PRELIMINARY ENGINEERING REPORT

Space Coast Trail

Project Development & Environment (PD&E) Study

Brevard and Volusia County, Florida

Financial Project ID Number: 437093-1-22-01

ETDM Number: 14227

PROFESSIONAL ENGINEER CERTIFICATION

PRELIMINARY ENGINEERING REPORT

Project: Space Coast Trail PD&E

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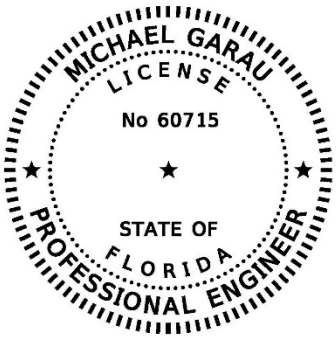
Financial Project ID: 437093-1-22-01

Federal Aid Project Number: N/A

This preliminary engineering report contains engineering information that fulfills the purpose and need for the Space Coast Trail PD&E Study from A. Max Brewer Memorial Highway to the Atlantic Ocean in Brevard and Volusia County, Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Kimley-Horn and Associates, Inc., and that I have prepared or approved the evaluation, findings, opinions, conclusions or technical advice for this project.



This item has been digitally signed and sealed by Michael Garau, P.E. on the date adjacent to the seal.

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Michael Garau

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1.0 PROJECT SUMMARY

1.1 Project Description

The Florida Department of Transportation (FDOT), in cooperation with the U.S. Fish and Wildlife Service (USFWS), National Park Service (NPS), and National Aeronautics and Space Administration (NASA), proposes to construct multiple trail segments within the Merritt Island National Wildlife Refuge (MINWR or Refuge) and Canaveral National Seashore (CANA or Seashore) in Brevard and Volusia counties, Florida. The proposed improvements are divided into the following segments and limits (***Figure 1.1 – Location Map***):

- East-West (E-W) MINWR Segment: From the Parrish Park/MINWR boundary on Playalinda Beach Road to Kennedy Parkway North – 6.1 miles
- East-West (E-W) CANA Segment: From Kennedy Parkway North to Parking Area No. 1 within CANA – 4.6 miles
- North-South (N-S) MINWR-1 Segment: Along Kennedy Parkway North from Playalinda Beach Road to the Haulover Canal bridge – 7 miles
- North-South (N-S) MINWR-2 Segment: Along Kennedy Parkway North from the Haulover Canal bridge to US-1 – 9 Miles
- Interpretive Loop Trail – 3.5-mile pathway looping between the MINWR Visitor Center and the Space Coast Trail

This Preliminary Engineering Report (PER) documents the engineering analysis and design parameters used for the development of the Space Coast Trail. The proposed Space Coast Trail would require careful design to discourage use of the facility that is incompatible with the purposes, visions, and management goals of MINWR and CANA. To be consistent with the goals and objectives of MINWR and CANA, the proposed Space Coast Trail would need to provide opportunities for the enjoyment of appropriate and compatible outdoor recreation, promote awareness and appreciation of natural resources, and protect, conserve, and manage wildlife, habitat, and cultural resources for the benefit of present and future generations, while also meeting NASA operational and security requirements.

The proposed Space Coast Trail would serve as a key link for the Coast-to-Coast (C2C) Trail and St. Johns River-to-Sea Loop Trail. The E-W segments would serve as the easternmost section of the Florida C2C Trail, which is an ongoing statewide effort by multiple state, regional, and municipal agencies to provide a continuous multi-use trail extending from St. Petersburg on the Gulf of Mexico to the Atlantic Ocean (***Figure 1.2 – Regional Trail Map***). Once completed, the C2C Trail would provide a 250-mile long continuous trail across the Florida peninsula. Currently the C2C Trail, portions of which are already under construction or have been constructed, ends at Parrish Park in the City of Titusville, which is where the proposed trail would begin.

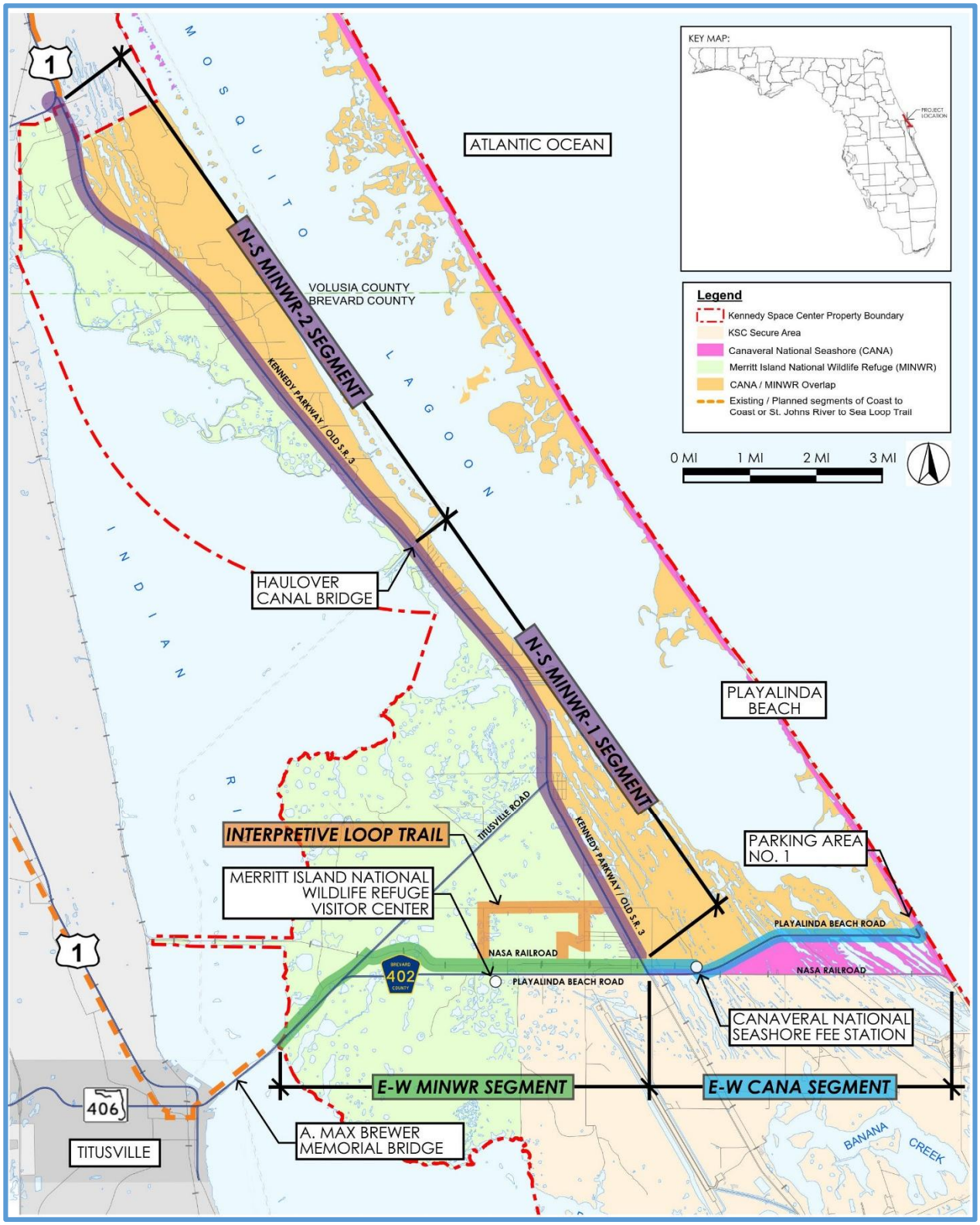

Figure 1-1: Project Location Map

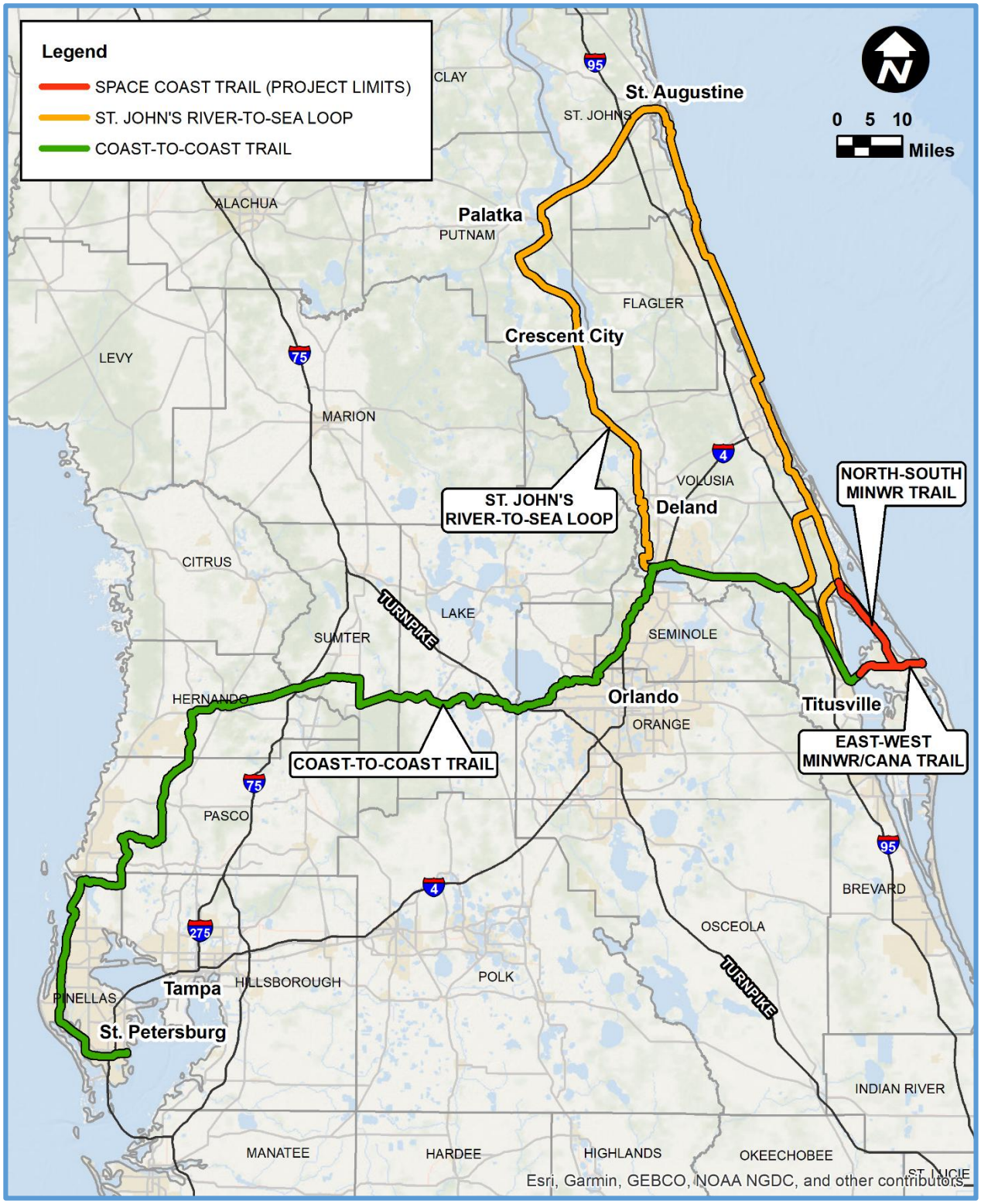

Figure 1-2: Regional Trail Map

The proposed N-S segments along Kennedy Parkway North would serve as a component of the St. Johns River-to-Sea Trail, a planned 266-mile trail from St. Augustine to Titusville looping along the St. Johns River Basin through the communities of Palatka, Crescent City, DeLand, and DeBary, and then continuing to Titusville and Edgewater (***Figure 1.2 – Regional Trail Map***).

1.2 Purpose & Need

1.2.1 Purpose

The purpose of the C2C Trail is to provide a continuous multi-modal opportunity to enjoy natural, cultural, and recreation resources within a statewide context and provide users the opportunity to explore central Florida from the Gulf of Mexico in St. Petersburg to the Atlantic Ocean at the CANA. The purpose of the St. Johns River-to-Sea Loop Trail is to provide users an opportunity to explore natural, cultural, and recreation resources from the St. Johns River to the Atlantic Ocean.

The purpose of the proposed Space Coast Trail would be to serve the purposes of MINWR and CANA while also serving as a major component of the C2C Trail and the St. Johns River-to-Sea Loop Trail, providing the easternmost section of the C2C trail between Titusville and the Atlantic Ocean and providing connectivity for the St. Johns River-to-Sea Loop Trail. Supporting the purposes and goals of MINWR and CANA, the Space Coast Trail would provide opportunities for the enjoyment of appropriate and compatible outdoor recreation; promote awareness and appreciation of natural resources; and protect, conserve, and manage wildlife, habitat, and cultural resources for the benefit of present and future generations, while also meeting NASA operational and security requirements.

MINWR was established administratively in 1963 through an agreement between NASA and USFWS. The primary purpose of the MINWR is "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" [16 USC §715d (Migratory Bird Conservation Act)]. Additional purposes of MINWR address protection and conservation of federally listed species and wetlands and application of the purposes of CANA in the CANA overlay of MINWR. MINWR is managed under the mandates of the National Wildlife Refuge System Improvement Act (1997). As outlined in the Comprehensive Conservation Plan (CCP), the MINWR provides opportunities for appropriate and compatible wildlife-dependent visitor uses which benefit the conservation of fish and wildlife resources and which contribute to the enjoyment of the public. These uses include hunting, fishing, observing wildlife, photographing wildlife, and participating in environmental education and interpretation.

The CANA was established by Congress in 1975 "... to preserve and protect the outstanding natural, scenic, scientific, ecologic, and historic values ... and to provide for public outdoor recreation use and enjoyment of the same ... the Secretary shall retain such lands in their natural and primitive condition, shall prohibit vehicular traffic on the beach except for administrative purposes, and shall develop only those facilities which he deems essential for public health and safety and Seashore administration. " [16 USC §459(j)]. Visitors to CANA enjoy recreational opportunities that include fishing, boating, sailing, canoeing, kayaking, surfing, sunbathing, swimming, hiking, horseback riding, wildlife viewing, and backcountry camping.

NASA is the land owner for the properties managed by MINWR and CANA at Kennedy Space Center (KSC) within the limits of the Space Coast Trail. Management agreements between the

agencies stipulate that security and operations for NASA are given priority over the management of other activities. Trail alternatives and management plans would be developed and evaluated with the concurrent goal of meeting security and operational needs of NASA. It would be expected that access to the Space Coast Trail may be limited during certain operating conditions as deemed appropriate by KSC, MINWR, and/or CANA.

1.2.2 Need

The proposed E-W Segment of the Space Coast Trail would be needed to complete the eastern terminus of the C2C Trail and to provide a transportation alternative for bicyclists and hikers, including less experienced users, between Parish Park in Titusville through MINWR to the CANA and the Atlantic Ocean in accordance with the purposes of MINWR and CANA and the goals and objectives in the MINWR CCP and CANA General Management Plan (GMP). Further, the proposed Space Coast Trail, including both the E-W MINWR Segment and the N-S MINWR Segment, would be needed to provide a key segment of the St. Johns River-to-Sea Loop Trail.

1.2.3 MINWR CCP and CANA GMP Goals and Objectives

The proposed E-W Segments of Space Coast Trail would help meet goals and objectives identified in the MINWR CCP and the CANA GMP. These goals and objectives include providing trails for additional “wildlife first” opportunities for observing wildlife, photographing wildlife, and participating in environmental education and interpretation. A central shared use trail would provide MINWR the framework to develop additional trails (including trails previously proposed in the CCP), education opportunities, interpretive displays, and wildlife viewing and photography areas. The facility would be designed to discourage uses such as racing or other higher speed activities, high-speed cycling, off-road/trail mountain biking, and exercise/fitness focused uses, which are incompatible with the MINWR purposes, goals, and objectives.

1.2.4 Safety

The proposed Space Coast Trail is needed to alleviate safety concerns for pedestrians and bicycling visitors to the MINWR and CANA. Currently the C2C Trail and the St. Johns River-to-Sea Loop alignment end at the western boundary of the MINWR. The eco-tourism-based users of the C2C and St. Johns River-to-Sea Loop who desire to travel to the Atlantic Ocean and visit the MINWR and CANA currently utilize the existing road network for access. The existing roads are not adequately designed for eco-tourism and the use of them by pedestrians and cyclists creates safety concerns. These safety concerns were documented in the MINWR Road Safety Audit Report (US Department of Transportation 2014) and the MINWR CCP (FWS 2008).

1.2.5 Multi-Modal Connectivity

As visitation continues to grow at the MINWR and CANA, alternative forms of transportation would be needed, such as the proposed Space Coast Trail, to assist in reducing vehicular trips, improving visitor experience, and reducing the environmental impacts associated with pollution and congestion.

1.3 Commitments

The following commitments were developed by FDOT in coordination with the USFWS, NPS and NASA.

- The Standard Protection Measures for the eastern indigo snake during construction would be implemented.
- During construction, if there are stock pile areas, these should be covered when not in use to avoid potential nesting least terns (April – August).
- Eagle nest monitoring should take place during design and permitting prior to construction. Coordination with USFWS Migratory Bird Division should occur following the updated survey, when the current condition of the nest is known. Minimization measures should include restrictions on construction timing, contractor education to avoid impacts to nests, and nest monitoring during construction.
- The listed excerpt from the Standard Manatee Conditions for In-Water Work (2011) would be followed.
    - Siltation and turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured and shall be regularly monitored to avoid manatee entanglement and entrapment.
    - Barriers shall be installed as to not impede manatee movement.
- Contractor staging, and storage areas would be coordinated with the USFWS and CANA staff and would be placed in previously disturbed or paved areas.
- Pre-construction surveys for gopher tortoises would be conducted and, impacts will be addressed on the Refuge or Seashore, as applicable.
- For wetland impacts located within MINWR, mitigation for unavoidable wetland impacts will occur within the Refuge and will result in no net loss of wetland function.
- For wetland impacts located within CANA, wetlands compensation will be provided at a 10:1 ratio or approximately 20 acres as identified in the NPS Wetlands Statement of Findings. Compensatory mitigation would include enhancement of the existing estuarine intertidal and palustrine emergent wetlands through removal of exotics (primarily Brazilian pepper) adjacent to the trail, and along other berms and railroads in the CANA that have been disturbed as part of the mosquito impoundment ditching.
- Additional coordination will occur with National Marine Fisheries Service (NMFS) during permitting to minimize and address impacts of concern.
- Construction would occur during daylight hours only.
- Trail would be open during daylight hours only.
- Contractor education materials would be provided to minimize effects on wildlife that could be encountered.

- Best Management Practices (BMPs) to control erosion and sedimentation in accordance with *FDOT's Standard Specifications for Road and Bridge Construction* would be implemented.
- A qualified archaeological monitor will be present during ground-disturbing activities in the vicinity of the Crook/Watton Cemetery (8BR01626).
- Construction plans will include notes referencing the Florida Statutes Chapter 872.05 regarding unanticipated finds and associated requirements per the statute.
- To ensure the Preferred Alternative meets NPS requirements and minimizes impacts to wildlife and habitat, the proposed trail would not provide opportunities for sport, exercise, competitive races, or any type of extreme sporting events.
- To minimize effects related to the existing contamination sites, the FDOT will ensure during associated permitting and construction phases that contracts and operations address related concerns from FDEP, as listed.
    - Based on the Land Use Controls (LUCs) at this Solid Waste Management Unit as outlined in its LUCIP, when the trail is being built all contracted personnel should be made aware they are working in a LUC area, the contaminants of concern at the site should be explained, what media (soil) and at what depth they may be found should be explained, and appropriate personal protection equipment is to be worn.
    - All contaminated soil that is removed from the path for trail construction is to be appropriately evaluated and disposed of offsite.
    - A Work Plan for trail construction should be made available to the Department for comment and concurrence before work commences.

1.4 Alternatives Analysis Summary

Prior to the start of the PD&E Study, USFWS, NPS, NASA, and FDOT conducted a preliminary alternatives evaluation and summarized the results in the Space Coast Trail Preliminary Alternatives Report (dated September 2016 and available under separate cover). This evaluation determined the alternatives that would be carried forward for further study.

The alternatives analysis process involved regular coordination with Refuge and Seashore managers. An intergovernmental coordination team consisting of USFWS, NPS, NASA, and FDOT with support from the Space Coast Transportation Planning Organization, Brevard County, and City of Titusville was formed and meetings were held monthly. These meetings were held as part of the development of the preliminary alternative evaluation and continued through the PD&E Study. Build and No-Build alternatives were evaluated during the PD&E Study. Other alternatives were considered but ultimately dismissed during the process due to not meeting the purpose and need, incompatibility with MINWR and CANA management plans, or incompatibility with NASA security requirements.

Opportunities for connecting the western boundary of the Refuge at Playalinda Beach Rd to Parking Area No. 1 within the Seashore are limited to areas that have already been disturbed or next to existing development to minimize wildlife and habitat disturbances consistent with the

purpose and need. As a result, opportunities for connecting the C2C Trail to Parking Area No. 1 includes Dike T-10A, Pump House Road, NASA Railroad, and Playalinda Beach Road. The proposed E-W Segment would include a paved connection to the Refuge's visitor center as a key trailhead and information center for the C2C Trail and the proposed Space Coast Trail. The trail would be located within or near these facilities to minimize habitat impacts.

Like the E-W Segment, opportunities for the N-S Segment are limited to areas that have already been disturbed or next to existing development for consistency with the purpose and need. As a result, providing a north-south trail is limited to areas immediately adjacent to or near Kennedy Parkway North.

The proposed Interpretive Loop Trail would loop from the proposed E-W Segment where it intersects the visitor center connection; run north, east, and south along existing or former dirt roads; and reconnect to the proposed E-W Segment.

1.5 Description of Preferred Alternative

The Preferred Alternative consists of the following: constructing a paved shared-use path from the MINWR boundary at Playalinda Beach Road to Parking Area No. 1 within CANA; constructing paved buffered bicycle lanes along Kennedy Parkway North from the intersection of Playalinda Beach Road to US 1; and constructing the Interpretive Loop Trail as a pervious pathway with a paved section from the MINWR Visitor Center to the East-West Segment. To support these trail alignments, bicycle/pedestrian roadway crossings will be added at: (1) the Playalinda Beach Road entrance to the refuge to connect the trail on the north side of the road with the existing parking area, kiosk, and observation deck on the south side of the road; (2) the east side of the railroad crossing at Titusville Road; (3) Playalinda Beach Road to connect the refuge's visitor center area to the E-W Segment and the Interpretive Loop Trail; (4) the north side of the railroad crossing at Kennedy Parkway North; (5) the east side of the railroad crossing along the Seashore's entrance road before the fee booth; and (6) at the Seashore's curve where the entrance road turns north toward the parking areas. Railroad crossings will also be added at: (1) the Pump House Road railroad crossing immediately before the Titusville Road crossing, and (2) the railroad crossing to connect the E-W Segment and Interpretive Loop Trail to the refuge's visitor center.

Maps and figures related to the Preferred Alternative are provided in **Appendix A**.

E-W MINWR (from Parrish Park/MINWR Boundary to Kennedy Parkway North: The Preferred Alternative will begin the trail at the newly constructed eastern terminus of the Coast-to-Coast Trail at the refuge's western boundary on Playalinda Beach Road. The entrance will include a bicycle/pedestrian crossing from the trail on the north side of the road to the existing entrance parking area, kiosk, and observation deck on the south side of the road. This includes the former roadway alignment that previously served as the entrance road. Pump House Road, Dike T-10A, and Dike T-10F are all part of a former roadway with remnants of the roadbed still in place. The Proposed Alternative for this segment will consist of constructing a 12-foot wide paved shared-use path on top of Dike T-10A and continuing along Pump House Road. Pump House Road is currently not paved and serves as a maintenance road with no public access. At the eastern terminus of Pump House Road, the trail will cross over a canal (unnamed) and continue along Dike T-10F. The trail will cross over the NASA railroad and Titusville Road adjacent to the existing

railroad crossing and immediately turn towards the east to continue along the north side of the rail tracks. The typical section may be reduced to 10-feet wide in areas of severe environmental constraint. In areas where the trail will cross wetlands, the trail will utilize boardwalks to minimize impacts. This segment of the trail is located entirely within the boundaries of MNWR and the USFWS will be responsible for future maintenance activities.

Interpretive Loop Trail: The Preferred Alternative for this segment will consist of a 12-foot wide trail using a pervious surface that will connect to the E-W Segment and will loop between the MINWR Visitor Center, Center Road, and the trailhead for the Oak and Palm Hammock trails. The trail alignment will follow existing unpaved maintenance roads**.** This will include a paved bicycle/pedestrian crossing of Playalinda Beach Road from the refuge's visitor center area to provide direct access to the E-W Segment and the Interpretive Loop Trail. This segment of the trail is located entirely within the boundaries of MINWR and the USFWS will be responsible for future maintenance activities.

E-W CANA (from Kennedy Parkway North to Parking Area No. 1): The Preferred Alternative for this segment will consist of constructing a 12-foot wide paved shared-use path along the north side of the existing NASA railroad up to Playalinda Beach Road, and an 8-foot wide paved shared-use path along the south side of Playalinda Beach Road to CANA's Parking Area No. 1. An 8-foot wide paved shared-use path will be constructed from the crossing of Playalinda Beach Road to Parking Area No. 1 due to environmental constraints. As part of this alternative, the curve where CANA's entrance road turns north toward the parking areas will be reconfigured into a T-intersection. In addition, the section of CANA's entrance road from the curve to Parking Area No. 1 will be shifted approximately 13 feet to the west to avoid the sand dune. In areas where the trail crosses wetlands, the trail will utilize boardwalks to minimize impacts. The Preferred Alternative for this segment will include bicycle/pedestrian crossings at: (1) Kennedy Parkway North adjacent to the existing railroad crossing; (2) the Seashore's entrance road at the existing railroad crossing; and (3) the re-alignment of the curve where the Seashore's entrance road turns north towards the parking areas. The section of the trail from Kennedy Parkway North to the railroad crossing at Playalinda Beach Road is located within the management overlap area and the USFWS will be responsible for future maintenance activities. NPS will be responsible for the section of this segment from the railroad crossing at Playalinda Beach Road to Parking Area No. 1 within CANA.

N-S MINWR (from Playalinda Beach Road to US-1): The Preferred Alternative will consist of constructing northbound and southbound buffered bike lanes along Kennedy Parkway North from Playalinda Beach Road to US-1 with the exception of the crossing over the Haulover Canal bridge. Sharrow markings will be provided over the Haulover Canal bridge, then continuing with the buffered bike lane along Kennedy Parkway North to US-1. A three-foot wide steel metal plate along each direction of travel will be attached to the bridge surface to aid bicyclist during wet/slippery conditions. This segment of the trail is located entirely within the boundary of MINWR. Because the buffered bike lanes will be connected to the existing roadway, future maintenance activities for the buffered bike lanes could rest with USFWS, NASA, or a combination of USFWS and NASA.

1.6 List of Technical Documents

The following is a list of the technical documents prepared for the study:

- Natural Resource Evaluation (NRE) Report
- Florida Scrub-Jay (Aphelocoma coerulescens) Survey Report
- Cultural Resource Assessment Survey (CRAS)
- Contamination Screening Evaluation Report (CSER)
- Location Hydraulics Report (LHR)
- State Environmental Impact Report (SEIR)
- Environmental Assessment (EA) Report
- Finding of No Significant Impact (FONSI)

2.0 EXISTING CONDITIONS

The limits of the proposed Space Coast Trail are located entirely within the Refuge and Seashore, established as an overlay of KSC. As the Refuge and Seashore were dedicated to preserve and protect the natural, scenic, ecological, and historic values of the area, most of the Refuge and Seashore is undeveloped.

2.1 Roadway

There are three existing paved roadways within the Refuge and Seashore and all are two lane undivided facilities. Titusville Road traverses diagonally in the northeast-southwest direction from the Refuge entrance to Kennedy Parkway North; Playalinda Beach Road traverses in the east-west direction from Titusville Road to the Seashore; and Kennedy Parkway North traverses in the north-south direction from south of Playalinda Beach Road to US-1. There are remnants of abandoned roadways in the study area identified as Dike T-10A and Pump House Road. A map illustrating the existing roadways is provided in **Figure 2-1**.

2.2 Right-of-Way

The project area is located entirely within the boundaries of the Refuge and Seashore. The land encompassing the project area is managed by the USFWS and NPS and owned by NASA.

2.3 Roadway Classification

Within the Refuge and Seashore, Playalinda Beach Road is classified as a rural principal arterial (other), and both Titusville Road and Kennedy Parkway North are classified as rural major collectors.

2.4 Adjacent Land Use

The project area is located entirely within federally-owned land that is managed by USFWS and NPS for recreation, habitat, and conservation purposes.

2.5 Access Management Classification

All of the existing paved roadways within Refuge and Seashore are off-system facilities and are not classified.

2.6 Design and Posted Speeds

The speed limit on Titusville Road varies from 35 MPH to 55 MPH. On Playalinda Beach Road, the posted speed limit for the segment from Titusville Road to Kennedy Parkway North is 55 MPH but drops to 45 MPH near the entrance to the MINWR Visitor Information Center. Within the Seashore, the speed limit on Playalinda Beach Road is 35 MPH and drops to 25 MPH at the curve where the roadway turns north and runs parallel to the beach. On Kennedy Parkway North the posted speed limit varies from 45 MPH to 55 MPH. The design speed for these facilities are unknown.

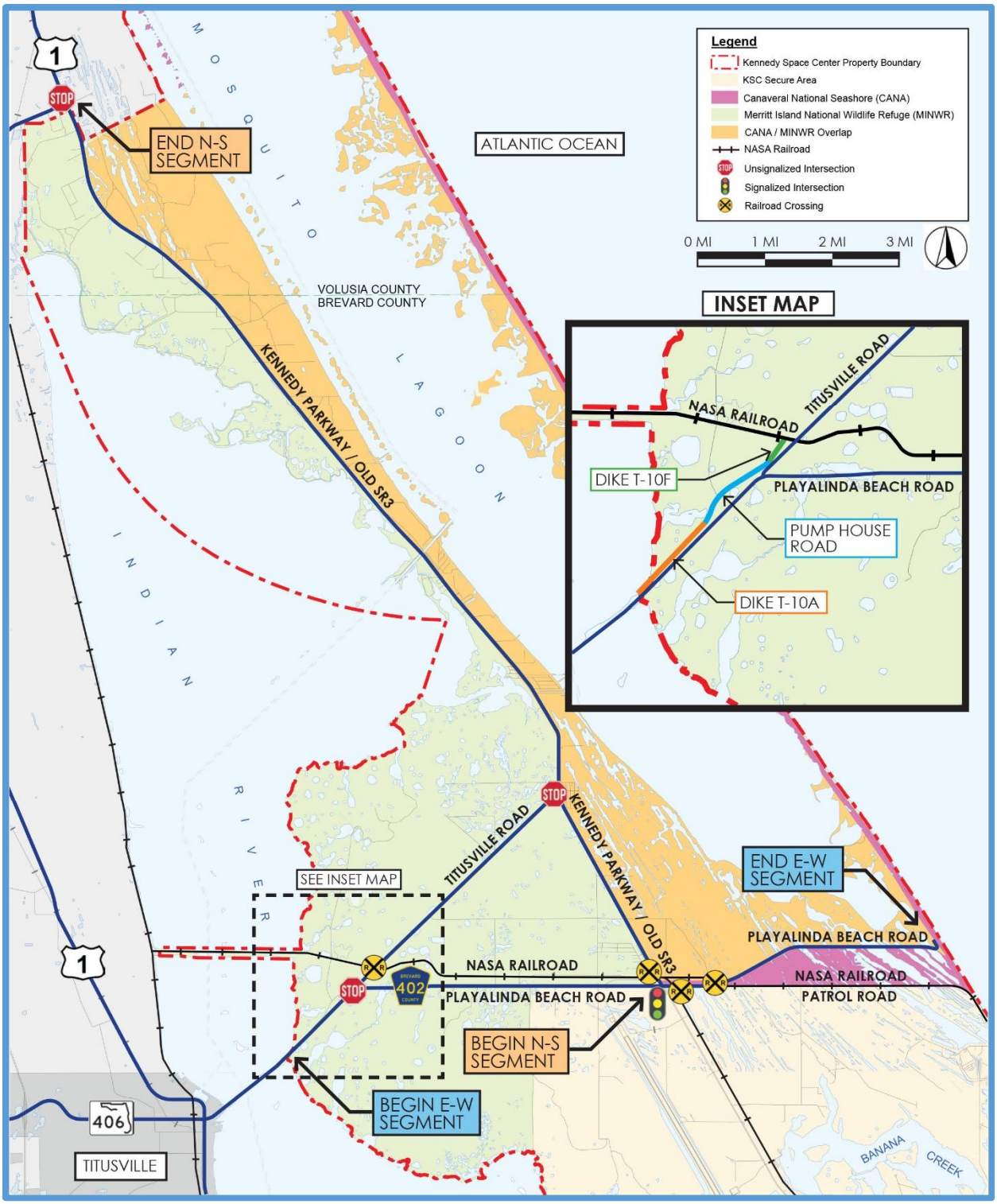

Figure 2-1: Existing Features of the Study Area

2.7 Vertical and Horizontal Alignment

Vertical alignment data is not available; however, the vertical profiles of the existing roadways are relatively flat and level except for the crossing of Kennedy Parkway North over the Haulover Canal. The bridge over the Haulover Canal is approximately 32 feet above sea level and the roadway approaches extend approximately 1,200 feet in either direction.

Horizontal alignment data is not available; however, Titusville Road traverses diagonally in the northeast – southwest direction, Playalinda Beach Road traverses in the east-west direction, and Kennedy Parkway North traverses in the north-south direction.

2.8 Pedestrian Accommodations

There are no sidewalk facilities adjacent to the existing paved roadways within the Refuge and Seashore. There are six hiking trails (unpaved) within the Refuge and none within the southern section of the Seashore.

2.9 Bicycle Facilities

There are no bicycle facilities within the Refuge or Seashore. Bicyclists are allowed on existing roads; however, there are no paved shoulders and motorists are known to travel at high speeds. Due to these safety concerns, NASA restricts bicycle use on the Refuge from 6 a.m. to 9 a.m. and 3 p.m. to 6 p.m., Monday through Friday, when vehicle volumes are high.

2.10 Transit Facilities

There are no transit services or facilities within the Refuge or Seashore.

2.11 Pavement Condition

The pavement condition of the existing paved roadways is not known.

2.12 Traffic Volumes and Operational Conditions

Traffic data was not collected within the project limits.

2.13 Intersection Layout and Traffic Control

There are four intersections within the study area and they are listed below. A map illustrating the location of these intersections is provided in **Figure 2-1**.

- Titusville Road and Playalinda Beach Road
- Titusville Road and Kennedy Parkway North
- Playalinda Beach Road and Kennedy Parkway North
- Kennedy Parkway North and US -1

Only the intersection of Playalinda Beach Road and Kennedy Parkway North is signalized. The remaining are under stop control.

2.14 Railroad Crossings

There is a NASA-owned railroad that traverses through the Refuge and Seashore (**Figure 2-1**). The railroad is currently not in use but may become operational at any time at NASA's discretion. NASA has indicated that if the tracks were to reopen, trains would only run at night and at low speeds.

There are four existing railroad crossings within the project limits (**Figure 2-1**). One crossing traverses across Titusville Road, just north of the intersection with Playalinda Beach Road. The second crossing goes across Kennedy Parkway North, just north of the intersection with Playalinda Beach Rd. The remaining two crossings are both over Playalinda Beach Rd, one directly east of the intersection with Kennedy Parkway North and the other just outside of the CANA fee station. Since the railroad is not in use, all the crossings within the project limits are uncontrolled with all of the lowering arms removed.

2.15 Crash Data and Safety Analysis

Crash data was not collected for this project. However, the Eastern Federal Lands Office of the Federal Highway Administration prepared a Road Safety Audit in 2014 for the Refuge. This report is available under separate cover.

2.16 Drainage

The basin area is located within the East Coast, Middle Watershed, between Indian River and Mosquito Lagoon which are under federal jurisdiction and federally owned land. Indian River and Mosquito Lagoon function as a body of the Indian River Lagoon system, which has been designated as an aquatic preserve and Outstanding Florida Waters (OFW). OFWs are subject to additional pollution abatement criteria as established by state regulatory agencies. Indian River and Mosquito Lagoon have been declared impaired water bodies by the Florida Department of Environmental Protection (FDEP). However, only Mosquito Lagoon has a course of action for restoring water quality with a Reasonable Assurance Plan (RAP).

There is no appearance of a defined drainage system. Inlets are situated sporadically throughout the corridor segment. Much of the stormwater run-off is conveyed to dilapidated adjacent swales, open spaces, and open fields before dissipating during the natural hydrologic processes of evaporation, transpiration, and infiltration. Significant segments of the study area predate local and state environmental stormwater permitting criteria. There are pockets of permitted stormwater management facilities within the study area. The stormwater management facility consists of rudimentary exfiltration systems, bay area's/swales, cross culverts, and bridge culverts that discharge into their corresponding wetlands. Below is a drainage summary of the major facilities within the study area.

Pump House Road

Pump House Road is a rural dirt service road that provides access to a pump station. Along Pump House Road, stormwater run-off sheet flows to a series of adjacent depressional bays that function ostensibly as attenuation/treatment swales. The depressional bays are connected via culverts that ultimately discharge to the Indian River.

NASA Railroad

The watershed features vary along the rail corridor. In the eastern segment (towards Titusville Rd), stormwater run-off sheet flows from the apex of the track centerline to wetlands located on both sides. Along the north side of the tracks is a maintenance berm or pathway that varies in width from 15 to 30 feet. In the western segment (towards Kennedy Parkway North), runoff sheet flows from the tracks and into areas more defined by uplands.

Playalinda Beach Road

Stormwater run-off sheet flows from the centerline of the roadway into flanking adjacent swales whose dimensions fluctuate, which correlate to wet and dry storages conditions.

Within the Seashore and just east of the CANA fee station, there is an existing exfiltration system. The exfiltration system consists of dual 6-inch perforated pipes, which flank the existing roadway alignment. In this stormwater management configuration, stormwater run-off is collected via ditch bottom, and the exfiltration system provides attenuation and pollution abatement before discharging to an adjacent wetland area. It should be noted that the existing ditch profiles are not conducive for the conveyance of stormwater run-off to the existing inlets, and therefore, exfiltration systems are not operating at design capacity. The existing stormwater system is operating in a sump condition in which, after conveyance though the exfiltration system, stormwater will "bubble up" out of the inlet tops and discharge to the adjacent wetlands.

Kennedy Parkway North

The watershed features along Kennedy Parkway have no apparent semblance of a defined drainage system. The drainage patterns consist of stormwater run-off sheet flowing from the centerline of the roadway to roadside swales that transition from a defined swale configuration to an area of open space and ultimately the adjacent wetlands of Indian River or Mosquito Lagoon.

Cross drains and bridges

Existing cross drains are summarized in **Table 2-1**. Haulover Canal bridge (Bridge Number 703004/E4-2414) is located directly over the Haulover Canal and delineates the Indian River from the Indian River Lagoon.

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Table 2-1: Summary of Existing Cross Drains and Bridges

Structure Number	Chain	Approx. Location	Description	Flowline Invert
CD-1	Pump House Rd.	N/A	1-30" Pipe	UNK
CD-2	NASA Railroad	N/A	1-36"x36" CBC	UNK
CD-3	NASA Railroad	N/A	Unknown	UNK
CD-4	Playalinda Beach Rd.	36+00	1-42"x29" Alum. Alloy	1.37
CD-5	Playalinda Beach Rd.	72+00	2-42"x29" Alum. Alloy	-0.53
CD-6	Playalinda Beach Rd.	96+00	2-42"x29" Alum. Alloy	-0.51
CD-7	Playalinda Beach Rd.	109+00	2-43"x27" Alum. Alloy	-0.33
CD-8	Playalinda Beach Rd.	115+00	2-42"x29" Alum. Alloy	-0.31
CD-9	Playalinda Beach Rd.	141+00	2-42"x29" Alum. Alloy	0.56
CD-10	Playalinda Beach Rd.	147+00	2-42"x29" Alum. Alloy	0.44
CD-11	Playalinda Beach Rd.	166+00	2-42"x29" Alum. Alloy	-0.22
CD-12	Playalinda Beach Rd.	175+00	1-42"x29" Alum. Alloy	-0.29
CD-13	Playalinda Beach Rd.	180+00	1-42"x29" Alum. Alloy	-0.29
CD-14	Playalinda Beach Rd.	189+00	2-42"x29" Alum. Alloy	0.23
CD-15	Kennedy Parkway	N/A	2-24" Pipe	UNK
CD-16	Kennedy Parkway	N/A	1-24" Pipe	UNK
CD-17	Kennedy Parkway	N/A	1-18" Pipe	UNK
CD-18	Kennedy Parkway	N/A	Unknown	UNK
CD-19	Kennedy Parkway	N/A	Unknown	UNK
CD-20	Kennedy Parkway	N/A	Unknown	UNK
CD-21	Kennedy Parkway	N/A	1-24" Pipe	UNK
#703004	Kennedy Parkway	N/A	Haulover Canal Bridge	N/A
CD-22	Kennedy Parkway	N/A	Unknown	UNK
CD-100	Pump House Rd.	N/A	Unknown	UNK

2.17 Soils and Geotechnical Data

The major soil types in the study area were defined through the United States Department of Agriculture/National Resources Conservation Service (NRCS) Soil Survey and are summarized in **Table 2-2**. These soils are primarily derived from sandy marine sediments, are gently sloping, and with a variety of drainage characteristics. Additional information related to soils is provided in the *Natural Resource Evaluation* (NRE) report available under separate cover.

2.18 Utilities

Through coordination with Sunshine 811, six (6) utility providers, as listed below, were identified as having utilities within the project area.

- ATT
- Florida Power and Light
- Level 3 Communications
- Tower Cloud, Inc.
- Century Link
- NASA

2.19 Lighting

There is no existing lighting within the Refuge or Seashore.

2.20 Signs

There are no major overhead signs located within the study limits. There are speed limit signs and informational signs located along the roadway facilities within the Refuge and Seashore. NASA indicated that any new signs along existing vehicular roadways should be removable in case of trucks with large payloads.

2.21 Aesthetics Features

The Refuge and Seashore provides an outstanding natural environment that is preserved for the benefit of the species that inhabit the properties and the visitors looking for scenic and recreational opportunities. Potential stops on the trail that could serve as vistas or scenic views should be coordinated with USFWS and NPS.

2.22 Bridges and Structures

There is one bridge within the project limits. The bridge is a bascule bridge over the Haulover Canal located along Kennedy Parkway North near the midway point between Playalinda Beach Rd and US-1. The bridge is owned and maintained by NASA. The bridge was constructed in 1965 with a total length of 225 ft. NASA conducted an inspection of the bridge in 2015 through which a sufficiency rating of 74.02 was determined. A copy of the inspection report is retained in the project files where additional data and information is provided. In 2018, the bridge was closed for repairs and has since reopened to traffic.

Table 2-2: NRCS Soils Identified in the Study Area

Soil Name	Parent Material	Drainage Class	Water Capacity	Hydraulic Conductivity	Depth to Restrictive Feature	Groundwater Depth
Anclote sand, depressional	Sandy marine sediments	Very poorly drained	Moderate to low	Rapid	>72 inches	10-40 inches
Anclote sand, frequently flooded	Sandy marine sediments	Very poorly drained	Moderate to low	rapid	>72 inches	10-40 inches
Astatula fine sand, 0 to 8 percent slopes	Sandy marine or eolian sediments	Excessively drained	Very low	Very rapid	>80 inches	>80 inches
Candler fine sand	Sandy marine or eolian sediments	Excessively drained	Very low	Very rapid	>80 inches	>80 inches
Basinger sand	Sandy marine sediments	Poorly drained	Very low to low	Very rapid	>80 inches	10 to 40 inches
Canaveral – urban land complex	Marine sand and shell fragments	Moderately well drained	Very low	Very rapid	>80 inches	40 to 60 inches
Beaches	Quartz sand and fragments of sea shells	Not designated	Not designated	Not designated	Not designated	Not designated
Cocoa Sand	Deposits of sandy marine or eolian sediments overlying coquina rock	Well drained	Very low to low	Rapid	38 inches	>6 feet
Copeland-Bradenton-Wabasso complex	Sandy and loamy marine sediments over limestone	Very poorly drained	Moderate	Rapid	30 inches	<10 inches
Riviera and winder soils	Loamy marine material	Poorly drained	Low to moderate	Rapid to moderate	>65 inches	<30 inches
Riviera and winder soils – depressional	Loamy marine material	Poorly drained	Low to moderate	Rapid to moderate	>65 inches	<30 inches
Immokalee sand	Marine sands	Poorly drained	Moderate to very low	Moderate to moderately rapid	>80 inches	10 to 40 inches
Myakka fine sand	Marine sands	Poorly drained	Moderate to very low	Rapid to moderately rapid	>63 inches	10 to 40 inches

Soil Name	Parent Material	Drainage Class	Water Capacity	Hydraulic Conductivity	Depth to Restrictive Feature	Groundwater Depth
Myakka variant fine sand	Marine sands	Poorly drained	Low	Rapid to moderately rapid	>80 inches	<10 inches
Orsino fine sand	Sandy marine or Eolian sediments	Moderately well drained	Very low	Very rapid	>80 inches	40 to 60 inches
Palm Beach sand	Marine sand and shell fragments	Excessively drained	Very low	Very rapid	>105 inches	>10 feet
Paola fine sand, 0 to 5 percent slopes	Eolian sands	Excessively drained	Very low	Very rapid	>90 inches	>10 feet
Paola fine sand, 0 to 8 percent slopes	Eolian sands	Excessively drained	Very low	Very rapid	>90 inches	>72 inches
Pineda fine sand	Sandy and loamy marine material	Poorly drained	Low to moderate	Rapid to moderately rapid	>64 inches	10 to 40 inches
Pomello sand	Marine sands	Moderately well drained	Very low to moderate	Moderately rapid to very rapid	>80 inches	30 to 40 inches
Pompano fine sand	Marine sand	Poorly drained	Low to very low	Very rapid	>90 inches	<10 inches
Pompano-Placid complex	Marine sand	Poorly drained	Low to very low	Very rapid	>90 inches	<10 inches
Quartzipsamment, smoothed	Variable	Variable	Very low	Very rapid	Not designated	<50 inches
St. Johns sand	Marine sand	Poorly drained	Moderate to very low	Moderate to very rapid	>70 inches	<10 inches
St. Johns sand, depressional	Marine sand	Poorly drained	Moderate to very low	Moderate to very rapid	>70 inches	<10 inches
Turnbull and Riomar soils, tidal	Loamy or clayey tidal deposits	Very poorly drained	Low	Very slow	>25 inches	<10 inches
Arents, moderately wet	Unknown - variable	Somewhat poorly drained	Variable	Variable	Variable	Variable – 20 to 60 inches
Wabasso sand	Sandy marine sediments over loamy materials	Poorly drained	Low to very low	Rapid to moderate	>62 inches	<30 inches

3.0 PROJECT DESIGN CONTROLS & CRITERIA

3.1 Roadway Context Classification

Roadway context classification is not applicable to this project.

3.2 Design Control and Criteria

Table 3-1 provides a summary of the design control and criteria.

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Table 3-1: Design Criteria Table

Design Element	Criteria	Proposed Design	Design Variation	Source
SHARED USE PATH ELEMENTS				
Functional Classification	Shared-Use Path, within the SUN TRAIL NETWORK	Paved Shared-Use Path through Merritt Island National Refuge and Canaveral National Seashore	N/A	FDOT Design Manual, Section 224
Design Year Traffic	2040	N/A	N/A	
Design Traffic Volume (AADT)	N/A	N/A	N/A	
Design Speed	18 MPH 30 MPH (when grades exceed 4%)	18 MPH Design longitudinal grades to be less than 4%	NO	FDOT Design Manual, 224.9 AASHTO 5.2.4
Curb Ramps and Transitions	Maximum Slope 1:12 (8.3%)	8.3 % or less than	NO	FDOT Design Manual, 222.2.2 Standard Plans, Index 522-002
Detectable Warnings	Provide full width of walking surface and 2' deep	Detectable warning will be provided full width of trail. Specify on the plans appropriate Detectable Warning System or consider short sections of concrete	NO	FDOT Design Manual, 222.2.3 Standard Plans, Index 522-002
Shared Use Path Widths	**SUN Trail Network 12' min** 10 - 14' (range) 12' (standard) 10' (min) 8' (short segments at constrained condition) Constrained conditions include environmental, bridge abutment, utility structure, fence and such Consider accommodation of emergency and maintenance vehicles.	Varies 8' to 12' Implement Warning Signs When Path Narrows (MUTCD Sign W5-4a)	**YES** Approval from Chief Planner, since the trail is within the SUN Trail Network	FDOT Design Manual, 224.4 AASHTO Guide for Bicycle Facilities 2012 MUTCD 2012, Part 9, Figure 9B-3

Design Element	Criteria	Proposed Design	Design Variation	Source
Tunnel Widths, Bridges, Underpasses	Shared Use Path plus 4' Lighting should be discussed with FDOT	N/A No tunnels, bridges or overpasses on this project	NO	FDOT Design Manual, 224.4 AASHTO Guide for Bicycle Facilities 2012, Section 5.10
Cross Slopes	2%	1.5% Per request from FDOT, This will account for construction tolerances, not to exceed the 2% for ADA compliance	NO	FDOT Design Manual, 224.5 Americans with Disabilities Act (ADA)
Cross Slope Transition	75' When it is desired to change the slope direction of the path	75' When it is desired to change the slope direction of the path, primarily for drainage	NO	FDOT Design Manual, 224.5
HORIZONTAL ALIGNMENT				
Conflict Points and Cyclists Enter and Exist Paths	Minimizing and Managing conflict points	Implement appropriated Signing & Pavement Markings at Shared-use Path Crossings (roadways / driveways / railroad) Keep in mind the path provides two-way bicycle traffic and motorists are not in the habit of scanning both directions for bicyclists	NO	FDOT Design Manual, 224.1.4, 223.2.4 MUTCD 2012
Minimum Radius @ 18 mph (For Shared Use Path Design Max Cross Slope of -2% governs)	86' FDOT 60' AASHTO	86' or greater 60' in constrained conditions	**YES**	FDOT Design Manual, 224.10.1, Table 224.10.1 AASHTO Guide for Bicycle Facilities 2012, Table 5.2
Minimum Radius @ 30 mph (For Shared Use Path Design Max Cross Slope of -2% governs)	316' FDOT 166' AASHTO	N/A **Do not use longitudinal grade greater than 4%**	NO	FDOT Design Manual, 224.10.1, Table 224.10.1

Design Element	Criteria	Proposed Design	Design Variation	Source
Minimum Stopping Sight Distance @ 18mph	FDM and AASHTO Downhill - 156' at 4% Uphill - 120' at 4% Downhill - 149' at 3% Uphill - 123' at 3% Flat - 134'	SSD **to be checked** Based on the downhill longitudinal grades, since this is a 2-way path, use grater of the values	NO	FDOT Design Manual, 224.10.2, Table 224.10.2 AASHTO Guide for Bicycle Facilities 2012, Table 5.4
Minimum Lateral Clearance (Horizontal Sightline Offset or HSO) for Horizontal Curves	Varies based on Table 5-6	Horizontal Sightline Offset **to be checked** Based on Curve Radii	NO	AASHTO Guide for Bicycle Facilities 2012, Table 5.6
Minimum Horizontal Clearance for lateral objects	4' FDM 2' AASHTO 2' to Post Mounted Sign, Overhead Sign Post or other traffic control devices	Varies 2' to 4'	**YES** 2' offset from trail to split rail fence	FDOT Design Manual, 224.7 AASHTO Guide for Bicycle Facilities 2012, Section 5.2.1 MUTCD 2012, Section 9, Figure 9B.1
Horizontal Clearance for slopes adjacent to path	2', max 1:6 slope	2', 1.5% slope	NO	FDOT Design Manual, 224.7 AASHTO Guide for Bicycle Facilities 2012, Section 5.2.1
Separation from Roadway	**FDM** **DS ≤ 45 MPH** Flush Shoulder Roadways 5' from the edge of the paved shoulder Curbed Roadways 4' from the back of curb **DS ≥ 50 MPH** 5' from the shoulder break point **AASHTO** 5' Distance between the edge of travel way or roadway curb (i.e. face of curb)	Varies 5'-8' from edge of roadway Playalinda Beach Road (has no paved shoulders)	NO	FDOT Design Manual, 224.12 AASHTO Guide for Bicycle Facilities 2012, Section 5.2.2

Design Element	Criteria	Proposed Design	Design Variation	Source
Drop-off Hazards	**CASE 1** Greater than 10" that is closer than 2' **CASE 2** Slope steeper than 1:2 that begins closer than 2' shoulder be considered a hazard and shielded when total drop off is greater than 60"	2-ft wide graded area is being provided adjacent to the trail and all slopes are 1:2 or flatter	NO	FDOT Design Manual, 224.15, Figure 224.15.1
Path Adjacent to Parallel Bodies of Water	For slopes steeper than 1:3 a wider separation should be considered 5' from the edge of the path to the top of the slope is desirable	Provide slopes at 1:3 for path parallel to bodies of water **Will need to verify depths (for safety rail requirements)**	NO	AASHTO Section 5.2.1, Figure 5-3
Shared Use Path Crossing Roadway Intersection Angle of Path Crossing Roadway	90 Degree Preferred (Perpendicular to Roadway) 60 Degree Minimum	Path alignment to be 90 Degrees Perpendicular to roadway	NO	AASHTO Section 5.3, Figure 5-14
VERTICAL ALGNMENT				
Minimum Stopping Sight Distance @ 18mph	FDM and AASHTO 156' at 4% 149' at 3% 134' at 0%	SSD **to be checked** Based on the longitudinal grades and Vertical Curves	NO	FDOT Design Manual, 224.10.2, Table 224.10.2 AASHTO Guide for Bicycle Facilities 2012, Table 5-4
SSD Object height / Bicyclist Eye Height	0' / 4.5	SSD **to be checked** Based on the longitudinal grades and Vertical Curves	NO	FDOT Design Manual, 224.10.2, Table 224.10.2 AASHTO Guide for Bicycle Facilities 2012, Table 5-5
Maximum Longitudinal Grade	5%	4% for Design Speed 18 MPH 4% to 5% for Design Speed 30 MPH **If longitudinal grade exceeds 4%, radii will need to be checked for DS - 30 MPH**	NO	FDOT Design Manual, 224.6 AASHTO Guide for Bicycle Facilities 2012, Section 5.2.7

Design Element	Criteria	Proposed Design	Design Variation	Source
Maximum Length of Vertical Curve (when S > L)	L = 2S – (900/A)	Vertical Curves to be Checked throughout Project Limits	NO	FDOT Design Manual, 224.11 AASHTO Guide for Bicycle Facilities 2012, Table 5.5
Maximum Length of Vertical Curve (when S < L)	L = AS^2 / 900			
Vertical Clearance	12' Desirable 10' Minimum 8' for overhead signs Existing elements that provide 8' vertical clearance are not required to be corrected	10' Minimum 8' for signs	NO	FDOT Design Manual, 224.8 AASHTO Guide for Bicycle Facilities 2012, Section 5.2.1
Path Railing Height Requirements	**FDM** 42" Standard 48" When all three of the conditions exist: 1) Bicyclists are permitted to travel within 3' of railing 2) The path is on downward grade of 5% 3) Horizontal curve having less than specified for the design speed for the bicycle. **AASHTO** Where there is a high vertical drop or body of water adjacent to the path where railing is provided, engineering judgement should be used to determine whether a railing suitable for bridges (as described in section 5.2.10) should be provided. Openings between horizontal and vertical members on railings should be small enough that 6" sphere cannot pass through them in lowered 27".	**FDM** 42" Height A wood split rail fence design will be used as requested by the agencies to provide for a more natural look to the environmental surroundings. **AASHTO** Will need to verify depths adjacent to body of water, slopes and offsets (for safety rail requirements)	NO	FDOT Design Manual, 222.4 AASHTO Guide for Bicycle Facilities 2012, Section 5.2.1 and 5.2.10

Design Element	Criteria	Proposed Design	Design Variation	Source
NASA RAILROAD - AT GRADE CROSSING and PARALLEL TO RAILROAD				
Surface of the Crossing	Firm, Stable and Slip Resistant Level and Flush with the top of the rail at the outer edges of the rails, and area between the rails aligns with the top of the rail	A Concrete Pavement Design will be provided at the railroad crossing and meet these requirements	NO	FDOT Design Manual, Section 222.2.4
Placement of Detectable Warnings	Located between 6 and 15 feet from the centerline of the nearest rail. Where gates are provided, detectable warnings are to be placed a minimum of 4 feet from the side of the gates opposite the rail.	No Gate is being provided, therefore detectable warnings will be placed between 6 and 15 feet from the centerline of the nearest rail.	NO	FDOT Design Manual, Section 222.2.4 Figure 222.2.2
Maximum Flangeway Gap	2½" for all non-freight rail track and 3" for freight rail track.	3"	NO	FDOT Design Manual, Section 222.2.4
Shared use path parallel to the railroad, offset requirements.	6'-6" Minimum From the nearest railroad rail to the Split Rail Fence (See Typical Section No. 2)	6'-6" Minimum	NO	David Spencer, NASA, Email dated March 18, 2019
Signing and Pavement Markings for Trail Crossing the Railroad	12' Minimum from nearest railroad rail to Stop Bar and Signage	12'	NO	MUTCD 2012, Part 8, Figure 8D-1

SOURCE REFERENCE
1. FDOT Design Manual (FDM), (January 2020)
2. AASHTO "Guide for the Development of Bicycle Facilities", Fourth Edition (2012)
3. Manual of Uniform Traffic Control Devices (MUTCD) 2012
4. Park Road Standards - National Park Service 1984

4.0 ALTERNATIVES ANALYSIS

4.1 Previous Planning Studies

A preliminary alternatives study was completed in 2016 to identify alternatives for consideration during this PD&E study. The results of this analysis are documented in the *Space Coast Trail Preliminary Alternatives Report*, available under separate cover. The preliminary alternatives study was a joint effort between FDOT, USFWS, NPS, and NASA that considered existing Refuge and Seashore management agreements and goals and objectives from the MINWR CPP and CANA GMP. The build alternatives considered in this PD&E Study are consistent with the recommendations of the Preliminary Alternatives Report with the exception that a shared-use path along Playalinda Beach Rd within the Seashore was considered during the PD&E. This alternative was eliminated during the preliminary alternatives study but later reintroduced in response to public comments received during the public meeting open house.

4.2 No-Build (No-Action) Alternative

The No-Build (or No-Action) Alternative assumes that the Space Coast Trail is not constructed, and the Refuge and Seashore would continue to be managed per existing management plans. It provides a benchmark for comparative purposes with the build alternatives.

Under the No-Build Alternative, bicycles would continue to be allowed on the Refuge and on the Seashore on the roadways in the lane of travel with cars, in accordance with Refuge and Seashore rules and in conformance with NASA restrictions that prohibit bicycles on the roadways from 6:00 to 9:00 am and from 3:00 to 6:00 pm. In accordance with the 2008 CCP, the Refuge would continue to pursue the siting and development of bicycle paths to move bicycle users from inappropriate locations to help minimize user conflicts and wildlife and habitat impacts. The No-Build Alternative is a viable alternative throughout the study and can be applied to the entire project or segments of the project.

4.3 Transportation Systems Management and Operations Alternative (TSM&O)

No TSM&O Alternatives were considered for this project.

4.4 Future Conditions

This study considers the construction of a multi-use trail within the Refuge and Seashore. No vehicular traffic data was collected or considered. The study area is located within federal lands managed by USFWS, NPS, and NASA. Current land uses in the study area include conservation, preservation, and recreation and are not expected to change.

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4.5 Build Alternative(s)

Multiple alternatives were considered for each segment of the Space Coast Trail.

4.5.1 East-West (E-W) MINWR Alternatives

The limits of the East-West (E-W) segment within MINWR extend from the Parrish Park/MINWR boundary to Kennedy Parkway North. Within this segment, two alternatives and an interpretive loop trail were considered as illustrated in **Figure 4.1** and described below.

E-W MINWR Alternative 1

E-W MINWR Alternative 1 consists of constructing a 12-ft wide shared-use path along the north side of Playalinda Beach Road. A typical section is provided in **Figure 4.2**. The proposed typical section may be reduced to 10-ft wide in areas of severe environmental constraint. In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

E-W MINWR Alternative 2

E-W MINWR Alternative 2 consists of constructing a 12-ft wide shared-use path on top of Dike T-10A and continuing along Pump House Road (**Figure 4.3**). Pump House Road is currently not paved and serves as a maintenance road with no public access. At the eastern terminus of Pump House Road, the trail would cross over a canal (unnamed) and continue along Dike T-10F. The trail would cross over the NASA railroad and immediately turn towards the east to continue along the north side of the rail tracks (**Figure 4.4**). The proposed typical section may be reduced to 10-ft wide in areas of severe environmental constraint. In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

Interpretive Loop Trail

This alternative consists of a 12-ft wide trail using a pervious surface that loops between the MINWR Visitor Center, Center Road, and the trail head for the Oak and Palm Hammock Trails. The trail alignment will follow an existing unpaved maintenance path as shown in ***Figure 4.1***. This would include a paved bicycle/pedestrian crossing of Playalinda Beach Road from the Refuge's visitor center area to provide direct access to the E-W Segment and the Interpretive Loop Trail.

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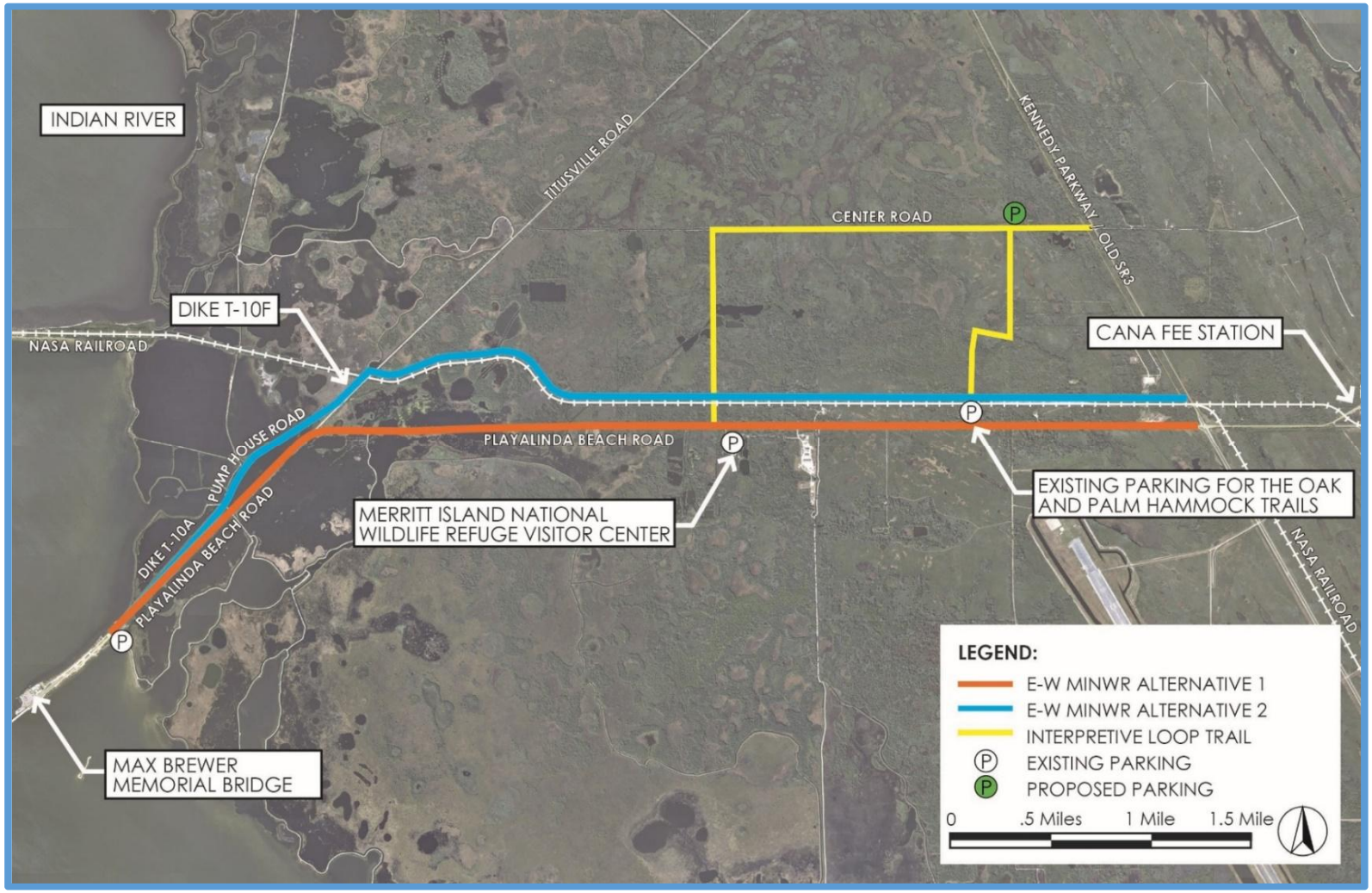


Figure 4-1: E-W MINWR Alternatives

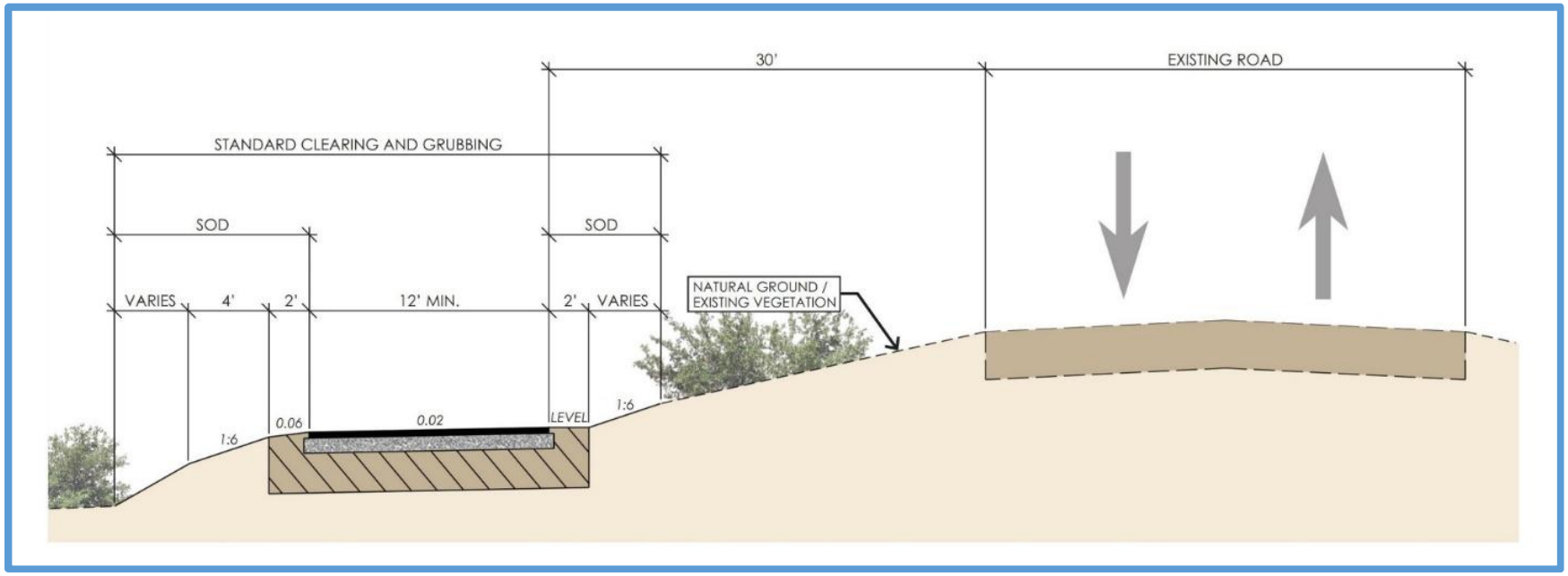


Figure 4-2: Typical Section, E-W MINWR Alternative 1 (along North Side of Beach Road)

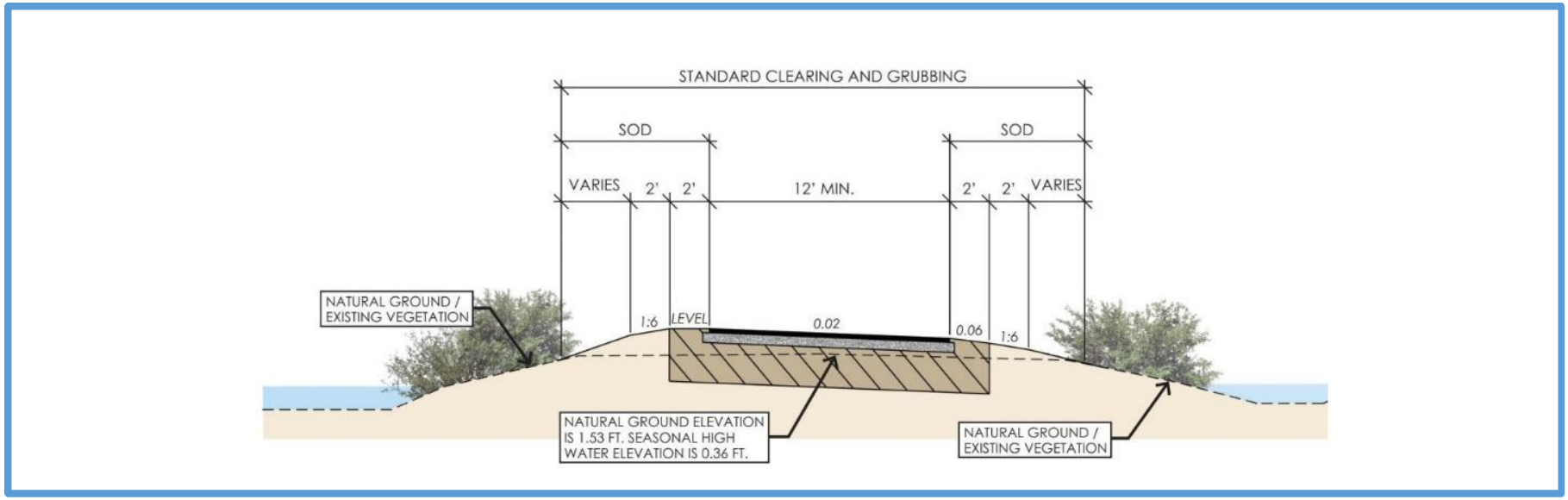


Figure 4-3: Typical Section, E-W MINWR Alternative 2 (along Dike and Pump House Service Road)

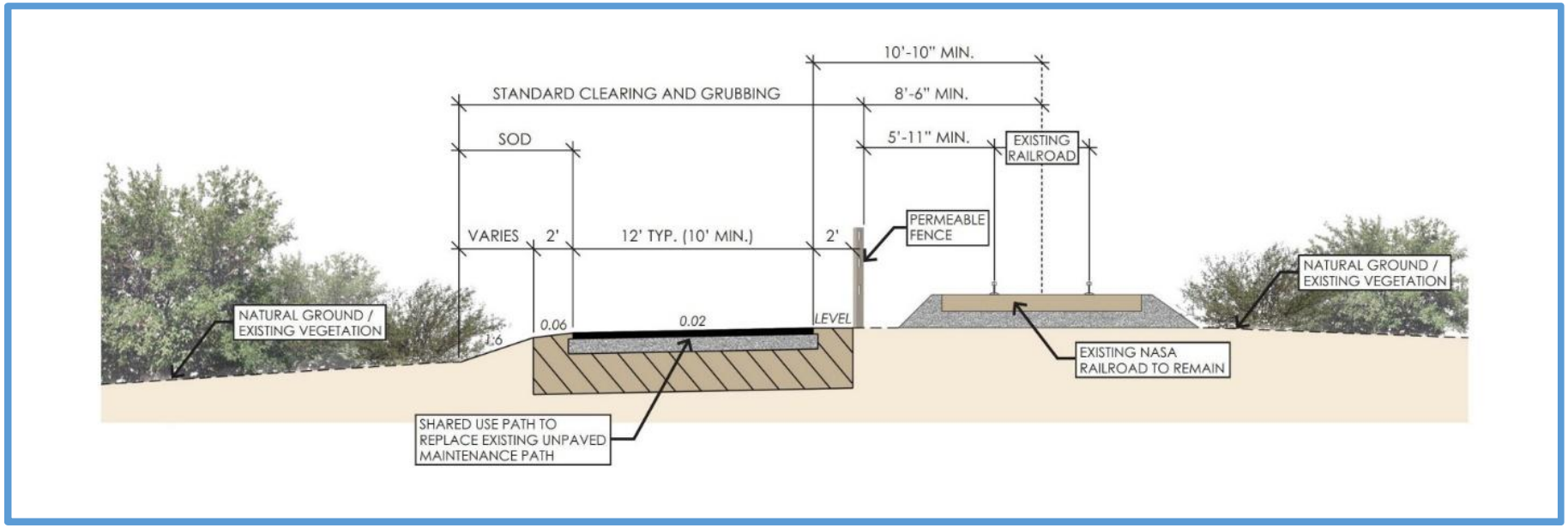


Figure 4-4: Typical Section, E-W MINWR Alternative 2 and E-W CANA Alternatives 2A and 2B (along NASA Railroad)

4.5.2 East-West (E-W) CANA Alternatives

The limits of this segment extend from Kennedy Parkway North to Parking Area No. 1 within CANA. Within this segment, four alternatives were considered as illustrated in ***Figure 4.5*** and described below.

E-W CANA Alternative 1A

E-W CANA Alternative 1A consists of constructing a 12-ft wide shared-use path along the north side of Playalinda Beach Road (***Figure 4.6***). Where Playalinda Beach Road crosses the railroad (2nd railroad crossing from the west near the CANA fee station), the shared-use path would end and bicyclists could continue along Playalinda Beach Road. Sharrow markings would be placed on Playalinda Beach Road indicating that bicyclists and vehicles can share the road (***Figure 4.7***). In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

E-W CANA Alternative 1B

E-W CANA Alternative 1B consists of constructing a 12-ft wide shared-use path along the north side of Playalinda Beach Road (***Figure 4.6***). At the railroad crossing near the CANA fee station, the trail would transition to the south side of Playalinda Beach Road and continue as an 8-foot wide shared use path up to Parking Area No. 1 (***Figure 4.8***). An 8-ft wide shared-use path is proposed due to extreme environmental constraints. As part of this alternative, the section of Playalinda Beach Road that runs parallel to the beach would be shifted 13 feet to the west to avoid the sand dune, and the intersection of Playalinda Beach Road and Patrol Road would be constructed as a T-intersection (***Figure 4.9***). In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

E-W CANA Alternative 2A

E-W CANA Alternative 2 consists of constructing a 12-ft wide shared-use path along the north side of the existing NASA railroad (***Figure 4.4***). Where Playalinda Beach Road crosses the railroad (2nd railroad crossing from the west near the CANA fee station), the shared-use path would end, and bicyclists could continue along Playalinda Beach Road. Sharrow markings would be placed on Playalinda Beach Road indicating that bicyclists and vehicles can share the road (***Figure 4.7***). The proposed typical section may be reduced to 10-ft wide in areas of severe environmental constraint. In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

E-W CANA Alternative 2B

E-W CANA Alternative 2B consists of constructing a 12-ft wide shared-use path along the north side of the existing NASA railroad up to Playalinda Beach Road (***Figure 4.4***) and an 8-foot wide shared use path along the south side of Playalinda Beach Road from the crossing of the NASA railroad to Parking Area No. 1 (***Figure 4.8***). An 8-ft wide shared-use path is proposed due to extreme environmental constraints. As part of this alternative, the section of Playalinda Beach Road that runs parallel to the beach would be shifted 13 feet to the west to avoid the sand dune, and the intersection of Playalinda Beach Road and Patrol Road would be constructed as a T-intersection (***Figure 4.9***). In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

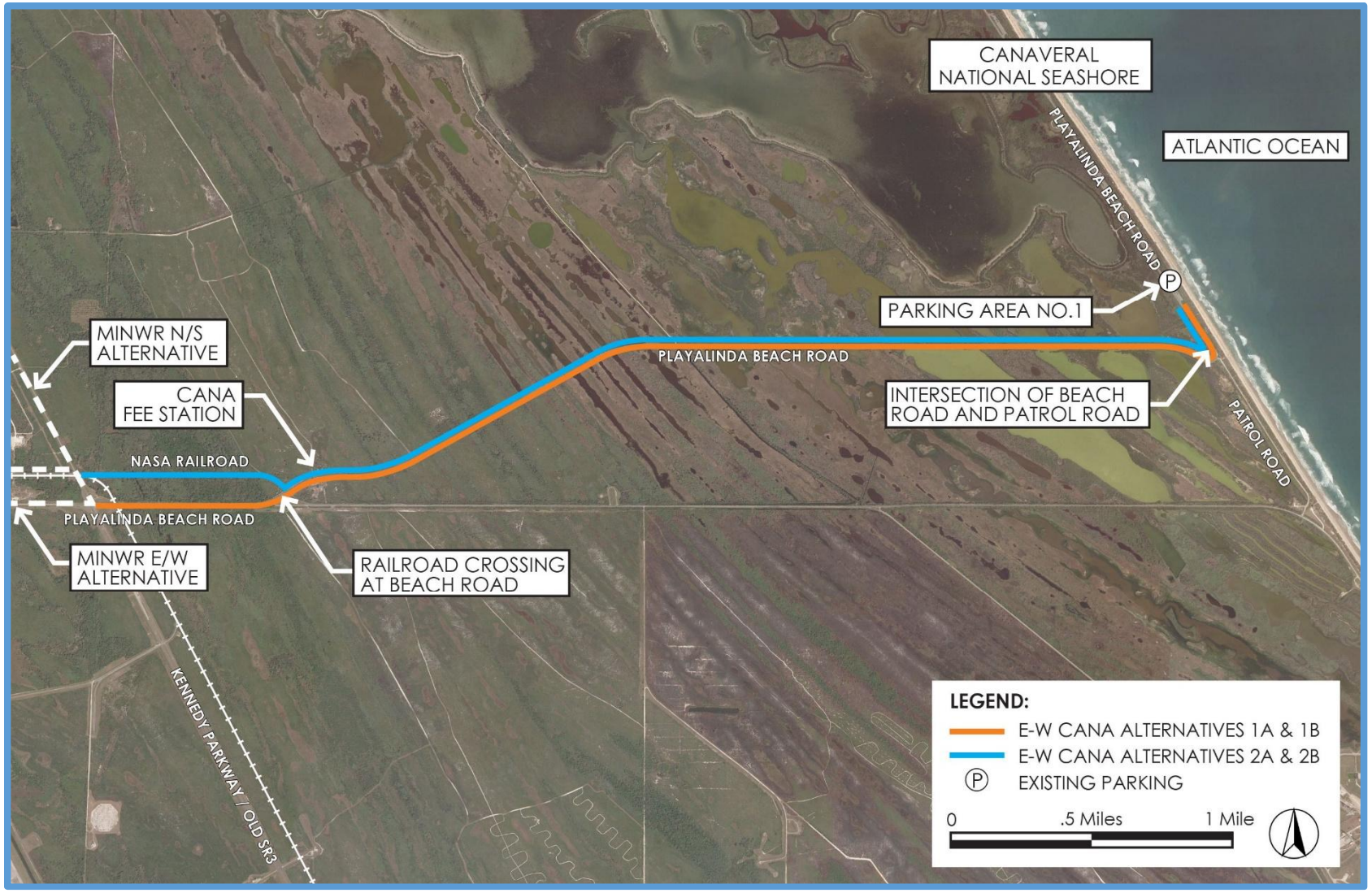


Figure 4-5: E-W CANA Alternatives

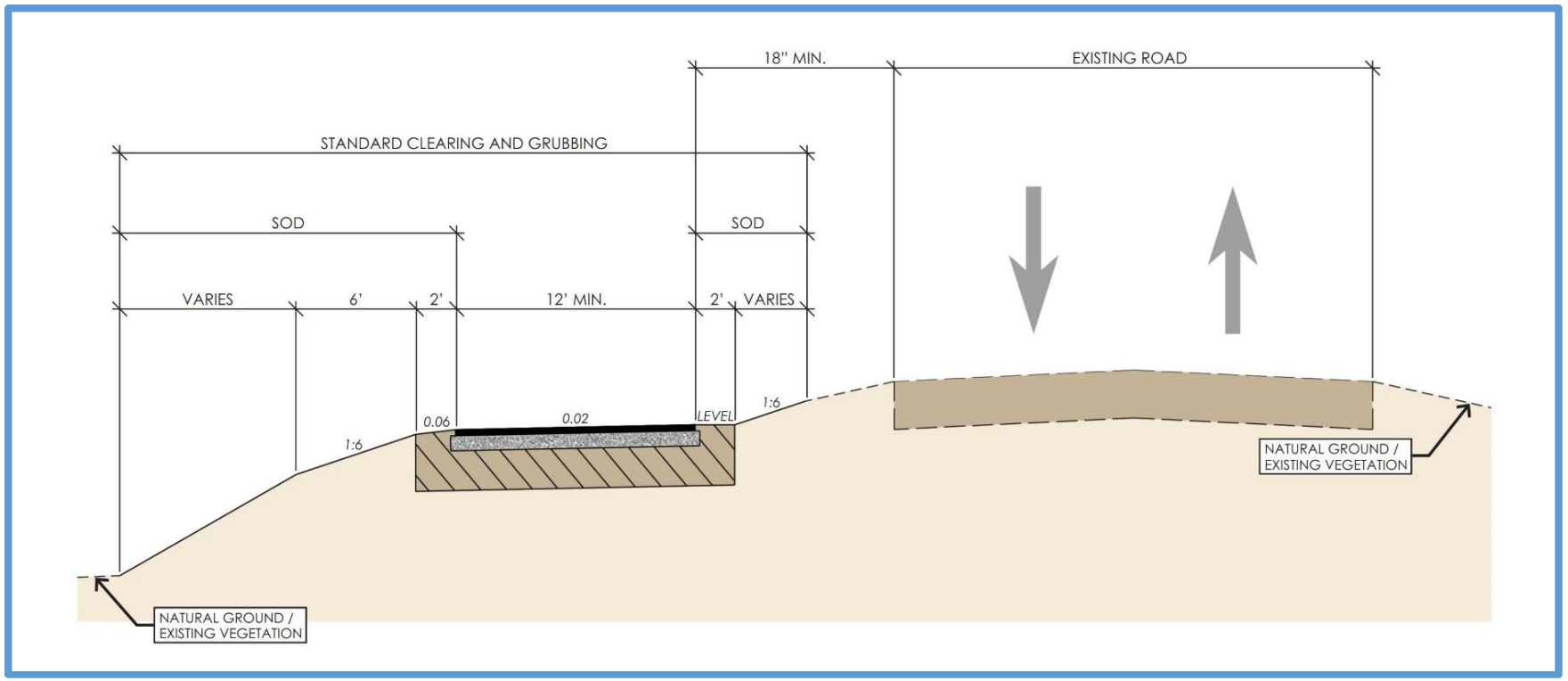


Figure 4-6: Typical Section, E-W CANA Alternatives 1A and 1B (along North Side of Beach Road)

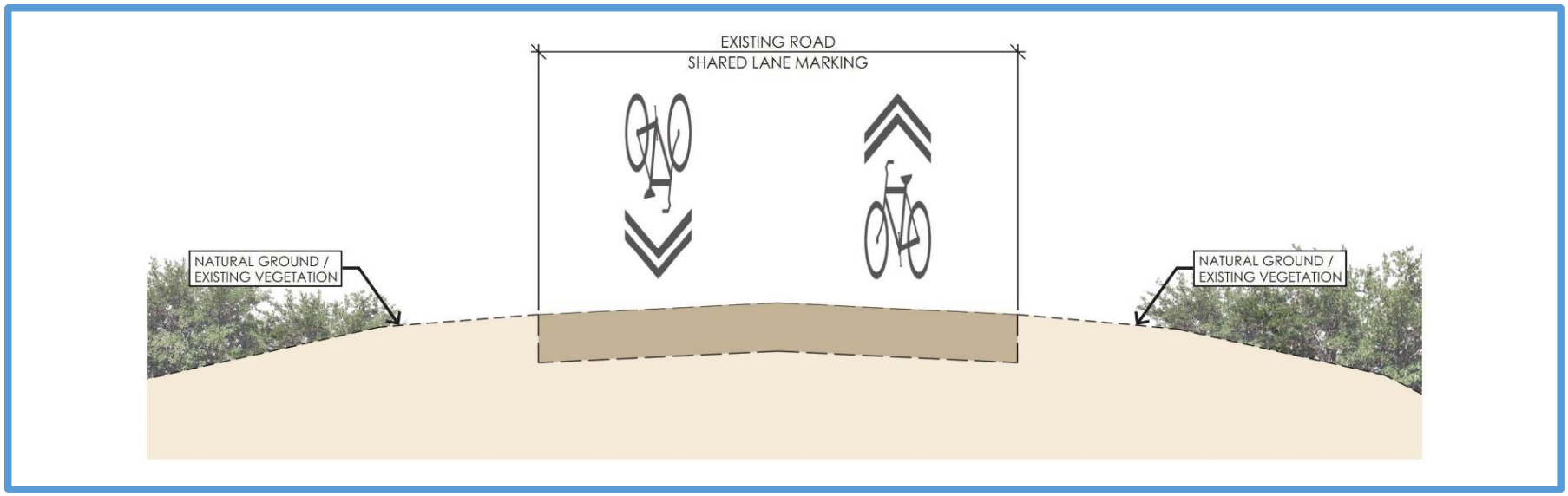


Figure 4-7: Typical Section, E-W CANA Alternatives 1A and 2A

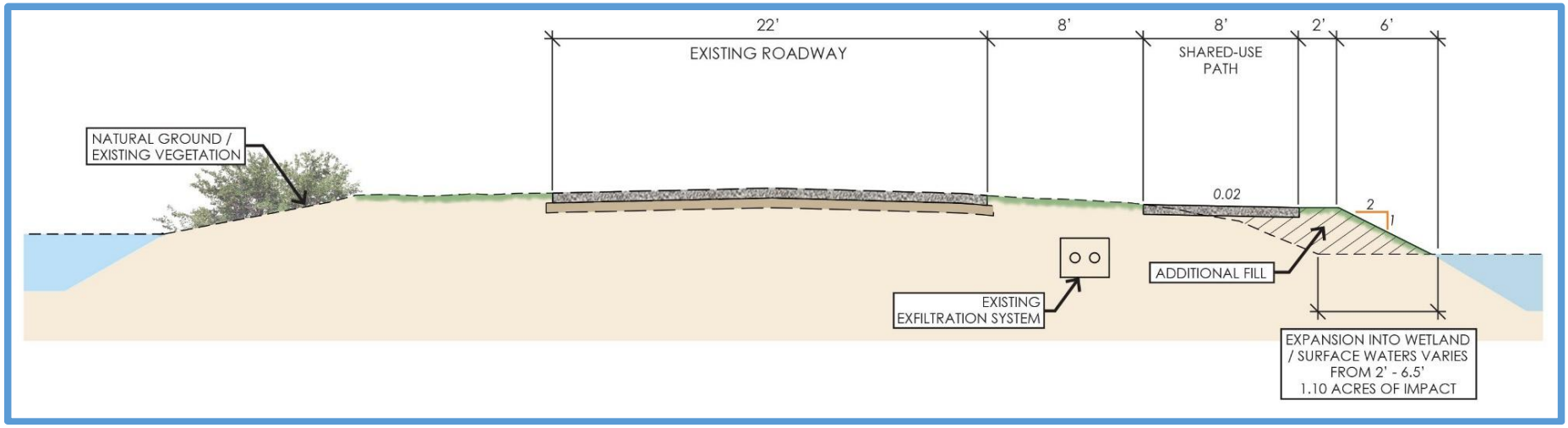


Figure 4-8, Typical Section, E-W CANA Alternatives 1B and 2B

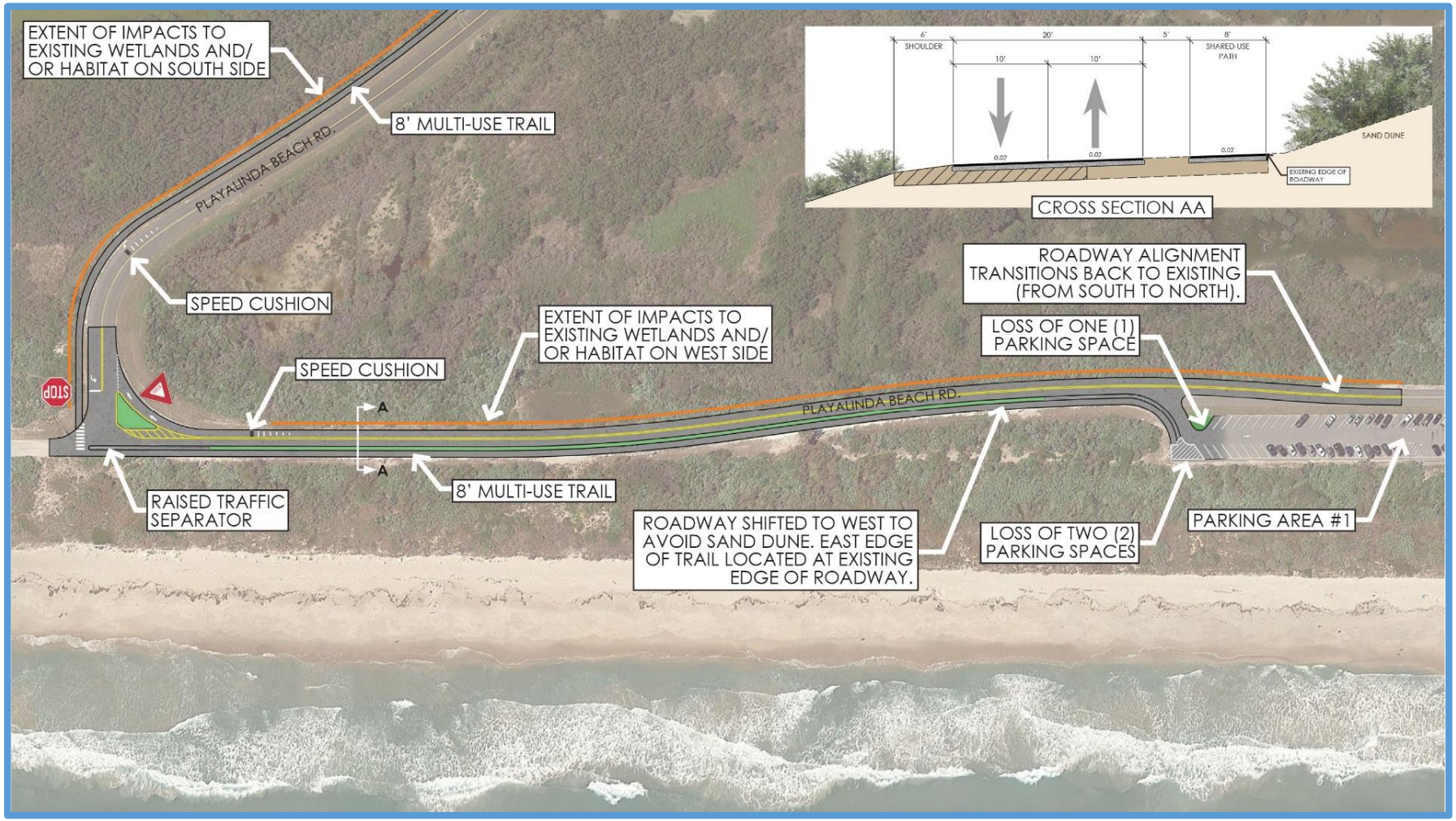


Figure 4-9: E-W CANA Alternatives 1B and 2B: Section from Patrol Road to Parking Area No. 1

4.5.3 North-South (N-S) MINWR Segment 1 Alternatives

The limits of this segment extend from Playalinda Beach Road to the Haulover Canal bridge. Within this segment, three alternatives were considered as illustrated in ***Figure 4.10*** and described below.

N-S MINWR-1 Alternative 1

N-S MINWR-1 Alternative 1 consists of constructing buffered bike lanes along Kennedy Parkway North from Playalinda Beach Road to the Haulover Canal bridge (***Figure 4.11***).

N-S MINWR-1 Alternative 2

N-S MINWR-1 Alternative 2 consists of constructing a shared-use path along the west side of Kennedy Parkway North from Playalinda Beach Road to the Haulover Canal bridge (***Figure 4.12***). The proposed typical section may be reduced to 10-ft wide in areas of severe environmental constraint. In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

N-S MINWR-1 Alternative 3

N-S MINWR-1 Alternative 3 consists of constructing a shared-use path along the east side of Kennedy Parkway North from Playalinda Beach Road to the Haulover Canal bridge (***Figure 4.13***). The proposed typical section may be reduced to 10-ft wide in areas of severe environmental constraint. In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

4.5.4 North-South (N-S) MINWR Segment 2 Alternatives

The limits of this segment extend from the Haulover Canal bridge to US-1. Within this segment, three alternatives were considered as illustrated in ***Figure 4.10*** and described below.

N-S MINWR-2 Alternative 1

N-S MINWR-2 Alternative 1 consists of providing sharrow markings on the Haulover Canal bridge and then continuing to US-1 with buffered bike lanes (***Figure 4.11***).

N-S MINWR-2 Alternative 2

N-S MINWR-2 Alternative 2 consists of providing sharrow markings on the Haulover Canal bridge and then continuing to US-1 with a shared-use path along the west side of Kennedy Parkway North (***Figure 4.12***). The proposed typical section may be reduced to 10-ft wide in areas of severe environmental constraint. In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

N-S MINWR-2 Alternative 3

N-S MINWR-2 Alternative 3 consists of providing sharrow markings on the Haulover Canal bridge and then continuing to US-1 with a shared-use path along the east side of Kennedy Parkway North (***Figure 4.13***). The proposed typical section may be reduced to 10-ft wide in areas of severe environmental constraint. In areas where the trail crosses wetlands, the trail would utilize boardwalks to minimize impacts.

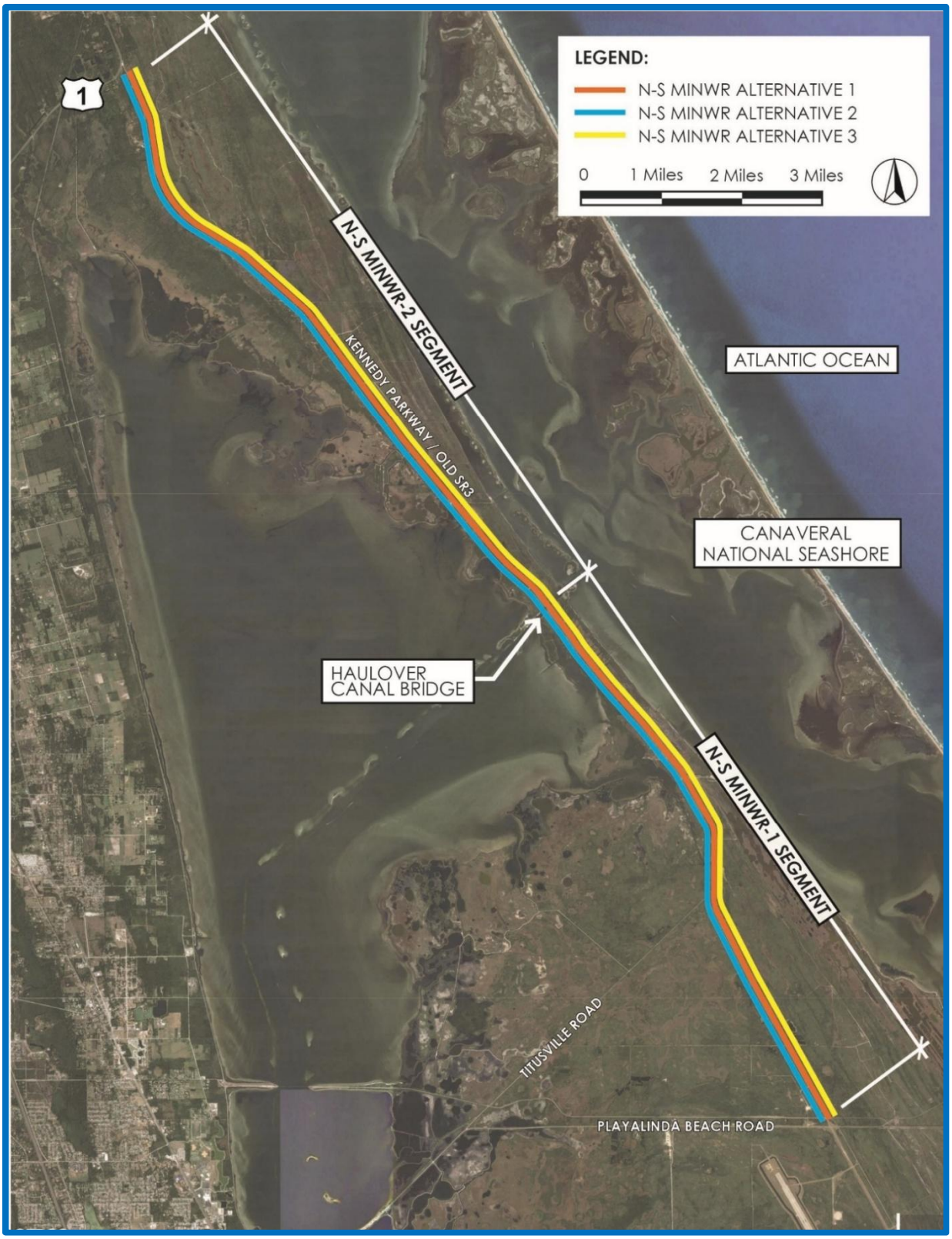


Figure 4-10: N-S MINWR Alternatives

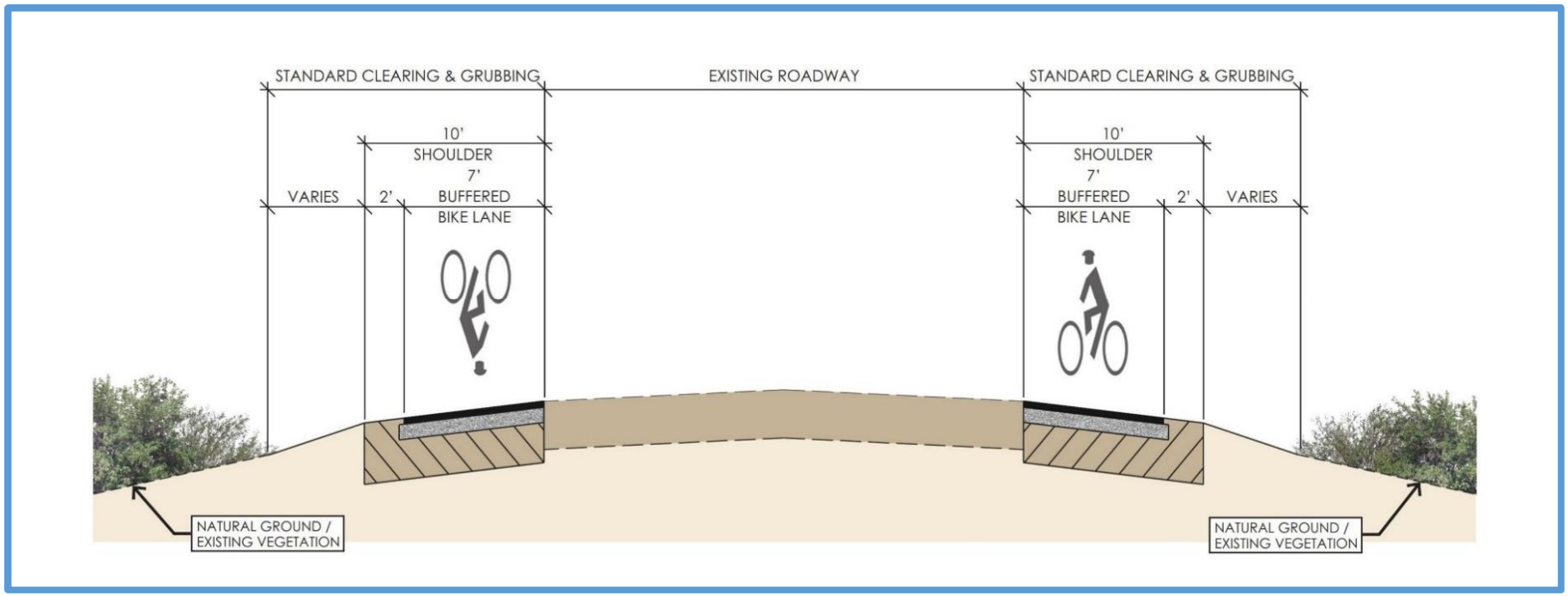


Figure 4-11: Typical Section, N-S MINWR Alternative 1

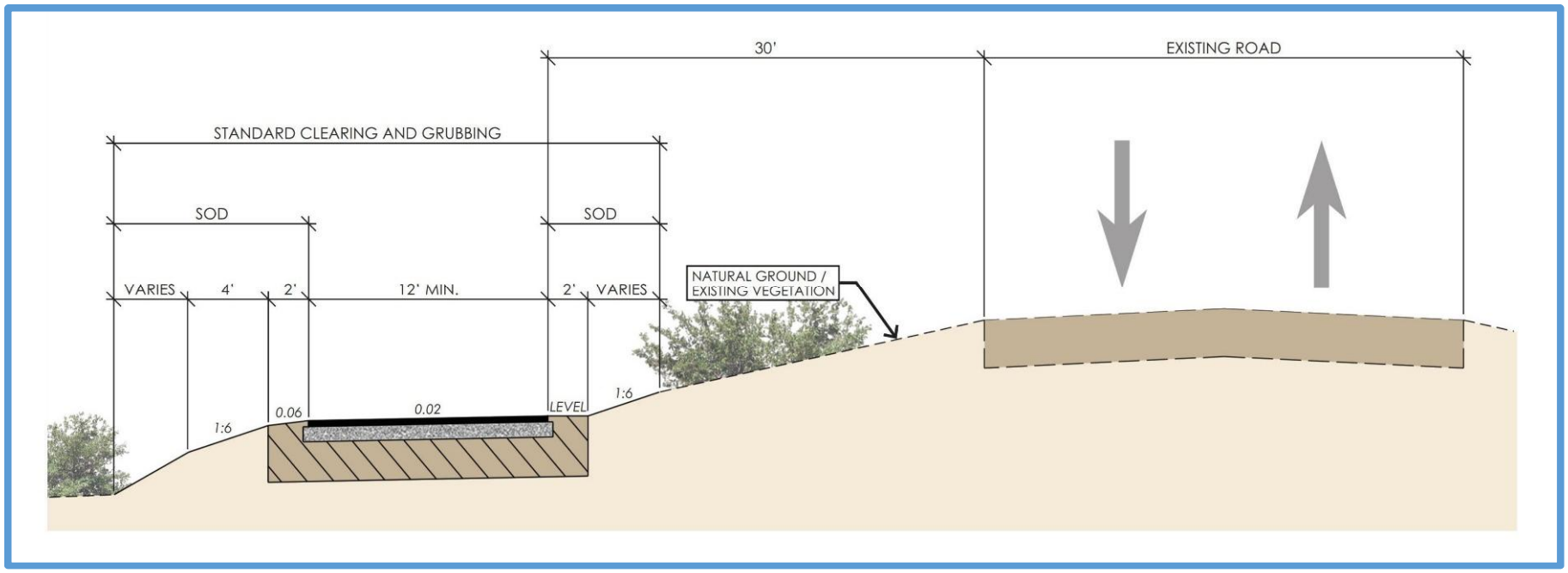


Figure 4-12: Typical Section, N-S MINWR Alternative 2

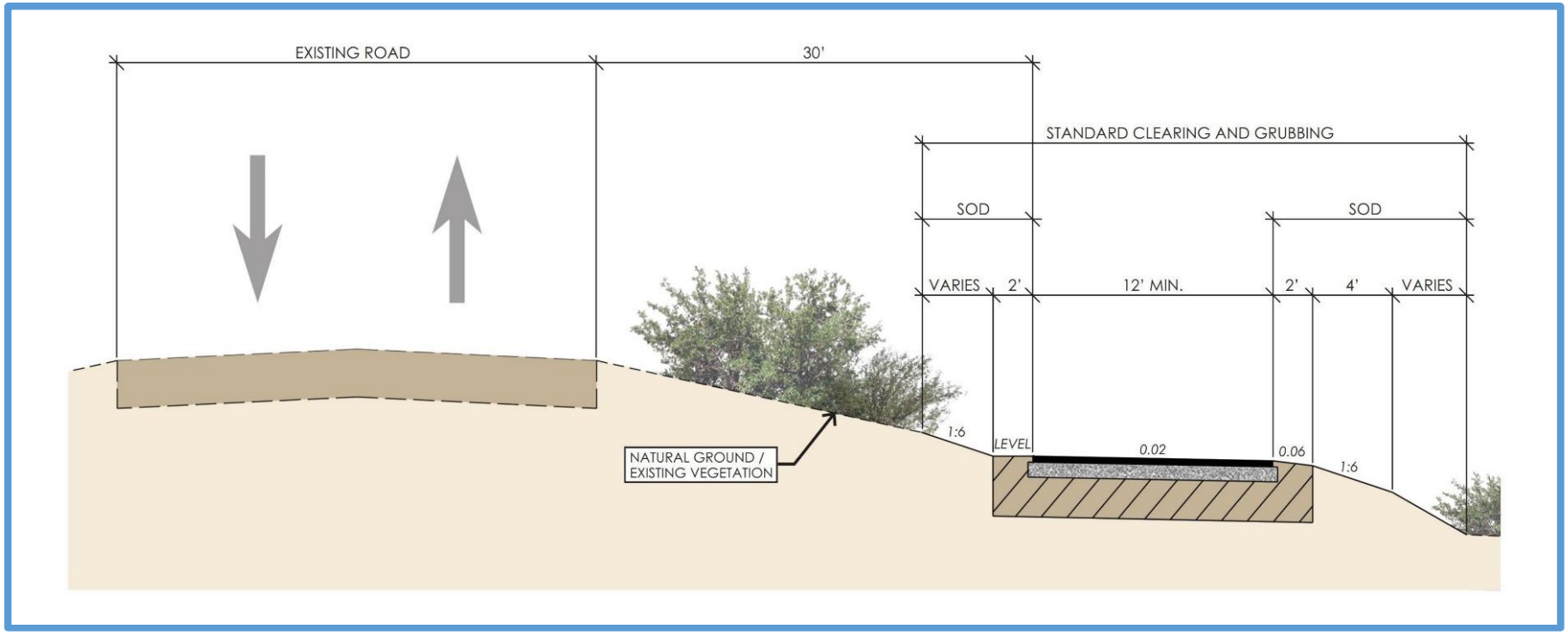


Figure 4-13: Typical Section, N-S MINWR Alternative 3

4.6 Comparative Alternatives Evaluation

A comparison of the No-Build and Build Alternatives is provided below.

Table 4-1: Evaluation Matrix for E-W MINWR Alternatives

Evaluation Criteria	No-Build	E-W MINWR Alternative 1	E-W MINWR Alternative 2
Purpose and Need			
Supports the completion of the C2C Trail?	No	Yes	Yes
Accommodates less experienced users?	No – Bicyclist would be required to use existing roadways	Yes	Yes
Consistent with MINWR CCP and/or CANA GMP?	No – Proposed trail is identified in the MINWR CCP.	No - Does not expand opportunities for wildlife observation, photography, education, and interpretation due to its proximity to the roadway.	Yes - Provides opportunities for wildlife observation, photography, education, and interpretation within the Refuge
Consistent with NASA safety, operational, and management requirements?	Yes	Yes	Yes
Environmental Impacts			
Surface Water impacts (acres)	0	1.29	0.01
Wetland impacts (acres)	0	4.51	0.54
Floodplain impacts (acres)	0	3.19	2.85
Scrub-Jay habitat impacts (acres)	0	0.09	0
Bald Eagle's nest within 660 feet	0	0	0
Essential Fish Habitat permanent impacts (acres)	0	4.01	0.07
Direct impacts to Archaeological/Historic Sites	0	0	0
Contaminated Sites	0	1 (high risk)	1 (low risk)
Estimated Project Costs			
Design (15%)	$0	$432,905	$649,369
R/W acquisition	$0	$0	$0
Mitigation	$0	TBD(1)	TBD(1)
Construction	$0	$2,886,034	$4,329,129
Construction engineering and inspection (CEI) (12%)	$0	$346,324	$519,496
Total Costs	$0	$3,665,263	$5,497,994

(1) Mitigation costs are unknown but will be provided within the Refuge and Seashore

Table 4-2: Evaluation Matrix for Interpretive Loop Trail

Evaluation Criteria	No-Build	Interpretive Loop Trail
Purpose and Need		
Consistent with MINWR CCP and/or CANA GMP?	No – Proposed trail is identified in the MINWR CCP.	Yes – Provides opportunities for wildlife observation, photography, education, and interpretation within the Refuge
Consistent with NASA safety, operational, and management requirements?	Yes	Yes
Environmental Impacts		
Surface Water impacts (acres)	0	0.01
Wetland impacts (acres)	0	0.38
Floodplain impacts (acres)	0	0
Scrub-Jay habitat impacts (acres)	0	0
Bald Eagle's nest within 660 feet	0	0
Essential Fish Habitat permanent impacts (acres)	0	0
Direct impacts to Archaeological/Historic Sites	0	0
Contaminated Sites	0	0
Estimated Project Costs		
Design (15%)	$0	$51,142
R/W acquisition	$0	$0
Mitigation	$0	TBD(1)
Construction	$0	$340,950
Construction engineering and inspection (CEI) (12%)	$0	$40,914
Total Costs	$0	$433,006

(1) Mitigation costs are unknown but will be provided within the Refuge and Seashore

Table 4-3: Evaluation Matrix for E-W CANA Alternatives

Evaluation Criteria	No-Build	E-W CANA Alternative 1A	E-W CANA Alternative 1B	E-W CANA Alternative 2A	E-W CANA Alternative 2B
Purpose and Need					
Supports the completion of the C2C Trail?	No	No	Yes	No	Yes
Accommodates less experienced users?	No	No	Yes	No	Yes
Consistent with MINWR CCP and/or CANA GMP?	No- CANA GMP identifies new trail along the existing roadway	No- CANA GMP identifies new trail along the existing roadway	No - Does not expand opportunities for wildlife observation, photography, education, and interpretation due to its proximity to the roadway.	No- CANA GMP identifies new trail along the existing roadway	Yes
Consistent with NASA safety, operational, & management requirements?	Yes	Yes	Yes	Yes	Yes
Environmental Impacts					
Surface Water impacts (acres)	0	0	0.48	0	0.48
Wetland impacts (acres)	0	1.03	2.51	0.07	1.58
Floodplain impacts (acres)	0	0.87	1.48	0.87	1.48
Scrub-Jay habitat impacts (acres)	0	0.06	0.42	0.06	0.34
Bald Eagle's nest within 660 feet	0	0	0	0	0
Essential Fish Habitat permanent impacts (acres)	0	0	0.12	0	0.12
Direct impacts to Archaeological/Historic Sites	0	0	0	0	0
Contaminated Sites	0	0	0	0	0
Estimated Project Costs					
Design (15%)	$0	$97,671	$403,660	$100,712	$406,701
R/W acquisition	$0	$0	$0	$0	$0
Mitigation	$0	TBD(1)	TBD(1)	TBD(1)	TBD(1)
Construction	$0	$651,143	$2,691,069	$671,416	$2,711,341
Construction engineering and inspection (CEI) (12%)	$0	$78,137	$322,928	$80,570	$325,361
Total Costs	$0	$826,952	$3,417,658	$852,698	$3,443,403

(1) Mitigation costs are unknown but will be provided within the Refuge and Seashore

Table 4-4: Evaluation Matrix for N-S MINWR-1 Alternatives

Evaluation Criteria	No-Build	N-S MINWR-1 Alternative 1	N-S MINWR-1 Alternative 2	N-S MINWR-1 Alternative 3
Purpose and Need				
Provides connectivity for the St. Johns River-to-Sea Loop?	No	No	Yes	No
Consistent with MINWR CCP?	Yes	Yes – Does not propose a separate trail, instead proposes bike lanes along Kennedy Parkway	No – N-S trail not identified in MINWR CCP	No- N-S trail not identified in MINWR CCP
Consistent with NASA safety, operational, & management requirements?	Yes	Yes	Yes	Yes
Environmental Impacts				
Surface Water impacts (acres)	0	0	0.19	0.26
Wetland impacts (acres)	0	0	0.40	1.63
Floodplain impacts (acres)	0	7.84	3.60	7.16
Scrub-Jay habitat impacts (acres)	0	3.64	3.35	2.91
Bald Eagle's nest within 660 feet	0	0	0	0
Essential Fish Habitat permanent impacts (acres)	0	0	0.04	0.06
Direct impacts to Archaeological/Historic Sites	0	0	0	0
Contaminated Sites	0	0	0	0
Estimated Project Costs				
Design (15%)	$0	$593,473	$504,473	$480,009
R/W acquisition	$0	$0	$0	$0
Mitigation	$0	TBD(1)	TBD(1)	TBD(1)
Construction	$0	$3,956,489	$3,363,155	$3,200,057
Construction engineering and inspection (CEI) (12%)	$0	$474,779	$403,579	$384,007
Total Costs	$0	$5,024,741	$4,271,207	$4,064,073

(1) Mitigation costs are unknown but will be provided within the Refuge and Seashore

Table 4-5: Evaluation Matrix for N-S MINWR-2 Alternatives

Evaluation Criteria	No-Build	N-S MINWR-2 Alternative 1	N-S MINWR-2 Alternative 2	N-S MINWR-2 Alternative 3
Purpose and Need				
Provides connectivity for the St. Johns River-to-Sea Loop?	No	No	Yes	No
Consistent with MINWR CCP?	Yes	Yes – Does not propose a separate trail, instead proposes bike lanes along Kennedy Parkway	No – N-S trail not identified in MINWR CCP	No- N-S trail not identified in MINWR CCP
Consistent with NASA safety, operational, & management requirements?	Yes	Yes	Yes	Yes
Environmental Impacts				
Surface Water impacts (acres)	0	0	0	0
Wetland impacts (acres)	0	0	0.29	2.05
Floodplain impacts (acres)	0	2.75	2.29	3.89
Scrub-Jay habitat impacts (acres)	0	0.92	0.40	0.65
Bald Eagle's nest within 660 feet	0	2	2	2
Essential Fish Habitat permanent impacts (acres)	0	0	0	0
Direct impacts to Archaeological/Historic Sites	0	0	0	0
Contaminated Sites	0	0	0	0
Estimated Project Costs				
Design	$0	$707,666	$572,369	$572,369
R/W acquisition	$0	$0	$0	$0
Mitigation	$0	TBD(1)	TBD(1)	TBD(1)
Construction	$0	$4,717,775	$3,815,795	$3,815,795
Construction engineering and inspection (CEI)	$0	$566,133	$457,895	$457,895
Total Costs	$0	$5,991,575	$4,846,060	$4,846,060

(1) Mitigation costs are unknown but will be provided within the Refuge and Seashore

4.7 Selection of the Preferred Alternative

The Preferred Alternative consists of the following: constructing a paved shared-use path from the MINWR boundary at Playalinda Beach Road to Parking Area No. 1 within CANA; constructing paved buffered bicycle lanes along Kennedy Parkway North from the intersection of Playalinda Beach Road to US 1; and constructing the Interpretive Loop Trail as a pervious pathway with a paved section from the MINWR Visitor Center to the East-West Segment. To support these trail alignments, bicycle/pedestrian roadway crossings will be added at: (1) the Playalinda Beach Road entrance to the refuge to connect the trail on the north side of the road with the existing parking area, kiosk, and observation deck on the south side of the road; (2) the east side of the railroad crossing at Titusville Road; (3) Playalinda Beach Road to connect the refuge's visitor center area to the E-W Segment and the Interpretive Loop Trail; (4) the north side of the railroad crossing at Kennedy Parkway North; (5) the east side of the railroad crossing along the Seashore's entrance road before the fee booth; and (6) at the Seashore's curve where the entrance road turns north toward the parking areas. Railroad crossings will also be added at: (1) the Pump House Road railroad crossing immediately before the Titusville Road crossing, and (2) the railroad crossing to connect the E-W Segment and Interpretive Loop Trail to the refuge's visitor center.

Maps and figures related to the Preferred Alternative are provided in **Appendix A**.

E-W MINWR (from Parrish Park/MINWR Boundary to Kennedy Parkway North: The Preferred Alternative will begin the trail at the newly constructed eastern terminus of the Coast-to-Coast Trail at the refuge's western boundary on Playalinda Beach Road. The entrance will include a bicycle/pedestrian crossing from the trail on the north side of the road to the existing entrance parking area, kiosk, and observation deck on the south side of the road. This includes the former roadway alignment that previously served as the entrance road. Pump House Road, Dike T-10A, and Dike T-10F are all part of a former roadway with remnants of the roadbed still in place. The Proposed Alternative for this segment will consist of constructing a 12-foot wide paved shared-use path on top of Dike T-10A and continuing along Pump House Road. Pump House Road is currently not paved and serves as a maintenance road with no public access. At the eastern terminus of Pump House Road, the trail will cross over a canal (unnamed) and continue along Dike T-10F. The trail will cross over the NASA railroad and Titusville Road adjacent to the existing railroad crossing and immediately turn towards the east to continue along the north side of the rail tracks. The typical section may be reduced to 10-feet wide in areas of severe environmental constraint. In areas where the trail will cross wetlands, the trail will utilize boardwalks to minimize impacts. This segment of the trail is located entirely within the boundaries of MNWR and the USFWS will be responsible for future maintenance activities.

Interpretive Loop Trail: The Preferred Alternative for this segment will consist of a 12-foot wide trail using a pervious surface that will connect to the E-W Segment and will loop between the MINWR Visitor Center, Center Road, and the trailhead for the Oak and Palm Hammock trails. The trail alignment will follow existing unpaved maintenance roads**.** This will include a paved bicycle/pedestrian crossing of Playalinda Beach Road from the refuge's visitor center area to provide direct access to the E-W Segment and the Interpretive Loop Trail. This segment of the trail is located entirely within the boundaries of MINWR and the USFWS will be responsible for future maintenance activities.

E-W CANA (from Kennedy Parkway North to Parking Area No. 1): The Preferred Alternative for this segment will consist of constructing a 12-foot wide paved shared-use path along the north side of the existing NASA railroad up to Playalinda Beach Road, and an 8-foot wide paved shared-use path along the south side of Playalinda Beach Road to CANA's Parking Area No. 1. An 8-foot wide paved shared-use path will be constructed from the crossing of Playalinda Beach Road to Parking Area No. 1 due to environmental constraints. As part of this alternative, the curve where CANA's entrance road turns north toward the parking areas will be reconfigured into a T-intersection. In addition, the section of CANA's entrance road from the curve to Parking Area No. 1 will be shifted approximately 13 feet to the west to avoid the sand dune. In areas where the trail crosses wetlands, the trail will utilize boardwalks to minimize impacts. The Preferred Alternative for this segment will include bicycle/pedestrian crossings at: (1) Kennedy Parkway North adjacent to the existing railroad crossing; (2) the Seashore's entrance road at the existing railroad crossing; and (3) the re-alignment of the curve where the Seashore's entrance road turns north towards the parking areas. The section of the trail from Kennedy Parkway North to the railroad crossing at Playalinda Beach Road is located within the management overlap area and the USFWS will be responsible for future maintenance activities. NPS will be responsible for the section of this segment from the railroad crossing at Playalinda Beach Road to Parking Area No. 1 within CANA.

N-S MINWR (from Playalinda Beach Road to US-1): The Preferred Alternative will consist of constructing northbound and southbound buffered bike lanes along Kennedy Parkway North from Playalinda Beach Road to US-1 with the exception of the crossing over the Haulover Canal bridge. Sharrow markings will be provided over the Haulover Canal bridge, then continuing with the buffered bike lane along Kennedy Parkway North to US-1. A three-foot wide steel metal plate along each direction of travel will be attached to the bridge surface to aid bicyclist during wet/slippery conditions. This segment of the trail is located entirely within the boundary of MINWR. Because the buffered bike lanes will be connected to the existing roadway, future maintenance activities for the buffered bike lanes could rest with USFWS, NASA, or a combination of USFWS and NASA.

Selection Rationale

The Preferred Alternative was selected through extensive coordination with USFWS, NPS, and NASA. Within the E-W segment, the Preferred Alternative would complete the eastern terminus of the C2C and allow the public to enjoy wildlife and recreational opportunities within the Refuge and Seashore. The Preferred Alternative directs the development of programs to best achieve the purposes, vision, goals, and objectives of MINWR and CANA; serving the missions of the USFWS, National Wildlife Refuge System, and NPS; and meeting the Service's appropriateness and compatibility requirements, while also meeting NASA operational and safety needs at Kennedy Space Center. An E-W shared-use trail would provide the framework to develop additional trails, education opportunities, interpretive displays, and wildlife viewing and photography areas in the Refuge and Seashore. At the same time, these management actions provide balanced levels of compatible public use opportunities consistent with existing laws, Service policies, and sound biological principles. The Preferred Alternative provides the best mix of program elements to achieve desired long-term conditions. Under this alternative, all lands and waters of MINWR and CANA under the management and direction of the Service (USFWS

or NPS) will be protected, maintained, and enhanced to best achieve national, ecosystem, and refuge-specific goals and objectives within anticipated funding and staffing levels.

Within the N-S segment, a shared-use path was not selected as construction of a separate trail would not be compatible with the purposes, vision, goals, and objectives of MINWR and CANA. Although direct impacts to cultural resources and scrub-jay habitat would be minimal, the proximity of a shared-use trail to these important resources would not be consistent with the objectives of the MINWR CCP and CANA GMP. Although buffered bicycle lanes do not accommodate pedestrian users, buffered bicycle lanes can accommodate more experienced riders attempting to connect with the St. Johns River-to-Sea Loop.

5.0 PROJECT COORDINATION & PUBLIC INVOLVEMENT

5.1 Agency Coordination

The planning process began with the gathering of information. An intergovernmental coordination team was formed comprised of staff from the USFWS, NPS, NASA, and FDOT with support from the Space Coast Transportation Planning Organization, Brevard County, and City of Titusville. The intergovernmental coordination team met regularly to review public comments, data, and information. Key tasks involved defining the purpose, need, and goals of the project; reviewing proposed trail alternatives; identifying, reviewing, and filtering the issues; and providing a reality check.

Initial scoping for the proposed Space Coast Trail began with Tribal scoping letters sent in March 2016 to the five potentially interested Native American Tribes; the joint letter was signed by the Regional Director of the USFWS Southeast Region and by the CANA Park Superintendent. This was followed by the publication of the proposed project on the FDOT's Efficient Transportation Decision Making (ETDM) system on April 4, 2016. Multiple state and federal agencies submitted comments through the ETDM system. Information was also published on the NPS's Planning, Environment and Public Comment (PEPC) site in August 2016.

5.2 Public Involvement

A public meeting open house was held on December 7, 2017 at the City of Titusville City Hall to obtain feedback from the public on the proposed alternatives and potential benefits and impacts. The public meeting open house was advertised within the local newspaper (Florida Today), on the Florida Administrative Register, and on the Refuge's website and NPS's PEPC site. Flyers were distributed by email and mail to those on the Refuge and Seashore mailing lists. All advertisements and notifications included information on how to submit comments. Approximately 38 people attended the open house and five written comments were received. All comments expressed support for the proposed Space Coast Trail, and most expressed a preference for providing some separation between the proposed trail and the existing roadways. Two commenters specifically expressed concern over the "sharrow" option that would allow bicyclist and vehicles to share the roadway within the Seashore segment. Three commenters specifically identified a preference for a shared-use path along Kennedy Parkway North as opposed to buffered bike lanes.

Prior to the public meeting open house, only a sharrow option within the Seashore was considered. Following the open house, a shared-use path option within the Seashore was considered and developed as part of the Build Alternatives.

6.0 DESIGN FEATURES OF THE PREFERRED ALTERNATIVE

The Preferred Alternative consists of the following: a paved shared-use path from the MINWR boundary at Playalinda Beach Road to Parking Area No. 1 within the Seashore (E-W MINWR Alternative 2 and E-W CANA Alternative 2B); paved buffered bicycle lanes along Kennedy Parkway North from the intersection of Playalinda Beach Road to US-1 (N-S MINWR-1 Alternative 1 and N-S MINWR-2 Alternative 1); and an Interpretive Loop Trail as a pervious pathway with a paved section from the MINWR Visitor Center to the E-W Segment.

Additional details are provided below. Maps and figures related to the Preferred Alternative are provided in **Appendix A**. Concept plan sheets are provided in **Appendix B**.

6.1 Engineering Details of the Preferred Alternative

6.1.1 Typical Sections

Typical sections for the Preferred Alternative are provided in **Appendix A**. With the design phase funded for the E-W MINWR and CANA segments, a Typical Section Package was prepared for these segments and provided in **Appendix C**.

6.1.2 Bridges and Structures

Within the E-W MINWR segment, one new structure is proposed for crossing over a small channel parallel to Pump House Road (**Appendix B, Sheet 7**). The crossing could be provided through a new bridge structure or culverts. The channel is not a navigable waterway. A final determination for the appropriate crossing treatment will be made during the design phase.

Within the N-S MINWR segment, buffered bike lanes are proposed except across the existing Haulover Canal bridge. At the bridge, buffered bike lanes would discontinue and sharrow markings would be provided allowing bicyclists and vehicles to share the road (**Appendix B, Sheets 61 – 66**). A 3-foot wide steel metal plate along each direction of travel would be attached to the bridge surface to aid bicyclist during wet/slippery conditions.

6.1.3 Right-of-Way and Relocations

No additional right-of-way is required for the Preferred Alternative.

6.1.4 Horizontal and Vertical Geometry

The horizontal alignment for the proposed trail generally follows existing berms and roadways, former roadways, and previously disturbed areas as illustrated in **Appendix B**. The vertical alignment is mostly flat. Grading will be performed on paved sections to construct at the necessary grade as determined during the design phase.

6.1.5 Bicycle and Pedestrian Accommodations

The purpose of the project is to provide bicycle and pedestrian accommodations within the Refuge and Seashore. The Preferred Alternative includes the construction of shared-use path from the

Refuge boundary at Playalinda Beach Road to Parking Area No. 1 at the Seashore and buffered bike lanes along Kennedy Parkway.

6.1.6 Multi-Modal Accommodations

There are no existing or proposed transit routes within the Refuge or Seashore. The Preferred Alternative includes two railroad crossings and a trail segment located adjacent to the existing NASA railroad. No impacts to the existing rail lines are proposed or to potential future operations.

6.1.7 Access Management

No changes in access management are proposed.

6.1.8 Intersection and Interchange Concepts

The Preferred Alternative would modify one intersection within the project limits. Within the Seashore, the section of Playalinda Beach Road that runs parallel to the beach would be shifted 13 feet to the west to avoid the sand dune as required by NPS, and the intersection of Playalinda Beach Road and Patrol Road would be reconstructed as a T-intersection (**Appendix B, Sheet 28**). Currently, there is a curve along Playalinda Beach Rd at this location allowing free-following traffic. Under the Preferred Alternative, eastbound to northbound traffic would be under stop control and southbound to westbound traffic would be under yield control. This alternative was developed in coordination with NPS to address safety and speed concerns.

6.1.9 Intelligent Transportation System and TSMO Strategies

Intelligent Transportation System (ITS) and/or TSMO strategies were not applicable to this project.

6.1.10 Utilities

Through coordination with Sunshine 811, six utility providers, listed below, were identified as having utilities within the project area.

- ATT
- Florida Power and Light
- Level 3 Communications
- Tower Cloud, Inc.
- Century Link
- NASA

Efforts would be made during final design to minimize impacts to the underground utilities, to the greatest extent possible. It is anticipated that there will be the need for adjustment of some of these utilities.

6.1.11 Drainage and Stormwater Management Facilities

The proposed trails are intended for pedestrian and cycling use. As such, water quality will not be impacted by this project. This project is exempt from attenuation requirements; the additional impervious from the trails are inconsequential to the coastal area.

There are numerous existing cross drains in the project area that appear to be in serviceable condition and would be extended where necessary. Thorough inspection of these cross drains will be necessary during the design phase to ensure their structural integrity.

6.1.12 Floodplain Analysis

A *Location Hydraulics Report* (LHR) was completed for this project and is available under separate cover. The Preferred Alternative would result in unavoidable impacts to floodplains. The total floodplain impact is approximately 14.92 acres, which is attributed to the fill volume of new pavement to construct the Space Coast Trail. However, the project is located on a coastal barrier island, therefore, there would be no floodplain impacts. Coordination with state, local, and federal agencies will be required for addressing permitting during final design. There will be no significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, the proposed project encroachment is not significant.

6.1.13 Transportation Management Plan

The Preferred Alternative proposes the construction of a shared-use path and buffered bike lanes. Minor work is proposed at the roadway crossings, but no road closures or detours are anticipated.

6.1.14 Special Features

The Preferred Alternative includes trail crossings at the following locations: (1) the Playalinda Beach Road entrance to the Refuge to connect the trail on the north side of the road with the existing parking area, kiosk, and observation deck on the south side of the road; (2) the east side of the railroad crossing at Titusville Road; (3) Playalinda Beach Road to connect the Refuge's visitor center area to the E-W Segment and the Interpretive Loop Trail; (4) the north side of the railroad crossing at Kennedy Parkway North; (5) the east side of the railroad crossing along the Seashore's entrance road before the fee booth; and (6) at the Seashore's curve where the entrance road turns north toward the parking areas. For each of these crossings, special signage and traffic calming details were identified as shown in **Appendix B**. These treatments include advance warning signs, rectangular rapid flashing beacons (RRFBs), and speed tables.

NASA indicated that any new signs or pedestrian flashing beacons along Playalinda Beach Road, Titusville Road, or Kennedy Parkway North should be removable in case of trucks with large payloads.

6.1.15 Design Variations and Design Exceptions

Design variations are proposed for lateral offset and shared-use path width. A variation for lateral offset is needed for the E-W segment parallel to the NASA railroad. The lateral offset from the edge of trail to the split rail fence varies from two to four feet. A variation is needed where the lateral offset is less than four feet.

A variation for the shared-use path width is needed for the E-W segment within the Seashore. An eight-foot wide path is proposed due to severe environmental constraint. The standard width for a shared-use path is 12 feet.

The Typical Section Package provided in **Appendix C** identifies the proposed design variations.

6.1.16 Cost Estimates

The cost estimate for the Proposed Alternative was calculated based on FDOT Long Range Estimate (LRE) and is provided below.

- Design (15% of construction): $2,614,200
- Right-of-way: $0
- Construction: $17,427,997
- CEI (12% of construction): $2,091,360
- Total: $22,133,557

6.2 Summary of Environmental Impacts of the Preferred Alternative

6.2.1 Future Land Use

Future land use is for conservation/preservation and recreation purposes. As the project is on federally owned and managed land, there is no future Land use mapping. The proposed multi-use trail will have minimal impact on existing land uses as the alternatives have been developed along existing disturbed areas.

6.2.2 Section 4(f)

This project does not involve funding through the U.S. Department of Transportation; therefore, Section 4(f) does not apply.

6.2.3 Cultural Resources

A cultural resources evaluation was conducted and documented in a *Cultural Resource Assessment Survey* (CRAS). The CRAS determined that no historic properties would be adversely affected. The State Historic Preservation Officer (SHPO) concurred with the findings of the CRAS in a letter dated August 6, 2019 on the condition that a qualified archaeological monitor be present during ground-disturbing activities in the vicinity of the Crook/ Watton Cemetery (8BR01626). This cemetery is located just west of Kennedy Parkway and north of the Haulover Canal bridge. A copy of the CRAS and SHPO letter is retained in the project file.

6.2.4 Wetlands

A wetland evaluation was conducted, and the results are summarized in the *Natural Resource Evaluation* (NRE) report available under separate cover. Construction of the Preferred Alternative would impact 2.5 acres of wetlands and 0.5 acres of surface waters. The Preferred Alternative was designed to minimize potential adverse impacts to wetlands and surface waters by locating much of the proposed trail on existing berms, former roadways, and previously disturbed areas (e.g., railroad and road shoulders), where practical. Mitigation for wetland and surface water

impacts would occur within the boundaries of the Refuge and Seashore and though coordination with USFWS and NPS.

6.2.5 Protected Species and Habitat

A protected species and habitat evaluation was conducted, and the results are summarized in the NRE available under separate cover. The adverse impacts of the Preferred Alternative on the biological resources of the Refuge and Seashore are anticipated to be minor to negligible. USFWS Refuge staff coordinated the Section 7 consultation with the USFWS Ecological Services staff. The USFWS Ecological Services staff concurred with the effect determinations documented in the NRE.

There are multiple bald eagle nests documented within the Refuge and Seashore with two located 190 feet and 150 feet from Kennedy Parkway in the segment north of the Haulover Canal bridge. Bald eagle nest monitoring should take place during design and permitting prior to construction. Coordination with USFWS Migratory Bird Division should occur following the updated survey.

6.2.6 Essential Fish Habitat

An Essential Fish Habitat (EFH) assessment was conducted and the results are summarized in the NRE available under separate cover. The Preferred Alternative would have minor to negligible adverse impacts to EFH on the Refuge and Seashore. Construction of the Preferred Alternative would result in 0.19 acres of permanent impacts and 10.16 acres of temporary impacts. In an email dated September 6, 2019, National Marine Fisheries Service (NMFS) indicated that EFH consultation would occur when the acreage impacts were more certain. Impacts would be finalized during design and permitting, and consultation will be initiated at that time.

6.2.7 Highway Traffic Noise

In accordance with the FDOT PD&E Manual, Part 2, Chapter 18, *Highway Traffic Noise*, this project qualifies as a Type III project; therefore, a noise analysis or consideration of noise abatement measures is not required.

6.2.8 Contamination

A Level 1 *Contamination Screening Evaluation Report* (CSER) was prepared using historical research, review of environmental record databases, site reconnaissance, and detailed file reviews. A total of six (6) sites/facilities and/or properties were identified, located in and around the project study area. Of the six sites investigated, the following risk rankings were applied: three “No” ranking sites, two “Low” ranking sites, zero "Medium" ranking sites, and one “High” ranking site for potential contamination concerns.

The Preferred Alternative would encroach Wilson’s Railroad Yard (Solid Waste Management Unit 71 (SWMU 71)) located along the E-W MINWR segment adjacent to the railroad tracks. This site is under a Land Use Control and Implementation Plan (LUCIP – SWMU 71). The Wilson’s Railroad Yard is a NASA-operated facility constructed in the early 1960’s. The facility includes an approximately 3,200-foot section of railroad track and three railroad sidings, a former asphalt plant area, and the Wilson’s Support area which is approximately 1,600 feet to the northeast. The Wilson’s Railroad Yard Area comprises approximately 16 acres. This facility is currently used for

the storage of maintenance vehicles. A Phase II Environmental Site Assessment was conducted in this area, and the findings are documented in the CSER.

Based on the proposed construction activities, the Wilson's Corner Railroad Yard / SWMU 71 would remain at its current location and would not impact the proposed alignment of the trail. The construction of the proposed trail would include a hard surface feature added to the site. For the associated permitting and construction phases, FDOT will ensure that contracts and operations address related concerns from FDEP, as listed.

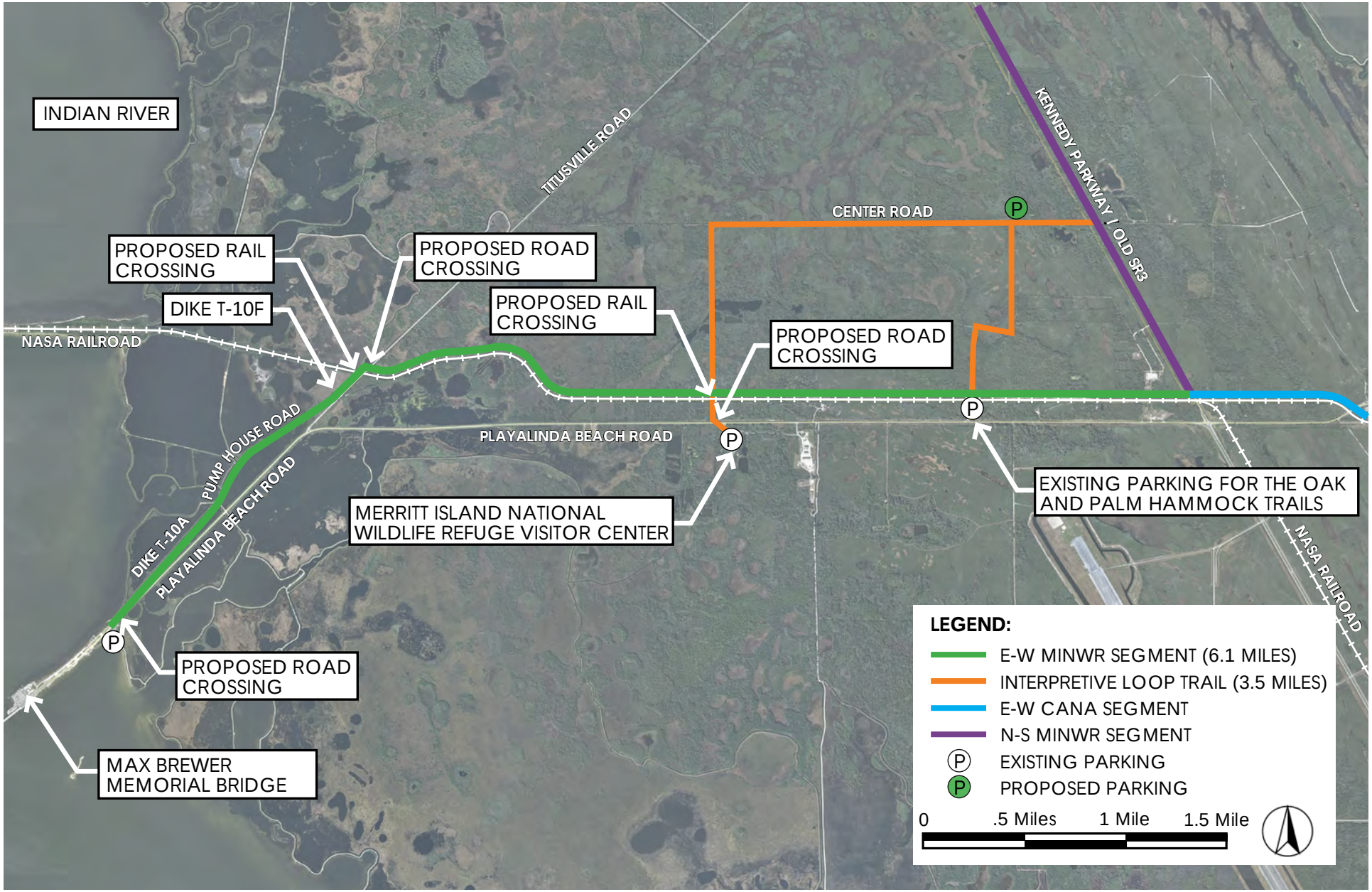
- Based on the Land Use Controls (LUCs) at this SWMU as outlined in its LUCIP, when the trail is being built all contracted personnel should be made aware they are working in a LUC area, the contaminants of concern at the site should be explained, what media (soil) and at what depth they may be found at, and appropriate personal protection equipment to be worn.
- All contaminated soil that is removed from the path for trail construction is to be appropriately evaluated and disposed of offsite.
- A Work Plan for trail construction should be made available to the Department for comment and concurrence before work commences.

APPENDIX

APPENDIX A:

Maps and Figure Related to the Preferred Alternative

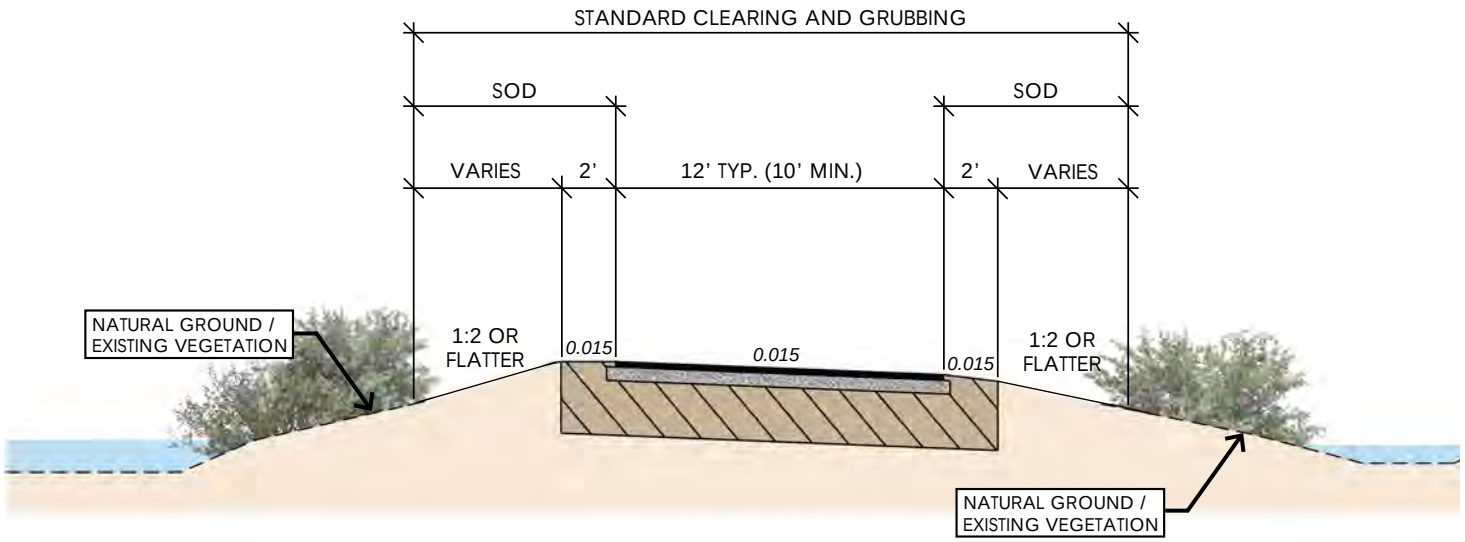
U.S. Fish and Wildlife Service and National Park Service



PROPOSED SPACE COAST TRAIL

E-W MINWR SEGMENT

FIGURE 1

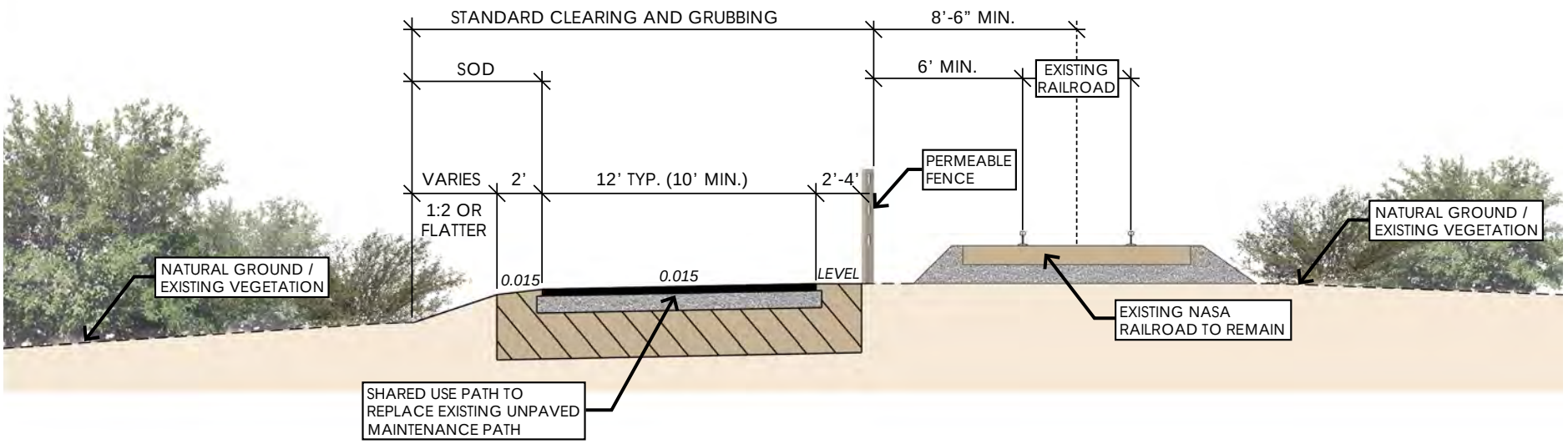


Construct new shared-use path on top of Dike T-10A, Pump House Service Road, and Dike T-10F. Pump House Service Road is currently being utilized as an unpaved maintenance road.

PROPOSED SPACE COAST TRAIL

E-W MINWR SEGMENT TYPICAL SECTION

FIGURE **2**

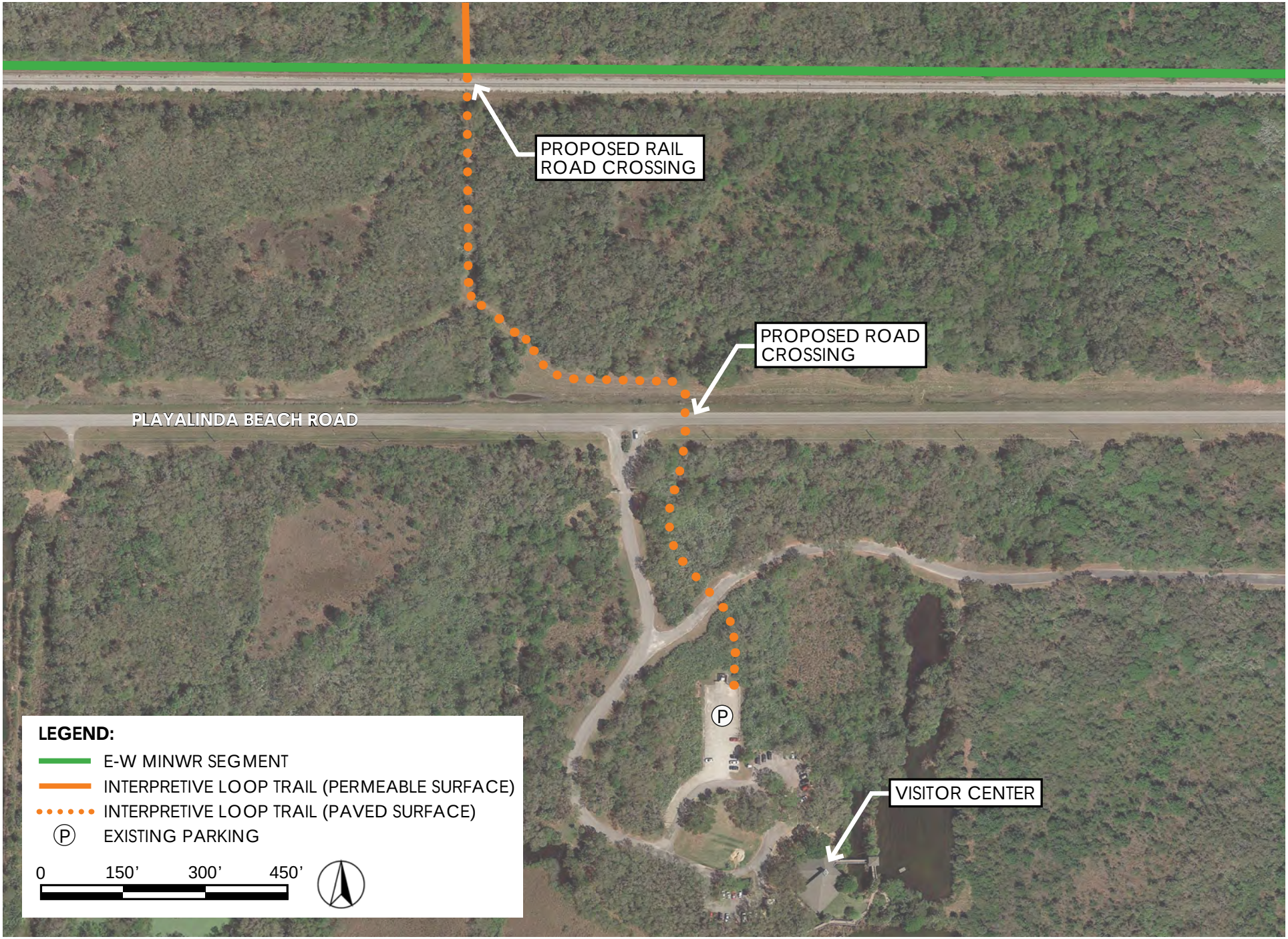


Construct new shared-use path along north side of the NASA railroad. Proposed shared-use path would replace the existing unpaved maintenance road.

PROPOSED SPACE COAST TRAIL

E-W MINWR SEGMENT TYPICAL SECTION

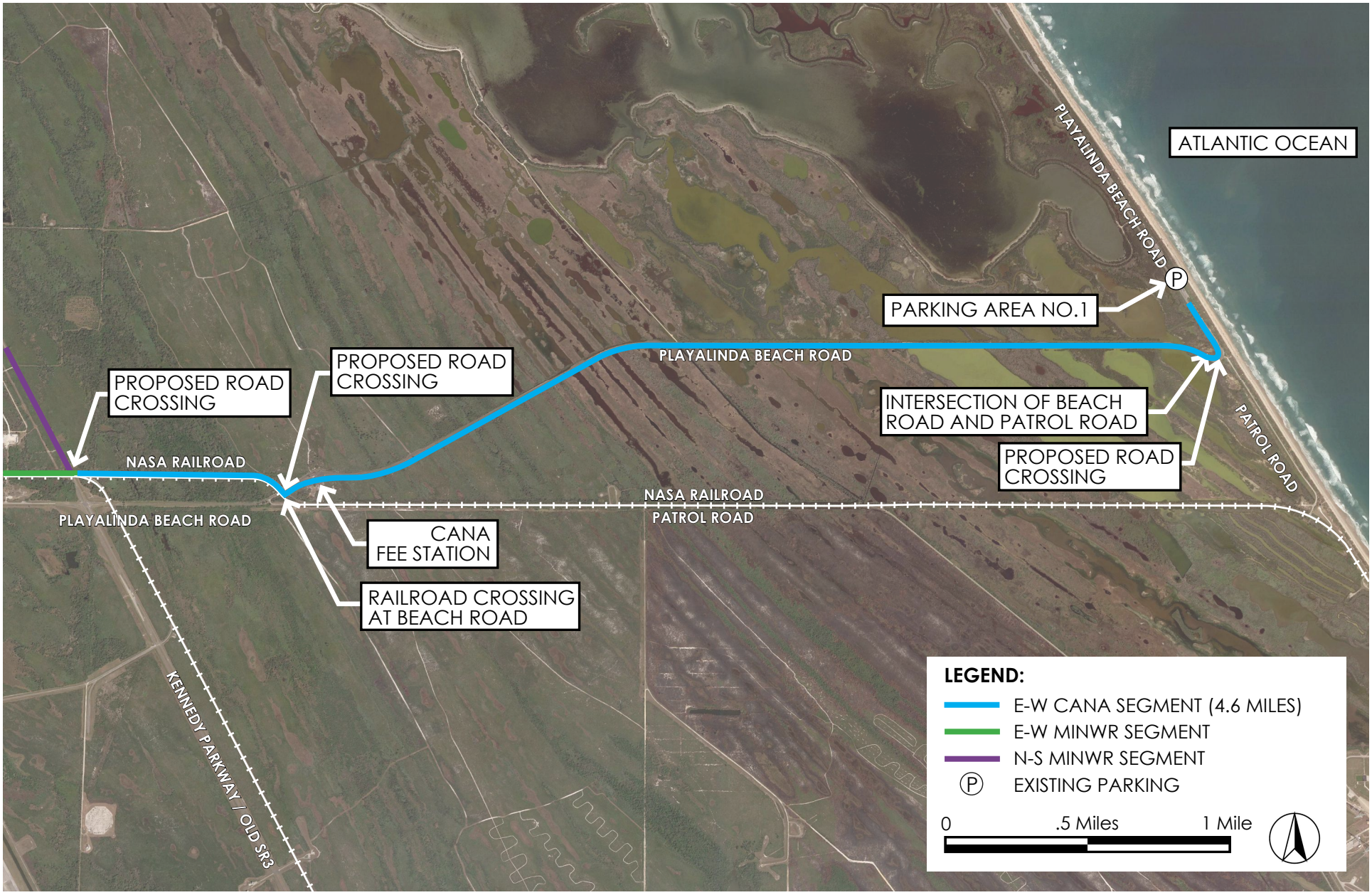
FIGURE 3



PROPOSED SPACE COAST TRAIL

VISITOR CENTER CONNECTION

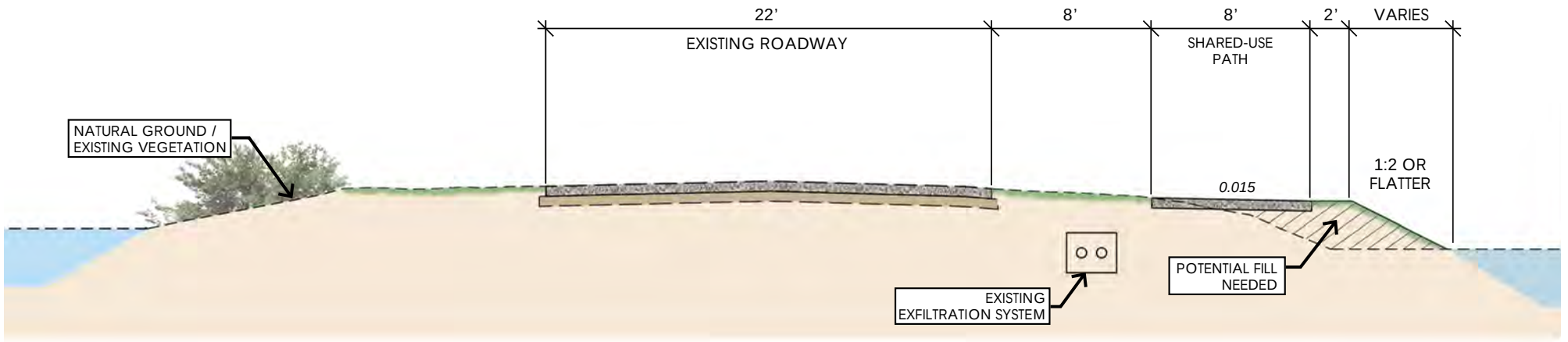
FIGURE **4**



PROPOSED SPACE COAST TRAIL

E-W CANA SEGMENT

FIGURE 5



Construct new shared-use path along south side of Playalinda Beach Road from the NASA railroad crossing to Parking Area No. 1. An 8 ft wide shared-use path is proposed due to extreme environmental constraints.

Length = 3.5 Miles

PROPOSED SPACE COAST TRAIL

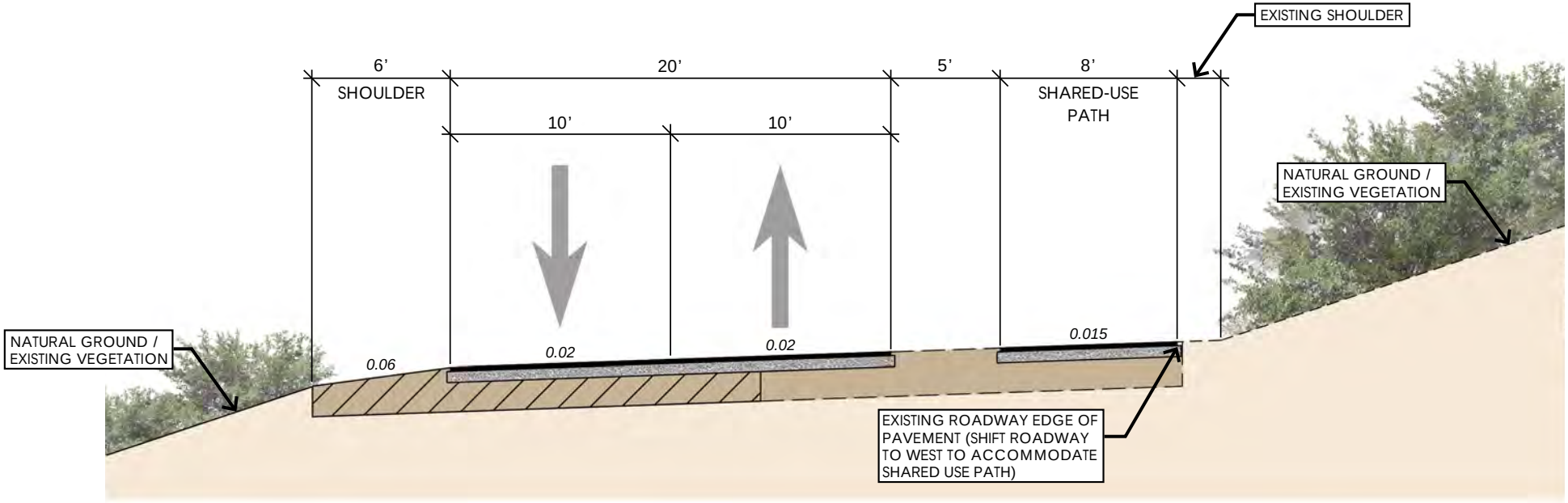
E-W CANA SEGMENT TYPICAL SECTION

FIGURE 6

PROPOSED SPACE COAST TRAIL

INTERSECTION OF BEACH RD. & PATROL RD.

FIGURE 7



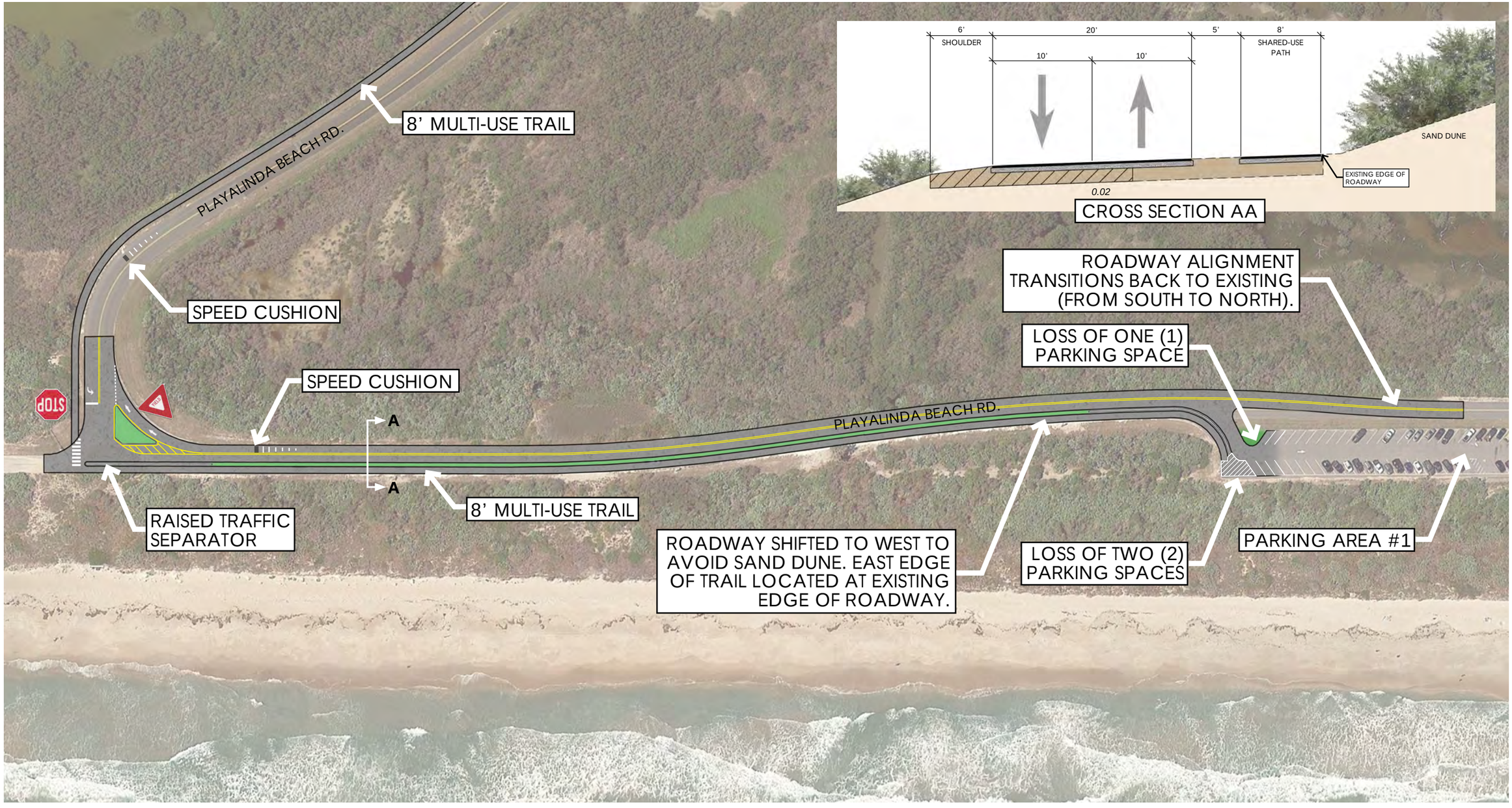
1,500' section between the intersection of Beach Road and Patrol Road to Parking Area No. 1. Beach Road is shifted 13' to the west and shared-use path would be constructed along east side.

Length 0.3 Miles

PROPOSED SPACE COAST TRAIL

E-W CANA SEGMENT TYPICAL SECTION

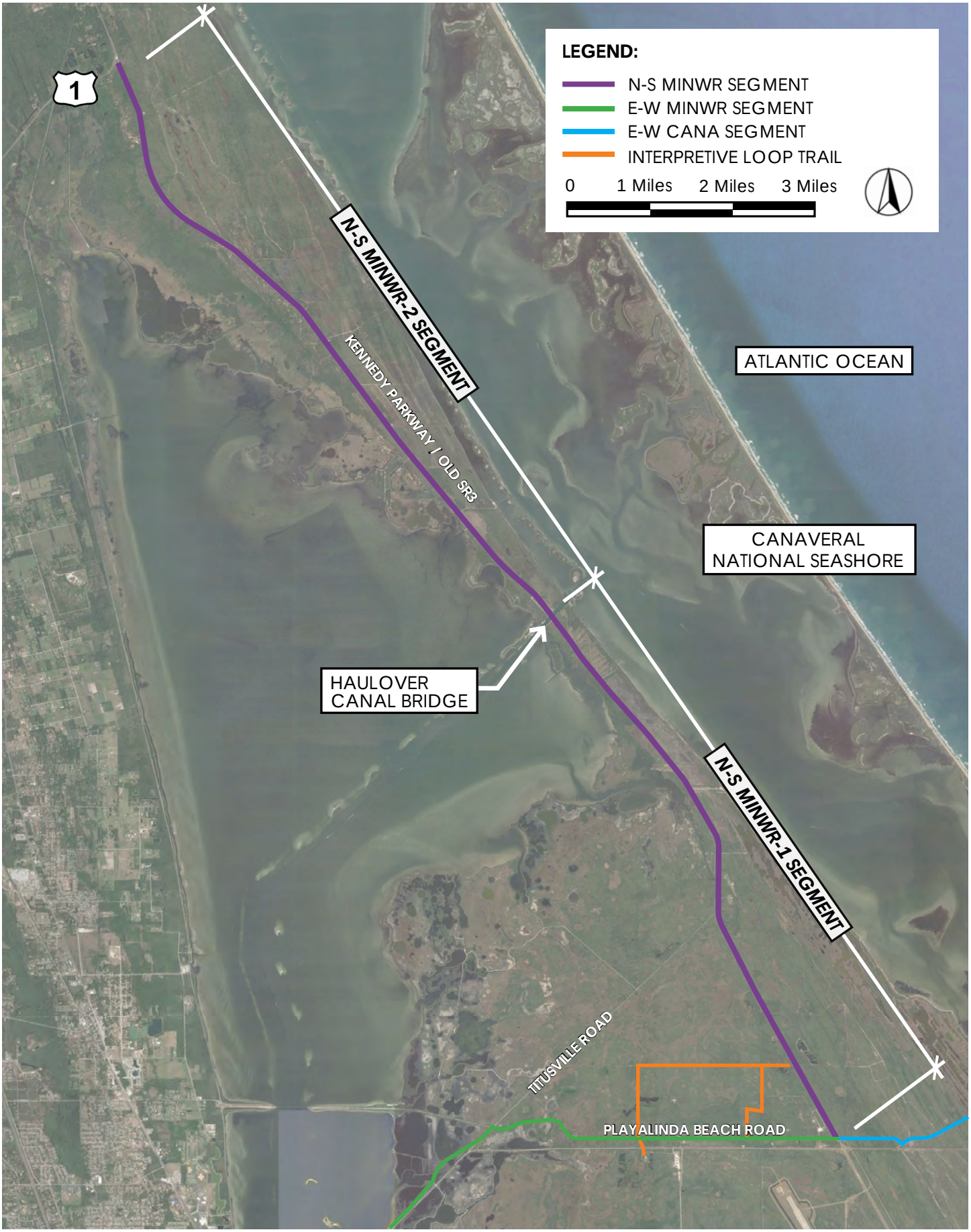
FIGURE **8**



PROPOSED SPACE COAST TRAIL

SECTION FROM CURVE TO PARKING AREA NO. 1

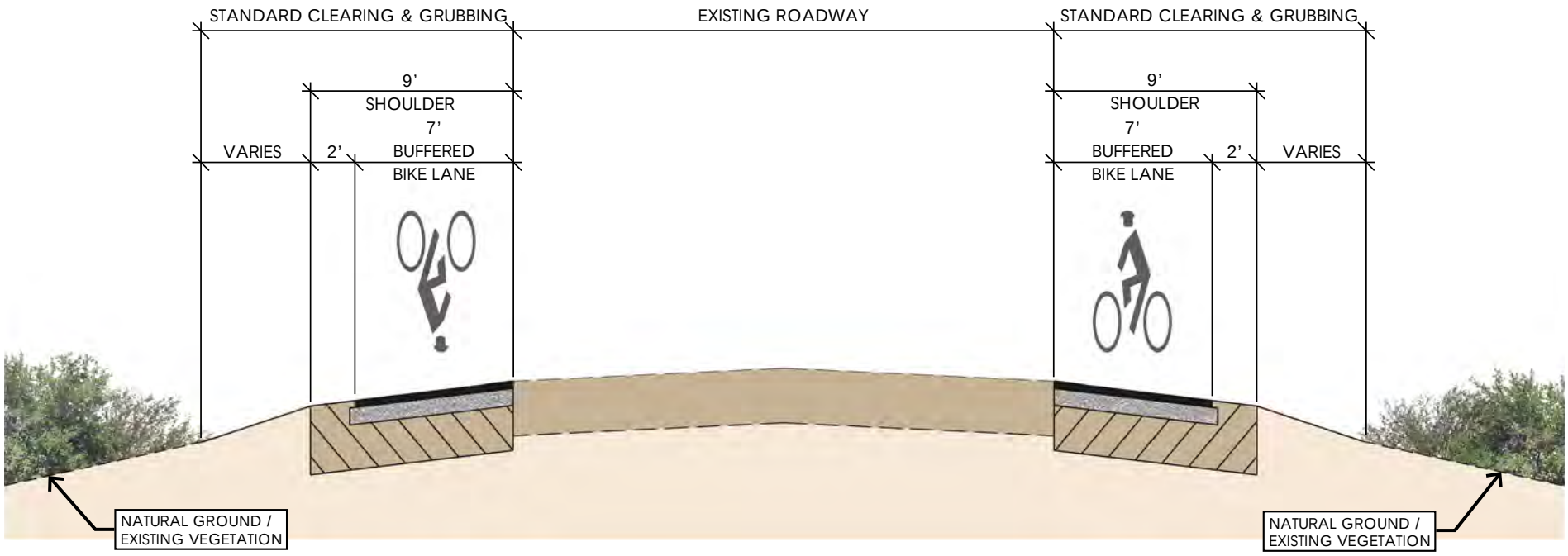
FIGURE 9



PROPOSED SPACE COAST TRAIL

N-S CANA SEGMENT

FIGURE 10



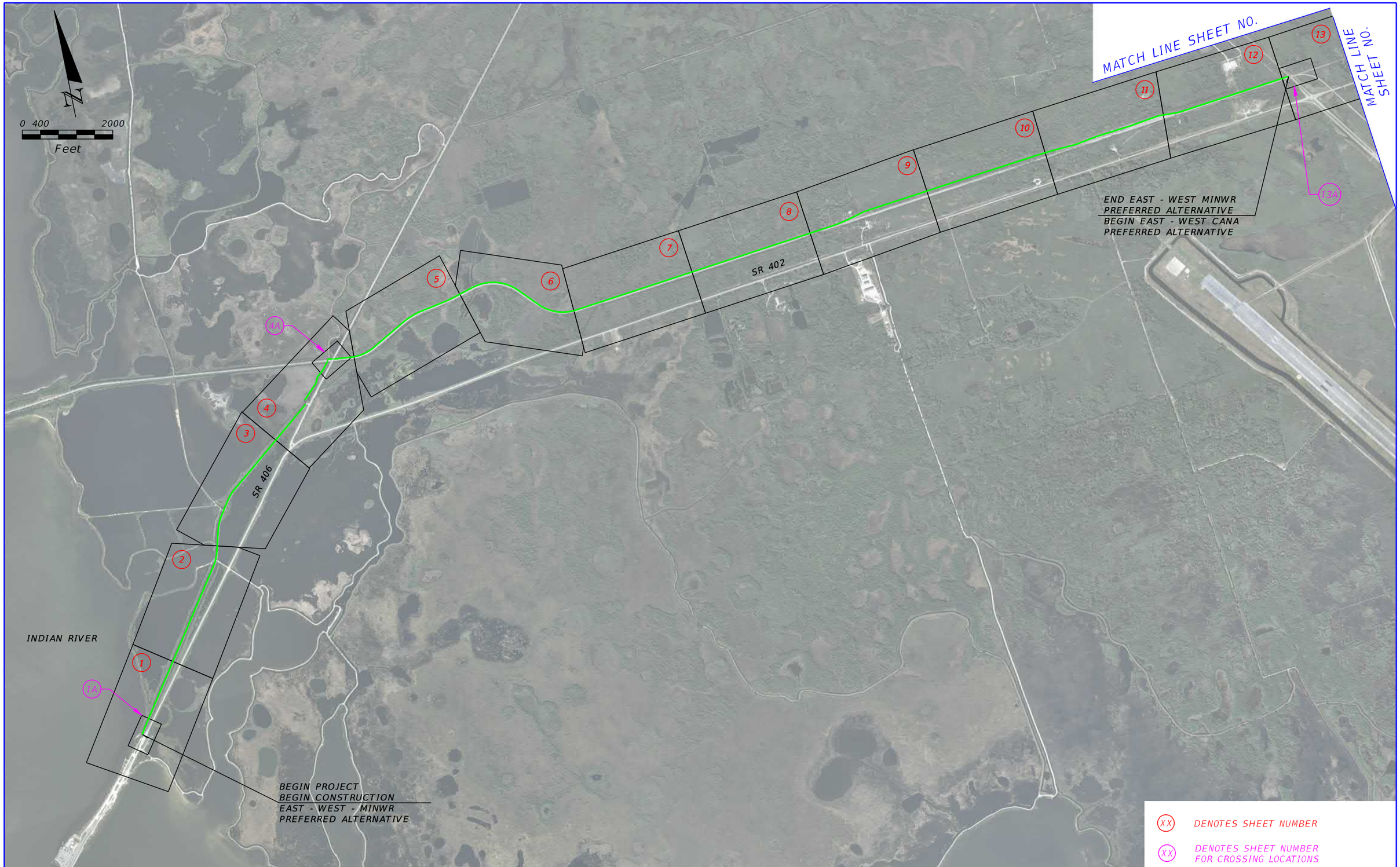
Construct new buffered bike lanes along both sides of Kennedy Parkway North.
No new structure over the Haulover Canal.

PROPOSED SPACE COAST TRAIL

N-S MINWR SEGMENT TYPICAL SECTION

FIGURE 11

Appendix B:
Concept Plans for the Preferred Alternative



XX DENOTES SHEET NUMBER

XX DENOTES SHEET NUMBER FOR CROSSING LOCATIONS

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST MINWR PREFFERRED ALTERNATIVE PROJECT LAYOUT (01)

SHEET NO. 1

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MOSQUITO LAGOON

ATLANTIC OCEAN

END EAST - WEST CANA
PREFERRED ALTERNATIVE

END EAST - WEST MINWR
PREFERRED ALTERNATIVE
BEGIN EAST - WEST CANA
PREFERRED ALTERNATIVE

SR 402

MATCH LINE SHEET NO.

12 13 14 15 16 17 18 19 20 21

13A 14A 21A 21B

N

0 400 2000
Feet

XX DENOTES SHEET NUMBER

XX DENOTES SHEET NUMBER
FOR CROSSING LOCATIONS

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EAST - WEST CANA PREFERRED ALTERNATIVE PROJECT LAYOUT (02)

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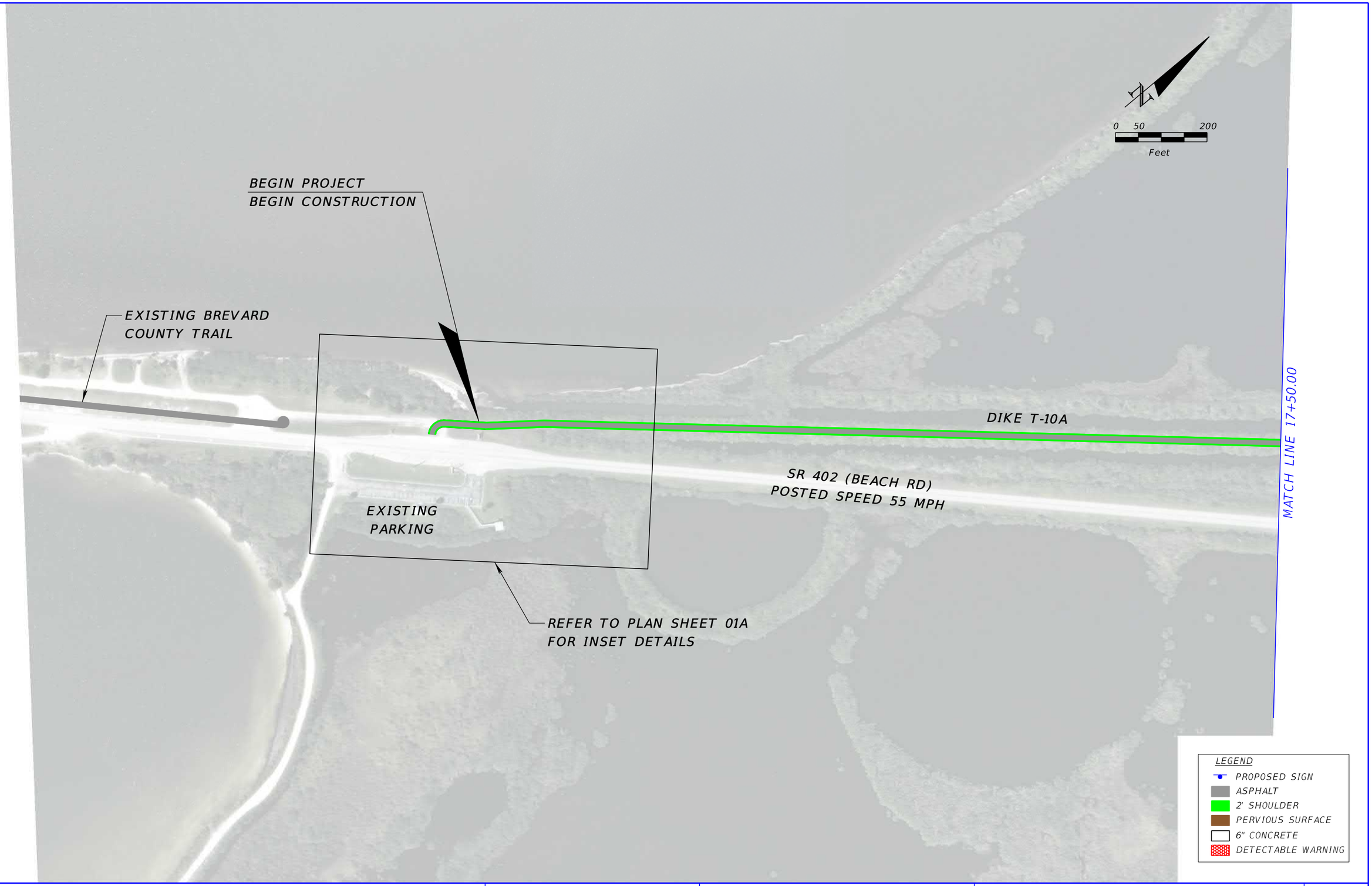

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EAST - WEST MINWR
PREFERRED ALTERNATIVE
(PLAN 01)

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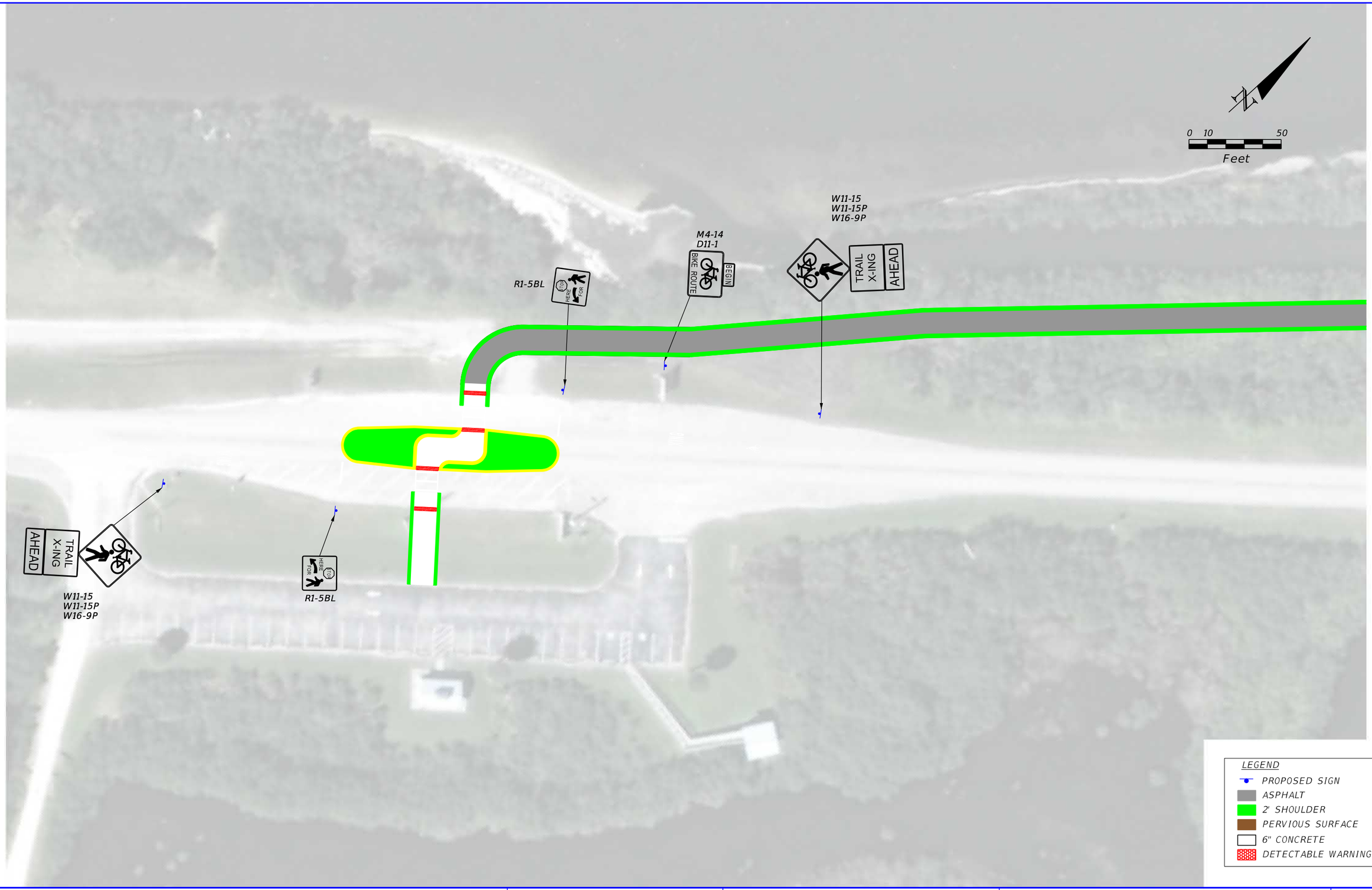

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(PLAN 01A)

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EAST - WEST MINWR PREFERRED ALTERNATIVE (PLAN 02)

SHEET NO. 5

PUMP HOUSE SERVICE RD

MATCH LINE 45+00.00

MATCH LINE 72+50.00

SR 402 (BEACH RD)
POSTED SPEED 55 MPH

0 50 200
Feet

LEGEND
- PROPOSED SIGN
- ASPHALT
- 2' SHOULDER
- PERVIOUS SURFACE
- 6" CONCRETE
- DETECTABLE WARNING

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EAST - WEST MINWR PREFERRED ALTERNATIVE (PLAN 03)

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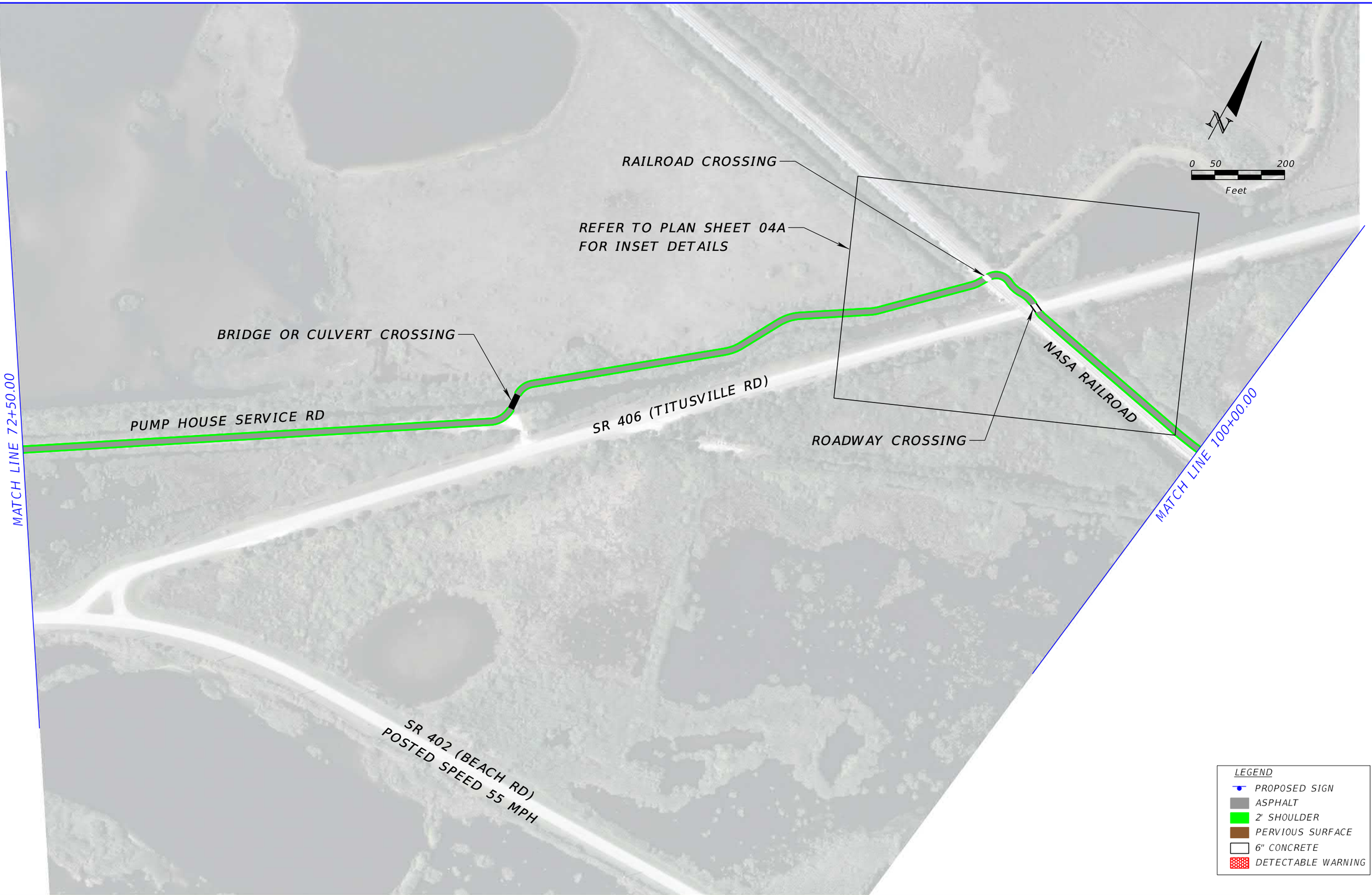

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(PLAN 04)

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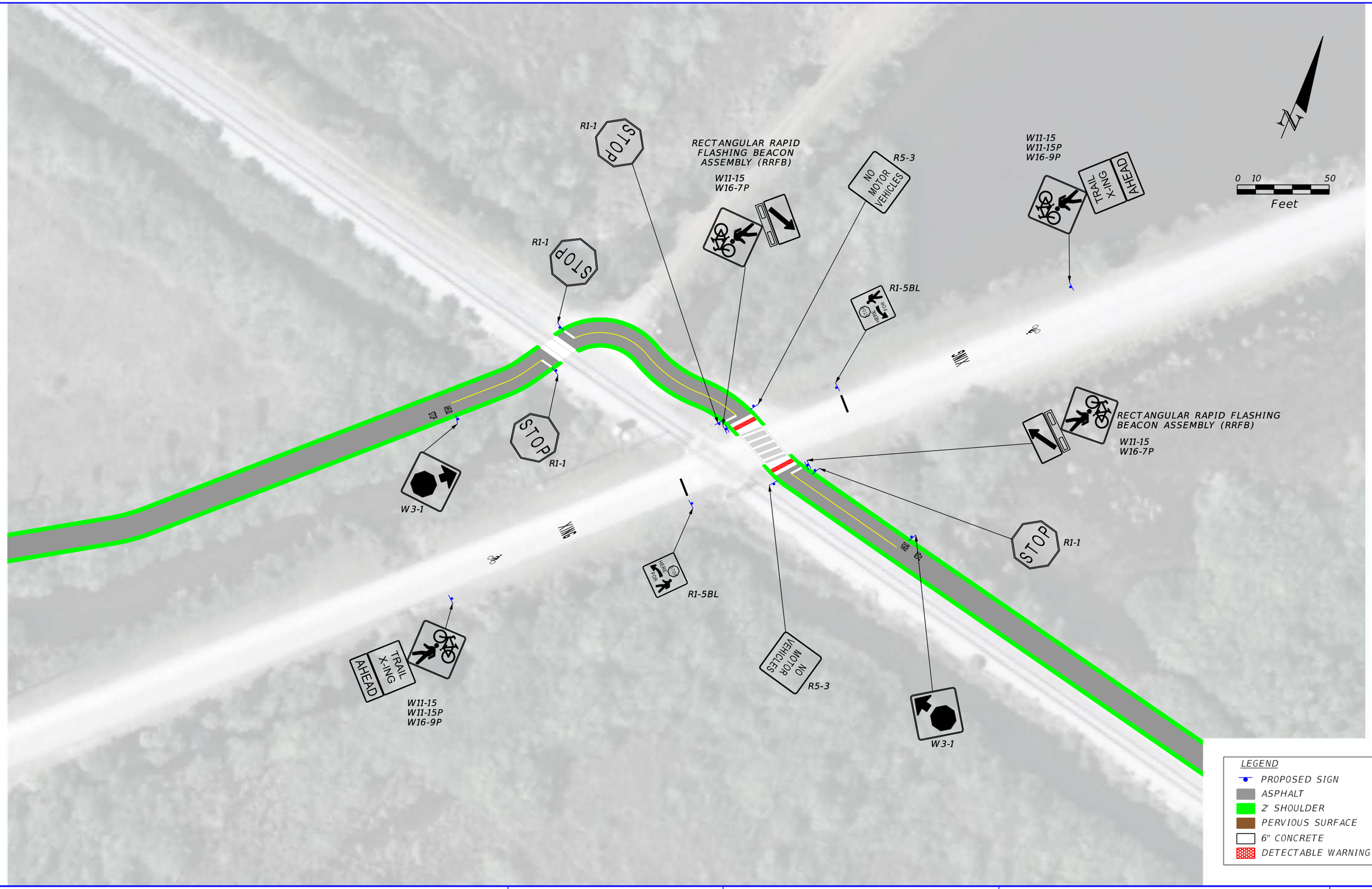

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EAST - WEST MINWR PREFERRED ALTERNATIVE (PLAN 07)

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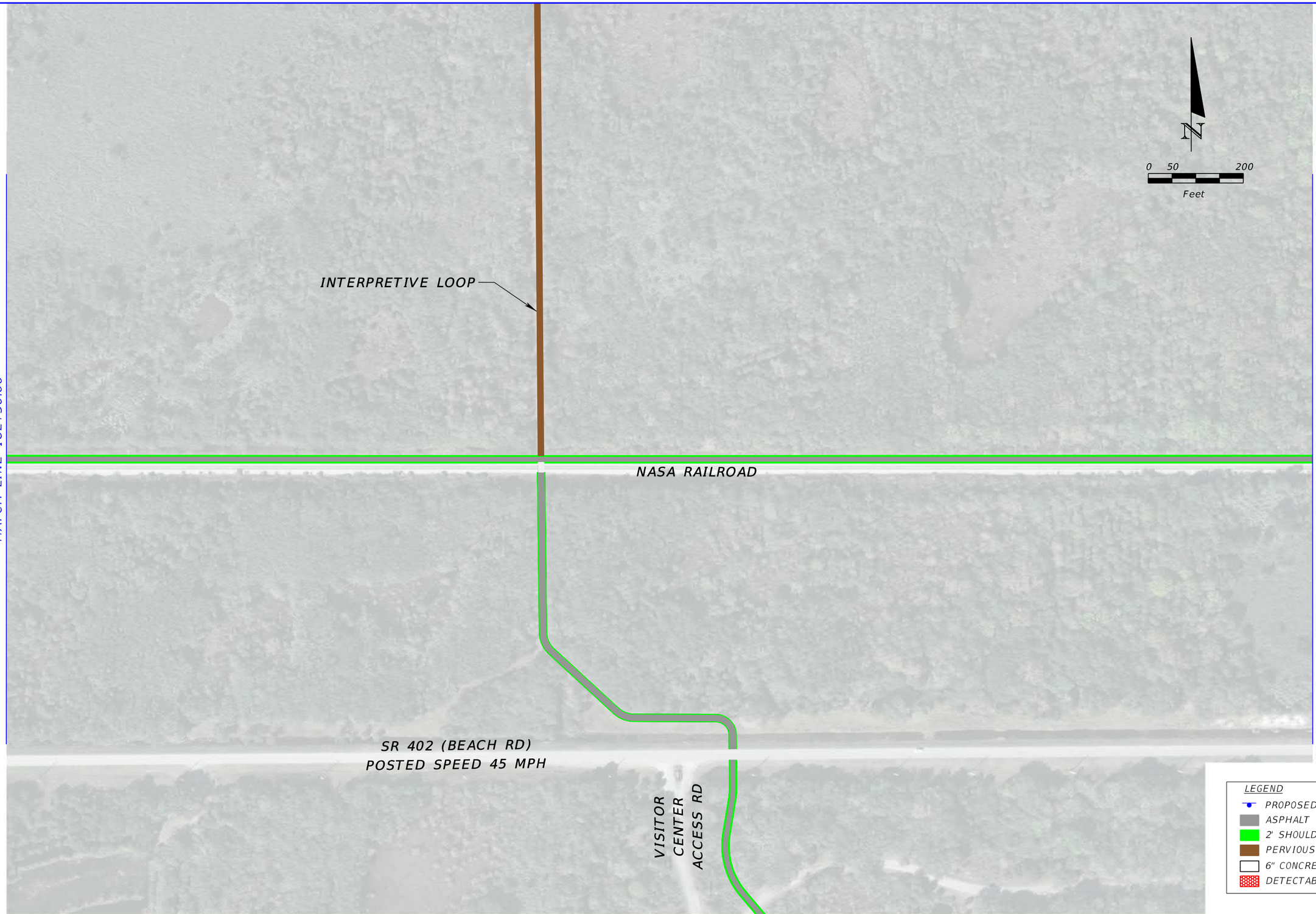

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EAST - WEST MINWR PREFERRED ALTERNATIVE (PLAN 08)

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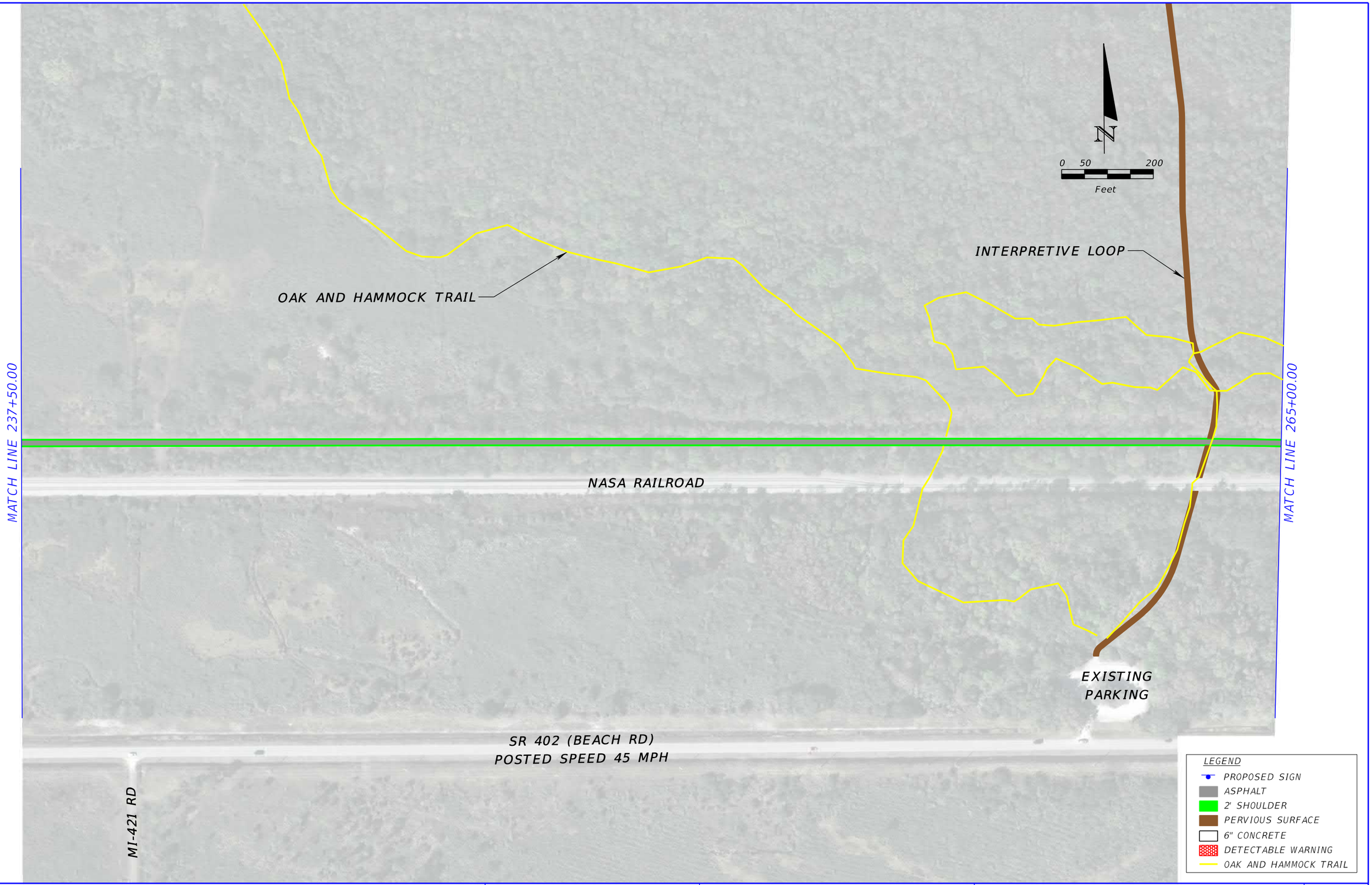

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EAST - WEST MINWR PREFERRED ALTERNATIVE (PLAN 10)

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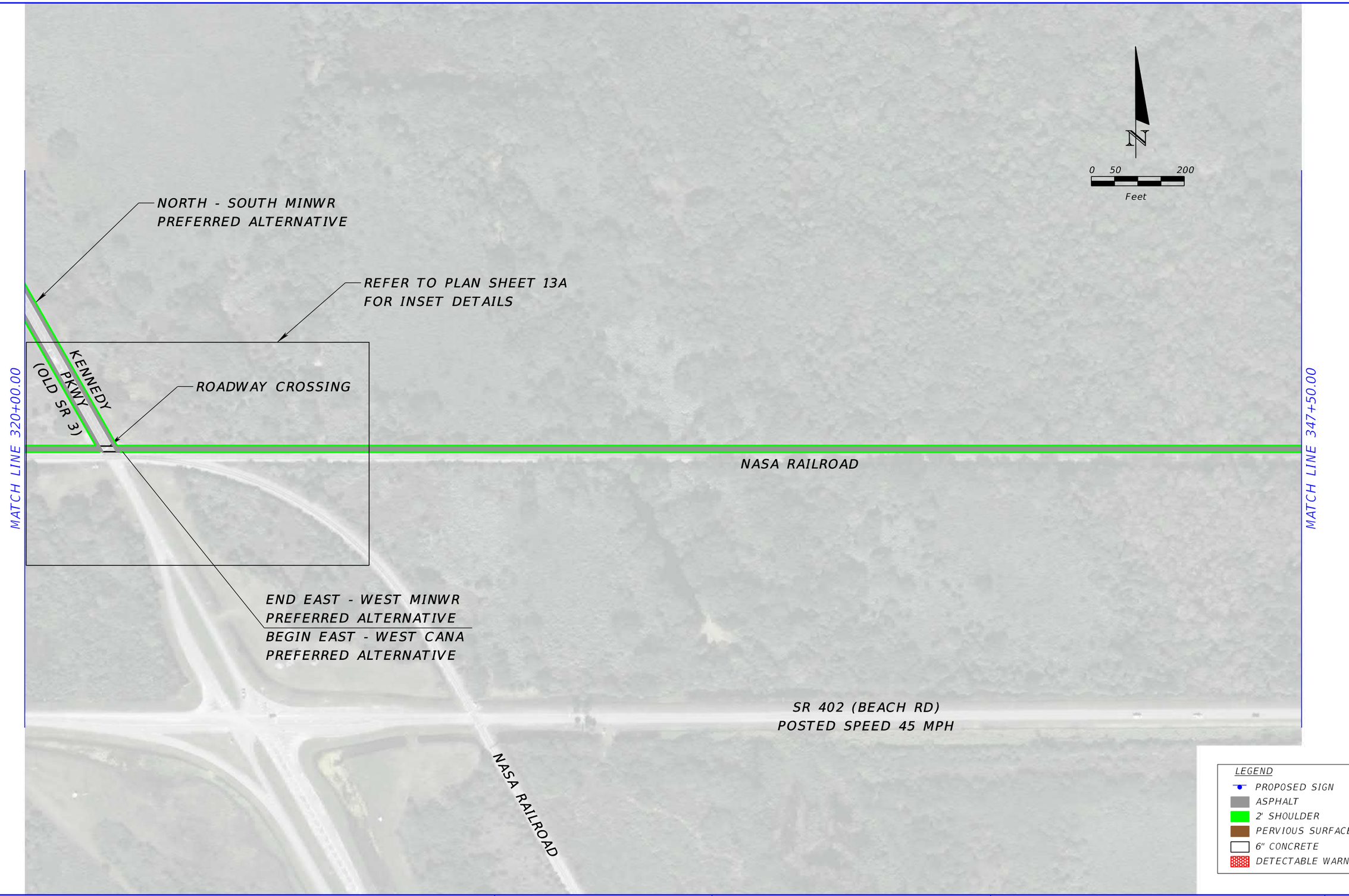
EAST - WEST MINWR PREFERRED ALTERNATIVE (PLAN 12)

SHEET NO. 16



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EAST - WEST CANA PREFERRED ALTERNATIVE (PLAN 13)

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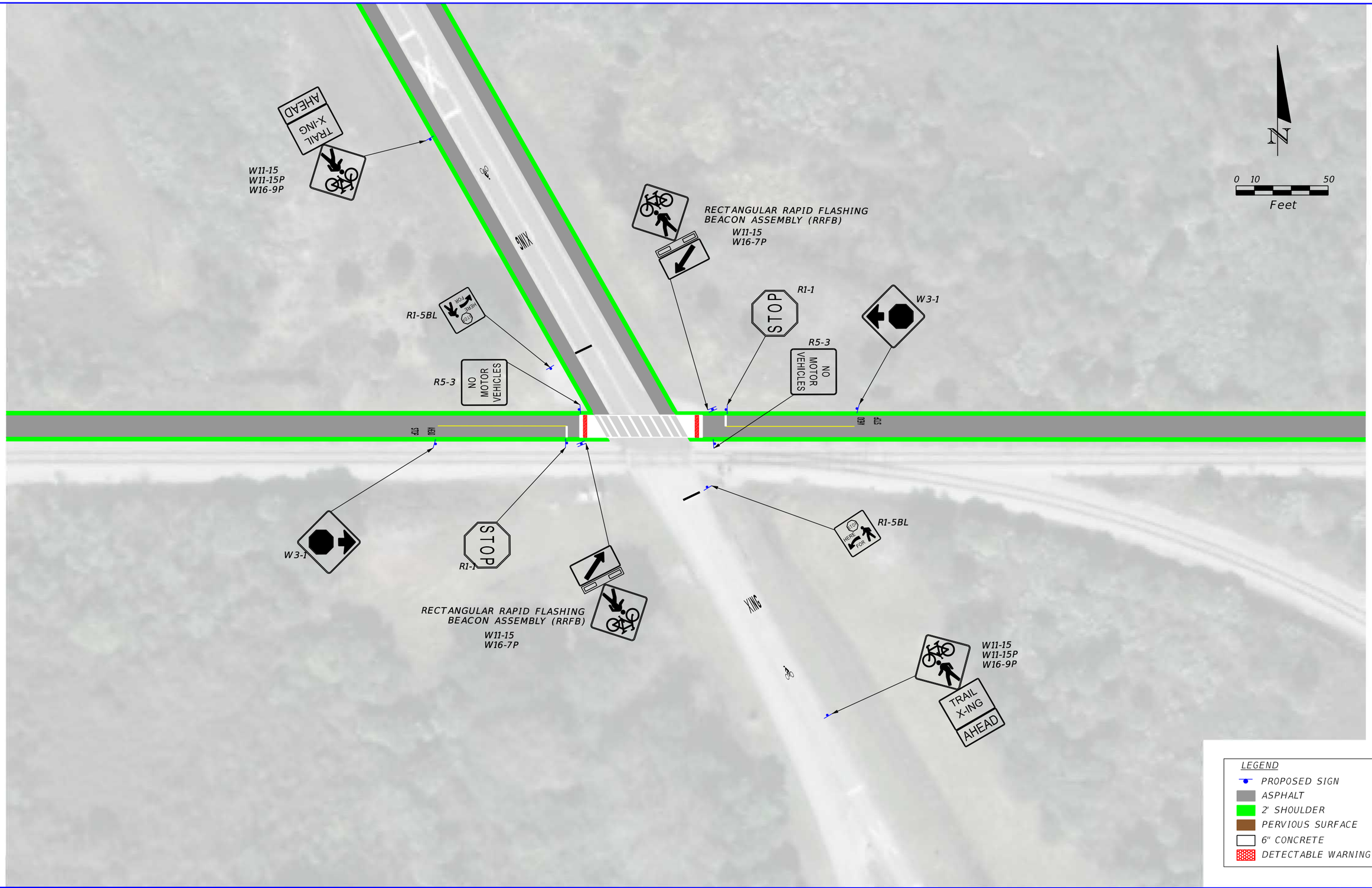

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA
PREFERRED ALTERNATIVE
(PLAN 13A)

SHEET NO.
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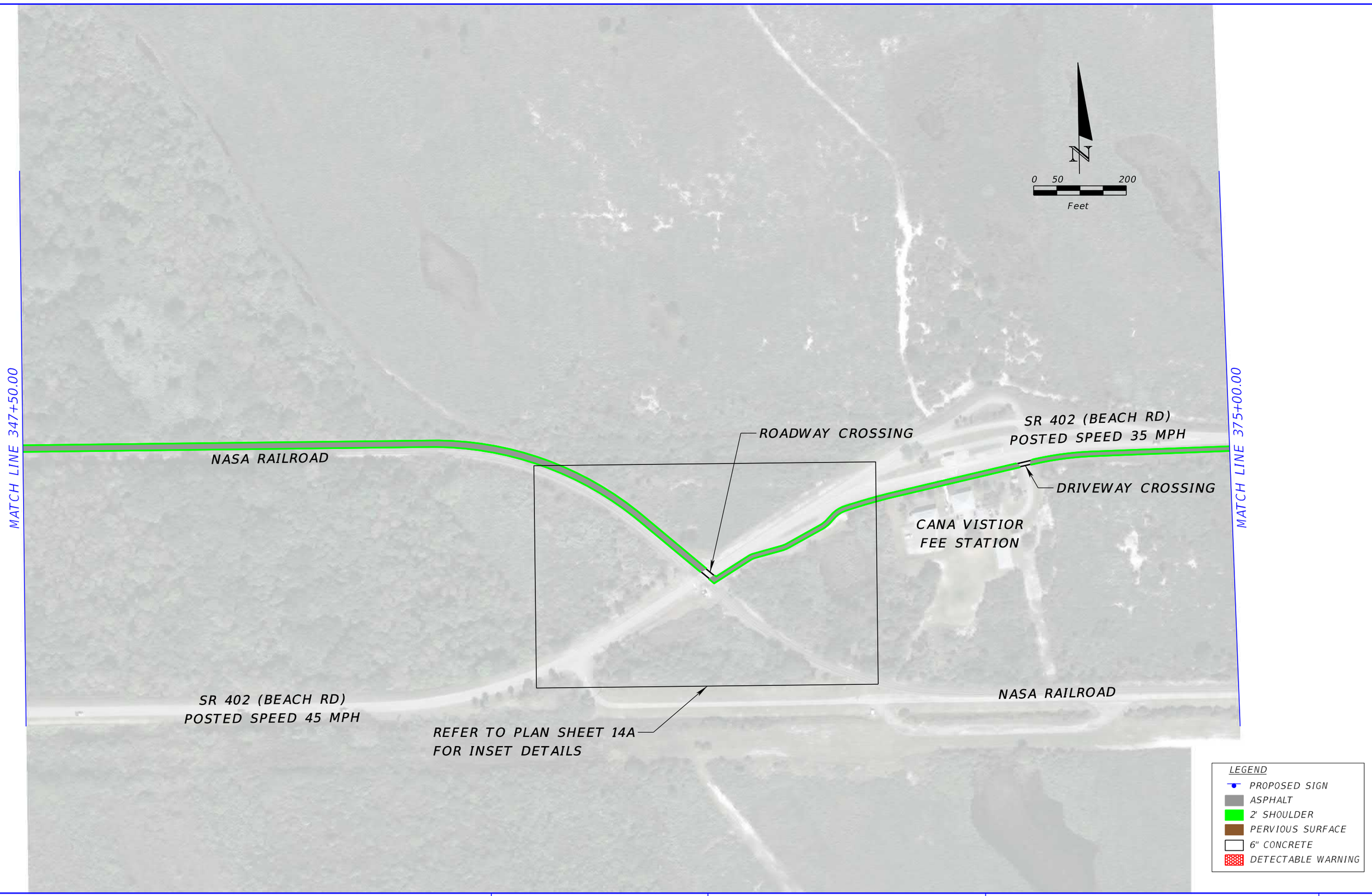

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EAST - WEST CANA
PREFERRED ALTERNATIVE
(PLAN 14)

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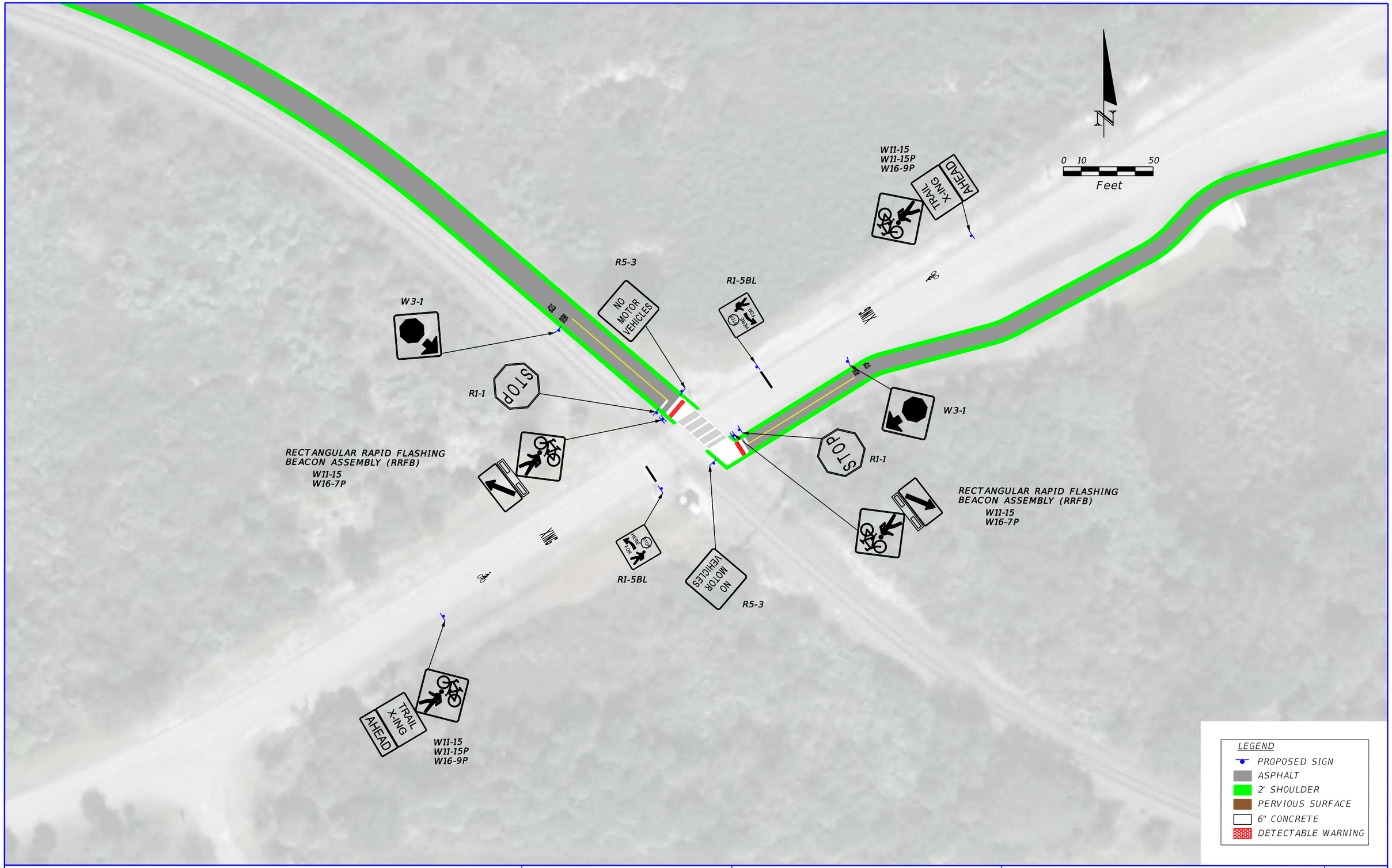

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA
PREFERRED ALTERNATIVE
(PLAN 13A)

SHEET NO.
20

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA
PREFERRED ALTERNATIVE
(PLAN 15)

SHEET NO. 21

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA PREFERRED ALTERNATIVE (PLAN 16)

SHEET NO. 22

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA
PREFERRED ALTERNATIVE
(PLAN 17)

SHEET NO. 23

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA
PREFERRED ALTERNATIVE
(PLAN 18)

SHEET NO. 24

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA PREFERRED ALTERNATIVE (PLAN 19)

SHEET NO. 25

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA PREFERRED ALTERNATIVE (PLAN 20)

SHEET NO. 26

MATCH LINE 540+00.00

N

0 50 200
Feet

END PROJECT
END CONSTRUCTION

SR 402 (BEACH RD)
POSTED SPEED 35 MPH

SR 402 (BEACH RD)
POSTED SPEED 35 MPH

BEACH PATROL RD

ROADWAY CROSSING

REFER TO PLAN SHEET 21A
FOR INSET DETAILS

REFER TO PLAN SHEET 21B
FOR INSET DETAILS

LEGEND
- PROPOSED SIGN
- ASPHALT
- 2' SHOULDER
- PERVIOUS SURFACE
- 6" CONCRETE
- DETECTABLE WARNING

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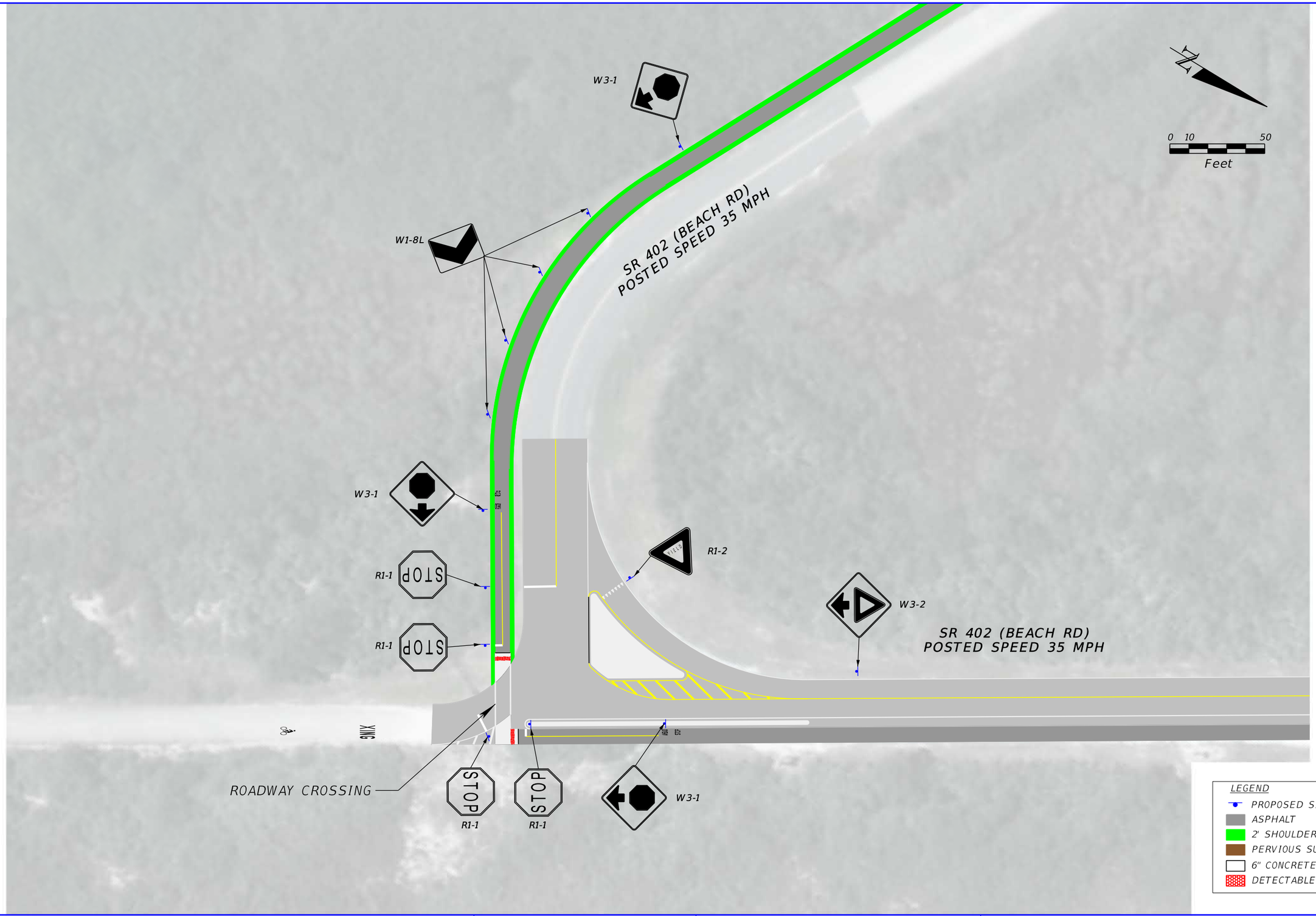
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA
PREFERRED ALTERNATIVE
(PLAN 21)

SHEET NO. 27



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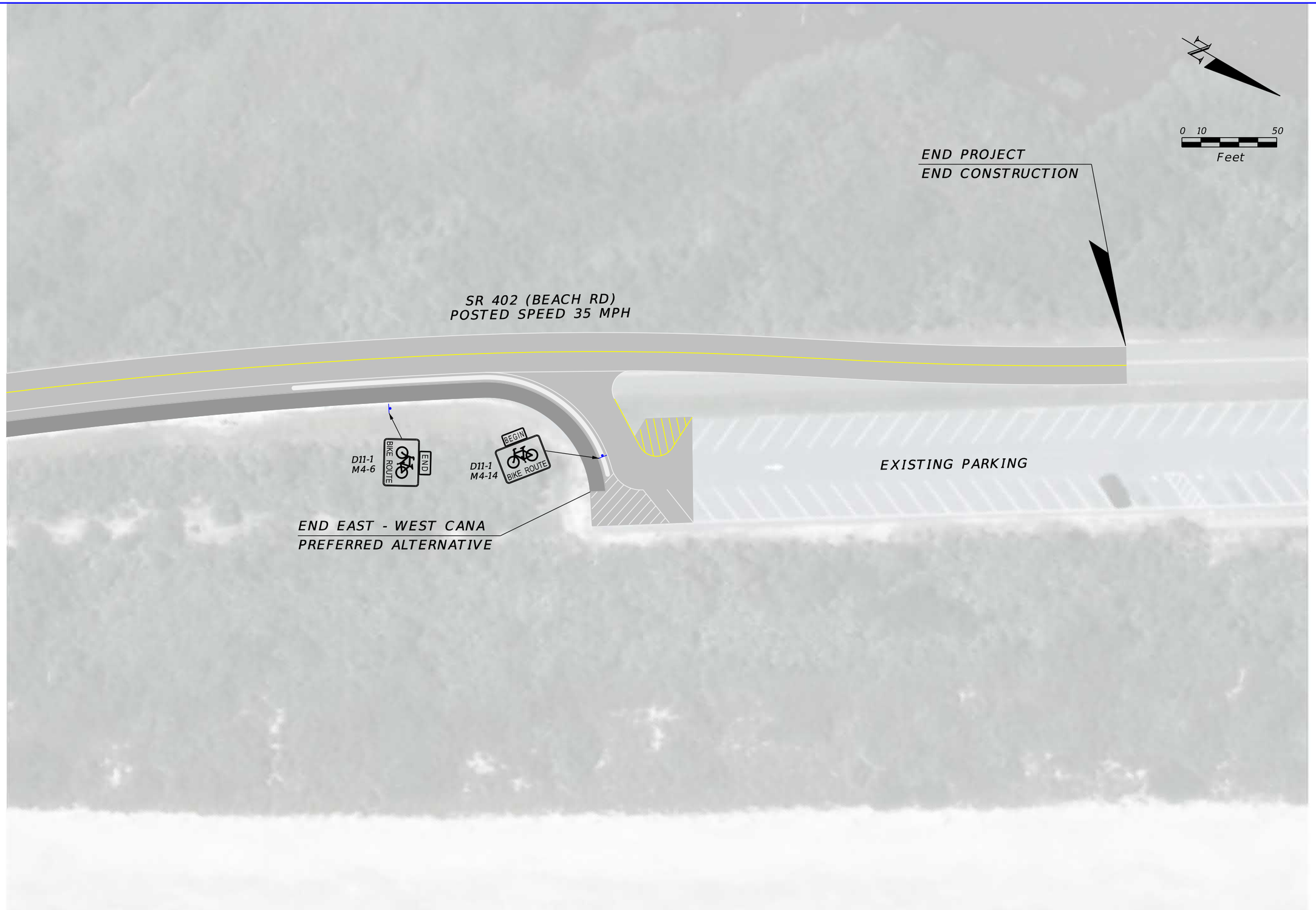
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA PREFERRED ALTERNATIVE (PLAN 21A)

SHEET NO. 28



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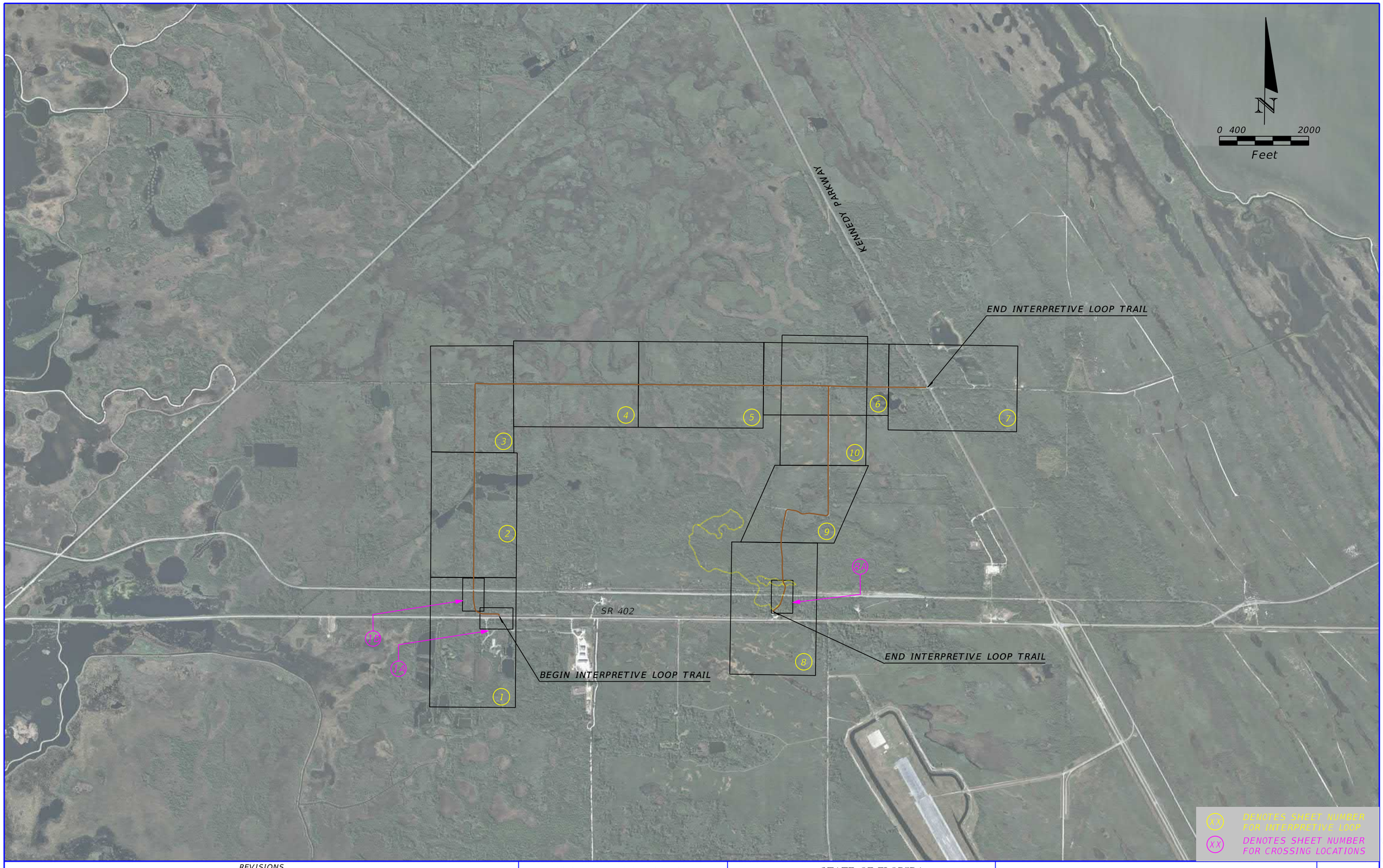
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

EAST - WEST CANA PREFERRED ALTERNATIVE (PLAN 21B)

SHEET NO.
29



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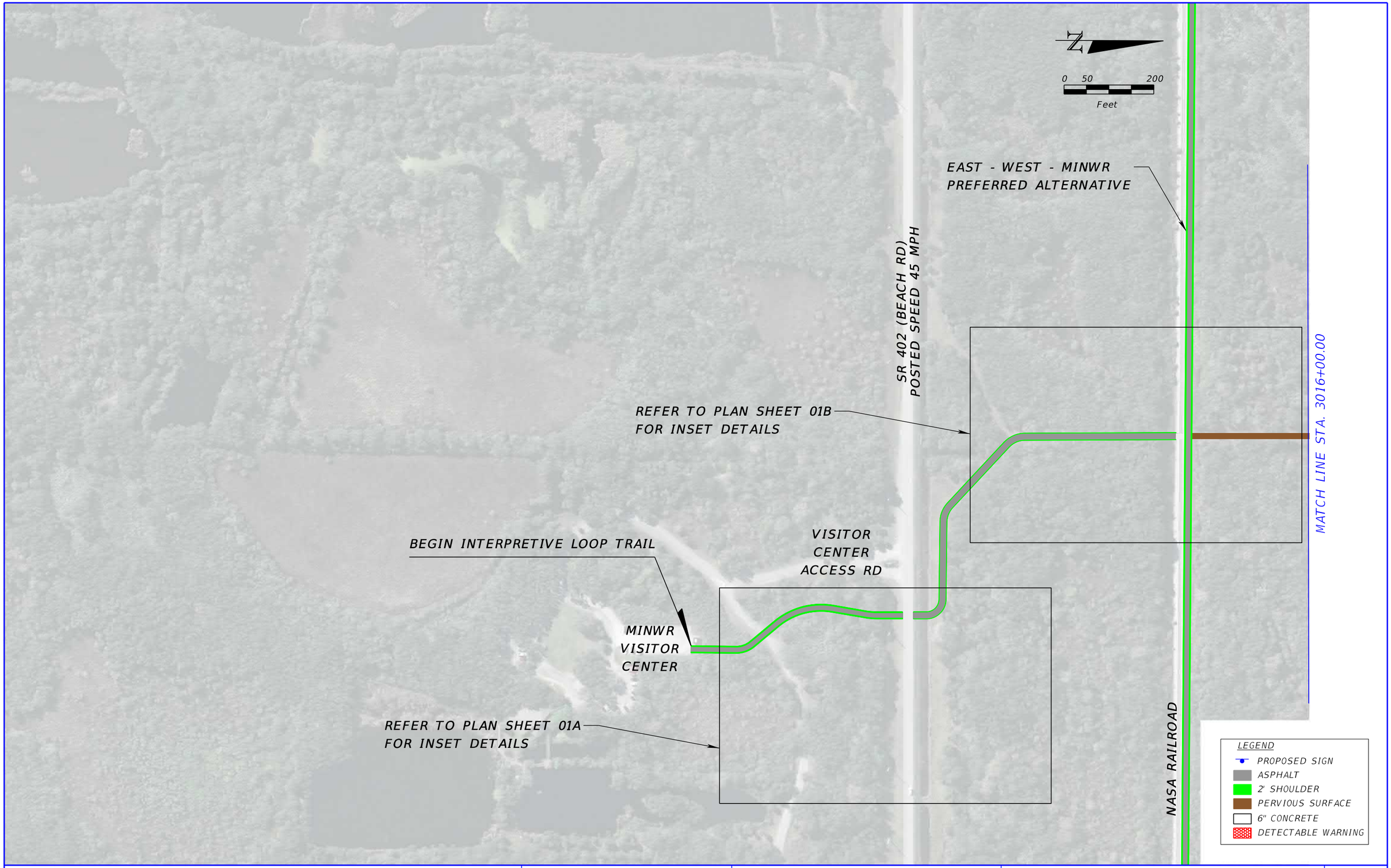
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PROJECT LAYOUT (03)

SHEET NO. 30



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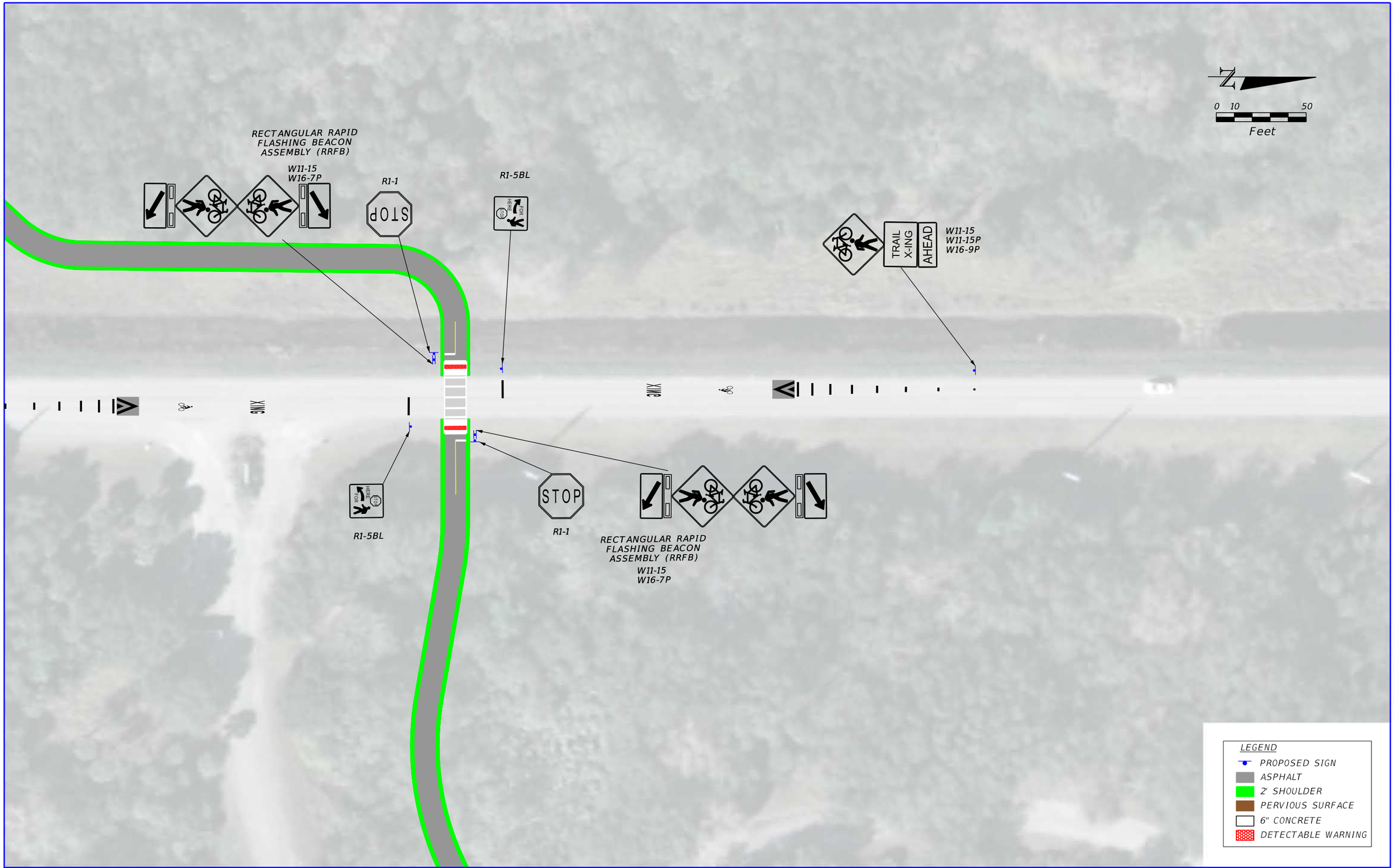
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 01)

SHEET NO. 31



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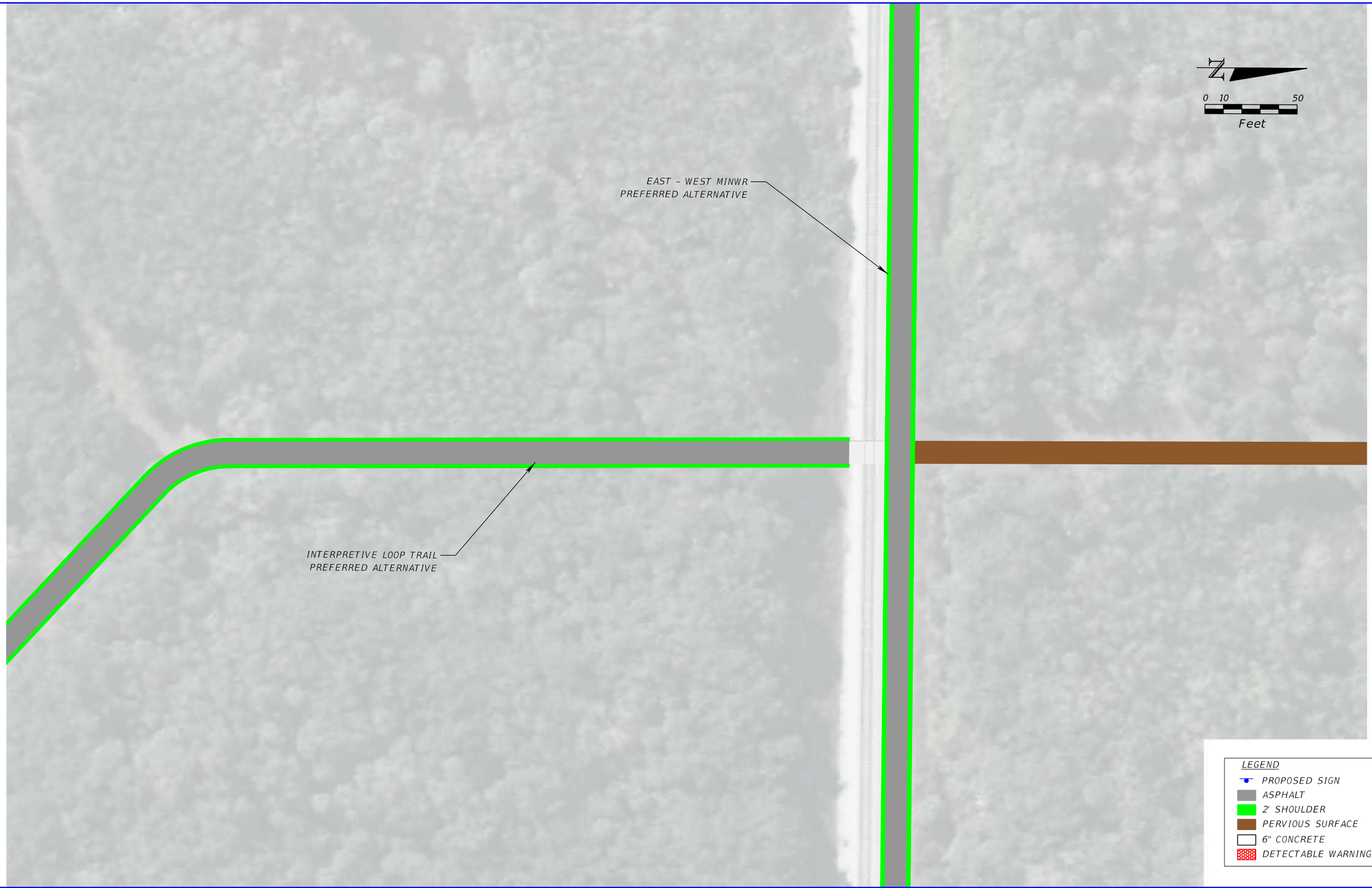
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 01A)

SHEET NO. 32



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 01B)

SHEET NO. 33

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 02)

SHEET NO. 34

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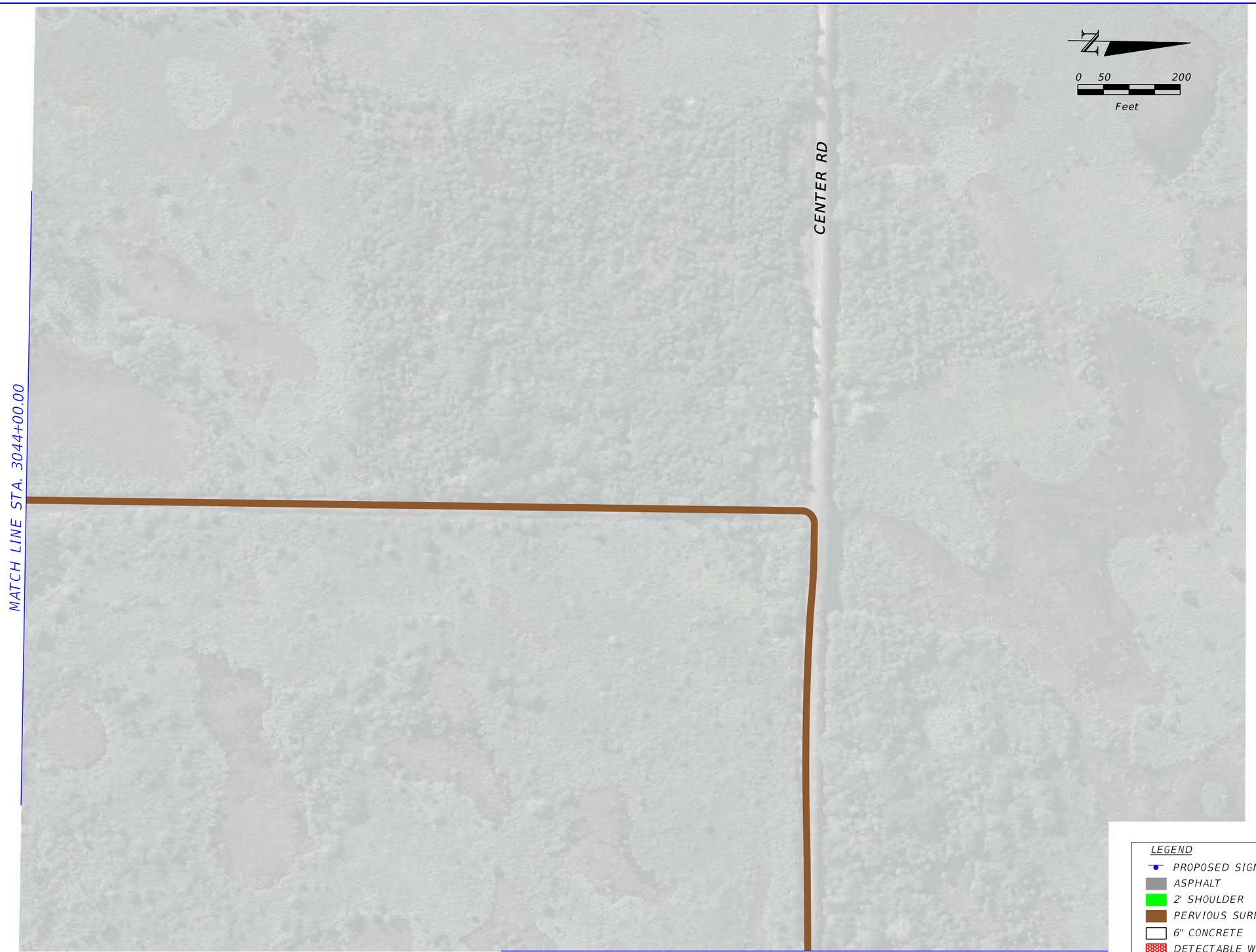

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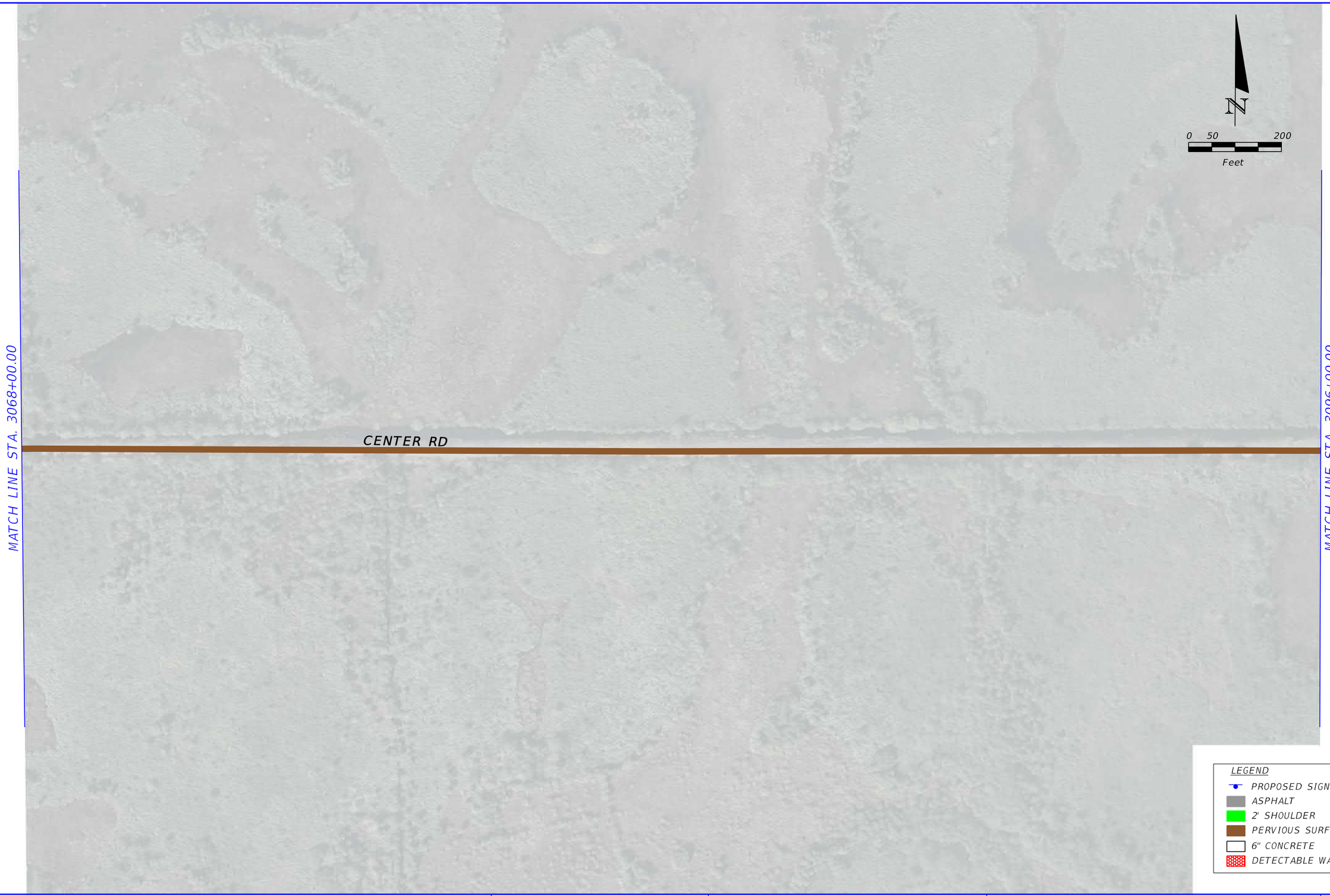
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 03)

SHEET NO. 35



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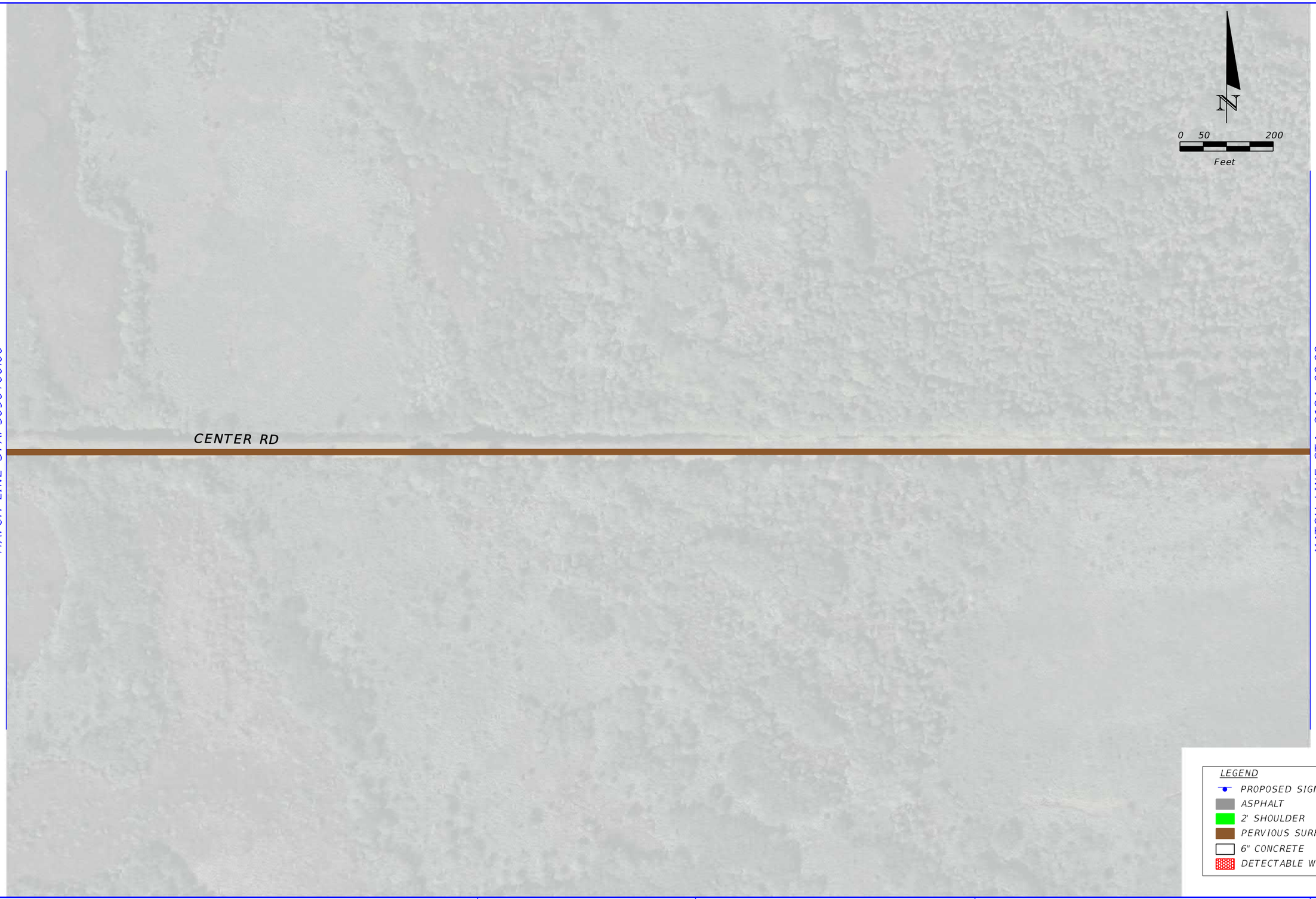
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL
PREFERRED ALTERNATIVE
(PLAN 04)

SHEET NO.
36



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INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 05)

SHEET NO. 37

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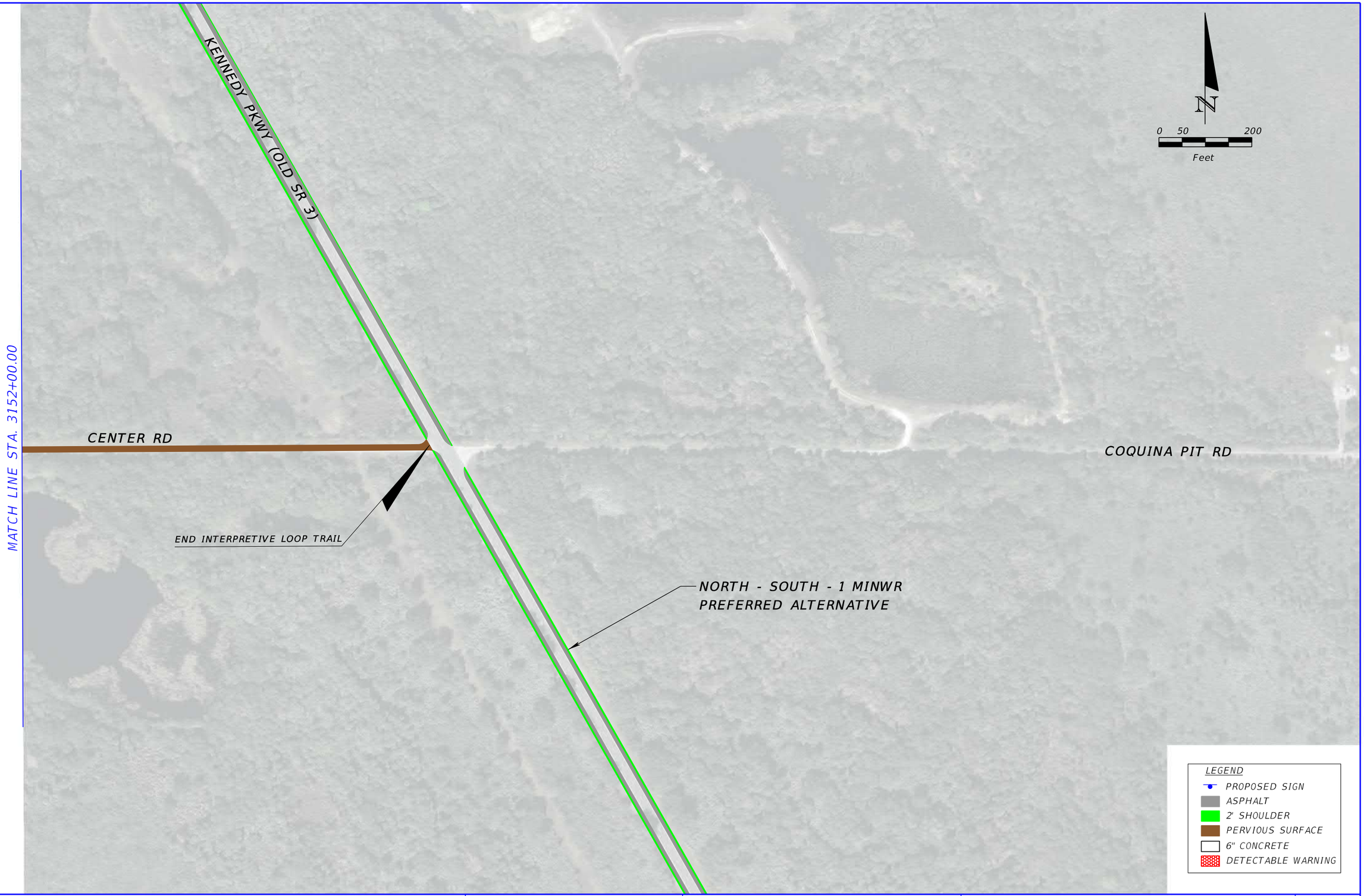
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 06)

SHEET NO. 38



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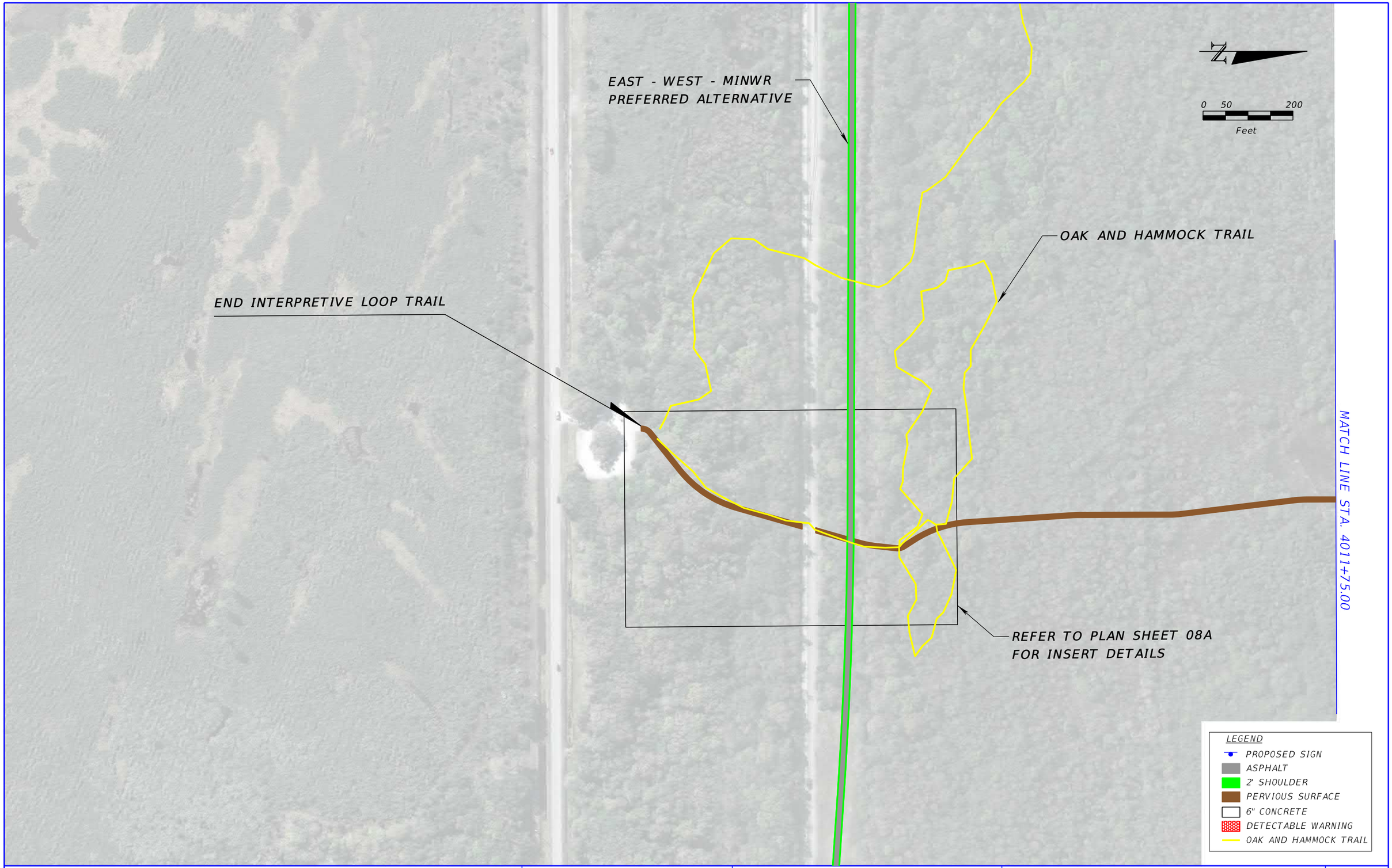
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 07)

SHEET NO. 39



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 08)

SHEET NO. 40

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INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 08A)

SHEET NO. 41

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	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 09)

SHEET NO. 42

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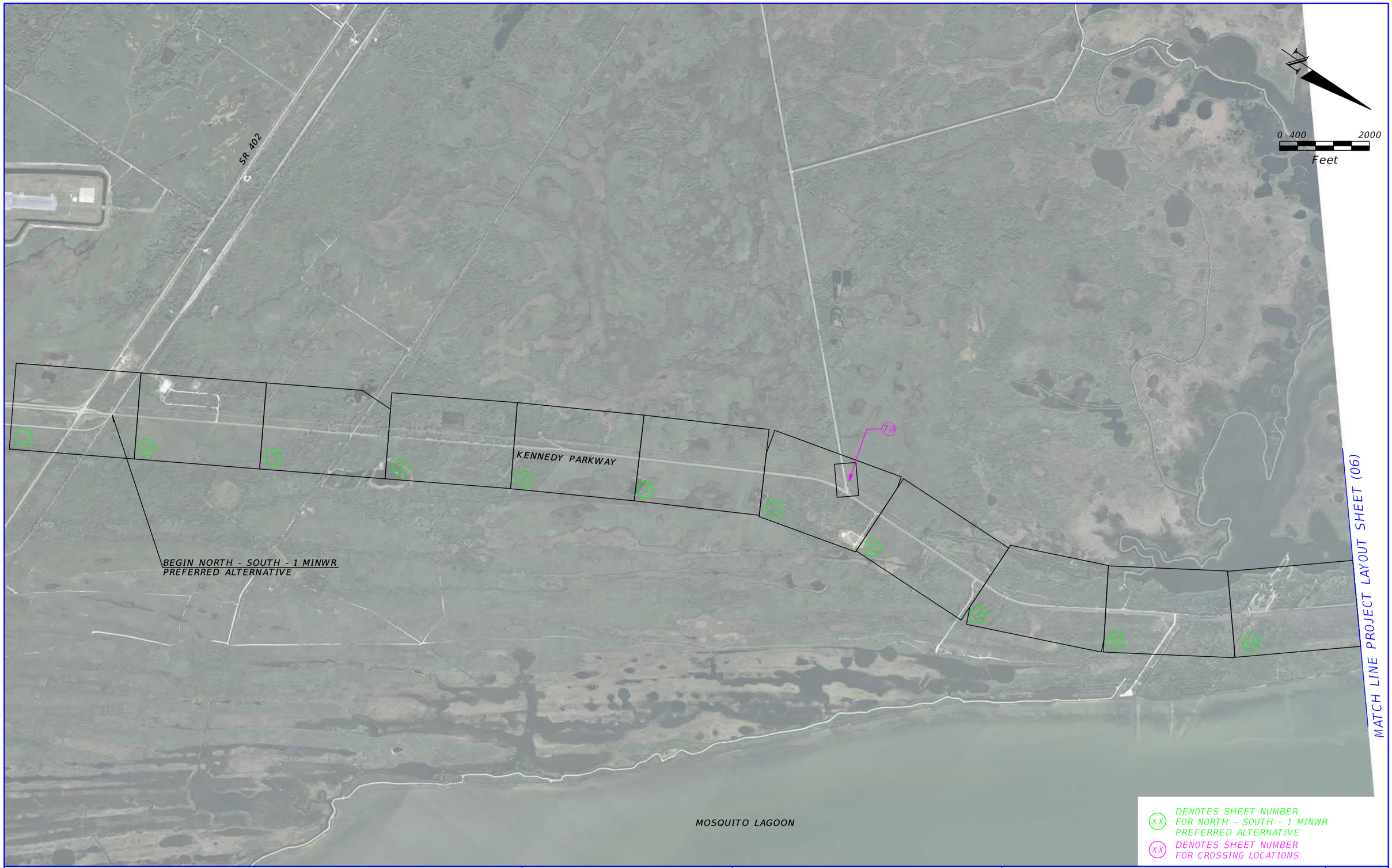
	BREVARD VOLUSIA	437093-1-22-01

INTERPRETIVE LOOP TRAIL PREFERRED ALTERNATIVE (PLAN 10)

SHEET NO. 43



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NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE PROJECT LAYOUT (04)

SHEET NO. 44

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NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE PROJECT LAYOUT (05)

SHEET NO. 45

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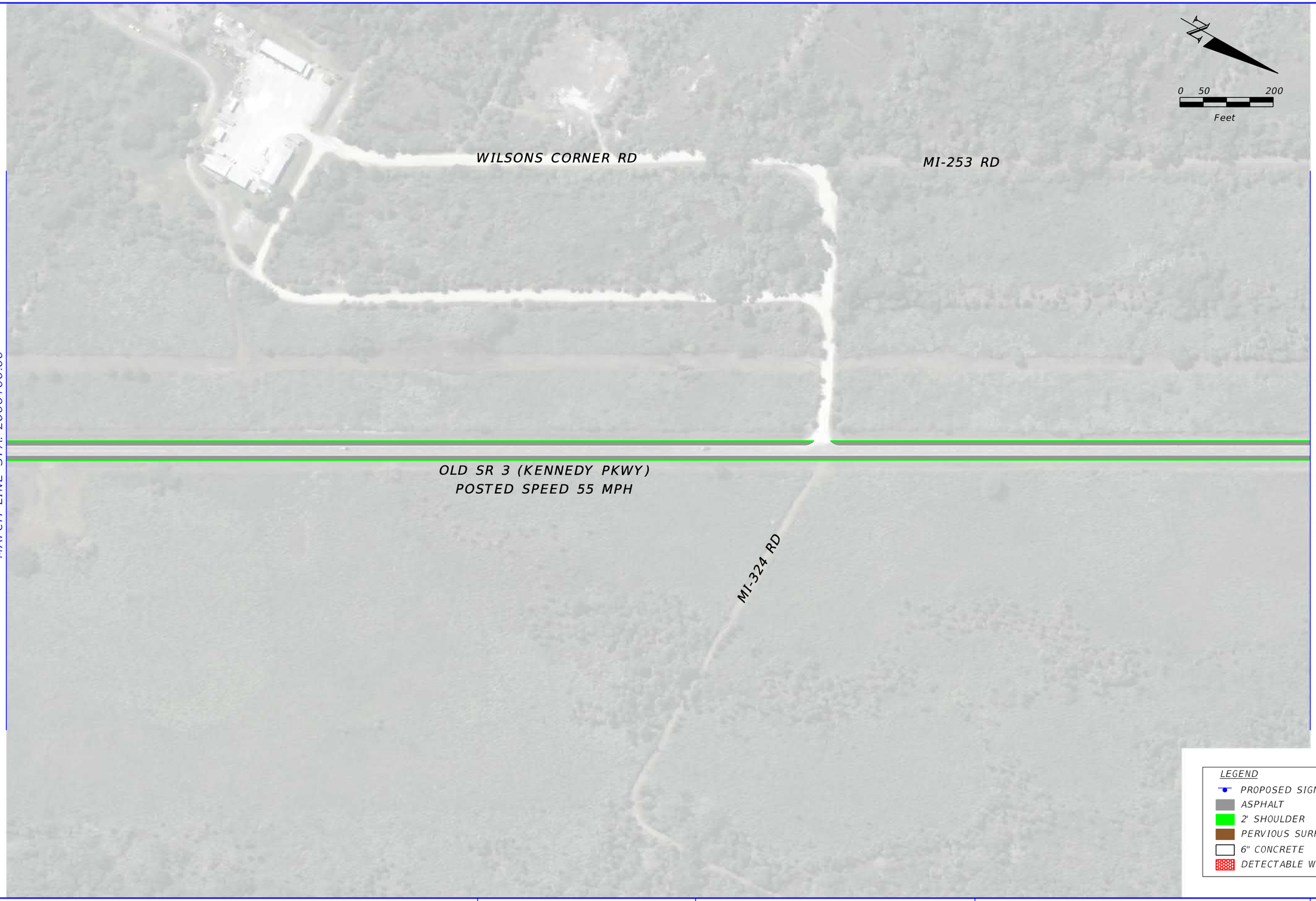
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 01)

SHEET NO. 46



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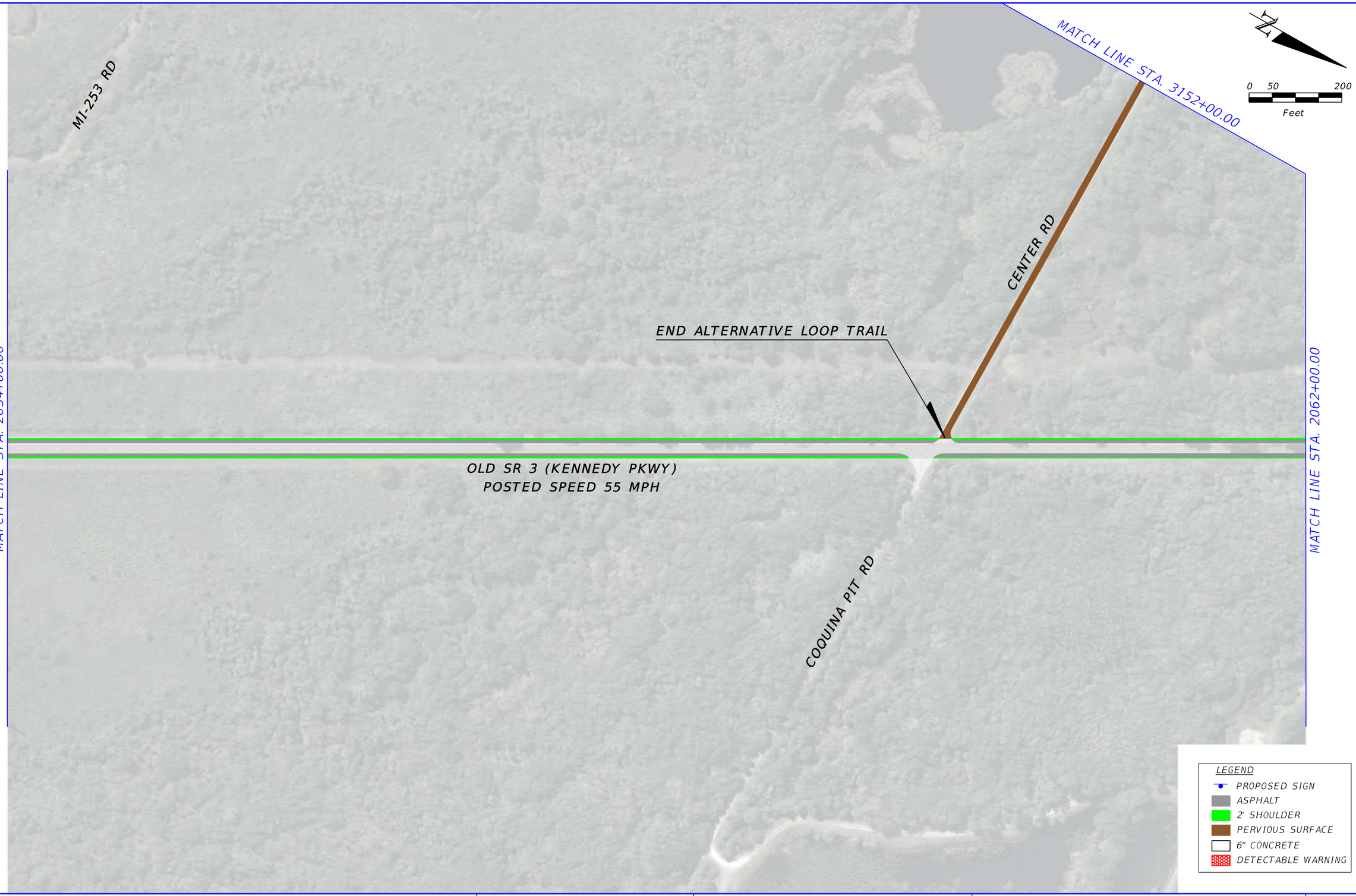
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 02)

SHEET NO. 47



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	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 03)

SHEET NO. 48

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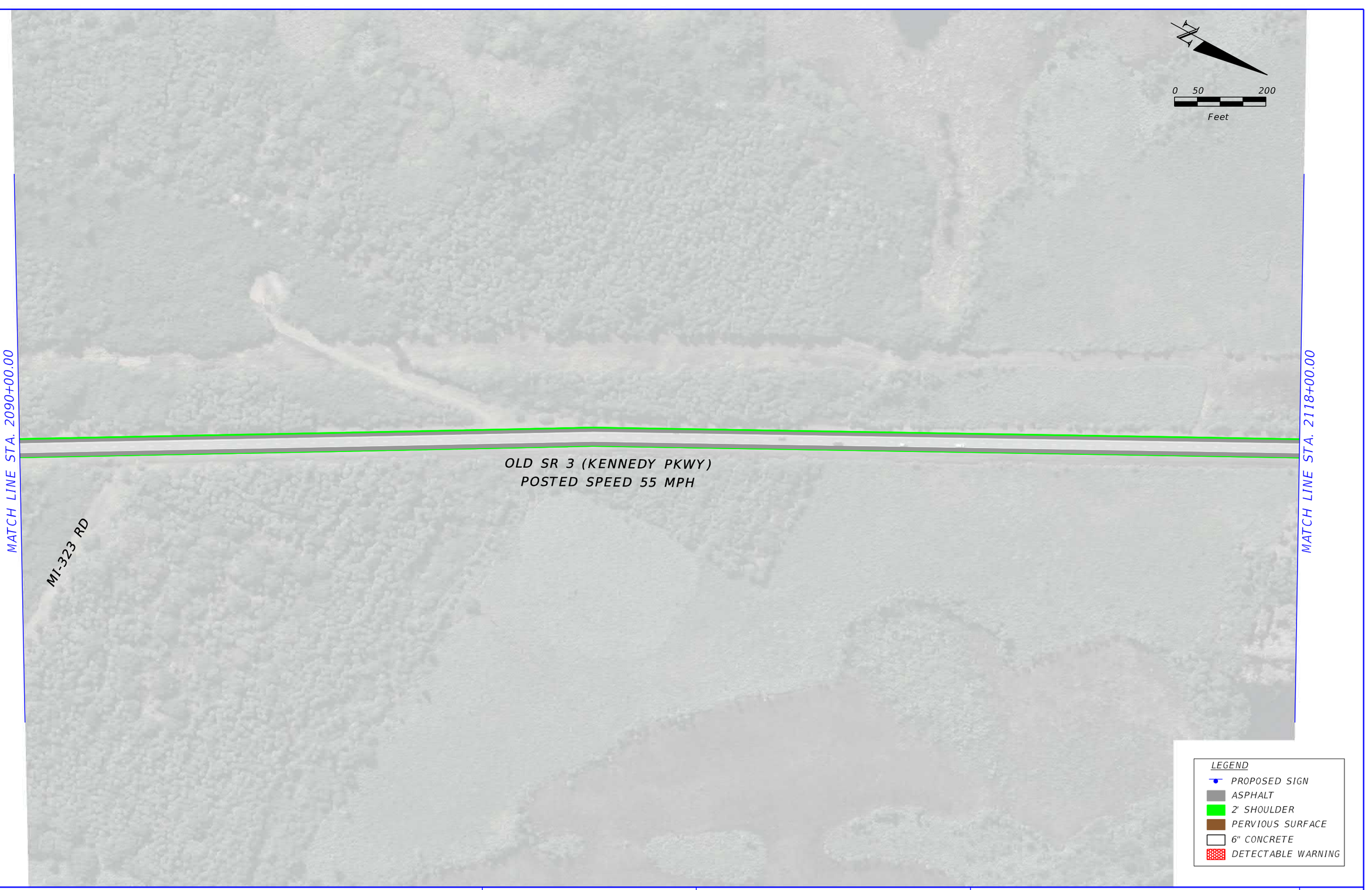
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 04)

SHEET NO.
49



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NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 05)

SHEET NO. 50

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NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 06)

SHEET NO. 51

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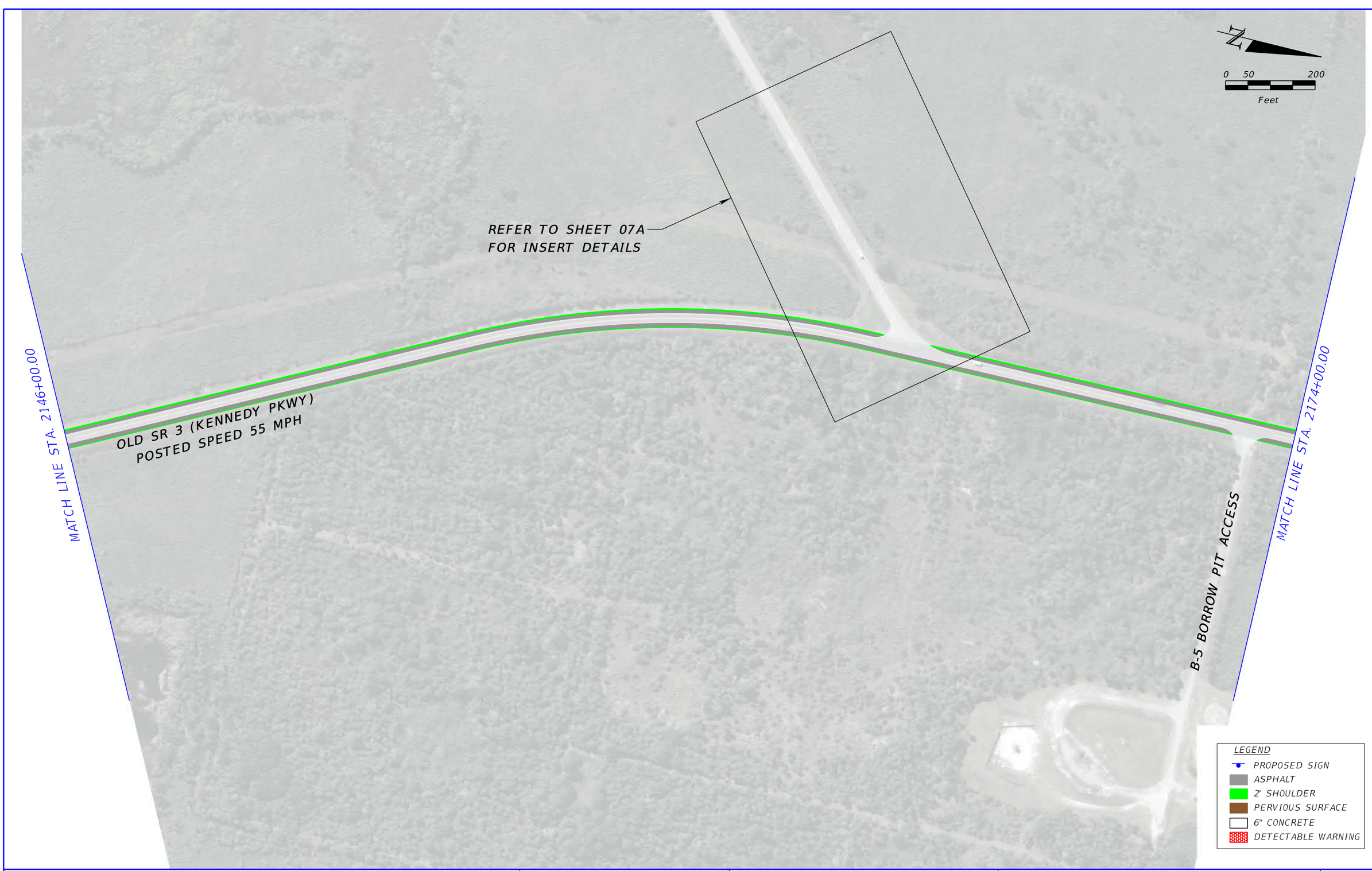

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NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 07)

SHEET NO. 52

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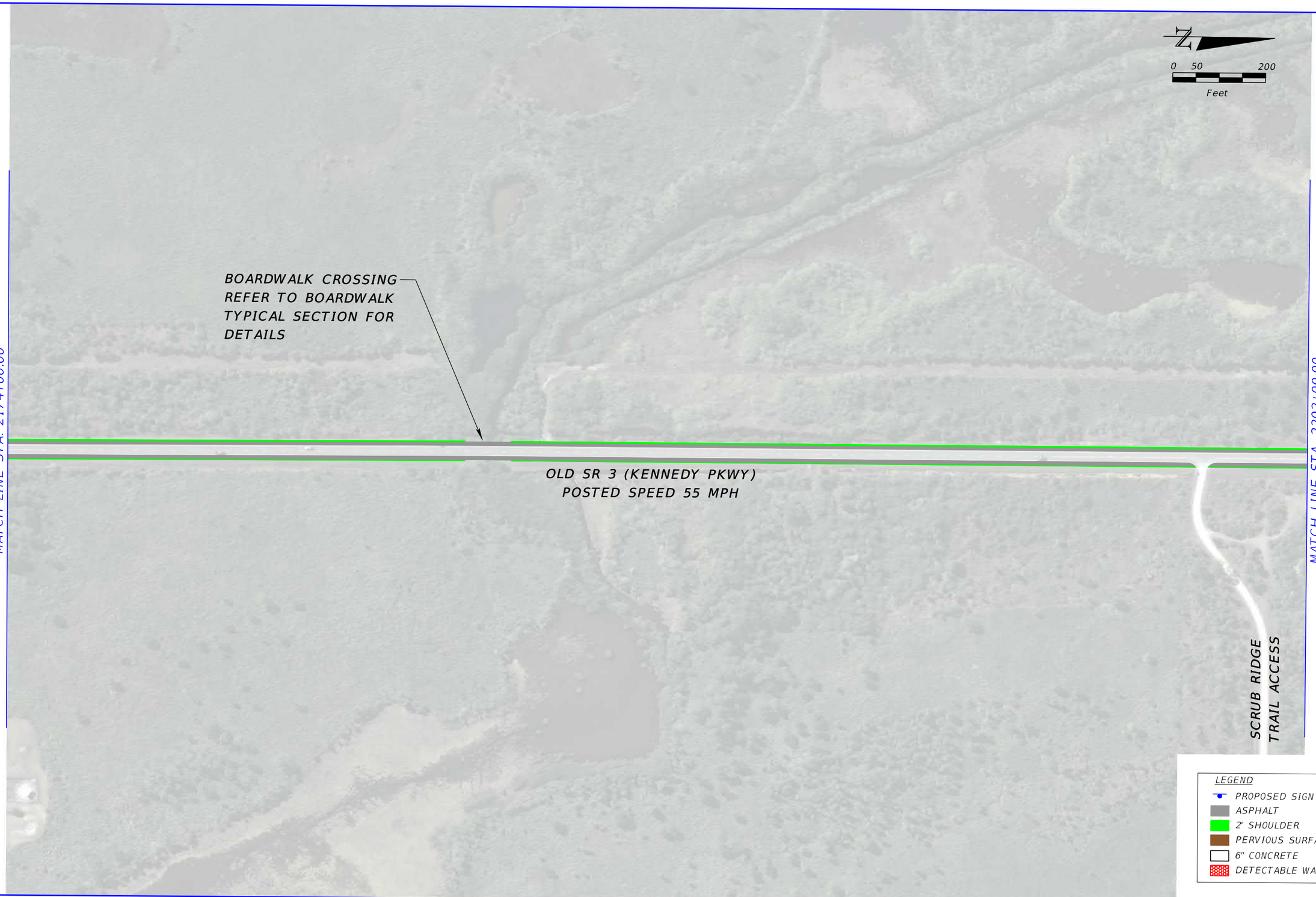
NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 07A)

SHEET NO. 53



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NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 08)

SHEET NO. 54

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Kimley-Horn and Associates, Inc.
Certificate Of Authorization No. 696
Michael Garau, P.E.
P.E. License No. 60715
189 South Orange Avenue, Suite 1000
Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 09)

SHEET NO. 55

REVISIONS			
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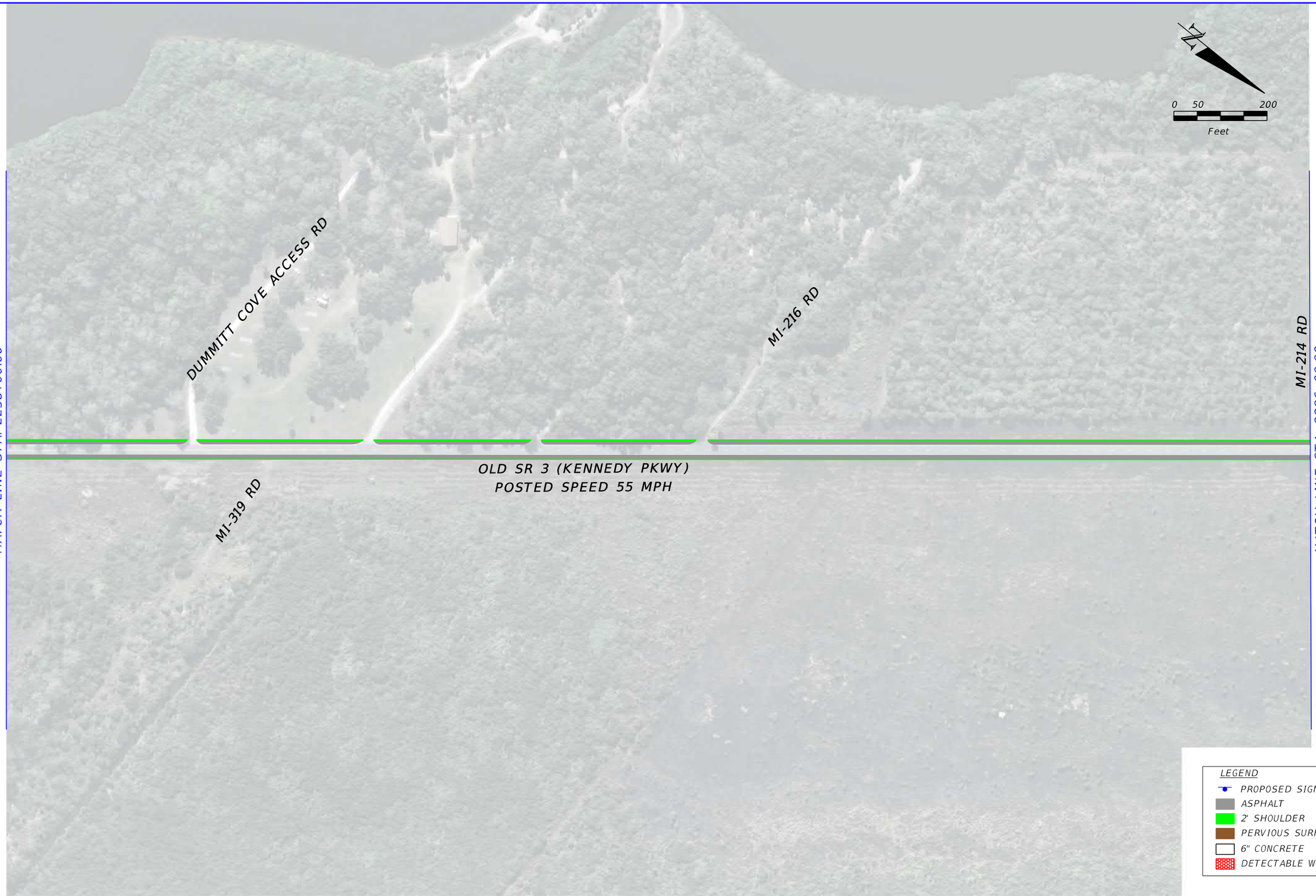
Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 10)

SHEET NO. 56



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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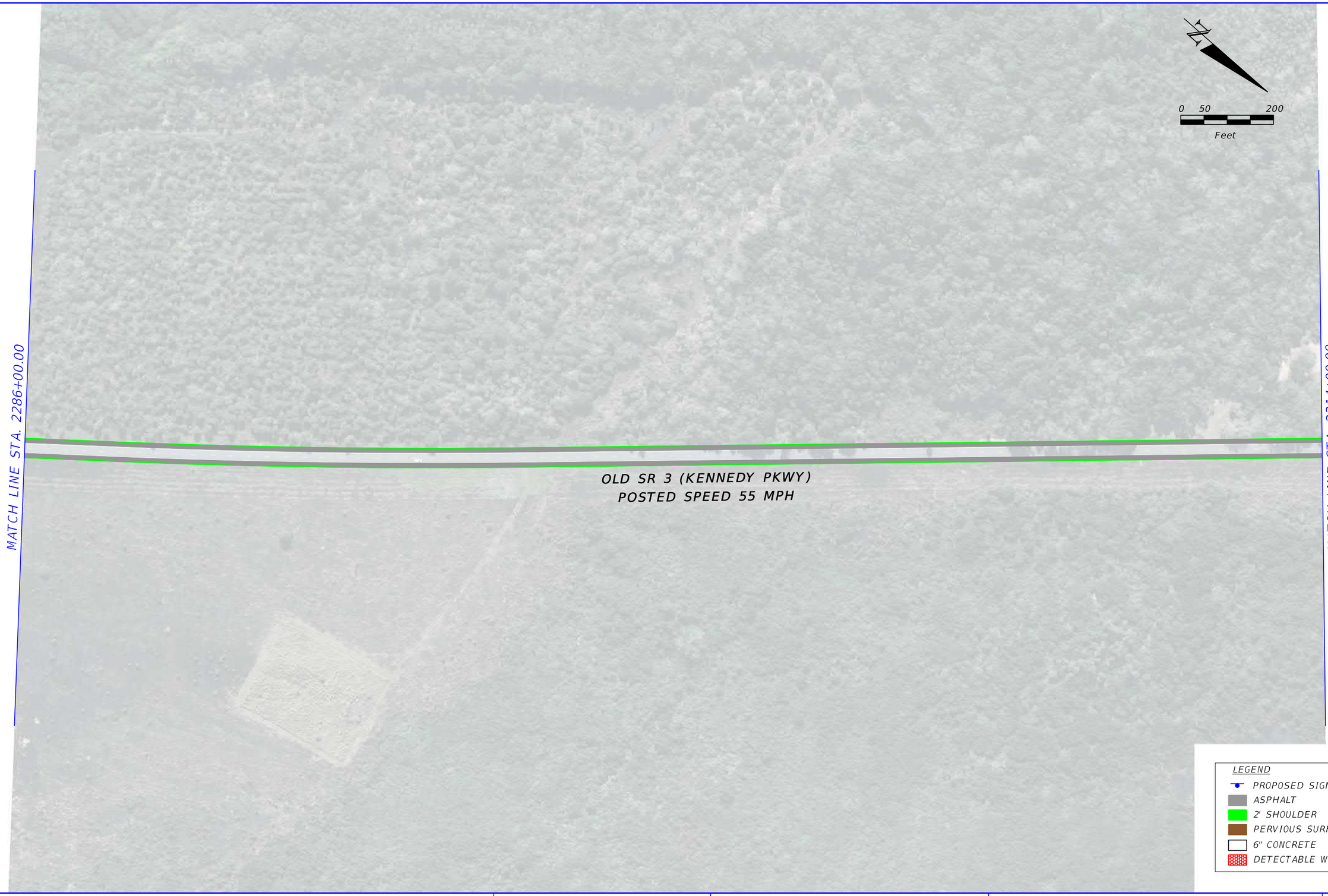
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 11)

SHEET NO. 57



REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 12)

SHEET NO. 58

REVISIONS			
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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 13)

SHEET NO. 59

REVISIONS			
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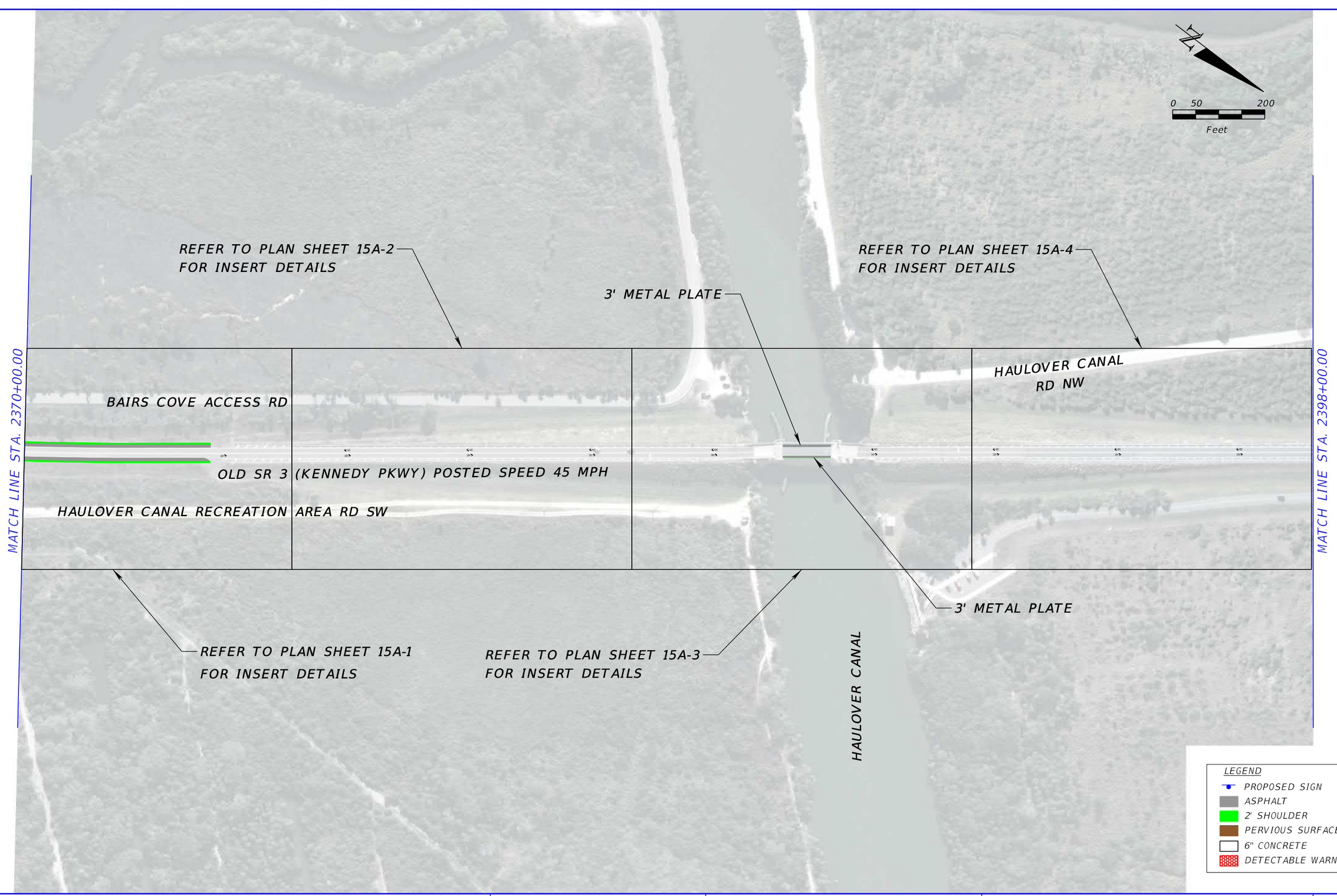
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 14)

SHEET NO.
60



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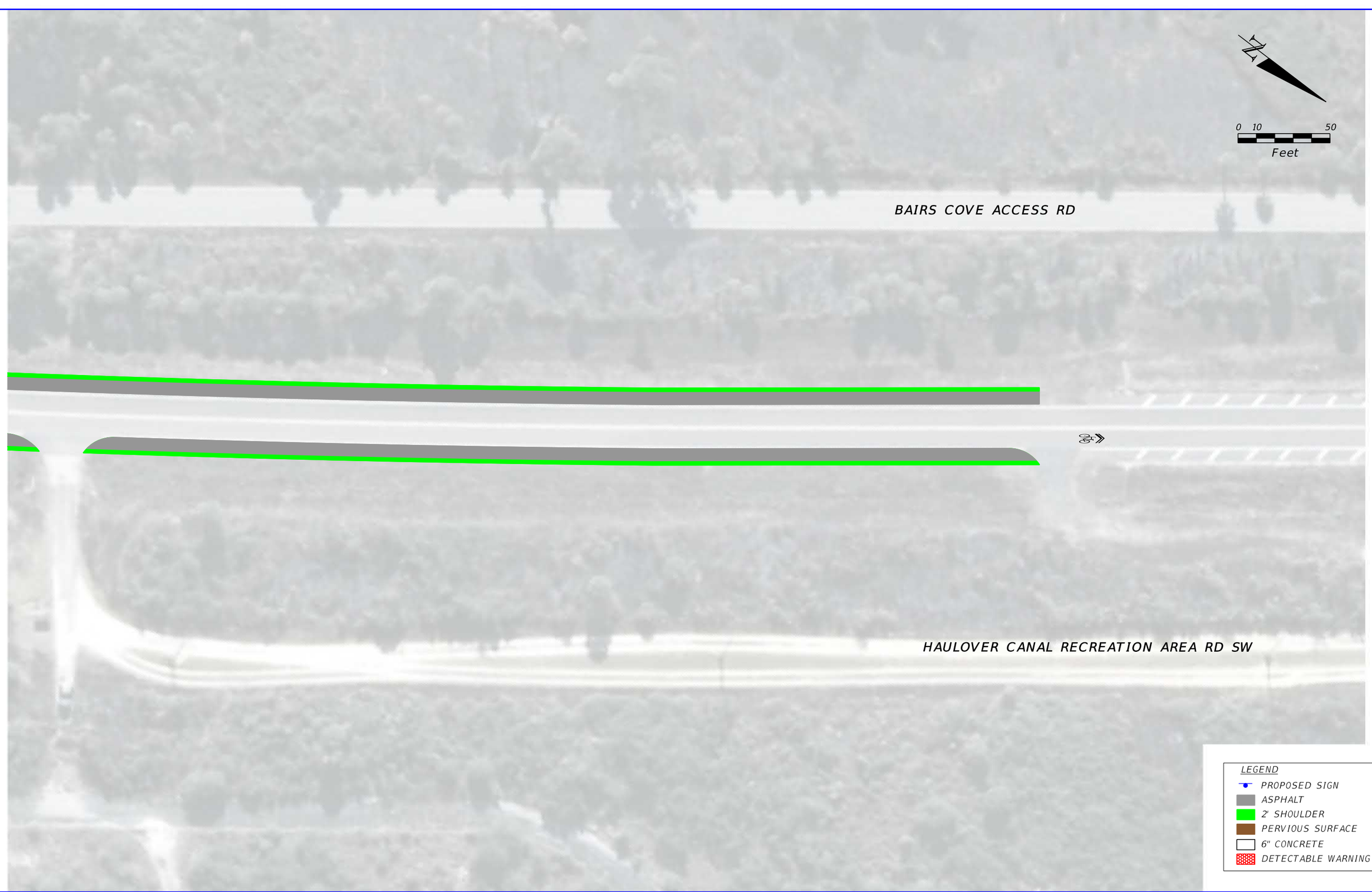
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 15)

SHEET NO. 61



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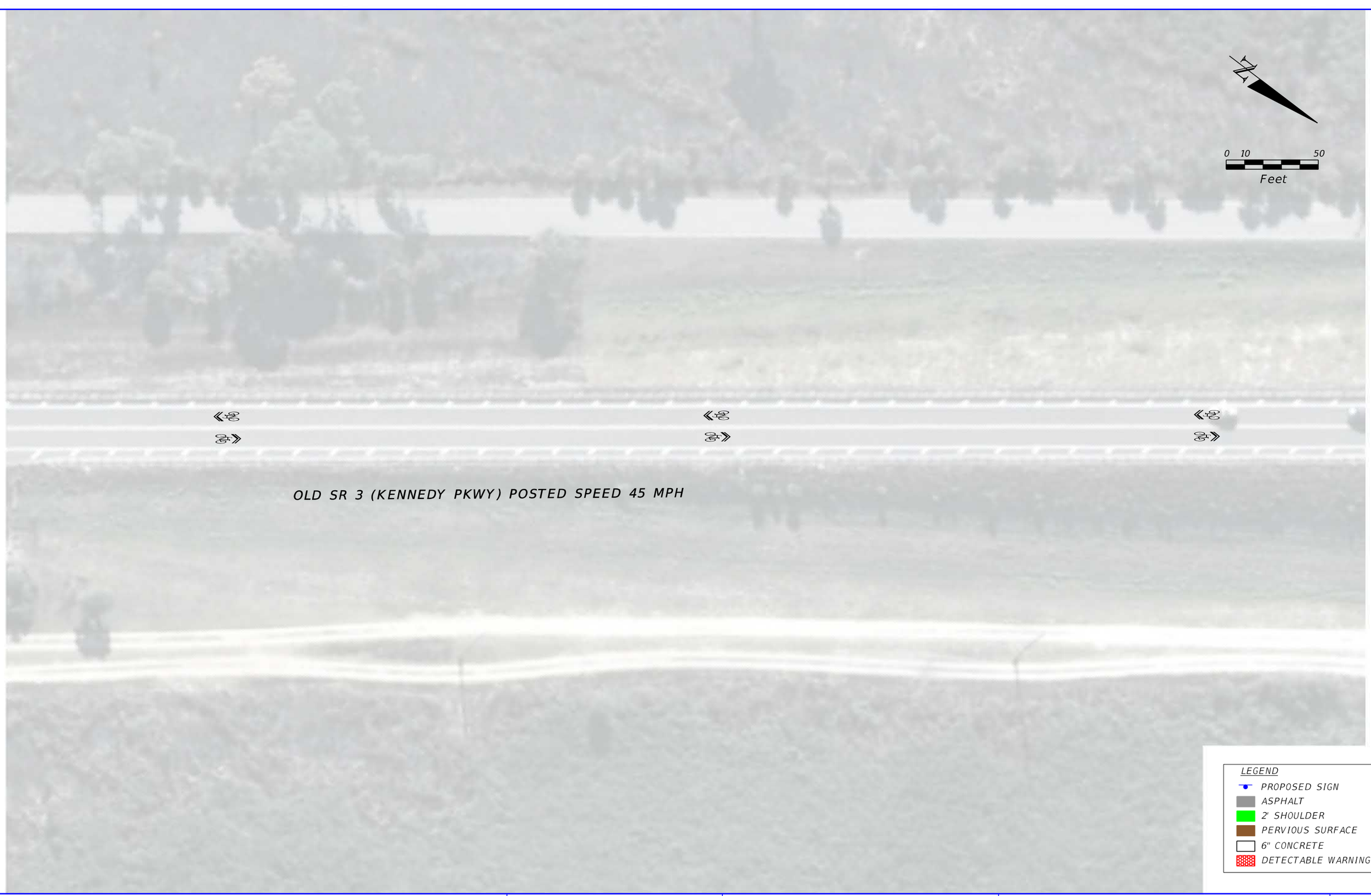
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 15A-1)

SHEET NO.
62

Spencer.Edwards 3/30/2020 7:05:13 AM K:\ORL_Roadway\149753000_Space Coast Trail PD&E\Engineering\43709312201\roadway\Prefered Alternative\Plan Sheets\Plans_NS



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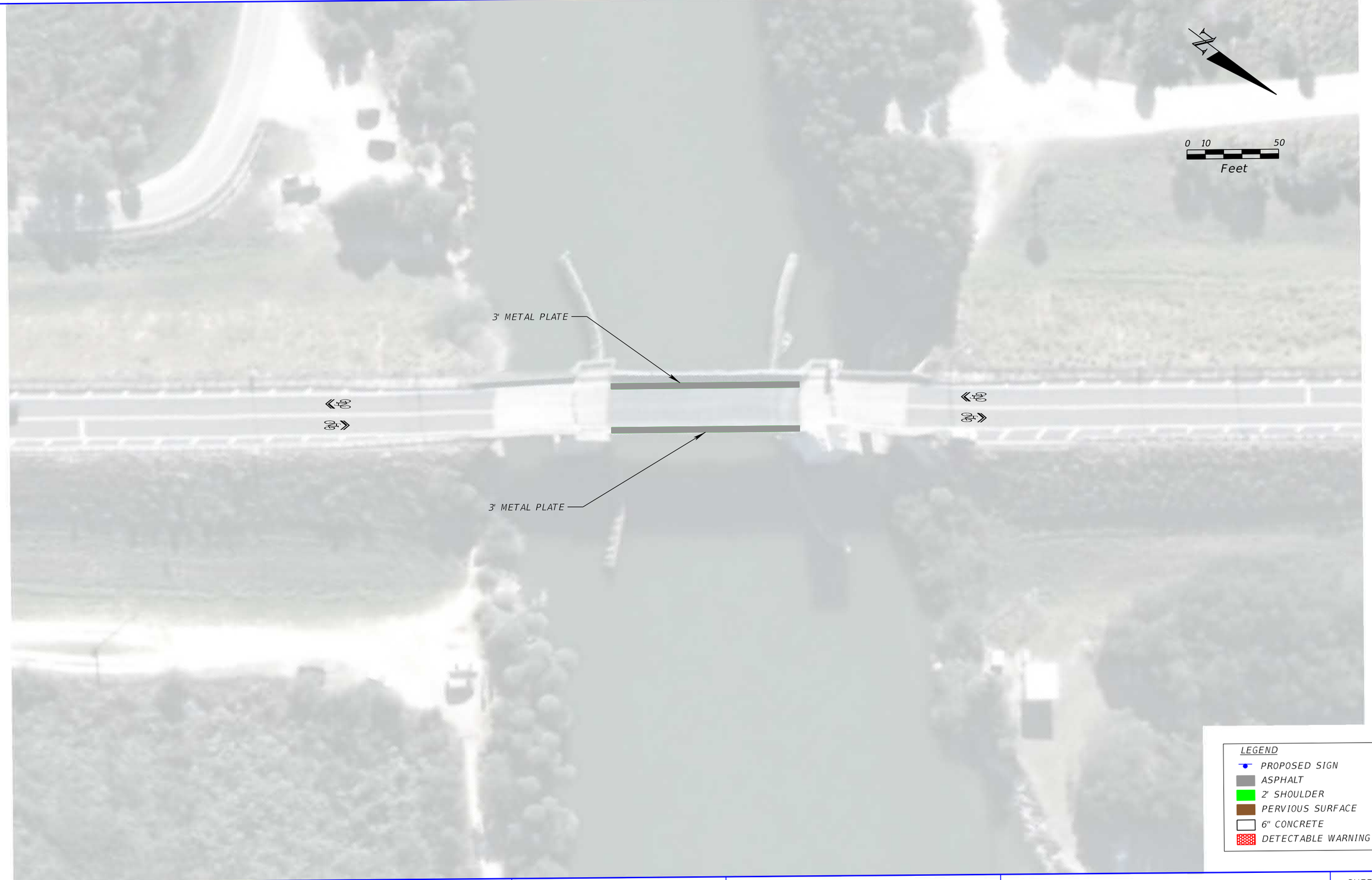
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 15A-2)

SHEET NO.
63



REVISIONS			
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Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 15A-3)

SHEET NO. 64

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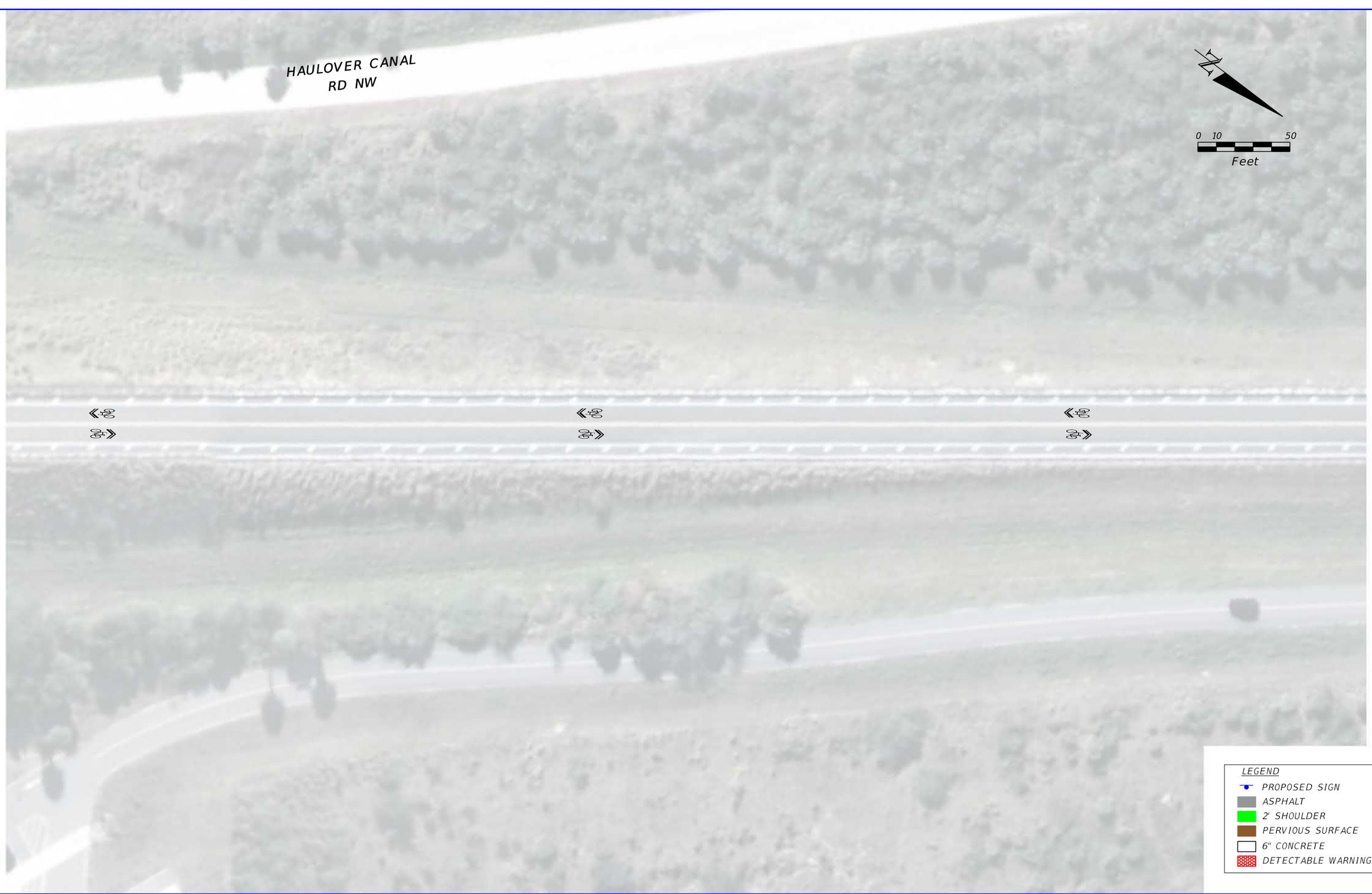

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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Michael Garau, P.E.
P.E. License No. 60715
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 15A-4)

SHEET NO.
65

N

0 50 200

Feet

END NORTH - SOUTH - 1 MINWR
PREFERRED ALTERNATIVE

BEGIN NORTH - SOUTH - 2 MINWR
PREFERRED ALTERNATIVE

HAULOVER CANAL RD NW

MATCH LINE STA. 2398+00.00

OLD SR 3 (KENNEDY PKWY)
POSTED SPEED 45 MPH

MATCH LINE STA. 2426+00.00

REFER TO PLAN SHEET 16A-1
FOR INSERT DETAILS

LEGEND

- PROPOSED SIGN
- ASPHALT
- 2' SHOULDER
- PERVIOUS SURFACE
- 6" CONCRETE
- DETECTABLE WARNING

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Kimley-Horn and Associates, Inc.
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Michael Garau, P.E.
P.E. License No. 60715
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Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 16)

SHEET NO.
66

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 1 MINWR PREFERRED ALTERNATIVE (PLAN 16A)

SHEET NO.
67

REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH -2 MINWR PREFERRED ALTERNATIVE PROJECT LAYOUT (06)

SHEET NO. 68

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE PROJECT LAYOUT (07)

SHEET NO. 69

END NORTH - SOUTH - 1 MINWR
PREFERRED ALTERNATIVE

BEGIN NORTH - SOUTH - 2 MINWR
PREFERRED ALTERNATIVE

HAULOVER CANAL RD NW

MATCH LINE STA. 2398+00.00

OLD SR 3 (KENNEDY PKWY)
POSTED SPEED 45 MPH

MATCH LINE STA. 2426+00.00

REFER TO PLAN SHEET 16A-1
FOR INSERT DETAILS

N

0 50 200
Feet

LEGEND
- PROPOSED SIGN
- ASPHALT
- 2' SHOULDER
- PERVIOUS SURFACE
- 6" CONCRETE
- DETECTABLE WARNING

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 01)

SHEET NO.
70

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 02)

SHEET NO. 71

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 03)

SHEET NO. 72

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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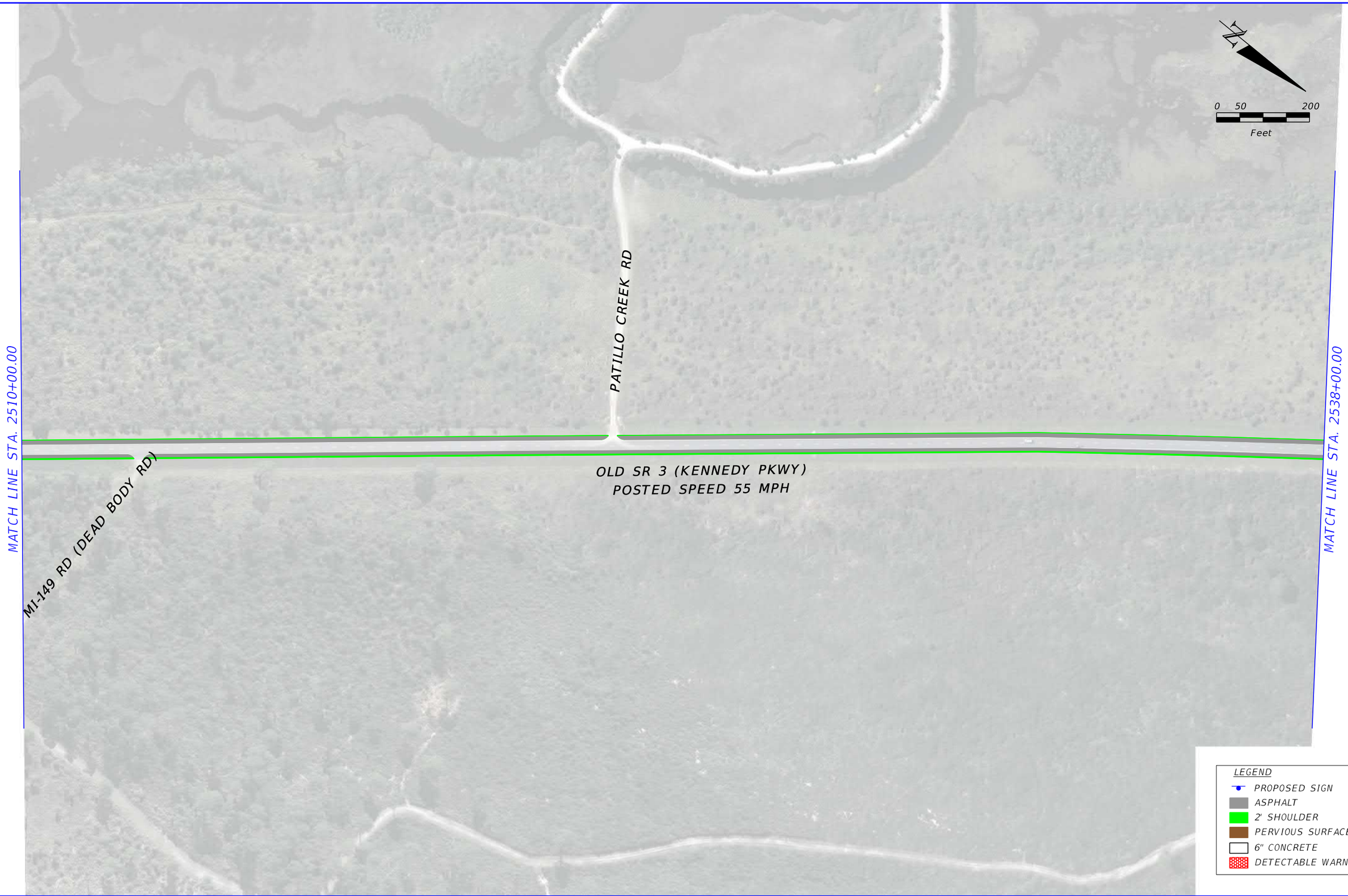
Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 04)

SHEET NO. 73



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 05)

SHEET NO.
74

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 06)

SHEET NO.
75

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 07)

SHEET NO.
76

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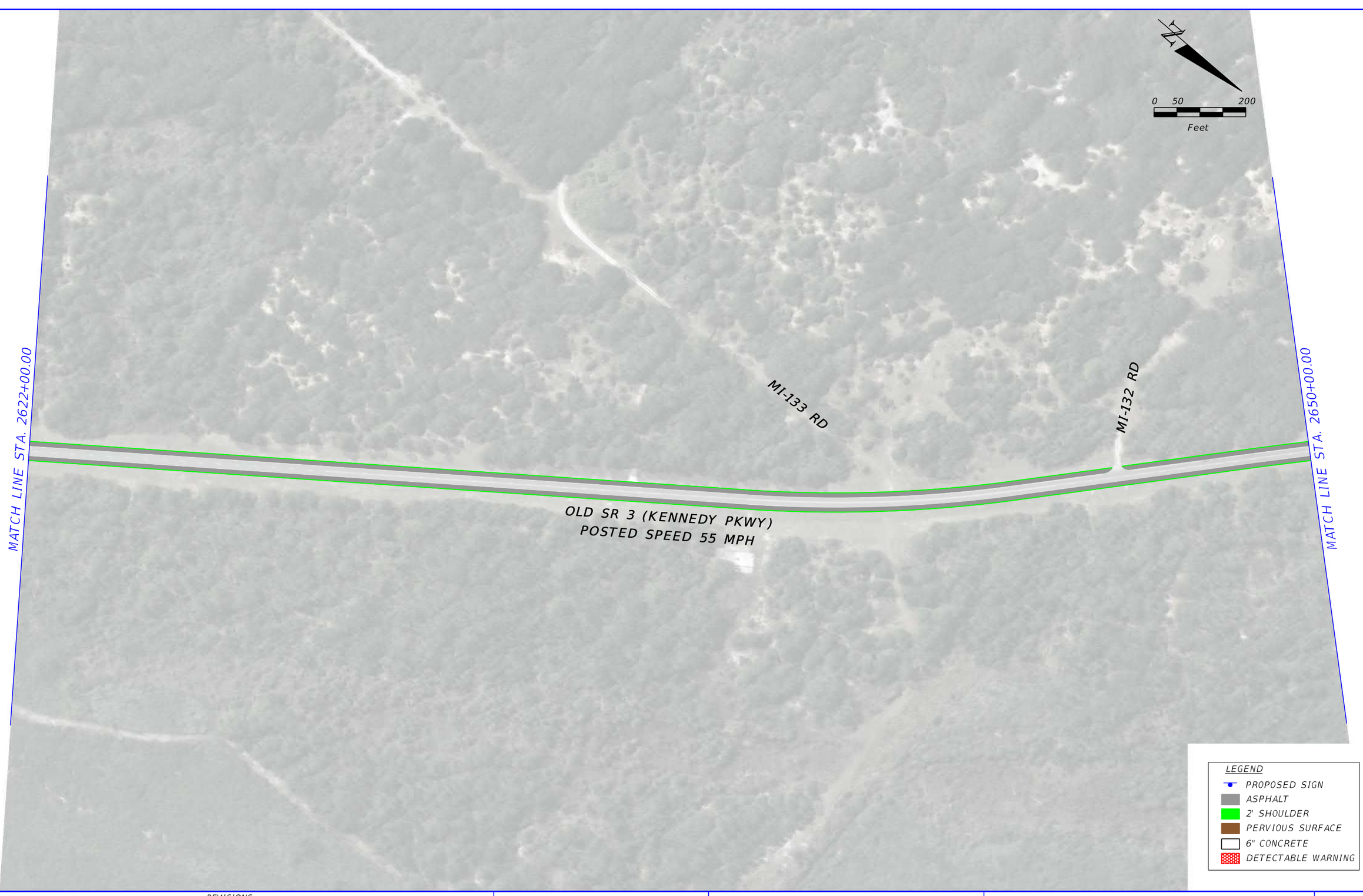
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 08)

SHEET NO.
77



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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 09)

SHEET NO. 78

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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 10)

SHEET NO. 79

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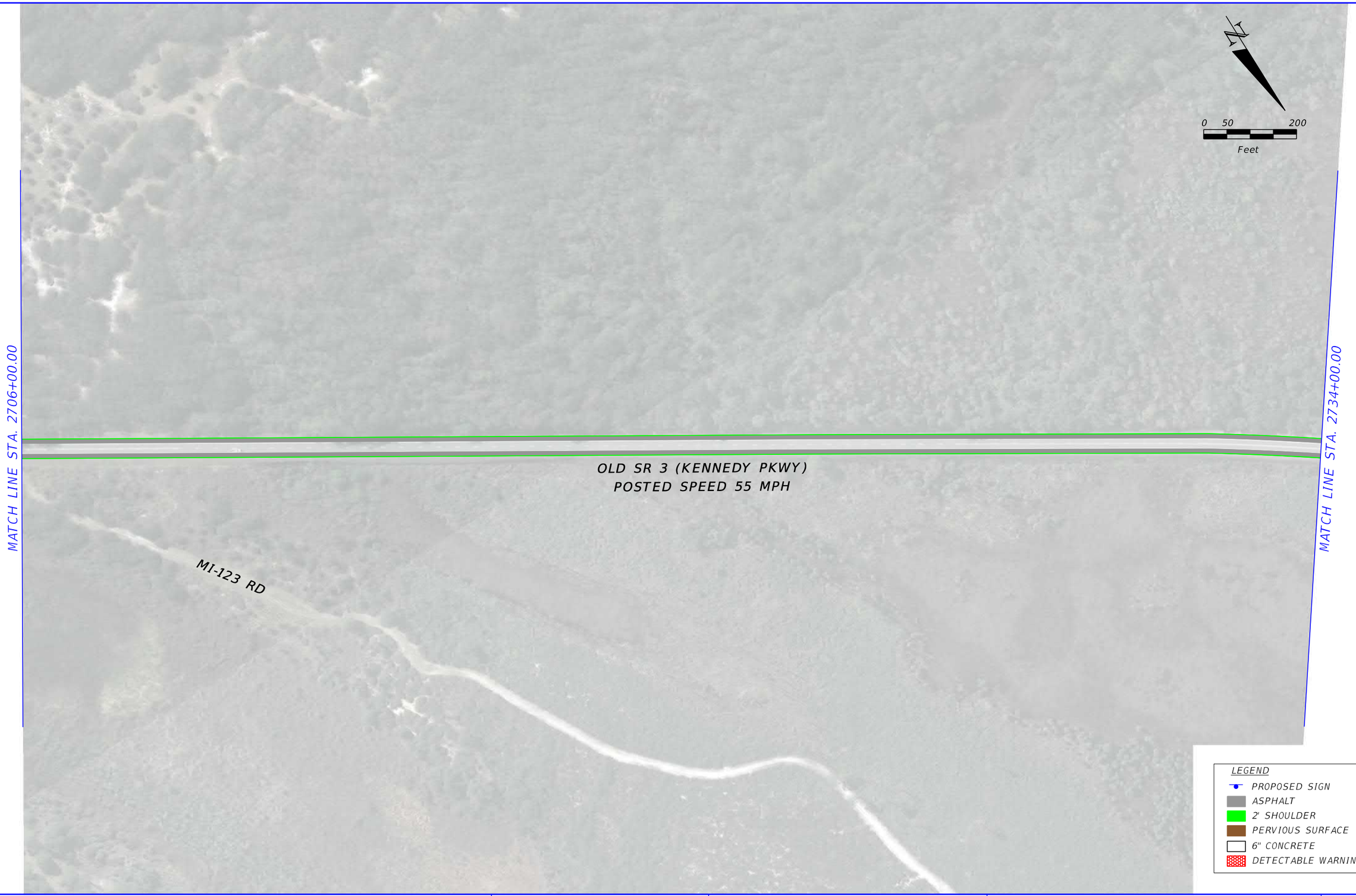
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 11)

SHEET NO. 80



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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 12)

SHEET NO.
81

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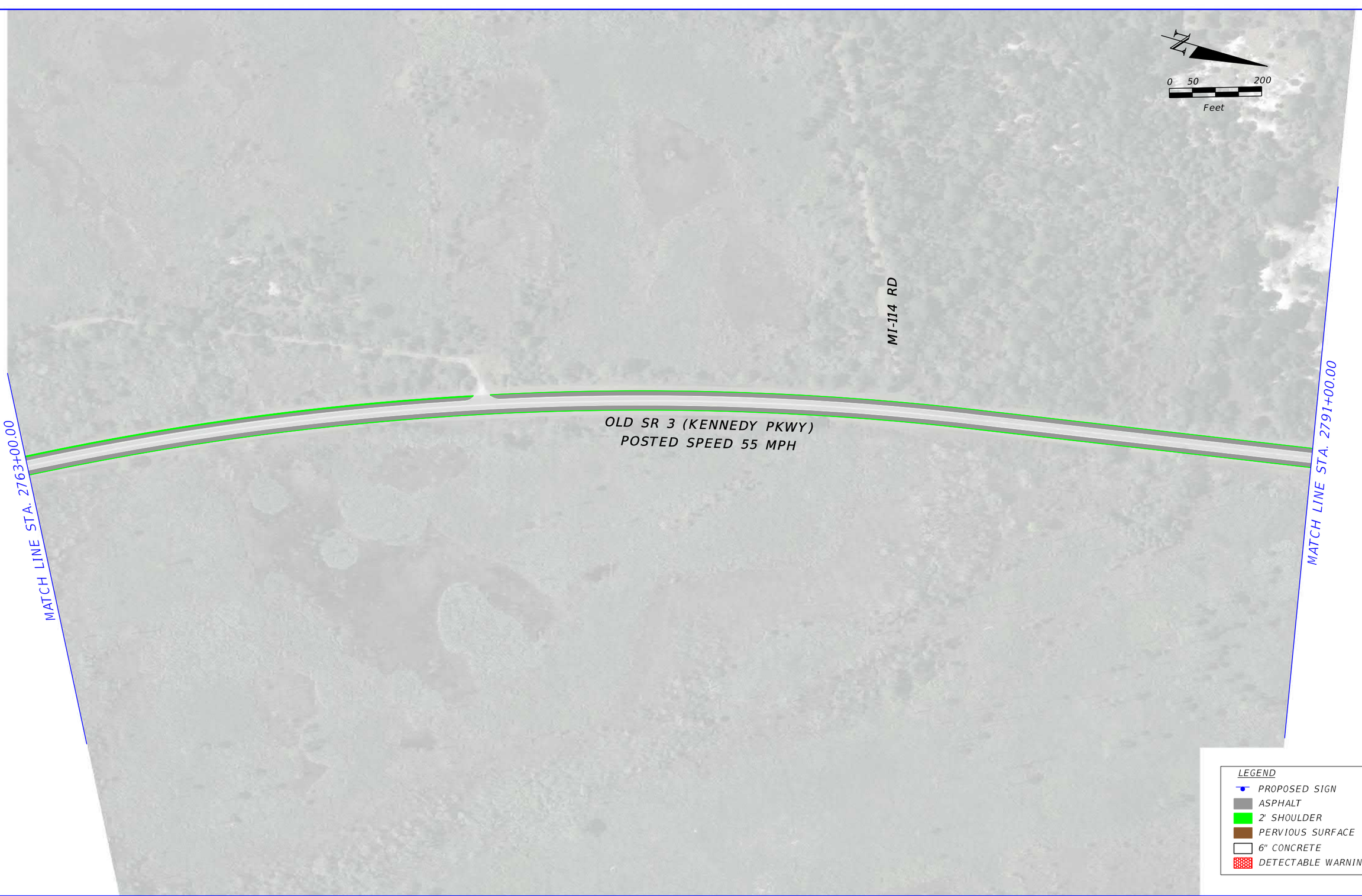
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 13)

SHEET NO. 82



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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 14)

SHEET NO. 83

MI-110 RD (POWERLINE RD)

MATCH LINE STA. 2791+00.00

MATCH LINE STA. 2820+00.00

OLD SR 3 (KENNEDY PKWY)
POSTED SPEED 55 MPH

N

0 10 50
Feet

LEGEND
- PROPOSED SIGN
- ASPHALT
- 2' SHOULDER
- PERVIOUS SURFACE
- 6" CONCRETE
- DETECTABLE WARNING

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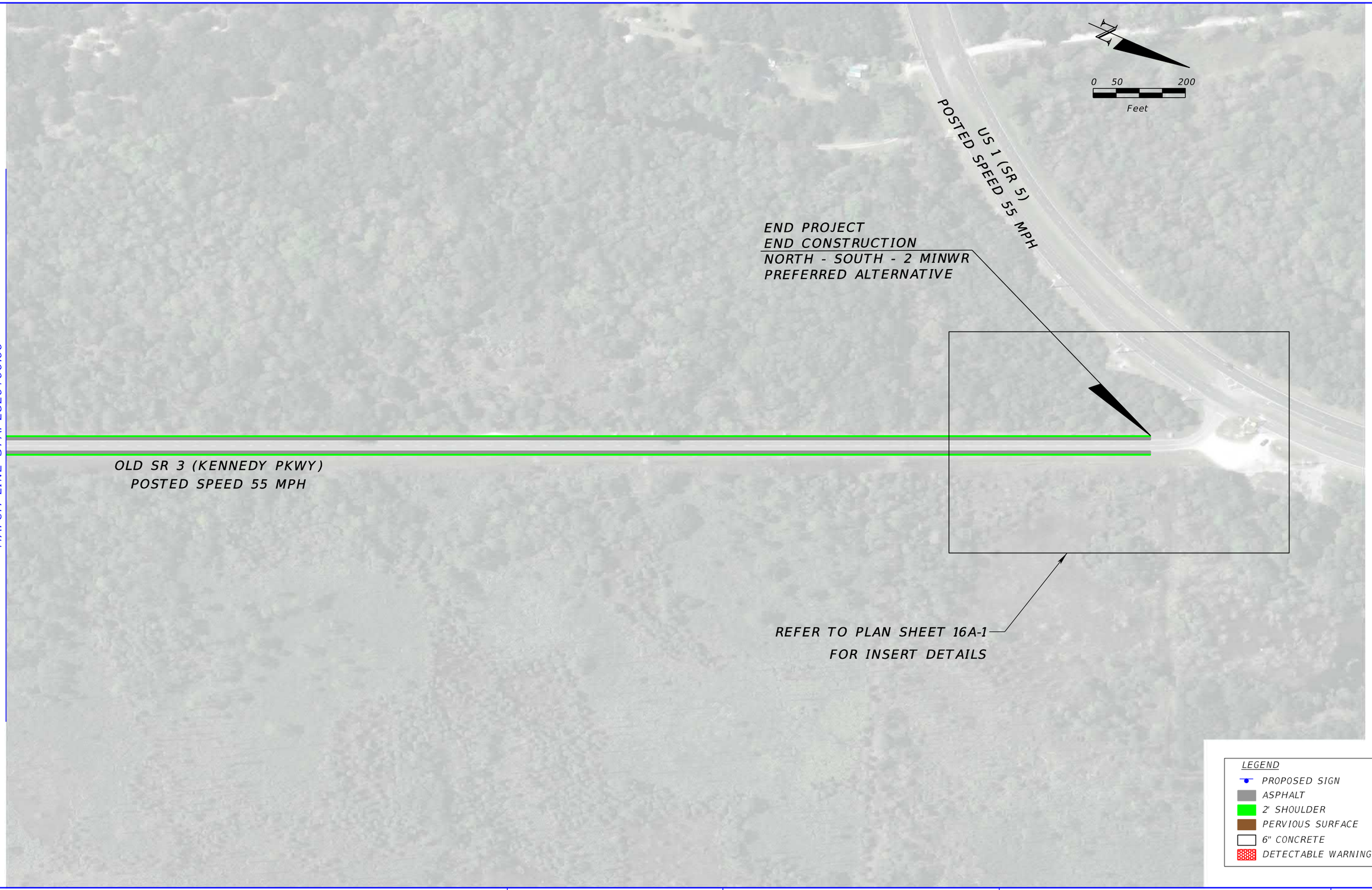
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR
PREFERRED ALTERNATIVE
(PLAN 15)

SHEET NO.
84



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 16)

SHEET NO. 85

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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Orlando, Florida 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BREVARD VOLUSIA	437093-1-22-01

NORTH - SOUTH - 2 MINWR PREFERRED ALTERNATIVE (PLAN 16A)

SHEET NO.
86

Appendix C:
Approved Typical Section Package for E-W Segment

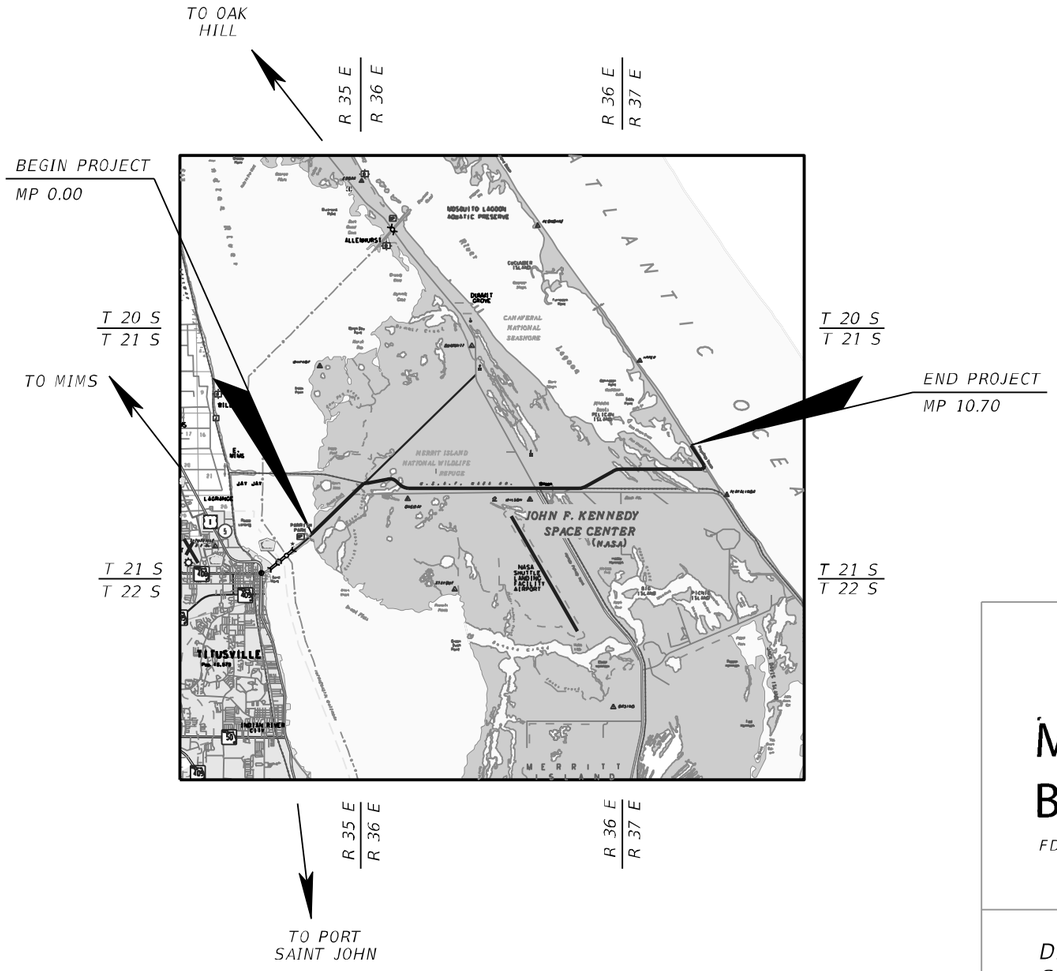
STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 437093-1-22-01

BREVARD COUNTY (70160)



APPROVED BY:

SHARI K. BARNWELL
No 71357
STATE OF FLORIDA
PROFESSIONAL ENGINEER

THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY:

Shari K Barnwell

Date: 2019.12.02 09:47:17 -05'00'

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON THE ELECTRONIC DOCUMENTS.

KIMLEY-HORN AND ASSOCIATES, INC.
189 SOUTH ORANGE AVENUE, SUITE 1000
ORLANDO, FLORIDA 32801
CERTIFICATE OF AUTHORIZATION: 00000696
SHARI K. BARNWELL, P.E. NO. 71357

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

TYPICAL SECTION PACKAGE

TYPICAL SECTION CONCURRENCE

Mario J Bizzio — Digitally signed by Mario J Bizzio Date: 2020.02.13 09:24:33 -05'00'

FDOT DISTRICT DESIGN ENGINEER

FDOT DISTRICT STRUCTURES DESIGN ENGINEER

FHWA TRANSPORTATION ENGINEER

DESIGN SPEED AND POSTED SPEED CONCURRENCE:

FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER

Mario J Bizzio — Digitally signed by Mario J Bizzio Date: 2020.02.13 09:24:48 -05'00'

FDOT DISTRICT DESIGN ENGINEER

CONTEXT CLASSIFICATION CONCURRENCE:

loreen.bobo@dot.state.fl.us — Digitally signed by: loreen.bobo@dot.state.fl.us DN: CN = loreen.bobo@dot.state.fl.us Date: 2020.02.24 09:17:18 -05'00'

FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER

SHEET NO.
1

11/4/2019 11:01:30 AM

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(X)	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
( )	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
( )	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
( ) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
(X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

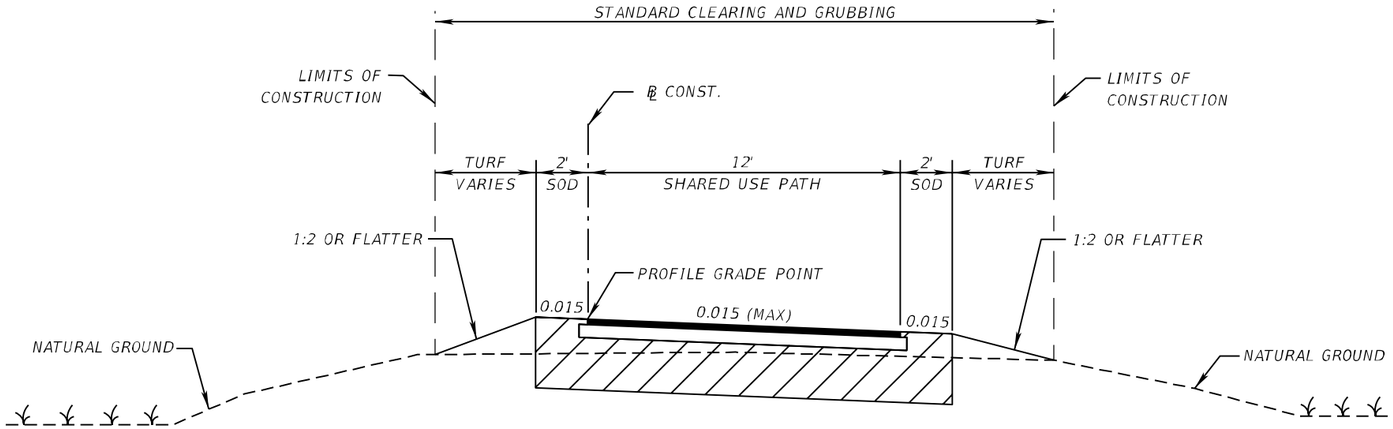
( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 1



TYPICAL SECTION
SHARED USE PATH
EAST - WEST MINWR

ALONG DIKE T-10A, PUMP HOUSE SERVICE ROAD,
AND DIKE T-10F (M.P. 0.00 TO M.P. 1.80)

ALONG THE NORTHSIDE OF NASA RAILROAD
CORRIDOR FROM EAST OF SR 406 (M.P. 4.20) TO
WEST OF KENNEDY PARKWAY (M.P. 5.60)

FINANCIAL PROJECT ID	SHEET NO.
437093-1-22-01	2

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

(X)	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
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FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
( )	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
( ) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
(X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

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( ) 7 - BOTH MEDIAN TYPES

CRITERIA

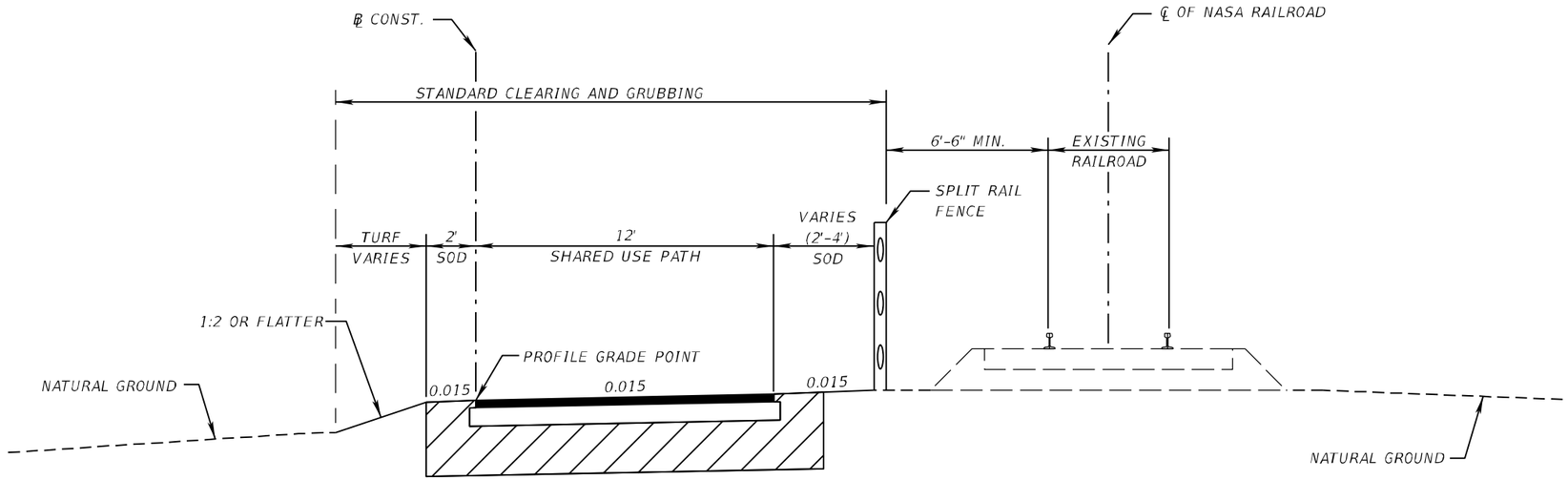
(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

1. LATERAL OFFSET

TYPICAL SECTION No. 2



TYPICAL SECTION
SHARED USE PATH
EAST - WEST MINWR

ALONG NORTH SIDE OF NASA RAILROAD CORRIDOR
FROM SR 406 (M.P. 1.80) TO EAST OF SR 406 (M.P. 4.20)

ALONG NORTH SIDE OF NASA RAILROAD CORRIDOR
FROM WEST OF KENNEDY PARKWAY NORTH (M.P. 5.60)
TO EAST OF KENNEDY PARKWAY NORTH (M.P. 6.90)

FINANCIAL PROJECT ID	SHEET NO.
437093-1-22-01	3

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(X)	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
( )	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
( )	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
( ) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
(X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
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( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

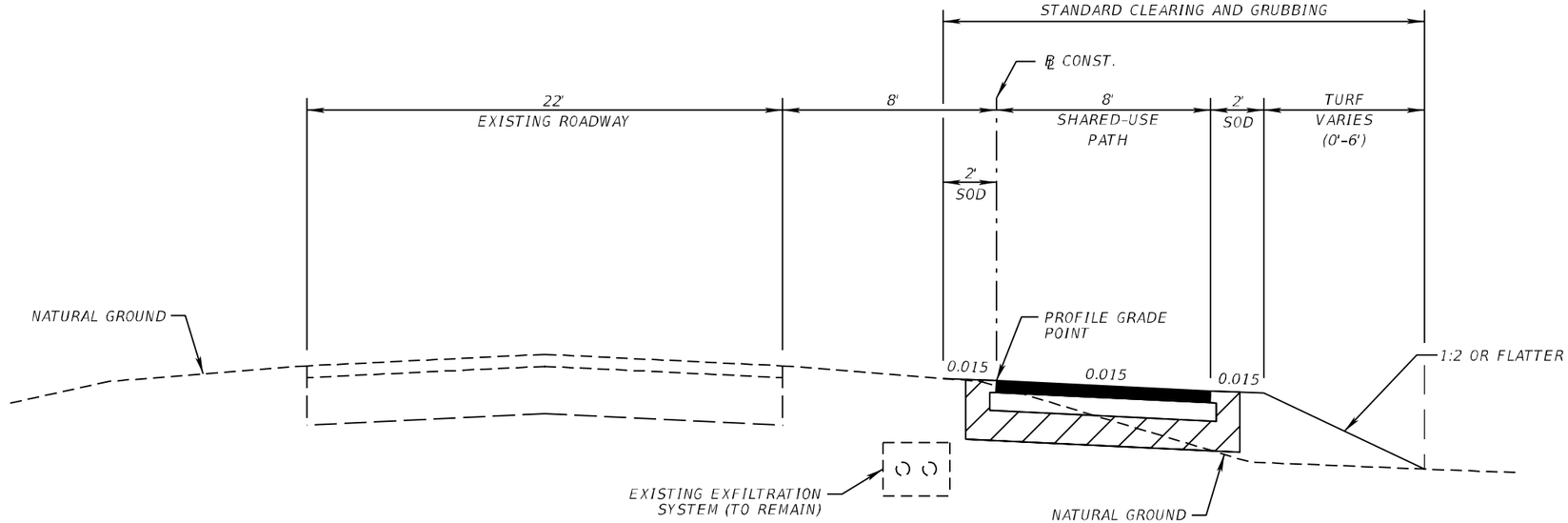
(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

1. SHARED-USE PATH WIDTH

TYPICAL SECTION No. 3



TYPICAL SECTION
SHARED USE PATH
EAST - WEST CANA

ALONG SOUTH SIDE OF PLAYALINDA BEACH ROAD
FROM THE NASA RAILROAD CROSSING AT SR 402
(M.P. 6.90) TO THE INTERSECTION OF BEACH ROAD
AND PATROL ROAD (M.P. 10.40)

FINANCIAL PROJECT ID	SHEET NO.
437093-1-22-01	4

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(X)	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
( )	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
( )	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

- ( ) NATIONAL HIGHWAY SYSTEM
- ( ) STRATEGIC INTERMODAL SYSTEM
- ( ) STATE HIGHWAY SYSTEM
- (X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- ( ) 1 - FREEWAY
- ( ) 2 - RESTRICTIVE w/Service Roads
- ( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- ( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- ( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- ( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- ( ) 7 - BOTH MEDIAN TYPES

CRITERIA

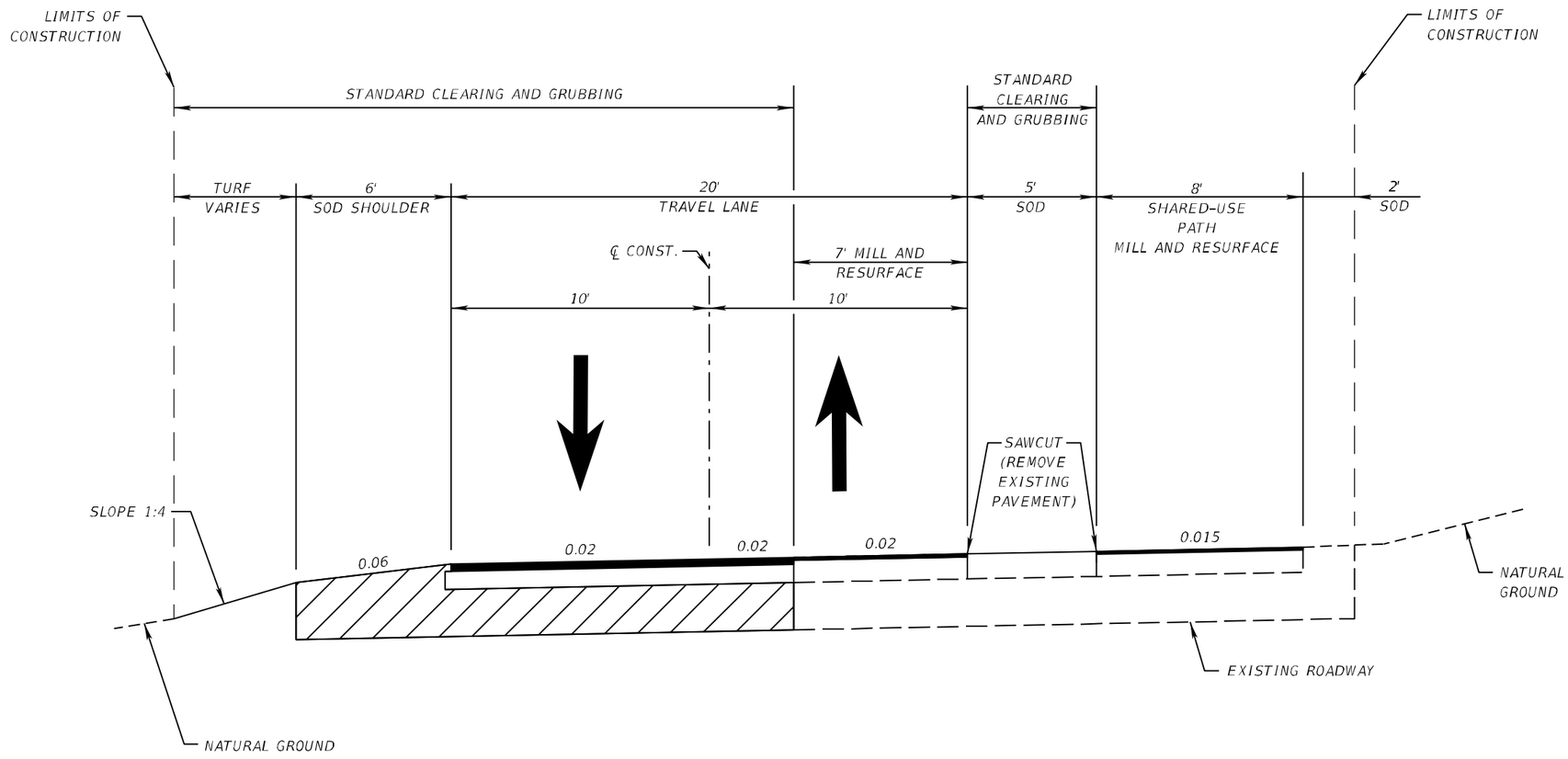
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- ( ) RESURFACING (LA FACILITIES)
- ( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

1. SHARED-USE PATH WIDTH

TYPICAL SECTION No. 4



TYPICAL SECTION
SHARED USE PATH
EAST - WEST CANA

BETWEEN THE INTERSECTION OF
BEACH ROAD AND PATROL ROAD
(M.P. 10.40) TO PARKING AREA
NO. 1 (M.P. 10.70)

FINANCIAL PROJECT ID	SHEET NO.
437093-1-22-01	5

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