (35)	0.00 - 0.56	A-3	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jun-Oct	High	Moderate
	0.56 - 0.76	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0042					
	0.76 - 1.30	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141					
	1.30 - 2.03	A-2-4, A-2-6	SM, SM-SC, SC	0.0004 - 0.0042					
Chobee soils (39)	0.00 - 0.28	A-2-4	SP-SM, SM	0.0014 - 0.0042	0.0 - 0.3	Apparent	Jun-Feb	Moderate	Low
	0.28 - 1.42	A-2-6, A-2-7	SC	<0.0001					
	1.42 - 2.03	A-2-4, A-2-6, A-6, A-7	SP-SM, SM, SC, SM-SC	0.0001 - 0.0042					

Segment B Structures

The Soil Survey of Pasco County indicates one (1) primary mapping unit within the vicinity of the existing I-75 over S.R. 54 bridge structures. The map unit encountered is shown in Table 4.

TABLE 4

USDA Map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Pomona fine sand (2)	0.00 - 0.15	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jul-Sep	High	High
	0.15 - 0.56	A-3, A-2-4	SP, SP-SM, SM	0.0042 - 0.0141					
	0.56 - 0.91	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0014					
	0.91 - 1.32	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141					
	1.32 - 1.52	A-2-4, A-4, A-6	SC, SM-SC, SM	0.0001 - 0.0004					

Segment C Roadway

The Soil Survey at Pasco County indicates ten (10) primary mapping units within the vicinity of the existing roadway (see Sheet 4). The map soil units encountered are shown in Table 5. Mucky soils (map unit 60) are located near Station 284+00 and mucky fine sand (map unit 8) is located between Stations 308+00 and 319+00.

TABLE 5

USDA Map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Pomona fine sand (2)	0.00 - 0.15	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jul-Sep	High	High
	0.15 - 0.56	A-3, A-2-4	SP, SP-SM, SM	0.0042 - 0.0141					
	0.56 - 0.91	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0014					
	0.91 - 1.32	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141					
	1.32 - 1.52	A-2-4, A-4, A-6	SC, SM-SC, SM	0.0001 - 0.0004					
Tavares sand (6)	0.00 - 2.18	A-3	SP, SP-SM	>0.0141	1.1 - 1.8	Apparent	Jun-Dec	Low	High
Sparr fine sand (7)	0.00 - 0.15	A-3, A-2-4	SP-SM	0.0042 - 0.0141	0.5 - 1.1	Apparent	Jul-Oct	Moderate	High
	0.15 - 1.09	A-3, A-2-4	SP-SM	0.0042 - 0.0141					
	1.09 - 1.22	A-2	SM-SC, SC, SM	0.0004 - 0.0014					
	1.22 - 1.50	A-2, A-4, A-6	SC, SM-SC	0.0004 - 0.0014					
	1.50 - 2.03	A-2, A-4, A-6	SC, SM-SC, SC	0.0004 - 0.0014					

TABLE 5

USDA Map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Sellers mucky loamy fine sand (8)	0.00 - 0.23	A-3, A-2-4	SP-SM, SM	0.0042 - 0.141	+0.6 - 0.0	Apparent	Jun-Mar	High	High
	0.23 - 0.61	A-3, A-2-4	SP-SM, SM	0.0042 - 0.141					
	0.61 - 2.03	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
Smyrna fine sand (21)	0.00 - 0.33	A-3	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jul-Oct	High	High
	0.33 - 0.64	A-3, A-2-4	SM, SP-SM	0.0004 - 0.0042					
	0.64 - 2.03	A-3	SP, SP-SM	0.0042 - 0.0141					
Basinger fine sand (22)	0.00 - 0.25	A-3	SP	>0.0141	0.0 - 0.3	Apparent	Jun-Feb	High	Moderate
	0.25 - 0.48	A-3, A-2-4	SP, SP-SM	>0.0141					
	0.48 - 2.03	A-3, A-2-4	SP, SP-SM	>0.0141					
Chobee soils (39)	0.00 - 0.28	A-2-4	SP-SM, SM	0.0014 - 0.0042	0.0 - 0.3	Apparent	Jun-Feb	Moderate	Low
	0.28 - 1.42	A-2-6, A-2-7	SC	<0.0001					
	1.42 - 2.03	A-2-4, A-2-6, A-6, A-7	SP-SM, SM, SC, SM-SC	0.0001 - 0.0042					
Palmetto (Palmetto Zephyr Sellers Complex) (60)	0.00 - 0.25	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141	+0.6 - 0.3	Apparent	Jun-Feb	High	High
	0.25 - 1.17	A-3, A-2-4	SP-SM	0.0042 - 0.0141					
	1.17 - 2.03	A-2-4, A-2-6	SM, SM-SC, SC	0.0001 - 0.0004					
Zephyr (Palmetto Zephyr Sellers Complex) (60)	+0.33 - 0.00	A-8	Peat	0.0042 - 0.0141	+0.6 - 0.3	Apparent	Jun-Feb	High	High
	0.00 - 0.46	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
	0.46 - 1.22	A-2-4, A-2-6	SM, SM-SC, SC	0.0000 - 0.0001					
	1.22 - 1.70	A-2-4, A-4	SM, SM-SC	0.0004 - 0.0042					
Sellers (Palmetto Zephyr Sellers Complex) (60)	0.00 - 0.13	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141	+0.6 - 0.0	Apparent	Jun-Nov	High	High
	0.13 - 0.71	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
	0.71 - 2.03	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
Millhopper fine sand (69)	0.00 - 1.50	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141	1.1 - 1.8	Perched	Aug-Feb	Low	Moderate
	1.50 - 2.03	A-2-4, A-3, A-2-6	SM, SM-SC, SC	0.0004 - 0.0014					
Zolfo fine sand (73)	0.00 - 0.08	A-3, A-2-4	SP-SM	>0.0141	0.6 - 1.1	Apparent	Jun-Nov	Low	Moderate
	0.08 - 1.65	A-3, A-2-4	SP-SM, SM	>0.0141					
	1.65 - 2.03	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0014					

Segment C Structures

The Soil Survey of Pasco County indicates two (2) primary mapping units within the vicinity of the existing Overpass Road over I-75 bridge structure. The map units encountered are shown in Table 6.

TABLE 6

USDA map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Sparr fine sand (7)	0.00 - 0.15	A-3, A-2-4	SP-SM	0.0042 - 0.0141	0.5 - 1.1	Apparent	Jul-Oct	Moderate	High
	0.15 - 1.09	A-3, A-2-4	SP-SM	0.0042 - 0.0141					
	1.09 - 1.22	A-2	SM-SC, SC, SM	0.0004 - 0.0014					
	1.22 - 1.50	A-2, A-4, A-6	SC, SM-SC	0.0004 - 0.0014					
	1.50 - 2.03	A-2, A-4, A-6	SC, SM-SC, SC	0.0004 - 0.0014					
Zolfo fine sand (73)	0.00 - 0.08	A-3, A-2-4	SP-SM	>0.0141	0.6 - 1.1	Apparent	Jun-Nov	Low	Moderate
	0.08 - 1.65	A-3, A-2-4	SP-SM, SM	>0.0141					
	1.65 - 2.03	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0014					

Segment D Roadway

The Soil Survey of Pasco County indicates six (6) primary mapping units within the vicinity of the existing roadway (see Sheet 6). The map soil units encountered are shown in Table 7. Muck (map unit 16) is located between Stations 356+00 and 359+00, and Stations 377+00 and 378+00.

TABLE 7

USDA Map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Wauchula fine sand (1)	0.00 - 0.20	A-3, A-2-4	SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jun-Feb	High	High
	0.20 - 0.48	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
	0.48 - 0.66	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0042					
	0.66 - 0.86	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
	0.86 - 2.03	A-2-4, A-2-6, A-4, A-6	SM, SM-SC, SC	0.0004 - 0.0042					

TABLE 7

USDA Map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Pomona fine sand (2)	0.00 - 0.15	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jul-Sep	High	High
	0.15 - 0.56	A-3, A-2-4	SP, SP-SM, SM	0.0042 - 0.0141					
	0.56 - 0.91	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0014					
	0.91 - 1.32	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141					
	1.32 - 1.52	A-2-4, A-4, A-6	SC, SM-SC, SM	0.0001 - 0.0004					
Zephyr muck (16)	+0.33 - 0.00	A-8	Peat	0.0042 - 0.0141	+0.6 - 0.3	Apparent	Jun-Feb	High	High
	0.00 - 0.46	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
	0.46 - 1.22	A-2-4, A-2-6	SM, SM-SC, SC	0.0000 - 0.0001					
	1.22 - 1.70	A-2-4, A-4	SM, SM-SC, SC	0.0004 - 0.0042					
Eaugallie fine sand (35)	0.00 - 0.56	A-3	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jun-Oct	High	Moderate
	0.56 - 0.76	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0042					
	0.76 - 1.30	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141					
	1.30 - 2.03	A-2-4, A-2-6	SM, SM-SC, SC	0.0004 - 0.0042					
Nobleton fine sand (64)	0.00 - 0.74	A-2-4, A-3	SP-SM, SM	0.0042 - 0.0141	0.5 - 1.1	Perched	Jul-Oct	High	High
	0.74 - 0.91	A-2-6, A-6	SC	0.0001 - 0.0014					
	0.91 - 1.19	A-6, A-7	SC, CL, CH	0.0001 - 0.0004					
	1.19 - 2.03	A-2-6, A-6	SC	0.0001 - 0.0014					
Millhopper fine sand (69)	0.00 - 1.50	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141	1.1 - 1.8	Perched	Aug-Feb	Low	Moderate
	1.50 - 2.03	A-2-4, A-3, A-2-6	SM, SM-SC, SC	0.0004 - 0.0014					

Segment D Structures

The Soil Survey of Pasco County indicates one (1) primary mapping unit at each of the existing crossings over S.R. 52 and the abandoned railroad. Map unit 2 was encountered in the vicinity of S.R. 52 bridge and map unit 1 was encountered in the vicinity of the railroad bridge. The soil information associated with these map units are shown in Table 8.

TABLE 8

USDA Map Soil Name and Symbol	Classification				Seasonal High Water Table			Risk of Corrosion	
	Depth (m)	AASHTO Group	USCS Group	Permeability (cm/sec)	Depth (m)	Kind	Month	Uncoated Steel	Concrete
Wauchula fine sand (1)	0.00 - 0.20	A-3, A-2-4	SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jun-Feb	High	High
	0.20 - 0.48	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
	0.48 - 0.66	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0042					
	0.66 - 0.86	A-3, A-2-4	SP-SM, SM	0.0042 - 0.0141					
	0.86 - 2.03	A-2-4, A-2-6, A-4, A-6	SM, SM-SC, SC	0.0004 - 0.0042					
Pomona fine sand (2)	0.00 - 0.15	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141	0.0 - 0.3	Apparent	Jul-Sep	High	High
	0.15 - 0.56	A-3, A-2-4	SP, SP-SM, SM	0.0042 - 0.0141					
	0.56 - 0.91	A-3, A-2-4	SP-SM, SM	0.0004 - 0.0014					
	0.91 - 1.32	A-3, A-2-4	SP, SP-SM	0.0042 - 0.0141					
	1.32 - 1.52	A-2-4, A-4, A-6	SC, SM-SC, SM	0.0001 - 0.0004					

3.5 Potentiometric Surface Elevations

The map "Potentiometric Surface of the Upper Floridian Aquifer System, West-Central Florida", issued May 1996, published by the USGS, was reviewed for the potentiometric surface elevations of water in the limestone formation in the vicinity of the project I-75 roadway segments. The results are presented below:

Segment A

The average potentiometric surface elevation within this segment is approximately 15 meters NGVD while the natural ground surface elevations range from approximately 15 to 18 meters NGVD. As a result, the potential for artesian conditions within this segment is low.

Segment B

The average potentiometric surface elevation is approximately 18 meters NGVD while the natural ground surface elevations range from approximately 18 to 26 meters NGVD, with the exception of Cabbage Swamp with natural ground surface elevation of approximately 15 meters NGVD. However, at the northern end of the segment, the potentiometric surface is at elevation 21 meters NGVD while the natural ground is at an approximate elevation 26 meters NGVD. As a result, the potential for artesian condition within this segment is low.

Segment C

The average potentiometric surface elevations is approximately 21 meters NGVD while the natural ground surface elevations range from approximately 26 to 30 meters NGVD. As a result, the potential for artesian conditions within the segment is low.

Segment D

The average potentiometric surface elevation is approximately 21 meters NGVD while the natural ground elevations are in the range of approximately 27 to 30 meters NGVD. As a result, the potential for artesian condition within this segment is low.

3.6 Review of Past Projects

Segment A

FDOT construction drawings for I-75 over Cypress Creek dated December 1977 were reviewed. Based on the review, the soil conditions encountered at the Cypress Creek bridges are summarized in the table below.

DEPTH* (meters)	Standard Penetration Test (SPT) N-Value (blows for 0.3 meter penetration)	SOIL DESCRIPTION
0 - 5	3 - 27	Very loose to medium dense, clean to clayey fine sand
5 - 13	3 - 9	Soft to stiff, sandy clay and very loose to loose, clayey fine sand
>13	8 - 49	Limestone formation
* Below ground surface (approximate elevation of 14 meters NGVD).		

Segment B

For the bridges over S.R. 54, we reviewed Phase II geotechnical report for structures, I-75/S.R. 54 Interchange and S.R. 54 Improvements, issued by others, dated November 26, 1993. Based on the review, the soil conditions encountered at these structures are summarized below:

DEPTH* (meters)	Standard Penetration Test (SPT) N-Value (blows for 0.3 meter Penetration)	SOIL DESCRIPTION
0 - 12	3 - 44	Very loose to dense, clean to clayey sand
12 - 14	WH - 50/150 mm	Very soft to hard clay
>14	28 - 50/0 mm	Limestone formation
* Below ground surface (approximate elevation of 17 meters NGVD).		

Segment C

No previous project in the vicinity of this I-75 segment, from approximately Station 273+18 to 321+72, was available for our review.

Segment D

No previous project in the vicinity of this I-75 segment, from approximately Station 321+72 to 390+00, was available for our review.

4.0 PRELIMINARY EVALUATION OF ROADWAY AREAS (SEGMENTS A THROUGH D)

4.1 Soil Usage Summary

The project alignment, based on our review of published information and past projects reports, generally consists of suitable near-surface sandy soils with a few areas consisting of near-surface mucky soils.

The existing subsurface soils should be acceptable for construction to support a typical embankment pavement section after proper subgrade preparation. Unsuitable soils, muck, or debris, if encountered within the right-of-way during construction, should be removed and replaced with compacted fine sands.

SEGMENT	USDA MAP SOIL NAME AND SYMBOL	APPROXIMATE LOCATION (BASELINE SURVEY)
A	Mucky Fine Sand (map unit 63)	193+55 - 196+00
B	Mucky Fine Sand (map unit 8)	249+00 258+00 - 261+00
C	Mucky Soils (map unit 60)	284+00
	Mucky Fine Sand (map unit 8)	308+00 - 319+00
D	Muck (map unit 16)	356+00 - 359+00 377+00 - 378+00

Material use and/or removal should be completed in accordance with FDOT Index Nos. 500 and 505. Materials directly beneath the base should be "SELECT" materials.

The removal of topsoil and other shallow surficial organic soil deposits should be accomplished in accordance with FDOT Standard Specifications for Road and Bridge Construction, Section 110. Organic soils are highly compressible and may cause excessive settlements if left in-place. This material is also susceptible to significant secondary compression settlements.

Backfill should consist of materials conforming with Standard Index No. 505 and compacted in accordance with the Standard Specifications for Road and Bridge Construction.

4.1.1 Earth Embankments

In general, the majority of the fine sands to slightly silty fine sands can be moved and used for grading purposes, site levelling, general engineering fill, structural fill and backfill in other areas, provided the fill is free of organic materials, clay, debris or any other material deemed unsuitable for construction. Clayey or silty soils may be used as embankment soils as described in FDOT Index 505.

4.1.2 Pavement Design Considerations

The design Limerock Bearing Ratio (LBR) value for pavements constructed on structure fill should be based on the earthfill material. Although the sources of the earthfill, the "borrow areas", have not yet been defined, we expect sources local to the proposed roadway alignment will be favorable. We recommend a preliminary LBR value of 18% for soil support for the purpose of the PD&E study.

Based on published information for the project areas, groundwater levels along the corridor generally vary from +0.6 meters to greater than 1.8 meters below the natural ground surface. The bottom of the base of the proposed widening areas should be a minimum of 0.9 meters above sustained water levels in roadside ditches, making positive drainage of the ditches important. The roadway grades will need to be designed so as to incorporate the minimum base separation for all the widening areas. The choice of base material would depend upon the relationship of final roadway improvement grades and the bottom of the base to the estimated seasonal high groundwater table levels. Soil cement or coquina shell base materials are more resistant to wet conditions than limerock and the separation can be somewhat reduced. Crushed

concrete is also less sensitive to moisture than limerock, but should be treated in the same fashion.

4.2 Roadway Construction

Site preparation and roadway construction should be in accordance with the latest FDOT Standard Specifications for Road and Bridge Construction and Roadway and Traffic Design Standards.

5.0 PRELIMINARY EVALUATION OF BRIDGE STRUCTURE AREAS (SEGMENTS A THROUGH D)

5.1 Feasibility of Foundation Alternatives

5.1.1 General

The feasibility of typical foundation alternatives for the future widening of the project bridge structures are discussed below. Based on our review of published information and previous geotechnical reports in the project area, the project soil conditions do not appear to pose any extraordinary concerns related to the design and construction of the various alternatives. However, specific geotechnical investigations at the project bridge structures and cost analyses will better define suitable foundation alternatives.

5.1.2 Scour Depths

For the Cypress Creek Crossings in I-75 segment A, anticipated scour depths have not been developed during this PD&E Study. However, scour should be considered when assessing the total pile capacity and lateral deflection for the widening of the bridges over Cypress Creek.

5.1.3 Shallow Foundations

Where appropriate, the use of shallow foundations is typically the most cost effective for the project bridge structures. With this foundation system, the structure loads are transmitted to the subsoil at a pressure suited for the properties of the soil. These properties are typically governed by the allowable soil pressure and the total and differential settlement criteria. The loose/soft surficial soils throughout the project site will most likely require densification to achieve an adequate bearing capacity. This densification may require excavation with sheet piling, dewatering and densification techniques which will impact the economy of this foundation system tremendously. Maintenance of traffic impacts, prolonged construction timing and staging requirements for construction adjacent to existing traffic usually interfere with the efficiencies of this densification process. These impacts also apply between future and existing construction in areas where proposed or future widening of the facility is anticipated. Based on these difficulties and resultant high costs, we recommend shallow foundations not be considered for widening of the project bridge structures.

5.1.4 Deep Foundations

Based on our review of FDOT construction drawings dated December 1977, the northbound I-75 over Cypress Creek bridge in Segment A was widened from 2 to 4 lanes and the southbound widened from 2 to 3 lanes. The original and widened areas of these bridges are being supported by 455 mm square prestressed concrete (PSC) pilings. Based on our review of FDOT construction drawings dated October 1962 for the I-75 over S.R. 54 bridges (Segment B), the intermediate bridge bents consist of piers supported on 355 mm square PSC pilings and the end bents consist of 455 mm square PSC pilings.

Based on our extensive experience on similar projects and the available existing bridge foundation information, it is our opinion that deep foundations are most appropriate for the proposed structures. The following foundation types are considered to be reasonable alternatives:

- Square precast prestressed concrete piles
- Steel piles
- Drilled shafts

5.4.4.1 Precast Prestressed Concrete Piles

Square precast prestressed concrete piles are considered an appropriate foundation type. They are the most common bridge foundation type in Florida and prior experience has generally shown them to be an economical foundation type. Typical pile sizes are 455 mm and 610 mm square prestressed concrete (PSC) piles.

5.4.4.2 Steel Piles

Steel piles are a foundation alternative, however, previous experience has shown that they are usually more expensive than precast prestressed concrete piles. Steel piles include pipe piles and H-sections. Steel piles are well suited to conditions with high variability of the anticipated penetration depth where frequent splicing is expected. In some instances, steel piles will also more easily penetrate dense layers if necessary to achieve a desired penetration. It is apparent in comparison with precast prestressed square concrete piles that the steel piles do not develop as much capacity for similar penetration depths, and rough cost data indicate that the steel pipe piles are as expensive as the 455 mm (18 inches) SPC piles. Steel H-sections are not addressed further because they have even lower capacities than the pipe piles for similar or greater costs.

5.4.4.3 Drilled Shafts

Drilled cast-in-place straight sided concrete shafts are a feasible foundation alternative for the project. Drilled shafts have the advantage of being able to develop high axial and lateral capacities in a single unit. A disadvantage of drilled shaft foundations include a high dependency on construction procedures and quality control. This type of foundation system is often the selected foundation alternative for sites where limestone or very dense bearing strata are present at a relatively shallow depth. In addition, drilled shafts typically generate lower construction-induced vibrations than for driven piles. Typical drilled shaft sizes are 910mm, 1065mm and 1220mm in diameter.

6.0 PRELIMINARY CONSTRUCTION CONSIDERATIONS (SEGMENTS A THROUGH D

6.1 General Construction Recommendations

Site preparation and construction should be in accordance with the latest FDOT Standard Specifications for Road and Bridge Construction and Roadway and the Traffic Design Standards.

Groundwater levels at the bridge sites generally vary from 0.6 meters above ground surface to greater than 1.8 meters below the existing ground surface. Depending upon groundwater levels at the time of construction, some form of dewatering could be required in some areas.

6.2 Construction Slopes

Excavation slopes for the bridge and slope construction should conform to OSHA, State of Florida and any other local regulations. Dewatering using a well-point system is very difficult in clayey soils. The contractor should also asses equipment loads and vibrations when considering slopes or excavation bracing.

6.3 Groundwater Control

Depending upon groundwater levels at the time of construction, some form of dewatering may be required for excavations and/or to achieve the required compaction. Groundwater can normally be controlled in shallow excavations with a sump pump. During subgrade soil preparation, any plastic soils below design grade could become disturbed by construction activities. If any plastic soils are encountered within any excavations performed for the bridge structures the contractor may be directed by the Department's representative to remove the disturbed or pumping soils to a depth of 0.3 to 0.45 meters below design grade and backfill the area with structural fill in accordance with the latest FDOT Standard Specifications for Roads and Bridge Construction.

Surface water and groundwater control will be necessary during construction to permit establishment of a stable sand bottom. A section of the construction area could be dammed off, and water diverted through a temporary ditch or pumped around construction activities. If a pump is used, a standby pump is recommended.

Depending upon shallow groundwater levels at the time of construction, seepage may enter from the bottom and sides of excavated areas. Such seepage will act to loosen soils, and create difficult working conditions. Therefore, it may be necessary to wellpoint or sump pump and rim ditch excavation areas. Groundwater levels should be at least 0.6 meters (24 inches) below the lowest working area to facilitate proper material placement and compaction.

7.0 SINKHOLE/GROUND SUBSIDENCE EVALUATION (SEGMENTS A THROUGH D)

PSI completed a preliminary sinkhole/ground subsidence evaluation which consisted of field reconnaissance of the proposed roadway alignment and study of available published data and field investigation information. Prior to the site visit, the available published data including topographic, soils and geological data was reviewed. In addition, project specific aerial topographic photographs were reviewed as well as past reports prepared by PSI for projects in the vicinity.

Circular depressional areas were indicated at a few locations in the vicinity of the existing I-75 roadway alignment. Specifically, depressional areas were noted at Station 305+50 (Segment C), Station 322+50 (Segment D) and Station 381+00 (Segment D). It is highly probable that the circular depressional areas observed are due to past sinkhole activity. The depressional areas do not appear to be recent or active sinkholes. Based on the surficial conditions such as the presence of old growth trees and gently sloping perimeters, it is probable that these depressions have not occurred in the recent past. Continued raveling due to sinkhole activity would result, based on our knowledge and experience, with steep slopes leading into the deeper center of the depression and probably reduce the possibility for growth of grasses and large cypress trees which generally exist in the depressions.

Based on our knowledge of the geology of the area and the sinkhole processes, the published subsurface data for the project areas, the soil borings performed for other studies in the vicinity

of the project areas and our experience with similar conditions, it is our preliminary opinion that the project areas have a low to moderate chance of sinkhole activity. However, to better evaluate the sinkhole activity, a more detailed subsurface exploration program including Standard Penetration Test (SPT) borings will be necessary for the project. Also, it should be noted that many factors may affect the potential of sinkhole activity, including area geology, confinement of surface waters, well installation and drawdown, fluctuations in the potentiometric levels of the limestone aquifer, and environmental conditions, particularly intense rainfall.

8.0 REPORT LIMITATIONS

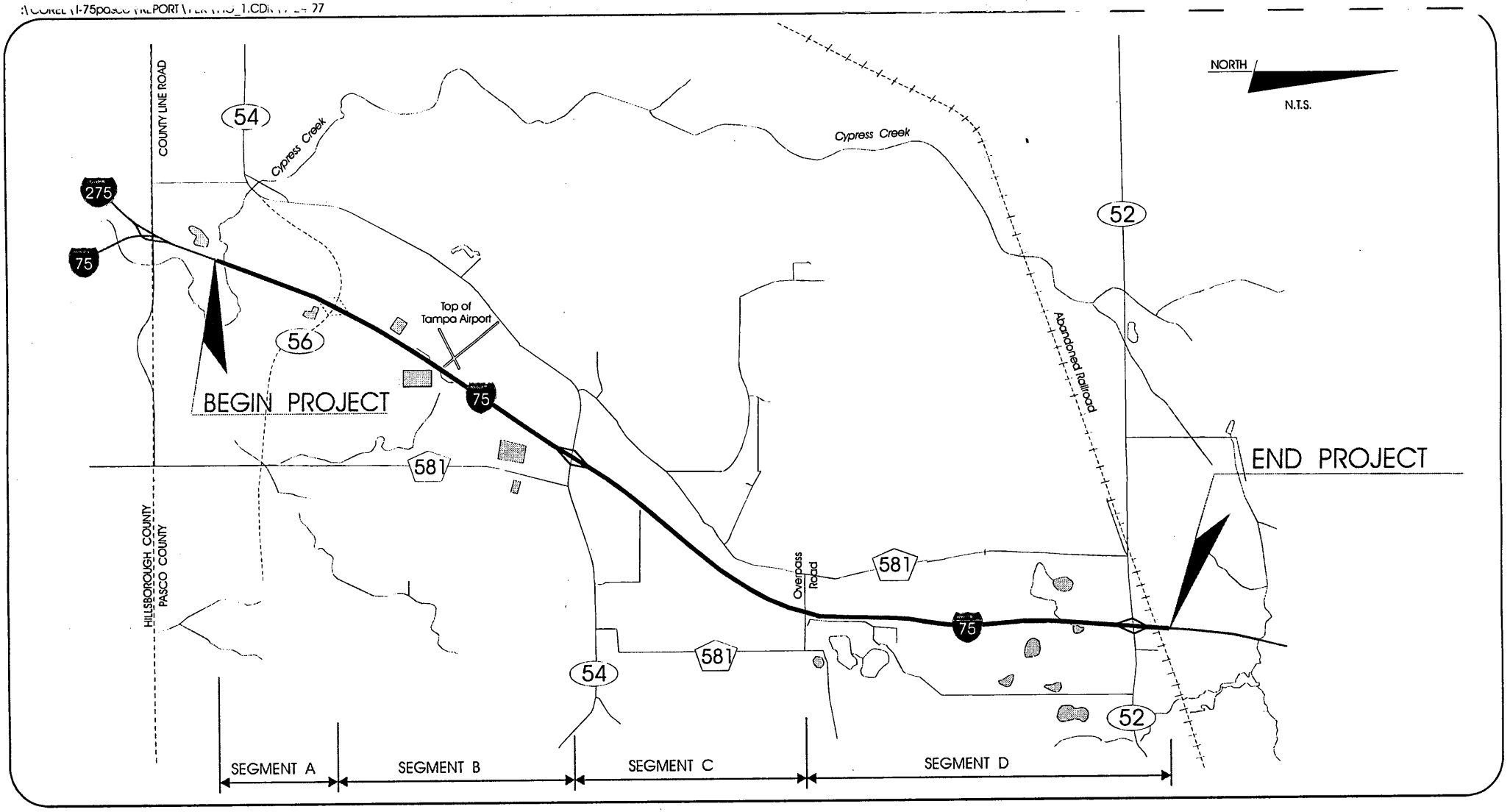
The professional services have been performed, the findings obtained, and the recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. We are not responsible for the conclusions, opinions or recommendations made by others based on this data.

The preliminary recommendations submitted in this report are based upon the anticipated location and type of construction, the subsurface data obtained from published information, and the data obtained from the soil borings performed for other studies in the vicinity of the project areas. If any variations become evident during the course of construction, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered.

The scope of our services does not include any field or laboratory testing or any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report are intended only as a guide for assessing the feasibility of the proposed project improvements.

APPENDIX

FIGURE 1



LEGEND

- Project Limits
- River / Water
- Railroad
- (54) State Road Numbers
- (581) County Road Numbers
- Proposed Roadway

FLORIDA DEPARTMENT OF TRANSPORTATION

I-75 (S.R. 93)
PD&E STUDY
From South of S.R. 56 to North of S.R. 52
Pasco County, Florida

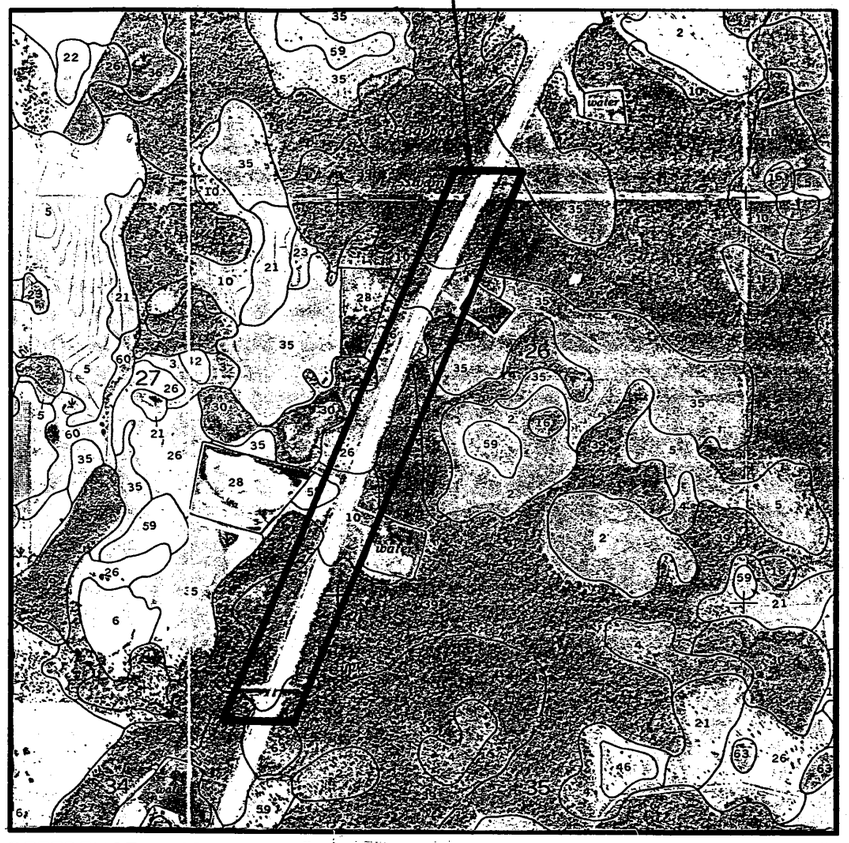
PROJECT LOCATION MAP

SPN #: 14140-1423
WPI #: 7147619
FAP#: NH-75-1(91)275

FIGURE 1

SHEETS 1-7

APPROXIMATE SITE LOCATION

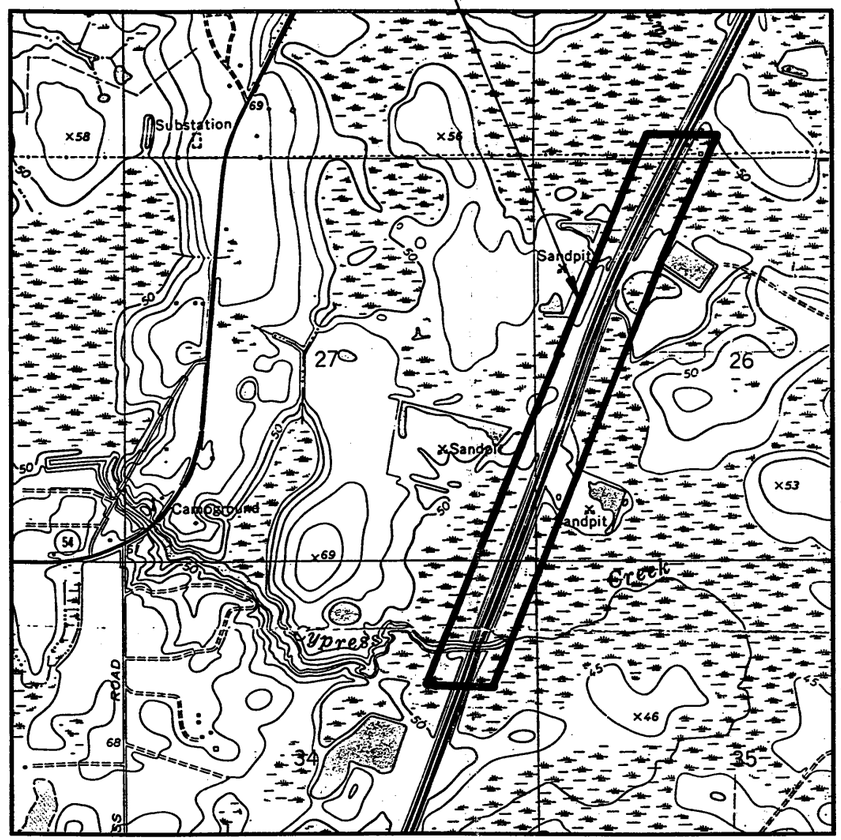


REFERENCE: USDA SCS, "SOIL SURVEY OF PASCO COUNTY, FLORIDA"

TOWNSHIP:	26 SOUTH	ISSUED:	1982
RANGE:	19 EAST	PHOTO:	1975
SECTION:	23,26,27 AND 34	SCALE:	1 : 24,000

USDA VICINITY MAP

APPROXIMATE SITE LOCATION



REFERENCE: USGS "LUTZ, FLORIDA" QUADRANGLE MAP

TOWNSHIP:	26 SOUTH	ISSUED:	1974
RANGE:	19 EAST	PHOTOREVISED:	–
SECTION:	23,26,27 AND 34	SCALE:	1 : 24,000

USGS VICINITY MAP

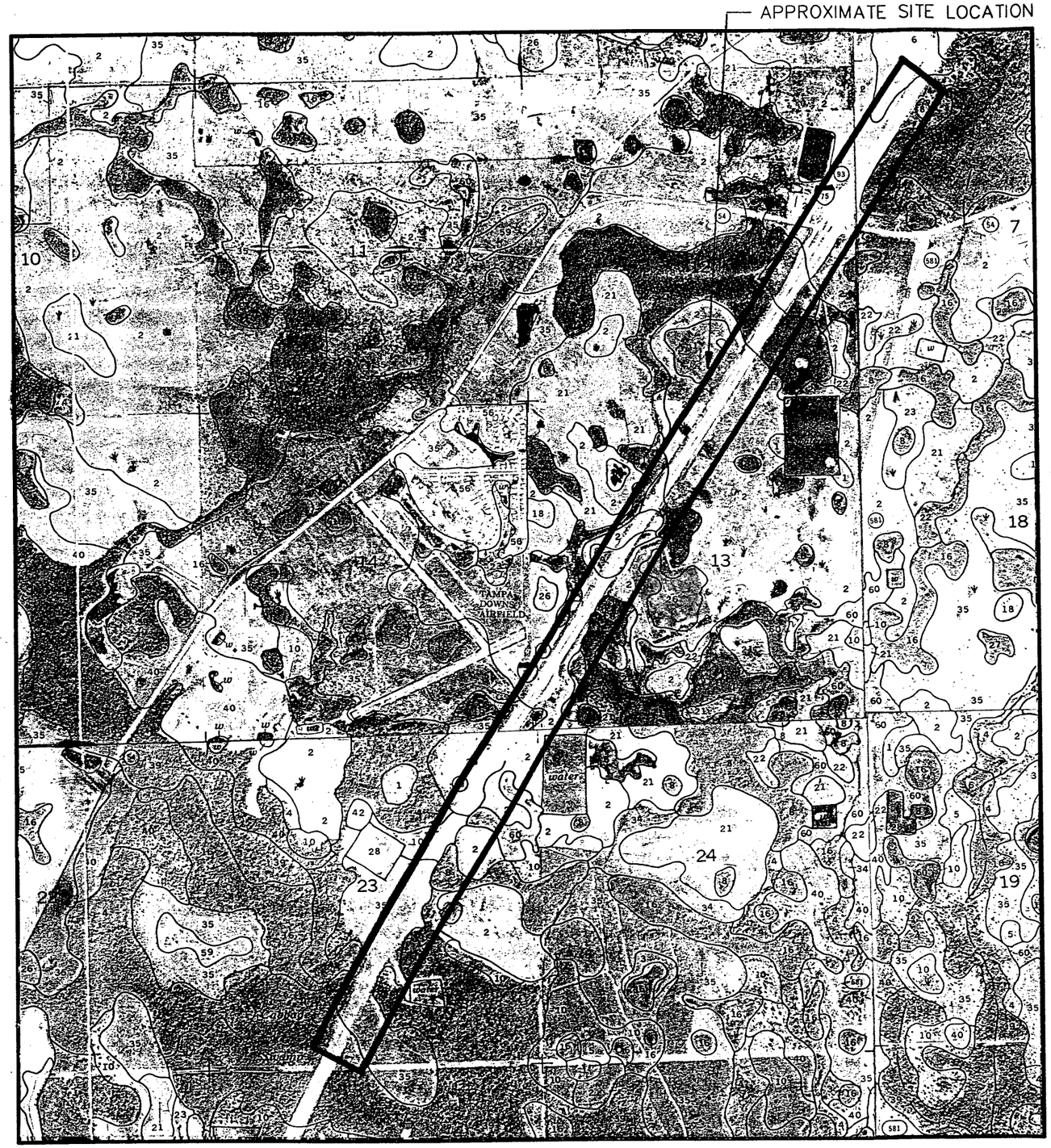
SEGMENT A

DRAWN	KM
CHECKED	SBJ
APPROVED	CLK
SCALE	NOTED

USDA & USGS VICINITY MAPS
PD & E STUDY I-75 (S.R. 93) FROM SOUTH OF S.R. 56 TO NORTH OF S.R. 52
PASCO COUNTY, FLORIDA

psi ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION

DATE	PROJ. NO.	SHEET
JULY 97	775-65241	SHEET 1



REFERENCE: USDA SCS, "SOIL SURVEY OF PASCO COUNTY, FLORIDA"

TOWNSHIP:	26 SOUTH	26 SOUTH	ISSUED: 1982
RANGE:	19 EAST	20 EAST	PHOTO: 1975
SECTION:	12,13,14 & 23	7	SCALE: 1 : 24,000

USDA VICINITY MAP

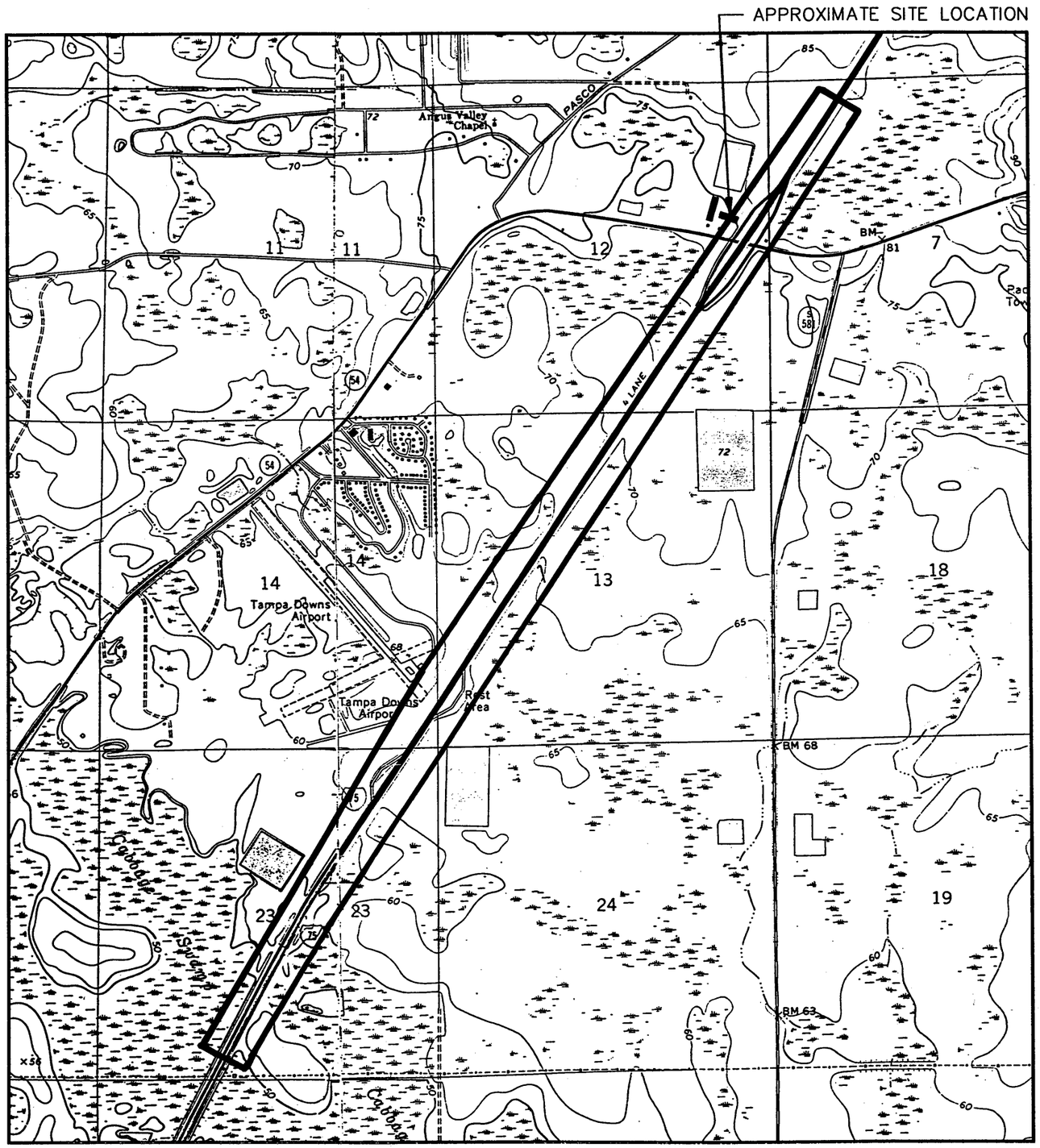
SEGMENT B

DRAWN	KM
CHECKED	SBJ
APPROVED	CLK
SCALE	NOTED

USDA VICINITY MAP
PD & E STUDY I-75 (S.R. 93) FROM SOUTH OF S.R. 56 TO NORTH OF S.R. 52
PASCO COUNTY, FLORIDA

psi ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION

DATE	PROJ. NO.	SHEET
JULY 97	775-65241	SHEET 2



REFERENCE: USGS "LUTZ, FLORIDA" QUADRANGLE MAP
TOWNSHIP: 26 SOUTH — ISSUED: 1974
RANGE: 19 EAST — PHOTOREVISED: –
SECTION: 23 — SCALE: 1 : 24,000

REFERENCE: USGS "WESLEY CHAPEL, FLORIDA" QUADRANGLE MAP

TOWNSHIP:	26 SOUTH	26 SOUTH	ISSUED: 1973
RANGE:	19 EAST	20 EAST	PHOTOREVISED: –
SECTION:	12,13,14 & 23	7	SCALE: 1 : 24,000

USGS VICINITY MAP

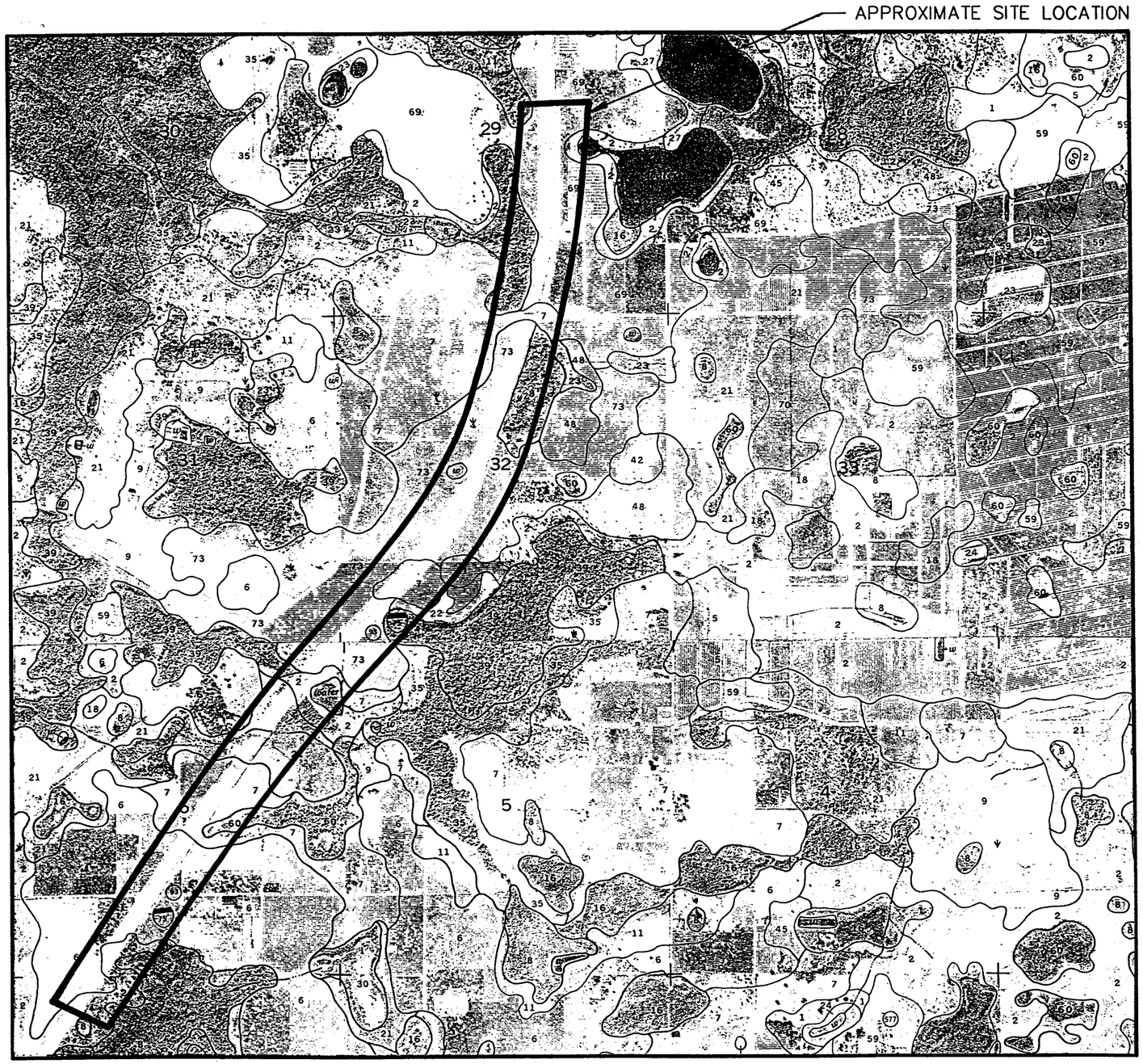
SEGMENT B

DRAWN	KM
CHECKED	SBJ
APPROVED	CLK
SCALE	NOTED

USGS VICINITY MAP
PD & E STUDY I-75 (S.R. 93) FROM SOUTH OF S.R. 56 TO NORTH OF S.R. 52
PASCO COUNTY, FLORIDA

psi ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION

DATE	PROJ. NO.	SHEET
JULY 97	775-65241	SHEET 3



REFERENCE: USDA SCS, "SOIL SURVEY OF PASCO COUNTY, FLORIDA"

TOWNSHIP:	25 SOUTH	26 SOUTH	ISSUED:	1982
RANGE:	20 EAST	20 EAST	PHOTO:	1975
SECTION:	29,31 & 32	5,6 & 7	SCALE:	1 : 24,000

USDA VICINITY MAP

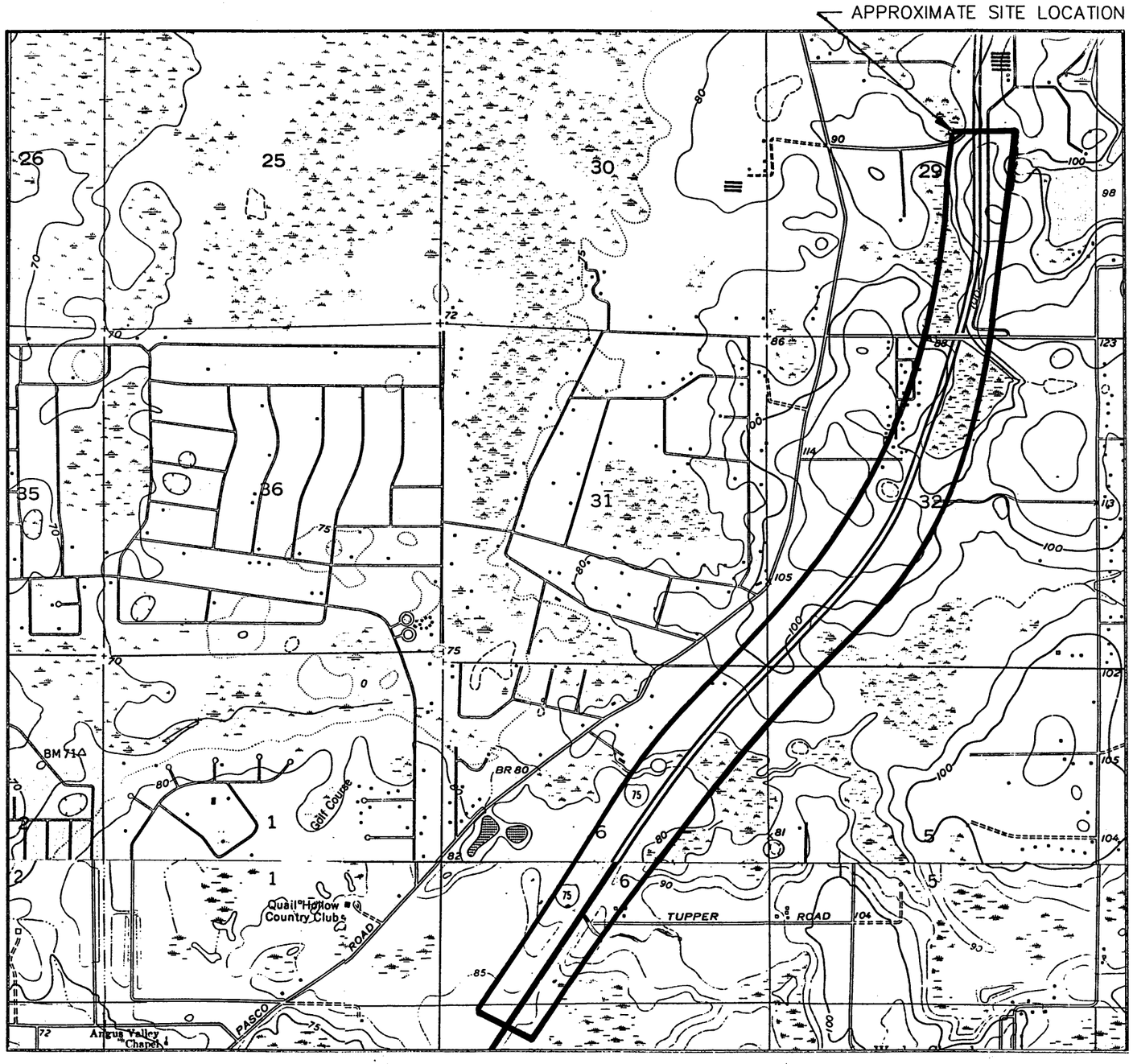
SEGMENT C

DRAWN	KM
CHECKED	SBJ
APPROVED	CLK
SCALE	NOTED

USDA VICINITY MAP
PD & E STUDY I-75 (S.R. 93) FROM SOUTH OF S.R. 56 TO NORTH OF S.R. 52
WESLEY CHAPEL, FLORIDA

psi ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION

DATE	PROJ. NO.	SHEET
JULY 97	775-65241	SHEET 4



REFERENCE: USGS "WESLEY CHAPEL, FLORIDA" QUADRANGLE MAP

TOWNSHIP:	26 SOUTH	ISSUED:	1973
RANGE:	20 EAST	PHOTOREVISED:	–
SECTION:	5,6, & 7	SCALE:	1 : 24,000

REFERENCE: USGS "SAN ANTONIO, FLORIDA" QUADRANGLE MAP

TOWNSHIP:	25 SOUTH	26 SOUTH	ISSUED:	1954
RANGE:	20 EAST	20 EAST	PHOTOREVISED:	1988
SECTION:	29,31 & 32	5 & 6	SCALE:	1 : 24,000

USGS VICINITY MAP

N

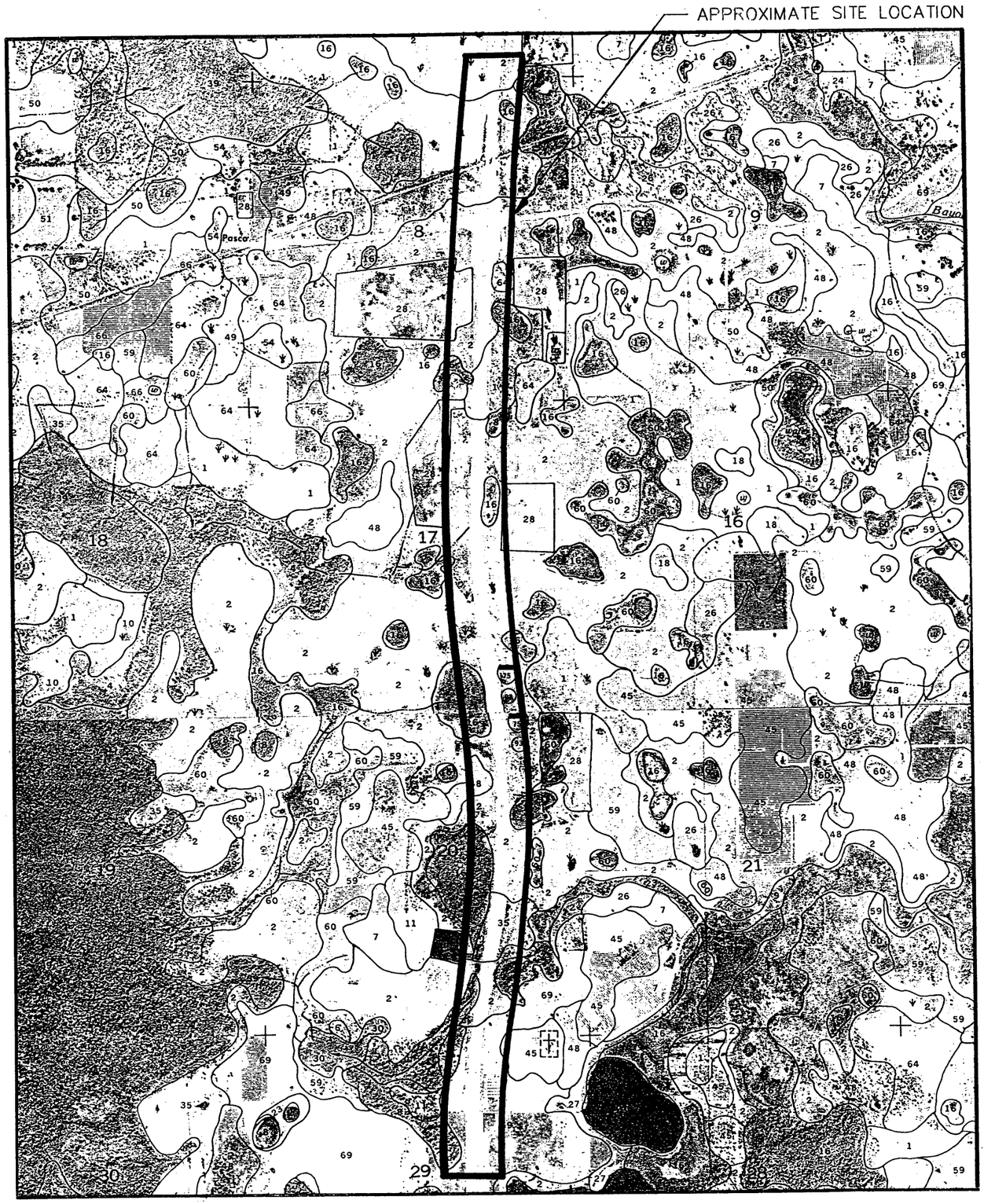
SEGMENT C

DRAWN	KM
CHECKED	SBJ
APPROVED	CLK
SCALE	NOTED

USGS VICINITY MAP
PD & E STUDY I-75 (S.R. 93) FROM SOUTH OF S.R. 56 TO NORTH OF S.R. 52
WESLEY CHAPEL, FLORIDA

psi ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION

DATE	PROJ. NO.	SHEET
JULY 97	775-65241	SHEET 5



REFERENCE: USDA SCS, "SOIL SURVEY OF PASCO COUNTY, FLORIDA"
TOWNSHIP: 25 SOUTH
RANGE: 20 EAST
SECTION: 5,8,17,20 & 29
ISSUED: 1982
PHOTO: 1975
SCALE: 1 : 24,000

USDA VICINITY MAP

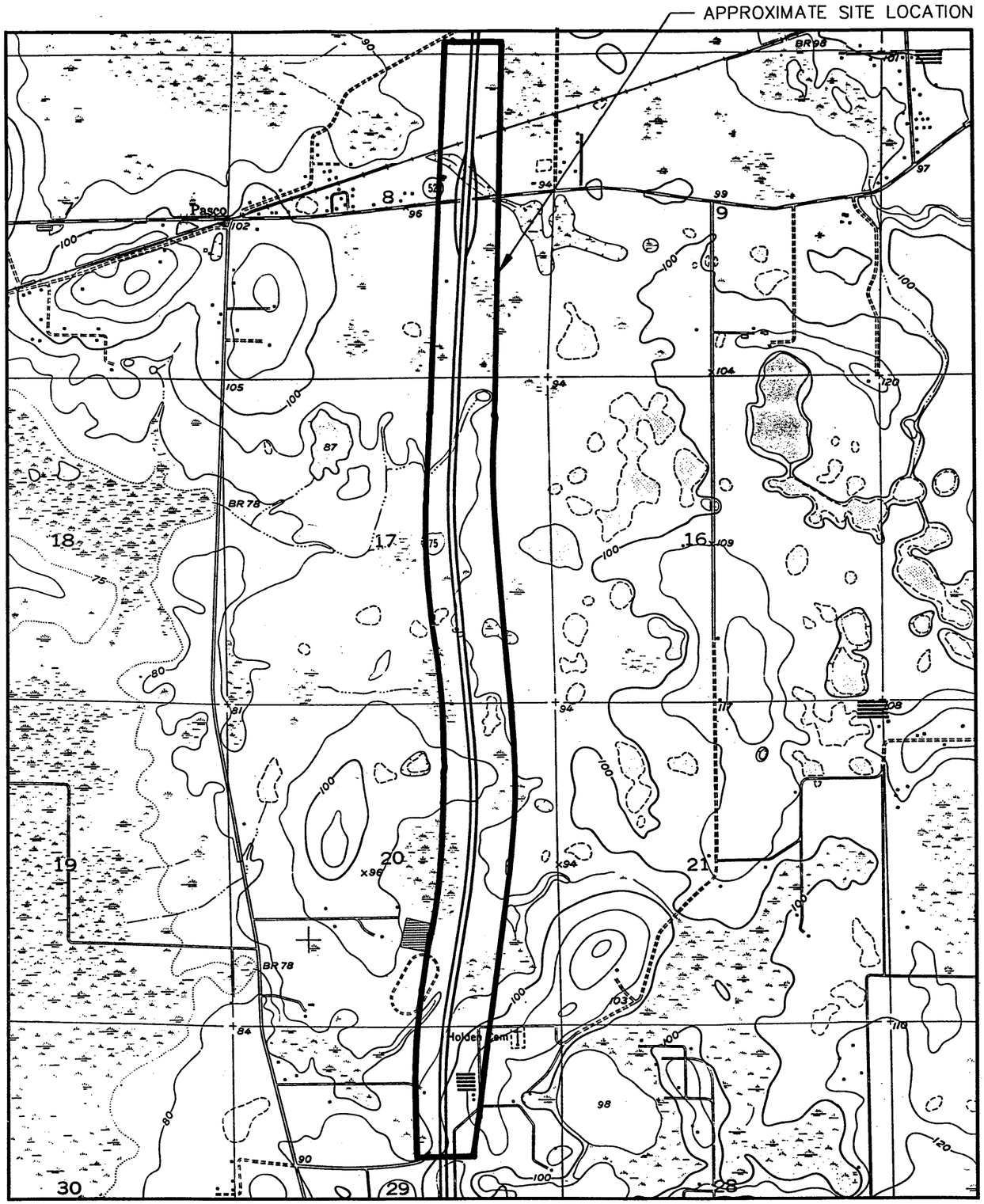
SEGMENT D

DRAWN	KM
CHECKED	SBJ
APPROVED	CLK
SCALE	NOTED

USDA VICINITY MAP
PD & E STUDY I-75 (S.R. 93) FROM SOUTH OF S.R. 56 TO NORTH OF S.R. 52
WESLEY CHAPEL, FLORIDA

[psi] ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION

DATE	PROJ. NO.	SHEET
JULY 97	775-65241	SHEET 6



REFERENCE: USGS "SAN ANTONIO, FLORIDA" QUADRANGLE MAP

TOWNSHIP:	25 SOUTH	ISSUED:	1954
RANGE:	20 EAST	PHOTOREVISED:	1988
SECTION:	5,8,17,20 & 29	SCALE:	1 : 24,000

USGS VICINITY MAP

SEGMENT D

DRAWN	KM
CHECKED	SBJ
APPROVED	CLK
SCALE	NOTED

USGS VICINITY MAP
PD & E STUDY I-75 (S.R. 93) FROM SOUTH OF S.R. 56 TO NORTH OF S.R. 52
WESLEY CHAPEL, FLORIDA

psi ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION

DATE	PROJ. NO.	SHEET
JULY 97	775-65241	SHEET 7