NOISE STUDY REPORT ADDENDUM

Florida Department of Transportation

District One

SR 29 Immokalee

Limits of Project: Oil Well Road to SR 82

Collier County, Florida

Financial Management Number: 417540-1

ETDM Number: 3752

Date: March 2024

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration and FDOT.

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SECTION 1 INTRODUCTION

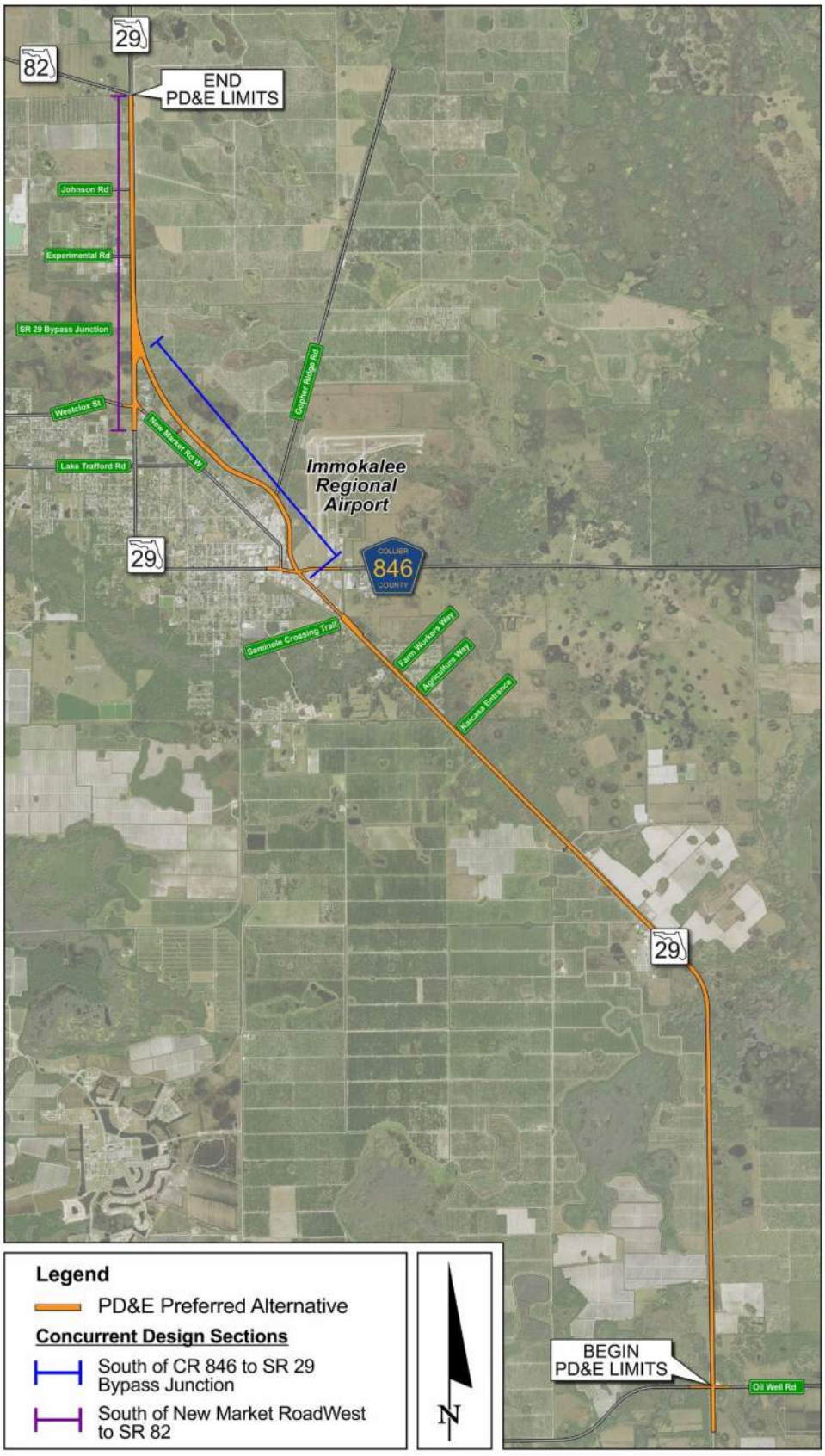
A Project Development and Environment (PD&E) Public Hearing was held on November 15, 2018, to present the Preferred Alternative and provide the public with the opportunity to review project documents and provide comments. Refinements to the Preferred Alternative have been made to meet the Florida Department of Transportation (FDOT) Design Manual (FDM) requirements and include the identification of stormwater management facilities (SMF), necessary to accommodate stormwater runoff. This Noise Study Report Addendum supplements the Noise Study Report dated July 2018, and specifically addresses the design refinements for the project.

Refer to **Appendix A** for updated concept plans. The project location is shown in **Figure 1**.

CR 846 to SR 29 Bypass Junction: The proposed new signalized intersection at CR 846 and the proposed intersection at Gopher Ridge Road have been revised to roundabouts at these locations. The proposed right-of-way (ROW) requirement previously varied from 108 feet to 200 feet and has been increased to varying from 144 feet to 250 feet. The two 11-foot travel lanes in each direction have been increased to 12-foot travel lanes in each direction from CR 846 to Gopher Ridge Road. The 6-foot sidewalk and 7-foot buffered bicycle lanes in each direction have been replaced with 12-foot shared use paths from CR 846 to Gopher Ridge Road. Twelve-foot shared use paths have been added to both sides of the corridor from Gopher Ridge Road to the SR 29 Bypass Junction. As a result of criteria updates, the proposed design speeds, ranging from 45-50 miles per hour (mph), have been updated and range from 45-55 mph. Three SMFs have been identified. The three proposed SMFs will require approximately 22 acres of offsite right-of-way. Stormwater runoff will be conveyed to the proposed SMFs by an open drainage system within the existing mainline right-of-way.

South of New Market Road West to SR 82: The currently existing signalized intersection at New Market Road West and SR 29 has been revised to a roundabout at this location. A 10-foot shared use path has been added on the east side of the roadway from north of New Market Road West to SR 82, thus providing a 10-foot shared use path on both sides of the corridor. The mainline roadway improvements required for the proposed project will not require any additional right-of-way. As a result of criteria updates, the proposed design speeds, ranging from 50-60 mph, have been unified at 55 mph. Six SMFs have been identified. The six proposed SMFs will require approximately 20.3 acres of offsite right-of-way. Stormwater runoff will be conveyed to the proposed SMFs by an open drainage system within the existing mainline right-of-way.

Figure 1 Project Location Map



SECTION 2 METHODOLOGY

Design refinements for the Preferred Alternative have occurred since the previous Noise Study Report (July 2018) was prepared. This Noise Study Report Addendum documents the land use review performed for SR 29 from CR 846 to SR 82 to identify any land use changes that warrant traffic noise analysis. Field reviews to identify land use changes were conducted on December 12, 2023, and February 6, 2024. The land use changes are listed and discussed below:

- A new residential development is under construction along Foundation Way. Receptors were added to the Traffic Noise Model (TNM) to include these noise sensitive sites.
- Florida Power and Light Immokalee Solar Energy Center, located approximately 1,000 feet north of Johnson Road and continuing north to SR 82 (northern terminus), on the east side of SR 29, is a large solar panel facility. It is not a noise sensitive land use and therefore does not warrant noise analysis.

This noise analysis was prepared in accordance with Title 23 Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise. The evaluation uses methodologies established by FDOT and documented in the FDOT PD&E Manual (July 2023). The design year (2045) noise exposure levels were predicted using the Federal Highway Administration's (FHWA) approved noise modeling software, TNM 2.5.

2.1 NOISE METRICS

Existing year noise levels, noise study area, previously modeled receptors, and noise abatement criteria utilized within the July 2018 Noise Study Report (FDOT District One, 2018) were utilized for this analysis. Additionally, the traffic information provided in the July 2018 Noise Study Report (FDOT District One, 2018) was also used for the purpose of this noise evaluation. Additional receptors were added for the new residential development along Foundation Way, which consists of 18 parcels.

Ambient noise measurements were previously collected along Madison Avenue. No new noise measurements were collected due to the proximity of a previous ambient measurement to the new residential development. Therefore, validation of the existing model was not necessary.

2.2 NOISE ABATEMENT CRITERIA

The analysis of the proposed design update for the SR 29 Immokalee project was completed using TNM 2.5, the FHWA's approved model for predicting noise levels associated with highway projects. TNM generated noise emission levels for the project, which are reported in dB(A), were compared against the Noise Abatement Criteria (NAC) thresholds to determine whether a receptor is impacted. A traffic noise impact occurs if one of the following criteria is found to be true:

- Predicted dB(A) levels approach [within at least 1 dB(A)] or exceed the NAC identified, or
- Predicted dB(A) levels substantially increase [at least 15 dB(A)] over the existing ambient levels.

FHWA assesses noise impacts based upon the Leq(h). That is, a receptor's cumulative traffic noise exposure from all events over a one-hour period. The maximum hourly noise level occurs with level of service (LOS) C traffic volumes. Traffic volumes used for the noise analysis are the lesser of the LOS C or demand volumes. The demand volumes were used for the Build (2045) scenario as documented in the Noise Study Report dated July 2018.

A land use review was performed to evaluate any changes in land use since the last noise study was performed. This review identified a new residential development with 18 single-family parcels along Foundation Way that warrant a traffic noise impact analysis. As such, these parcels were evaluated for traffic noise impacts. Mapping of the receptors can be found in **Appendix B**.

2.3 NOISE ABATEMENT MEASURES

Consideration of measures to mitigate or abate traffic noise impacts must be afforded if impacted receptors have been identified in the analysis area. FDOT considers noise abatement measures when predicted noise levels approach or exceed the NAC or when noise levels increase substantially, as defined above. In order for abatement to be considered and implemented into the project, it must be determined if it is both feasible and reasonable to construct.

SECTION 3 TRAFFIC NOISE ANALYSIS

Future noise levels with the proposed improvements were modeled using TNM. Based upon the completed analysis, eight of the 18 residential parcels (receptors) were identified as substantially exceeding the existing ambient levels (at least 15 dBA above existing conditions). No receptors were identified as having predicted levels approaching or exceeding the NAC. Predicted noise levels can be found in **Appendix C**. Maps indicating the impacted receptors can be found in **Appendix B**.

3.1 PREDICTED NOISE LEVELS AND ABATEMENT ANALYSIS

Since eight receptors were identified as having a substantial noise increase over ambient conditions within the residential development in construction along Foundation Way, a noise barrier was evaluated to determine if noise abatement measures could be provided that would meet the feasible and reasonable criteria. Maps showing the location of the impacted noise receptors and the noise barrier that was analyzed are located in **Appendix B**.

Several barrier alternatives were modeled, including barrier heights of 8 feet, 10 feet, 12 feet, 14 feet, 15 feet, 16 feet, 18 feet, 20 feet, and 22 feet. The noise barrier alternatives with heights of 14 feet and above were considered reasonable because they provided an Insertion Loss of 7dB(A) for at least one impacted receptor and an insertion loss of 5dB(A) for at least two impacted receptors. However, the cost per benefitted receptor of the barrier was greater than $42,000 for all the height and length alternatives analyzed. Therefore, a barrier at this location is not cost reasonable. Please refer to **Table 1** below.

Table 1 Noise Barrier Analysis Results

Barrier Height (Feet)	Barrier Length (Feet)	Number of Impacted Receptors	Noise Reduction at Impacted* Receptors dB(A)			Number of Benefited Receptors			Average Reduction for Benefited Receptors** dB(A)	Total Estimated Cost***	Cost per Benefited Receptor****
			5-5.9 dB(A)	6-6.9 dB(A)	≥7 dB(A)	Impacted	Not Impacted	Total			
8	1417	8	0	0	0	NA*****	NA*****	NA*****	NA*****	NA***	NA****
10	1417	8	0	0	0	NA*****	NA*****	NA*****	NA*****	NA***	NA****
12	1278	8	3	1	0	4	0	4	5.4	$460,123	$115,031
14	1417	8	4	3	1	8	0	8	5.9	$595,125	$74,391
15	1417	8	5	3	1	8	1	9	6.0	$637,634	$70,848
16	1370	8	5	4	1	8	2	10	6.0	$657,712	$65,771
18	1417	8	7	3	3	8	5	13	6.1	$765,161	$58,859
20	1417	8	7	3	4	8	6	14	6.3	$850,179	$60,727
22	1370	8	7	3	4	8	6	14	6.4	$904,353	$64,597

* Receptors with predicted noise level of 66 dB(A) or greater and/or with ≥ 15 dB(A) increase
** Receptors with a predicted reduction of 5 dB(A) or more are considered benefited
*** Based on a unit cost of $30 per square foot
**** FDOT cost reasonable criterion is $42,000 per benefited receptor
***** 7 dB(A) reduction not achieved at any receptor

SECTION 4 CONSTRUCTION NOISE AND VIBRATION

Based on the existing land use within the limits of this project, construction of the proposed roadway improvements is not anticipated to have any significant construction noise or vibration impact. If sensitive land uses develop adjacent to the roadway prior to construction, increased potential for construction noise and vibration 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 District Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

SECTION 5 NOISE CONTOUR ANALYSIS FOR LOCAL OFFICIALS

Conflicts with future development along the proposed corridor can be minimized with appropriate noise compatible planning. This effort starts with knowledge about a project's specific noise impacts being shared with those local officials having the decision-making authority over the planning and zoning status of land within the analysis area. In accordance with 23 CFR 772.15, this report will be provided to local planning authorities.

Land uses such as residences, motels, parks, recreation areas, places of worship, etc. are considered incompatible with highway noise levels exceeding the NAC. Noise level contours were reevaluated to delineate the distance from the improved roadway's edge of travel lane to where 56, 66, and 71 dB(A)

are expected to occur in the future (2045). This evaluation confirmed that the noise contours did not change with these design refinements on the Preferred Alternative.

SECTION 6 PUBLIC INVOLVEMENT

FDOT has previously conducted several public workshops for this project (FDOT District One, 2018). Additionally, a Public Hearing was held on November 15, 2018. Full documentation of the public meetings and Public Hearing are included in the Comments and Coordination Report (FDOT District One, 2018).

SECTION 7 CONCLUSION

This addendum was developed to evaluate design changes to the Preferred Alternative (Central Alternative #2) for the SR 29 from CR 846 to SR 82 project located in Immokalee, Collier County, Florida. Land use reviews were conducted to determine if changes in land use warranted additional noise analysis since the previous Noise Study Report (July 2018) was completed. Additional land use reviews will be conducted during design to identify any land use changes or new development that is permitted for construction prior to the project's Date of Public Knowledge.

This addendum included the analysis of additional receptors due to a new residential development currently under construction along Foundation Way. With the proposed Preferred Alternative, exterior traffic noise levels are predicted to range from 44.7 to 61.6 dB(A). Levels are not expected to approach, meet, or exceed the NAC at any receptor; however, a substantial noise increase (increase of 15 dB(A) or more) was identified for eight receptors. The impacted receptors are located within the Foundation Way Development (Sites FW4 - FW11). Noise abatement measures were considered for the eight impacted receptors. No feasible and reasonable measures were identified that can be implemented to abate traffic noise for the eight impacted receptors. Additional information regarding the traffic noise abatement measures analyzed are in **Section 3.1** of this report.

SECTION 8 REFERENCES

23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, July 13, 2010.

Federal Highway Program Manual, Volume 7, Section 3, August 9, 1982.

FHWA Highway Traffic Noise: Analysis and Abatement Guidance, December 2011.

Federal Highway Administration, Federal Lands Highway Project Development and Design Manual, February 8, 2008.

Florida Department of Transportation, Project Development and Environment Manual, Part 2, Chapter 18 – Highway Traffic Noise, July 2023.

Florida Department of Transportation, Traffic Noise Modeling and Analysis Practitioners Handbook, December 2018.

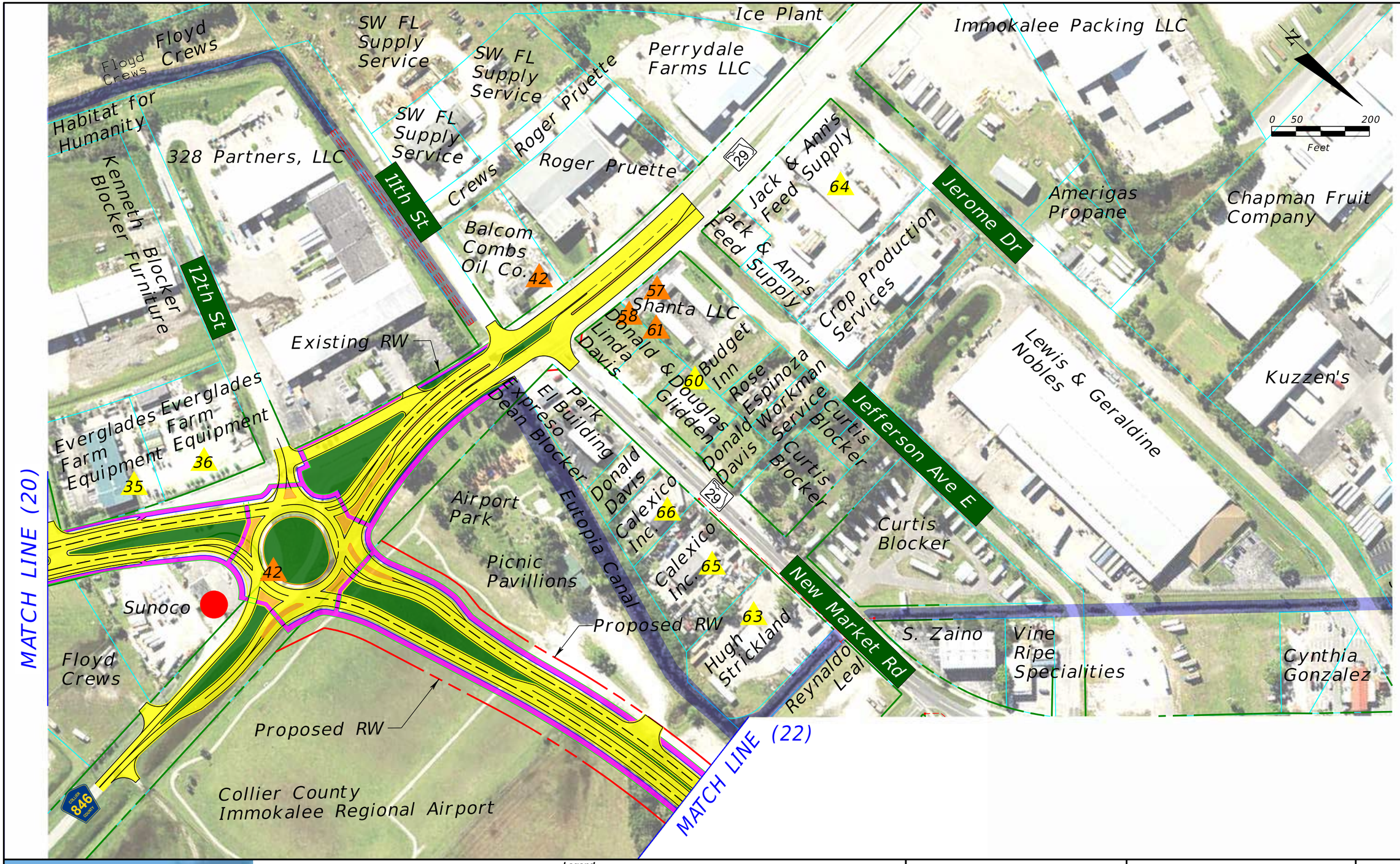
Florida Department of Transportation District One, SR 29 Immokalee Project Development and Environment Study from Oil Well Road to SR 82, Collier County, Florida, Noise Study Report, July 2018.

APPENDICES

Appendix A	Preferred Alternative Concept Plans (Sheets 21 – 34)
Appendix B	Aerials – Traffic Noise Receptor and Barrier Maps
Appendix C	TNM Output Tables

APPENDIX A

Preferred Alternative Concept Plans
(Sheets 21 – 34)



SR 29 PD&E Study

From Oil Well Road to SR 82

FPID NO: 417540 1 22 01 / FAP NO: 3911 022 P

Legend

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- Proposed Guardrail
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- Potential Contamination (Low)
- Potential Contamination (Medium or High)

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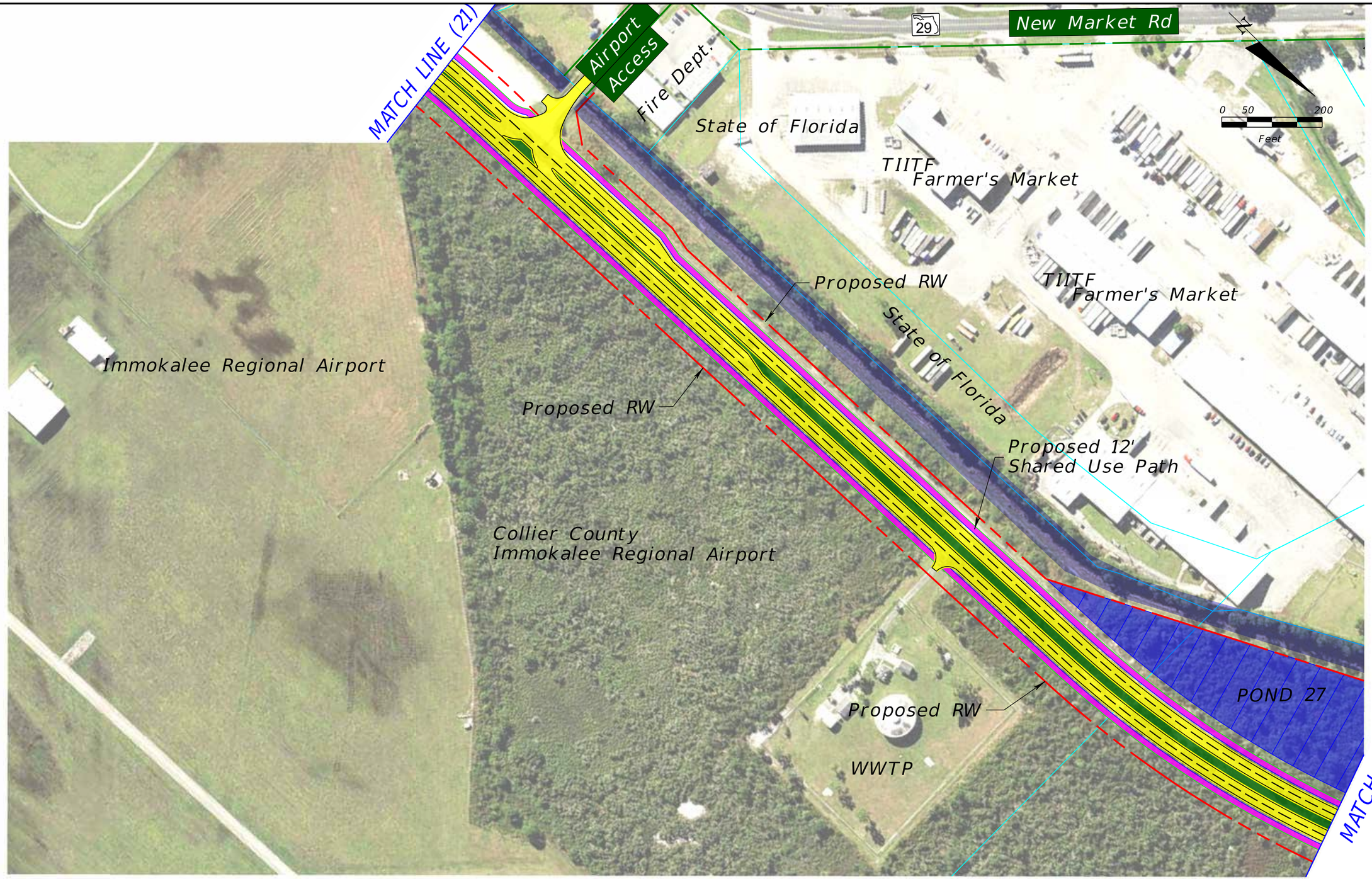
Preferred Alternative

Sheet No. 21



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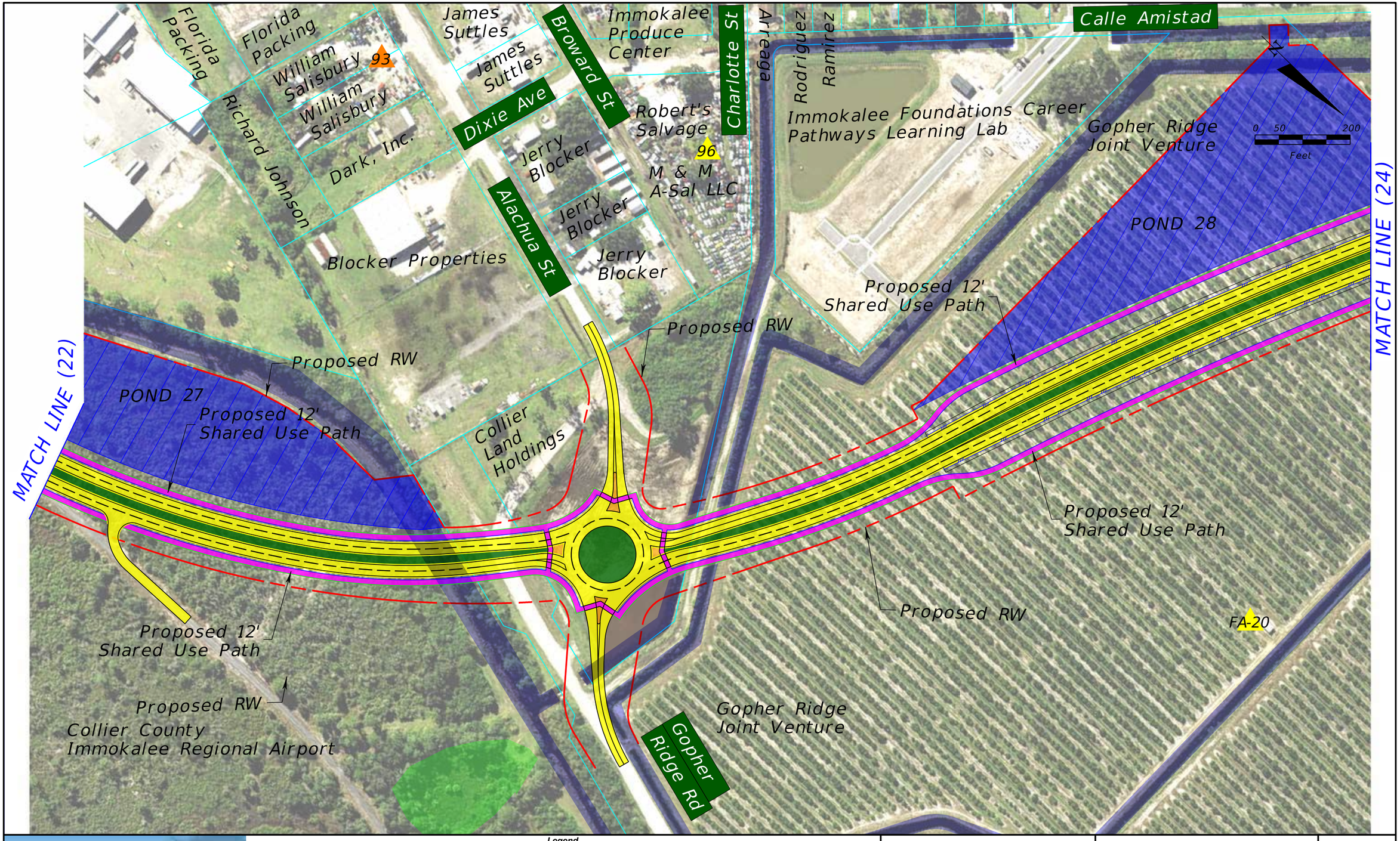

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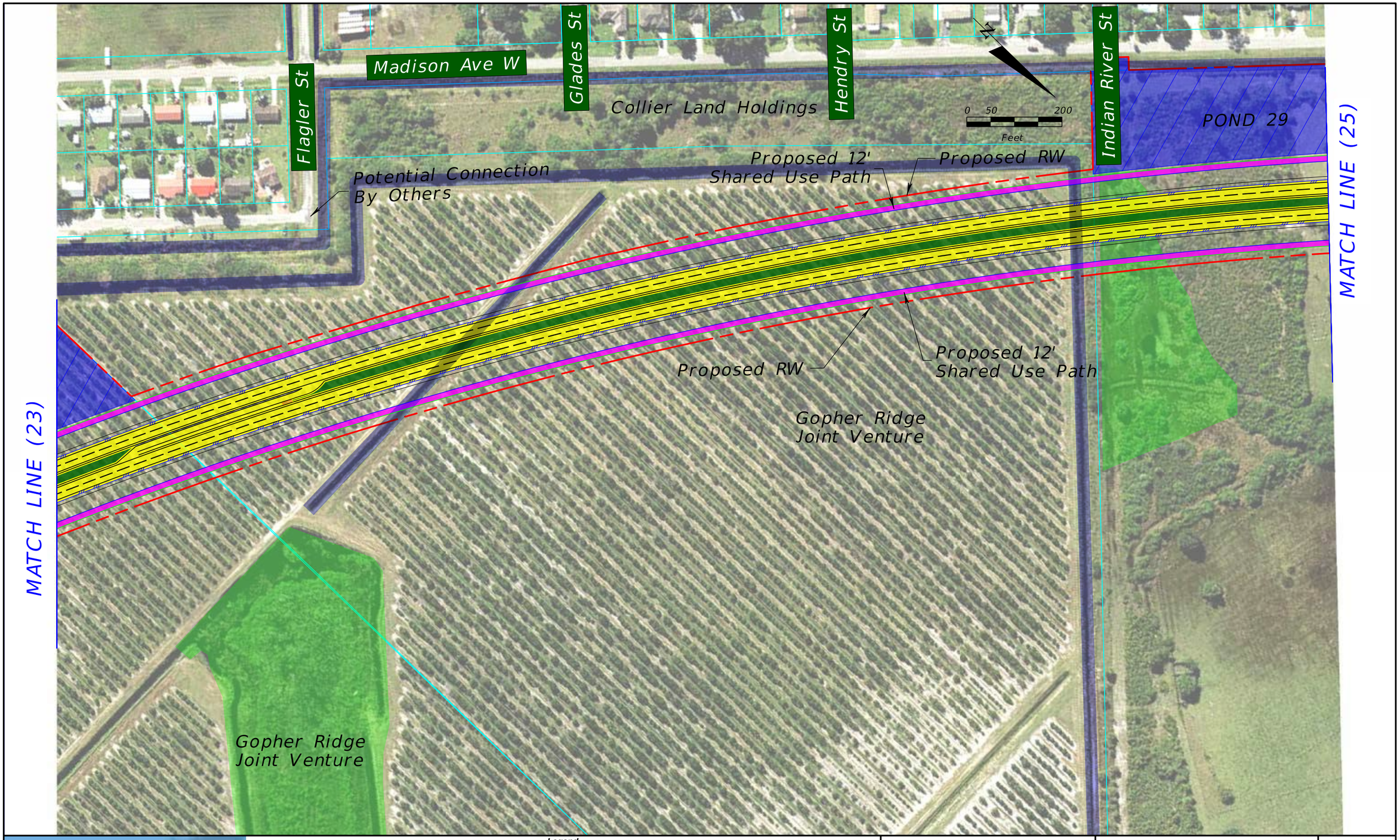

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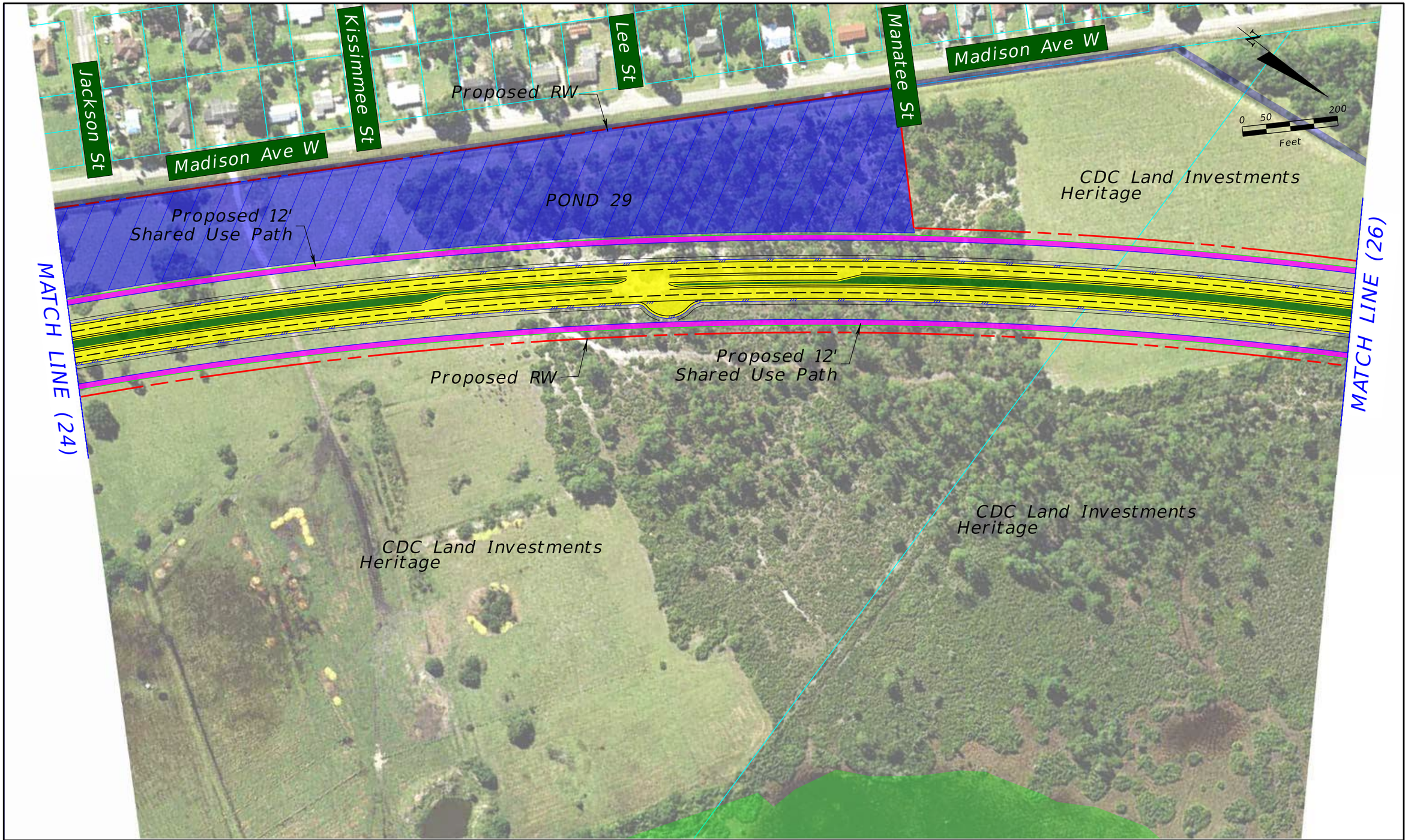

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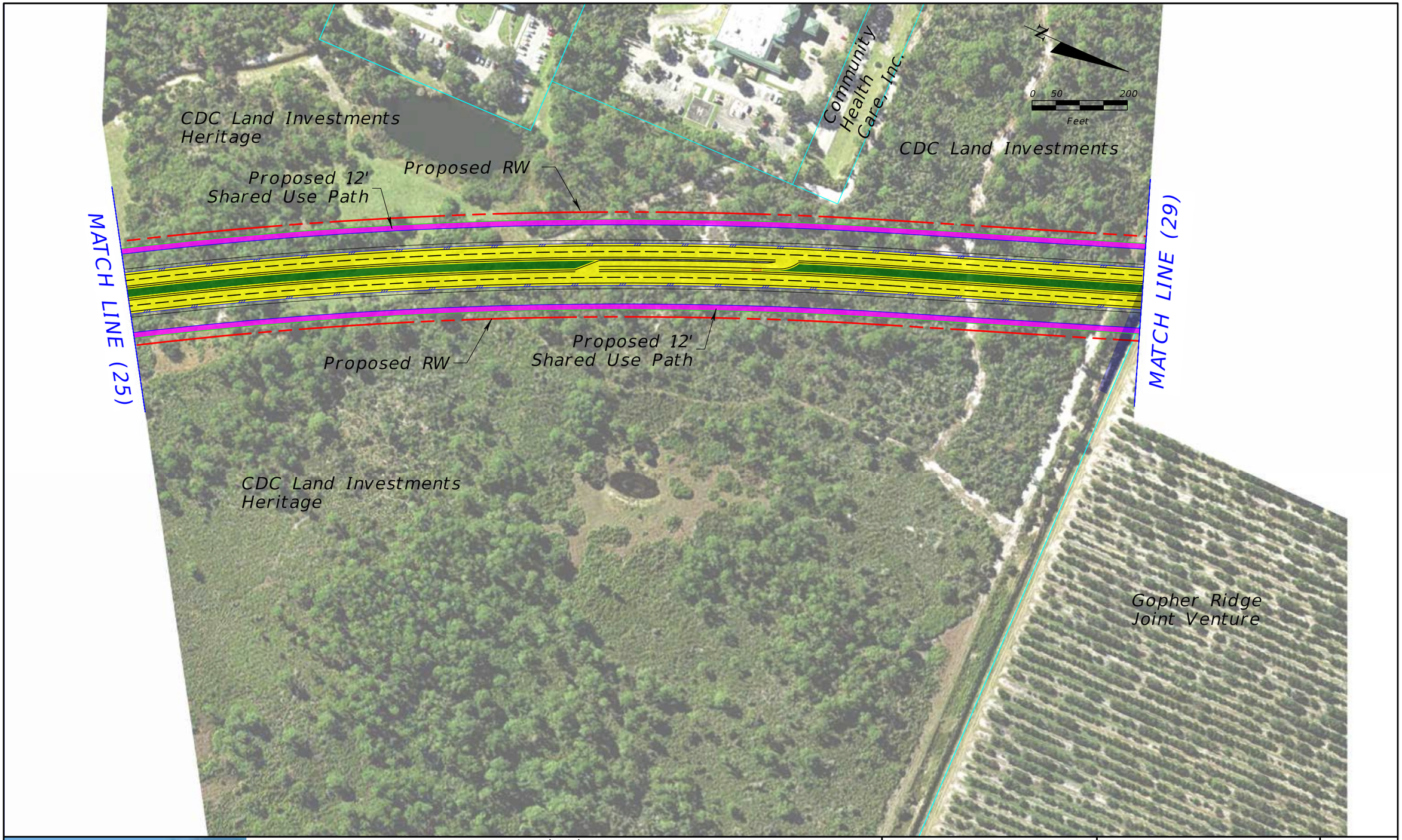

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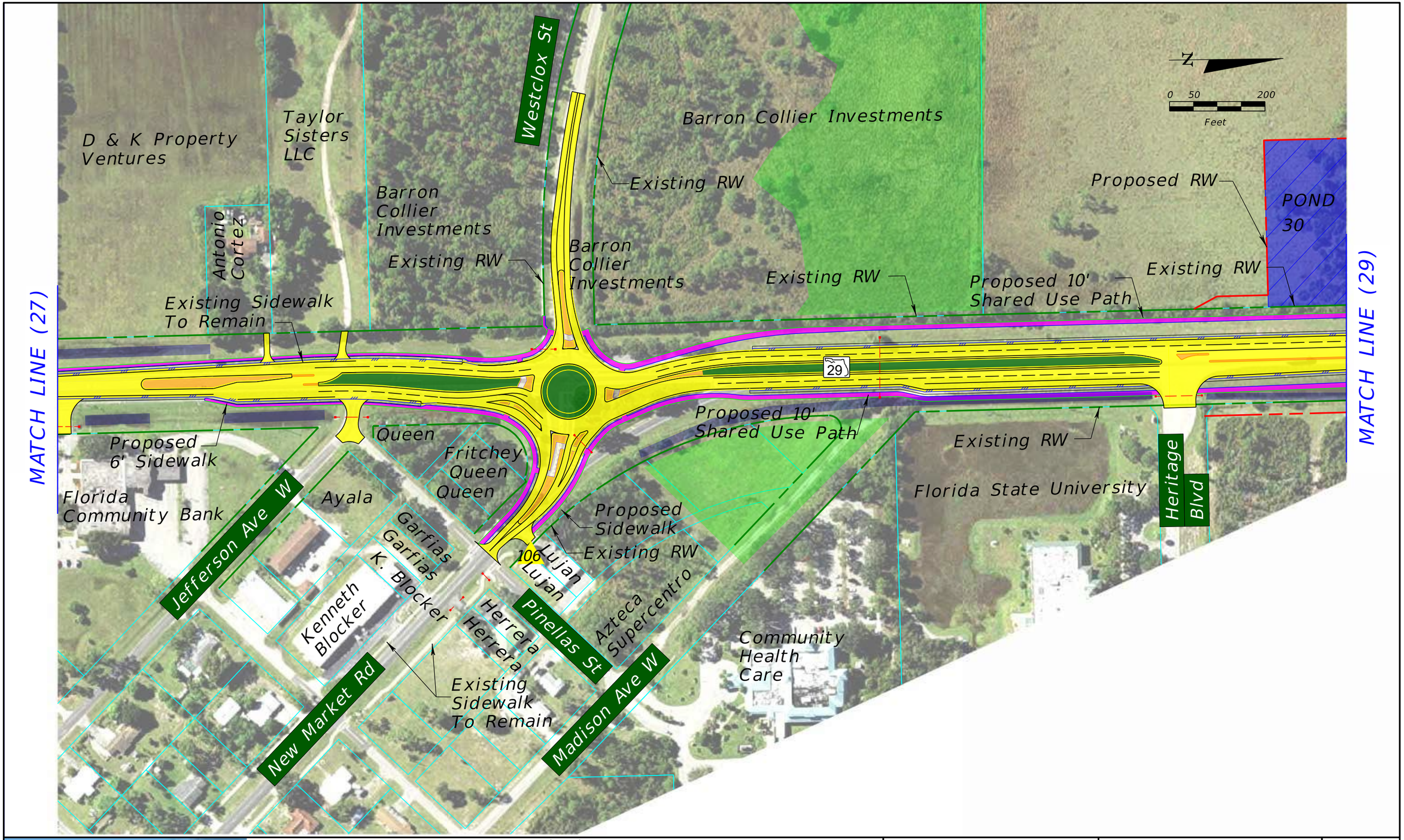

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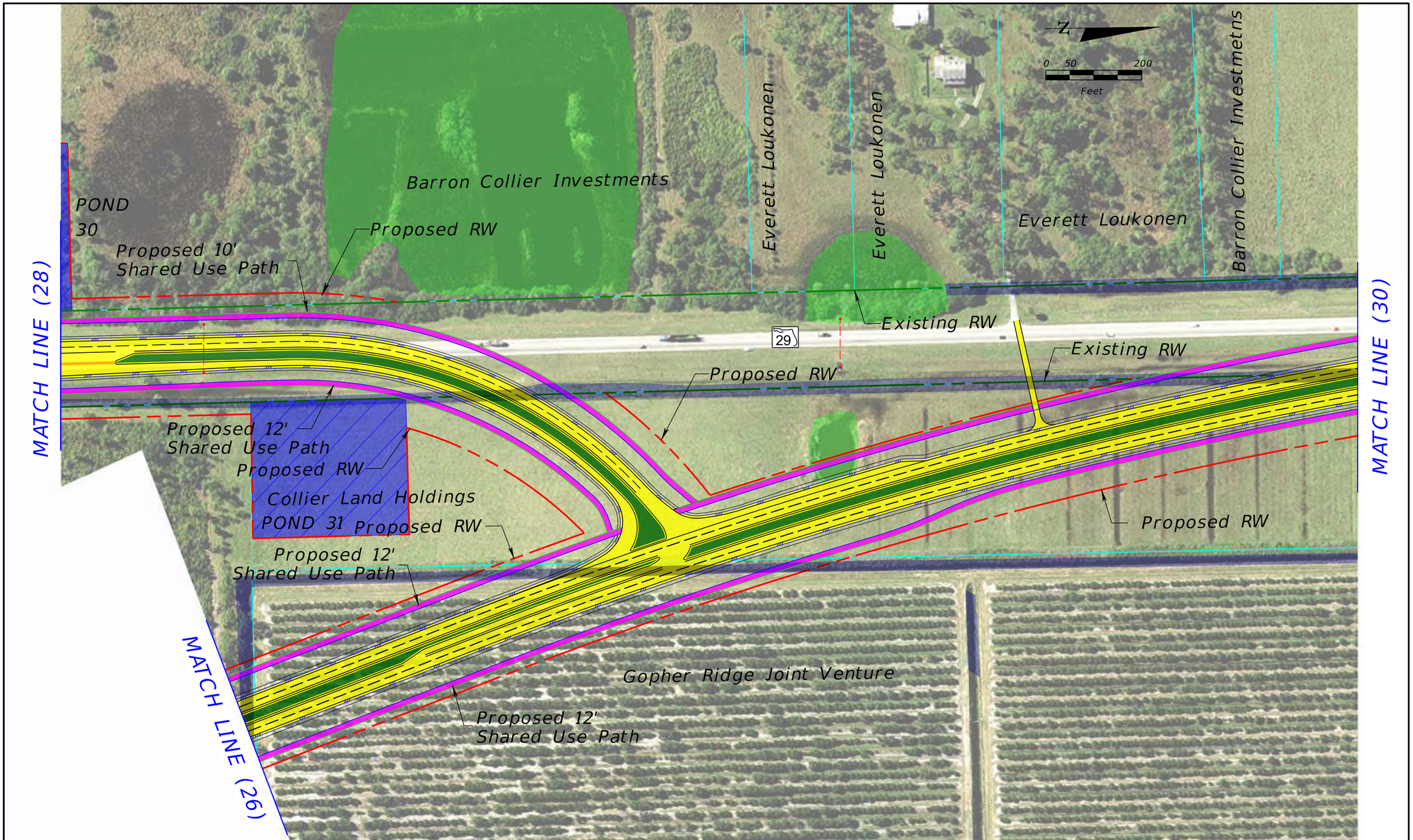

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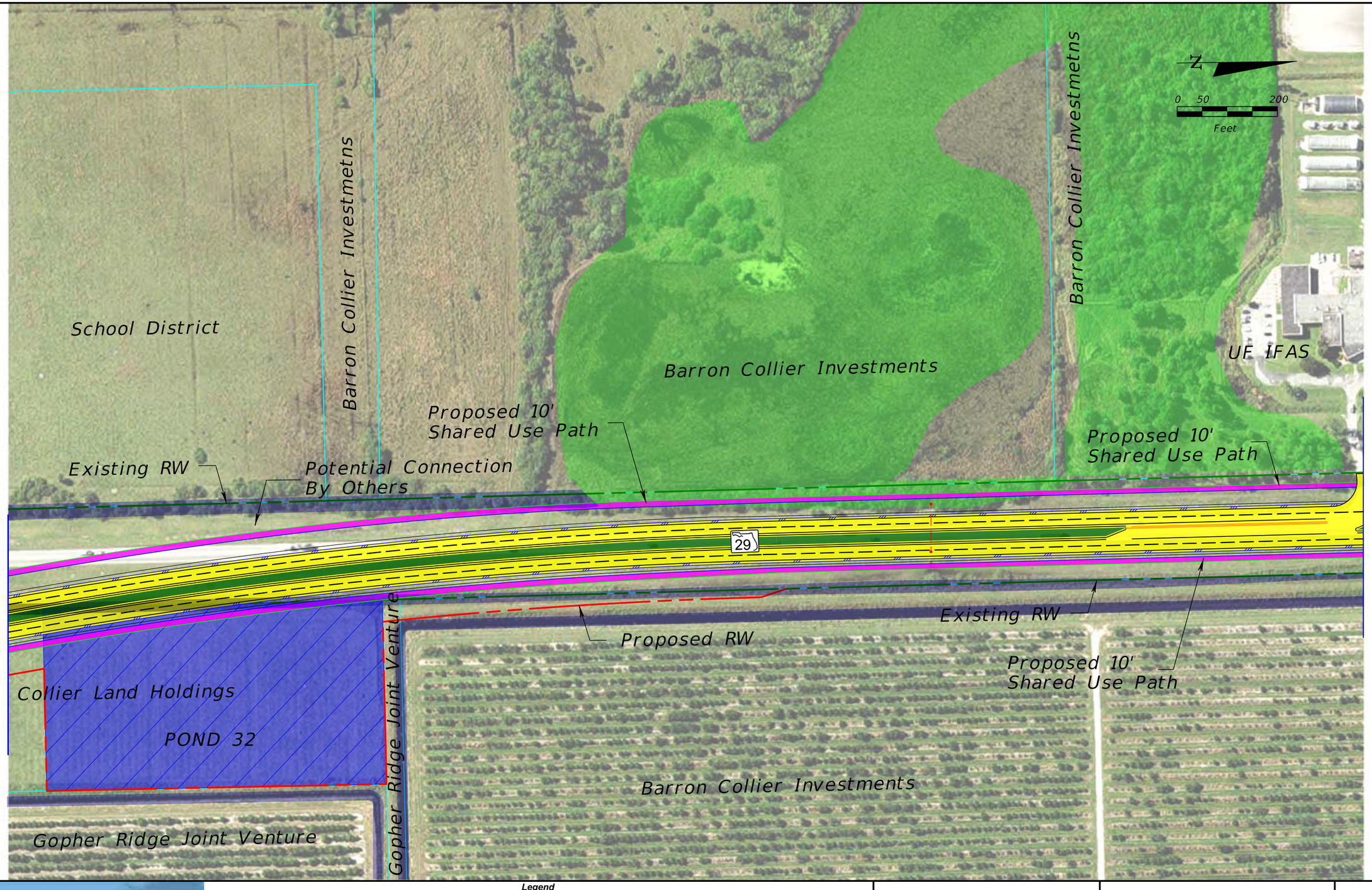

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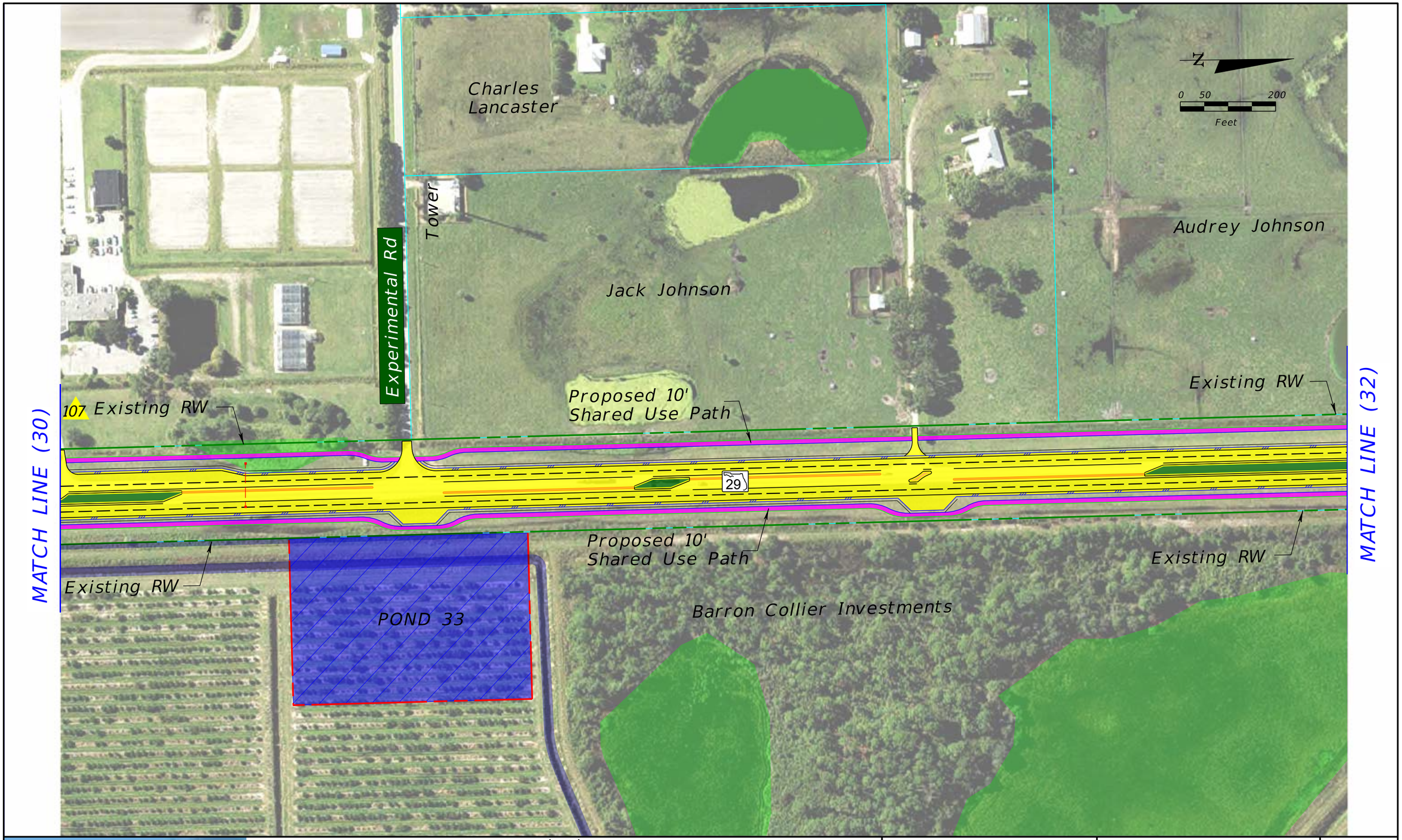

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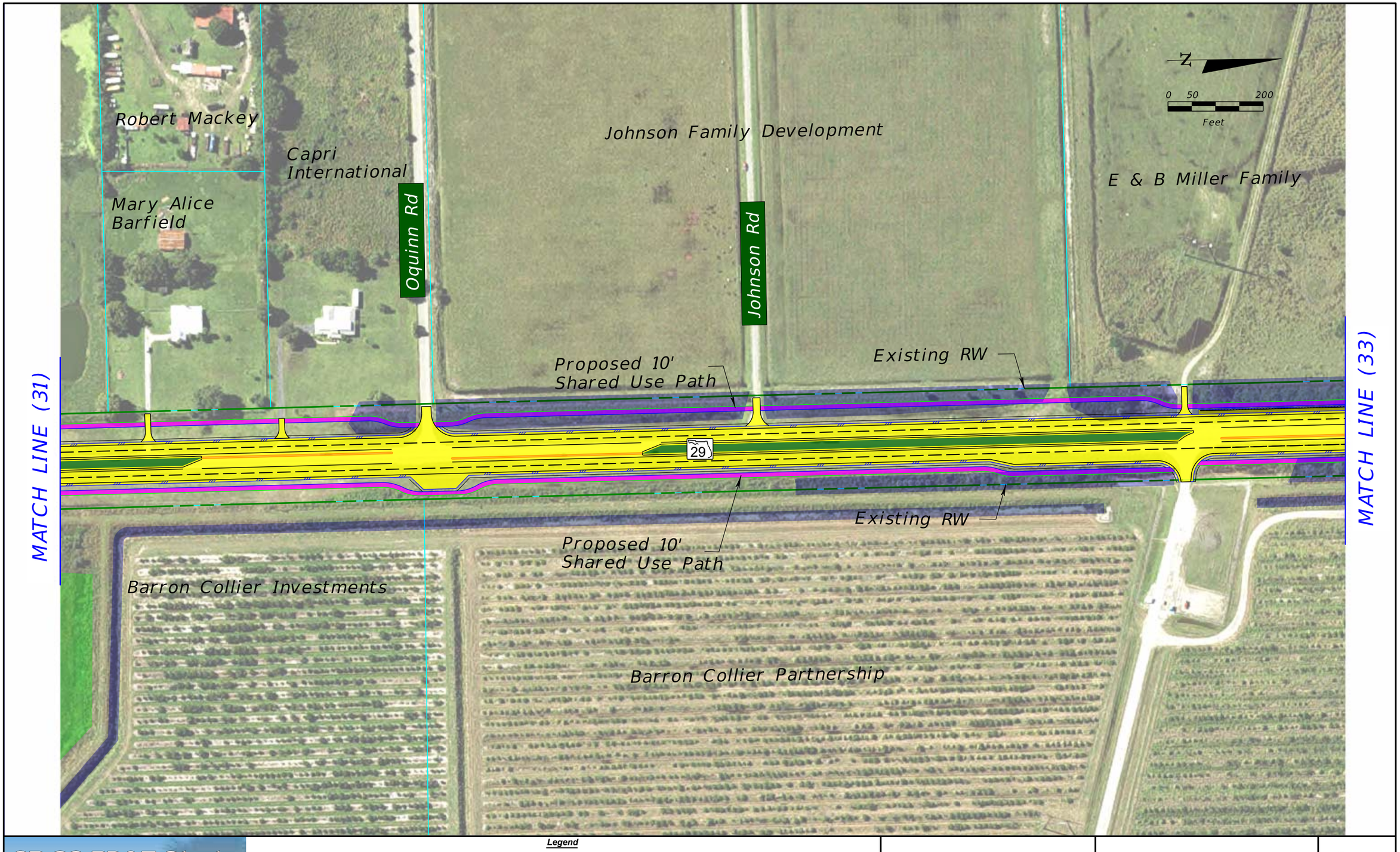

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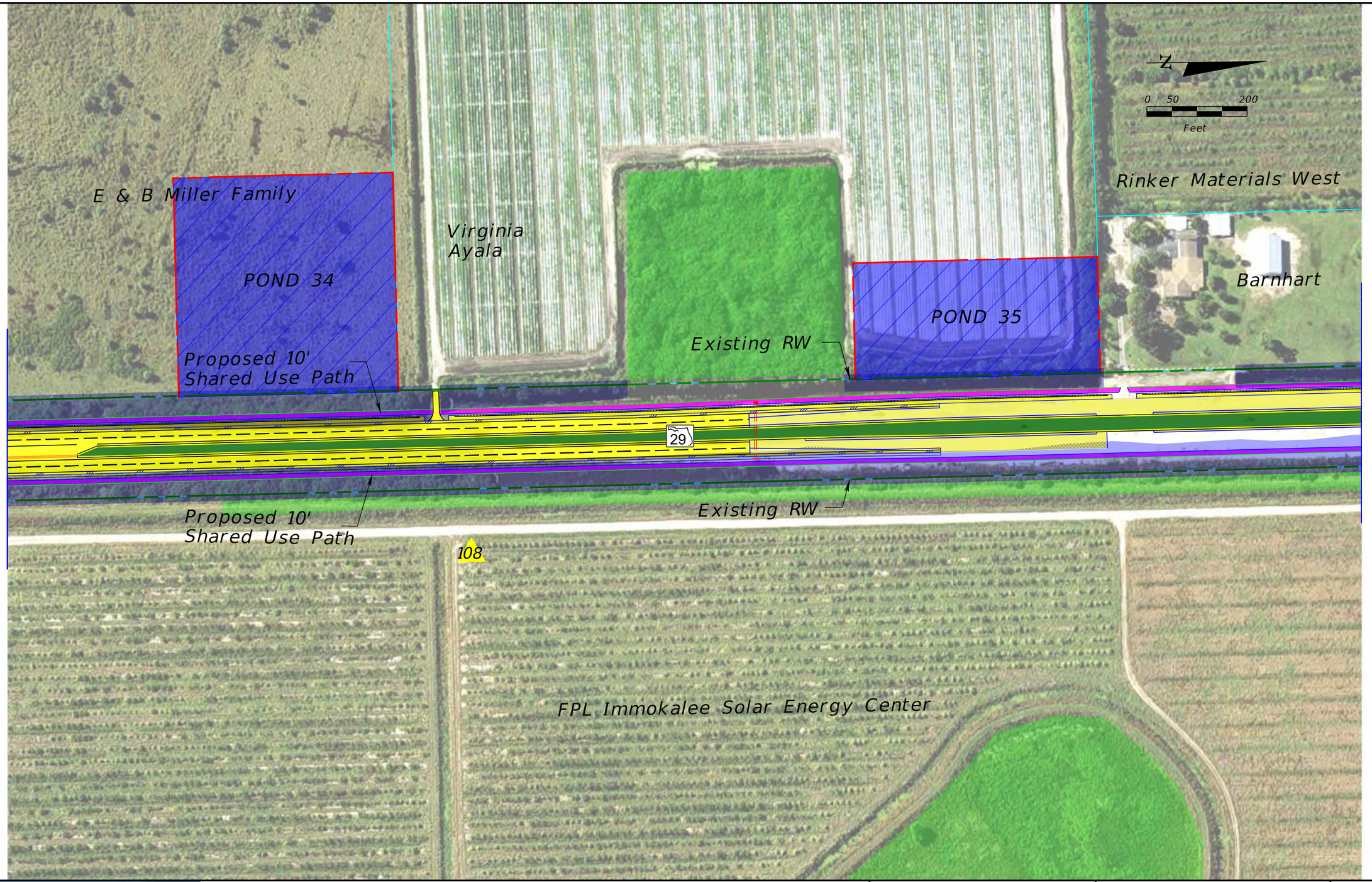

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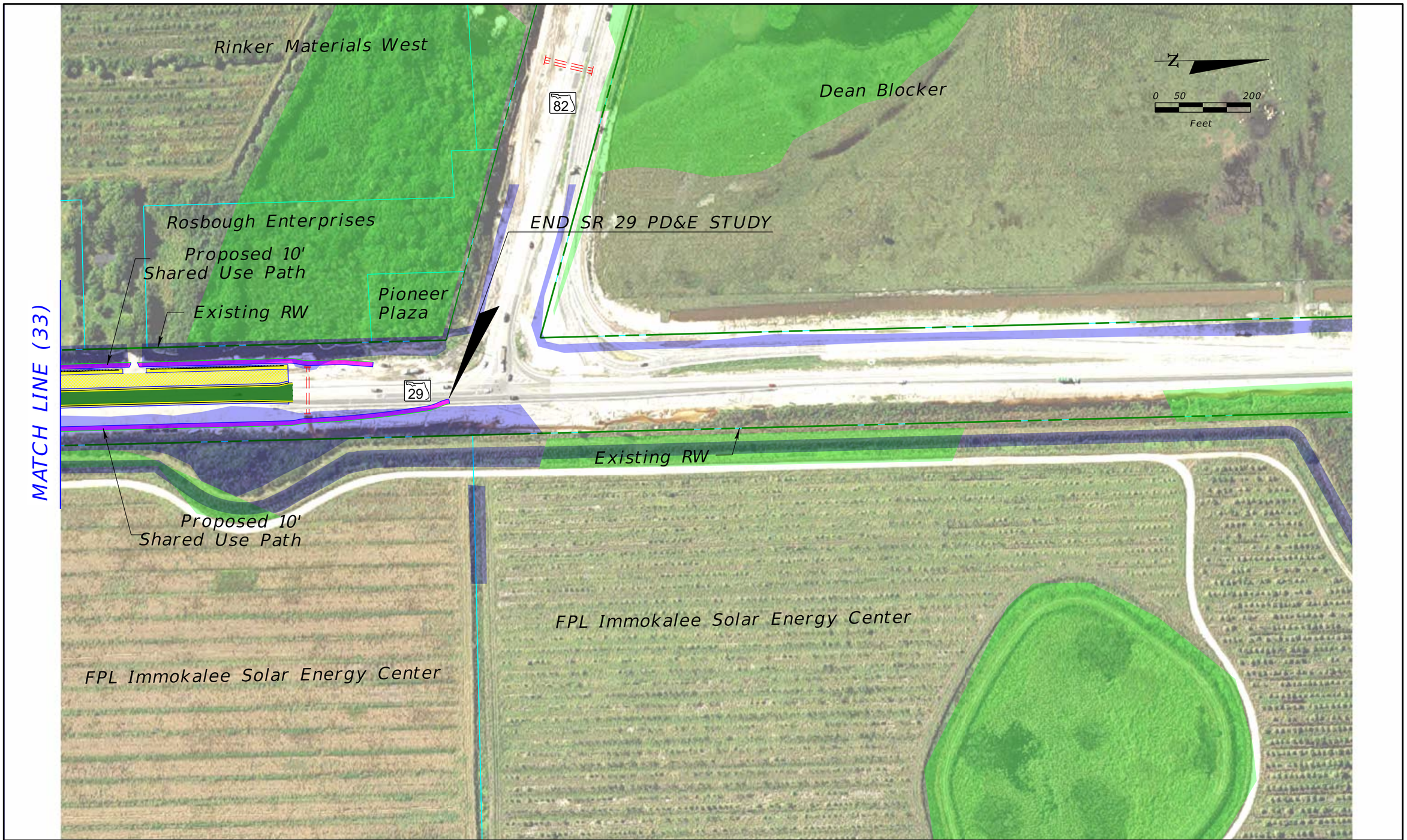
FBPR Certificate of Auth. #894

Preferred Alternative

Sheet No. 33



SR 29 PD&E Study

From Oil Well Road to SR 82

FPID NO: 417540 1 22 01 / FAP NO: 3911 022 P

Legend

- Existing Right-of-Way
- Parcels
- Proposed Right-of-Way
- Water/Canal
- Wetland
- Proposed Pond
- Potential Pond
- Potential Floodplain Compensation
- Traffic Signal
- Proposed Pavement
- Proposed Median/Border
- Proposed Sidewalks/ Shared Use Path
- Proposed Traffic Separator
- Existing Drainage Structure
- Proposed Guardrail
- Potential Business Relocation
- Potential Contamination (Low)
- Potential Contamination (Medium or High)

H. W. Lochner, Inc.
4300 W. Cypress St., Suite 500
Tampa, Florida 33607
FBPR Certificate of Auth. #894

Preferred Alternative

Sheet No. 34

APPENDIX B

Aerials – Traffic Noise Receptor and Barrier Maps

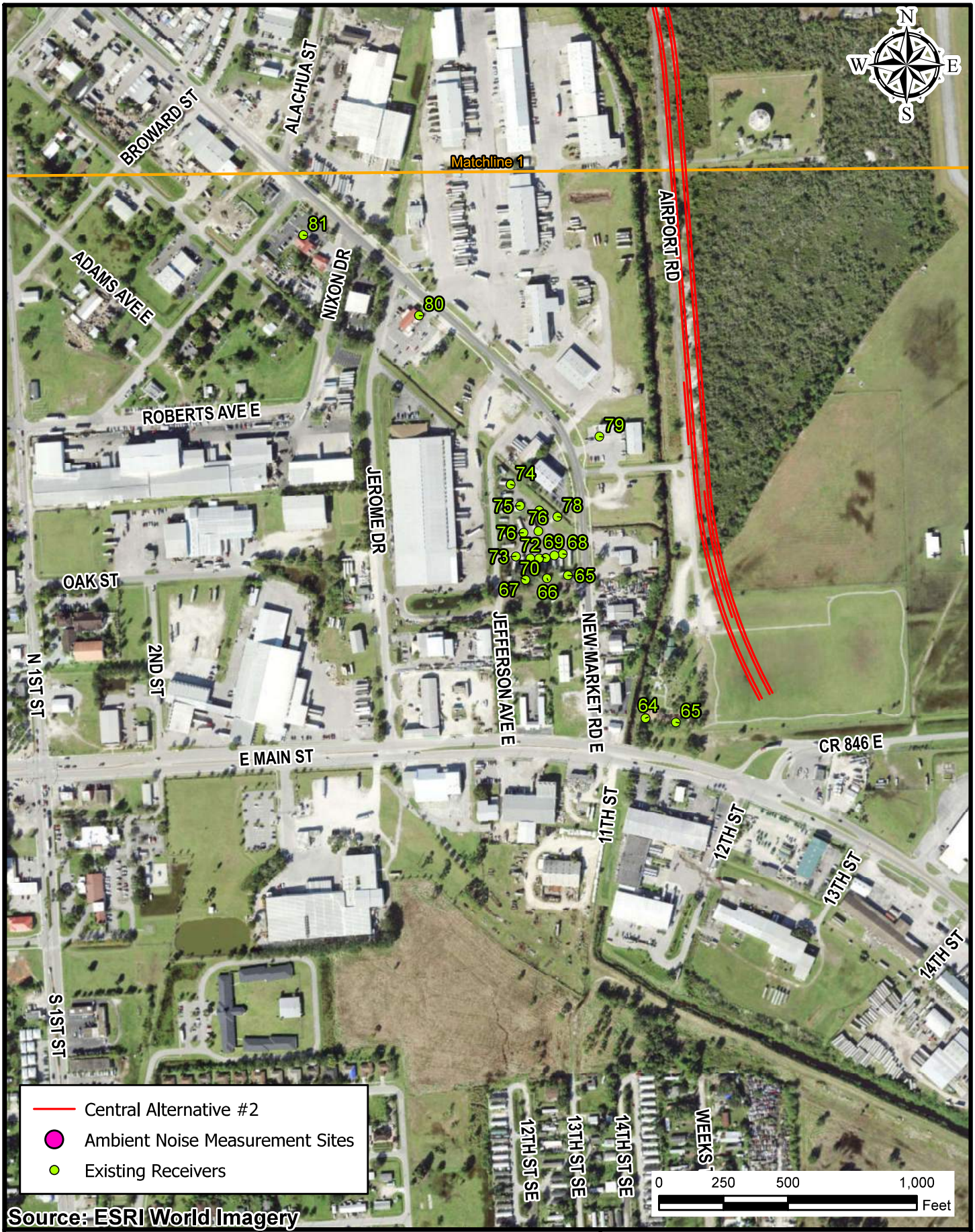


Figure 3: Previous Report Measurement Locations (Map 1 of 5)

Patel, Greene & Associates, PLLC
215 E. Main St.
Bartow, FL 33830

SR 29 Immokalee Noise Addendum

Township: Immokalee
County: Collier
State: Florida

Date: 11/01/2023

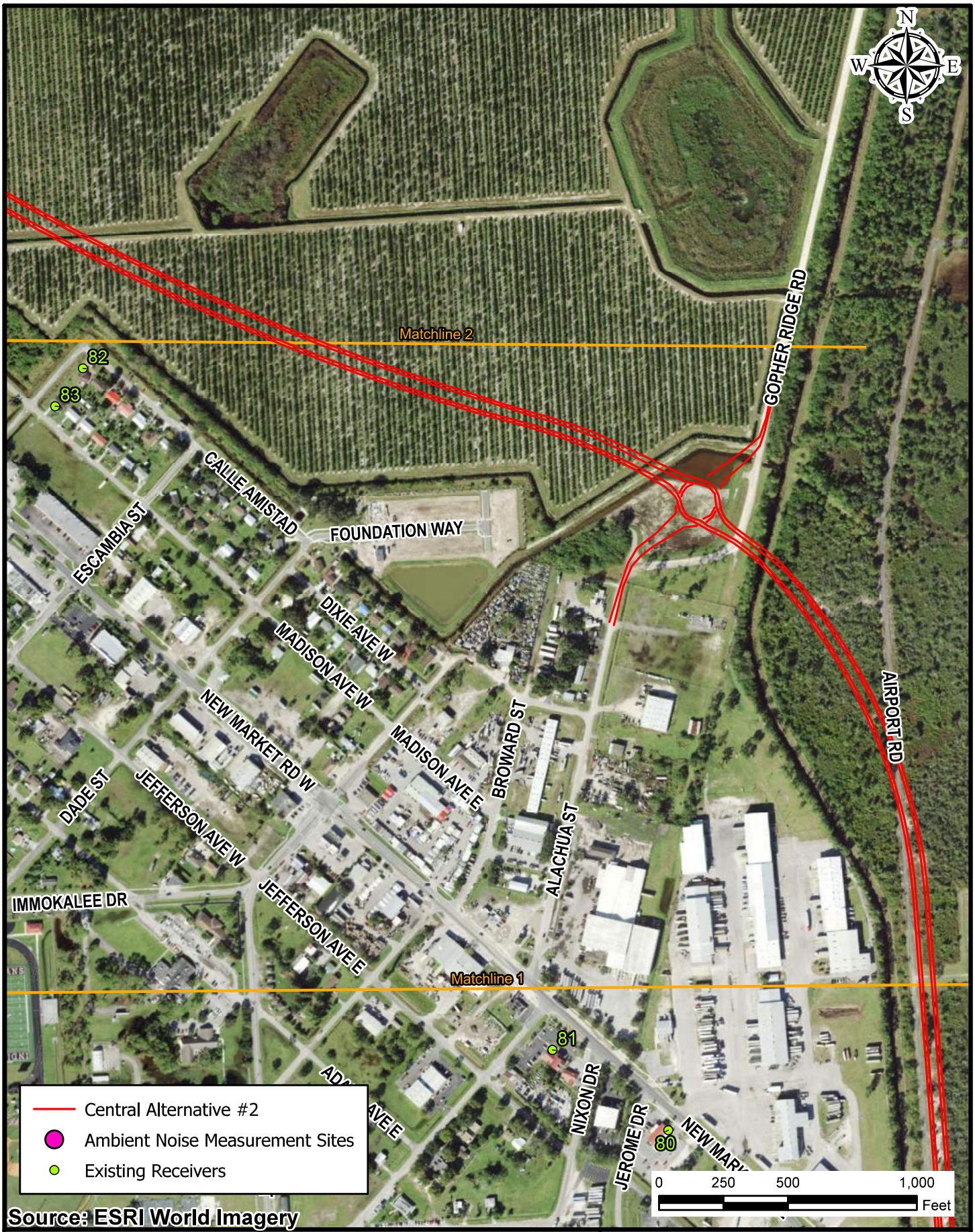


Figure 3: Previous Report Measurement Locations (Map 2 of 5)

Patel, Greene & Associates, PLLC
215 E. Main St.
Bartow, FL 33830

SR 29 Immokalee Noise Addendum

Township: Immokalee
County: Collier
State: Florida

Date: 11/01/2023

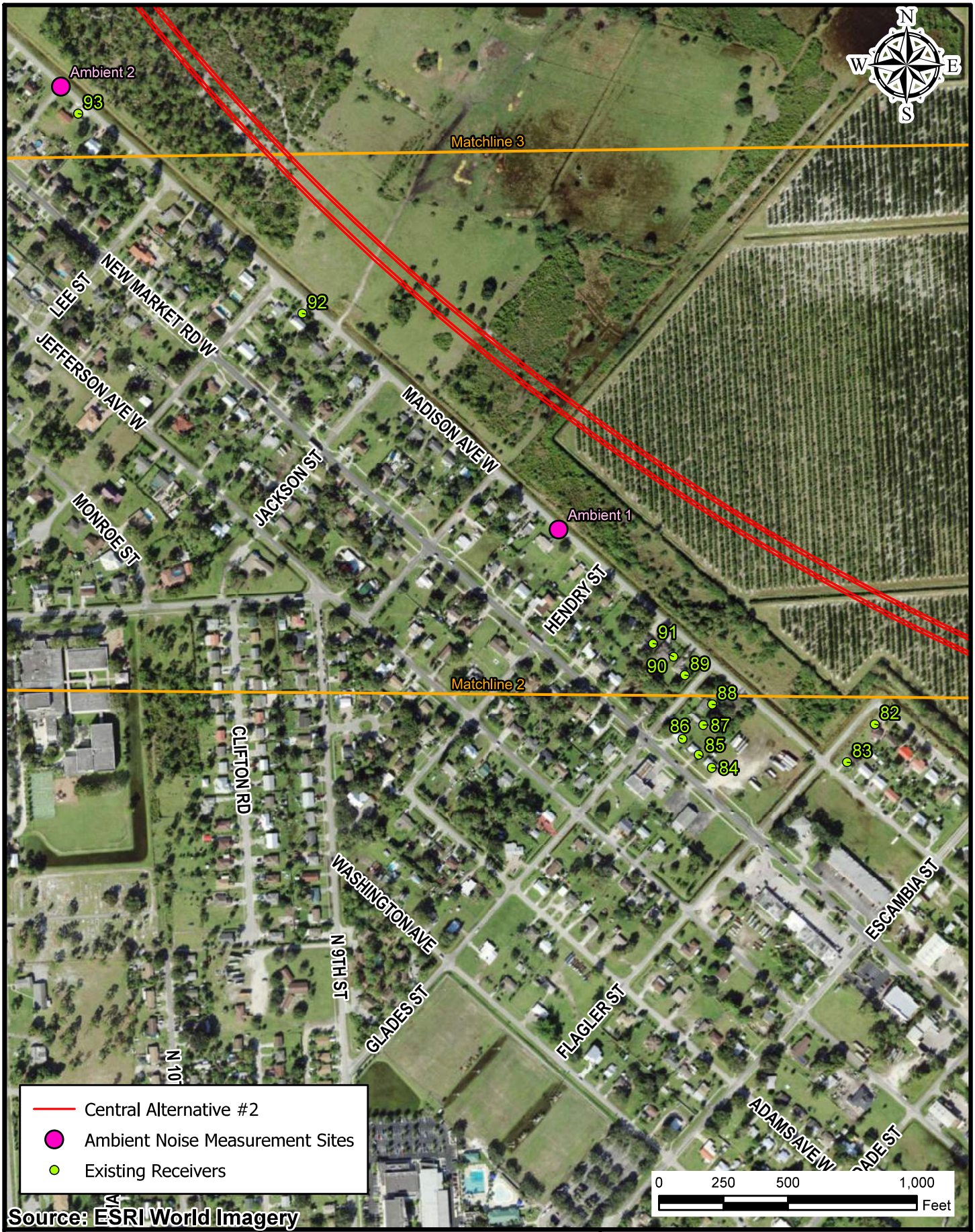


Figure 3: Previous Report Measurement Locations (Map 3 of 5)

Patel, Greene & Associates, PLLC
215 E. Main St.
Bartow, FL 33830

SR 29 Immokalee Noise Addendum

Township: Immokalee
County: Collier
State: Florida

Date: 11/01/2023

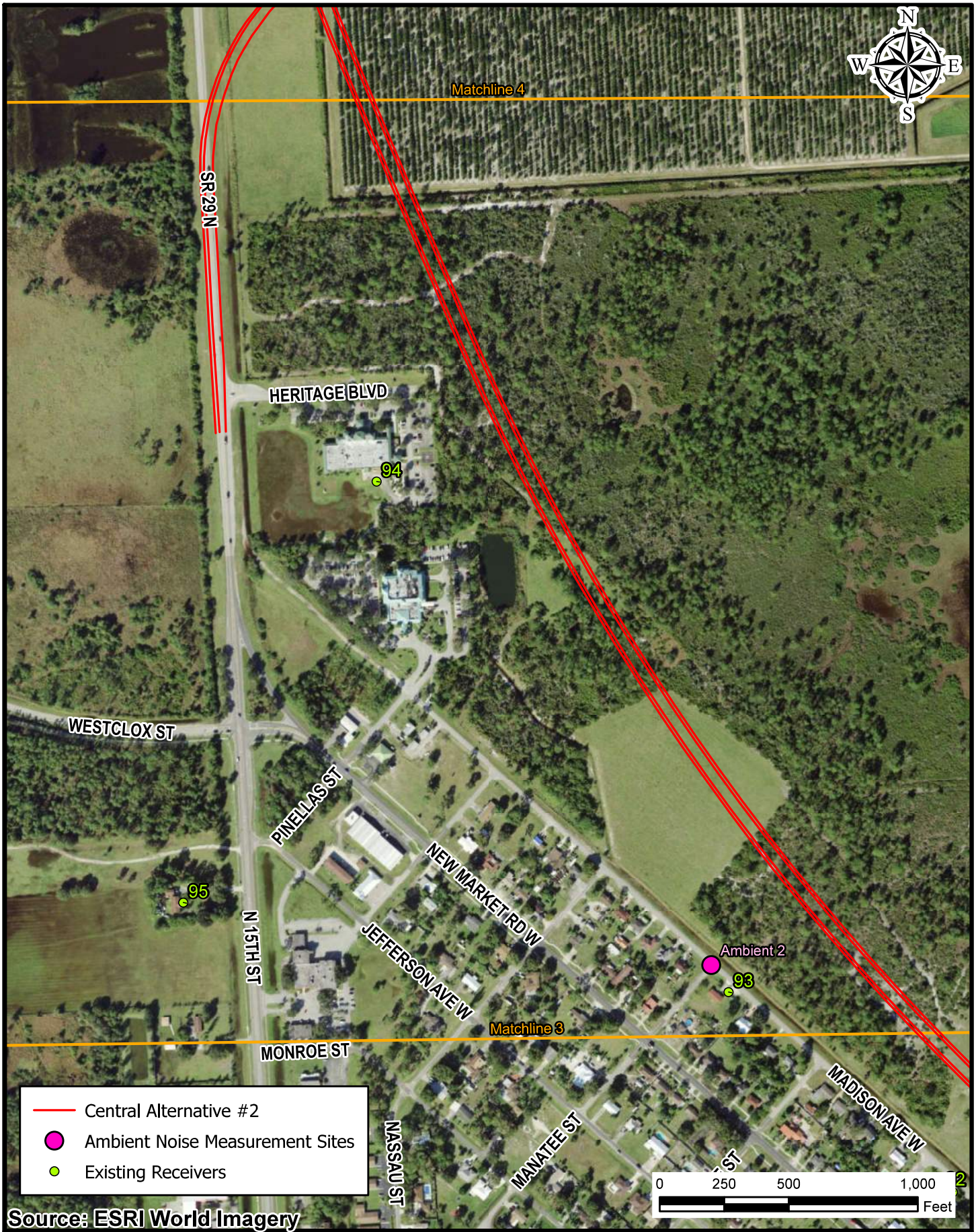


	Figure 3: Previous Report Measurement Locations (Map 4 of 5)	SR 29 Immokalee Noise Addendum
	Patel, Greene & Associates, PLLC 215 E. Main St. Bartow, FL 33830	Township: Immokalee County: Collier State: Florida Date: 11/01/2023

Figure 3: Previous Report Measurement Locations (Map 5 of 5)

Patel, Greene & Associates, PLLC
215 E. Main St.
Bartow, FL 33830

SR 29 Immokalee Noise Addendum

Township: Immokalee
County: Collier
State: Florida

Date: 11/01/2023

Figure 4. Noise Barrier Analysis

Patel, Greene & Associates, PLLC
215 E. Main St.
Bartow, FL 33830

SR 29 Immokalee Noise Addendum

Location: Immokalee
County: Collier
State: Florida

Date: 11/01/2023

APPENDIX C

TNM Output Tables

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 8 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	55.2	2.0	5	-3.0
FW2	33	1	44.7	57.5	66	12.8	15	----	55.2	2.3	5	-2.7
FW3	34	1	44.7	58.0	66	13.3	15	----	55.5	2.5	5	-2.5
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	55.6	2.7	5	-2.3
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	55.8	3.0	5	-2.0
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	56.0	3.3	5	-1.7
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	56.3	3.5	5	-1.5
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	57.7	3.9	5	-1.1
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	56.7	3.4	5	-1.6
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	55.9	3.2	5	-1.8
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	55.2	2.8	5	-2.2
FW12	43	1	43.2	56.3	66	13.1	15	----	53.9	2.4	5	-2.6
FW13	44	1	43.4	55.7	66	12.3	15	----	53.4	2.3	5	-2.7
FW14	45	1	43.7	54.2	66	10.5	15	----	52.1	2.1	5	-2.9
FW15	46	1	44.2	52.8	66	8.6	15	----	50.7	2.1	5	-2.9
FW16	47	1	44.5	50.0	66	5.5	15	----	48.2	1.8	5	-3.2
FW17	48	1	45.0	53.2	66	8.2	15	----	50.7	2.5	5	-2.5
FW18	49	1	45.4	50.1	66	4.7	15	----	48.8	1.3	5	-3.7

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	18	1.3	2.6	3.9
All Impacted	8	2.7	3.2	3.9

All that meet NR Goal		0	0.0	0.0	0.0								

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 10 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	55.0	2.2	5	-2.8
FW2	33	1	44.7	57.5	66	12.8	15	----	55.1	2.4	5	-2.6
FW3	34	1	44.7	58.0	66	13.3	15	----	55.4	2.6	5	-2.4
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	55.5	2.8	5	-2.2
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	55.7	3.1	5	-1.9
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	55.9	3.4	5	-1.6
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	55.9	3.9	5	-1.1
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	57.4	4.2	5	-0.8
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	56.6	3.5	5	-1.5
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	55.9	3.2	5	-1.8
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	55.2	2.8	5	-2.2
FW12	43	1	43.2	56.3	66	13.1	15	----	53.7	2.6	5	-2.4
FW13	44	1	43.4	55.7	66	12.3	15	----	53.3	2.4	5	-2.6
FW14	45	1	43.7	54.2	66	10.5	15	----	52.0	2.2	5	-2.8
FW15	46	1	44.2	52.8	66	8.6	15	----	50.6	2.2	5	-2.8
FW16	47	1	44.5	50.0	66	5.5	15	----	48.3	1.7	5	-3.3
FW17	48	1	45.0	53.2	66	8.2	15	----	50.5	2.7	5	-2.3
FW18	49	1	45.4	50.1	66	4.7	15	----	48.8	1.3	5	-3.7

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	18	1.3	2.7	4.2
All Impacted	8	2.8	3.4	4.2

All that meet NR Goal		0	0.0	0.0	0.0								

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 12 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	54.8	2.4	5	-2.6
FW2	33	1	44.7	57.5	66	12.8	15	----	54.9	2.6	5	-2.4
FW3	34	1	44.7	58.0	66	13.3	15	----	55.2	2.8	5	-2.2
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	55.3	3.0	5	-2.0
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	54.3	4.5	5	-0.5
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	54.3	5.0	5	0.0
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	54.3	5.5	5	0.5
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	55.6	6.0	5	1.0
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	55.0	5.1	5	0.1
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	54.6	4.5	5	-0.5
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	54.1	3.9	5	-1.1
FW12	43	1	43.2	56.3	66	13.1	15	----	52.6	3.7	5	-1.3
FW13	44	1	43.4	55.7	66	12.3	15	----	52.3	3.4	5	-1.6
FW14	45	1	43.7	54.2	66	10.5	15	----	50.6	3.6	5	-1.4
FW15	46	1	44.2	52.8	66	8.6	15	----	49.7	3.1	5	-1.9
FW16	47	1	44.5	50.0	66	5.5	15	----	48.0	2.0	5	-3.0
FW17	48	1	45.0	53.2	66	8.2	15	----	50.3	2.9	5	-2.1
FW18	49	1	45.4	50.1	66	4.7	15	----	48.7	1.4	5	-3.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	18	1.4	3.6	6.0
All Impacted	8	3.0	4.7	6.0

All that meet NR Goal		4	5.0	5.4	6.0								

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 14 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	53.4	3.8	5	-1.2
FW2	33	1	44.7	57.5	66	12.8	15	----	53.2	4.3	5	-0.7
FW3	34	1	44.7	58.0	66	13.3	15	----	53.4	4.6	5	-0.4
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	53.2	5.1	5	0.1
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	53.2	5.6	5	0.6
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	53.3	6.0	5	1.0
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	53.3	6.5	5	1.5
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	54.4	7.2	5	2.2
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	53.8	6.3	5	1.3
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	53.4	5.7	5	0.7
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	53.0	5.0	5	0.0
FW12	43	1	43.2	56.3	66	13.1	15	----	51.5	4.8	5	-0.2
FW13	44	1	43.4	55.7	66	12.3	15	----	51.2	4.5	5	-0.5
FW14	45	1	43.7	54.2	66	10.5	15	----	49.5	4.7	5	-0.3
FW15	46	1	44.2	52.8	66	8.6	15	----	48.6	4.2	5	-0.8
FW16	47	1	44.5	50.0	66	5.5	15	----	46.8	3.2	5	-1.8
FW17	48	1	45.0	53.2	66	8.2	15	----	49.2	4.0	5	-1.0
FW18	49	1	45.4	50.1	66	4.7	15	----	47.9	2.2	5	-2.8

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	18	2.2	4.9	7.2
All Impacted	8	5.0	5.9	7.2

All that meet NR Goal		8	5.0	5.9	7.2								

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 15 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	53.1	4.1	5	-0.9
FW2	33	1	44.7	57.5	66	12.8	15	----	53.0	4.5	5	-0.5
FW3	34	1	44.7	58.0	66	13.3	15	----	53.1	4.9	5	-0.1
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	53.0	5.3	5	0.3
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	53.0	5.8	5	0.8
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	53.0	6.3	5	1.3
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	53.0	6.8	5	1.8
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	54.1	7.5	5	2.5
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	53.6	6.5	5	1.5
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	53.2	5.9	5	0.9
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	52.8	5.2	5	0.2
FW12	43	1	43.2	56.3	66	13.1	15	----	51.3	5.0	5	0.0
FW13	44	1	43.4	55.7	66	12.3	15	----	51.0	4.7	5	-0.3
FW14	45	1	43.7	54.2	66	10.5	15	----	49.3	4.9	5	-0.1
FW15	46	1	44.2	52.8	66	8.6	15	----	48.4	4.4	5	-0.6
FW16	47	1	44.5	50.0	66	5.5	15	----	46.7	3.3	5	-1.7
FW17	48	1	45.0	53.2	66	8.2	15	----	49.0	4.2	5	-0.8
FW18	49	1	45.4	50.1	66	4.7	15	----	47.8	2.3	5	-2.7

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	18	2.3	5.1	7.5
All Impacted	8	5.2	6.2	7.5

All that meet NR Goal		9	5.0	6.0	7.5								

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 16 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	53.1	4.1	5	-0.9
FW2	33	1	44.7	57.5	66	12.8	15	----	53.0	4.5	5	-0.5
FW3	34	1	44.7	58.0	66	13.3	15	----	53.1	4.9	5	-0.1
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	53.0	5.3	5	0.3
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	53.0	5.8	5	0.8
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	52.9	6.4	5	1.4
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	52.9	6.9	5	1.9
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	54.0	7.6	5	2.6
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	53.5	6.6	5	1.6
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	53.0	6.1	5	1.1
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	52.7	5.3	5	0.3
FW12	43	1	43.2	56.3	66	13.1	15	----	51.1	5.2	5	0.2
FW13	44	1	43.4	55.7	66	12.3	15	----	50.9	4.8	5	-0.2
FW14	45	1	43.7	54.2	66	10.5	15	----	49.2	5.0	5	0.0
FW15	46	1	44.2	52.8	66	8.6	15	----	48.3	4.5	5	-0.5
FW16	47	1	44.5	50.0	66	5.5	15	----	46.7	3.3	5	-1.7
FW17	48	1	45.0	53.2	66	8.2	15	----	49.0	4.2	5	-0.8
FW18	49	1	45.4	50.1	66	4.7	15	----	47.8	2.3	5	-2.7

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	18	2.3	5.2	7.6
All Impacted	8	5.3	6.2	7.6

All that meet NR Goal		10	5.0	6.0	7.6								

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 18 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	52.6	4.6	5	-0.4
FW2	33	1	44.7	57.5	66	12.8	15	----	52.5	5.0	5	0.0
FW3	34	1	44.7	58.0	66	13.3	15	----	52.6	5.4	5	0.4
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	52.5	5.8	5	0.8
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	52.5	6.3	5	1.3
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	52.5	6.8	5	1.8
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	52.5	7.3	5	2.3
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	53.5	8.1	5	3.1
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	53.1	7.0	5	2.0
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	52.7	6.4	5	1.4
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	52.4	5.6	5	0.6
FW12	43	1	43.2	56.3	66	13.1	15	----	50.8	5.5	5	0.5
FW13	44	1	43.4	55.7	66	12.3	15	----	50.5	5.2	5	0.2
FW14	45	1	43.7	54.2	66	10.5	15	----	48.8	5.4	5	0.4
FW15	46	1	44.2	52.8	66	8.6	15	----	47.9	4.9	5	-0.1
FW16	47	1	44.5	50.0	66	5.5	15	----	46.5	3.5	5	-1.5
FW17	48	1	45.0	53.2	66	8.2	15	----	48.7	4.5	5	-0.5
FW18	49	1	45.4	50.1	66	4.7	15	----	47.7	2.4	5	-2.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	18	2.4	5.5	8.1
All Impacted	8	5.6	6.7	8.1

All that meet NR Goal		13	5.0	6.1	8.1								

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 20 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	52.4	4.8	5	-0.2
FW2	33	1	44.7	57.5	66	12.8	15	----	52.3	5.2	5	0.2
FW3	34	1	44.7	58.0	66	13.3	15	----	52.4	5.6	5	0.6
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	52.2	6.1	5	1.1
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	52.2	6.6	5	1.6
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	52.2	7.1	5	2.1
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	52.2	7.6	5	2.6
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	53.2	8.4	5	3.4
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	52.8	7.3	5	2.3
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	52.5	6.6	5	1.6
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	52.2	5.8	5	0.8
FW12	43	1	43.2	56.3	66	13.1	15	----	50.6	5.7	5	0.7
FW13	44	1	43.4	55.7	66	12.3	15	----	50.3	5.4	5	0.4
FW14	45	1	43.7	54.2	66	10.5	15	----	48.5	5.7	5	0.7
FW15	46	1	44.2	52.8	66	8.6	15	----	47.7	5.1	5	0.1
FW16	47	1	44.5	50.0	66	5.5	15	----	46.4	3.6	5	-1.4
FW17	48	1	45.0	53.2	66	8.2	15	----	48.7	4.5	5	-0.5
FW18	49	1	45.4	50.1	66	4.7	15	----	47.7	2.4	5	-2.6

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	18	2.4	5.7	8.4
All Impacted	8	5.8	6.9	8.4

All that meet NR Goal		14	5.1	6.3	8.4								

American Structurepoint
LCJ/KLW

31 October 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 29 Immokalee Noise Addendum
RUN: SR29 CA#2
BARRIER DESIGN: FW Barrier - 22 ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
FW1	32	1	44.3	57.2	66	12.9	15	----	52.6	4.6	5	-0.4
FW2	33	1	44.7	57.5	66	12.8	15	----	52.4	5.1	5	0.1
FW3	34	1	44.7	58.0	66	13.3	15	----	52.4	5.6	5	0.6
FW4	35	1	42.5	58.3	66	15.8	15	Sub'l Inc	52.3	6.0	5	1.0
FW5	36	1	41.4	58.8	66	17.4	15	Sub'l Inc	52.2	6.6	5	1.6
FW6	37	1	42.1	59.3	66	17.2	15	Sub'l Inc	52.1	7.2	5	2.2
FW7	38	1	42.5	59.8	66	17.3	15	Sub'l Inc	52.1	7.7	5	2.7
FW8	39	1	42.0	61.6	66	19.6	15	Sub'l Inc	53.0	8.6	5	3.6
FW9	40	1	42.0	60.1	66	18.1	15	Sub'l Inc	52.6	7.5	5	2.5
FW10	41	1	42.1	59.1	66	17.0	15	Sub'l Inc	52.3	6.8	5	1.8
FW11	42	1	42.4	58.0	66	15.6	15	Sub'l Inc	52.1	5.9	5	0.9
FW12	43	1	43.2	56.3	66	13.1	15	----	50.5	5.8	5	0.8
FW13	44	1	43.4	55.7	66	12.3	15	----	50.3	5.4	5	0.4
FW14	45	1	43.7	54.2	66	10.5	15	----	48.5	5.7	5	0.7
FW15	46	1	44.2	52.8	66	8.6	15	----	47.6	5.2	5	0.2
FW16	47	1	44.5	50.0	66	5.5	15	----	46.3	3.7	5	-1.3
FW17	48	1	45.0	53.2	66	8.2	15	----	48.7	4.5	5	-0.5
FW18	49	1	45.4	50.1	66	4.7	15	----	47.7	2.4	5	-2.6

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	18	2.4	5.8	8.6
All Impacted	8	5.9	7.0	8.6

All that meet NR Goal		14	5.1	6.4	8.6								