

GEOTECHNICAL TECHNICAL MEMORANDUM

Florida Department of Transportation

District One

North Sarasota Multimodal Connector PD&E Study

Sarasota, Florida

Financial Management Number: 442034-1

ETDM Number: 14348

Date: June 2020

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 May 26, 2022 and executed by FHWA and FDOT.

Geotechnical Technical Memorandum

Lakewood Ranch Boulevard Overpass Over I-75 to Cattlemen Road

Sarasota County, Florida

FPID No. 442034-1-21-01

ETDM No. 14348

Project Development and Environment Study

**Sarasota County
Public Works**

June 2020

June 12, 2020

Kisinger Campo & Associates, Corp.
201 North Franklin Street, Suite 400
Tampa, FL 33602

Attn: Ms. Nicole Selly

**RE: Geotechnical Technical Memorandum
Project Development and Environment (PD&E) Soil Survey Study
Lakewood Ranch Boulevard Overpass over I-75 to Cattlemen Road
Sarasota County, Florida
FPID No. 442034-1-21-01
Tierra Project No. 6511-19-154**

Ms. Selly:

Tierra, Inc. (Tierra) has completed Geotechnical Engineering Services for the referenced project. The results of the study are enclosed herein.

Tierra appreciates the opportunity to provide our services to Kisinger Campo & Associates, Corp. (KCA) and Sarasota County on this project. If you have any questions regarding this report, please contact us at (813) 989-1354.

Respectfully Submitted,

TIERRA, INC.



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USDA Soil Survey and USGS Quadrangle Maps (1 Sheet)

1.0 PROJECT SUMMARY

1.1 Project Description

Sarasota County, in coordination with the Florida Department of Transportation (FDOT), is conducting a Project Development and Environment (PD&E) study to evaluate the proposed North Sarasota Multimodal Connector, a new east-west four-lane roadway and overpass crossing SR 93 (I-75) between the Fruitville Road interchange and the University Parkway interchange in Sarasota County. The new east-west overpass will require improvements along N. Cattlemen Road to accommodate a new intersection. Improvements along N. Cattlemen Road will maintain the existing four-lane divided typical section.

The project is in the Lakewood Ranch area of north Sarasota County. Lakewood Ranch is a 30,000-acre mixed-used master planned development in Sarasota County. The project is within Sections 12 and 13 of Township 36 South Range 18 East and Section 7 of Township 36 South Range 19 East. The project limits cover approximately 0.6 miles. The proposed overpass crosses Interstate-75 (I-75). The project study area and project limits are shown in Figure 1-1.

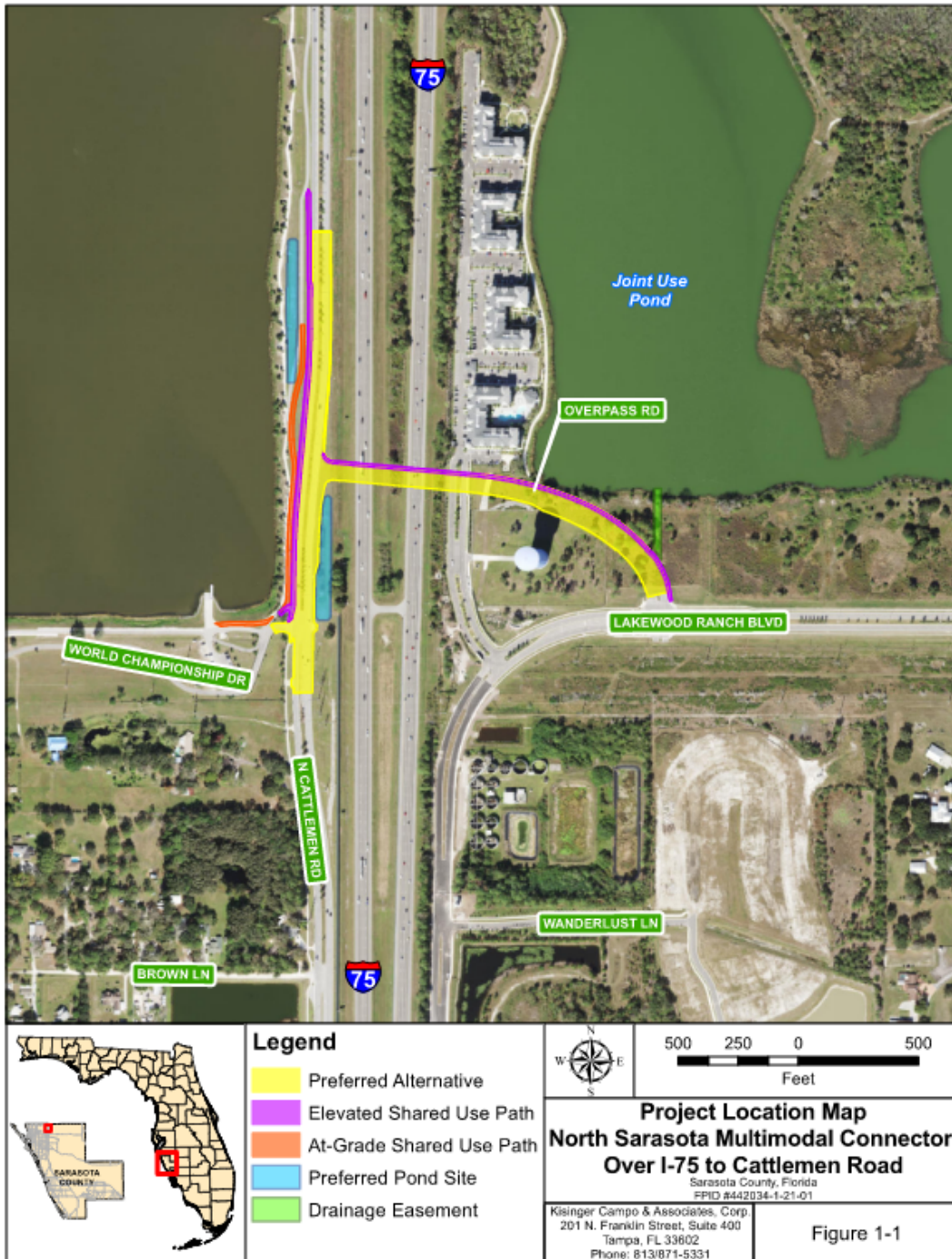
The project was evaluated through FDOT's Efficient Transportation Decision Making (ETDM) process as project #14348. An ETDM Programming Screen Summary Report containing comments from the Environmental Technical Advisory Team (ETAT) was published on November 9, 2018. The ETAT evaluated the project's effects on various natural, physical, and social resources. Other components of the PD&E study include a Preliminary Engineering Report (PER), concept plans, environmental studies, a public involvement program and other information for use in the development of this project.

Upon completion, the study will meet all requirements of the National Environmental Policy Act of 1969 (NEPA) as administered by the Federal Highway Administration (FHWA) and the requirements of other federal and state laws so as to qualify the proposed project for federal-aid funding.

1.2 Project Purpose & Need

The purpose of the project is to enhance access to destinations east and west of I-75 and to provide relief of traffic congestion on both Fruitville Road and University Parkway partly attributed to increased traffic demand from existing and planned development in the Lakewood Ranch area. The need for the project is supported by the following criteria.

Figure 1-1: Preferred Alternative Proposed Alignment



1.2.1 Improve Transportation Network Connectivity

Currently there is no efficient access to employment centers and commercial activity in the Lakewood Ranch area and other destinations east and west of I-75 within the vicinity of the project area. Under existing conditions, travelers have access to Lakewood Ranch area and other destinations east and west of I-75 via Fruitville Road and University parkway which are congested, and travelers experience long delays. Traffic analysis documented in the Traffic Technical Memorandum: *I-75 Overpass Transportation Impact Assessment (prepared in Feb. 2016; revised in Sept. 2016)* suggests that creating a link that connects destinations east and west of I-75 and Lakewood Ranch area would relieve existing and future congestions on Fruitville Road and University Parkway and hence improve accessibility for travelers.

1.2.2 Improve Operational Conditions

Existing and planned developments in the Lakewood Ranch area has increased the travel demand to use Fruitville Road and University Parkway and their interchanges with I-75. According to the traffic analysis summarized in the *Traffic Technical Memorandum: I-75 Overpass Transportation Impact Assessment (prepared in Feb. 2016; revised in Sept. 2016)*, the roadway segments west of the Fruitville Road and University Parkway interchanges with I-75 are currently operating at an unacceptable level of service (LOS) E and are projected to continue to deteriorate in the future.

1.2.3 Improve Safety Conditions

According to crash data obtained from Sarasota County, 278 total crashes, including one fatality, occurred along Fruitville Road from Cattlemen Road to Lakewood Ranch Boulevard between 2016 and 2020. Rear-end and sideswipe crashes were the most frequent crash types along Fruitville Road at 62.59% and 16.55%, respectively. The Actual Crash Rate “ACR” was calculated based on the AADT values of the years 2016 to 2020 and was found to be 3.602 crashes per million vehicles miles driven higher than the 3.144 statewide average for an urban six lane two-way divided roadway. Almost all the crashes (81.7%) occurred at the intersection of Cattlemen Road with traffic congestion being the leading factor. With a large majority of rear-end crashes, it is concluded traffic congestion and the signal timing at Cattlemen Road are the main issue along Fruitville Road.

1.3 Existing Facility

The North Sarasota Multimodal Connector is a new roadway. Within the study area, I-75 consists of eight lanes with a posted speed of 70 miles per hour (mph). The nearest existing east-west roadways crossing I-75 are Fruitville Road (to the south) and University Parkway (to the north). These existing parallel roadways are separated by approximately 3.5 miles and are the only existing roadways accommodating east-west travel across the I-75 limited access right-of-way within the project area.

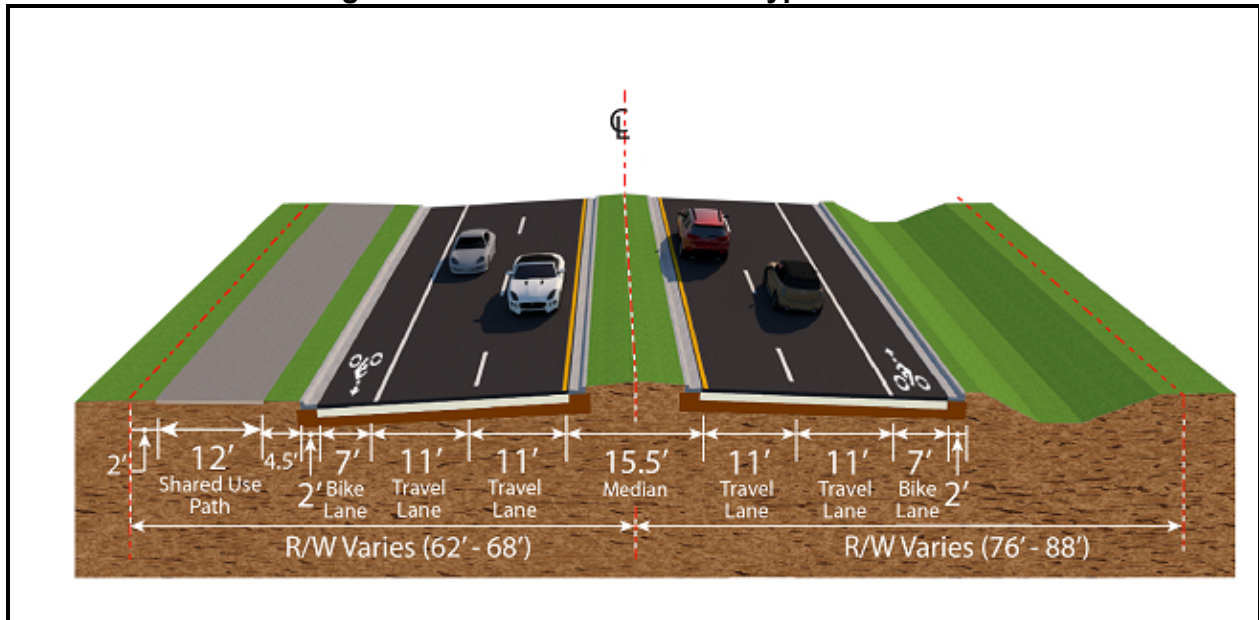
1.4 Proposed Action

The proposed action is to construct a new four-lane roadway and overpass with two eastbound and two westbound lanes over I-75 (Overpass Road) connecting Lakewood Ranch Boulevard to Cattlemen Road.

1.4.1 Four-lane Typical Section

The Overpass Road section is comprised of four 11-foot travel lanes, two in each direction, two seven-foot bicycle lanes, one in each direction, and a 12-foot shared use path on the north side of the roadway. The proposed roadway is divided by a 15.5-foot grassed median (**Figure 1-2**). The design speed is 40 mph. The total right-of-way width required to accommodate the proposed overpass along this segment varies from 138 feet to 156 feet.

Figure 1-2: Four-lane At-Grade Typical Section



1.4.2 Four-lane Elevated Typical Section

The North Sarasota Multimodal Connector includes two separate typical sections for the segments of the roadway near the proposed overpass where the vertical alignment separates from natural ground.

The first elevated typical section is for the section along the Overpass Road and includes four 11-foot travel lanes, two in each direction, two seven-foot bicycle lanes, one in each direction, and a 12-foot shared use path on the north side of the roadway. The proposed roadway will be divided by a grassed median varying from seven feet to 15.5 feet in width to transition the roadway to match the proposed bridge typical section (**Figure 1-3**). The design speed is 40

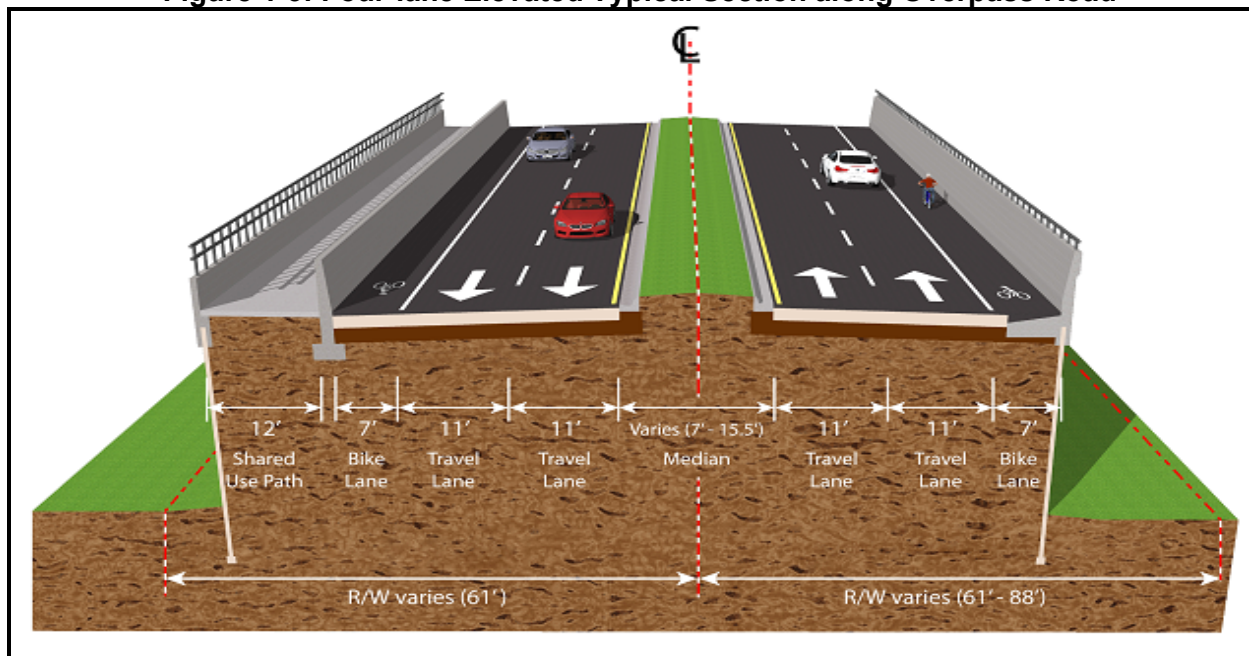
mph. The total right-of-way width required to accommodate the proposed overpass along this segment varies from 122 feet to 149 feet.

The second elevated typical section is along N. Cattlemen Road and includes four 12-foot travel lanes, two in each direction, two five-foot bicycle lanes, one on each direction, and a 15-foot shared use path is provided on the west side of the roadway and is separated from the adjacent bicycle lane by a concrete barrier. The proposed roadway is divided by a 19-foot grassed median (Figure 1-4). The design speed is 40 mph.

MSE (Mechanically Stabilized Earth) walls and concrete barrier are proposed where roadway side slopes cannot tie to natural ground within the proposed right-of-way (Figure 1-3 and Figure 1-4).

The proposed 15-foot shared-use path on Cattlemen Road and the 12-foot shared-use path on the Overpass Road will be located along the proposed elevated overpass roadway and will provide a connection between the Nathan Benderson Park and the Lakewood Ranch Development. The existing alignment of the unpaved path and paved Bill Robinson Trail traversing the perimeter of the lake will be modified, as needed, to maintain the 15-foot paved trail.

Figure 1-3: Four-lane Elevated Typical Section along Overpass Road



1.4.3 Four-lane Bridge Typical Section

The proposed bridge over I-75 includes four 11-foot travel lanes, two in each direction, and two seven-foot bicycle lanes, one in each direction. A concrete bridge rail and 2.5-foot inside

shoulders separate the opposing travel lanes. A 12-foot shared use path is provided on the north side of the bridge and is separated from the adjacent bicycle lane by a concrete bridge rail. The total bridge width is approximately 83'-1.5" (Figure 1-5).

Figure 1-4: Four-lane Elevated Typical Section along N. Cattlemen Road

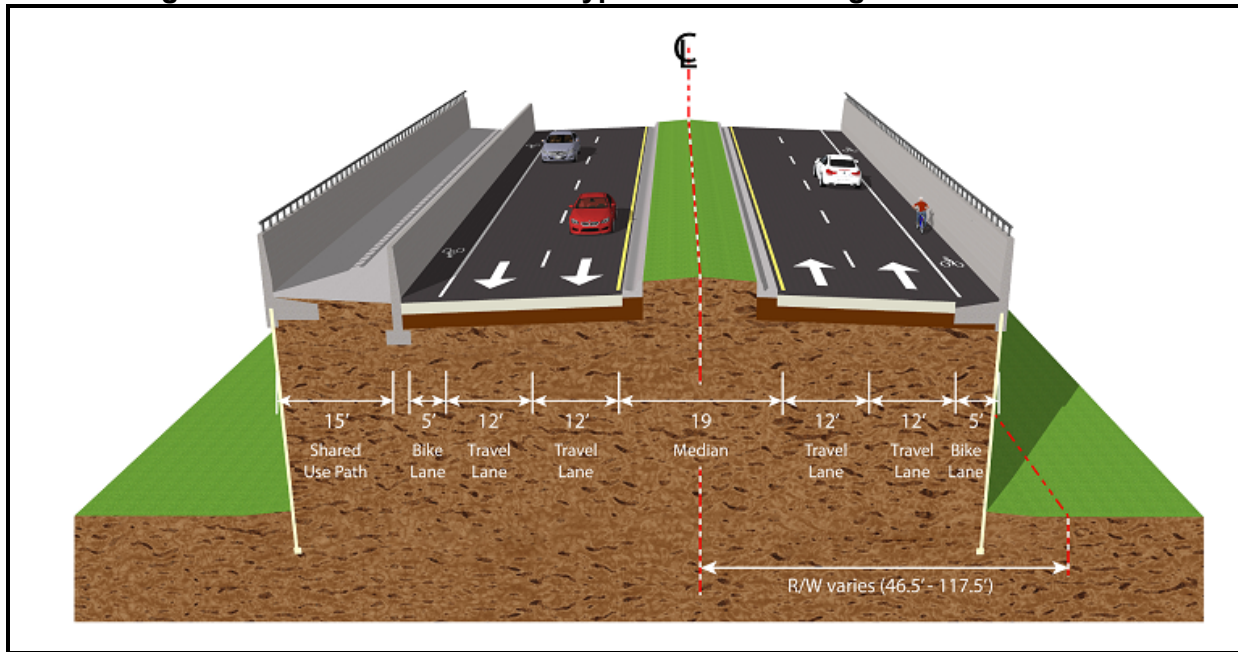
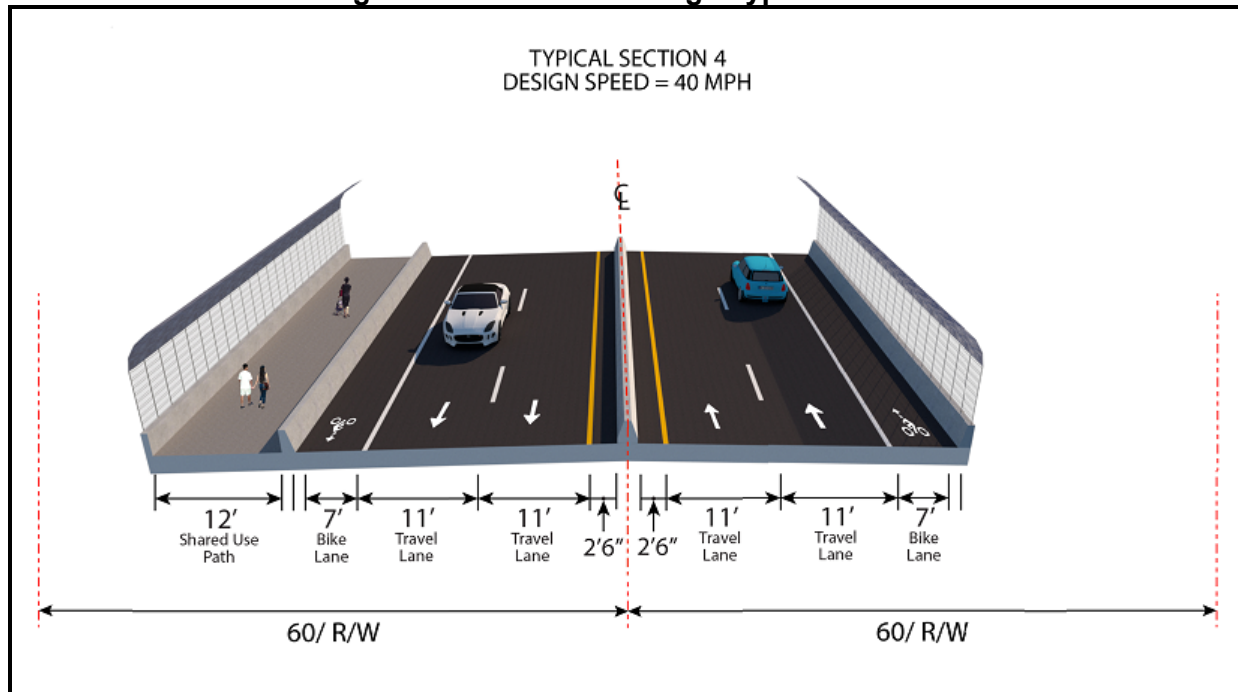


Figure 1-5: Four-lane Bridge Typical Section



1.5 Proposed Improvements

1.5.1 No-Build Alternative

Throughout this study, a “No-Build” (no-action) alternative is also considered. The “No-Build” alternative assumes that the North Sarasota Multimodal Connector over I-75 is not built, but accounts for routine maintenance on existing adjacent roads.

The No-Build Alternative minimizes right-of-way and construction costs along with environmental impacts. However, it does not accomplish the purpose and need for this project.

1.5.2 Build Alternative

Three build alternatives, Build Alternative 1 (South), Build Alternative 2 (Center), and Build Alternative 3 (North) were evaluated. These alternatives applied the typical sections described in **Section 1.4** along three independent alignments connecting N. Cattlemen Road west of I-75 to Professional Parkway or Lakewood Ranch Boulevard east of I-75. With considerations for residential relocations and environmental impacts, Build Alternative 2 was selected as the Preferred Alternative. A detailed alternatives analysis and concept plans are included in the PER prepared under separate cover.

1.6 Proposed Pond Sites

There are 3 preferred stormwater management facilities (SMF) associated with the Preferred Alternative described above. Two SMF’s are located on the west side of the overpass along N. Cattlemen Road. Stormwater will also be treated in the existing joint-use facility directly northeast of the overpass. There will be an easement from the roadway to this joint-use facility. All drainage improvements are within the project study area.

2.0 SCOPE OF SERVICES

The purpose of the geotechnical portion of the PD&E study is to evaluate published information on the existing subsurface conditions within the project corridor and along the proposed roadway alignment alternatives to assist in the preparation of the PD&E Report for the project. The following services were provided to achieve the preceding objective:

1. Reviewed published topographic information. This published information was obtained from the “Lorraine, Florida” and “Bee Ridge, Florida” Quadrangle Maps published by the USGS.
2. Reviewed published soils information. This published information was obtained from the Web Soil Survey of Sarasota County, Florida published by the USDA – NRCS.
3. Reviewed existing geotechnical data within the project area.
4. Prepared this Geotechnical Technical Memorandum for the project.

3.0 REVIEW OF REGIONAL GEOLOGY

The following Sarasota County Geology information was paraphrased from the Florida Geological Survey, Open-File Report 80, 2001 and other geologic references.

The near surface geologic deposits and formations from youngest to oldest in Sarasota County include: Holocene Sediment (Qh), Undifferentiated sediments (Qu), Shelly sediments (TQsu), the Hawthorn Group Peace River Formation (Thp), the Hawthorn Group Arcadia Formation (Tha), and the Hawthorn Group Arcadia Formation Tampa Member (That).

The Holocene sediments generally occur near the coastline and with river flood plains and includes quartz sands, carbonate sand and muds with organics. The Undifferentiated sediments and Beach and ridge dunes are siliciclastics that are light gray, tan, brown to black, unconsolidated to poorly consolidated, clean to clayey silty, unfossiliferous, variably organic-bearing sands to blue green to olive green, poorly to moderately consolidated, sandy, silty clays. The Shelly sediments are variably calcareous and fossiliferous quartz sands to well indurated, sandy, fossiliferous limestones with clayey sands and sandy clays present.

The Peace River Formation is primarily found near the surface in the northwest corner of Sarasota County and is approximately 50 feet thick under the county. The Peace River Formation is composed of interbedded sands, clays and carbonates. The sands are generally light gray to olive gray, poorly consolidated, clayey, variably dolomitic, very fine to medium grained and phosphatic. The clays are yellowish gray to olive gray, poorly to moderately consolidated sandy, silty, phosphatic and dolomitic. The carbonates are light gray to yellowish gray, poorly to well indurated, variably sandy and clayey, and phosphatic. The carbonates often include opaline chert.

The Arcadia Formation is predominantly a carbonate unit with variable siliciclastic component and is 250 to 300 feet thick in Sarasota County. Arcadia Formation is composed of yellowish gray to light olive gray to light brown, micro to finely crystalline, variably sandy, clayey and phosphatic, fossiliferous limestones and dolostones. Thin beds of sand and clay are common. The sands are yellowish gray, very fine to medium grained, poorly to moderately indurated, clayey, dolomitic and phosphatic. The clays are yellowish gray to light olive gray, poorly to moderately indurated, sandy, silty, phosphatic and dolomitic. The Tampa member is white to yellowish gray, fossiliferous and variably sandy and clayey mudstones, wackestone and packstone with minor to no phosphate grains that is found from 250 to 300 feet below mean sea level.

4.0 REVIEW OF USGS QUADRANGLE MAP

Based on a review of the "Lorraine, Florida" and "Bee ridge, Florida" USGS Quadrangle Map, it appears that the project site elevations are on the order of approximately +25 to +30 feet, National Geodetic Vertical Datum of 1929 (NGVD 29). A **USGS Quadrangle Map** of the project area is illustrated in attachments.

5.0 REVIEW OF USDA-NRCS SOIL SURVEY

5.1 Sarasota County Soil Survey

Based on a review of the Sarasota County Soil Survey published by the USDA-NRCS, it appears that there are five (5) soil-mapping units noted within the project limits. A detailed soil survey map is shown on the **USDA Soil Survey** in the attachments. The general soil descriptions are presented in the sub-sections below, as described in the Web Soil Survey.

5.1.1 Delray Fine Sand (Unit 8)

The Delray, depressional component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during June, July, August, September, October, November, and December. Organic matter content in the surface horizon is about 5 percent.

5.1.2 EauGallie and Myakka Fine Sands (Unit 10)

The EauGallie component makes up 45 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September. Organic matter content in the surface horizon is about 4 percent.

The Myakka component makes up 40 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September. Organic matter content in the surface horizon is about 4 percent.

5.1.3 Felda Fine Sand (Unit 12)

The Felda component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent

material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during July, August, September, and October. Organic matter content in the surface horizon is about 2 percent.

5.1.4 Holopaw Fine Sand (Unit 22)

The Holopaw component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during July, August, September, and October. Organic matter content in the surface horizon is about 3 percent.

5.1.5 Pits and Dumps (Unit 32)

Generated brief soil descriptions are created for major soil components. Pits and Dumps are miscellaneous areas.

5.2 General Soil Properties

Additional information regarding the soils and groundwater conditions for the above soil mapping units was obtained from the Sarasota County Soil Survey published by USDA-NRCS and the Web Soil Survey and is presented in **Tables 5-1** and **5-2** as follows:

Table 5-1
Sarasota County USDA NRCS Soil Survey Information

Map No.	Soil Name	Hydrologic Soil Group	Depth to High Water Table (ft)*	Typical Soil Types (Profile from Ground Surface to depth of approximately 80 inches)
8	Delray Fine Sand	A/D	+2.0-0.0	Fine Sand to Sand to Sandy Loam (Sandy Clay)
10	EauGallie and Myakka Sands	A/D	0.5-1.5	Fine Sand to Sandy Loam to Loamy Fine Sand (Clayey Sand); Fine Sand
12	Felda Fine Sand	A/D	+2.0-0.0	Fine Sand to Fine Sandy Loam to Fine Sand
22	Holopaw Fine Sand	A/D	+2.0-0.0	Fine Sand to Fine Sandy Loam to Loamy Fine Sand
32	Pits and Dumps	Data not available for Pits and Dumps		
*Depth to High Water Table is also commonly known as the depth to the Seasonal High Groundwater Table.				

**Table 5-2
 Sarasota County USDA NRCS Soil Survey Information**

USDA Map Symbol and Soil Name	Soil Classification			
	Depth (in)	USCS	AASHTO	Permeability (in/hr)
(8) Delray,depressional	0-30	SC-SM, SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	30-54	SP-SM	A-2-4, A-3	6.0 - 20.0
	54-80	SC, SC-SM, SM	A-2-4, A-2-6	0.6 - 6.0
(10) EauGallie - Myakka	0-6	SP, SP-SM	A-3	6.0 - 20.0
	6-22	SP, SP-SM	A-3	6.0 - 20.0
	22-44	SM, SP-SM	A-2-4, A-3	0.6 - 6.0
	44-48	SP, SP-SM	A-2-4, A-3	6.0 - 20.0
	48-66	SC, SC-SM, SM	A-2-4, A-2-6	0.1 - 0.6
	66-80	SC, SC-SM, SM	A-2-4, A-2-6	0.6 - 6.0
	0-6	SP, SP-SM	A-3	6.0 - 20.0
	6-24	SP, SP-SM	A-3	6.0 - 20.0
	24-42	SM, SP-SM	A-2-4, A-3	0.6 - 6.0
	42-80	SP, SP-SM	A-3	6.0 - 20.0
(12) Felda	0-7	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
	7-24	SP-SM, SM	A-2-4, A-3	6.0 - 20.0
	24-36	CL, SC, SC-SM	A-7-6, A-2-4, A-4	0.6 - 6.0
	36-80	SP-SM, SM	A-2-4	6.0 - 20.0
(22) Holopaw	0-4	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	4-50	SM, SP-SM	A-3, A-2-4	6.0 - 20.0
	50-66	SC, SC-SM	A-2-4, A-4, A-6	2.0 - 6.0
	66-80	SC-SM, SM	A-2-4	6.0 - 20.0
(32) Dumps - Pits	Data not available for Dumps.			
	Data not available for Pits.			

5.3 Groundwater Conditions

According to the USDA-NRSC Soil Survey, much of the project corridor consists of poorly drained to very poorly drained soils with shallow water table levels. Developed land consisting of commercial, recreational, and residential land uses exist along the project corridor. The natural seasonal high groundwater table is at or above the ground surface to a depth of 1½ feet below natural grade throughout much of the corridor.

6.0 REVIEW OF EXISTING GEOTECHNICAL DATA

6.1 General

To further evaluate the subsurface conditions within the project corridor, geotechnical data obtained from projects located within the project vicinity have been reviewed. These projects include the I-75 (SR 93) at University Parkway Interchange (FPID: 201277-2-52-01 and 201030-4-52-01) as well as the I-75 (SR 93) Overpass project (Sarasota County Project No: Pending).

6.2 Subsurface Conditions

Based on a review of the existing geotechnical data within the project vicinity, predevelopment Seasonal High Groundwater Table (SHGWT) levels are anticipated to range from 6 inches to 5 feet below natural grades. Existing soil borings indicate the surficial conditions consist of predominantly sandy soils (A-3/A-2-4).

Deeper SPT borings performed for the I-75 (SR 93) Overpass project indicate these very loose to medium dense sandy soils are encountered from the ground surface to an elevation of approximately -1 feet, NGVD 29, and are underlain by interbedded layers of firm to very stiff sandy silt to silt to clay to the boring termination elevations ranging from approximately -78 to -88 feet, NGVD 29. SPT borings performed for the University Parkway Interchange project encountered predominantly very loose to medium dense sandy soils from the natural ground surface to the boring termination elevations ranging from approximately -14 to -25 feet, NGVD 29.

7.0 PRELIMINARY ENGINEERING EVALUATIONS

7.1 General

Based upon the USDA-NRCS Soil Survey for Sarasota County, with the exception of the areas identified as Pits and Dumps, sandy soils are reported along the majority of the project corridor alternatives to depths of 80 inches below the natural ground surface. Some areas along the project corridor alternatives are expected to contain clayey soils. Portions of the project corridor have been identified as **Pits and Dumps** and these areas are expected to potentially contain deleterious material.

In general, the sandy soils are suitable for supporting proposed roadway embankments after proper subgrade preparation and removal of unsuitable materials. Areas along the project corridor where shallow groundwater conditions, clay soils or deleterious materials may impact the project are detailed below.

7.1.1 Shallow Groundwater

The Seasonal High Groundwater Table for the soil units presented above is reported to range from at or above the predevelopment natural grade to a depth of 1½ feet below the predevelopment natural grade within the project limits. Existing geotechnical data within the project limits anticipate SHGWT levels at depths ranging from 6 inches to 5 feet below the existing ground surface.

Roadway base to groundwater clearance will need to be evaluated to ensure minimum separation between the base and the SHGWT is maintained or to determine if additional measures are required (ie, blackbase, underdrains, etc.). In areas where the existing SHGWT is above grade, the SHWGT will have to be established by the project biologist utilizing biological indicators.

7.1.2 Near Surface Clayey Soils

The following soil mapping unit noted plastic/clayey soils (A-4/ A-7-6) at reported depths of 24 to 36 inches below natural grades within the project limits:

- Felda Fine Sand (Unit 12)

Plastic soils have limitations related to base clearance and are also poorly drained. Separation between plastic clayey soils and the roadway pavement sections should be in accordance with Sarasota County Specifications or FDOT Standard Plans, Indices 120-001 and 120-002. As the project progresses beyond the PD&E stage, additional geotechnical services should be performed to determine the impact these materials will have to the proposed design.

7.1.3 Pits and Dumps

Portions of the project corridor have been identified as Pits and Dumps. Pits and Dumps are typically areas that have either been excavated for soil as fill material then potentially backfilled or are disturbed areas used for the disposal of waste and rubble.

The specific subsurface conditions within these soil units are unknown and will require site-specific exploration to identify the subsurface conditions. As the project progresses beyond the PD&E phase, delineation of these locations identified by the USDA Soil Survey as potentially containing deleterious materials as well as other areas suspected of landfilling operations will be required to determine the impact of these conditions on the proposed design and to evaluate in accordance with Sarasota County Specifications or FDOT Standard Plans Index Requirements.

Geotechnical services including test borings and **test pits** should be performed to identify the type of material and vertical and horizontal limits of these materials within the project limits. Deleterious materials such as buried debris or undocumented fill material deemed unsuitable for construction could cause settlement over time and lead to distress of the proposed roadway.

7.2 Roadway Construction

Site preparation should consist of normal clearing and grubbing followed by compaction of subgrade soils. Subgrade preparation should include the removal of plastic soils, top-soils, organic soils, and unsuitable materials in accordance with Sarasota County Specifications or FDOT Standard Plans, Index 120-002. Backfill embankment materials should consist of materials conforming to Sarasota County Specifications or FDOT Standard Plans, Index 120-001. Clearing and grubbing and compaction should be accomplished in accordance with the latest Sarasota County and FDOT Standard Specifications.

The overall site preparation and mechanical densification work for the construction of the proposed roadway improvements should be in accordance with Sarasota County Specifications or FDOT Standard Specifications and Standard Plans Index requirements. In general, the existing subsurface soils appear capable of supporting the construction of the proposed roadway improvements subject to the above geotechnical considerations and after proper subgrade preparation.

8.0 LIMITATIONS

Our professional services have been performed, our findings obtained and our preliminary evaluations prepared in accordance with generally accepted geotechnical engineering principles and practices at the time of this report. Tierra is not responsible for the conclusions, opinions or recommendations made by others based on this data.

The scope of the geotechnical portion of the PD&E study is to provide information on the existing subsurface conditions along the project alignment based on a review of the Sarasota County Soil Survey published by the USDA-NRCS to assist in the preparation of the PD&E Report for the project. The preliminary evaluations submitted in this report are based upon the data obtained from the published information. Should subsoil variations become evident during the course of this project, a re-evaluation will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed roadway construction and stormwater management areas.