DRAFT
Design
NOISE STUDY REPORT ADDENDUM

CENTRAL POLK PARKWAY FROM SR 570 TO US 17
Polk County, Florida

Financial Project Identification (FPID) Number: 440897-2

Prepared for:

Florida's Turnpike Enterprise

November 2020

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Prepared for:

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Prepared by:

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November 2020

Executive Summary

The Florida Department of Transportation (FDOT), Florida's Turnpike Enterprise (FTE) is conducting a design-level noise study to determine the engineering and environmental effects of the proposed project for the Central Polk Parkway (CPP) from SR 570 (Polk Parkway) to SR 35 (US 17), a distance of approximately 6.4 miles. This project includes a new alignment for the proposed four-lane divided limited access facility. The proposed typical section includes 12' wide travel lanes with 8' inside and 12' outside shoulders and a median width of 62 to 106 feet. The proposed right-of-way varies from 124 to 482 feet.

This Design phase Noise Study includes a traffic noise analysis for residential areas along the Preferred Alternative. The traffic noise study is completed in accordance with Title 23, Code of Federal Regulations, Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise* following methodology and procedures established by the FDOT in the *PD&E Manual*, Part 2, Chapter 18 (*Highway Traffic Noise*). The purpose of this traffic noise study is to identify noise sensitive sites that would be impacted by the proposed project, evaluate abatement measures at impacted noise sensitive sites and determine where noise abatement (i.e., noise barriers) needs to be included in the design plans.

Traffic noise levels were predicted at 160 receptor points representing 141 residences and one special land use (a recreational trail). For Design Year (2045) conditions, traffic noise levels are predicted to approach, meet, or exceed the Noise Abatement Criteria (NAC) at two residences (W30 and E111). In addition, based on predictions made during the PD&E phase, substantial increases in noise are expected to occur in some areas, as CPP is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise. Compared to existing monitored and modeled conditions, traffic noise levels for Design Year Preferred Alternative conditions are also predicted to substantially increase at five (5) residences (W33 through W36 and E61) and one special land use (recreational area; W43-13 through W43-17) with Design Year Preferred Alternative conditions. These impacted residences and the special land use were further evaluated to determine the feasibility and cost reasonableness of providing noise barriers to reduce traffic noise.

However, two residences (E61 and E111) are isolated impacts and are not considered in the same Common Noise Environment (CNE) as other impacted receptors. Because FDOT's Noise Policy requires that two impacted receptors (discrete or representative locations of a noise sensitive area) be benefited by a five (5) decibel (dB[A]) reduction in order for a noise barrier to be a feasible abatement measure, there are no feasible and reasonable abatement measures to reduce or eliminate the predicted impact at the two isolated residences. Additionally, noise barriers were not found to be a reasonable or feasible abatement measure for the remaining residential and special land uses which are predicted to experience a substantial increase in traffic noise because either the noise barrier could not achieve the Noise Reduction Design Goal (NRDG), or the noise barrier was determined to be not cost reasonable. Therefore, noise barriers were not considered for these impacted residences and special land use.

This study identified that for Design Year (2045) conditions, traffic noise levels are predicted to approach, meet, or exceed the NAC at two (2) residences, and five (5) residences and a recreational area (i.e., special land use) are predicted to experience a substantial increase in traffic noise due to the Design. However, noise barriers were not found to be a reasonable or feasible abatement measure and, therefore, were not recommended for this project. Based on the traffic noise analyses performed to date, there are no feasible solutions available to mitigate the traffic noise impacts at the eleven impacted residential receptors and the special land use.

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ACRONYMS

AET	All Electronic Tolling
CFR	Code of Federal Regulations
CNE	Common Noise Environment
CPP	Central Polk Parkway
dB	Decibels
dB(A)	A-weighted decibels
FAA	Federal Aviation Administration
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
Ft	Feet
FTE	Florida's Turnpike Enterprise
LOS	Level of Service
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NRDG	Noise Reduction Design Goal
NSR	Noise Study Report
NSRA	Noise Study Report Addendum
PD&E	Project Development and Environment
ROW	Right-of-way
SEIR	State Environmental Impact Report
SR	State Road
TIP	Transportation Improvement Program
TNM	Traffic Noise Model

SECTION 1
Introduction

1.1 *PROJECT DESCRIPTION*

A Project Development and Environment (PD&E) study for the Central Polk Parkway (CPP), conducted by the Florida Department of Transportation (FDOT), District One, FPID 423601-1-22-01, concluded in March 2011 with the approved State Environmental Impact Report (SEIR). The 2011 PD&E study evaluated a new six-lane limited access facility with two recommended alternatives: the Western Leg (SR 60 to the Polk Parkway [SR 570]) and the Eastern Leg (SR 60 to I-4). In February of 2013, the design for Segment One (Polk Parkway [SR 570] to US 17 [SR 35]) of the 2011 PD&E Western Leg was partially completed to Phase I design by FDOT District One, FPID 431641-1-52-01. The District One project was placed on hold in April 2016 due to insufficient funding and low forecasts for traffic across the entire corridor that did not justify the project at that time.. Segment One (i.e., the subject of this Noise Study Report) is currently under design by the Florida's Turnpike Enterprise (FTE) to provide a new four-lane divided limited access expressway from the Polk Parkway to US 17, FPID 440897-2-52-01. This new expressway will feature all electronic tolling (AET).

The Florida Department of Transportation (FDOT), Florida's Turnpike Enterprise (FTE) is conducting a design-level study to determine the engineering and environmental effects of the proposed project for the CPP from SR 570 (Polk Parkway) to SR 35 (US 17) in Polk County, a distance of approximately 6.4 miles (). This project includes a new alignment for the proposed four-lane divided limited access facility. The proposed typical section (**Figure 1-2**) includes 12' wide travel lanes with 8' inside and 12' outside shoulders and a median width of 62 to 106 feet. The proposed right-of-way varies from 124 to 482 feet.

Land use in the area generally includes large sections of pasture with residential housing concentrated near SR 540, Thornhill Road and US 17. There is a large section of conservation lands located west of CPP adjacent of Lake Hancock. In addition, the Bartow Executive Airport is located within 2 miles of the CPP Segment 2 project.

1.2 *SUMMARY OF PD&E RESULTS AND COMMITMENTS*

In March 2011, a PD&E Study was completed to evaluate noise sensitive areas and to determine if noise abatement is feasible and reasonable for the proposed new alignment of the Florida's Turnpike, CPP, from SR 570 to US 17 (423601-1,CPPfrom SR 60 to SR 570 and from SR 60 to I-4).

Based on the PD&E study, traffic noise impacts exist along the corridor. Additionally, based on predictions made during the PD&E phase, substantial increases in traffic noise are expected to occur in some areas because CPP is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise. The results from the PD&E study indicated that Noise Barrier Analysis #6 (located on the PD&E Study Panel W-2) found that two (2) impacted residences may be benefited by a potentially feasible and cost reasonable noise barrier 300 feet long, 8 feet high and costing $72,000. The cost per benefited residence in the 2011 PD&E study was predicted to be $36,000. However, the current

design has changed in this area. Impacted receptors no longer exist in this area due to the change in design since the PD&E study. The remaining noise barrier analyses in this segment of CPP were not considered cost reasonable abatement measures (Noise Barrier Analysis #7 and #8).

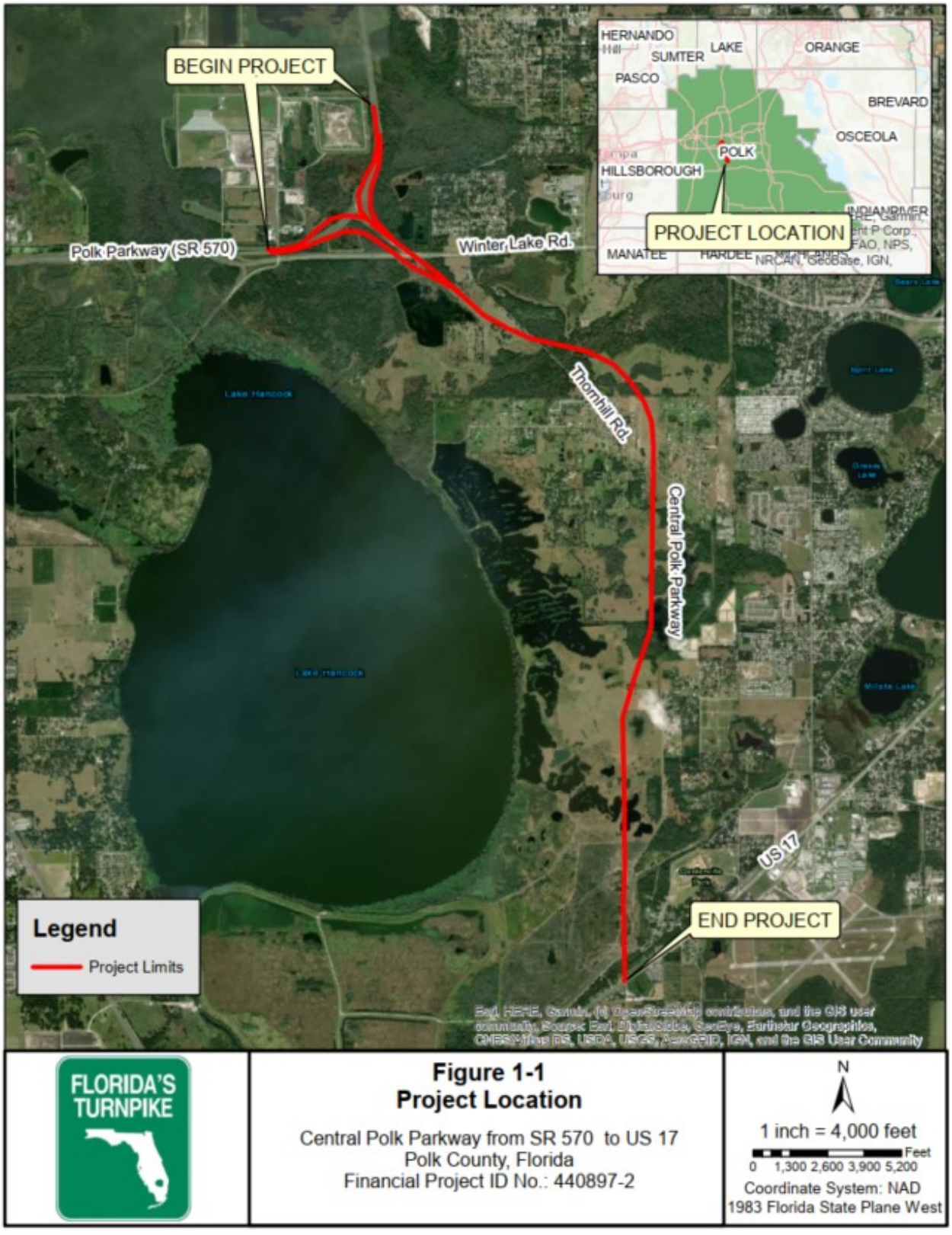
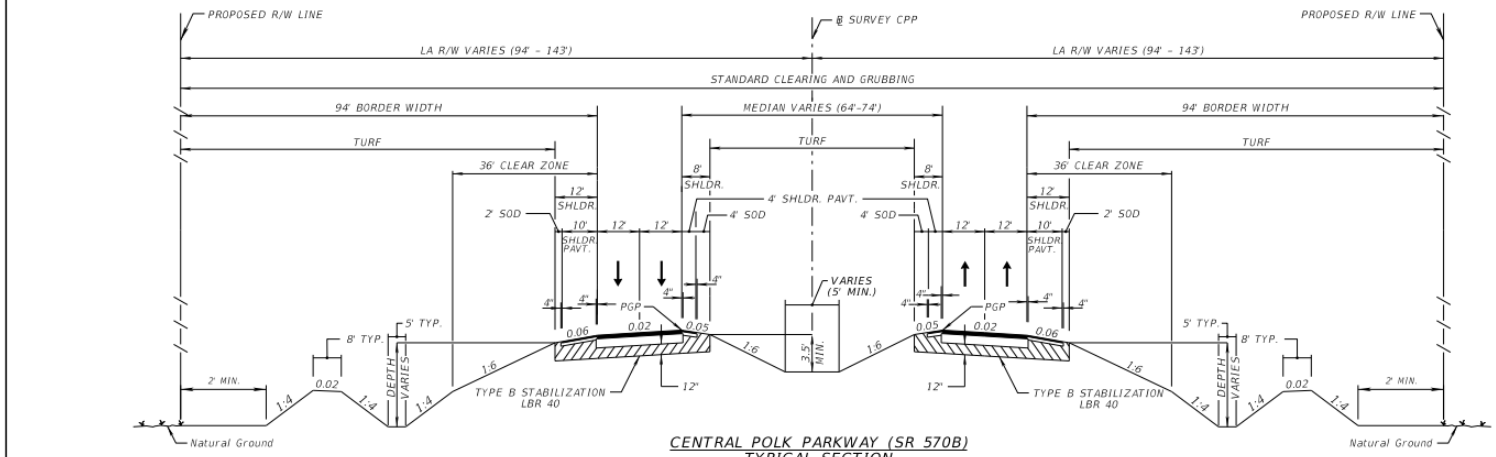


Figure 1-1 Project Location Map



CENTRAL POLK PARKWAY (SR 570B)
TYPICAL SECTION

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 11,700
ESTIMATED DESIGN YEAR = 2045 AADT = 19,000
K = 10% D = 53% T = 8.5% (24 HOUR)
DESIGN HOUR T = 4%
TRUCK DDHV = 113
DESIGN SPEED = 70 MPH
POSTED SPEED = 65 MPH

STATION LIMITS

STA. 1045+83.50 (MP 0.858) TO STA. 1317+47.99 (MP 6.003)

NEW CONSTRUCTION

OPTIONAL BASE GROUP 11 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (7.0") AND
FRICTION COURSE FC-5 (0.75") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 2 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC A) (1.5") (PG 76-22)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Kisinger Campo & Associates Corp.
201 N. Franklin Street, Suite 400
Tampa, Florida 33602
Florida Certificate of Authorization No. 02317
Engineer of Record: Todd M. Gardina, P.E.
P.E. No.: 66373

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

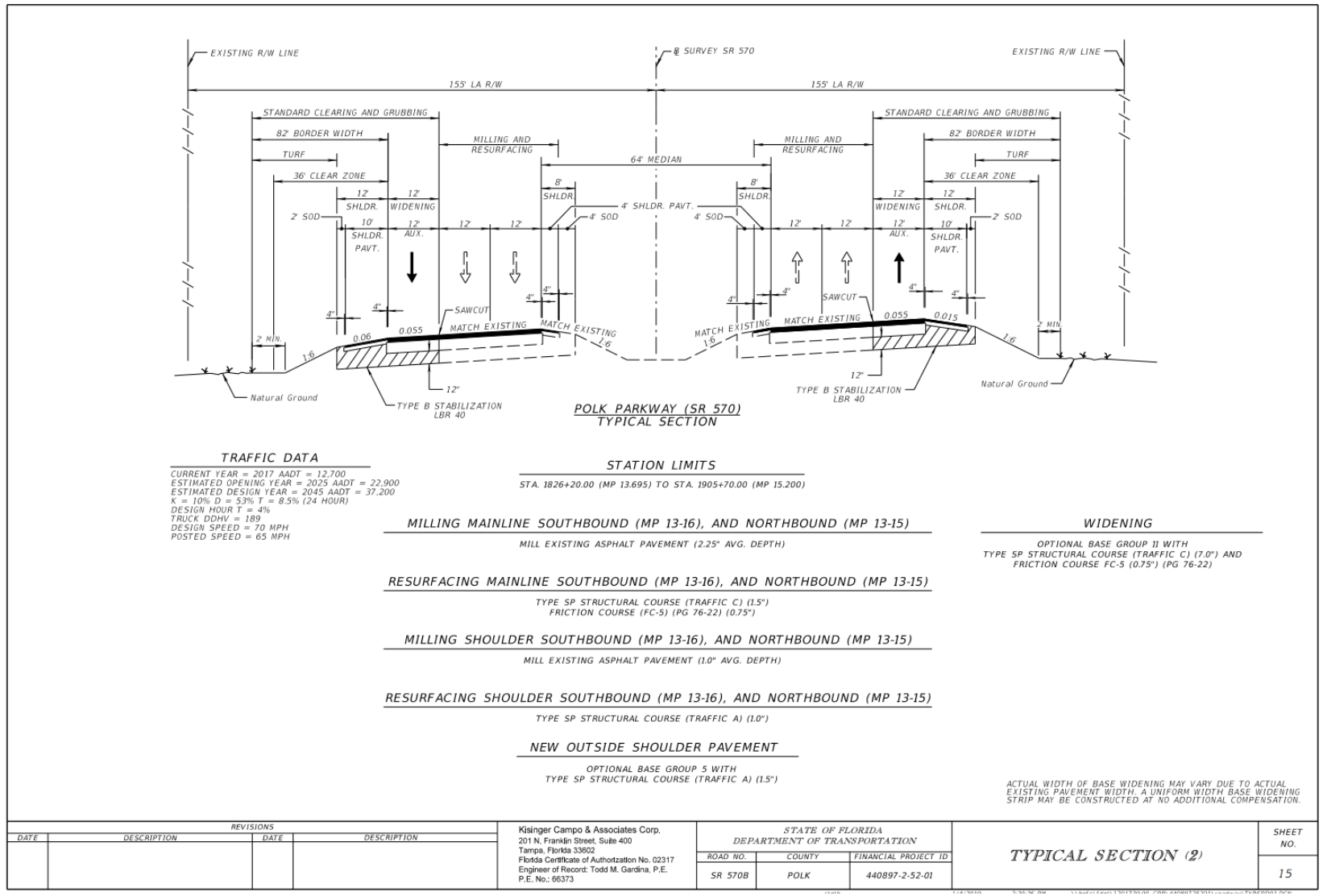
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 570B	POLK	440897-2-52-01

TYPICAL SECTION (1)

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.

Figure 1-2 Proposed Typical Section



POLK PARKWAY (SR 570)
TYPICAL SECTION

TRAFFIC DATA

CURRENT YEAR = 2017 AADT = 12,700
ESTIMATED OPENING YEAR = 2025 AADT = 22,900
ESTIMATED DESIGN YEAR = 2045 AADT = 37,200
K = 10% D = 53% T = 8.5% (24 HOUR)
DESIGN HOUR T = 4%
TRUCK DDHV = 189
DESIGN SPEED = 70 MPH
POSTED SPEED = 65 MPH

STATION LIMITS

STA. 1826+20.00 (MP 13.695) TO STA. 1905+70.00 (MP 15.200)

MILLING MAINLINE SOUTHBOUND (MP 13-16), AND NORTHBOUND (MP 13-15)

MILL EXISTING ASPHALT PAVEMENT (2.25" AVG. DEPTH)

RESURFACING MAINLINE SOUTHBOUND (MP 13-16), AND NORTHBOUND (MP 13-15)

TYPE SP STRUCTURAL COURSE (TRAFFIC C) (1.5")
FRICTION COURSE (FC-5) (PG 76-22) (0.75")

MILLING SHOULDER SOUTHBOUND (MP 13-16), AND NORTHBOUND (MP 13-15)

MILL EXISTING ASPHALT PAVEMENT (1.0" AVG. DEPTH)

RESURFACING SHOULDER SOUTHBOUND (MP 13-16), AND NORTHBOUND (MP 13-15)

TYPE SP STRUCTURAL COURSE (TRAFFIC A) (1.0")

NEW OUTSIDE SHOULDER PAVEMENT

OPTIONAL BASE GROUP 5 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC A) (1.5")

WIDENING

OPTIONAL BASE GROUP 11 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (7.0") AND
FRICTION COURSE FC-5 (0.75") (PG 76-22)

ACTUAL WIDTH OF BASE WIDENING MAY VARY DUE TO ACTUAL EXISTING PAVEMENT WIDTH. A UNIFORM WIDTH BASE WIDENING STRIP MAY BE CONSTRUCTED AT NO ADDITIONAL COMPENSATION.

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

REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 570B	POLK	440897-2-52-01

TYPICAL SECTION (2)

SHEET NO. 15

Figure 1-2 Proposed Typical Section (Cont.)

SECTION 2
Methodology

The traffic noise study is performed in accordance with the Code of Federal Regulations Title 23 Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise* using methodology established in the FDOT *PD&E Manual*, Part 2, Chapter 18 (*Highway Traffic Noise*) (FDOT, January 2019). Predicted traffic noise levels were produced using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM), version 2.5.

2.1 *NOISE METRICS*

Traffic noise levels developed for this analysis are expressed in decibels (dB) using an "A"-scale [dB(A)] weighting. This scale most closely approximates the response characteristics of the human ear to typical traffic noise levels. All reported traffic noise levels are hourly equivalent noise levels [Leq(h)]. The Leq(h) is defined as the equivalent steady-state sound level that, in an hourly period, contains the same acoustic energy as the time-varying sound level for the same hourly period. Use of these metrics is consistent with the requirements of 23 CFR 772.

2.2 *TRAFFIC DATA*

Among other factors, traffic noise is heavily dependent on both traffic speed and traffic volume with the amount of noise generated by traffic increasing as the vehicle speed and number of vehicles increases. The traffic conditions that result in the highest noise levels for roadways are the hourly traffic volumes that represent Level of Service (LOS) C traffic conditions because they represent maximized traffic volumes that continue to travel at free flow speed.

Traffic data were reviewed to determine maximum traffic volumes that would allow traffic to flow at speeds consistent with established speed limits. Traffic data for the 2045 Build condition were provided by FTE and reviewed to identify forecasted traffic volumes that would allow vehicles to travel at speeds consistent with established speed limits. For roadway segments where the predicted hourly design year traffic volumes equaled or exceeded LOS C, LOS C hourly traffic was utilized. For roadway segments where the predicted hourly traffic demand was less than LOS C traffic volumes, the predicted hourly demand volumes were utilized. For ramp volumes, hourly traffic demand volumes were utilized. Traffic volumes and speeds used in the analysis are provided in **Appendix A**.

In addition, the total vehicle volume is divided between five classifications: cars, medium trucks, heavy trucks, buses, and motorcycles. Traffic vehicle percentages used in the analysis are provided in **Appendix A**.

2.3 *NOISE ABATEMENT CRITERIA*

Noise sensitive sites are any property where frequent human use occurs and a lowered noise level would be of benefit. FHWA has established noise levels at which abatement is considered for various types of noise sensitive sites. These levels, which are used by the FTE for the purpose of evaluating traffic noise,

are referred to as the Noise Abatement Criteria (NAC). As shown in **Table 2-1**, NAC vary by activity category (i.e., land use). Noise abatement measures are considered when predicted traffic noise levels for the design year (2045) approach, meet, or exceed the NAC. FDOT defines "approach" as within 1 dB(A) of FHWA criteria. For perspective, **Table 2-2** provides typical noise levels of common indoor and outdoor activities.

Noise abatement measures must also be considered when a substantial increase in traffic noise will occur as a direct result of the transportation project. FDOT defines a substantial increase as 15 or more decibels above existing conditions. A substantial increase typically occurs in areas where traffic noise is a minor component of the existing noise environment but would become a major component after the project is constructed (e.g., new alignment project). Based on predictions made during the PD&E phase, substantial increases in traffic noise are expected to occur in some areas since CPP is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise.

Common Noise Environments (CNEs) are studied separately. A CNE is a group of receptors of the same NAC that are exposed to traffic noise in a similar way. These noise exposures are due to traffic mix, volume, speed and topographic features, and typically occur between two secondary noise sources such as interchanges, intersections, and cross roads.

Table 2-1
FHWA Noise Abatement Criteria

Activity Category	Activity Leq(h)		Evaluation Location	Description of Land Use Activity Category
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	66	Exterior	Residential.
C	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A – D or F.
F	------	------	------	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	------	------	------	Undeveloped lands that are not permitted.

Source: 23 CFR Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, FHWA, 2010.

Table 2-2
Typical Noise Levels

Common Outdoor Activities	Noise Level dB(A)	Common Indoor Activities
	---110---	Rock Band
Jet Fly-over at 1000 ft		
	---100---	
Gas Lawn Mower at 3 ft		
	---90---	
Diesel Truck at 50 ft, at 50 mph		Food Blender at 3 ft
	---80---	Garbage Disposal at 3 ft
Noise Urban Area (Daytime)		
Gas Lawn Mower at 100 ft	**---70---**	Vacuum Cleaner at 10 ft
Commercial Area		Normal Speech at 3 ft
Heavy Traffic at 300 ft	**---60---**	
		Large Business Office
Quiet Urban Daytime	**---50---**	Dishwasher Next Room
Quiet Urban Nighttime	**---40---**	Theater, Large Conference Room
Quiet Suburban Nighttime		(Background)
	---30---	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall
	---20---	(Background)
	---10---	
Lowest Threshold of Human Hearing	**---0---**	Lowest Threshold of Human Hearing

Source: California Dept. of Transportation Technical Noise Supplement, Oct. 1998, Page 18.

2.4 *NOISE ABATEMENT MEASURES*

Noise abatement is considered at all noise sensitive sites predicted to approach, meet, or exceed the NAC as stipulated by 23 CFR 772. Abatement measures considered during the PD&E phase included traffic management, alignment modifications, noise buffer zones through application of land use controls and noise barriers. However, noise barriers were determined to be the only viable noise abatement measure. Therefore, consistent with the results of the PD&E, noise barriers are considered at all noise sensitive sites predicted to approach, meet, or exceed the NAC for the year 2045 Build condition.

Barriers reduce noise levels by blocking the sound path between a highway and noise sensitive site. To effectively reduce traffic noise, a barrier must be relatively long, continuous (with no intermittent openings), and of sufficient height. For a noise barrier to be considered feasible and cost reasonable, the following minimum conditions should be met:

- At least two impacted receptors must be provided a noise reduction of 5 dB(A) or more to be considered feasible.

- A noise barrier must also attain the Noise Reduction Design Goal (NRDG), which states that a minimum noise reduction of 7 dB(A) for at least one benefited receptor must be achieved. Of importance, this receptor may also have been previously identified as meeting the feasibility requirement of receiving a 5 dB(A) reduction (first bullet).
- The cost of the noise barriers should not exceed $42,000 per benefited receptor. This is the upper cost limit established by FDOT. A benefited receptor is defined as a recipient of an abatement measure that experiences at least a 5 dB(A) reduction as a result of providing a noise barrier. The current unit cost used to evaluate cost reasonableness is $30 per square foot (sq. ft.).

Within the project limits, noise barrier locations were evaluated as follows:

- Right-of-way noise barriers located outside the clear recovery zone, but within the right-of-way (ROW), are initially considered at heights ranging from 8 ft. to 22 ft. in 2-ft. increments. According to the *FDOT Design Manual,* noise barriers outside the clear zone shall not exceed a maximum height of 22 ft.
- If a right-of-way barrier cannot provide at least a 5 dB(A) reduction to an impacted receptor or the barrier is not feasible due to construction limitations, then a shoulder barrier is evaluated. According to the *FDOT Design Manual,* shoulder barriers within the clear zone shall not exceed 14 ft. in height when on embankment and 8 ft. in height when on structure.
- The length and height of the noise barriers are optimized based on the benefit provided to noise sensitive sites with predicted noise levels that approach, meet, or exceed the NAC.

2.4.1 *SPECIAL LAND USES*

It should be noted that the methodology used to evaluate noise barriers for special land uses (i.e., non-residential) is different than for residential receptors. Noise barriers for special land use were evaluated following procedures documented in *A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations* (FDOT 2009). This methodology accounts for the threshold of $42,000 per benefited receptor and translates it to apply to a non-residential receptor based on person-hours-of-use in the following equation:

$$\frac{\$42k}{residence} x \frac{residence}{2.46\ persons} x \frac{usage}{24\ hours} x\ (14ft. x\ 100ft.) = \$995{,}935/\text{person hour/ft}^2$$

The cost of abatement is considered reasonable if the calculated "abatement cost factor" is below the "criteria abatement cost factor" of the above equation ($995,935/person-hour/ft^2).

2.5 *EXISTING CONDITONS*

The PD&E phase noise study identified that substantial increases in traffic noise would occur throughout the CPP corridor. Therefore, an evaluation of substantial increases was performed for this Design phase analysis. The CPP is on a new alignment and traffic noise is not a prevalent noise source at some noise sensitive areas along the Preferred Alternative. Therefore, noise monitoring was performed at representative locations to establish existing conditions where traffic noise is a minor component of the noise environment or where traffic data is not available to predict traffic noise originating from a nearby road.

Noise monitoring followed the procedures documented in FHWA's *Measurement of Highway-Related Noise*. Five Existing noise measurements were taken using a Quest Technologies Q-300 noise monitor, which was calibrated using a QC-10 calibrator. Noise sources during each monitoring event were noted to classify the various sources and assign a reasonable existing condition at noise sensitive locations based on physical conditions (e.g., characteristics of vegetation, presence of wildlife, types of man-made noise sources, etc.) and are found in **Appendix B**. Common natural noise sources included birds, other wildlife such as insects, and the effects of wind. Common man-made noise sources included airplanes, distant traffic, residential equipment (e.g., air conditioners, pool pumps) and noise generated by neighborhood activities.

Ambient noise monitoring results are provided in **Table 2-3**. The locations of ambient noise monitoring sites are shown in the aerial sheets found in **Appendix D**. However, it should be noted that some monitoring stations were deemed inappropriate due to high levels of construction vehicle traffic, as construction traffic is temporary in nature (noted in **Table 2-3**). For these locations, specifically around Thornhill Road, existing conditions were established by running FHWA's TNM 2.5. Each noise sensitive site was assigned an existing noise level from a representative monitoring station's average LEQ or the results from TNM and is provided in **Appendix C.**

Table 2-3 Ambient Noise Monitoring

Monitoring Site	Event	Duration	Date	Time	LEQ	Average LEQ	Field Notes	Validity	Notes
M1	C001	10 mins.	11/19/2020	9:00 AM	49.5	48.1	Distant traffic from Polk Parkway, birds, distant plane, nearby plane (2)	Valid	N/A
	C002	10 mins.	11/19/2020	9:15 AM	46.7		Birds, distant traffic from Polk Parkway/SR 540, one distant rooster/crow.		
M2	C003	10 mins.	11/19/2020	9:45 AM	58.3	57.4	Traffic from Thornhill Rd; trucks and cars; residential pool pump nearby. Lots of large trucks on Thornhill.	Invalid	Construction vehicles on Thornhill Rd. significantly increased existing traffic noise levels. Deemed inappropriate.
	C004	10 mins.	11/19/2020	9:58 AM	56.5		Traffic from Thornhill Rd. residential pool pump, intercom at nearby subdivision gate, distant plane. Lots of large trucks on Thornhill Rd.		
M3	C006	10 mins.	11/19/2020	10:20 AM	57.0	56.5	Thornhill Rd., heavy trucks, distant dog, plane overhead.	Invalid	Construction vehicles on Thornhill Rd. significantly increased existing traffic noise levels. Deemed inappropriate.
	C007	10 mins.	11/19/2020	10:31 AM	56.0		Thornhill Rd. heavy trucks.		
M4	C008	10 mins.	11/19/2020	10:56 AM	46.5	47.0	Nearby barking dog briefly, distant barking dog, distant small plane, rustling leaves, 1 or 2 infrequent cars on a local street, quiet very distant traffic, quiet distant horn.	Valid	N/A
	C009	10 mins.	11/19/2020	11:10 AM	47.5		Very quiet rustling leaves, very distant quiet traffic from Thornhill Rd., Three cars on local street, small plane overhead.		

Monitoring Site	Event	Duration	Date	Time	LEQ	Average LEQ	Field Notes	Validity	Notes
M5	C010	10 mins.	11/19/2020	11:35 AM	53.0	55.9	Traffic on Thornhill Rd. in distance, traffic on Thornhill Estates Dr S., rooster in distance, goat nearby.	Invalid	Construction vehicles on Thornhill Rd. significantly increased existing traffic noise levels. Deemed inappropriate.
	C011	10 mins.	11/19/2020	11:47 AM	58.5		Traffic on Thornhill Rd., distant plane, three pickup trucks on Thornhill Estates Dr. S., wind increase as difference in noise level.		
	C012	10 mins.	11/19/2020	12:00 PM	56.2		Three large pickup trucks/SUVs on Thornhill Estates Dr. S., distant traffic from Thornhill Rd.		
M6	C013	10 mins.	11/19/2020	1:33 PM	46.9	47.9	Very quiet, only breeze, rustling leaves.	Valid, but not preferred	Same vicinity as M7. M7 was preferred as it was closer to residences.
	C014	10 mins.	11/19/2020	1:44 PM	48.9		Very quiet, breeze, one vehicle drove by (mail jeep), howl of wind across guy wire holding power pole.		
M7	C015	10 mins.	11/19/2020	2:05 PM	45.4	46.1	Breeze, wind chimes at 25 Arthur Ln., place in the distance.	Valid	N/A
	C016	10 mins.	11/19/2020	2:16 PM	46.7		Breeze, wind chimes at 25 Arthur Ln., cow grazing 10' from microphone, audible "moo"ing.		
M8	C017	10 mins.	11/19/2020	2:51 PM	46.8	45.9	Rustling leaves, distant intermittent traffic on Old Bartow Eagle Lake Rd., distant helicopter from Bartow Airport, dog barking in distance.	Valid	N/A
	C018	10 mins.	11/19/2020	3:03 PM	45.0		Rustling leaves, distant traffic on Old Bartow Eagle Lake Rd., dog barking in distance, distant weed whacker.		
M9	C019	10 mins.	11/19/2020	3:22 PM	45.8	44.1	Two nearby planes from Bartow Airport, very distant traffic.	Valid	N/A
	C020	10 mins.	11/19/2020	3:33 PM	42.3		Really quiet, distant planes, distant traffic.		

Monitoring Site	Event	Duration	Date	Time	LEQ	Average LEQ	Field Notes	Validity	Notes
M10	C001	10 mins.	12/3/2019	9:00 AM	55.5	55.6	Traffic from US 17 constant and dominant, birds chirping around 7 minutes into event (lasted about 1 min.)	Valid	N/A
	C002	10 mins.	12/3/2019	9:10 AM	55.7		Traffic from US 17 constant and dominant, one car drove by for about 10 seconds, plane directly overhead (duration 30 seconds), birds chirping		

SECTION 3
Traffic Noise Analysis

3.1 *PREDICTED NOISE LEVELS AND ABATEMENT ANALYSIS*

Within the project limits, noise sensitive land uses adjacent to CPP include residential areas. Residential communities are in Activity Category B of the NAC. Noise levels were predicted at 153 receptor points in total, which represent 153 residences affected by traffic noise.

The location of the receptor points representing the noise sensitive sites are in accordance with the FDOT *PD&E Manual,* Part 2, Chapter 18 (*Highway Traffic Noise*). Residential receptor points are located at the edge of the building closest to CPP.

Predicted noise levels for these sites are provided in **Appendix C**. The locations of the receptor points identified in **Appendix C** are depicted on the aerials found in **Appendix D**. The alphanumeric identification for each receptor point (e.g., E4, W13) associated with a noise sensitive site is formulated as follows:

- A "W" or "E" denotes which side of CPP the receptor is located (e.g., W4). A "W" indicates that the receptor is located along the southbound lanes (i.e., west of CPP) while an "E" indicates that the receptor is located along the northbound lanes (i.e., east of CPP).
- The numbers identify a specific receptor point and generally increase from north to south.

For the year 2045 Build condition, traffic noise levels are predicted to approach, meet, or exceed the NAC at two (2) residences within the project limits. In addition, based on predictions made during the PD&E phase, substantial increases in noise are expected to occur in some areas, as CPP is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise. Compared to existing monitored conditions, traffic noise levels for Design Year Preferred Alternative conditions are also predicted to substantially increase at five (5) residences and one special land use (recreational area) with Design Year Preferred Alternative conditions. These impacted residences were further evaluated to determine the feasibility and cost reasonableness of providing noise barriers to reduce traffic noise..

3.1.1 *NOISE SENSITIVE SITES - EAST SIDE OF CPP*

Predicted traffic noise levels are predicted to approach, meet, or exceed the NAC for 2045 Build condition at one residence (E111) along the east side (i.e., northbound lanes) of the proposed CPP. In addition, a substantial increase is predicted to occur at one (1) residence and is considered impacted (E61). This impacted noise sensitive site was evaluated to determine the feasibility and reasonableness of providing barriers to reduce traffic noise. The discussions that follow analyze residential communities along the east side (i.e., northbound lanes) of the proposed CPP from north to south.

3.1.1.1 Residences along Indian Bluff and Byni Ridge

Residences along Indian Bluff and Byni Ridge (**Appendix D**, Aerial Sheet 5) are located north of CR 540 (Winter Lake Road). Residences in the communities are represented by 24 receptor points representing

24 residences (E1 through E24). Exterior traffic noise levels are predicted to range from 53.7 to 62.4 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. In addition, a substantial increase is not predicted to occur. Therefore, a noise barrier for the residences along Indian Bluff and Byni Ridge was not considered.

3.1.1.2 Isolated Residence along Thornhill Rd.

The isolated residence along Thornhill Rd. (E25) (**Appendix D**, Aerial Sheet 6) is predicted to have an exterior traffic noise level of 57.2 dB(A) for the Design year and does not approach, meet or exceed the NAC. In addition, a substantial increase is not predicted to occur. Therefore, a noise barrier for the isolated residence along Thornhill Rd. was not considered.

3.1.1.3 Isolated Residence south of SR 540

The isolated residence south of SR 540 (E26) (**Appendix D**, Aerial Sheet 7) is predicted to have an exterior traffic noise level of 52.9 dB(A) for the Design year and does not approach, meet or exceed the NAC. In addition, a substantial increase is not predicted to occur. Therefore, a noise barrier for the isolated residence south of SR 540 was not considered.

3.1.1.4 Residences east of CPP on Thornhill Rd. and in Thornhill Estates

Residences east of CPP on Thornhill Rd. and in Thornhill Estates (**Appendix D**, Aerial Sheets 9 and 10) are represented by 42 receptor points representing 42 residences (E28 through E68). Exterior traffic noise levels are predicted to range from 50.2 to 65.1 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence.

In addition, a substantial increase is predicted to occur at one receptor (E61). However, this impacted residence is considered an isolated impact. Because FDOT policy requires two impacted receptors to be benefited by a 5 dB(A) reduction in order for a barrier to be feasible, a barrier is not considered a feasible abatement measure. Therefore, a noise barrier for the residences east of CPP on Thornhill Rd. and in Thornhill Estates was not considered.

3.1.1.5 Residences along Old Bartow Eagle Lake Rd.

Residences along Old Bartow Eagle Lake Rd. (**Appendix D**, Aerial Sheets 16 and 17) are represented by 25 receptor points representing 25 residences (E81 through E105). Exterior traffic noise levels are predicted to range from 51.1 to 57.3 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. In addition, a substantial increase is not predicted to occur. Therefore, a noise barrier for the residences along Old Bartow Eagle Lake Rd. was not considered.

3.1.1.6 Residences along US 17

Residences along US 17 (**Appendix D**, Aerial Sheet 17) are represented by six receptor points representing six residences (E106 through E111). Exterior traffic noise levels are predicted to range from 62.7 to 66.4 dB(A) for the Design year and approaches, meets or exceeds the NAC at one residence (E111). However, this receptor experiences an impact due to traffic from a nearby arterial road (US 17). In addition, because FDOT policy requires two impacted receptors to be benefited by a 5 dB(A) reduction in order for a barrier to be feasible, a barrier is not considered a feasible abatement measure for the isolated impacted

residence. In addition, a substantial increase is not predicted to occur. Therefore, a noise barrier for the residences along US 17 was not considered.

3.1.2 *NOISE SENSITIVE SITES – WEST SIDE OF CPP*

Predicted noise levels are predicted to approach, meet, or exceed the NAC for 2045 Build condition at one residence (W30) along the west side (i.e., southbound lanes) of the proposed CPP. In addition, a substantial increase is predicted to occur at four (4) residences (W33 through W36) and one special land use (a recreational trail; W43-13 through W43-17) and are considered impacted. All impacted noise sensitive sites were evaluated to determine the feasibility and reasonableness of providing barriers to reduce traffic noise. The discussions that follow analyze residential communities along the west side (i.e., southbound lanes) of the proposed CPP from north to south.

3.1.2.1 Marshall Hampton Trail

The Marshall Hampton Trail (**Appendix D**, Aerial Sheets 4, 5 and 6) is a recreational trail and was modeled as an Activity Category C. The trail was represented by 19 receptor points (W43-1 through W43-19). Exterior traffic noise levels are predicted to range from 54.9 to 65.9 dB(A) for the Design year and do not approach, meet or exceed the NAC. However, a substantial increase is predicted to occur at five receptors (W43-13 through W43-17). Therefore, a noise barrier was evaluated for the recreational trail.

A noise barrier was evaluated following FDOT Special Land Use procedures outlined in **Section 2.4.1**. The roadway in this area is elevated. Therefore, a shoulder barrier was evaluated at heights ranging up to 14 ft. in two-foot increments, shown in **Table 3-1**. The barrier analysis found that noise barriers 10-14 ft. in height would meet the NRDG and provides a benefit to 25% of the impacted receptors. For a 12 ft. ROW noise barrier to be cost reasonable, 2,500 people need to use the trail per day for one hour. Considering the number of available parking spaces at the trail head[1], it is not reasonable to assume this level of use would be achieved.

Additionally, a ROW barrier was evaluated at heights ranging up to 22 ft. in two-foot increments, shown in **Table *3-2***. The barrier analysis found that noise barriers 10-22 ft. in height would meet the NRDG and provides a benefit to 19-25% of the impacted receptors. For a 12 ft. ROW noise barrier to be cost reasonable, 2,066 people need to use the trail per day for one hour. Considering the number of available parking spaces at the trail head[1], it is not reasonable to assume this level of use would be achieved. Therefore, a noise barrier for the impacts to the Marshall Hampton Trail was not evaluated further.

[1] The Polk County Parks and Natural Resources Department was contacted about the usage of the Marshall Hampton Trail in this area, but no usage data was able to be provided.

Table 3-1 Noise Barrier Evaluation (Shoulder)
Marshall Hampton Trail

Barrier Height (feet)	Total Barrier Length (feet)[1]	Total Cost[2]	Benefited Acreage within 0.36 Acre Impact Area	Percentage of Impacted Area Benefited	Average Reduction in Benefited Area [(dB(A)]	Required Person-Hours of Daily Use Within Benefited Area[3]	Number of Person Hours of Daily Use in the area of the trail studied that are needed to be under the cost reasonable limit of $995,935
8	NRDG not met						
10	1,500	$450,000	0.09	25	6.6	633	2,532
12	1,234	$444,240	0.09	25	7.0	625	2,500
14	1,125	$472,500	0.09	25	7.2	665	2,660

[1] Full height is for the length indicated. If a shoulder noise barrier location is indicated, the length of vertical height tapers at the shoulder barrier's terminus (See FDOT Standard Plans) would be in addition to the length indicated.
[2] Unit cost of $30 per sq. f.t of noise barrier.
[3] Based on $995,935/person-hour/ft^2 of barrier as the limit for cost reasonableness.

Table 3-2 Noise Barrier Evaluation (ROW)
Marshall Hampton Trail

Barrier Height (feet)	Total Barrier Length (feet)[1]	Total Cost[2]	Benefited Acreage within 0.36 Acre Impact Area	Percentage of Impacted Area Benefited	Average Reduction in Benefited Area [(dB(A)]	Required Person-Hours of Daily Use Within Benefited Area[3]	Number of Person Hours of Daily Use in the area of the trail studied that are needed to be under the cost reasonable limit of $995,935
8	NRDG not met						
10	1,007	$302,100	0.07	19	5.8	425	2,186
12	906	$326,160	0.08	22	7.1	459	2,066
14	1,007	$422,940	0.09	25	8.1	595	2,380
16	1,007	$483,360	0.09	25	9.2	680	2,720
18	1,007	$543,780	0.09	25	10.0	765	3,060
20	1,007	$604,200	0.09	25	10.6	850	3,400
22	1,007	$664,620	0.09	25	11.2	944	3,776

[1] Full height is for the length indicated. If a shoulder noise barrier location is indicated, the length of vertical height tapers at the shoulder barrier's terminus (See FDOT Standard Plans) would be in addition to the length indicated.
[2] Unit cost of $30 per sq. f.t of noise barrier.
[3] Based on $995,935/person-hour/ft^2 of barrier as the limit for cost reasonableness.

3.1.2.2 Residences along Thornhill Rd. from Country Walk Ln. to CPP

Residences along Thornhill Rd. from Country Walk Ln. to CPP (**Appendix D**, Aerial Sheets 8 and 9) are represented by 29 receptor points representing 29 residences (W1 through W29). Exterior traffic noise levels are predicted to range from 53.9 to 60.2 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. In addition, a substantial increase is not predicted to occur. Therefore, a noise barrier for the residences along Thornhill Rd. from Country Walk Ln. to CPP was not considered.

3.1.2.3 Residences south of Thornhill Rd. and along Fussell Rd. and Beth Ln.

Residences south of Thornhill Rd. and along Fussell Rd. and Beth Ln. (**Appendix D**, Aerial Sheet 10) are represented by 13 receptor points representing 13 residences (W30 through W42). Exterior traffic noise levels are predicted to range from 53.4 to 66.8 dB(A) for the Design year and approaches, meets or exceeds the NAC at one residence (W30). However, this receptor experiences an impact due to traffic from a nearby arterial road (Thornhill Rd.).

In addition, a substantial increase is predicted to occur at seven receptors (W30 through W36). Therefore, a noise barrier was evaluated for these residences. The evaluation found that a noise barrier could not meet the NRDG of a 7 dB(A) reduction. Therefore, a noise barrier for the residences south of Thornhill Rd. and along Fussell Rd. and Beth Ln. was not considered.

SECTION 4
Conclusions

4.1 *TRAFFIC NOISE IMPACTS*

Traffic noise levels were predicted at 160 receptor points representing 141 residences and one special land use (a recreational trail). For Design Year (2045) conditions, noise levels at residences are predicted to approach, meet, or exceed the Noise Abatement Criteria (NAC) at two residences (W30 and E111). In addition, based on predictions made during the PD&E phase, substantial increases in traffic noise are expected to occur in some areas, as CPP is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise. Compared to existing monitored and modeled conditions, traffic noise levels for Design Year Preferred Alternative conditions are also predicted to substantially increase at five (5) residences (W33 through W36 and E61) and one special land use (recreational area; W43-13 through W43-17) with Design Year Preferred Alternative conditions. These impacted residences and the special land use were further evaluated to determine the feasibility and cost reasonableness of providing noise barriers to reduce traffic noise.

However, two residences (E61 and E111) are isolated impacts and are not considered in the same Common Noise Environment (CNE) as other impacted receptors. Because FDOT's Noise Policy requires that two impacted receptors (discrete or representative locations of a noise sensitive area) be benefited by a five (5) decibel (dB[A]) reduction in order for a noise barrier to be a feasible abatement measure, there are no feasible and reasonable abatement measures to reduce or eliminate the predicted impact at the two isolated residences. Additionally, noise barriers were not found to be a reasonable or feasible abatement measure for the remaining residential and special land uses which are predicted to experience a substantial increase in traffic noise because either the noise barrier could not achieve the Noise Reduction Design Goal (NRDG), or the noise barrier was determined to be not cost reasonable. Therefore, noise barriers were not considered for these impacted residences and special land use.

This study identified that for Design Year (2045) conditions, traffic noise levels are predicted to approach, meet, or exceed the NAC at two (2) residences, and five (5) residences and one recreational area are predicted to experience a substantial increase in traffic noise due to the Design. However, noise barriers were not found to be a reasonable or feasible abatement measure and, therefore, were not recommended for this project. Based on the traffic noise analyses performed to date, there are no feasible solutions available to mitigate the noise impacts at the eleven impacted receptors.

SECTION 5
Construction Noise and Vibration

Based on the existing land use within the limits of this project, construction of the proposed roadway improvements will not have any noise or vibration impact. If noise-sensitive land uses develop adjacent to the roadway prior to construction, additional impacts could result. It is anticipated that the application of the FDOT Standard Specifications for Road and Bridge Construction will minimize or eliminate most of the potential construction noise and vibration impacts. However, should unanticipated noise or vibration issues arise during the construction process, the Project Manager, in concert with the Florida's Turnpike Enterprise Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

SECTION 6
References

23 CFR Part 772, *"Procedures for Abatement of Highway Traffic Noise and Construction Noise"*, Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010; pages 39834-39839.

Florida Department of Transportation, *"A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations"*, July 2009. 64 pages.

Florida Department of Transportation. *"Highway Traffic Noise"*, Part 2, Chapter 18. Project Development and Environment Manual, Florida Department of Transportation, Tallahassee, July 1, 2020.

Florida Department of Transportation Design Manual Volume 1, Chapter 264, *"Noise Walls and Perimeter Walls"*, January 2019

Florida Department of Transportation *"Standard Specifications for Road and Bridge Construction"*, July 2020.

Florida Department of Transportation*, "2012 FDOT Quality/Level of Service Handbook"*; Tallahassee, Florida; 2012.

Florida Department of Transportation, *"FDOT Design Manual"*, Tallahassee, Florida; 2019.

Federal Highway Administration Report FHWA-HEP-10-025, *"Highway Traffic Noise: Analysis and Abatement Guidance"*, June 2010 (revised December 2010); 76 pages.

Federal Highway Administration Report FHWA-PD-96-009, *"FHWA Traffic Noise Model, Version 1.0 User's Guide"*, January 1998; 192 pages + supplements.

Federal Highway Administration Report Number FHWA-PD-96-046, *"Measurement of Highway-Related Noise"*, Cynthia S.Y. Lee and Gregg Fleming; May 1996; 206 pages.

Federal Highway Administration Report FHWA-HEP-06-015, *"FHWA Highway Construction Noise Handbook: Final Report"*. August 2006; 185 pages.

Federal Highway Administration. "*Consideration of Existing Noise Barrier in a Type I Noise Analysis FHWA-HEP-12-051."* https://www.fhwa.dot.gov/ENVIRONMENT/noise/noise_barriers/abatement/existing.cfm. Accessed May 6, 2019.

APPENDICES

Appendix A Traffic Data

Appendix B Ambient Noise Measurements

Appendix C Predicted Noise Levels

Appendix D Aerials

Appendix E TNM Files

APPENDIX A

TRAFFIC DATA

Traffic Data – CPP from SR 570 to US 17
Build (2045) Conditions

Polk Parkway and Central Polk Parkway (CPP) Mainline													
Mainline Segment	**Number of Lanes**	**AADT**	**LOS C AADT**	**Peak Hour Peak Direction**	**LOS C Peak Hour Peak Direction**	**Design Hr. % Trucks**	**Design Hr. % MT**	**Design Hr. % HT**	**Design Hr. % Buses**	**Design Hr. % Motorcycles**	**Standard K-factor**	**D-factor**	**Posted Speed (mph)**
Polk Parkway													
From U.S. 98 (MP 10) to S.R. 540 West Ramps (MP 13)	4	65,600	48,500	3,430	2,740	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	65
From S.R 540 West (MP 13) Ramp to CPP (MP 14)	4	37,100	48,500	1,950	2,740	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	65
Central Polk Parkway (CPP)													
From Polk Parkway to U.S. 17	4	24,600	48,500	1,540	2,740	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	65
From U.S. 17 to 91 Mine Road	4	8,900	24,300	560	2,740	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	65
Polk Parkway Ramps													
Interchange Ramp	**Number of Lanes**	**One-Way AADT**	**One-Way LOS C AADT**	**Peak Hour Peak Direction**	**LOS C Peak Hour Peak Direction**	**Design Hr. % Trucks**	**Design Hr. % MT**	**Design Hr. % HT**	**Design Hr. % Buses**	**Design Hr. % Motorcycles**	**K-factor**	**D-factor**	**Posted Speed (mph)**
S.R. 540 (Existing Ramps)													
Westbound On-ramp	2	14,250	22,500	1,480	2,540	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
Eastbound Off-ramp	2	14,250	22,500	1,480	2,540	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
Central Polk Parkway (CPP) Ramps													
Interchange Ramp	**Number of Lanes**	**One-Way AADT**	**One-Way LOS C AADT**	**Peak Hour Peak Direction**	**LOS C Peak Hour Peak Direction**	**Design Hr. % Trucks**	**Design Hr. % MT**	**Design Hr. % HT**	**Design Hr. % Buses**	**Design Hr. % Motorcycles**	**K-factor**	**D-factor**	**Posted Speed (mph)**
Polk Parkway and S.R. 540													
S.R. 540 + CPP Ramps from East Polk Parkway	1	8,500	11,300	1,050	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
S.R. 540 + CPP Ramps to East Polk Parkway	1	8,500	11,300	1,050	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
S.R. 540 Ramps from East Polk Parkway	1	2,250	11,300	290	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
S.R. 540 Ramps to East Polk Parkway	1	2,250	11,300	290	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
CPP Ramps from East Polk Parkway	1	6,250	11,300	760	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
CPP Ramps to East Polk Parkway	1	6,250	11,300	760	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
CPP Ramps from West Polk Parkway	1	4,300	11,300	550	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
CPP Ramps to West Polk Parkway	1	4,300	11,300	550	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
S.R. 540 Ramp from East CPP	1	1,750	11,300	230	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
S.R. 540 Ramp to East CPP	1	1,750	11,300	230	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
U.S. 17													
Westbound On-Ramp	2	9,550	22,500	1,200	2,540	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
Eastbound Off-Ramp	2	9,550	22,500	1,200	2,540	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
Westbound Off-Ramp	1	1,700	11,300	220	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
Eastbound On-Ramp	1	1,700	11,300	220	1,270	6.15%	2.68%	3.32%	0.15%	0.06%	10.0%	56.4%	45
Arterials													
Arterial Segment	**Number of Lanes**	**AADT**	**LOS C AADT**	**Peak Hour Peak Direction**	**LOS C Peak Hour Peak Direction**	**Design Hr. % Trucks**	**Design Hr. % MT**	**Design Hr. % HT**	**Design Hr. % Buses**	**Design Hr. % Motorcycles**	**K-factor**	**D-factor**	**Posted Speed (mph)**
S.R. 540													
East of CPP	4	48,500	40,000	2,570	1,920	3.40%	1.21%	2.10%	0.08%	0.21%	9.5%	50.5%	60
West of CPP	4	53,500	40,000	2,350	1,920	3.40%	1.21%	2.10%	0.08%	0.21%	9.5%	50.5%	60
Landfill Road													
North of S.R. 540	2	3,900	5,800	190	300	3.40%	1.21%	2.10%	0.08%	0.21%	9.5%	54.6%	25
South of S.R. 540	2	17,500	5,800	970	300	3.40%	1.21%	2.10%	0.08%	0.21%	9.5%	54.6%	25
Thornhill Road													
South of S.R. 540	2	17,300	13,800	730	660	3.39%	1.07%	2.13%	0.19%	0.03%	9.5%	50.5%	45
U.S. 17													
East of CPP	4	51,300	37,600	2,700	1,900	5.08%	2.35%	2.38%	0.35%	0.57%	9.5%	53.1%	55
West of CPP	4	62,300	37,600	3,340	1,900	5.08%	2.35%	2.38%	0.35%	0.57%	9.5%	53.1%	55
S.R. 60													
East of CPP/91 Mine Road	4	42,900	33,500	1,760	1,870	8.64%	1.62%	6.85%	0.62%	0.09%	9.5%	58.8%	55
West ofCPP/ 91 Mine Road	4	44,700	33,500	1,930	1,870	8.64%	1.62%	6.85%	0.62%	0.09%	9.5%	58.8%	55

Note: AADT: Annual Average Daily Traffic; MT: Medium Trucks; HT: Heavy Trucks.
(1) Number of lanes are obtained from the aerial maps and design layouts.
(2) Traffic data is obtained from the CPP PD&E study Project Traffic Forecast Memorandum.
(3) Peak hour demand and LOS C Peak Hour maximum service volumes are provided directionally.
(4) Freeway mainline and ramp LOS C targets are based on the FDOT Systems Planning Office Estimation of Capacities on Florida Freeways report, dated September 2014, and adjusted for local conditions. LOS C targets for the GUL are obtained from FDOT 2013 Generalized Service Volume Tables and adjusted for trucks.
(5) LOS C AADTs are estimated using K and D factors and the design hour peak direction LOS C maximum service volumes.
(6) Polk Parkway mainline and tolled ramps design hour truck percentages are based on toll data. Truck percentages for non-tolled ramps are based on applicable adjacent toll data. Truck factors for the Polk Parkway were used for the CPP. Truck percentages for arterials were estimated from counts and distributed based on class data from the Florida Traffic Online Application. The medium vehicle classifications listed here make a distinction between medium trucks and buses.
(7) Posted speed data is obtained from field observations.

APPENDIX B

AMBIENT NOISE MEASUREMENTS

M1

Ambient Monitoring Data Sheet		
	Morning Events 0902	0915 ~~Afternoon~~ Events
Date	11/19/2019	11/19
Time	09:00 - 09:10	09:15 - 09:25
Monitor #	#1 Quest 300	#1 Quest 300
Event #	Site 1 C001	Site 1 C002
Location Description and Latitude & Longitude	End of Cul de Sac, Byni Ridge 28.0133106, -81.825126) Edge of Pavement	← Same
Event Duration	10 minutes	10 minutes
Noise Environment Sources	Distant traffic from Polk Parkway, birds, , distant plane, nearby plane (2)	Birds, Distant traffic from Polk Parkway/SR 540 One distant rooster crow
Final LEQ	49.5 Lmin 32.7	46.7
Weather		
Temperature	64.0°F	66.0°F
Humidity	4%	64%
Wind Speed	1 mph	1-3 mph
Wind Direction	East	SE
Cloud Cover	10% cover	10% cover

M2

Ambient Monitoring Data Sheet		
	0947 Morning Events	1000 ~~Afternoon~~ Events
Date	11/19/19	11/19/19
Time	0945-0955	09:58-10:08
Monitor #	1	1
Event #	C003	C005
Location Description and Latitude & Longitude	27.996534, -81.8086329 Cul de sac at N. end Old Thornhill Rd near house 3686	= same
Event Duration	10 mins	10 min
Noise Environment Sources	Traffic from Thornhill Rd- trucks & cars, residential Pool pump nearby Lots of large trucks on Thornhill	Traffic from thornhill Rd, residential pool pump, intercom @ nearby subdivision gate, distant plane Lots of large trucks on Thornhill
Final LEQ	58.3	56.5
Weather		
Temperature	70°F	72°F
Humidity	55%	41%
Wind Speed	1-3 mph, gust to 4	3 mph, Gust to 4
Wind Direction	NW	NW
Cloud Cover	10%	10%

M3

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	11/19/19	11/19/19
Time	10:20 - 10:30	10:31 - 10:41
Monitor #	1	1
Event #	C006	C007
Location Description and Latitude & Longitude	27.992 9990, -81.8042425 Private Driveway at side gate 3940 - 3944 Thornhill Rd	← same
Event Duration	10 mins	10 mins
Noise Environment Sources	Thornhill Rd, heavy trucks, distant dog, plane overhead	Thornhill Rd, heavy trucks
Final LEQ	57.0 Leq	56.0 Leq
Weather		
Temperature	70°F	70°F
Humidity	41%	45%
Wind Speed	3-4 mph gust to 5	3-4 mph, gust to 5
Wind Direction	NW	W
Cloud Cover	10%	5%

M4

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	11/19/19	11/19/19
Time	10:56 - 11:06	11:10 - 11:20
Monitor #	1	1
Event #	C008	C009
Location Description and Latitude & Longitude	27.9940731, -81.7917921 West side Thornhill Estates Dr. N rear pond, fence	← Same
Event Duration	10 min	10 min
Noise Environment Sources	Nearby barking dog briefly Distant barking dog Distant small plane Rustling leaves, 1 or 2 infrequent cars on local street, quiet very distant traffic, quiet distant train horn	Very quiet rustling leaves Very distant quiet traffic from Thornhill Rd Three cars on local street Small plane overhead
Final LEQ	46.5 Leq	47.5 Leq
Weather		
Temperature	69°F	72°F
Humidity	45%	40%
Wind Speed	3-5 mph, gusts to 6	2-4 mph, gusts to 6
Wind Direction	NW	NW
Cloud Cover	5%	10%

M5

Ambient Monitoring Data Sheet		
	Morning Events	11:49 ~~Afternoon~~ Events
Date	11/19/19	11/19
Time	11:35 - 11:45	11:47 - 11:57
Monitor #	1	1
Event #	C010	C011
Location Description and Latitude & Longitude	27.98924115, -81.7977609 Opposite 100 & 102 Thornhill Ests. Drive S.	← Same
Event Duration	10 mins	10 mins
Noise Environment Sources	Traffic on Thornhill Rd in distance, traffic on Thornhill Estates Dr. S Rooster in distance, Goat nearby	Traffic Thornhill Rd Distant plane Three pickup trucks on Thornhill Estates Dr. S. Wind noise as difference?
Final LEQ	53.0 Leq	58.5 Leq
Weather		
Temperature	71° F	72° F
Humidity	42%	41%
Wind Speed	4-5 mph	5-7 gust to 10 mph
Wind Direction	W	W
Cloud Cover	Scattered 15-20%	20%

M5 contd

Ambient Monitoring Data Sheet		
	~~Morning~~ Events	Afternoon Events
Date	11/19/19	
Time	12:00 - 12:10	
Monitor #	1	
Event #	C012	
Location Description and Latitude & Longitude	Same as C010 & C011 27.989245, -81.777609	
Event Duration	10 mins	
Noise Environment Sources	3 large pickups, 2 SUVs on Thornhill Estates Dr S Distant traffic on Thornhill Rd	
Final LEQ	56.2 Leq	
Weather		
Temperature	74° F	
Humidity	42%	
Wind Speed	4-7 mph, Gusts to 10	
Wind Direction	W	
Cloud Cover	25%	

M6

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	11/19/19	11/19/19
Time	13:33 - 13:43	13:44 - 13:54
Monitor #	1	1
Event #	C013	C014
Location Description and Latitude & Longitude	27.9707503, -81.7963055 W. of 35 Hurst Road on Bend of Road at Dunaway Rd	← Same
Event Duration	10 minutes	10 min
Noise Environment Sources	Very Quiet, only breeze, rustling leaves	Very Quiet, breeze, one vehicle drove by (mail jeep), howl of wind across guy wire holding power pole
Final LEQ	46.9 Leq	48.9 Leq
Weather		
Temperature	74°F	73°F
Humidity	39%	38%
Wind Speed	3-4 mph	3-6 mph gust to 7
Wind Direction	W	W
Cloud Cover	Clear	Clear

M7

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	11/19/19	11/19/19
Time	14:05 - 14:15	14:16 - 14:26
Monitor #	1	
Event #	C015	C016
Location Description and Latitude & Longitude	Across 25 Arthur Lane 27.9696618, -81.7982762	← Same
Event Duration	10 minutes	10 minutes
Noise Environment Sources	Breeze, wind chimes at 25 Arthur Lane, Plane in distance	Breeze, wind chimes at 25 Arthur Lane Cow grazing 10' from Microphone - audible Mooing
Final LEQ	45.4	46.7
Weather		
Temperature	71°F	72°F
Humidity	40%	43%
Wind Speed	2-4 mph, gust to 7	2-4 mph, gust to 5
Wind Direction	NW	NW
Cloud Cover	Clear	Clear

M8

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	11/19/19	11/19/19
Time	14:57 - 15:01	15:03 - 15:13
Monitor #	1	1
Event #	C017	C018
Location Description and Latitude & Longitude	27.94 73858, -81.79 89806 In side yard of First Love Church of God in Christ	← Same
Event Duration	10 min	10 min
Noise Environment Sources	Rustling leaves, Distant intermittent traffic on Old Bartow Eagle Lake Road Distant helicopter from Bartow airport Dog barking in distance	Rustling leaves Distant traffic on Old Bartow Eagle Lake Road, Dog barking in distance Distant weed whacker
Final LEQ	46.8 dB(A) Leq	45.0 dB(A) Leq
Weather		
Temperature	72°F	72°F
Humidity	39%	41%
Wind Speed	3-5 mph, gusts to 8	2-5 mph
Wind Direction	W	W
Cloud Cover	Clear	Clear

M9

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	11/19/19	11/19/19
Time	15:22 - 15:32	15:33 - 15:43
Monitor #	1	1
Event #	C019	C020
Location Description and Latitude & Longitude	Front yard at end of Gertie's Rd. 27.9483729, -81.8017725	← Same
Event Duration	10 minutes	10 minutes
Noise Environment Sources	Two Nearby planes from Bartow airport Very distant traffic	Really quiet. Distant Planes. Distant traffic
Final LEQ	45.8 Leq dB(A)	42.3 Leq dB(A)
Weather		
Temperature	74°F	70°F
Humidity	39%	43%
Wind Speed	2-3 mph	2-4 mph, gust to 5
Wind Direction	W	W
Cloud Cover	Clear	Clear

M10

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	12/3/19	
Time	9:00 AM	
Monitor #	1	
Event #	c001, c002	
Location Description and Latitude & Longitude	27.9383192 -81,8061197	
Event Duration	10 minutes	
Noise Environment Sources	Event 1: Traffic from 17 constant and dominant. Bird chirping around 7 minutes into event, lasted about 1 minute Event 2: Traffic from 17 again dominant I car drove by for about 10 seconds. Plane directly overhead, duration 30 seconds. Birds chirping for about	
Final LEQ	E-1 55.5, E-2 55.7	
Weather		
Temperature	55 °F	
Humidity	50%	
Wind Speed	3 mph	
Wind Direction	N to S	
Cloud Cover	0%	

APPENDIX C

PREDICTED NOISE LEVELS

Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2045 Build Condition dB(A)	NAC Approached or Exceeded?	Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
	8	W1	B	Residential	1	58.2	NO	Existing Conditions Modeled	55.6	2.6	NO
	8	W2	B	Residential	1	56.3	NO	Existing Conditions Modeled	53.1	3.2	NO
	8	W3	B	Residential	1	54.6	NO	Existing Conditions Modeled	50.3	4.3	NO
	8	W4	B	Residential	1	54.0	NO	Existing Conditions Modeled	48.4	5.6	NO
	8	W5	B	Residential	1	53.9	NO	Existing Conditions Modeled	46.9	7.0	NO
	8	W6	B	Residential	1	54.2	NO	Existing Conditions Modeled	45.5	8.7	NO
	8	W7	B	Residential	1	54.4	NO	Existing Conditions Modeled	45.2	9.2	NO
	8 & 9	W8	B	Residential	1	54.1	NO	Existing Conditions Modeled	46.3	7.8	NO
	8 & 9	W9	B	Residential	1	54.0	NO	Existing Conditions Modeled	47.1	6.9	NO
	8 & 9	W10	B	Residential	1	54.1	NO	Existing Conditions Modeled	48.0	6.1	NO
	8 & 9	W11	B	Residential	1	54.4	NO	Existing Conditions Modeled	49.1	5.3	NO
	9	W12	B	Residential	1	54.8	NO	Existing Conditions Modeled	50.1	4.7	NO
	9	W13	B	Residential	1	55.3	NO	Existing Conditions Modeled	51.2	4.1	NO
	9	W14	B	Residential	1	56.8	NO	Existing Conditions Modeled	53.6	3.2	NO
Residences along Thornhill Rd. from Country Walk Ln. to CPP	9	W15	B	Residential	1	58.1	NO	Existing Conditions Modeled	55.3	2.8	NO
	9	W16	B	Residential	1	60.2	NO	Existing Conditions Modeled	57.7	2.5	NO
	8	W17	B	Residential	1	58.1	NO	Existing Conditions Modeled	55.5	2.6	NO
	8	W18	B	Residential	1	56.3	NO	Existing Conditions Modeled	53.1	3.2	NO
	8	W19	B	Residential	1	54.7	NO	Existing Conditions Modeled	50.4	4.3	NO
	8	W20	B	Residential	1	54.1	NO	Existing Conditions Modeled	48.8	5.3	NO
	8 & 9	W21	B	Residential	1	54.9	NO	Existing Conditions Modeled	50.6	4.3	NO
	8 & 9	W22	B	Residential	1	55.7	NO	Existing Conditions Modeled	52.1	3.6	NO
	9	W23	B	Residential	1	56.9	NO	Existing Conditions Modeled	53.9	3.0	NO
	9	W24	B	Residential	1	59.2	NO	Existing Conditions Modeled	56.7	2.5	NO
	8 & 9	W25	B	Residential	1	54.7	NO	Existing Conditions Modeled	45.4	9.3	NO
	8 & 9	W26	B	Residential	1	55.4	NO	Existing Conditions Modeled	45.9	9.5	NO
	8 & 9	W27	B	Residential	1	57.5	NO	Existing Conditions Modeled	43.9	13.6	NO
	9	W28	B	Residential	1	57.1	NO	Existing Conditions Modeled	49.4	7.7	NO
	9	W29	B	Residential	1	58.9	NO	Existing Conditions Modeled	47.4	11.5	NO
Residences along CPP south of Thornhill Rd.	10	W30	B	Residential	1	66.8	YES	Existing Conditions Modeled	62.3	4.5	NO

Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2045 Build Condition dB(A)	NAC Approached or Exceeded?	Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
	10	W31	B	Residential	1	64.5	NO	Existing Conditions Modeled	54.5	10.0	NO
	10	W32	B	Residential	1	64.9	NO	Existing Conditions Modeled	52.4	12.5	NO
	10	W33	B	Residential	1	64.4	NO	Existing Conditions Modeled	48.4	16.0	YES
	10	W34	B	Residential	1	64.1	NO	M4	47.0	17.1	YES
	10	W35	B	Residential	1	64.6	NO	M4	47.0	17.6	YES
	10	W36	B	Residential	1	64.3	NO	M4	47.0	17.3	YES
	10	W37	B	Residential	1	61.4	NO	Existing Conditions Modeled	46.8	14.6	NO
	10	W38	B	Residential	1	59.3	NO	Existing Conditions Modeled	51.3	8.0	NO
	10	W39	B	Residential	1	58.5	NO	Existing Conditions Modeled	45.1	13.4	NO
	10	W40	B	Residential	1	53.6	NO	M4	47.0	6.6	NO
	10	W41	B	Residential	1	53.4	NO	M4	47.0	6.4	NO
	10	W42	B	Residential	1	53.4	NO	M4	47.0	6.4	NO
Marshall Hampton Trail	4	W43-1	C	Trail	n/a	54.9	NO	M1	48.1	6.8	NO
	4	W43-2	C	Trail	n/a	56.1	NO	M1	48.1	8.0	NO
	4	W43-3	C	Trail	n/a	58.7	NO	M1	48.1	10.6	NO
	4	W43-4	C	Trail	n/a	59.7	NO	M1	48.1	11.6	NO
	6	W43-5	C	Trail	n/a	60.2	NO	M1	48.1	12.1	NO
	6	W43-6	C	Trail	n/a	60.5	NO	M1	48.1	12.4	NO
	6	W43-7	C	Trail	n/a	60.7	NO	M1	48.1	12.6	NO
	6	W43-8	C	Trail	n/a	60.9	NO	M1	48.1	12.8	NO
	6	W43-9	C	Trail	n/a	61.2	NO	M1	48.1	13.1	NO
	6	W43-10	C	Trail	n/a	61.5	NO	M1	48.1	13.4	NO
	6	W43-11	C	Trail	n/a	62.2	NO	M1	48.1	14.1	NO
	6	W43-12	C	Trail	n/a	62.9	NO	M1	48.1	14.8	NO
	6	W43-13	C	Trail	n/a	64.3	NO	M1	48.1	16.2	YES
	6	W43-14	C	Trail	n/a	65.6	NO	M1	48.1	17.5	YES
	6	W43-15	C	Trail	n/a	65.6	NO	M1	48.1	17.5	YES
	6	W43-16	C	Trail	n/a	65.9	NO	M1	48.1	17.8	YES
	6	W43-17	C	Trail	n/a	65.2	NO	M1	48.1	17.1	YES
	6	W43-18	C	Trail	n/a	62.6	NO	M1	48.1	14.5	NO

Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2045 Build Condition dB(A)	NAC Approached or Exceeded?	Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
	6	W43-19	C	Trail	n/a	60.4	NO	M1	48.1	12.3	NO
Residences along Indian Bluff and Byni Ridge	5	E1	B	Residential	1	53.9	NO	M1	48.1	5.8	NO
	5	E2	B	Residential	1	55.3	NO	M1	48.1	7.2	NO
	5	E3	B	Residential	1	56.5	NO	M1	48.1	8.4	NO
	5	E4	B	Residential	1	57.4	NO	M1	48.1	9.3	NO
	5	E5	B	Residential	1	57.2	NO	M1	48.1	9.1	NO
	5	E6	B	Residential	1	57.0	NO	M1	48.1	8.9	NO
	5	E7	B	Residential	1	56.5	NO	M1	48.1	8.4	NO
	5	E8	B	Residential	1	56.3	NO	M1	48.1	8.2	NO
	5	E9	B	Residential	1	55.7	NO	M1	48.1	7.6	NO
	5	E10	B	Residential	1	56.5	NO	M1	48.1	8.4	NO
	5	E11	B	Residential	1	56.5	NO	M1	48.1	8.4	NO
	5	E12	B	Residential	1	56.1	NO	M1	48.1	8.0	NO
	5	E13	B	Residential	1	55.7	NO	M1	48.1	7.6	NO
	5	E14	B	Residential	1	55.2	NO	M1	48.1	7.1	NO
	5	E15	B	Residential	1	55.2	NO	M1	48.1	7.1	NO
	5	E16	B	Residential	1	55.0	NO	M1	48.1	6.9	NO
	5	E17	B	Residential	1	54.7	NO	M1	48.1	6.6	NO
	5	E18	B	Residential	1	54.7	NO	M1	48.1	6.6	NO
	5	E19	B	Residential	1	54.3	NO	M1	48.1	6.2	NO
	5	E20	B	Residential	1	53.8	NO	M1	48.1	5.7	NO
	5	E21	B	Residential	1	53.8	NO	M1	48.1	5.7	NO
	5	E22	B	Residential	1	53.7	NO	M1	48.1	5.6	NO
	5	E23	B	Residential	1	54.5	NO	M1	48.1	6.4	NO
	5	E24	B	Residential	1	62.4	NO	M1	48.1	14.3	NO
Isolated Residence along Thornhill Rd.	6	E25	B	Residential	1	57.2	NO	M4	47.0	10.2	NO
Isolated Residence south of SR 540	7	E26	B	Residential	1	52.9	NO	M1	48.1	4.8	NO
Residences east of CPP on Thornhill Rd. and in Thornhill Estates	9	E27	B	Residential	1	51.1	NO	M4	47.0	4.1	NO
	9	E28	B	Residential	1	52.3	NO	M4	47.0	5.3	NO
	9	E29	B	Residential	1	53.7	NO	M4	47.0	6.7	NO

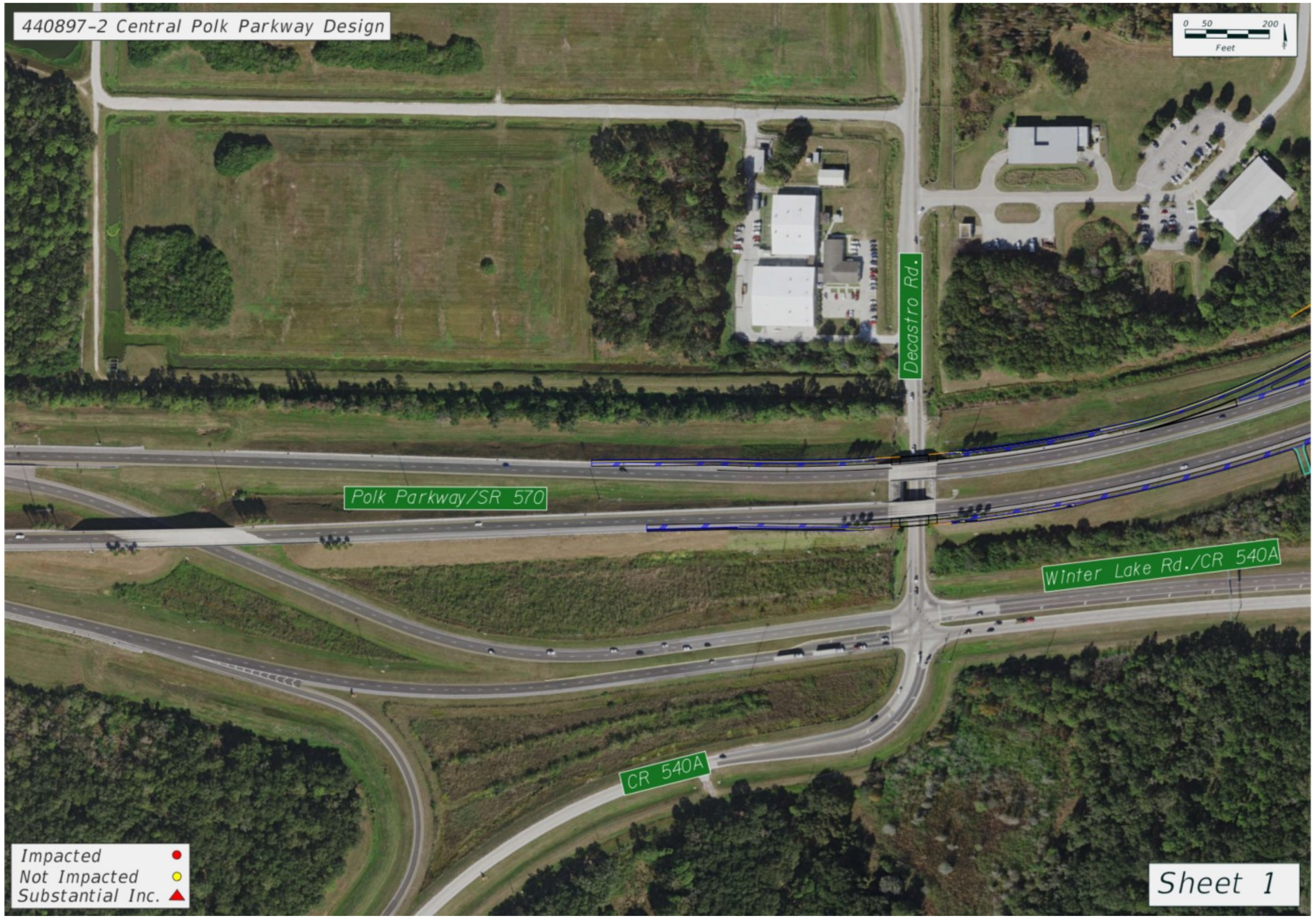
Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2045 Build Condition dB(A)	NAC Approached or Exceeded?	Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
	9	E30	B	Residential	1	55.6	NO	M4	47.0	8.6	NO
	9	E31	B	Residential	1	56.8	NO	M4	47.0	9.8	NO
	9	E32	B	Residential	1	59.4	NO	M4	47.0	12.4	NO
	9	E33	B	Residential	1	60.7	NO	M4	47.0	13.7	NO
	9	E34	B	Residential	1	58.7	NO	M4	47.0	11.7	NO
	9	E35	B	Residential	1	60.5	NO	M4	47.0	13.5	NO
	9	E36	B	Residential	1	58.5	NO	M4	47.0	11.5	NO
	9	E37	B	Residential	1	58.8	NO	M4	47.0	11.8	NO
	9 & 10	E38	B	Residential	1	58.3	NO	M4	47.0	11.3	NO
	9 & 10	E39	B	Residential	1	59.1	NO	M4	47.0	12.1	NO
	9 & 10	E40	B	Residential	1	58.9	NO	M4	47.0	11.9	NO
	9	E41	B	Residential	1	56.6	NO	M4	47.0	9.6	NO
	9	E42	B	Residential	1	54.8	NO	M4	47.0	7.8	NO
	9	E43	B	Residential	1	50.9	NO	M4	47.0	3.9	NO
	9	E44	B	Residential	1	50.6	NO	M4	47.0	3.6	NO
	9	E45	B	Residential	1	50.2	NO	M4	47.0	3.2	NO
	9	E46	B	Residential	1	50.3	NO	M4	47.0	3.3	NO
	9	E47	B	Residential	1	55.8	NO	M4	47.0	8.8	NO
	9	E48	B	Residential	1	55.5	NO	M4	47.0	8.5	NO
	9	E49	B	Residential	1	54.0	NO	M4	47.0	7.0	NO
	9	E50	B	Residential	1	54.2	NO	M4	47.0	7.2	NO
	9	E51	B	Residential	1	51.3	NO	M4	47.0	4.3	NO
	9	E52	B	Residential	1	52.7	NO	M4	47.0	5.7	NO
	9 & 10	E53	B	Residential	1	52.0	NO	M4	47.0	5.0	NO
	9 & 10	E54	B	Residential	1	53.3	NO	M4	47.0	6.3	NO
	9 & 10	E55	B	Residential	1	57.8	NO	M4	47.0	10.8	NO
	9 & 10	E56	B	Residential	1	56.6	NO	M4	47.0	9.6	NO
	9 & 10	E57	B	Residential	1	55.8	NO	M4	47.0	8.8	NO
	9 & 10	E58	B	Residential	1	54.7	NO	M4	47.0	7.7	NO
	9 & 10	E59	B	Residential	1	54.0	NO	M4	47.0	7.0	NO

Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2045 Build Condition dB(A)	NAC Approached or Exceeded?	Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
	9 & 10	E60	B	Residential	1	53.0	NO	M4	47.0	6.0	NO
	9 & 10	E61	B	Residential	1	65.1	NO	Existing Conditions Modeled	48.9	16.2	YES
	10	E62	B	Residential	1	61.5	NO	Existing Conditions Modeled	57.0	4.5	NO
	10	E63	B	Residential	1	59.7	NO	Existing Conditions Modeled	55.8	3.9	NO
	10	E64	B	Residential	1	62.9	NO	Existing Conditions Modeled	60.3	2.6	NO
	10	E65	B	Residential	1	56.7	NO	Existing Conditions Modeled	52.6	4.1	NO
	9 & 10	E66	B	Residential	1	53.7	NO	M4	47.0	6.7	NO
	10	E67	B	Residential	1	53.4	NO	M4	47.0	6.4	NO
	10	E68	B	Residential	1	52.0	NO	M4	47.0	5.0	NO
	16	E81	B	Residential	1	54.6	NO	M9	44.1	10.6	NO
	16	E82	B	Residential	1	52.3	NO	M9	44.1	8.3	NO
	16	E83	B	Residential	1	53.2	NO	M9	44.1	9.2	NO
	16	E84	B	Residential	1	53.2	NO	M9	44.1	9.2	NO
	16	E85	B	Residential	1	53.3	NO	M8	45.9	7.4	NO
	16	E86	B	Residential	1	53.1	NO	M8	45.9	7.2	NO
	16	E87	B	Residential	1	53.3	NO	M8	45.9	7.4	NO
	16	E88	B	Residential	1	51.4	NO	M8	45.9	5.5	NO
	16	E89	B	Residential	1	51.8	NO	M8	45.9	5.9	NO
	16	E90	B	Residential	1	51.4	NO	M8	45.9	5.5	NO
Residences on Old Bartow Eagle Lake Rd.	16	E91	B	Residential	1	51.1	NO	M8	45.9	5.2	NO
	16	E92	B	Residential	1	51.6	NO	M8	45.9	5.7	NO
	16	E93	B	Residential	1	52.0	NO	M8	45.9	6.1	NO
	16 & 17	E94	B	Residential	1	52.9	NO	M8	45.9	7.0	NO
	16 & 17	E95	B	Residential	1	53.9	NO	M8	45.9	8.0	NO
	16 & 17	E96	B	Residential	1	54.3	NO	M8	45.9	8.4	NO
	17	E97	B	Residential	1	55.2	NO	M8	45.9	9.3	NO
	17	E98	B	Residential	1	55.7	NO	M8	45.9	9.8	NO
	17	E99	B	Residential	1	56.0	NO	M8	45.9	10.1	NO
	17	E100	B	Residential	1	56.4	NO	M8	45.9	10.5	NO
	17	E101	B	Residential	1	56.4	NO	M8	45.9	10.5	NO

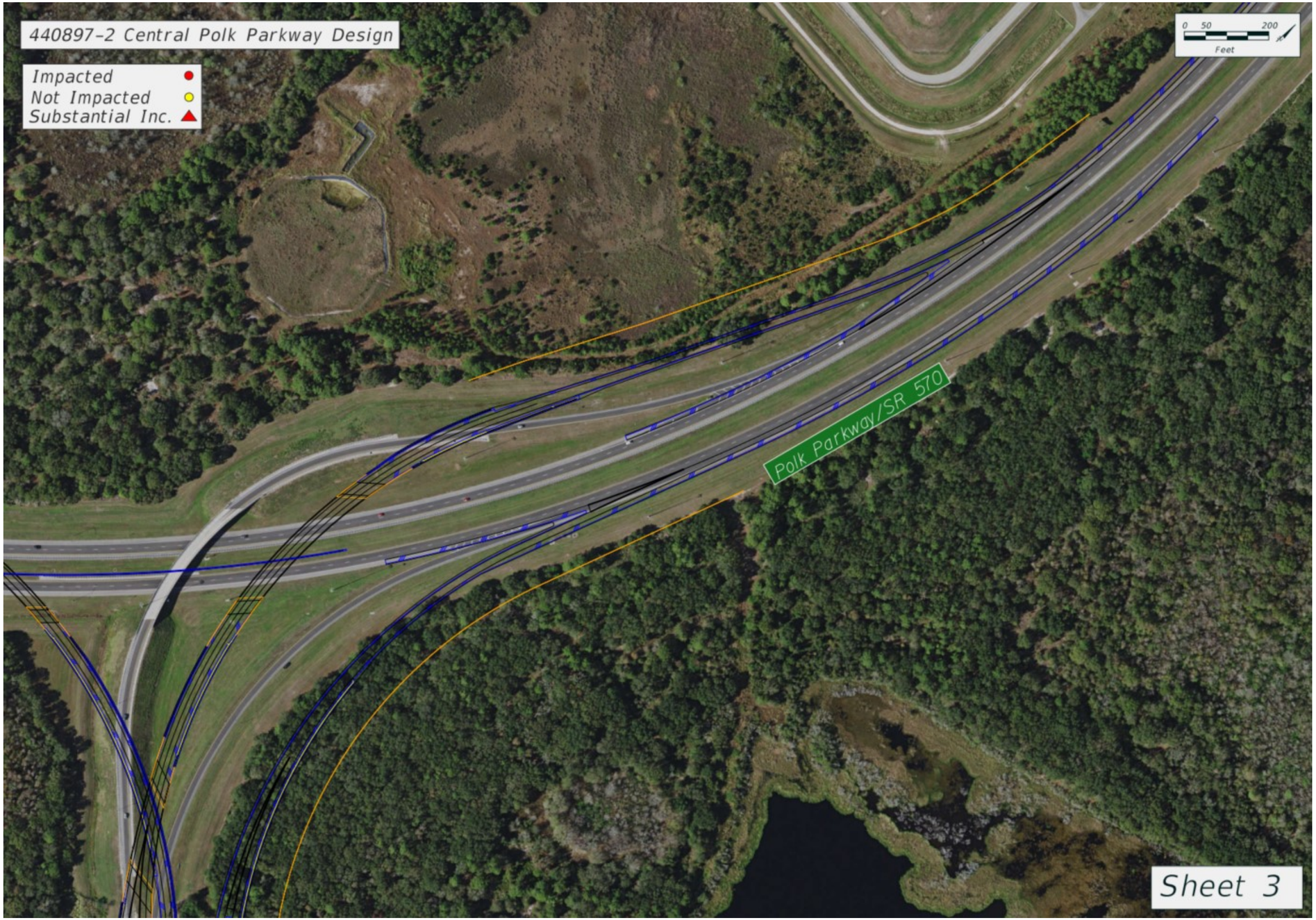
Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2045 Build Condition dB(A)	NAC Approached or Exceeded?	Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
	17	E102	B	Residential	1	56.6	NO	M8	45.9	10.7	NO
	17	E103	B	Residential	1	56.7	NO	M8	45.9	10.8	NO
	17	E104	B	Residential	1	57.2	NO	M8	45.9	11.3	NO
	17	E105	B	Residential	1	57.3	NO	M8	45.9	11.4	NO
Residences along US 17	17	E106	B	Residential	1	64.8	NO	M10	55.6	9.2	NO
	17	E107	B	Residential	1	63.5	NO	M10	55.6	7.9	NO
	17	E108	B	Residential	1	63.5	NO	M10	55.6	7.9	NO
	17	E109	B	Residential	1	62.7	NO	M10	55.6	7.1	NO
	17	E110	B	Residential	1	64.5	NO	M10	55.6	8.9	NO
	17	E111	B	Residential	1	66.4	YES	M10	55.6	10.8	NO

APPENDIX D

AERIALS


440897-2 Central Polk Parkway Design
0 50 200
Feet
Decastro Rd.
Polk Parkway/SR 570
Winter Lake Rd./CR 540A
CR 540A
Impacted
Not Impacted
Substantial Inc.
Sheet 1


440897-2 Central Polk Parkway Design
0 50 200
Feet
Decastro Rd.
Winter Lake Rd./CR 540A
Polk Parkway/SR 570
Impacted
Not Impacted
Substantial Inc.
Sheet 2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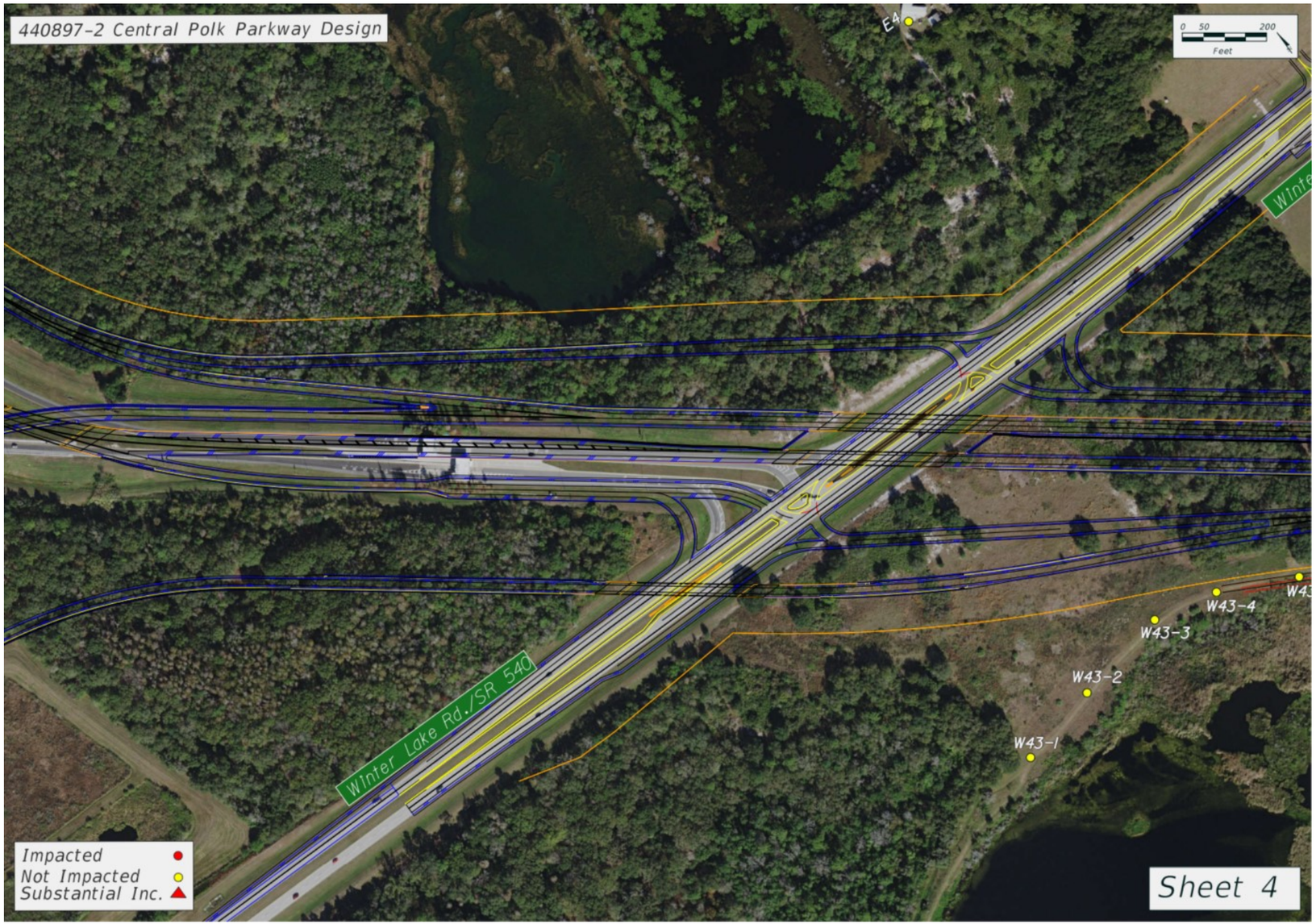
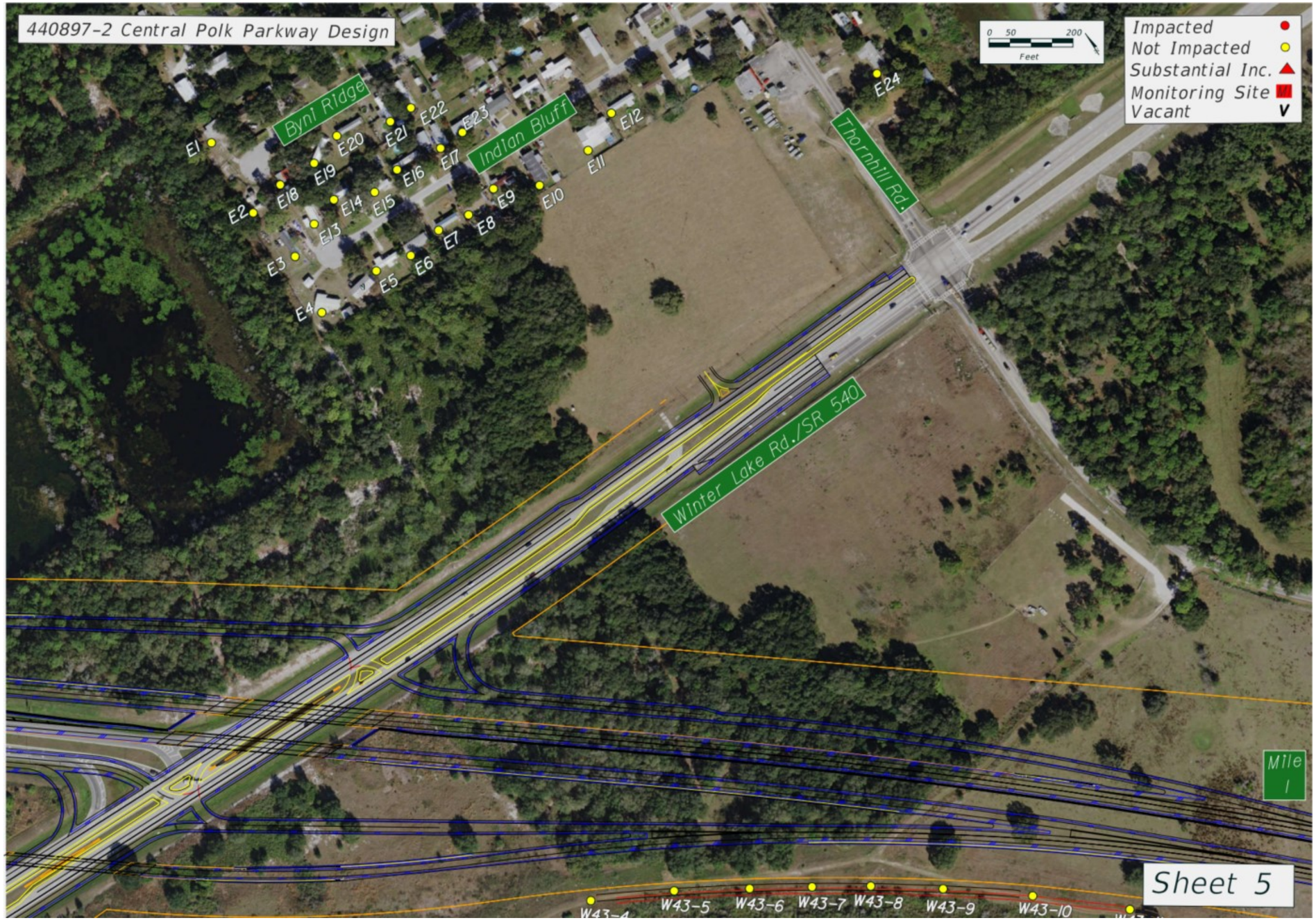
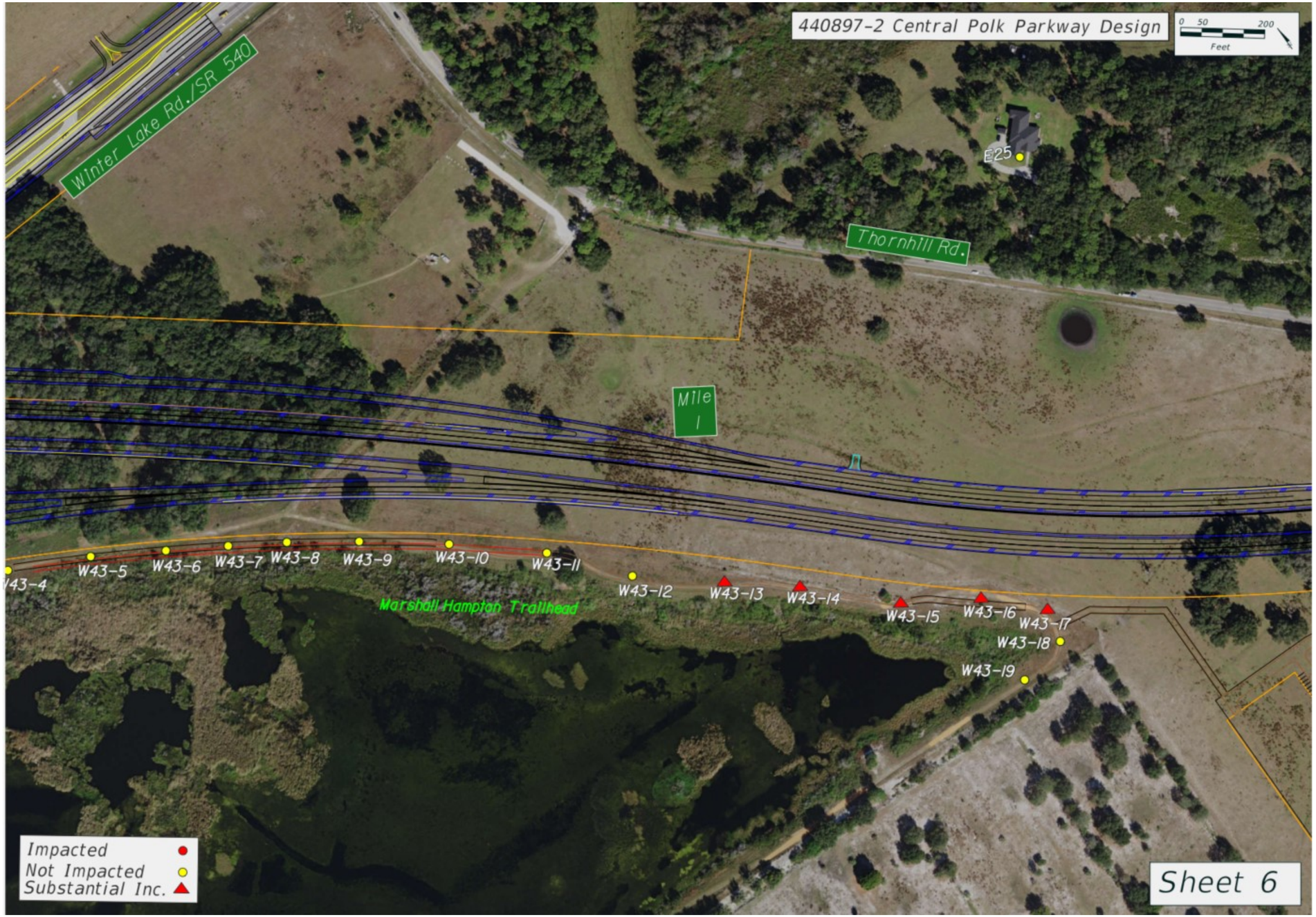
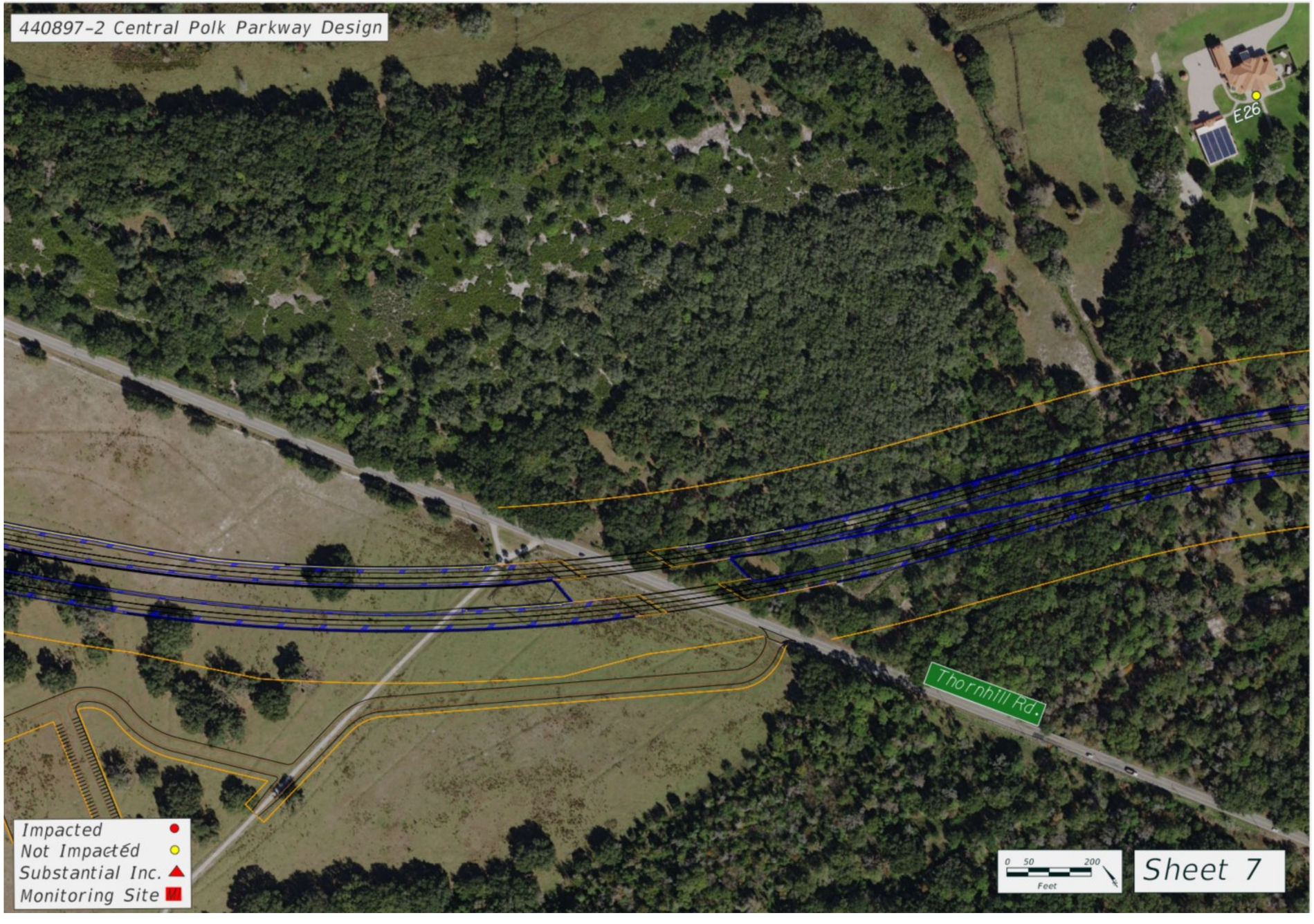
Impacted
Not Impacted
Substantial Inc.
0 50 200
Feet
Polk Parkway/SR 570
Sheet 3


440897-2 Central Polk Parkway Design
0 50 200
Feet
E4
W43-4
W43-3
W43-2
W43-1
Winter Lake Rd./SR 540
Impacted
Not Impacted
Substantial Inc.
Sheet 4

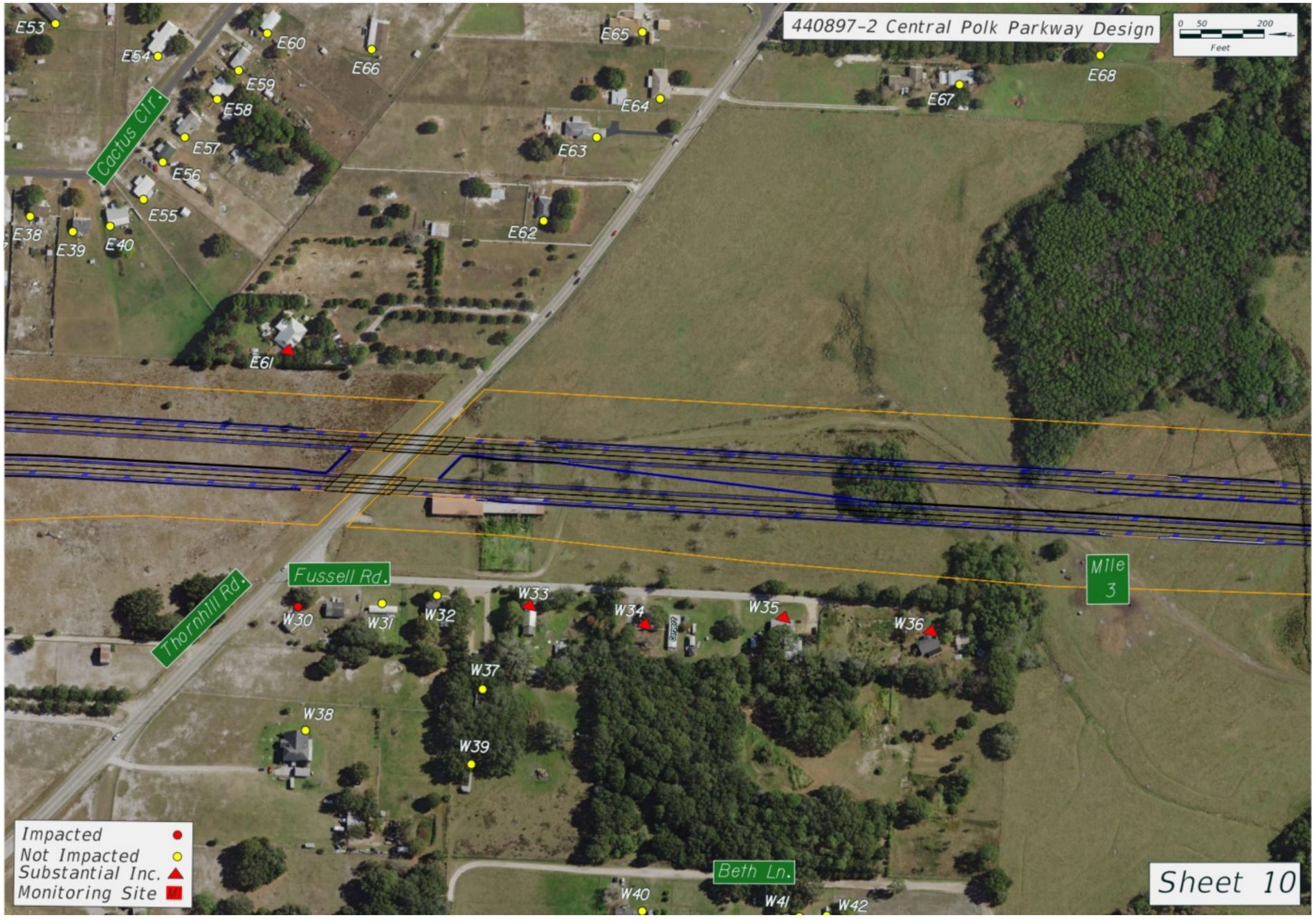

440897-2 Central Polk Parkway Design
0 50 200
Feet
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Vacant
Byni Ridge
Indian Bluff
Thornhill Rd.
Winter Lake Rd./SR 540
E1
E2
E3
E4
E5
E6
E7
E8
E9
E10
E11
E12
E13
E14
E15
E16
E17
E18
E19
E20
E21
E22
E23
E24
W43-5
W43-6
W43-7
W43-8
W43-9
W43-10
Mile
Sheet 5


440897-2 Central Polk Parkway Design
0 50 200
Feet
Winter Lake Rd./SR 540
E25
Thornhill Rd.
Mile
1
W43-4
W43-5
W43-6
W43-7
W43-8
W43-9
W43-10
W43-11
W43-12
W43-13
W43-14
W43-15
W43-16
W43-17
W43-18
W43-19
Marshall Hampton Trailhead
Impacted
Not Impacted
Substantial Inc.
Sheet 6


440897-2 Central Polk Parkway Design
E26
Thornhill Rd.
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
0 50 200
Feet
Sheet 7


440897-2 Central Polk Parkway Design
0 50 200
Feet
E26
Mile 2
Thornhill Rd.
W1
W2
W3
W4
W5
W6
W7
W8
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Sheet 8


440897-2 Central Polk Parkway Design
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
0 50 200
Feet
Thornhill Estates Ct.
Cactus Cir. N.
Cactus Cir.
Country Walk Ln.
Thornhill Rd.
Fussell Rd.
Mile 2
E27
E28
E29
E30
E31
E32
E33
E34
E41
E42
E43
E44
E45
E46
E51
E49
E47
E48
E50
E52
E53
E54
E35
E36
E37
E38
E39
E40
E55
E56
E61
W27
W29
W25
W26
W28
W7
W6
W8
W9
W10
W11
W12
W13
W14
W15
W16
W5
W20
W4
W19
W3
W18
W2
W17
W21
W22
W23
W24
W30
Sheet 9

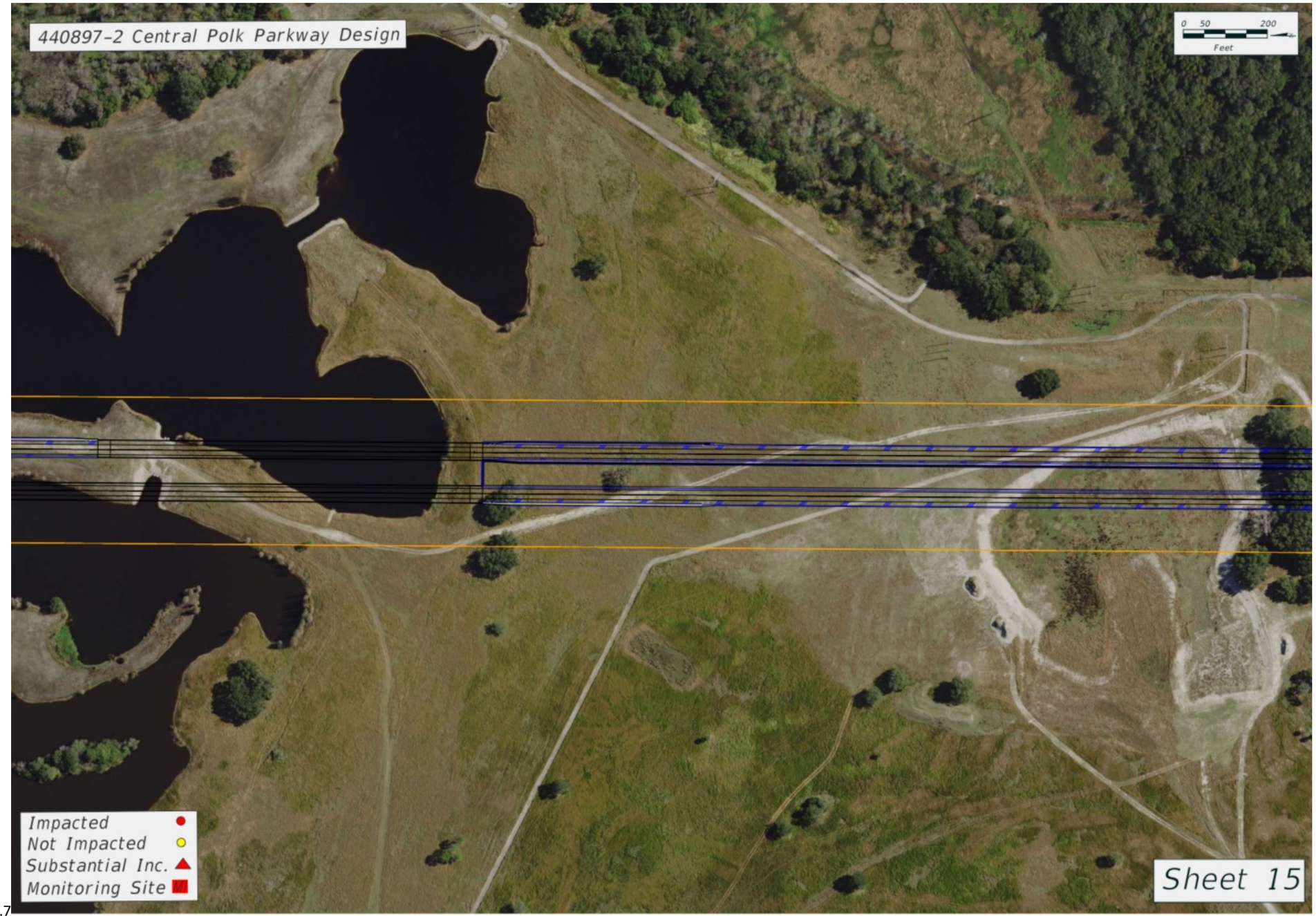

440897-2 Central Polk Parkway Design
0 50 200
Feet
E53
E54
E60
E66
E59
E58
E57
E56
E55
E38
E39
E40
E61
E65
E64
E63
E62
E68
E67
Cactus Ctr.
Fussell Rd.
Thornhill Rd.
Mile 3
W30
W31
W32
W33
W34
W35
W36
W37
W38
W39
W40
W41
W42
Beth Ln.
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Sheet 10


440897-2 Central Polk Parkway Design
E68
0 50 200
Feet
Mile 3
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Sheet 11

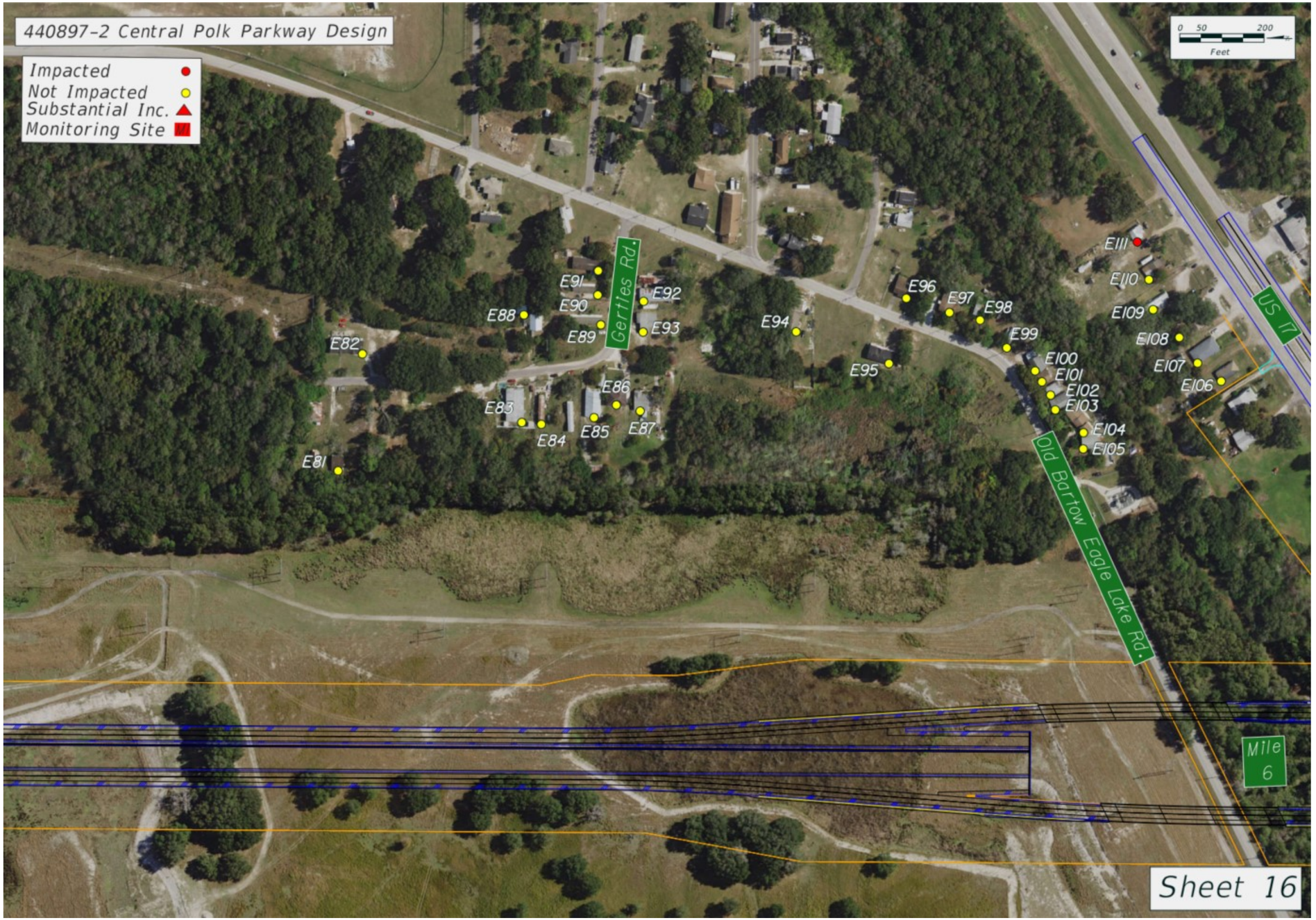

440897-2 Central Polk Parkway Design
0 50 200
Feet
Mile 4
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Sheet 12


440897-2 Central Polk Parkway Design
0 50 200
Feet
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Sheet 13


440897-2 Central Polk Parkway Design
0 50 200
Feet
Mile
5
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Sheet 14


440897-2 Central Polk Parkway Design
0 50 200
Feet
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Sheet 15

.7


440897-2 Central Polk Parkway Design
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
0 50 200
Feet
Gerties Rd.
US 17
Old Bartow Eagle Lake Rd.
Mile 6
E81
E82
E83
E84
E85
E86
E87
E88
E89
E90
E91
E92
E93
E94
E95
E96
E97
E98
E99
E100
E101
E102
E103
E104
E105
E106
E107
E108
E109
E110
E111
Sheet 16


440897-2 Central Polk Parkway Design
0 50 200
Feet
EI11
EI10
EI09
EI08
EI07
EI06
EI00
EI01
EI02
EI03
EI04
EI05
US 17
Old Bartow Eagle Lake Rd.
Mile 6
1st St.
Impacted
Not Impacted
Substantial Inc.
Monitoring Site
Take
Sheet 17

APPENDIX E

TNM Files

TNM Files provided in the Project File.